VS07 – Nützliche Tools im z/VSE und deren Anwendung

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27. Oct. 2009

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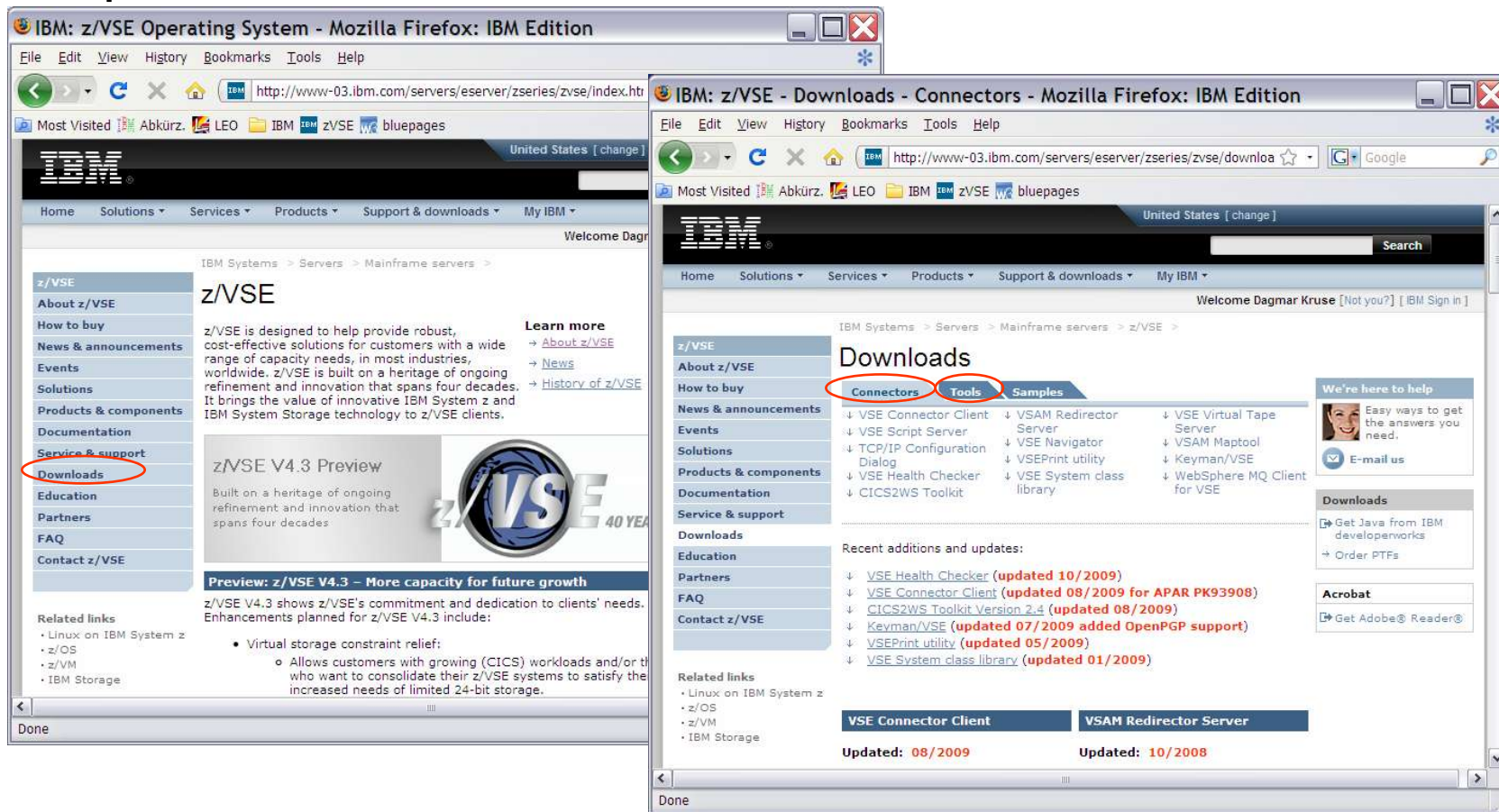
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Agenda

- **The z/VSE web site offers more than 20 tools ('as is', at no additional charge) for download.**

  – The tools are designed make certain z/VSE tasks easier and more interesting.

  – Because of the sheer number of tools, you may have lost track about what tools are provided and what they are for.

  – There may be a tool available that you are not aware of, for a task you need to perform.

- **This session will provide an overview of each the tools that are currently available on the VSE homepage.**

  – For every tool, a short description and usage scenarios will be discussed.

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Overview – z/VSE Homepage

http://ibm.com/vse

Overview - All Tools

Overview & News (Connectors)

- **Java-based Connector components (Part of VSE Connectors)**

  – VSE Connector Client   → updated 08/2009

  – VSAM Redirector Server   → updated 10/2008 with z/VSE V4.2

  – VSE Script Server   → updated 10/2008 with z/VSE V4.2

  – VSE Virtual Tape Server   → updated 10/2008 with z/VSE V4.2

- **Java-based Connector Tools (‚as-is')**

  – VSE Navigator   → updated 12/2008

  – VSAM Maptool

  – Keyman/VSE   → updated 07/2009

  – VSE Health Checker   → updated 10/2009

  – CICS2WS Toolkit   → updated 08/2009

  – VSEPrint Utility   → updated 05/2009

  – (VSE System class library   → updated 01/2009)

Overview & News (Tools)

- **Tools (mostly Java-based)**
  - z/VSE CPU Monitor Tool (CPUMON)   → updated 09/2009
  - z/VSE Installed Software Report Tool
  - IP Trace Tool
  - VSE ANT Task
  - ListVOL1 Utility
  - TS7700 Bulk Volume Information Retrieval Tool   → 09/2008   NEW!
  - Multi Instant Logic Analyzer4VSAM
  - JavaService - Run a Java program as a Windows Service → updated 03/2009
  - BSM Cross Reference Tool (BSMXREF)   → updated 08/2008
  - RACROUTE Encapsulation Services   → 02/2009
  - LE/VSE CEETRACE Tool (new with z/VSE4.2)   → updated 04/2009   NEW!
  - LE/VSE Control Center (new with z/VSE4.2)   → updated 08/2009
    - JCalc LE/VSE Tool
    - JLink LE/VSE Tool
    - JRun_LEVSE_Samples

Connector components

- **Part of z/VSE (5686-CF8-35)**

- **Officially supported**

Update with z/VSE V4.2

VSE Virtual Tape Server

VSE Connector Client Update 08/2009

VSAM Redirector Server

VSE Script Server

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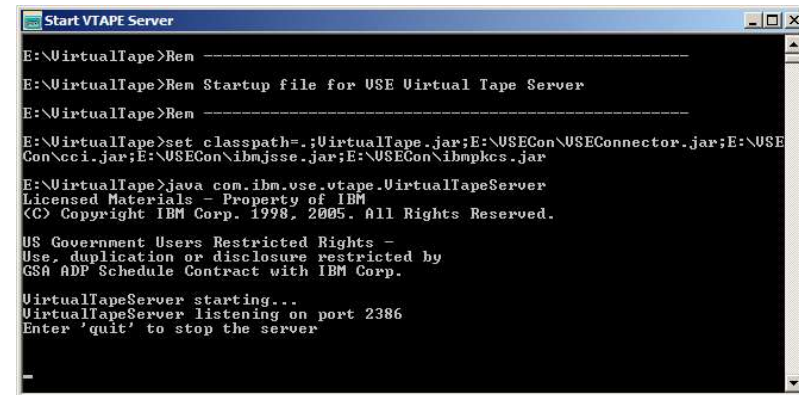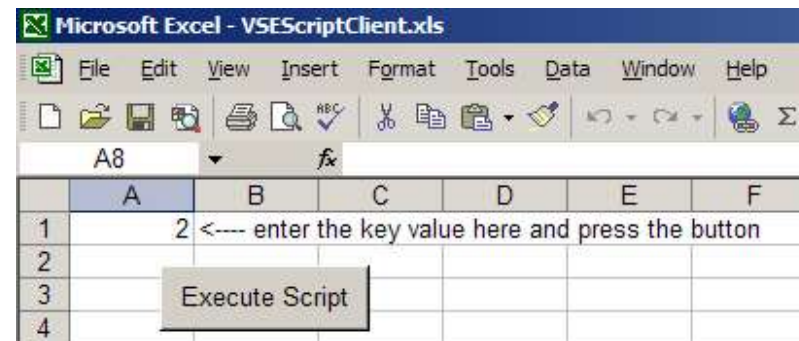
VSE Navigator

Update 12/2008

- **Graphical user interface for z/VSE**
  - Look and feel similar to Windows Explorer
- **Based on functions provided by VSE Connector Client**
- **Browse VSE libraries, POWER queues, ICCF libraries, VSAM catalogs**
- **Copy members via Drag & Drop**
- **Display and edit members with your favourite editor**
- **Display and change VSAM data**
- **Provides graphical system management functions**
  - System activity,
  - Retrace MSHP history file
  - ... and many more

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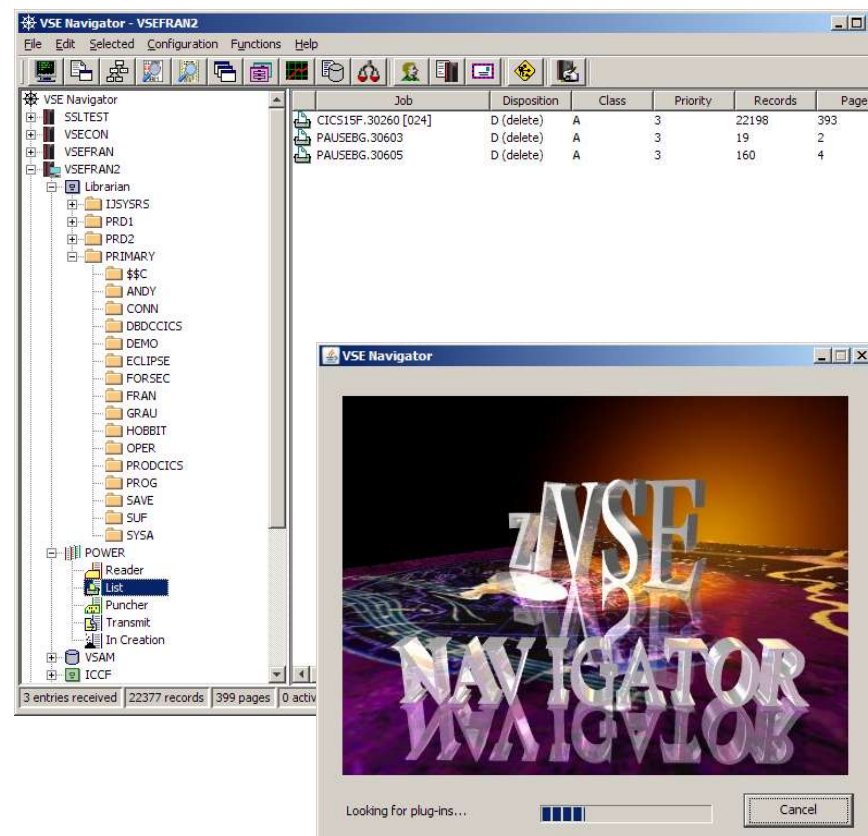
VSAM Maptool

- **Assists you in creating a mapping of your VSAM files**
  - Mapping is used by VSE Connector Client and VSAM Redirector
  - Mapping can also be created using the IDCAMS RECMAP command.
- **Import Cobol ot PLI copybook to create the mapping from it**
- **Import (receive) a given map from a given z/VSE system**
- **Export a map to a VSE system (send it to z/VSE)**
- **Import a map from a XML file**
- **Export a map to a XML file**
- **Create a Java source file from a given map. The Java program can get all records from the related VSAM file via the given map.**

VSE/VSAM Record structure from EMPPROG.COBOL

Name

0   25   60   n

Column:
→title: Name
→Offset: 25
→length: 35
→type: STRING
→Descr: Person name

MY.VSAM.
CLUSTER

Mapping
Repository
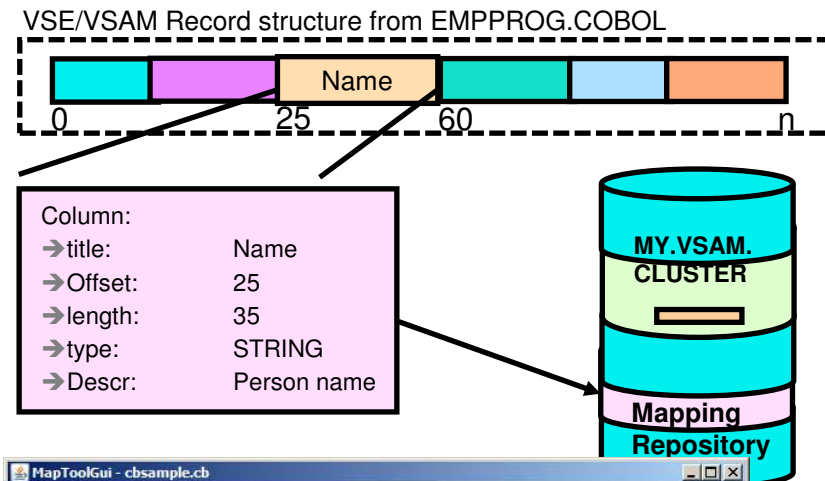
MapToolGui - cbsample.cb

Fieldname	Length	Offset	Type	Description
BANDA-SA	1	0	STRING	05 BANDA-SA PIC X VALUE 'A'.
BANDA-KZ	2	1	STRING	05 BANDA-KZ PIC XX VALUE 'GK'.
BANDA-BLZSPKDT	5	3	PACK...	05 BANDA-BLZSPKDT PIC 9(8) COMP-3.
BANDA-BLZSPKABS	5	8	PACK...	05 BANDA-BLZSPKABS PIC 9(8) COMP-3 VALU...
BANDA-ABS	27	13	STRING	05 BANDA-ABS PIC X(27) VALUE 'CUSTOM...
BANDA-ERSTELLDAT	4	40	PACK...	05 BANDA-ERSTELLDAT PIC 9(6) COMP-3.
FILLER-1	4	44	STRING	05 FILLER PIC X(4) VALUE SPACE.
BANDA-KTOABS	6	48	PACK...	05 BANDA-KTOABS PIC 9(10) COMP-3 VALUE ...
BANDA-REFERENZ	10	54	UZON...	05 BANDA-REFERENZ PIC 9(10) VALUE ZE...
FILLER-2	82	64	STRING	05 FILLER PIC X(82) VALUE SPACE.
BANDC-SA	1	146	STRING	05 BANDC-SA PIC X VALUE 'C'.
BANDC-AUFBLZ1	5	147	PACK...	05 BANDC-AUFBLZ1 PIC 9(8) COMP-3.
BANDC-BLZ	5	152	PACK...	05 BANDC-BLZ PIC 9(8) COMP-3.
BANDC-KTO	6	157	PACK...	05 BANDC-KTO PIC 9(10) COMP-3.
BANDC-NULL1	10	163	STRING	07 BANDC-NULL1 PIC X(10).
BANDC-NULL2	3	173	PACK...	07 BANDC-NULL2 PIC 9(5) COMP-3.
BANDC-TXSCHL-FI...	3	176	PACK...	05 BANDC-TXSCHL PIC 9(5) COMP-3.

Field options

Append	Edit
Insert	Delete

Map options

Lookup a field	Export
Change map info	Insert map

Import new
Exit

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Keyman/VSE

Update 07/2009

- **Keyman/VSE is a tool to manage the z/VSE specific public key infrastructure.**

- **Create RSA key pairs**

- **Create self-signed certificates for testing and learning purposes**

- **Create PKCS#10 certificate requests**

- **Sign certificate requests**

- **Import and export certificates**

- **Read and write PKCS#12 keyring files**

- **Catalog keys and certificates on VSE**

- **Maintain the mappings of VSE client certificates to VSE user IDs**

- **In addition to these basic functions, Keyman/VSE provides two "Wizard dialogs" for**

  – Creating a complete self-signed VSE keyring including the server side z/VSE library members and a client side keyring file, and

  – Creating a complete z/VSE keyring with certificates issued by an external Certificate Authority, like Thawte.

Keyman/VSE - F:\Temp\test.pfx

File   Options   Actions   Help

Alias	Certificate Item	Length	Type	VSE Us
vseKey	1024-bit RSA Key Pair	1024	Key	-
rootCert	VSE ROOT Certificate	1024	ROOT	-
vseCert	VSE Server Certificate	1024	User	-
clientCert	VSE Client Certificate	1024	Client	-

Certificate items saved to file F:\Temp\test.pfx   VSEFRAN2 : vsefran2
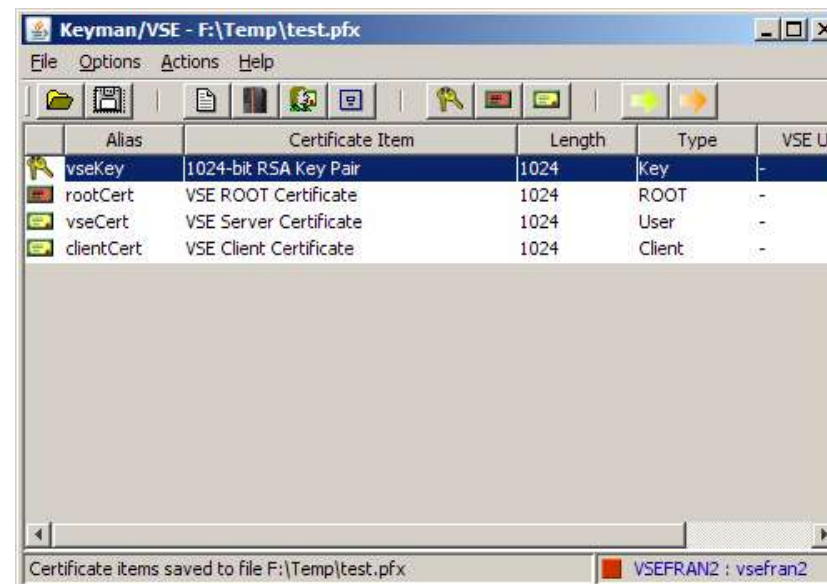
NEW!
- **Support for OpenPGP**
  – requires a Java 1.5 or higher
- **Support for JKS keystores**

VSE Health Checker

Update 10/2009

- **The VSE Health Checker is a Java-based system diagnosis utility**
  - Retrieves, displays, and analyzes performance relevant configuration settings and status information from z/VSE system.
  - Gathered data can be exported and imported in XML format.

- **A health check is performed by applying a set of rules against a snapshot of retrieved z/VSE data.**
  - A printable report can be generated

- **VSE data is retrieved by sending console commands, submitting VSE/POWER jobs, downloading VSE Librarian members, and invoking CICS transactions.**
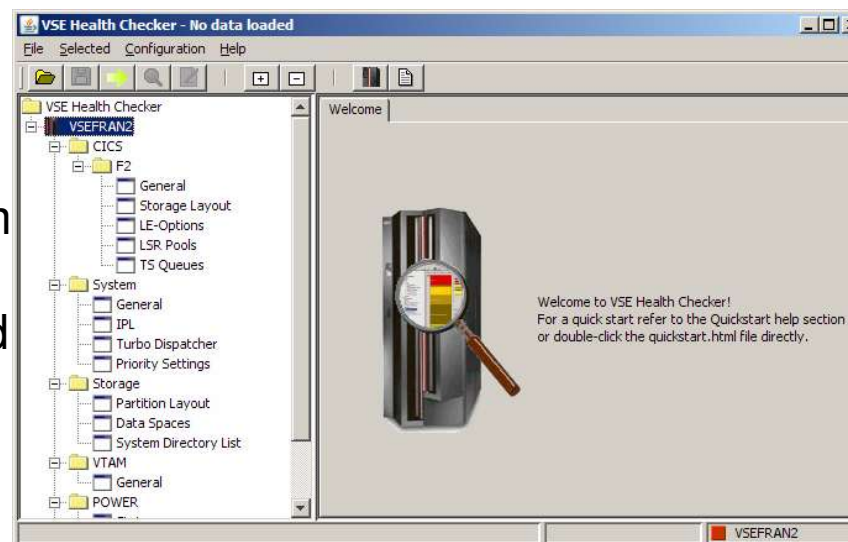
BSM Security information added NEW!

- BSM-Logging (Critical events)

- User inconsistencies and UACC entries

  requires BSMXREF utility

27. Oct. 2009

VSE Health Checker

BSM Security information added *NEW*

- BSM-Logging (Critical events)
- User inconsistencies

    and UACC entries requires BSMXREF utility

VSE Health Checker - No data loaded

File   Selected   Configuration   Help
    Look and feel
VSE Health Che   VSE Host Properties
 VSEALT   General Options
 VSETST
 ZVSE31
 ZVSE41
 ZVSE42

General Options

General | TS Queues Setup | Customize processor descriptions | TCP/IP Fixes

Timeout
    30   sec.

Analysis report
    Level   All
    Filename $HOSTNAME_report.html

Trace settings
☐ Console and job output trace (to text file)
☐ Data retrieval trace (to STDOUT)
☐ Data analysis trace (to STDOUT)

Wait Time Interval for CICS STAT Output
    Interval (sec.)   30

Data Retrieval
☑ VSE System data
☑ VSE Security data

VSE Health Checker - Data loaded from: ZVSE421_2009_10_22_14.48.06.x...

File   Selected   Configuration   Help

ZVSE41
ZVSE42
    CICS
    System
    Security
        Inconsistencies
        BSM Logging
    Storage
    VTAM

User Inconsistencies | ■ UACC Entries | ■ Administrator Users | ■ ICCF / IUI Users | ■ LDAP Mappings

Summary
    Total inconsistent users   0

Inconsistent Users   Group Membership   Access Rights

    Auth   Profile

ZVSE42

CICS2WS Toolkit Version 2.4

Update 08/2009

- **The CICS2WS Toolkit helps you to use Web Services with z/VSE**

  – Creates proxy code that you use as a layer between your existing programs and the VSE SOAP engine.

  – The proxy code is generated as Assembler program, therefor you do not need a Cobol or PL/I compiler.

- **Web Service enable an existing CICS program:**

  – The tool reads COBOL and PL1 copybooks and creates the proxy code and WSDL file.

- **Call an external Web Service from a CICS program**

  – Reads an WSDL file and creates the proxy code and a copybook for the COMMAREA mapping.

WSDL = Web Service Description Language
Contains all information required to call a particular Web Service.

NEW! Support for projects 02/2009

27. Oct. 2009

VSEPrint

Update 05/2009

- **The VSEPrint utility allows you to print VSE/POWER list queue entries on any locally or LAN-attached printer.**

- **The queue entry can be formatted for proper output by specifying a meta-file which contains instructions for formatting the file.**

- **The print-file can be previewed on the platform where the LAN-printer is attached.**

- **On VSE, the TCP/IP command DEFINE EVENT is used to setup a listener for list queue entries which have a given class.**

- **These queue entries are then sent via AUTOFTP to a platform, where the VSEPrint utility runs.**

- **The VSEPrint utility then performs all print setup, formatting and optional previewing.**

VSE CPU Monitor Tool (CPUMON)

Update 09/2009

- **Intended to help customers to measure the CPU utilization of their VSE system over a period of time.**

- **When you plan for a processor upgrade it is very important to know the CPU utilization of your VSE system over a day or a week.**

  – Helps you to estimate the size of the new processor.

- **The VSE CPU Monitor Tool is not intended to replace any existing monitoring product provided by partners.**

- **It provides only very basic monitoring capabilities on an overall VSE system level.**

- **No details about CPU usage of certain applications are provided**

Example CPU utilization chart
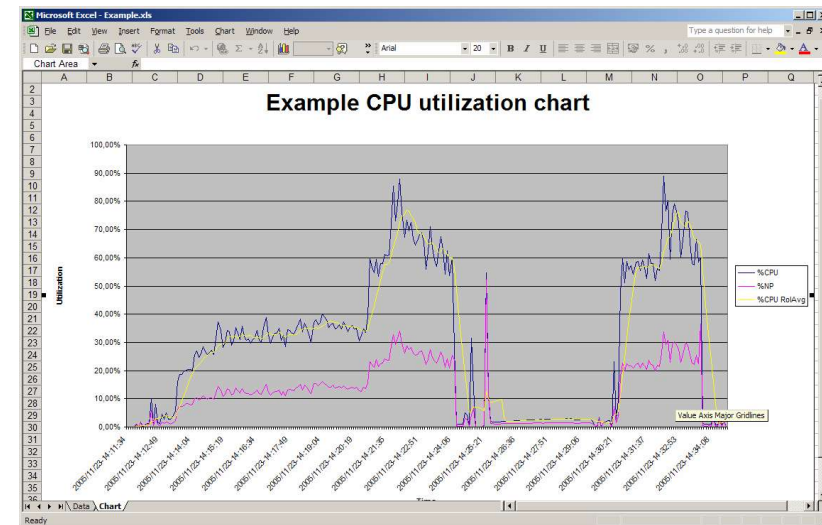
NEW! Accepted by IBM Techline for VSE capacity planning

z/VSE Installed Software Report Tool

- **This tool is able to generate a z/VSE Installed Software Report as used by IBM ShopzSeries.**

  – http://www.ibm.com/software/shopzseries

- **It connects to z/VSE via FTP and submitts 2 MSHP Jobs**

- **The output is retrived and a servcie bitmap is created**

- **The servcie bitmap (= Installed Software Report) can then be uploaded to ShopzSeries when ordering service for z/VSE.**

- **Note: This tool is officially supported by IBM.**
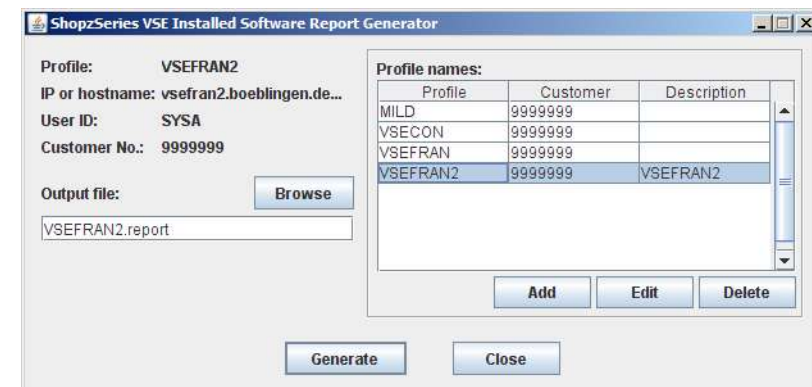
IP Trace Tool

- **This tool is able to read IP packet traces captured with TCP/IP for VSE and convert it into the CAP trace format**

- **Trace can then be viewed and analyzed with Wireshark (formerly Ethereal) or Packetyzer.**
  - http://www.wireshark.org/
  - http://sourceforge.net/projects/packetyzer/

- **Wireshark provides very powerfull network and protocol analysis functions like**

  - Follow TCP stream

  - Packet flow graph

  - TCP round trip time graph

  - Statistic and performance analysis

  - ... And many more.

- **Supports TCP/IP for VSE 1.5D, 1.5E and 1.5F**

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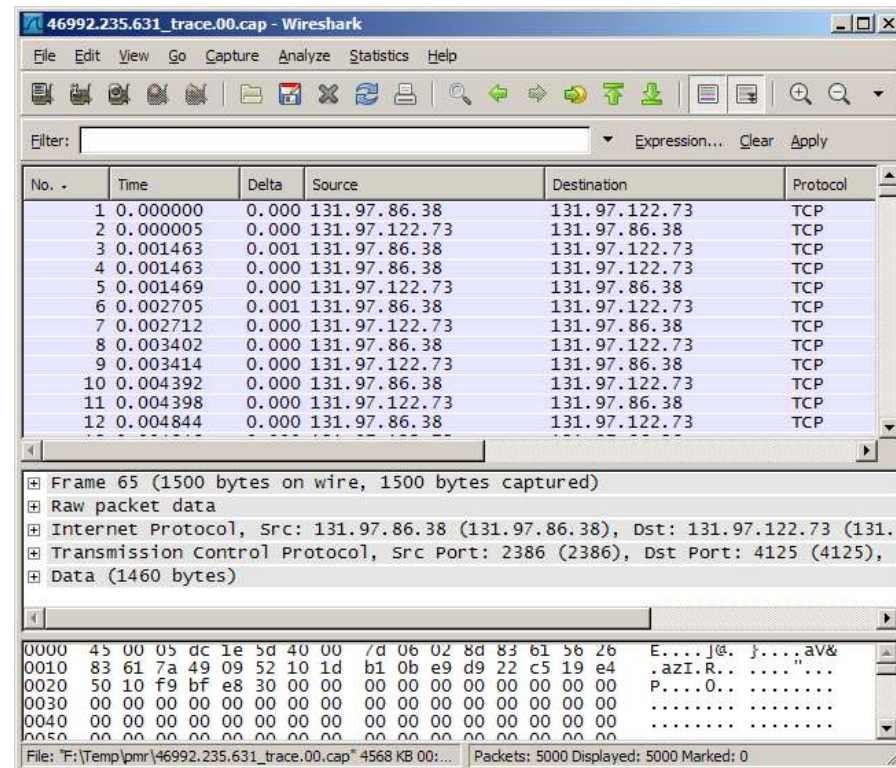
VSE ANT Tasks

- **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/
- **z/VSE provides a set of ANT-Tasks to automate VSE specific operations**
  - Submit VSE Jobs
  - Upload & Download members and files
  - Issue console commands and retrieve messages
  - Access VSAM data
- **Allows to automate VSE processes from a central place**
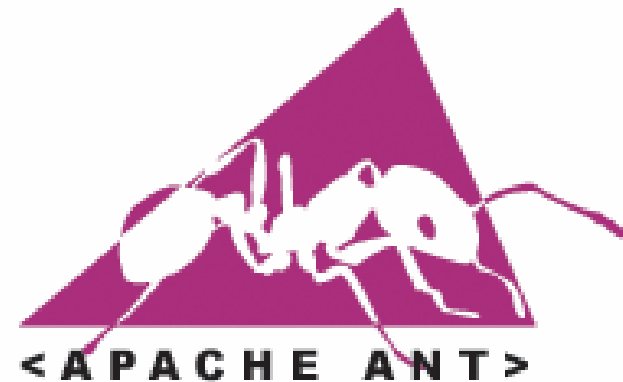
```
<submit jobfile="c:\vsejobs\define_vtape.job"
        waitforoutput="true"
        outfile="c:\vsejobs\output\definetape.txt"
        propertyprefix="definetape.job"
        vsesystem="TESTVSE1"/>


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


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

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ListVOL1 Utility

- **This tool helps to manage VSE VTAPE images stored in VSAM files**

- **It can display the VOLSER and File-ID of the files stored on the virtual tape without mounting it as VTAPE.**

- **The ListVOL1 utility reads the first 2 tape records of tape image**
  - You can specify multiple VTAPE files

- **It prints the VOLSER and FILE-ID from the VOL1 and HDR1 labels on the tape:**

```
LISTVOL1 UTILITY - LIST VOL1/HDR1 LABELS OF VTAPES

FILENAME: VOLSER   FILE-ID
-------------------------------------------------------------
VTAPE1   : TAPE00   TAPE.DATASET.00
VTAPE2   : PRDDAT   PRODUCTON.DATA
VTAPE3   : BACKUP   MY.BACKUP.FILE
-------------------------------------------------------------


LISTVOL1 UTILITY - FINISHED
```

TS7700 Bulk Volume Information Retrieval Tool

NEW!

09/2008

- **The Bulk Volume Information Retrieval (BVIR) tool is intended to enable customers to obtain information about all of the logical volumes a TS7700 manages**

- **Requests:**
  - VOLUME STATUS zzzzzz
  - CACHE CONTENTS
  - VOLUME MAP
  - POINT IN TIME STATISTICS
  - HISTORICAL STATISTICS FOR xxx-yyy
  - PHYSICAL MEDIA POOLS
  - PHYSICAL VOLUME STATUS VOLUME zzzzzz
  - PHYSICAL VOLUME STATUS POOL xx
  - COPY AUDIT COPYMODE INCLUDE/EXCLUDE libids

- **More information about the different request types and how to read their results, please have a look at the IBM System Storage Virtualization Engine TS7700 Redbook**
  - http://www.redbooks.ibm.com/abstracts/sg247312.html

Multi Instant Logic Analyzer4VSAM

Update 04/2008

- **The Multi Instant Logic Analyzer4VSAM combines several VSAM analysis tools:**
  - Extent analysis
  - Space map analysis
  - HALRBA/HUSRBA analysis
  - Capacity analysis
  - The SNAP013 analysis:
    - Extracts Snap013 trace tables from a given hex dump.
  - INDEX analysis tool:
    - Error analysis
    - Index component capacity analysis providing reorganization indicator

27. Oct. 2009
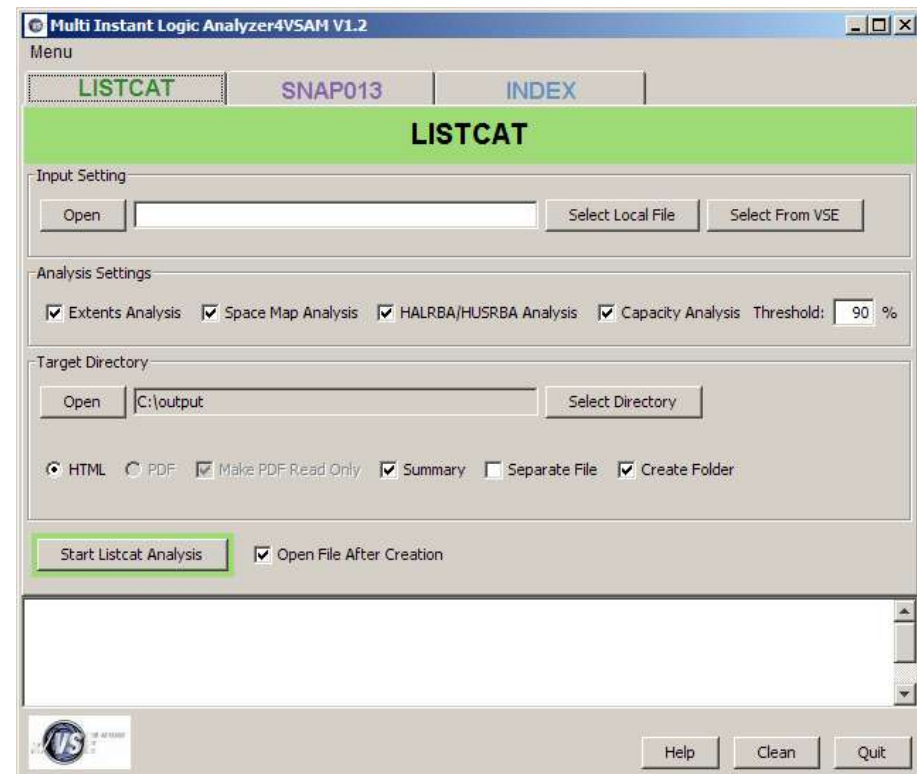
Update 03/2009

JavaService - Run a Java program as a Windows Service

- **IBM provides several server applications for use with z/VSE that are implemented in Java:**
  - VSAM Redirector Server
  - VSE VTAPE Server
  - VSE Script Server

- **You may wish to run such a server on an unattended Windows system.**
  - Even if no user is signed-on

- **The JavaService tool allows running a Java application as a Windows service in the background.**

- **It acts as a wrapper in-between the Windows Service Control Manager and the Java Program.**

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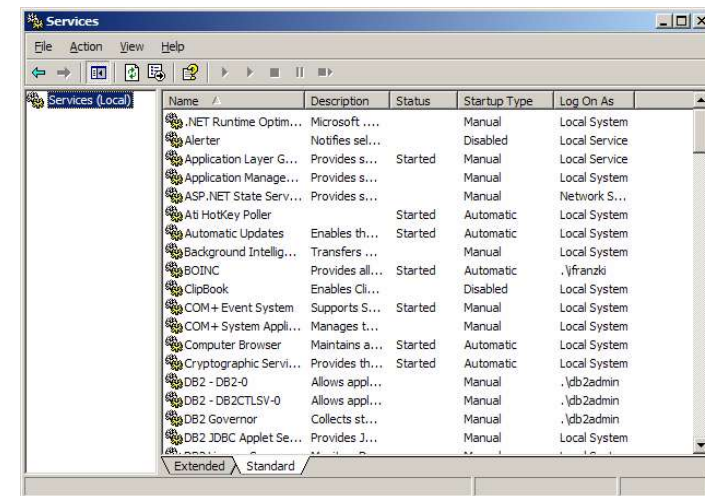
Update 08/2008

BSM Cross Reference Tool (BSMXREF)

- **The z/VSE BSM Cross Reference Tool is intended to help administrators control the profile definitions in the BSM control file.**

- **Example:**
  - When you delete a user ID, you can use it to ensure that you have removed the user ID from all access lists and groups.

- **The following functions are provided:**
  - List all groups and resource profiles which contain a specified user ID.

  - List all resource profiles where a specified group is on the access list.

  - List all user IDs found in the BSM control file but is not defined in the VSE control file.

  - List all resource profiles that allow any user to access a resource (UACC not NONE).

```
// EXEC BSTXREF,PARM='GROUP=*'

1S54I  PHASE BSTXREF  IS TO BE FETCHED FROM IJSYSRS.SYSLIB


                                        BSM Cross Reference Report
                                             of All Groups



 Occurrences of group GROUP01


 Group description TRANSEC CLASS MIGRAT

 Connect group for user $SRV

 Connect group for user CICSUSER

 Connect group for user OPER

 Connect group for user PROG

 Update authority in access list of profile FACILITY DFHRCF.BRSLPU

 Update authority in access list of profile FACILITY DFHRCF.BRSL01
```

02/2009

RACROUTE encapsulation services for TCP/IP (BSSTXRRS)

- **The IBM-provided TCP/IP security exit BSSTISX supports a pre- and post-processing interface**
  - These interfaces are solely intended to be used by customers to add self-written security checks

- **In particular when it is used to exploit the security definitions of the security manager, e.g. special profiles of the resource class FACILITY, normally one has to use the RACROUTE macro interface**
  - However, coding of RACROUTE requests can be very complex

- **Therefore these services were provided with BSSTXRRS to encapsulate the three basic RACROUTE requests:**
  - sign on
  - sign off
  - authorization checking for resource access.

```
+-----------+     +-----------+     +--------------+
|  TCP/IP   |---->|           |<--->| Pre-         |
|   for     |     |           |     | processing   |
|   VSE     |     | BSSTISX   |     | exit         |
|           |     |           |     +--------------+
|           |     |           |<==RACROUTE==> +-----------+
|           |     |           |               | Security  |
|           |     |           |               | Manager   |
|           |     |           |               | (BSM/ESM) |
|           |<----|           |<--->+--------------+
|           |     |           |     | Post-        |
|           |     |           |     | processing   |
|           |     |           |     | exit         |
+-----------+     +-----------+     +--------------+
```

LE/VSE CEETRACE Feature
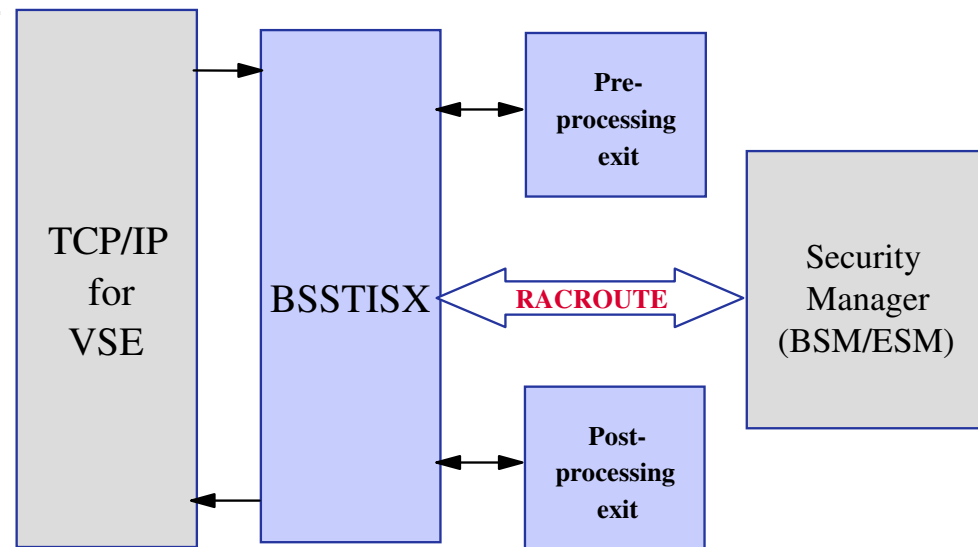
Update 04/2009

NEW! 10/2008 z/VSE V4.2

- **CEETRACE is designed to complement the already available LE z/VSE dump information to aid in application problem analysis**

  – by providing an execution statement history prior to any subsequent application failure

  – similar to the previously available READY TRACE facility of DOS/VS COBOL

- **Applications that do not abend will not automatically produce an execution statement report.**

- **CEETRACE is not intended to replace the LE z/VSE dump information or the Debug Tool for VSE/ESA**

LE/VSE Control Center

Update 08/2009

NEW!
10/2008
z/VSE V4.2

- **The LE/VSE Control Center is a Java based tool for easy access to z/VSE language resources.**
  - It follows an integrated approach to understand, plan and perform common language tasks and is comparably intended for new or experienced VSE users.
  - It offers various tools and usage options for language planning-, customization-, diagnostics-, environmental verification- and programming purposes including status and service reports.

LEVSE Control Center - Copyright IBM Corp. 2008 - Build id: 20081021V2.4

ⓘ Advisory Pilot - Choices with Language Environment for z/VSE

Please Select

Task:
Analysis_and_Debugging
Customization_Actions
Customization_Job_Skeletons
Customization_Planning
General_Information
Install_Verification_Programs
Programming
Service_Tasks

Topic:
Language_Independent_Abend_Trace_Tool
Sample_C/VSE_Routines
Sample_COBOL/VSE_Routines
Sample_PLI/VSE_Routines
VSE_Program_Compile_Linklists

Subtopic:
Activating_CEETRACE_Feature
Attention_Routine_Interface_Support
Deactivating_CEETRACE_Feature
Displaying_CEETRACE_Option_Settings
Excluding_COBOL_Source_Code_Lines
Excluding_CPU_Execution_Time_Stamp
Excluding_Warning_Messages_Only_E_and_S

Start   Exit   Help

Integrated in LE/VSE Control Center

JCalc LE/VSE Tool

- **This tool is able to calculate and provide an online view of SVA-eligible Language Environment for VSE**

- **It also takes into consideration whether default-, recommended- and/or optional LE/VSE supplied SVA-loadlists are intended to be used.**

Component Viewer

Routine Name	Description	Decimal Size	SVA Eligible	AMODE	RMODE	SVA List
CEEBINIT	Initialization/termination for batch	53640	YES	ANY	24	$SVACEE
CEEBLIBM	Library routine retention init/term	20784	YES	ANY	24	$SVACEE
CEEBLRR	Library routine retention interface	936	YES	ANY	24	$SVACEE
CEEBNATX	Null Abnormal termination exit	2	YES	31	ANY	$SVACEE
CEEBXITA	Assembler User Exit Interface	156	YES	31	ANY	$SVACEE
CEEBXTAN	Batch Abnormal termination exit table	274	YES	31	ANY	$SVACEE
CEECCICS	CICS library support routines	42008	YES	31	24	$SVACEE
CEECOPP	Compiler options parsing program	50424	YES	31	ANY	$SVACEE
CEECOPT	CICS Installation-wide default runopts	26688	YES	31	ANY	$SVACEE
CEECXTAN	CICS Abnormal Termination Exit table	290	YES	31	ANY	-
CEEDOPT	Batch Installation-wide default runopts	26688	YES	31	ANY	$SVACEE
CEEKDS	Contains dump services	94256	YES	31	ANY	$SVACEE
CEELCLE	Contains locale services	11064	YES	31	ANY	$SVACEE
CEELEDT	LE/VSE to VSE/POWER Interface Routine	8144	YES	31	ANY	-
CEELRRIN	Library routine retention init interface	352	YES	31	ANY	$SVACEE
CEELRRTR	Library routine retention term interface	344	YES	31	ANY	$SVACEE
CEEMENU0	Msg file + mixed-case Engl.msgs 000-999	9600	YES	31	ANY	$SVACEE
CEEMENU2	Msg file + mixed-case Engl.msgs 2000-2999	10384	YES	31	ANY	$SVACEE
CEEMENU3	Msg file + mixed-case Engl.msgs 3000-3999	33032	YES	31	ANY	$SVACEE
CEEMENU4	Msg file + mixed-case Engl.msgs 4000-4999	1032	YES	31	ANY	$SVACEE
CEEMENU5	Msg file + mixed-case Engl.msgs 5000-5999	696	YES	31	ANY	$SVACEE
CEEMJPN0	Msg file with Jap.msgs 000-999	9536	YES	31	ANY	-
CEEMJPN2	Msg file with Jap.msgs 2000-2999	10488	YES	31	ANY	-
CEEMJPN3	Msg file with Jap.msgs 3000-3999	33400	YES	31	ANY	-

Note: Large phases marked red, default SVA entries in blue

Help | Calculate SVA loadlist | Cancel

GSE Workshop for z/VSE, z/VM und Linux auf System z

JLink LE/VSE Tool

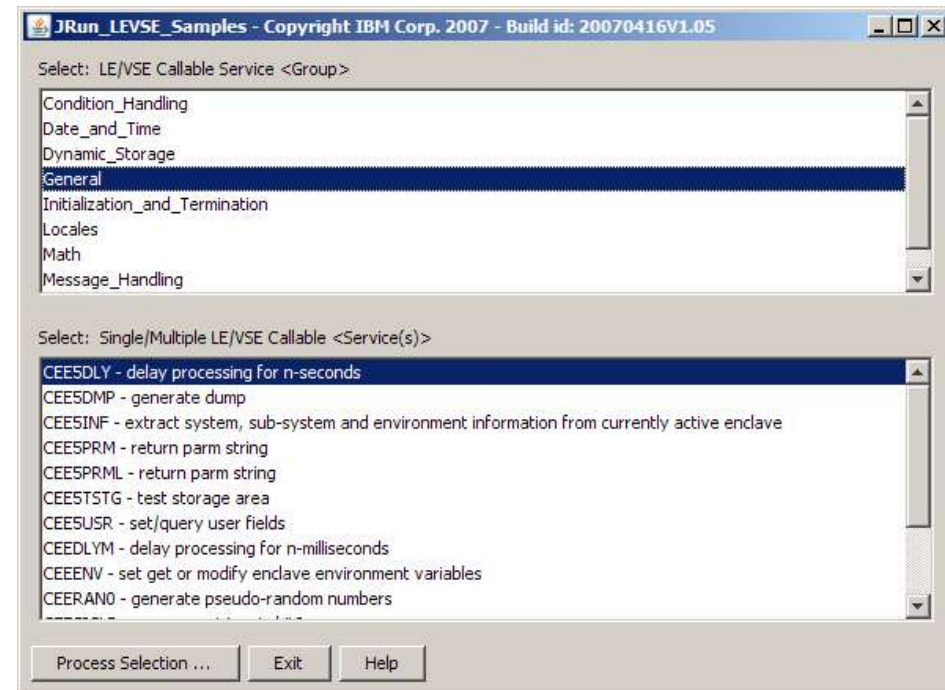Integrated in LE/VSE Control Center

- **Coping with Language Environment for VSE run-time problems often is a complex task**

  – It requires analysis of the failing application and environment.

- **A useful approach is to cross-check program compile/link lists (e.g in regard to languages, interfaces, products, options, stubs involved).**

- **This tool validates VSE compile/link list(s) to judge whether or not a run-time problem might be related to the way the application is built.**

  – The tool has initially been developed to help IBM support people to analyze LE related problems.

  – It is now also available to customers.
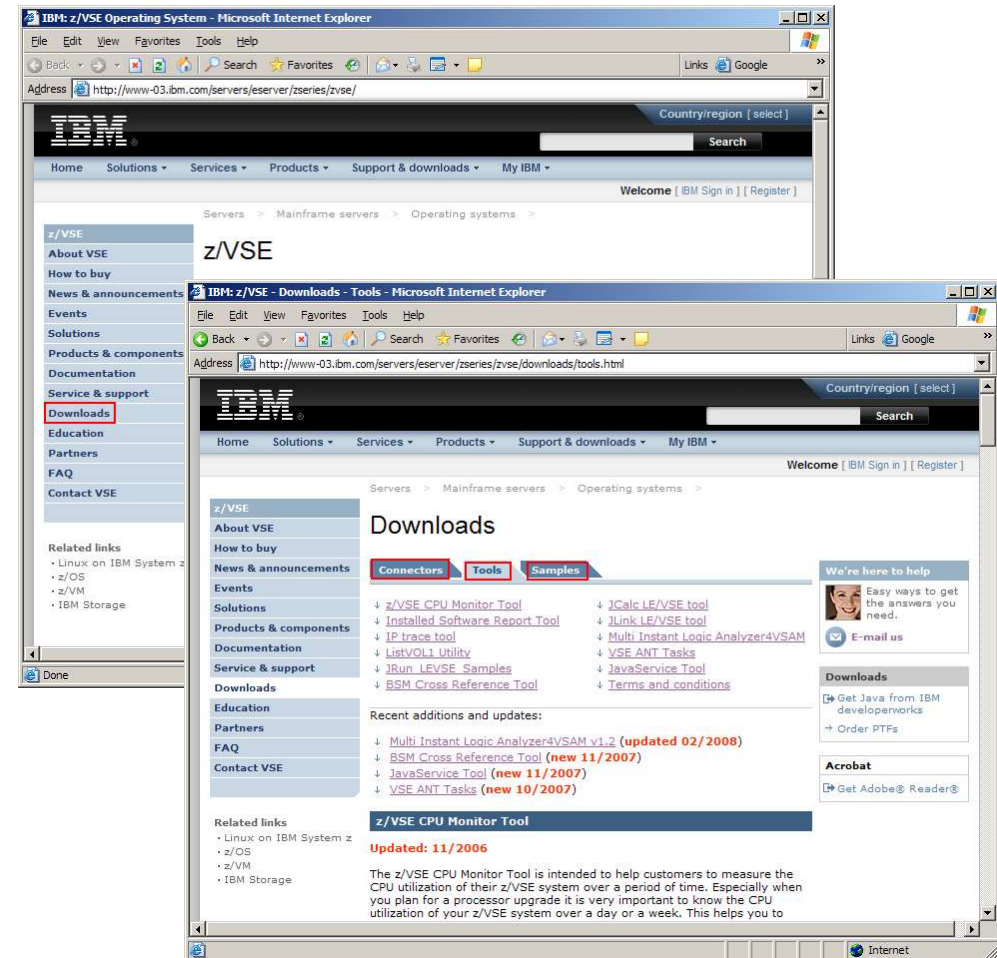
Integrated in LE/VSE Control Center

JRun_LEVSE_Samples

- **This tool provides an integrated front-end to download and try out IBM provided LE/VSE sample source programs**
  - Supports samples written in the COBOL, PL/I and C programming language.
  - LE/VSE callable services which can be coded cross programming language.

- **The following samples are covered:**
  - Condition Handling
  - Date and Time
  - Dynamic Storage
  - General, Initialization and Termination
  - Locales
  - Math
  - Message Handling
  - National Language Support

- **Note:**
  A corresponding LE/VSE conforming compiler (COBOL/VSE, PLI/VSE and/or C/VSE) must be installed on z/VSE

JRun_LEVSE_Samples - Copyright IBM Corp. 2007 - Build id: 20070416V1.05

Select: LE/VSE Callable Service <Group>

Condition_Handling
Date_and_Time
Dynamic_Storage
General
Initialization_and_Termination
Locales
Math
Message_Handling

Select: Single/Multiple LE/VSE Callable <Service(s)>

CEE5DLY - delay processing for n-seconds
CEE5DMP - generate dump
CEE5INF - extract system, sub-system and environment information from currently active enclave
CEE5PRM - return parm string
CEE5PRML - return parm string
CEE5TSTG - test storage area
CEE5USR - set/query user fields
CEEDLYM - delay processing for n-milliseconds
CEEENV - set get or modify enclave environment variables
CEERAN0 - generate pseudo-random numbers

Process Selection ...   Exit   Help

27. Oct. 2009

Summary

- **IBM offers are a huge set of tools available on the VSE Homepage**

  – http://ibm.com/vse
    Click on Download on the left

- **Most tools are 'as is', at no additional charge.**

- **Connector components (part of z/VSE and officially supported) are also available here**

- **Check it out now !**

Questions ?