

# IS03/VS01 - z/VSE Connector News



Ingo Franzki





## Trademarks

**The following are trademarks of the International Business Machines Corporation in the United States, other countries, or both.**

Not all common law marks used by IBM are listed on this page. Failure of a mark to appear does not mean that IBM does not use the mark nor does it mean that the product is not actively marketed or is not significant within its relevant market.

Those trademarks followed by ® are registered trademarks of IBM in the United States; all others are trademarks or common law marks of IBM in the United States.

For a complete list of IBM Trademarks, see [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml):

\*, AS/400®, e business (logo)®, DBE, ESCO, eServer, FICON, IBM®, IBM (logo)®, iSeries®, MVS, OS/390®, pSeries®, RS/6000®, S/30, VM/ESA®, VSE/ESA, WebSphere®, xSeries®, z/OS®, zSeries®, z/VM®, System i, System i5, System p, System p5, System x, System z, System z9®, BladeCenter®

**The following are trademarks or registered trademarks of other companies.**

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency, which is now part of the Office of Government Commerce.

\* All other products may be trademarks or registered trademarks of their respective companies.

### Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

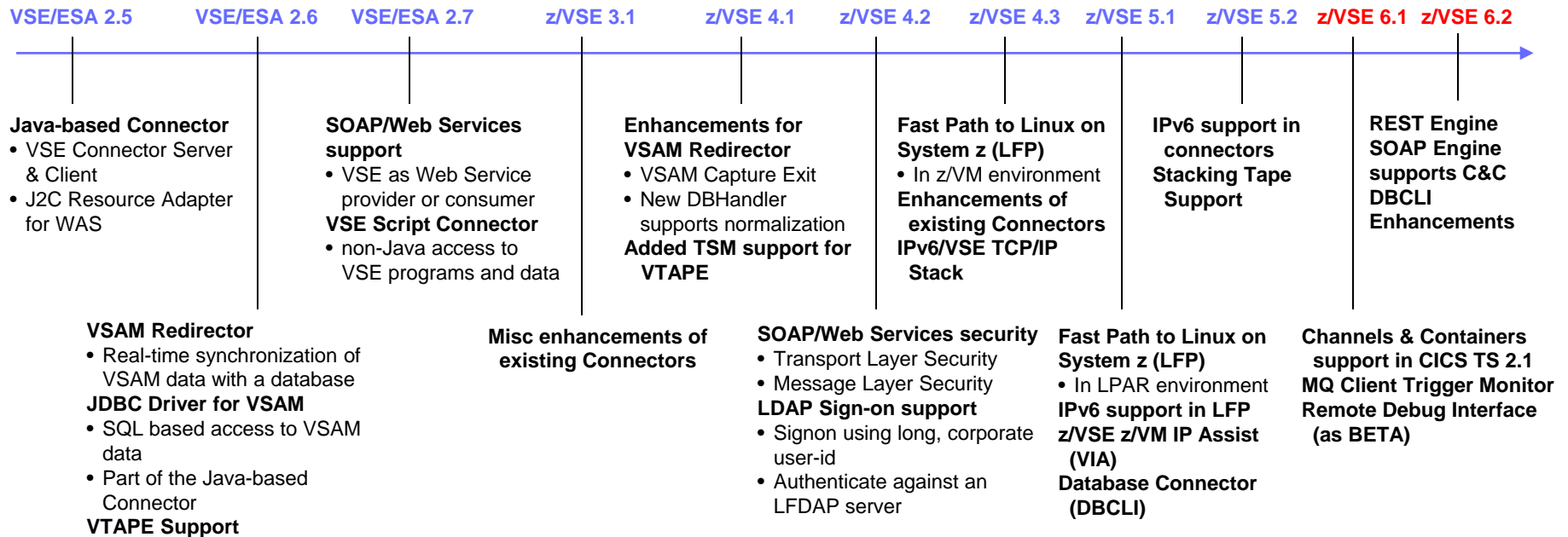
Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

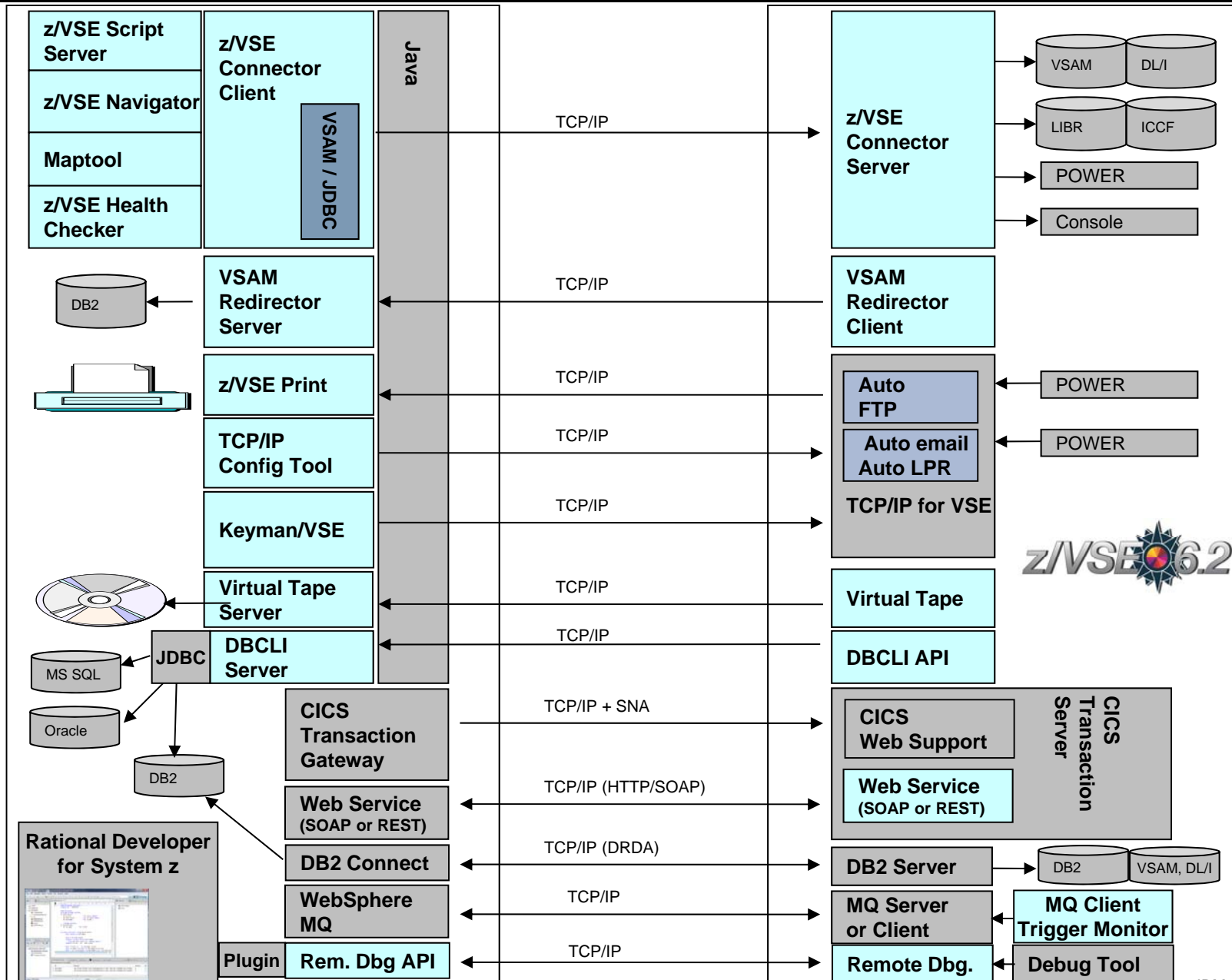
## Notice Regarding Specialty Engines (e.g., zIIPs, zAAPs and IFLs):

- Any information contained in this document regarding Specialty Engines ("SEs") and SE eligible workloads provides only general descriptions of the types and portions of workloads that are eligible for execution on Specialty Engines (e.g., zIIPs, zAAPs, and IFLs). IBM authorizes customers to use IBM SE only to execute the processing of Eligible Workloads of specific Programs expressly authorized by IBM as specified in the "Authorized Use Table for IBM Machines" provided at [http://www.ibm.com/systems/support/machine\\_warranties/machine\\_code/aut.html](http://www.ibm.com/systems/support/machine_warranties/machine_code/aut.html) ("AUT").
- No other workload processing is authorized for execution on an SE.
- IBM offers SEs at a lower price than General Processors/Central Processors because customers are authorized to use SEs only to process certain types and/or amounts of workloads as specified by IBM in the AUT.

## z/VSE Connectors - Introduction

- The z/VSE Connectors started as a single function in VSE/ESA 2.5
- Since then, it evolved over time
- Its now more a technology than just a function
  - consisting of many different features and functions
  - supporting various connector solutions



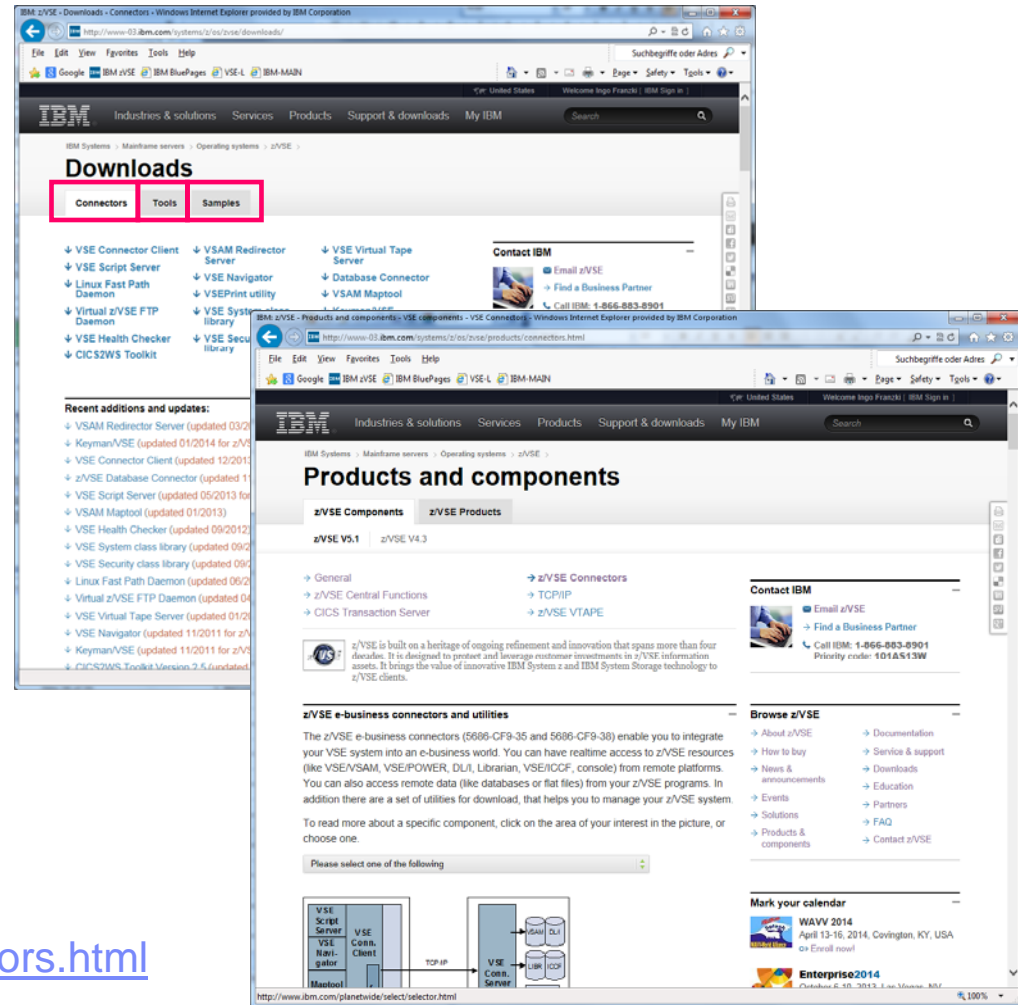


# z/VSE Connector & Tools - Downloads

- Connector components
  - Delivered as part of the z/VSE system as WBOOKs in PRD2.PROD
  - Also available on the z/VSE Homepage  
<http://ibm.com/zvse/downloads>

- Many ‘as-is’ tools are provided for download

- Information about the Connector Components can be found here:  
<http://ibm.com/zvse/products/connectors.html>



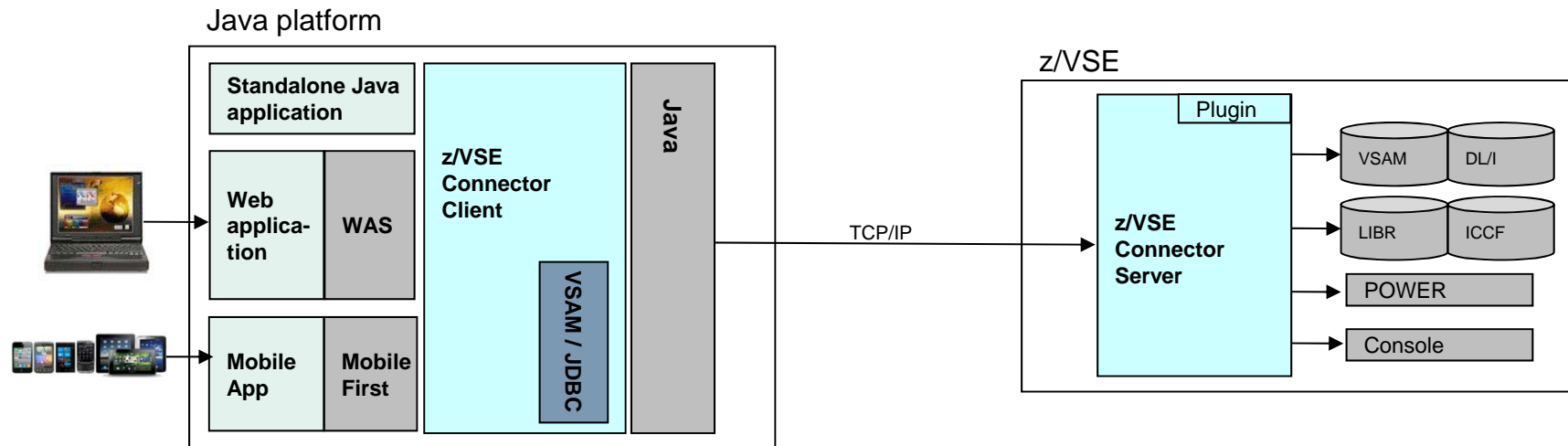


## Java-based Connector

- **Remote access to z/VSE data and programs from a Java program**
  - Real time access to VSAM, DL/I, LIBR, POWER, Console, Jobs, ...
  - From standalone Java programs
    - ...or from web applications (servlets, JSPs, Mobile Apps etc.)
  - Deployable as J2C Resource Adapter or JDBC Data Source into J2EE web applications servers, such as:
    - WebSphere Application Server
    - IBM Mobile First Server
  - Extendable via Plugins



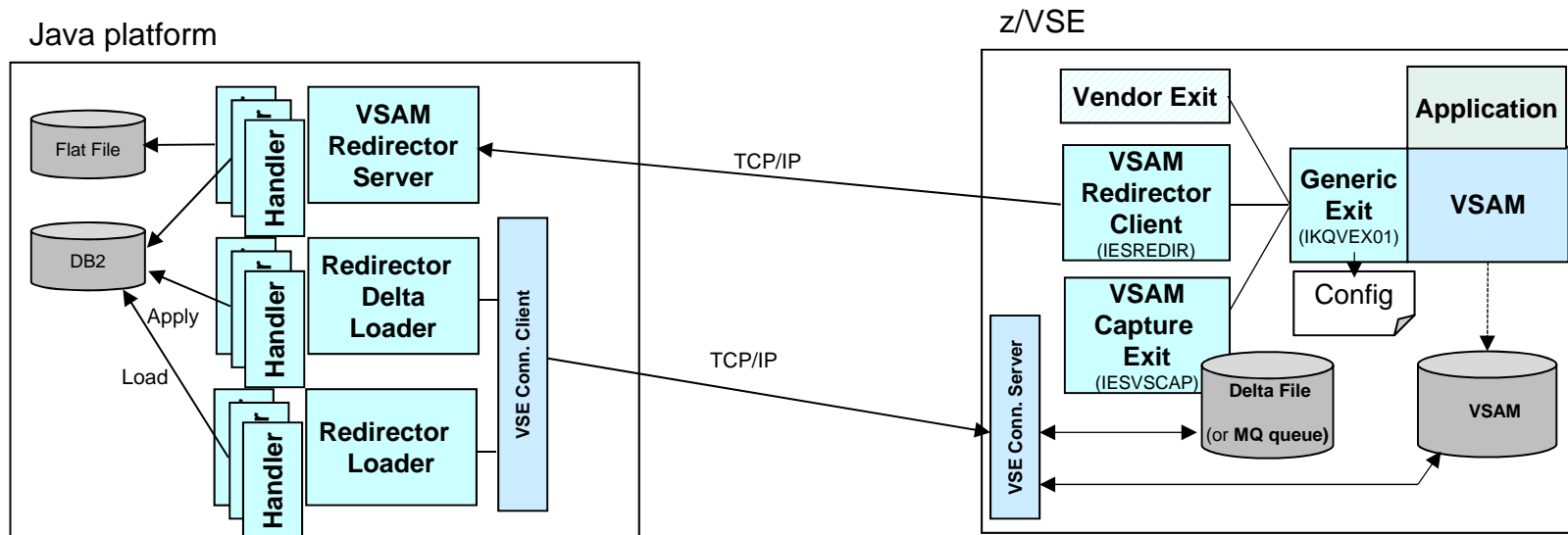
WebSphere software



# VSAM Redirector



- **Synchronization of VSAM data with a database**
- **Real-time: VSAM Redirector Client/Server**
  - **OWNER=VSAM:**
    - any INSERT, UPDATE or DELETE request is immediately replicated into the database
    - Read requests go against the VSAM dataset on z/VSE
  - **OWNER=REDIRECTOR:**
    - All VSAM requests are sent to the database.
    - No access to the VSAM dataset anymore (except OPEN / CLOSE).
- **Near real-time: VSAM Capture Exit**
  - Data changes are collected in a delta file or MQ queue
  - Delta file is downloaded and applied to database from time to time

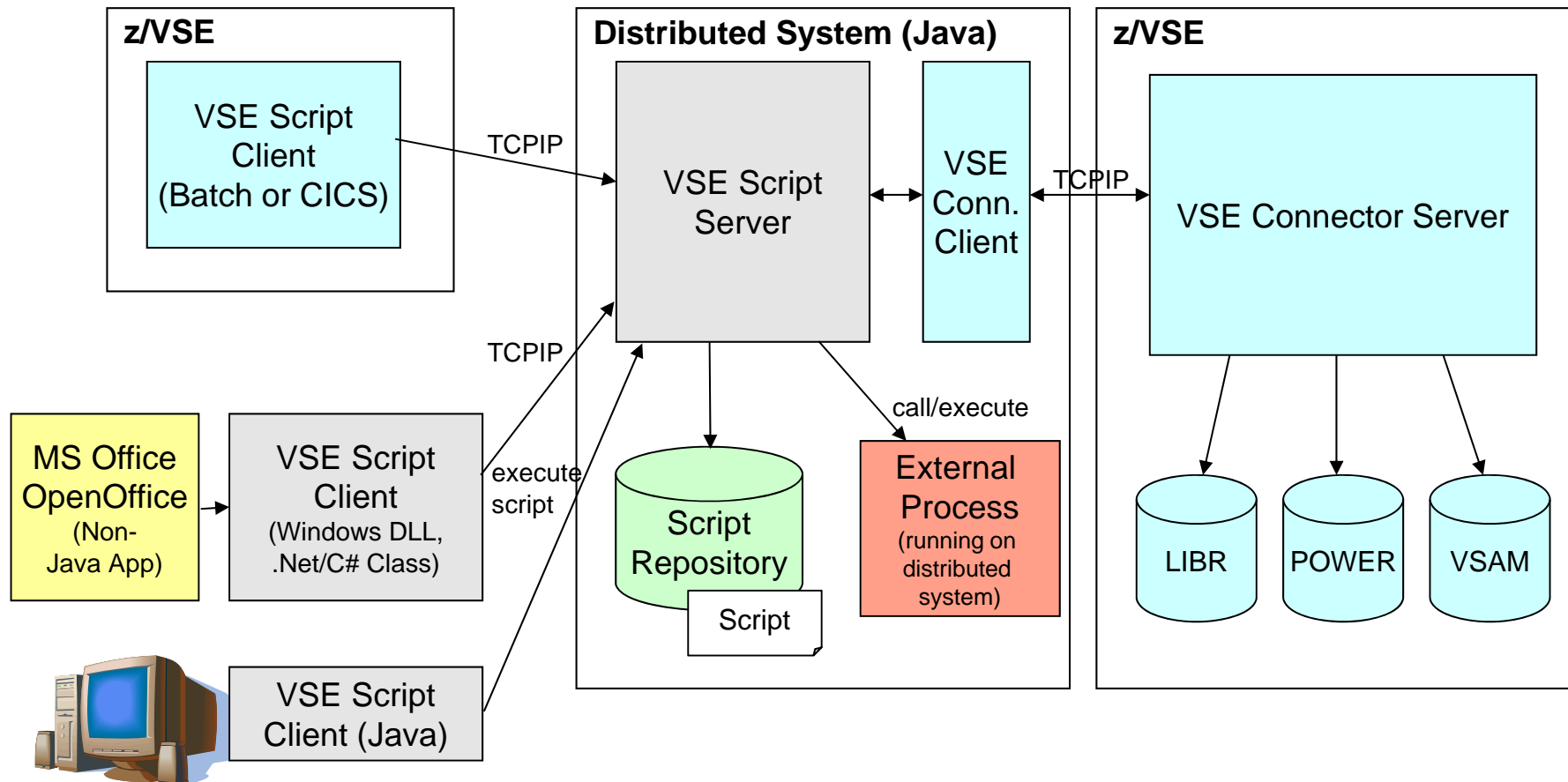




# z/VSE Script Connector

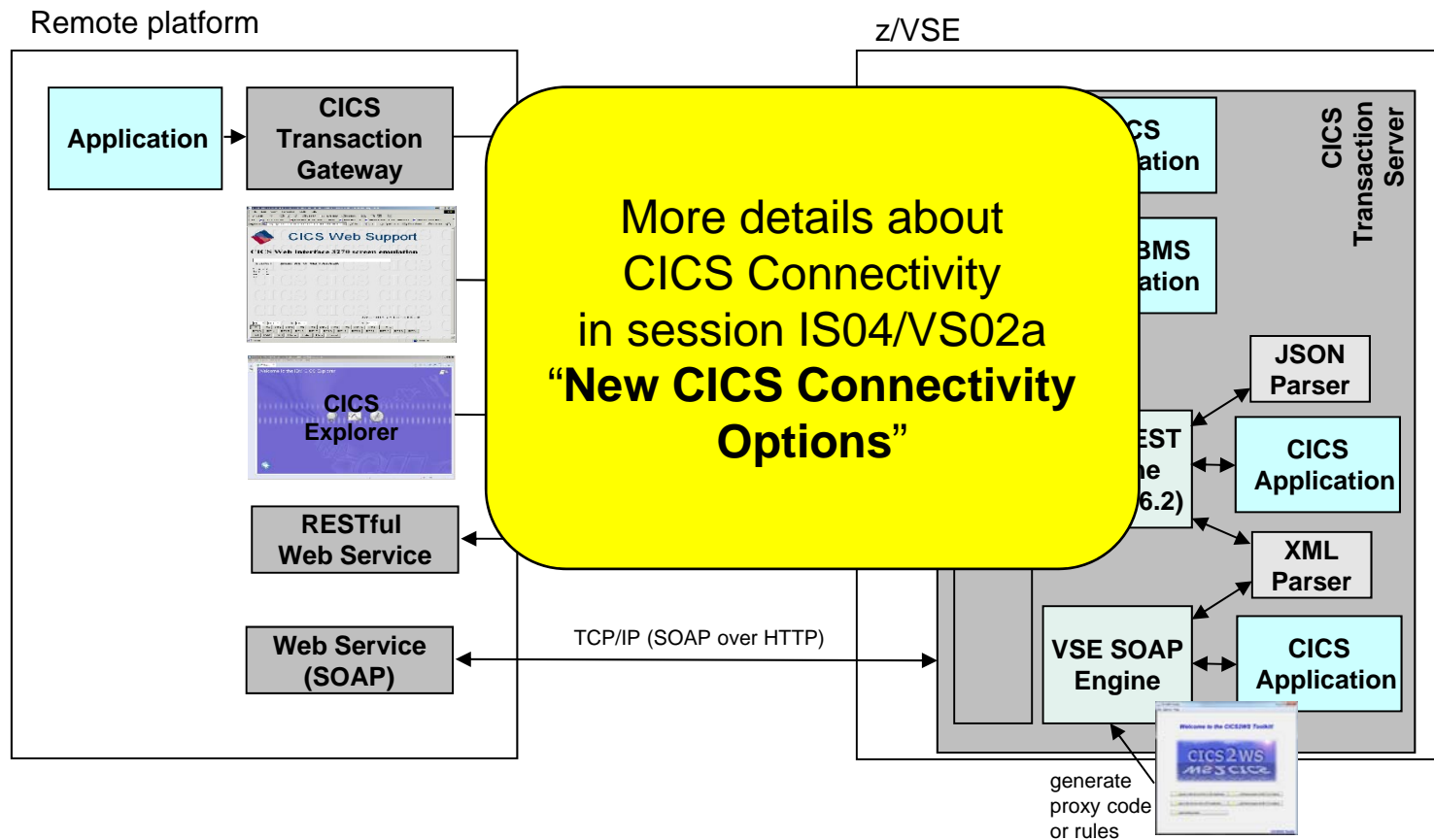
▪ **z/VSE Script Connector can be used to:**

- Access z/VSE resources from distributed non-Java applications
- Call/Execute processes on distributed systems from z/VSE applications or Jobs



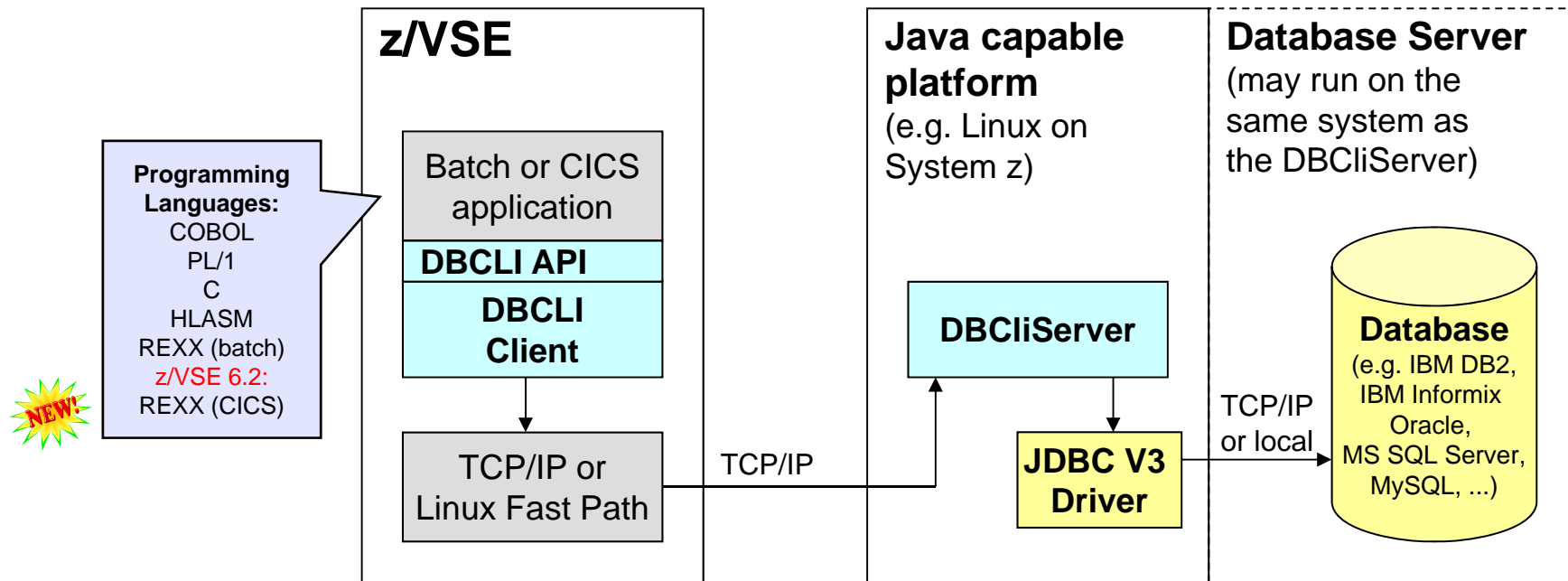
# CICS Connectivity

- CICS Web Support is the base of CICS connectivity

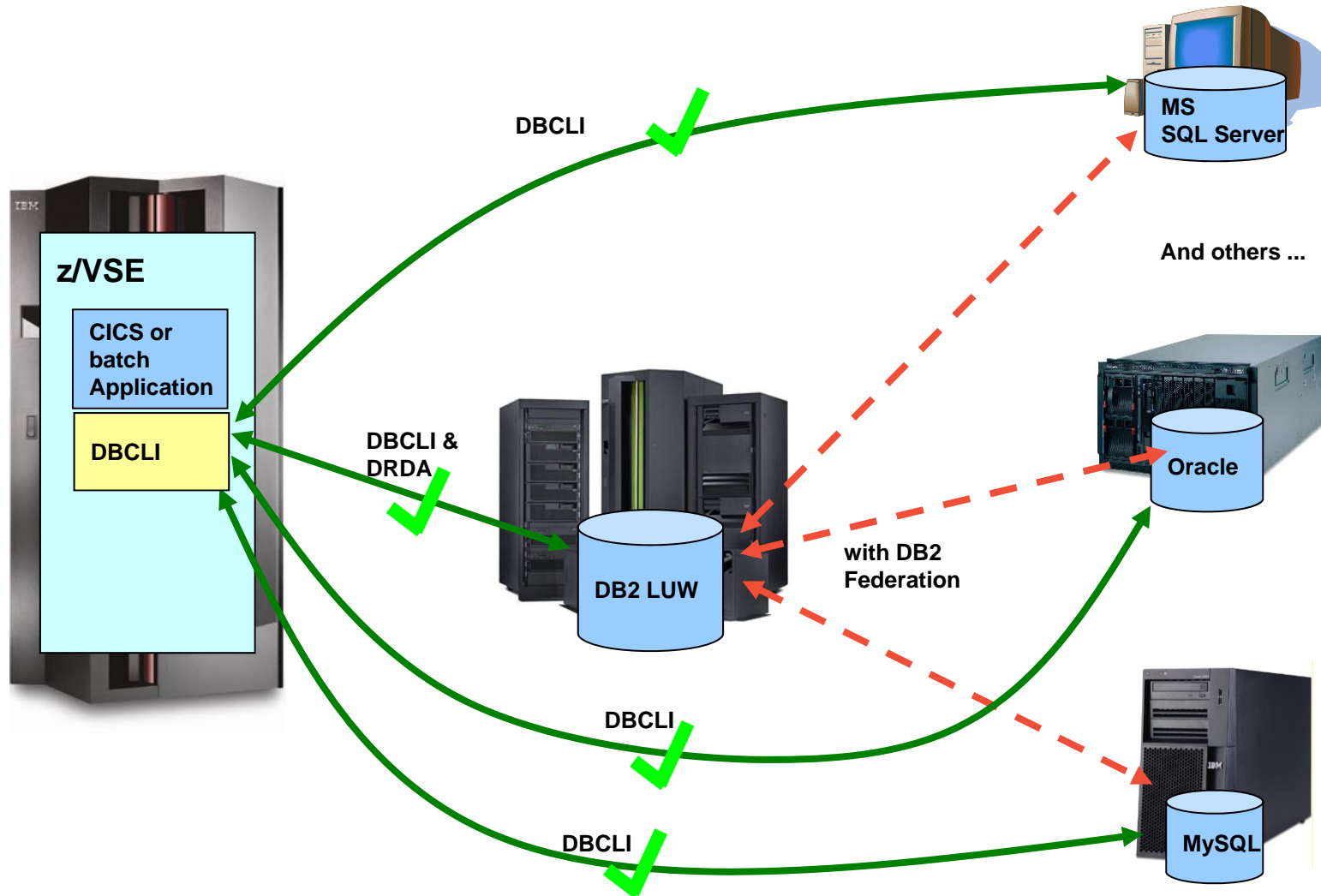


## z/VSE Database Call Level Interface (DBCLI)

- **Allows z/VSE applications to access a relational database on any suitable database server**
  - IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.
  - The database product must provide a JDBC driver that supports JDBC V3.0 or later
- **Utilize advanced database functions and use SQL statements provided by modern database products**



# z/VSE applications accessing Databases



# z/VSE 6.2: Interactive Query Tool for DBCLI



z/VSE Database Connector - Interactive Terminal

APPLID: DBDCCICS

EZA settings (optional):  
 TCPName: \_\_\_\_\_ ADSName: \_\_\_\_\_

Connection information:  
 Server: **winse06**  
 Port: **16178**  
 DBName: **SAMPLE**  
 User-ID: **Administrat**  
 Password: \_\_\_\_\_  
 SSL settings (optional):  
 SSLType: \_\_\_\_\_ (SSL3)  
 Keyring: \_\_\_\_\_  
 Keyname: \_\_\_\_\_  
 Ciphers: \_\_\_\_\_

SQL statement:  
**select \* from employee**

Stored procedure call (Y/N): \_\_\_\_\_

For PF4 (TABLES) or PF5 (C) Table: \_\_\_\_\_  
 You can use wild

Enter the required con

PF3: EX

MA B  
 Connected to remote server/host boeocvse u

---

z/VSE Database Connector - Interactive Terminal

APPLID: DBDCCICS

DBName: **SAMPLE**  
 Product: **DB2/NT**  
 Version: **SQL09075**

SQL statement:  
**select \* from employee**

| EMPNO<br>CHAR(6) | FIRSTNAME<br>VARCHAR(12) | MIDINIT<br>CHAR(1) | LASTNAME<br>VARCHAR(15) | WORKDEPT<br>CHAR(3) | PHONENO<br>CHAR(4) | HI<br>DA |
|------------------|--------------------------|--------------------|-------------------------|---------------------|--------------------|----------|
| 000010           | CHRISTINE                | I                  | HAAS                    | A00                 | 1234               | 01       |
| 000020           | MICHAEL                  | L                  | THOMPSON                | B01                 | 3476               | 10       |
| 000030           | SALLY                    | A                  | KWAN                    | C01                 | 4738               | 04       |
| 000050           | JOHN                     | B                  | GEYER                   | E01                 | 6789               | 08       |
| 000060           | IRVING                   | F                  | STERN                   | D11                 | 6423               | 09       |
| 000070           | EVA                      | D                  | PULASKI                 | D21                 | 7831               | 09       |
| 000090           | EILEEN                   | W                  | HENDERSON               | E11                 | 5498               | 08       |
| 000100           | THEODORE                 | Q                  | SPENSER                 | E21                 | 0972               | 06       |
| 000110           | VINCENZO                 | G                  | LUCCHESSI               | A00                 | 3490               | 05       |
| 000120           | SEAN                     | A                  | O'CONNELL               | A00                 | 2167               | 12       |
| 000130           | DELORES                  | M                  | QUINTANA                | C01                 | 4578               | 07       |
| 000140           | HEATHER                  | A                  | NICHOLLS                | C01                 | 1793               | 12       |
| 000150           | BRUCE                    | A                  | ADAMSON                 | D11                 | 4510               | 02       |
| 000160           | ELIZABETH                | R                  | PIANKA                  | D11                 | 3782               | 10       |
| 000170           | MASATOSHI                | J                  | YOSHIMURA               | D11                 | 2890               | 09       |
| 000180           | MARILYN                  | S                  | SCOUTTEN                | D11                 | 1682               | 07       |
| 000190           | JAMES                    | H                  | WALKER                  | D11                 | 2986               | 07       |
| 000200           | DAVID                    | A                  | BROWN                   | D11                 | 4501               | 03       |
| 000210           | WILLIAM                  | T                  | JONES                   | D11                 | 0942               | 04       |
| 000220           | JENNIFER                 | K                  | LUTZ                    | D11                 | 0672               | 08       |
| 000230           | JAMES                    | J                  | JEFFERSON               | D21                 | 2094               | 11       |
| 000240           | SALVATORE                | M                  | MARINO                  | D21                 | 3780               | 12       |
| 000250           | DANIEL                   | S                  | SMITH                   | D21                 | 0961               | 10       |
| 000260           | SYBIL                    | L                  | JOHNSON                 | D21                 | 8953               | 09       |
| 000270           | MARIA                    | P                  | PEREZ                   | D21                 | 9001               | 09       |
| 000280           | ETHEL                    | R                  | SCHNEIDER               | E11                 | 8997               | 03       |
| 000290           | JOHN                     | R                  | PARKER                  | E11                 | 4502               | 05       |
| 000300           | PHILIP                   | X                  | SMITH                   | E11                 | 2095               | 06       |
| 000310           | MAUDE                    | F                  | SETRIGHT                | E11                 | 3332               | 09       |
| 000320           | RAMLAL                   | V                  | MEHTA                   | E21                 | 9990               | 07       |
| 000330           | WING                     | A                  | LEE                     | E21                 | 2103               | 02       |
| 000340           | JASON                    | R                  | GOUNOT                  | E21                 | 5698               | 05       |

Displaying rows 1 to 32.  
 Use PF10/11 to scroll left/right, or PF7/8 to scroll backward/forward.

PF3: RETURN PF4: NEXT RESULT PF7: BACKW. PF8: FORW. PF10: LEFT PF11: RIGHT

MA B  
 Connected to remote server/host boeocvse using port 23

Print to Disk - Append 42/002

## z/VSE 6.2: Batch Query Tool for DBCLI



```
* $$ JOB JNM=RUNDBCLI,DISP=D,CLASS=4
* $$ LST DISP=D,CLASS=Q,PRI=3
// JOB RUNDBCLI
// LIBDEF *,SEARCH=(PRD2.CONFIG,PRD1.B
// EXEC IESDBCLB,PARM='SYMBOLS=YES ECH

CONNECT SERVER=my.database.server.com
        USER=db2user PASSWORD=password

SELECT EMPNO,FIRSTNME,LASTNAME,SALARY,
        FROM EMPLOYEE;

DISCONNECT;
/*
/&
```

```
// JOB RUNDBCLI
// LIBDEF *,SEARCH=(PRD2.CONFIG,PRD1.BASE,PRD2.TCPIPC)
// EXEC IESDBCLB,PARM='SYMBOLS=YES ECHO=ON'
1S54I PHASE IESDBCLB IS TO BE FETCHED FROM PRD1.BASE
DBCLI BATCH QUERY TOOL

CONNECT SERVER= my.database.server.com DBNAME=SAMPLE
        USER=db2user PASSWORD=(PASSWORD SUPPRESSED);
INFO: CONNECTED TO SERVER 'my.database.server.com' DBNAME 'SAMPLE'.
INFO: DATABASE PRODUCT 'DB2/NT' VERSION 'SQL09075'
INFO: LAST RC=0

SELECT EMPNO,FIRSTNME,LASTNAME,SALARY,BONUS FROM EMPLOYEE;
INFO: STATEMENT HAS BEEN EXECUTED, IT PRODUCED THE FOLLOWING RESULT SET:

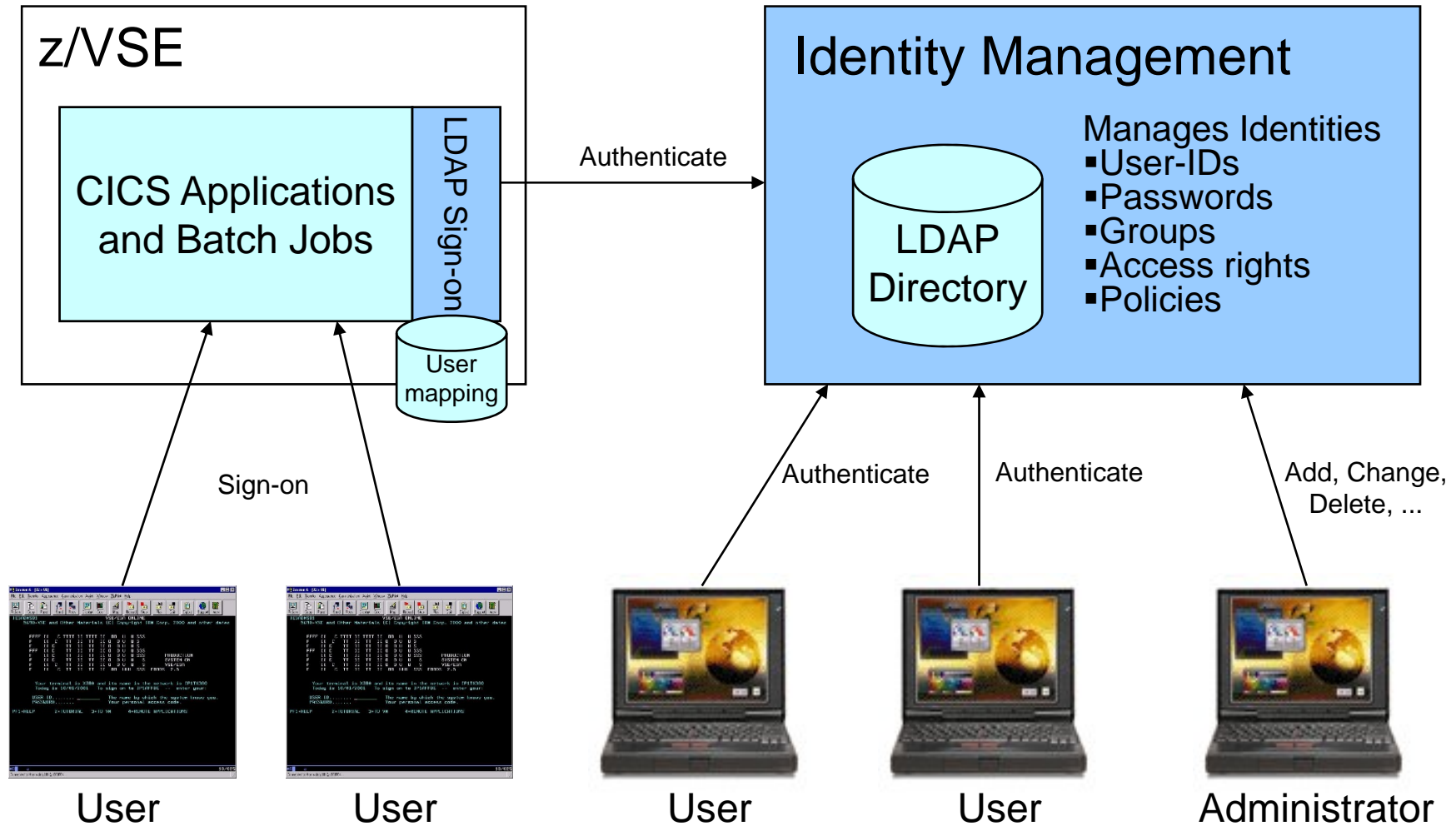
EMPNO    FIRSTNME    LASTNAME    SALARY    BONUS
CHAR(6)  VARCHAR(12) VARCHAR(15)  DECIMAL(9,2) DECIMAL(9,2)
-----
000010   CHRISTINE   HAAS        152750.00  1000.00
000020   MICHAEL    THOMPSON    94250.00   800.00
000030   SALLY      KWAN        98250.00   800.00
...

INFO: ROWCOUNT: 42
INFO: LAST RC=0

DISCONNECT;
INFO: DISCONNECT SUCCESSFULL.
INFO: LAST RC=0

1S55I LAST RETURN CODE WAS 0000
EOJ RUN        MAX.RETURN CODE=0000
```

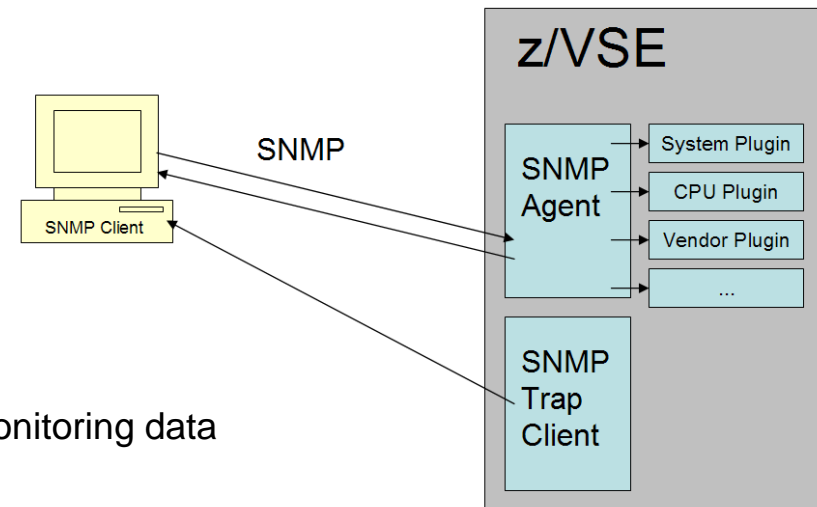
# LDAP Sign-on Support





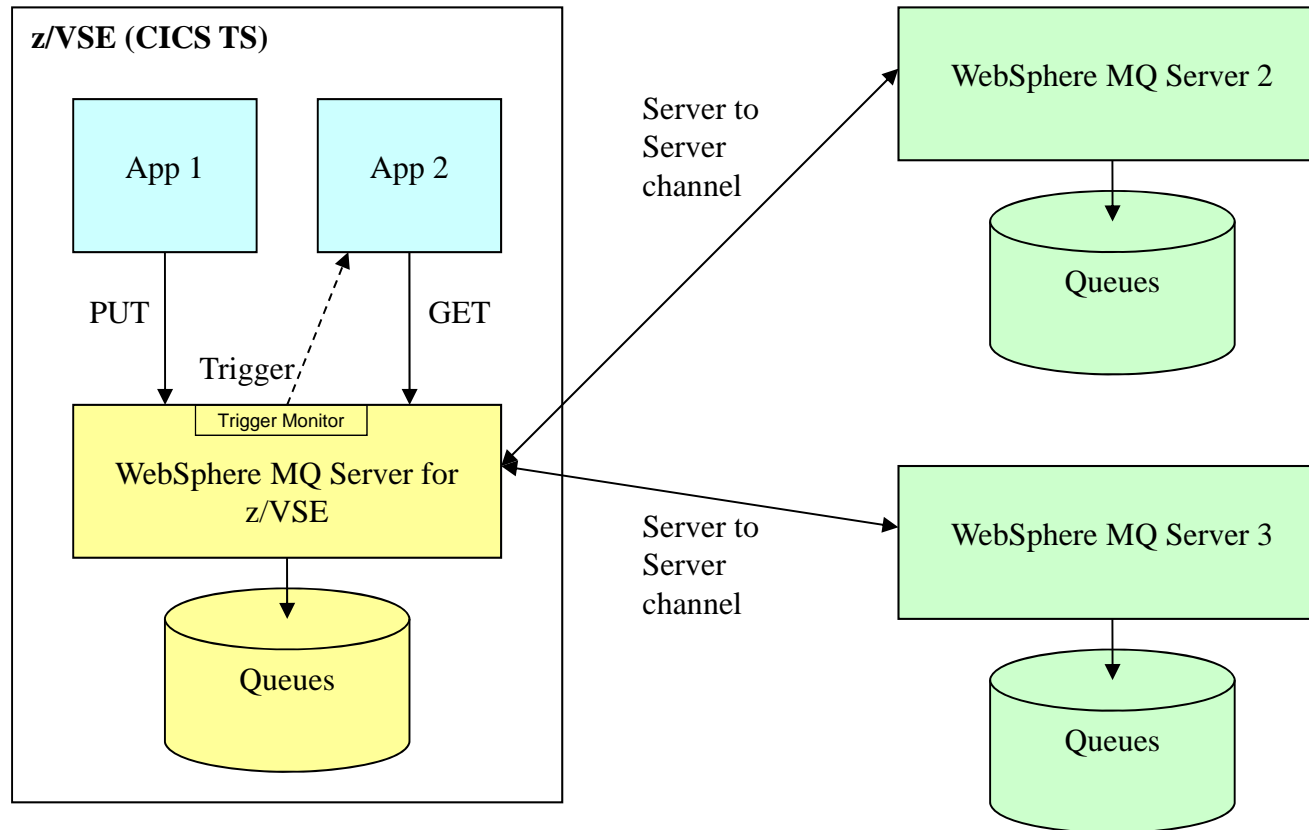
## z/VSE SNMP Monitoring Agent support

- **z/VSE Monitoring Agent enables customers to monitor z/VSE systems using standard monitoring interfaces (SNMP V1)**
  - Available since z/VSE V4.3
  - It also includes an open interface, which enables customers or vendors to use own programs (plugins) to collect additional data
- **Data collected by the IBM provided plugins contains**
  - Information about the environment (e.g. Processor, LPAR and z/VM information)
  - Number of partitions (static, dynamic, total, maximum)
  - Partition priorities
  - Number of CPUs (active, stopped, quiced)
  - Paging (page ins, page outs)
  - Performance counters overall and per CPU
  - CPU address and status
  - CPU time, NP time, spin time, allbound time
  - Number of SVCs and dispatcher cycles
- Plugin interface allows Vendors to provide additional monitoring data



# WebSphere MQ Server for z/VSE V3.0

**Withdrawn from service since September 30, 2015**

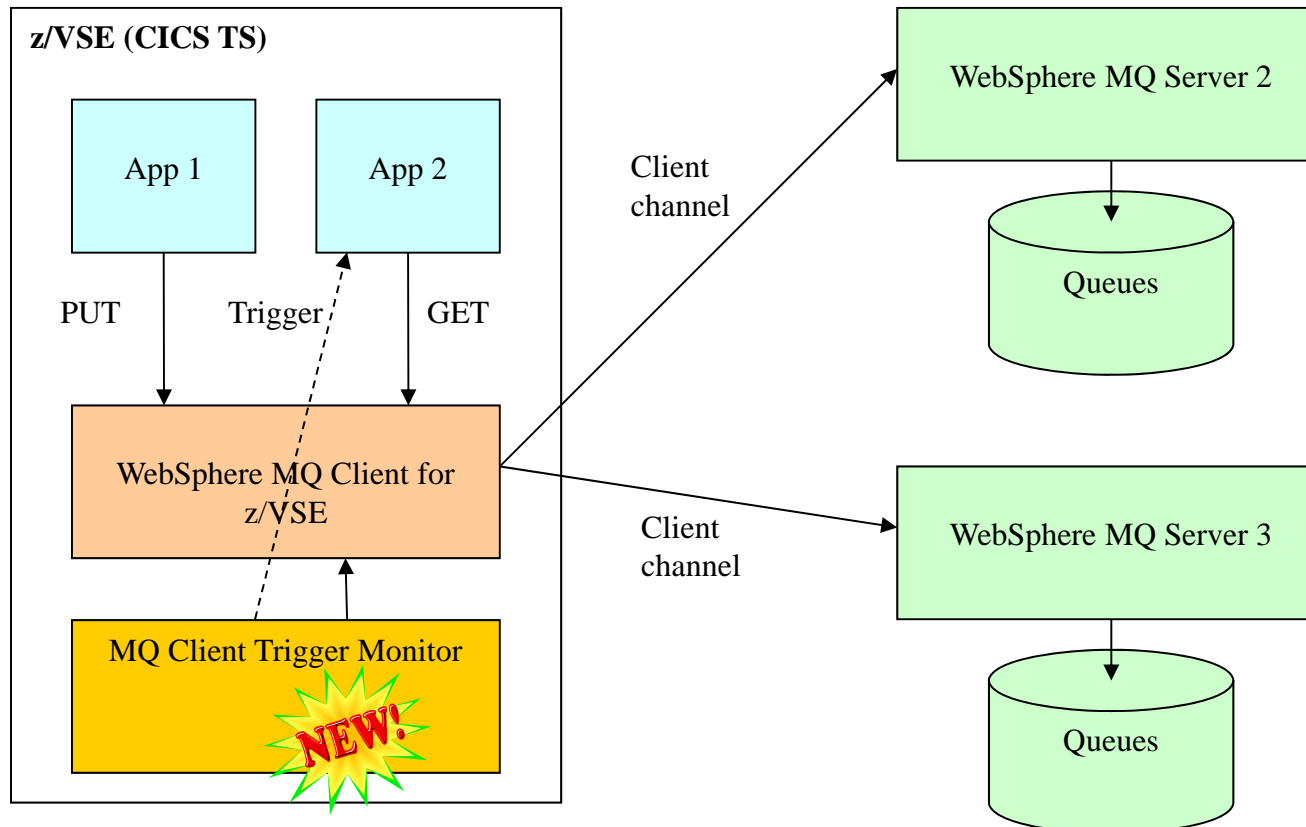


Note:

- z/VSE Applications don't have to be aware of MQ Server 2 and 3
- Decision which MQ Server Queue will host the messages is defined in channels between the MQ servers

# Replace the MQ Server on z/VSE with the MQ Client on VSE

**z/VSE applications work directly with the MQ Servers 2 and 3**

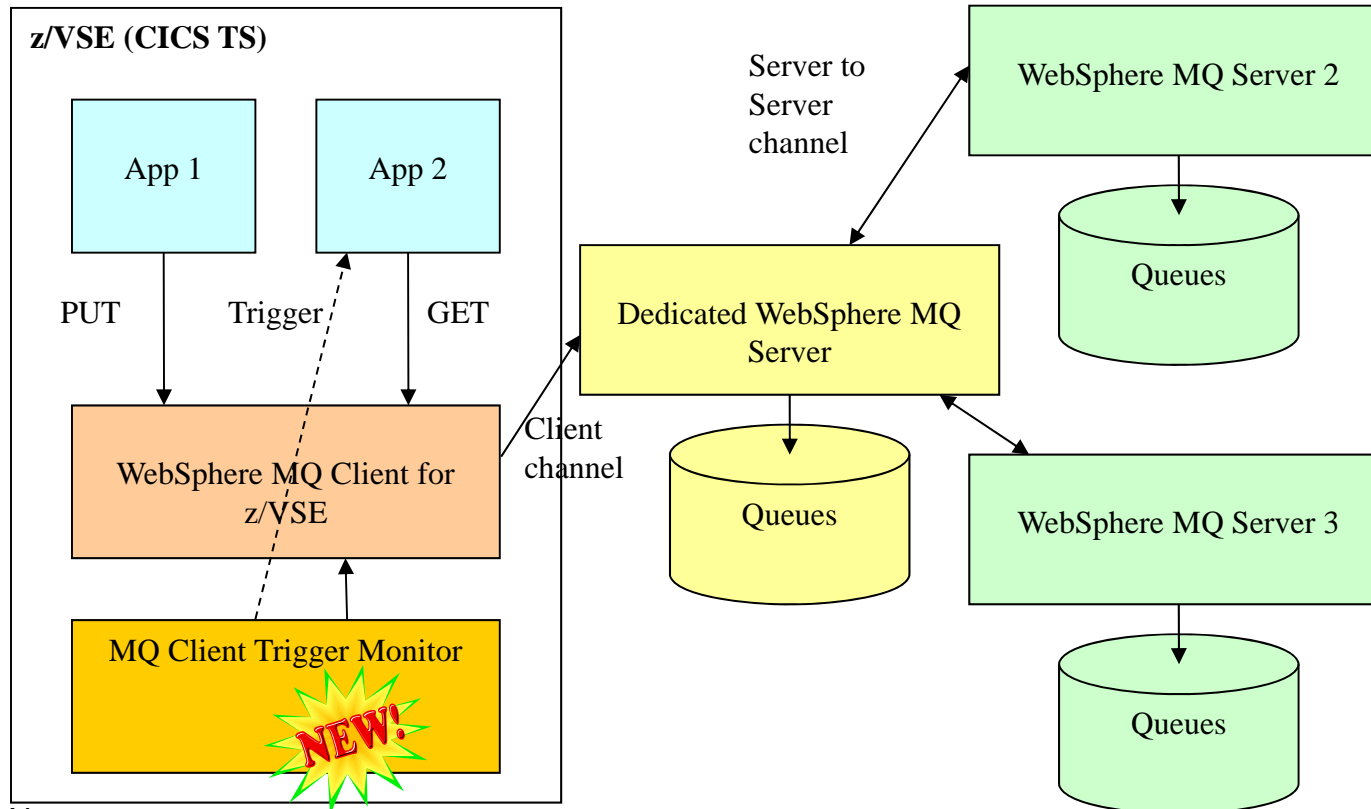


Note:

- z/VSE Applications have to be aware of MQ Server 2 and 3
- Decision which MQ Server Queue will host the messages has to be in the application

# Replace the MQ Server on z/VSE with the MQ Client on VSE

## Add a dedicated MQ Server (i.e. on Linux on System z)

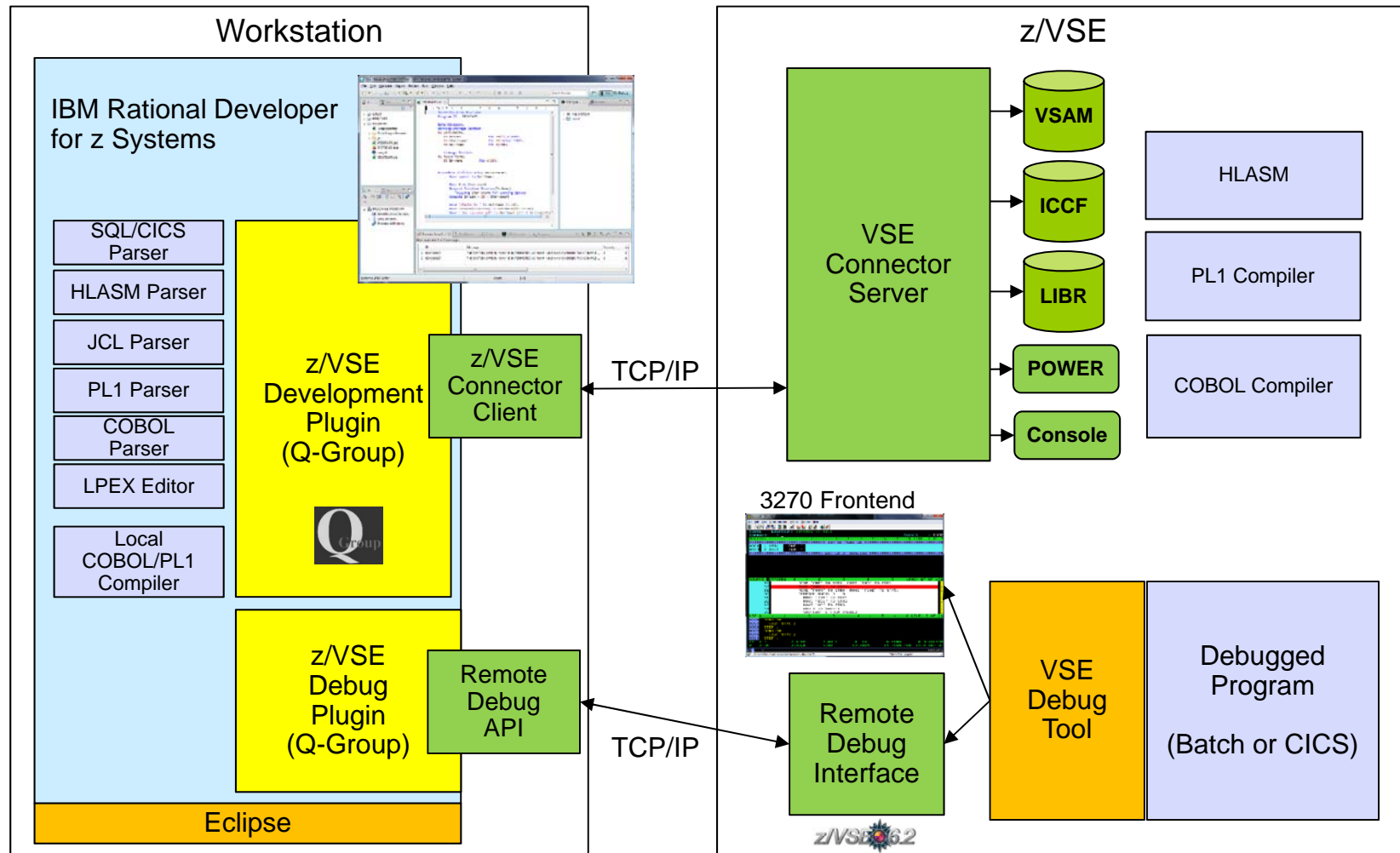


Note:

- z/VSE Applications are all working with the same MQ Server
- All definitions from z/VSE MQ Server can be replicated to the new dedicated MQ server
- z/VSE applications need to be aware of just one MQ server

# Rational Developer for z Systems (RDz)

*with z/VSE Development & Debug Plug-in for RDz – from QGroup*





VSE - RDZDEMO/PRINTAPP.cbl - IBM Rational Developer for System z

File Edit Source Refactor Navigate Search Project Run Window Help

Quick Access VSE Debug Java Java EE Database Development CVS Repository Exploring

z/OS Projects

- RDZDEMO
  - .vseproperties
  - BuildOutput
  - BuildOutputRemote
  - jcl
  - PRINTAPP.cbl
  - RDZDEMO.link
  - run.jcl
  - run.jcl.out
  - rundebug.jcl
  - STARTAPP.cbl

\*PRINTAPP.cbl

```

-----*A-1-B-----2-----3-----4-----5-----6-----7-----+-----
Identification Division.
Program-ID. PRINTAPP.

Data Division.
Working-Storage Section.
01 Work-Parms.
05 In-Len          PIC S9(4) BINARY.
05 Char-count     Pic 99 Value ZEROS.
05 Out-Name       PIC X(100).

Linkage Section.
01 Recvd-Parms.
05 In-name        Pic x(30).

Procedure Division using Recvd-Parms.
Move spaces to Out-Name.

Move 0 to Char-count3
Inspect Function Reverse(In-Name)
Tallying Char-count For Leading Spaces
Compute In-Len = 30 - Char-count
  
```

Remote Compile shows error in source editor

Remote Error List

Problems Tasks VSE Console Progress History

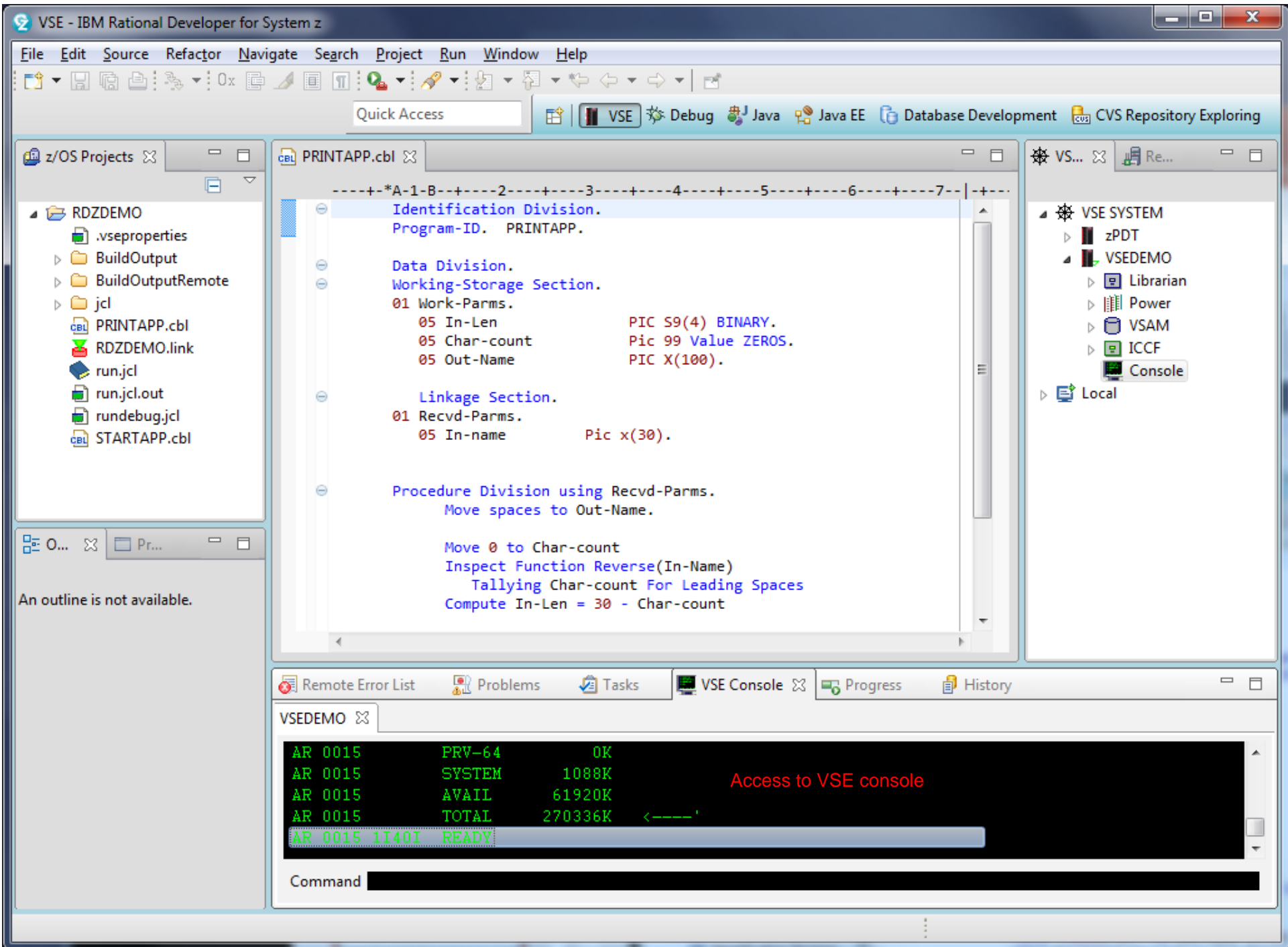
Filter matched 2 of 2 messages

| ID          | Message                                                                       | Sev... | Line | Location |
|-------------|-------------------------------------------------------------------------------|--------|------|----------|
| i IGYOS4027 | THE SYSTEM OPTION "SYM" IS INTERPRETED AS "MAP" AND MAY OVERRIDE THE COMPI... | 0      | -1   | PRINTAPP |
| x IGYPS2121 | "CHAR-COUNT3" WAS NOT DEFINED AS A DATA-NAME. THE STATEMENT WAS DISCAR...     | 2      | 19   | PRINTAPP |

Compiler Messages after Remote Compile

"CHAR-COUNT3" WAS NOT DEFINED AS A DATA-NAME. THE STATEMENT WAS DISCARDED.







Debug - VSEDebuggerTempFiles/vse2917040307456719476.cbl - IBM Rational Developer for System z

File Edit Navigate Search Project Run Window Help

Quick Access VSE Debug Java Java EE Database Development CVS Repository Exploring

Debug Servers

- VSE VSE Debug to VSEDEMO [Launch VSE Debugger]
  - VSE VM
    - Thread[1]
      - STARTAPP (line: 26)

Remote Debugger allows debugging of COBOL programs

Variables Breakpoints

| Name                 | Value                             |
|----------------------|-----------------------------------|
| PROGRAM-PASS-FIELDS  | 01 STARTAPP:>PROGRAM-PASS-FIELDS  |
| TEMP-NAME            | ' '                               |
| PROGRAM-OTHER-FIELDS | 01 STARTAPP:>PROGRAM-OTHER-FIELDS |
| INPUT-NAME           | ' '                               |
| CHAR-COUNT           | 00 <b>Display Variables</b>       |
| PROGRAM-FLAGS        | 01 STARTAPP:>PROGRAM-FLAGS        |

vse2917040307456719476.cbl

Line 30 Column 1 Insert

```

000022      *---+*A-1-B+---+2---+---3---+---4---+---5---+---6---+---7---+---8
000023      Initialize Program-pass-fields
000024      Program-other-fields
000025      Program-flags.
000026      Perform until Loop-done
000027      Display ' '
000028      Display 'Enter a name or Q to quit:'
000029      Move Spaces to Input-name
000030      Accept Input-name
000031      IF Input-name = Spaces
000032      Move 'Q' to Input-name
000033      End-IF
000034
  
```

Step through in program source

Breakpoint

Outline

- PROGRAM: StartApp
  - Identification Division.
  - Data Division.
    - Working-Storage Section.
      - 01 Program-pass-fields.
        - 05 Temp-name
      - 01 Program-other-fields.
        - 05 Input-name
        - 05 Char-count
      - 01 Program-flags.
        - 05 Loop-flag
    - Procedure Division.

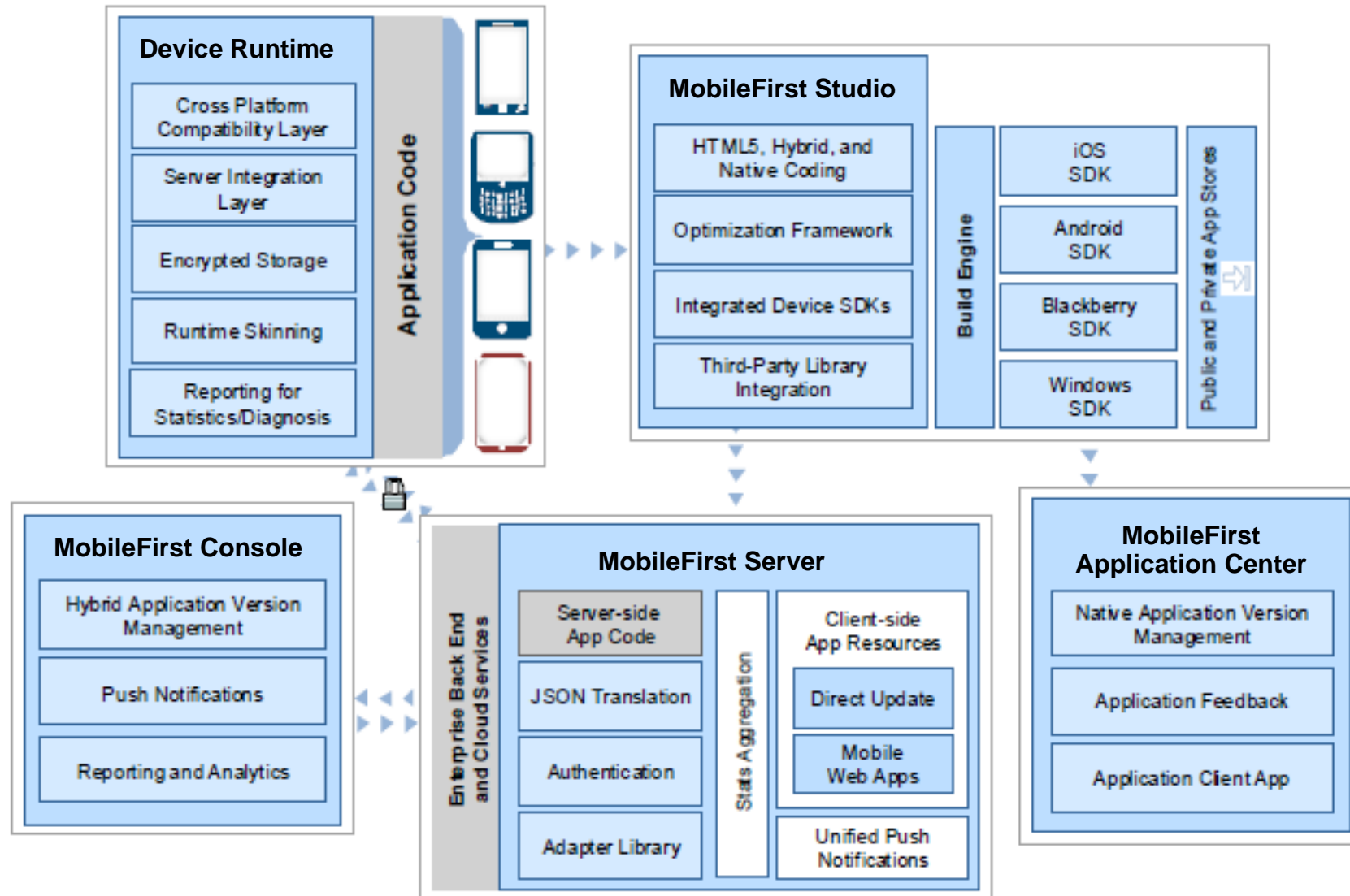
Console Tasks Problems Executables

0 errors, 182 warnings, 0 others (Filter matched 100 of 182 items)

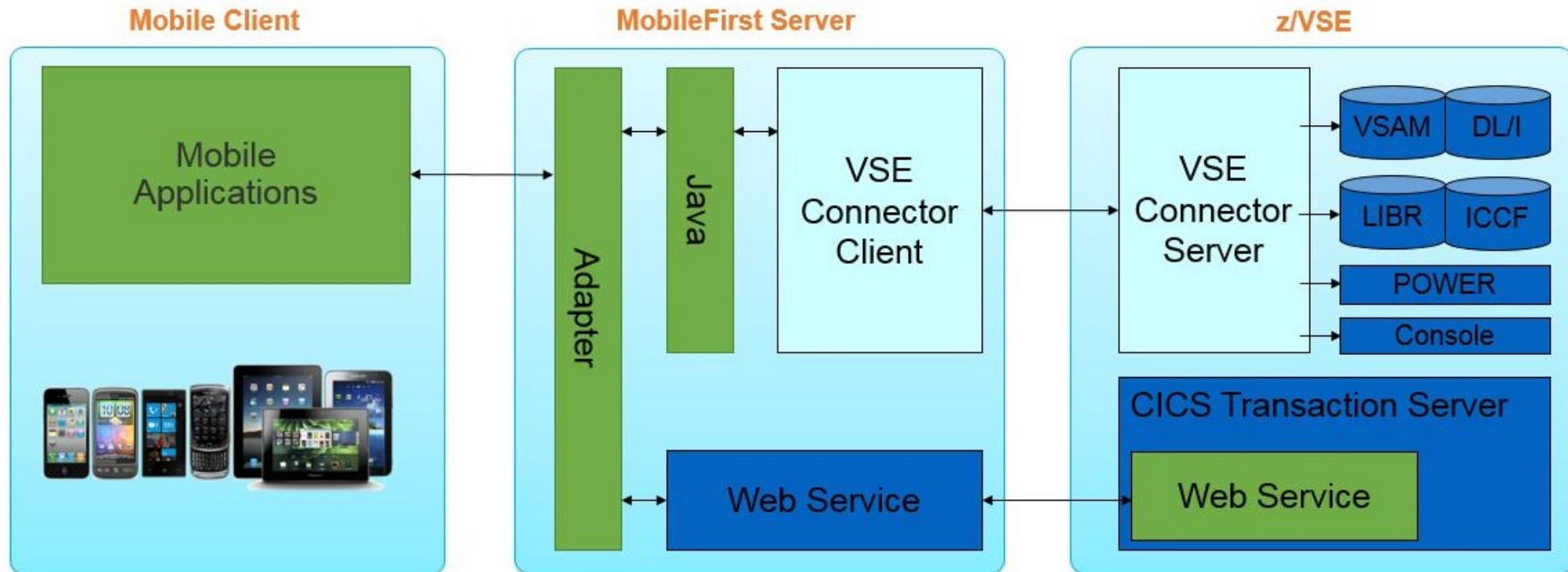
| Description                 | Resource | Path | Location | Type |
|-----------------------------|----------|------|----------|------|
| Warnings (100 of 182 items) |          |      |          |      |

System z LPEX Editor Insert 30 : 1

# IBM MobileFirst Foundation

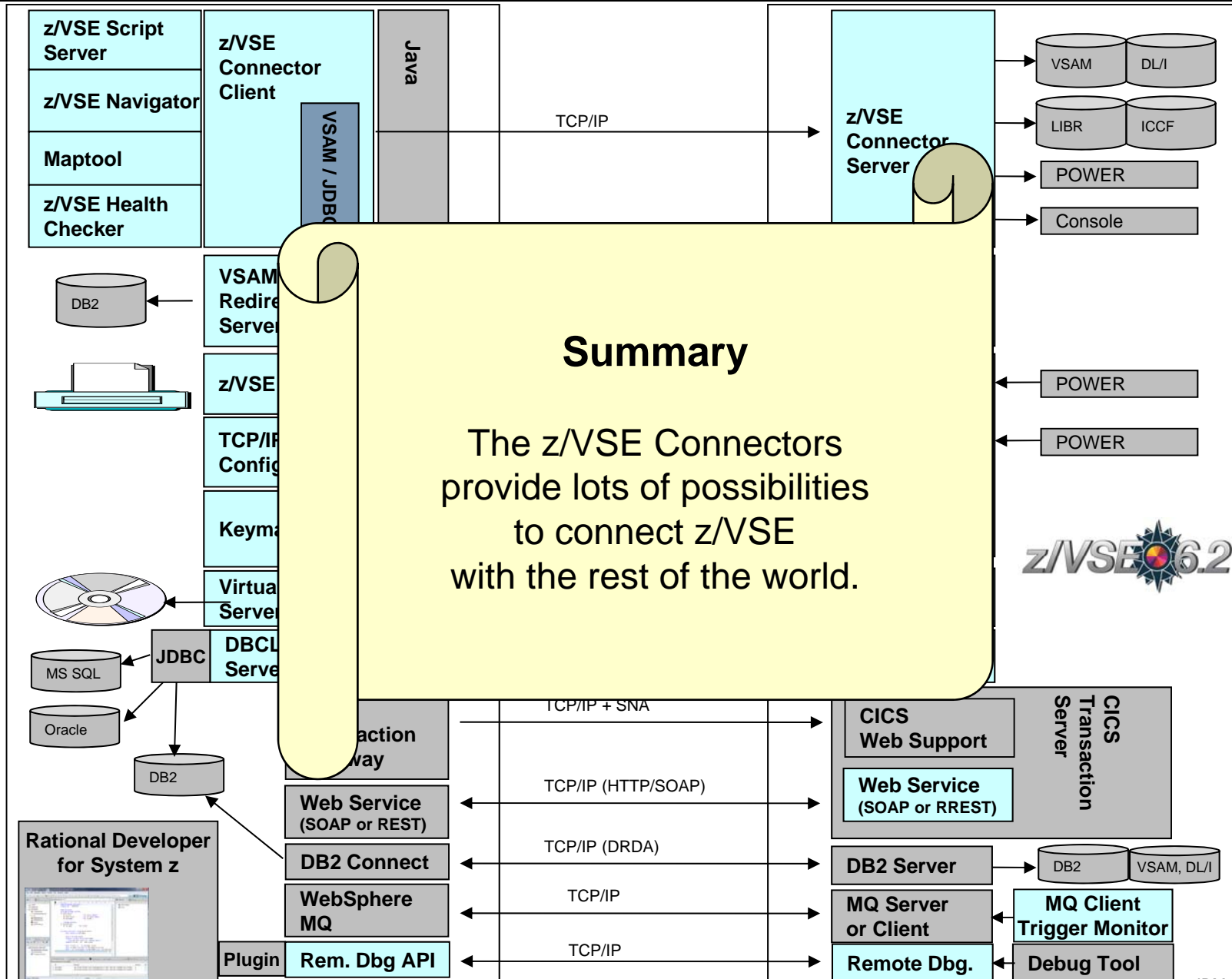


## z/VSE and IBM MobileFirst



To start mobile development with z/VSE, you need to have the following applications:

- The **IBM MobileFirst Platform Developer Edition**
- The **z/VSE Connector Client and Server**
- **Web Service** enabled CICS TS applications
- Whitepaper: <ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/download/GettingStartedWithMobileDevelopmentForVSE.pdf>



## Questions ?



THANK YOU