



| IBM System z – WAVV 2007

## 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



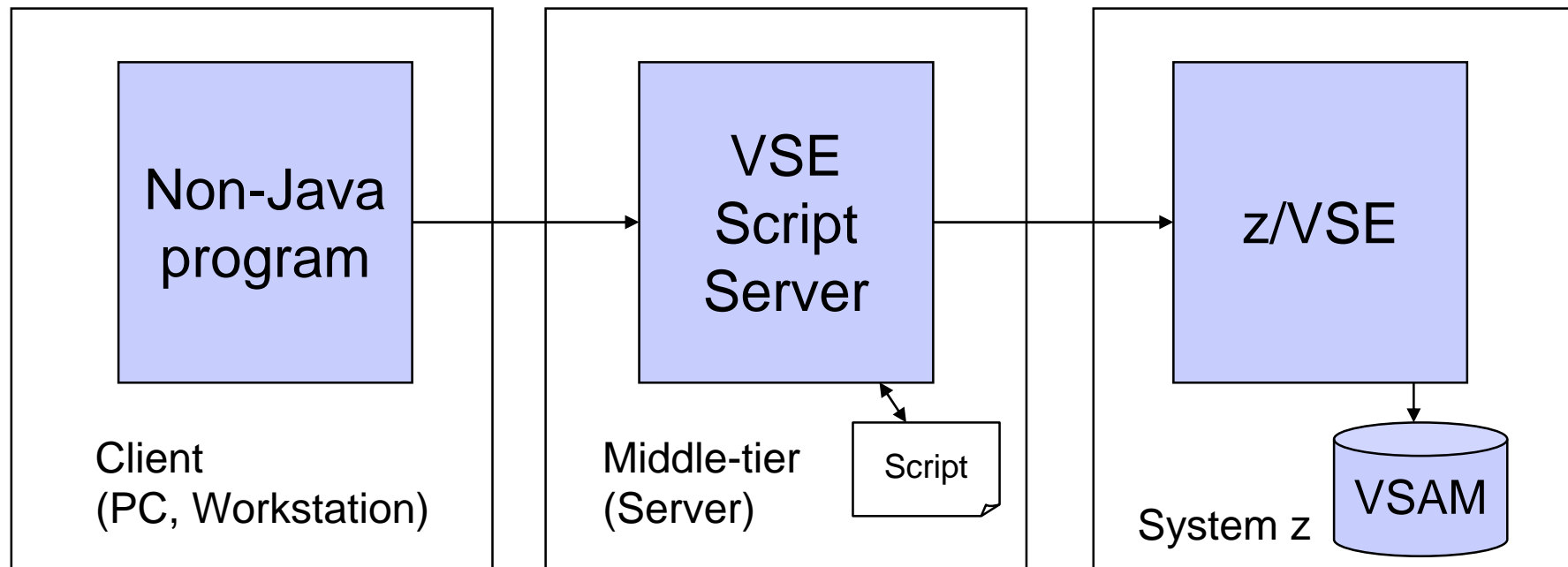
## Requirements

	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
...	...	...

## 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



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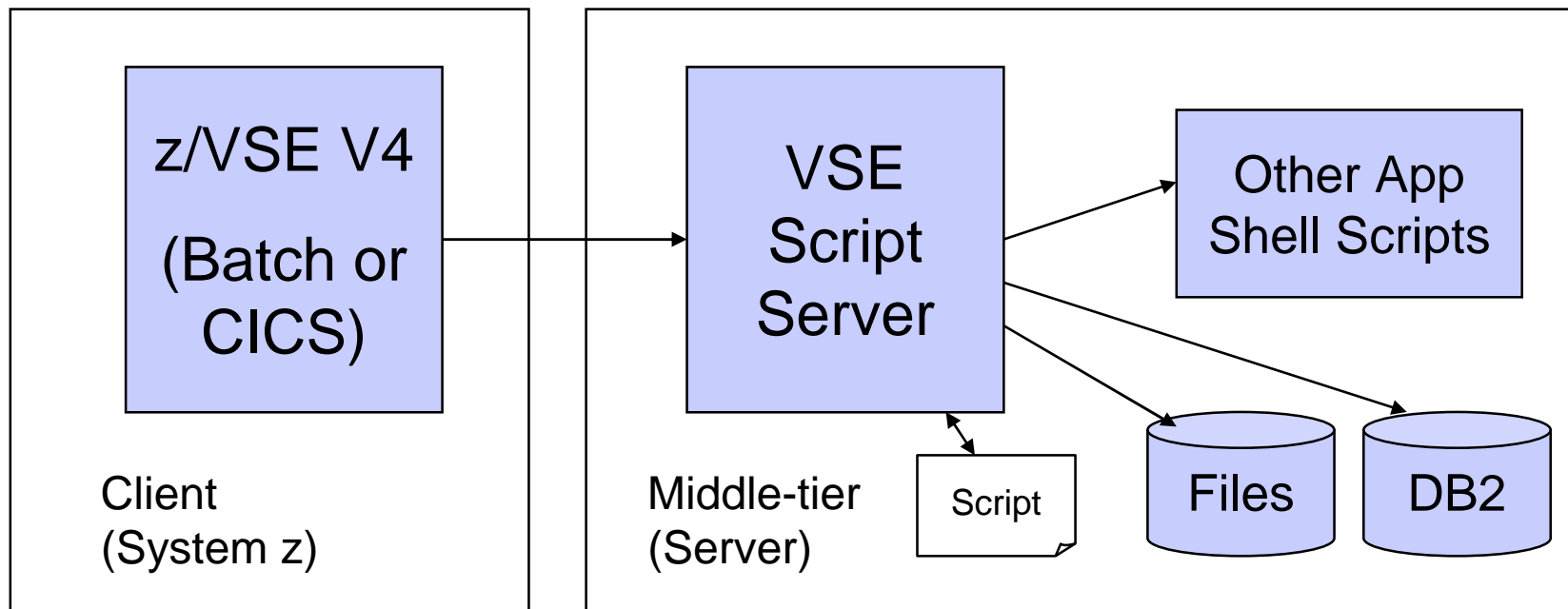
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## § Live Demo

## 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.		01 OUTPUT-COMMAREA.	
02 CODE-PAGE	PIC X(12).	02 CLIENT-RC	PIC 9(9) COMP.
02 FLAGS	PIC 9(4) COMP.	02 SCRIPT-RC	PIC 9(9) COMP.
02 LINE-COUNT	PIC 9(4) COMP.	02 LINE-COUNT	PIC 9(4) COMP.
02 PARAM-LINE1	PIC X(80).	02 OUTPUT-LINE1	PIC X(80).
02 PARAM-LINE2	PIC X(80).	02 OUTPUT-LINE2	PIC X(80).
02 PARAM-LINE3	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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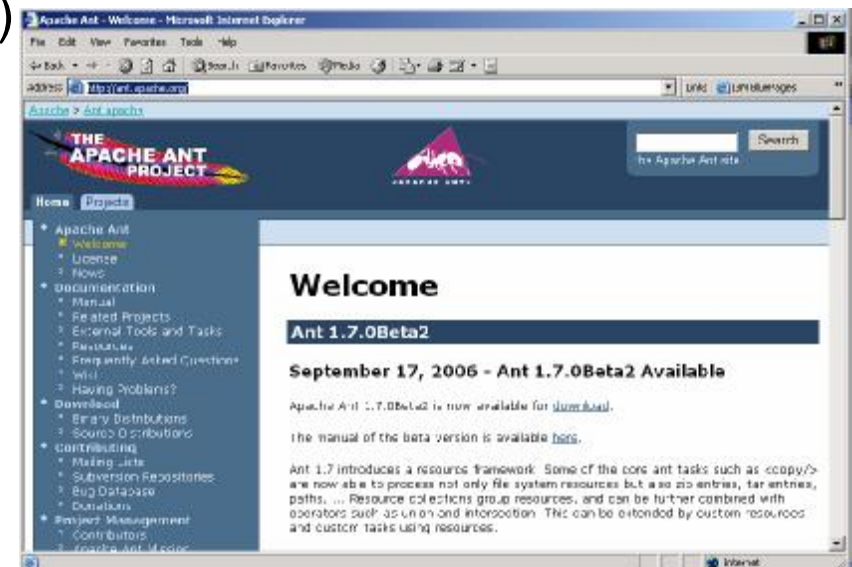
## § Using Apache ANT for automation

- What is Apache ANT
- Concepts, ANT Tasks
- Usage examples

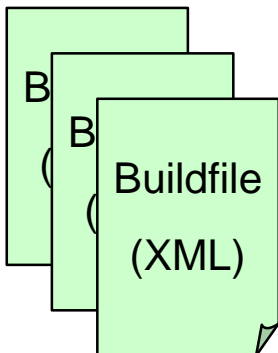
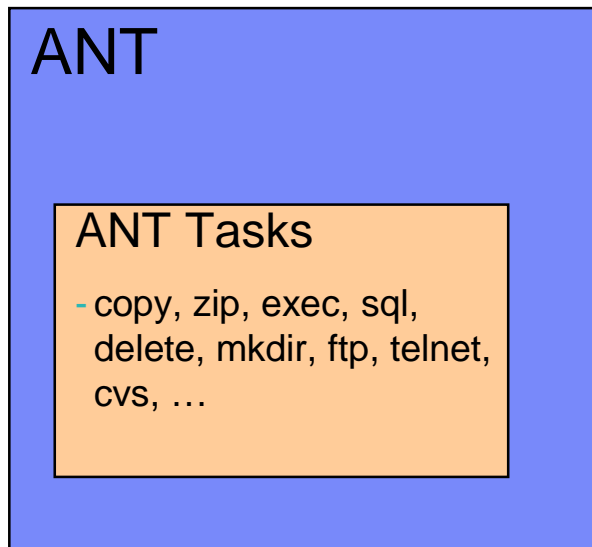
## § Live Demo

## What is Apache ANT

- § Apache ANT is an 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/>



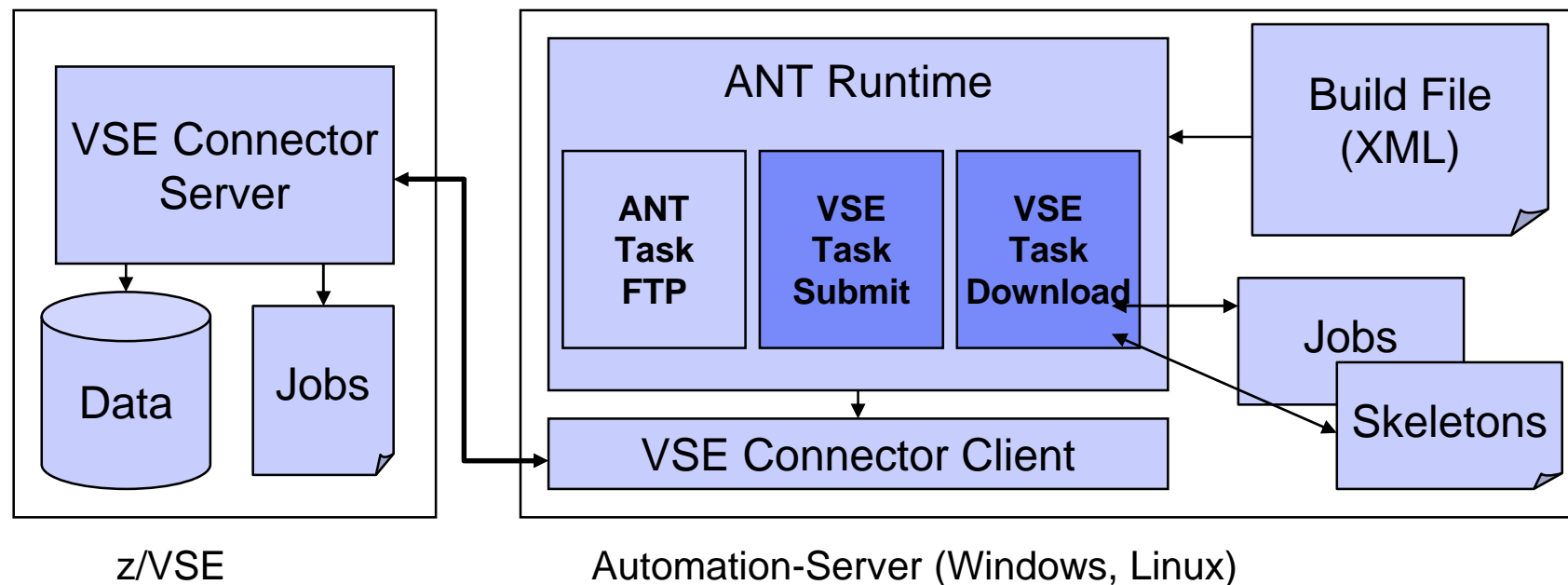
## How does ANT work?



- § ANT 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 in 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

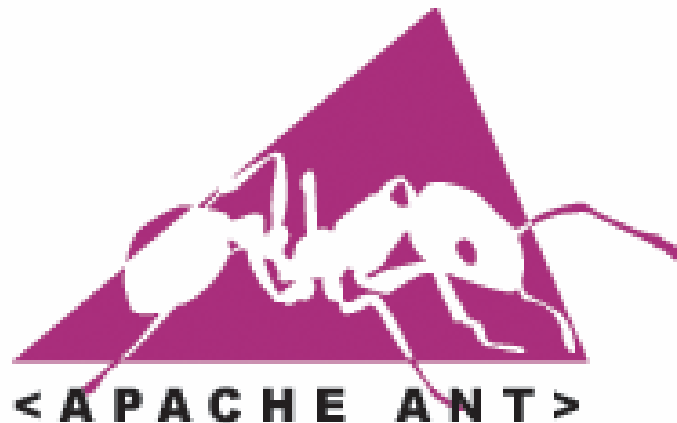
- Shutdown CICS (per Console Task)
- When CICS is down, submit or start batch jobs
- When batch is finished, restart CICS

## 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