CA 7 Cross-Platform Scheduling
Now and the Future

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Abstract

CA 7 has improved methods for controlling workload across the enterprise. Cross-platform scheduling includes sending jobs to UniCenter Agents (XPJOB). With r11.3 CA 7 will also be able to leverage the power of a new class of CA Workload Automation Agents (AGJOBs). With CA WA Agents, different job types aimed at different environments are supported such that more of your enterprise can be supported from the CA 7 system. Come learn more ways to control Workload Automation within your enterprise.
Agenda

> Past, Present, and Future
> Cross-platform Scheduling with CA Workload Automation
  Universal Agents
> Cross-platform Scheduling with CA Workload Automation
  Agents
Cross-platform Past: CA7TOUNI

> CA 7 WA-defined JOB to execute JCL

> The z/OS batch job creates a string of data sent via CA CCI network to a CA Workload Automation Universal Agent, CA AutoSys® Workload Automation, or another CA mainframe scheduling manager (CA 7 WA, CA Scheduler® Job Management, CA Jobtrac™ Job Management)

> Upon batch completion, status goes to 7UWT status, waiting for job feedback

> Uses CA 7 WA Driver Proc to resolve appropriate JCL

> Will continue to be supported for downward compatibility
Present (r11.1) and Future (r11.3)

> CA7TOUNI continues to be supported:
  - Edit will always present edit session in Mixed Case mode
  - New keyword XPHAO=primaryname in support of the High Availability Option (HAO)
    - HAO must be supported by Agent

> XPJOB is first stage of internal cross-platform scheduling
  - Communicates via CA CCI network communications
  - Can replace CA7TOUNI jobs

> AGJOB is new option for cross-platform scheduling
  - Communicates via TCP/IP network communications
  - Used with CA Workload Automation Agents r11.3
JOB Screen Swap

> Screens may be swapped if user requests the “other” job type

- User lists a CPU job from XPJOB screen; result is CPU job display on JOB (DB.1) screen
- User lists an XPJOB from a JOB screen; result is XPJOB job display on XPJOB(DB.10) screen
- User may delete jobs from either screen
- User may only request update from the same job-type screen (CPU JOB = DB.1, XPJOB= DB.10, AGJOB = DB.11)

> Use LJCK command to validate cross-platform parameter data
Cross-platform Scheduling with CA Workload Automation Universal Agents
**XPJOB: Cross-Platform Internalisation**

- Eliminate the need of CA7TOUNI z/OS batch job to submit request to another platform
- Provide better job routing abilities by dynamically altering target node based on availability
- Provide automatic retry if communication failure
- Provide better protection of the user ID and password data sent to the target node
- Provide a high-availability option (HAO or failover) for XPJOB and CA7TOUNI job tracking if CA 7 fails
- CA7TOUNI will continue to be supported
XPJOB Definition: DB.10 or XPJOB

Function: LIST (Add, DD, Delete, DELPRRN, Format, List, Purge, Update)

Job: EROCTST1

System: EROCSYS    JOBNET: Owner: UID: 0
XP Node: EROCTST
XP EXEC: cau9test.exe

XP PARM:

Optional PARMLIB: Member:
EXEC: Y    SUTYPE: Y    Cond-Code: 0    RO: 0    DRClass:
Hold: N    Verify: N    Satisfaction Lead Time: 0    ARFSET:
Clock Time: 0000    WLBClass: A    WLBPRTY: 000    Trace: N
Don't Schedule Before: 00000 0000    After: 99999 0000    Retain: N

PROGRAM: SM22    MSG-INDX: 00    -- DB.10    -- 07.072 / 14:34:15
MESSAGE: LIST SUCCESSFUL
XPJOB PARM Data

PARMLIB is equivalent to JCLLIB and supports numeric JCLID as well as JCL Index (&-)

- In PARMLIB:
  - PARM1= through PARM64=
  - SUBUSER=, SUBPASS=, DOMAIN=
  - LINELEN={AUTO|72|80}
  - DPROC= to name the standard DPROC

Use the LJCK command to validate the XPJOB information that will be used to build the buffer that will be sent to the remote node

- DPROCs and Global Variables are permitted in PARMLIB
XNODE (XN.1) Screen Format

------------- CA-7 XPS Node Table Entry -------------
Function: LIST (Add, Delete, Format, List, Update)

Node: TRODE05
Description: NODE USED FOR TESTING OF XPJ JOBS
Alternate 1:
Alternate 2:
State: ONLINE (Online, Offline, Stop)

PROGRAM: SMX1   MSG-INDX: 24   -- XN.1   --
MESSAGE: This is a Permanent Node

> Temporary Nodes are added because jobs routed to that agent and are not found in the database
Node States

> User Controlled:

- **ONLINE**: node is available to receive XPJOBs
- **OFFLINE**: this particular node is not available to receive XPJOBs from a CA 7 viewpoint
  - If alternate nodes are defined for this primary node, the XPJOB may be routed to the alternate node
- **STOP**: node and its alternates are not available to receive XPJOBs from a CA 7 viewpoint
  - XPJOB is requeued to the Request Queue

> CA 7 Controlled:

- **FAIL**: CA 7 tried to send an XPJOB but CCI returned errors
  - If alternate nodes are defined for this primary node, the XPJOB may be routed to the alternate node
- **XTRK**: Internal XTRK subtask is not active
XPJOB User ID and Password Control

> XPDEF,PSWDLOC= (\{DATABASE,NODE,OWNER,USER\})

- DATABASE uses Owner-Access record created as a result of XPSWD command
- NODE uses Node-Access record created as a result of XPSWD command
- OWNER uses the OWNER field of XPJOB (no password or domain allowed)
- USER uses PARMLIB member SUBUSER, SUBPASS, and DOMAIN keywords
XPSWD (XN.2) Command

------ CA-7 XPJOB User ID/Password Definition ------
Function: LIST         (Add, Delete, Format, List, Update)
Owner: TESTPSWD
or Node:

User ID: testpswd
Password:          (Password Present)
Reconfirm PSWD:
Domain Name:       (Windows platform)
XPJOB Topline Commands Overview

New Commands
> LNODE – List entries in XPJOB Node Table

Changed Commands
> LJOB – Select by type, node and list XPJOB data
> LQ – Select by type, status and list XPJOB data
> LPRRN – Select by type and list XPJOB data
> LRLOG – Select by type
> REQUEUE – Select by node
> CANCEL – Causes ‘kill’ request to be sent to target node
Internal Tracker and HAO

> CA 7 WA Cross-Platform Tracker (XTRK) currently runs as a subtask under CA7ICOM or as a separate address space

> With r11.1, XTRK may execute as a subtask in the CA7ONL address space

> Presence of XCKPT DD statement in CA7ONL JCL activates the internal XTRK

> XPJOB and the HAO option requires internal XTRK

> Commands passed to internal XTRK via /XTASK top-line command
Conversion Process

> The conversion process is used to convert existing CA7TOUNI cross-platform jobs to XPJOB-type jobs.

> Conversion consists of two components:

  - Conversion Utility is a batch process. It reads CA7TOUNI JCL members and creates the BTI commands.
  - CONVERT command is part of BTI deck created by the Utility. It changes the CA7TOUNI job to an XPJOB within CA 7 WA.

> Refer to Interfaces Reference Guide for process and assumptions

> Pre-conversion utility converts SYSIN DD data sets to in-stream data within CA7TOUNI jobs
Cross-platform Scheduling with CA Workload Automation Agents
Extending the Workload Automation Reach

> CA WA Agents r11.3 executes on a variety of platforms, such as UNIX, LINUX, Windows, i5/OS and more

> Agents includes various plug-ins to support applications such as SAP, Oracle, Data Base, Applications and more

> Uses TCP/IP to communicate between systems

> Supports AES encryption for communications
AGJOB Job Types

> General system agent job types for UNIX, LINUX, and Windows (UNIX_JOB, NT_JOB)
> Utility job types such as FTP Transfer (FTP_JOB) and File Trigger (FILE_TRIGGER)
> Data base tasks (SQL_JOB, DBSP_JOB, DB_TRIG, DB_MON)
> ERP Applications such as SAP, Oracle, and People Soft
> Monitors (CPU, DISK, IP, PROCESS, TEXT, EVENTLOG, SERVICE)
> Application Services for Java and J2EE and Web Services and SNMP and more!
CA Integrated Agent Services (IAS)

> CA IAS, a new component, to:
  - Handle TCP/IP communications to agents
  - Parse statements to build message sent to agent
  - Decode returned messages

> Separate FMID – CIAS100

> Documentation (3 manuals) included on CA Workload Automation bookshelf
  - User Guide to discuss supported CLANG statements in PARMLIB data
  - Implementation Guide to discuss installation and set up
  - Messages Guide for messages
Simple Big Picture

- z/OS LPAR
- CA7ONL
- CA IAS
- TCP/IP
- CA7ICOM

Distributed Platform

- CA WA Agent
- Agent Plug-in
  - DB
  - APP

SAP/Oracle/PeopleSoft ERP System

SHIFT YOUR Automation INTO HIGH GEAR
CA Workload Automation Initialisation

> Use AGJOB=YES on XPDEF statement
  - Default is AGJOB=NO

> Establish Security Options on SECURITY statement
  - AGUSER={((OWNER|REQ|QJCL|CA7))} → source of mainframe user ID for job validation
  - EXTERNAL=(LOGON,AGENT) → indicates agent-related security calls are made to security server
  - AGCLASS=FACILITY → names the security resource class to be used in security calls; default FACILITY shown here

> New DD statements in CA7ONL JCL
  - CA7AGNT – VSAM file to store returned data
  - CA IAS DD statements
CA IAS Initialisation Requirements

> Agent Configuration: IASAGENT DD statement to identify agents to whom this CA7ONL will communicate

> Encryption Key Definition: IASCRIPT DD statement to define the encryption names and keys to be used in communication with agents

> IAS Checkpoint: IASCKPT defines a Data-In-Virtual (DIV, VSAM) to capture current IAS checkpoints
CA IAS IASAGENT Sample

> Manager and Receiver (only one):

MANAGER NAME(CA7CA71) TCPIP(USCOIL31.CO.COM)
AGENTRCV CA77 PORT(7520)

> Agents (as many as required):

AGENT NTAGENT ASCII +
ADDRESS(147.222.77.235) PORT(7520) +
CRYPTNAME(KEY1) RETRYINTERVAL(60000) +
RETRYCOUNT(5) SLEEPTIME(3000)

AGENT UNIXAGENT ASCII +
ADDRESS(140.11.17.33) PORT(7520) +
CRYPTNAME(KEY2) RETRYINTERVAL(4000) +
RETRYCOUNT(5) SLEEPTIME(300)
CA IAS IASCRYPT Sample

> As many keys as needed
> More than one agent may use same key information
> Key name in IASAGENT, true key here:

```
CRYPTNAME NAME(KEY1) +
    KEY(010203040506070899AABBCCDDEEFFAD) TYPE(AES)
CRYPTNAME NAME(KEY2) +
    KEY(013121060225051761AFBEDC111700EE) TYPE(AES)
CRYPTNAME NAME(USA) +
    KEY(38E2C9D1BB7FEA55FDFDF6F93FAAAA8A) TYPE(AES)
```
Agent Job (AGJOB)

> Define Agent Job to CA Workload Automation database:
  - Requires job type and agent information
  - User ID is optional
  - Requires PARMLIB (unlike XPJOB)
  - Other “typical” fields: SYSTEM, HOLD, EXEC, etc.

> Permits selection of job type through DB menus
  - Alphabetic Characters used (e.g. DB.A.F.A = BDC_JOB)

> May opt to directly enter job information including job type through AGJOB or DB.11
AGJOB Job Definition

---------  CA-7 Agent Job Definition  ---------

Function:  (Add, DD, Delete, Format, List, Purge, Update)

Job:

System:    JOBNET:    Owner:    UID:

Agent Job Type:

Agent:

User:

Parmlib:    Member:    Use-Ovrd-Lib:

EXEC:    Hold:    Verify:

DRClass:    ARFSET:    Satisfaction Lead Time:

(... etc. ...)

SHIFT YOUR AUTOMATION INTO HIGH GEAR
PARMLIB Data

> Specify parameters in job definition's PARMLIB(Member)
  - This information is sent to CA WA Agent

> PARMLIB statements vary by job type
  - Consult CA IAS User Guide
  - Values are case-sensitive fields
  - Keywords are either case

> Always use LJCK for validation
  - Uses same process as submission to build message data
  - New option LJCK,JOB=\text{name},LIST=DEBUG shows sample message to be sent
PARMLIB Samples

> FTP_JOB Parameters

  SERVERADDR 111.222.333.444
  SERVERPORT 7717
  REMOTEFILENAME C:/TEMP/Testfile.txt
  LOCALFILENAME C:/MyDocuments/FTPRCV/docsamp
  TRANSFERDIRECTION DOWNLOAD
  TRANSFERCODETYPE A

> UNIX_JOB Parameters

  //*** Includes UNIX platforms Sun, LINUX, AIX, HP ***/*
  CMDNAME payroll/daily/report
  ARGSS "short,summary"
Agent Job Password Definition

> AGPSWD presents a formatted screen for Password entry
  - May be secured to “security group”
> With Agents, Password determined by a 4-entry look-up
  - User ID is required information
  - Optional Agent specification applies only to user IDs destined to this agent
  - Optional Job Type indicates this user ID/password combination applies only to jobs defined with this job type
  - Optional Source used only in selected job types to further qualify application (e.g., SMNP Auth/Priv)
AGPSWD

--- CA-7 Agent User ID/Password Maintenance --

Function: (Add, Delete, Format, List, Update)

User Id:
Agent:
Job Type:
Source:
Old Password: (for Update only)
New Password:
Verify Password:
Example of Password Look-up

> Sample entries in password definitions
  
  - USERA (no agent or job type) uses DFLTPSWD
  - USERA for AGENT A (no job type) uses PSWDA
  - USERA for AGENT A and FTP_JOB job type uses PSWDF

> JOBA, a UNIX_JOB, submitted to AGENT A will use PSWDA
> JOBF, an FTP_JOB, submitted to AGENT A will use PSWDF
> JOBD, an FTP_JOB, submitted to AGENT Z will use DFLTPSWD
AGJOB Queue Status Data

> CA WA Agent determines the success or failure of an agent job
  - This is different than CPU and XP jobs!
  - PARMLIB statement EXITCODE may set criteria

> New LQ status for AGJOBs:
  - W-AGENT – job is waiting on agent activation
  - W-REPLY – i5/OS job has intervention required and is waiting for a message reply
  - N-IAS – CA IAS interface is not active

> LQ,JOB=name,LIST=ALL shows status returned from CA WA agent
AGFILE Command

> Information returned from CA WA Agent is stored in CA7AGNT VSAM file

> AGFILE Command used to retrieve that information as well as to retrieve output information from job execution

> AGFILE, JOB=jobname, LIST=ALL functions include:

  - Information (data in CA7AGNT)
  - Spool (output data stored at the agent)
  - File list (some job types have lists of output, such as i5/OS, in which a user must select an output file)
  - And more depending on the job type
AGFILE, JOB=EROAG01, TYPE=INFO

----------- CA-7 job INFO for agent EROCSYS ----

Jobname: EROAG01 ca7#: 0105  System: EROCSYS
  SchId: 0001  Q-DtTm: 09236 1219

Job Type: NT_JOB
Job number: 5472
Agent: EROCSYS
Host: OCOEL02-217R
LogId/PID: CFA37C25D5D31DED468703230F85D0774C439CD2
STATUS: Process has been cancelled
New and Updated Commands

> LAGENT to list agent configuration information
> /IAS to send functions to CA IAS
  - Reconfigure agents (changes in IASAGENT/IASCRYPT)
  - Start or Stop TCP/IP Communications
  - Log operations (for debugging purposes only!)
> /AGENT to send functions to the agents
  - Clear files
  - Security Update
  - Shutdown the agent (note: no start!)
> Updated commands such as CANCEL, HOLD, and RELEASE to send to agents for selected job types
Conversion from XPJOB job type - Input

> Converts existing XPJOBs to AGJOB format

- If coming from CA7TOUNI, run XPJOB conversion 1st
- Similar to the CA7TOUNI to XPJOB conversion

> Initial control is done via an LJOB command

- Backup of entire PARMLIB PDS is done for restore
- Only XPJOB job types are included in the process
- Must supply list of XP NODE names, destination agent names, job type (UNIX or Windows), and PARMLIB
- Input for Restore mask, default PARMLIB, and INTERACTIVE keyword (NT_JOB)
- VRM also included for password and node information
Conversion from XPJOB – Updates/Doc

> Update files include:
  - BTI deck to convert and update the AGJOB definition
  - Security conversion of XPSWD to AJGOB
  - XPSWD records to delete from VRM file
  - Permanent NODE records to delete from VRM file

> A number of cautions/restrictions are documented

> Full details in the CA Workload Automation SE r11.3 Interfaces Guide
Summary

> CA7TOUNI was a good beginning
> With CA 7 WA r11.1, XPJOB internalizes cross-platform scheduling and introduced better recovery options with HAO
> CA 7 WA r11.3 introduces an interface to CA WA System Agents r11.3 and support for many job types
> All improve the ability of CA 7 WA to control workload on an enterprise level!
> If you are interested in being a CA Workload Automation r11.3 Beta Site, please let us know!
Questions