



J2U - The JCL Interpreter for Unix

Technical Specifications



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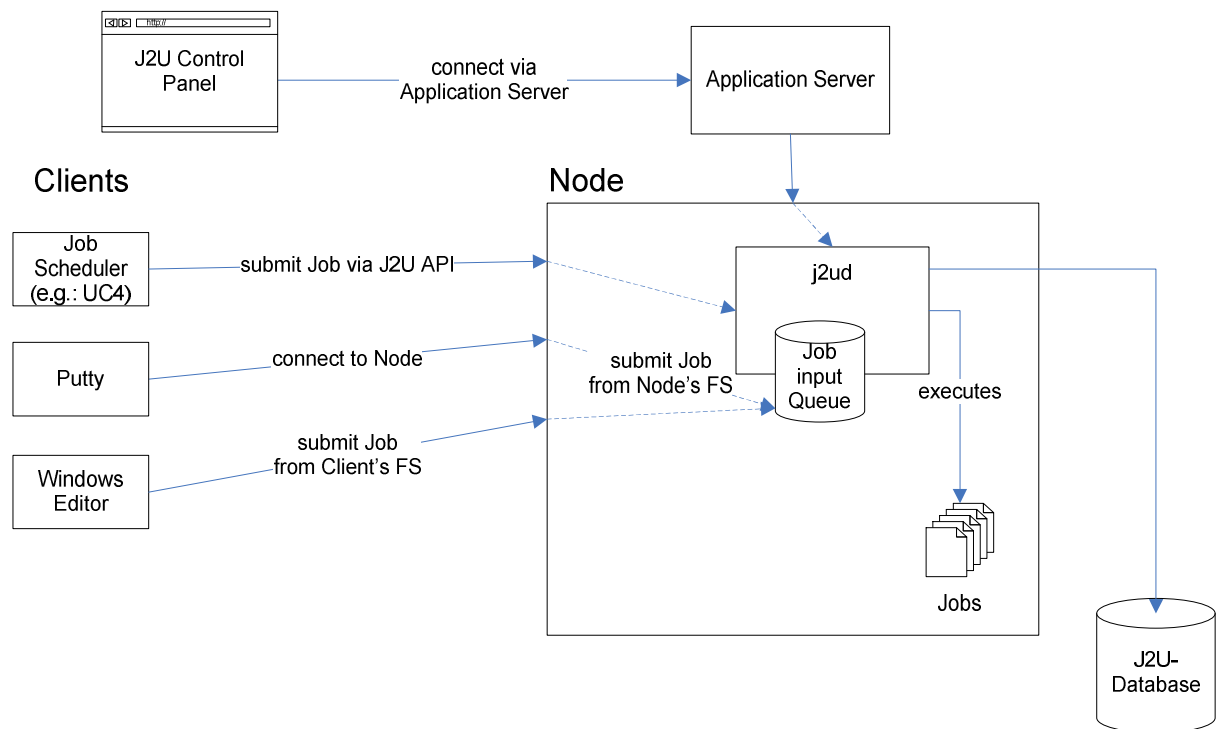
What is J2U?

J2U[®] is itgain's JCL interpreter. It allows for the execution of jobs that were written in Host-JCL on a computer with a Unix system with no need for changes to the JCL. J2U offers a complete runtime environment for the execution of jobs under Unix.

J2U architecture

J2U consists of the following components:

- The J2U runtime environment, which runs on each batch server (node) as Unix daemon j2ud. This daemon provides the functionality of a job entry subsystem like **JES2** or **JES3**.
- The **J2U client** that passes on jobs to J2U via Unix start script **sub**.
- The central **J2U database**.
- The web interface **J2U Control Panel** for controlling all functionalities of the J2U system.





J2U runtime environment

- Execution of unchanged JCL jobs under **Unix**, using the same logic as under **z/OS**.
- Transparent integration into job scheduling systems (e.g. **UC4**) and editors (remote or local submit).
- Transparent integration of the **DFSORT** compatible sort utility **Ahlsort**.
- Central listing of all files and of job relevant information in **RDBMS tables**.
- Evaluation and consideration of variables from various job schedulers, e.g. **OPC/TWS** and **APG-ZEKE**.
- Simple adaptability to customer-specific requirements (any number of clients, any number of execution levels and behavior of executables and their runtime environments, e.g.: **Microfocus**) via XML configuration files and database tables.

J2U clients

J2U clients are used to start jobs on a J2U node (batch server). There the following alternatives:

- Local login on the server (e.g.: via **Putty** or **SSH**) permits starting jobs from the server's file system.
- Remotely submitting a job, that is stored on the file system of a Windows workstation, via a program editor.
- Starting a job from a job scheduler like **UC4** via a specific **API**.
- Starting a job via the **J2U Control Panel – File Control**.

J2U database

- You can continue using your already existing database as database system for J2U. Alternatively, you can have **DB2** installed which comes bundled with J2U at no extra cost.
- Out of the box, J2U currently supports **DB2**, **Oracle** and **Adabas D**.

J2U Control Panel

The browser based web interface **J2U Control Panel** is the central administration tool for J2U.

It consists of the following components:

- **J2U Admin** for administrating J2U itself, e.g. user management, configuration and control of J2U components.
- **J2U Job Control** for controlling jobs and job lists, similar to SDSF.
- **J2U File Control** for querying and manipulating files, similar to the utility options of **ISPF/PDF**.
- **J2U Archive Control** for using the job archive system **J2U Archive** (available in J2U Version 4.1, first quarter 2008).

Supported JCL commands

Please note:

J2U ignores any commands not listed below.



- ▶ **EXEC** command with the parameters:
 - PGM=
 - PROC=
 - PARM=
 - COND=

- ▶ **DD** command with the parameters:
 - DSN=
 - DISP=
 - UNIT=
 - DCB=
 - LRECL=
 - RECFM=
 - PATH=
 - SYSOUT=
 - DATACLAS=
 - LIKE=
 - DDNAME=

J2U supports all formats of the DD command:

- **DD** [keyword parameter], e.g. **DD DSN=xxx,...**
- **DD DUMMY**
- **DD *** and **DD DATA DLM=** (instream files)

J2U also supports

- Generation Data Groups that follow the same rules as on the Host, but limited to a maximum of 9999 generations
- Backward references like **=*.STEPI.SORTOUT** or **DCB=*.SORTIN** and forward references (postponing dataset definitions), using **DD DDNAME=**
- Concatenation of an arbitrary number of files
- Temporary files
- Spool files (**SYSOUT=...**)

- ▶ **IF / THEN / ELSE / ENDIF** statements

- ▶ Procedure commands:

- **PROC**
- **PEND**
- **JCLLIB**

- ▶ **SET** command

- ▶ **INCLUDE** command

- ▶ Further JCL commands:

- **//** (Null command)
- **/*** (Instream End command)
- **//*** (Comment)



- ▶ The J2U runtime environment emulates the following IBM utilities:
 - **SORT** (via the external sort utility **Ahlsort**¹)
 - **IEBGENER / ICEGENER**
 - **FTP**
 - **IDCAMS** with subcommands **DELETE**, **DEFINE/ALTER GDG**, **REPRO** and **SET MAXCC=**
 - **IEBCOPY**
 - **IEFBR14** (for the use of **DISP** sub-parameters of the **DD** command)
 - **IKJEFT01** (for calling DB2 and REXX programs)

Requirements for J2U

- A Unix operating system. Currently, J2U supports:
 - ▶ Linux (Kernel 2.4 or higher)
 - ▶ AIX (Version 4.1. or higher)
 - ▶ Solaris (Version 8 or higher)
- Perl 5.8
- Any relational database system that comes with a Perl-DBI or ODBC driver.
Should the customer not wish to use any of their existing databases, we will install **DB2 for LUW at no extra cost**. Existing customer's installations currently use **DB2 for LUW**, **Oracle** and **Adabas D**.
- Open Object Rexx (formerly IBM Object Rexx), if you want to use Rexx programs
- For the **J2U Control Panel**:
 - ▶ On the client-side: A current browser that supports Javascript
 - ▶ On the server-side: One of the following application servers:
 - Apache Tomcat,
 - WebSphere,
 - Sun Application Server
- For starting a job from an editor on a Windows workstation:
 - ▶ A database client on the workstation

¹ For information on the DFSort-compatible utility Ahlsort see <http://www.itgain.de/en/produkte/ahlsort.htm>



Example call with J2U

The following code is an example for an original Host job that J2U will run unchanged. This job converts the contents of a file¹ from one format into another format by using the **OUTREC** command of **DFSORT**. The job demonstrates:

- the mapping a unit (**mandant1**) and a batch environment (**j2utest**) to the Unix file system;
- the compatibility of the Unix sort utility **Ahlsort** that is used by J2U;
- the use of instream files (...DD *) and
- backward references (**DD DSN=*.SORT.SORTOUT**)

Job example J2U0025

```
//&SYSUIDP JOB (18010000), 'OUTREC',
//          MSGCLASS=T, CLASS=S,
//          NOTIFY=&SYSUID, MSGLEVEL=(1,1)
//*
//RUBOUT EXEC PGM=IDCAMS
//SYSIN DD *
DELETE JO.SORTOUT
SET MAXCC = 0
//*
//***** SORT WITH OUTREC-STATEMENT
//***** Convert a file from IXF-Host format to DEL
//*          (Delimited format )
//SORT EXEC PGM=SORT, REGION=6M
//SYSOUT DD SYSOUT=*
//SORTIN DD *
C05CUST_NO          NYNR49600000          000002
C09CUST_STAT        NYNR50000000          000014
C11REGION           NYNR49600000          000021
D      0010018998  00001  00000000086
D      0010018999  00001  00000000086
D      0010019000  00001  00000000086
//SORTOUT DD DISP=(NEW,PASS), LRECL=50, UNIT=WORK
//SYSIN DD *
SORT FIELDS=(08,10,A),          CUSTOMER NO
          FORMAT=CH
*
* Filter: Only Data records (file type = "D"
INCLUDE COND=(1,1,CH,EQ,C'D')
*
* Construct records in DEL-Format
* Should look like this:
* "0010019000";"00001";"00000000086"
*
OUTREC FIELDS=(01:C'""',08,10,
              12:C'";"',20,05,
              20:C'";"',27,10,
              33:C'""')
//*
//***** Show Result using backward reference
//GENER EXEC PGM=ICEGENER, COND=(4,LT)
//SYSUT1 DD DISP=(OLD,DELETE), DSN=*.SORT.SORTOUT
//SYSUT2 DD SYSOUT=*
//SYSIN DD DUMMY
```

¹ The source file was generated by unloading a DB2 table into the IXF Host format. The destination file can be loaded into a DB2 table on Linux.



Starting the job, e.g. from a local console

The job is started via the **j2u** shell script **sub**¹

```
j2utest@linuxjo:/home/jo/jobs> sub J2U0025
JCL to Unix Version 3.2
JOB J2U0025 (JOB568) SUBMITTED
JOB J2U0025 ENDED WITH HIGHEST RC 0
j2utest@linuxjo:/home/jo/jobs>
```

Displaying all jobs with J2U Control Panel

The screenshot shows a web browser window titled "JCL2Unix Control Panel - Job Control - Mozilla Firefox". The address bar shows the file path: `file:///C:/Users/sven/Desktop/temp/jobLog2.jsp.htm`. The page content includes a navigation menu on the left with "Admin", "Job Control" (selected), and "File Control". The main area displays "Job Control" with a sub-header "Directory: /usr/j2u/mandant1/j2utest/logs/20070225/". A table lists jobs with columns for Name, Return code, Size, Type, and Date. The table contains three rows: a directory entry "[..]", a job "[J2U0025.2007-02-25.204546]" with a green return code, and a job "[WRITE.2007-02-25.211340]" with a yellow return code. Below the table, it says "0 bytes in 0 files". At the bottom, it states "View last updated on: Friday, July 20, 2007 18:07:58 CEST".

Name	Return code	Size	Type	Date
[..]				
[J2U0025.2007-02-25.204546]			DIR	20.07.2007 11:21:53
[WRITE.2007-02-25.211340]	5		DIR	20.07.2007 11:21:53
[WRITE2.2007-02-25.211326]	16		DIR	20.07.2007 11:21:53

¹ When in production, the shell script will be started by the appropriate job scheduling agent (tracker, executor) on the target server.



Choosing a job, viewing the job output

Job Control

Home | Logout |

You are logged in as user a since 18:10

Directory: /usr/j2u/mandant1/j2utest/logs/20070225/j2u0025.2007-02-25.204546/

Filter: by column: Name auto refresh

Name	Return code	Size	Type	Date
[..]				
\$1J2U.SYSMSG	0	1.32 KB	FILE	20.07.2007 10:38:02
\$2J2U.JCL	0	564 bytes	FILE	20.07.2007 10:38:02
\$3J2U.JOBMSG	0	9.77 KB	FILE	20.07.2007 10:38:02
GENER.SYSUT2	0	159 bytes	FILE	20.07.2007 10:38:02
RUBOUT.SYSPRINT	0	196 bytes	FILE	20.07.2007 10:38:03
SORT.SYSOUT	0	952 bytes	FILE	20.07.2007 10:38:02

12.93 KB in 8 files

View last updated on: Friday, July 20, 2007 18:10:31 CEST

Done

The files in the log directory equate to the lists that are written to the JES-Spool on the Host:

Please note:

- **\$1JES.SYSMSG** System messages
- **\$2JES.JCL** Resolved JCL
- **\$3JOB.MSG** Job related output
- Other Spool lists – like on the Host – are generated by `//xxxxx DD SYSOUT=*`



Showing a JOBMSG list

The screenshot shows a web browser window titled "JCL2Unix Control Panel - Job Control - Mozilla Firefox". The address bar shows the file path: `file:///C:/Users/sven/Desktop/temp/jobLog.jsp.htm`. The page title is "Job Control". On the right, it says "You are logged in as user a since 17:57". On the left, there is a navigation menu with "Admin", "Job Control", and "File Control". The main content area displays a "View File" window for the file `/usr/j2u/mandant1/j2utest/logs/20070225/J2U0025.2007-02-25.204546/$3J2U.JOBMSG`. The file content is a log of job steps with timestamps and system messages. A warning message is highlighted in yellow: `W 20.46.06 JRM105W ***SORTOUT MISSING OR CONFLICTING DCB-ATTRIBUTE`. The status bar at the bottom indicates "View last updated on: Friday, July 20, 2007 17:59:26 CEST".

Please note:

- J2U job log provides information on the current environment on the operating system, e.g. the current path and the current library path.
- Allocations for all DD commands and statistics (CPU usage) are being logged for each job step.
- Warnings and errors are marked yellow and red, respectively, in the Job Control Panel.



Outlook on J2U version 4

- Introduction of multi-job processing: arbitrary number of JOB commands in a JCL file.
- Introduction of output queues via parameter MSGCLASS for a flexible handling of output lists.
- Support for JES2-/JES3 command /*XEQ and /*ROUTE XEQ, respectively, for forwarding jobs to an arbitrary J2U server (node).
- **J2U Archive** for archiving job output analog Beta 92.
- **J2U Archive Control** as an extension of **J2U Control Panels** for a comfortable access to archived jobs.

Further product information

<http://www.itgain.de/en/produkte/j2u.html>