

## E53

### Automation of z/VSE and distributed platforms using Open Source ANT

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## Agenda

- **Automating processes in VSE**
  - Which possibilities exists
- **Using VSE Script for automation**
  - New with z/VSE V4: VSE Script Client that runs on VSE
- **Using Apache ANT for automation**
  - What is Apache ANT
  - Concepts, ANT Tasks
  - Usage examples
- **Live Demo**

## Approaches on automating processes in VSE

- **Which possibilities / tools exists today ?**
  - JCL
  - REXX
  - VSE Script
  - Vendor Software
- **A new possibility:**
  - Apache ANT



## Requirements

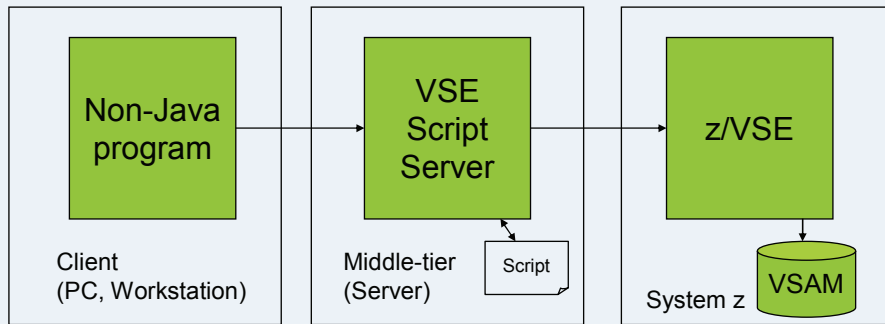
	Host / VSE	Workstation / distributed
<b>JCL</b>	Built into VSE	-
<b>REXX</b>	REXX (VSE or VM)	-
<b>VSE Script</b>	TCP/IP, VSE Script Client (batch or CICS, z/VSE 4.1)	VSE Script Server
<b>Vendor Software</b>	Depends ...	Depends ...
<b>Apache ANT</b>	TCP/IP , VSE Connector Server	VSE Connector Client, Apache ANT
...	...	...

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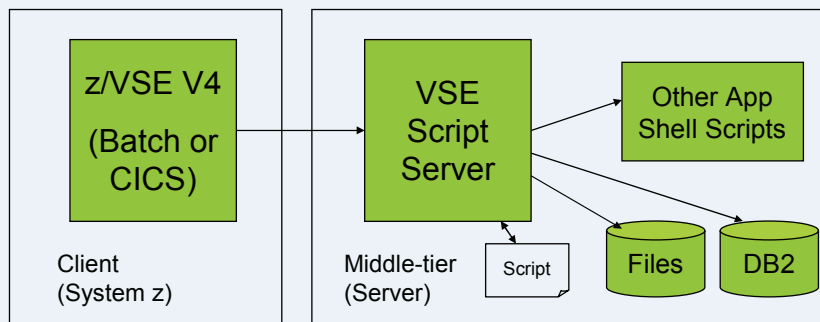
## Automation using VSE Script

- Originally VSE Script was intended to allow non-Java programs to access VSE data
  - E.g. Access VSAM data from MS Excel



## Automation using VSE Script news with z/VSE V4

- With z/VSE V4 we provide a Script client that runs on VSE
  - Allows to start scripts on remote system



## Automation using VSE Script news with z/VSE V4

- **Sample batch job**
  - Invokes a VSE script named 'myscript.src' on a remote system
  - Script could start FTP transfers, copy files, process data, ...
  - Replacement for REXEC
    - REXEC daemon is no longer available or back level on many Linux distributions

```
* $$ JOB JNM=VSESCRIPT,DISP=L,CLASS=A
// JOB VSESCRIPT INVOKE A VSE SCRIPT FROM BATCH
// LIBDEF *,SEARCH=(PRD1.BASE,PRD2.SCEEBASE,PRD2.DBASE)
// EXEC IESSCBAT,PARM='CODEPAGE=Cp1047 SHOWERROR=YES'
192.168.2.15:4711
myscript.src
First parameter
Second parameter
Third parameter
/*
/&
* $$ EOJ
```

## Automation using VSE Script news with z/VSE V4

- **Invoke a VSE script from a CICS program**
  - EXEC CICS LINK to program IESSCCIC with the following COMMAREA
  - Input and output data must fit into 32K

```
01 INPUT-COMMAREA.
02 CODE-PAGE      PIC X(12).
02 FLAGS          PIC 9(4) COMP.
02 LINE-COUNT     PIC 9(4) COMP.
02 PARAM-LINE1    PIC X(80).
02 PARAM-LINE2    PIC X(80).
02 PARAM-LINE3    PIC X(80).
...
01 OUTPUT-COMMAREA.
02 CLIENT-RC      PIC 9(9) COMP.
02 SCRIPT-RC      PIC 9(9) COMP.
02 LINE-COUNT     PIC 9(4) COMP.
02 OUTPUT-LINE1   PIC X(80).
02 OUTPUT-LINE2   PIC X(80).
02 OUTPUT-LINE3   PIC X(80).
...
```

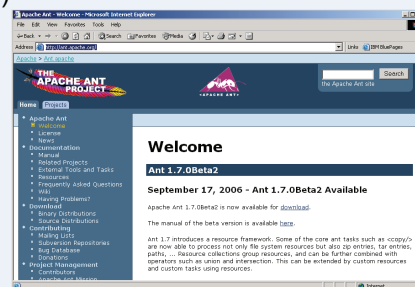
- See z/VSE V4R1 e-business Connectors User's Guide chapter 3.10.6 for more details

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## What is Apache ANT

- Apache ANT is a Java-based Open-Source Build-Tool, similar to Make.
- Originally intended for automated build (compile) of Java code
- ANT provides Java-Classes (Tasks) for automating different things
- Build-Scripts are formulated in XML
- Web Page:
  - <http://ant.apache.org/>

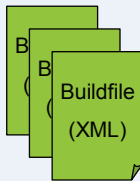


## How does ANT work?

### ANT

#### ANT Tasks

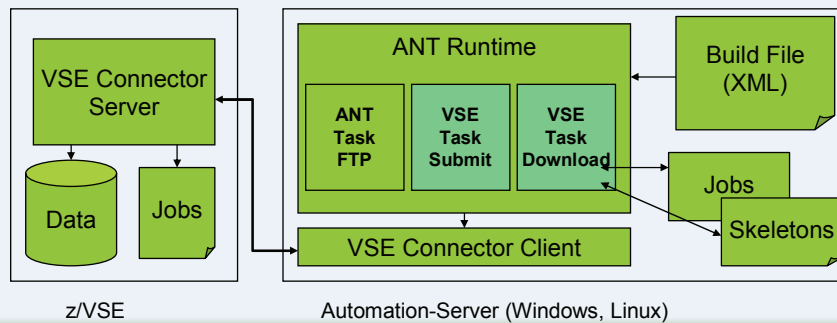
- copy, zip, exec, sql, delete, mkdir, ftp, telnet, cvs, ...



- ANT provides different functions as so called ANT-Tasks
- Processes are described in XML Build-Scripts. The ANT-Tasks are called from within those scripts
- Each ANT-Task is built out of a Java-Class
- You can easily develop your own ANT-Task.

## Idea: Using ANT to automate VSE processes

- Uses the Java-based VSE Connectors to access VSE resources
- We have developed a VSE specific Java-Class library containing ANT-Tasks
- These ANT-Tasks can interoperate with VSE (POWER, VSAM, ...)



## Example: ANT Build-Script

```
<?xml version="1.0"?>
<project name="Project1" default="main" basedir=".">
  ...
  <taskdef name="submit"
    classname="com.ibm.vse.ant.Submit"
    classpath="vseant.jar"/>
  ...
  <target name="startmsg">
    <echo>Starting build of ${Name}</echo>
  </target>
  ...
  <target name="dowork" depends="startmsg">
    <submit jobfile="${tempdir}/test.job"
      waitforoutput="true"
      vsesystem="${vsesystem}"/>
  </target>
  ...
  <target name="endmsg" depends="dowork">
    <echo>Finished build of ${Name}</echo>
  </target>
  ...
  <target name="main" description="runs this script">
    <tstamp/>
    <antcall target="endmsg"/>
  </target>
  ...
</project>
```

- One **Project** contains multiple **Targets**
- ① ▪ One **Target** can depend on other **Targets**
- ② ▪ Within a **Targets** you can call **Tasks**
- ③ ▪ Self written **Tasks** needs to be declared via **taskdef**

## ANT Properties (Variables)

- Within a ANT Script you can use so called Properties
- Property values can be retrieved using  
\${variable}

```
<property name="tcpip.partition" value="F7"/>
. . .
partition="${tcpip.partition}"
```

- Tasks can set the value of a property (as result) or they can get the value as input
- The process flow can be dependent on the value of a property, i.e. conditional branch or conditional exit
  - **Example: Waitfor, Fail, If, While, Loop**



## Example: Conditional branch based on Job-RC

```
<submit jobfile="c:\vsejobs\define_vtape.job"
    waitforoutput="true"
    outfile="c:\vsejobs\output\definetape.txt"
    propertyprefix="definetape.job"
    vsesystem="TESTVSE1"/>

<condition property="definetape.failed">
  <not>
    <equals arg1="${definetape.job.maxrc}"
            arg2="0000"/>
  </not>
</condition>

<fail if="definetape.failed"
    message="Define VTAPE on SCSI disk failed with
            MAXRC=${definetape.job.maxrc}."/>
```

## Standard ANT Tasks (Core & Optional Tasks)

- **File operations** – Copy, Move, Delete, Rename, Mkdir
- **Zip/Unzip** – compression/expansion of files
- **SQL** – Database queries (requires JDBC Driver)
- **FTP** – File transfer to remote systems
- **Mail** – Sending of e-Mails (including attachments)
- **Telnet** – Remote control of a Telnet-Session
- **Exec** – Executes a local system command or executable
- **Echo** – Issues messages
- ...

## VSE Tasks

- **VSEConnectionManager**
  - Maintains TCP/IP connections to VSE
- **Upload / Download (LIBR Members)**
  - Upload and download of LIBR Members, e.g. configuration members
- **SubmitJob**
  - Submits jobs into the POWER reader queue and retrieves the job output
- **Console**
  - Issues console commands and retrieves console messages
- **VSAM**
  - Download of VSAM Data as Text, Comma Separated File (CSV) or HTML

## Usage examples for ANT

- **Automation of daily file transfer**
  - Data is received and/or processed on remote system
  - Upload of files into VSE (e.g. VSAM)
  - Submission of a batch jobs for processing of the uploaded data on VSE
- **Load of a database (e.g. Data Warehouse)**
  - Download of VSAM data (using FTP or VSAM-Task)
  - Load of a database using a SQL-Loaders or SQL Task
  - Start a program on remote database server to process the data

## Usage examples for ANT (2)

- **Controlling or scheduling the execution of jobs**
  - Submit VSE Jobs
  - React based on return codes of the jobs or error messages in the listing
  - React on console messages
  - On error: send e-Mail/SMS to the operator
- **Switch between online and batch**
  - Shutdown CICS (per Console Task)
  - When CICS is down, submit or start batch jobs
  - When batch is finished, restart CICS

## Benefits

- **One central control instance for processes**
  - Processes may cross the border of a VSE system
- **Integration of distributed platforms and systems in the automated process**
  - Today, data is processed on many different platforms and system
- **One central place to store all automation scripts, files, jobs, ...**
- **Central processing and control, including easy archiving of the logs**

## Summary

- **Apache ANT is a very powerful tool for automating processes in heterogeneous environments**
- **Based on the Java-based Connector, it is very easy to make such a Open Source Tool usable for VSE**



## Downloads

- **VSE Connector Client**
  - <http://www.ibm.com/servers/eserver/zseries/zvse/downloads/>
- **Apache ANT**
  - <http://ant.apache.org/>
- **VSE Tasks**
  - **Currently the VSE Tasks are not available for download on the VSE Homepage**
  - **Send an e-mail to [zvse@de.ibm.com](mailto:zvse@de.ibm.com) if you would like to get them**

Questions ?



Now lets see a live demo