

SAP R/3 Batch Support on UNIX and Windows

This subsection covers the following topics:

- Overview
 - Client/Server Infrastructure
 - Script Language for SAP R/3 Jobs
 - Installation Notes
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Overview

Entire Operations supports SAP R/3 batch processing and provides a script language to define SAP R/3 jobs in text files.

- The Entire Operations runtime system may reside on a mainframe or on a UNIX system.
- The communication to an SAP R/3 system requires Entire System Server (UNIX or Windows) Version 2.1.1 or higher to be installed.
The SAP R/3 system must be reachable from the Entire System Server node via TCP/IP.
- SAP R/3 version 3.1h is the lowest version to be supported.
It does not matter whether the SAP R/3 system resides on UNIX or Windows.

Client/Server Infrastructure

- RFC Connections
- R/3 RFC Session Handling
- Job Type R3
- Script Language for SAP R/3
- Scheduling
- SAP R/3 Job Submission
- Online Logon to SAP R/3

To interface R/3's CCMS Background Processing System, SAP provides the XBP (Background processing) API. This is called via SAP's RFCs (Remote Function Calls) from external programs. The RFC transport protocol is TCP/IP based and is supported for C/C++/Visual Basic. It is available on several UNIX systems and Windows (which are the current SAP R/3 platforms).

The Entire System Server offers Entire Operations the necessary information to do job scheduling on Windows and UNIX.

The SAP R/3 support is integrated in Entire System Server (UNIX and Windows).

RFC Connections

To use the RFC API, an RFC connection will be established.

Using the destination entry configured by a file ("sideinfo" or "saprfc.ini"), it is possible to select a special R/3 system (system number) on a special host.

The relation between Entire System Server (UNIX and Windows) nodes and R/3 destinations is 1:N. So from one Entire System Server (UNIX and Windows) node, several R/3 systems can be reached.

When a R/3 session is opened, a client, a user, a password and an optional language will be defined.

This means that Entire System Server (UNIX and Windows) has to establish several RFC connections for different users or same users with different client parameters.

R/3 RFC Session Handling

- An R/3 RFC session will be opened implicitly by Entire System Server (UNIX and Windows) at the first call to any R/3 object.
- When the Entire Operations monitor performs a regular shutdown, or if a Entire Operations online user ends his Entire Operations session, it invokes the Entire System Server (UNIX and Windows) function USER | LOGOUT (with a special flag, if required) to terminate all current R/3 sessions opened by it.

Job Type R3

The job type "R3" is to be used to define SAP R/3 batch processing jobs.

The execution node of such a job is the Entire System Server (UNIX or Windows) node, from which the SAP R/3 system is accessed.

Script Language for SAP R/3

Entire Operations's R/3 Job Script will be capable to support R/3 job definitions as they are: as mixed sequence of R/3's internal and external job steps.

R/3 Job Scripts can be stored in all locations which can contain plain text files.

On UNIX and Windows systems, the JCL location TXT can be used.

See Script Language for SAP R/3 Jobs for details.

Scheduling

Scheduling functions of R/3 XBP are not used. Instead, the common operating system independent scheduling functionality of Entire Operations is used.

Jobs will be submitted (released in SAP R/3) with the start criterion "immediate" only.

SAP R/3 Job Submission

The R/3 job submission consists of the following steps:

1. The Active JCL (script language) is interpreted, with error checking.
2. The R/3 job definition APIs are invoked.
3. They are submitted into the R/3 runtime system.

Online Logon to SAP R/3

Entire Operations provides the direct command "LOGON R3 ..." for an online logon to an SAP R/3 system.

The logon screen is described in the subsection SAP R/3 System in the section Logging on to Entire Operations.

Script Language for SAP R/3 Jobs

- Advantages
- Features
- R/3 Script Language: Syntax Definition
- Script Language Examples
- Installation Notes

Advantages

By introducing a new R/3 Batch Script language, it is possible to completely define R/3 jobs in exactly one text member. The scripts can be added in a normal text editor and general text processing routines can run over these job definitions, without defining special user interfaces to rebuild R/3 dialogs.

Features

- The script language has an operating system independent (mainframe compatible) format.
- It will be interpreted on Entire System Server (UNIX and Windows).
- It supports the complete parameter set for the XBP job step functions SXMI_XBP_JOB_ADD_ABAP_STEP and SXMI_XBP_JOB_ADD_EXTPGM_STEP.

R/3 Script Language: Syntax Definition

- Grammar
- Phrasal Grammar
- Lexical Grammar

The syntax is defined as follows:

Value	Description
terminal	Courier text indicates a word or character that must appear exactly as shown. Ambiguous terminal characters are enclosed in single quotes ('').
Nonterminal	Italics indicate a word that is defined further.
[]	Brackets indicate that the enclosed item is optional.
{choose one}	Forked arrows / a group of words, separated by vertical bars () and grouped with curly brackets, indicates an either/or choice.
[]*	An asterisk (*) indicates that the preceding item(s), which is enclosed in square brackets, can be repeated zero or more times.
[]+	A plus sign (+) indicates that the preceding item(s), which is enclosed in square brackets, can be repeated one or more times.

Grammar

The grammar is divided into two parts: the phrasal and lexical grammars.

In the phrasal grammar, whitespace is insignificant. Space, tab, return, and linefeed characters are considered whitespace. Comments are considered whitespace. Comments consist of the characters between /* and */ (not nested), and between // and a return or linefeed character.

Phrasal Grammar

script:

```
step-definition*
```

step-definition:

```
{ abap-step-definition | external-program-definition }
```

abap-step-definition:

```
{abap[-step]}: expression
```

external-program-definition:

```
{external[-program][-step]}: expression
```

expression:

```
{ parameter-expression | compound-expression }
```

parameter-expression:

```
{ symbol = string | symbol = compound-expression }
```

compound-expression:

```
( expression-sequence ) | begin expression-sequence end
```

expression-sequence:

```
expression [ expression ]+
```

Lexical Grammar

string:

```
{ " character-sequence " }
```

character-sequence:

```
{ string-character | escape-sequence }*
```

string-character:

```
< any displayable ASCII char from 32 to 127, including tab character, without " >
```

escape-sequence:

```
" "
```

word:

```
'_'* alpha+ { alpha | digit | '_' }+
```

alpha:

```
{ 'a' | .. | 'z' | 'A' | .. | 'Z' }
```

digit:

```
{ '0' | .. | '9' }
```

Script Language Examples

- Example 1
- Example 2

Example 1

```
/*
 *R/3 Job Script Example
 *
 */
// step (1) - calls abap program SALARY
abap: program = "SALARY"
// step (2) - calls abap program SALARY with SPECIAL variant
abap: begin
  program = "SALARY"
  variant = "SPECIAL"
  sap_user_name = "HARRY"
end
// step (3) - create tapes
external: begin
  program="/usr/bin/archive.sh" parameter="/dev/rmt0"
end
// end script
```

Example 2

```
/*
 * R/3 Script EXAMPLE
 *
 * YOU ARE FREE TO WRITE keywords and symbols UPPER or lower case
 * and in one line if you like
 */

ABAP: program = "SALARY" ABAP: ( PROGRAM="SALARY" VARIANT="SPECIAL" )

EXTERNAL-STEP :

( /* but take care external programs and parameters may be
   * case sensitive
   */

   program = "/usr/bin/archive.sh" parameter = "/dev/rmt0"

)
```

Installation Notes

If not otherwise specified, these notes apply to UNIX and Windows.

- Entire System Server (UNIX and Windows), version 2.1.1 and above, is delivered with executables with or without SAP R/3 support.
Make sure that the module with SAP R/3 support is used.
For UNIX, this is "npretbr3" with "libnpr3.so".
For Windows, this is "npretbr3.exe" with "libnpr3.dll".
- The environment variable RFC_INI must contain the full path name to the "saprfc.ini" file.
- The SAP R/3 library "librfc.so" (UNIX) or "librfc.dll" (Windows) must be callable by the Entire System Server (UNIX and Windows).