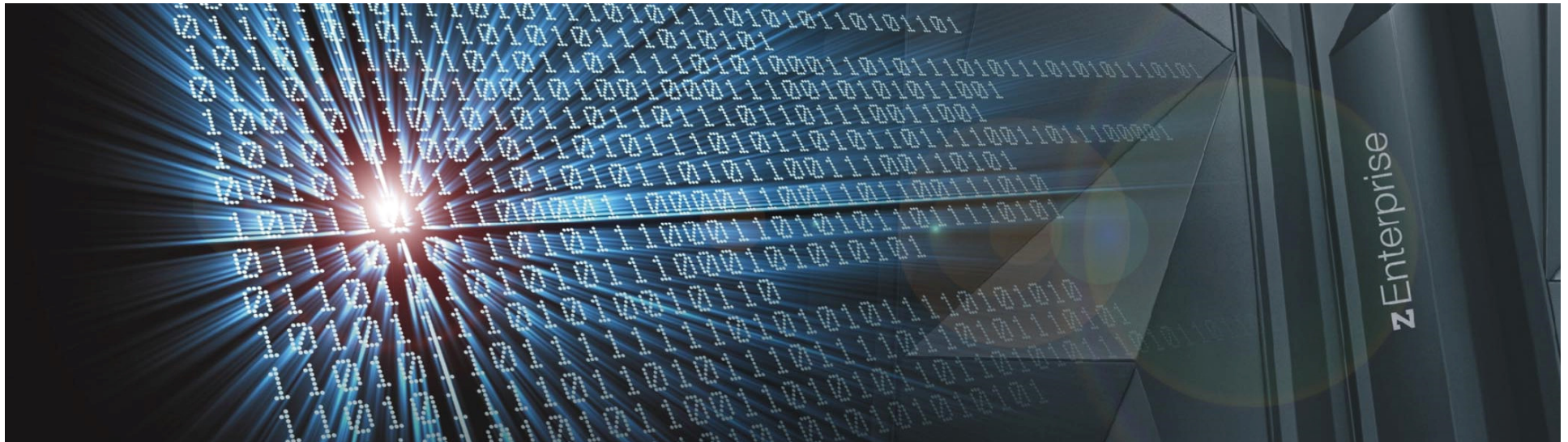# z/VSE 6.1 – a quick overview

Ingolf Salm – salm@de.ibm.com

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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.
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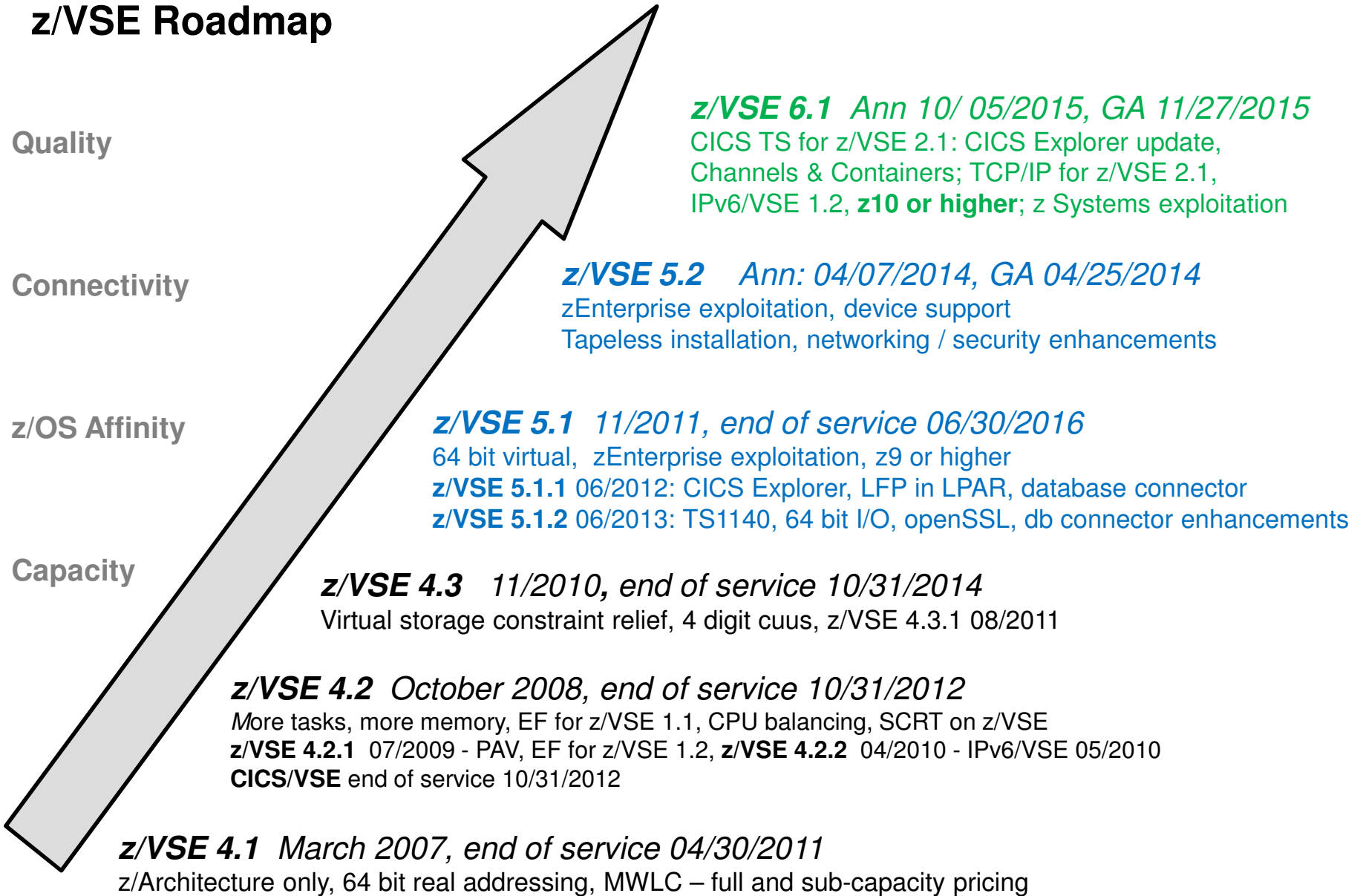This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.
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z/VSE 50
50 years of innovation

IBM

z/VSE Roadmap

Quality

z/VSE 6.1 *Ann 10/ 05/2015, GA 11/27/2015*
CICS TS for z/VSE 2.1: CICS Explorer update,
Channels & Containers; TCP/IP for z/VSE 2.1,
IPv6/VSE 1.2, **z10 or higher**; z Systems exploitation

Connectivity

z/VSE 5.2 *Ann: 04/07/2014, GA 04/25/2014*
zEnterprise exploitation, device support
Tapeless installation, networking / security enhancements

z/OS Affinity

z/VSE 5.1 *11/2011, end of service 06/30/2016*
64 bit virtual, zEnterprise exploitation, z9 or higher
z/VSE 5.1.1 06/2012: CICS Explorer, LFP in LPAR, database connector
z/VSE 5.1.2 06/2013: TS1140, 64 bit I/O, openSSL, db connector enhancements

Capacity

z/VSE 4.3 *11/2010, end of service 10/31/2014*
Virtual storage constraint relief, 4 digit cuus, z/VSE 4.3.1 08/2011

z/VSE 4.2 *October 2008, end of service 10/31/2012*
*M*ore tasks, more memory, EF for z/VSE 1.1, CPU balancing, SCRT on z/VSE
z/VSE 4.2.1 07/2009 - PAV, EF for z/VSE 1.2, **z/VSE 4.2.2** 04/2010 - IPv6/VSE 05/2010
CICS/VSE end of service 10/31/2012

z/VSE 4.1 *March 2007, end of service 04/30/2011*
z/Architecture only, 64 bit real addressing, MWLC – full and sub-capacity pricing

z/VSE 6.1 - overview

- Preview: May 11, 2015, GA ann.: 10/05/2015, GA 11/27/2015

- Hardware support
    - Architectural Level Set to IBM System z10 or later
    - IBM z13 support
        - Configurable Crypto Express5S
            - More than 16 crypto domain support
    - FICON Express16S for ECKD, channel to channel or FCP-attached SCSI
    - IBM System Storage options
        - IBM System Storage TS7700 Virtualization Engine Release 3.3
        - IBM System Storage DS8870 Release 7.5 (ECKD and FCP-attached SCSI disks)
        - IBM FlashSystem V9000 for use with FCP-attached SCSI disks.

z/VSE 6.1 overview …

- New CICS version: CICS TS for z/VSE 2.1 - fullfills Statement of Direction (SOD)

- Networking enhacements
    - IPv6/VSE 1.2 – new release
    - TCP/IP for z/VSE 2.1 – new version

- Connectors
    - MQ Client Trigger Monitor

- z/VSE 6.1 requires an initial installation,
  Fast Service Upgrade (FSU) from z/VSE V5 not supported

- z/VSE 6.1 will be delivered in English only

- Statemant of direction:
  IBM plans to deliver future upgrades of z/VSE on DVD or electronically only.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

CICS TS for z/VSE 2.1

- A new CICS TS version for z/VSE - The first major CICS TS update since 1999
  - GA Announcement 10/05/2015, GA 11/27/2015
  - Based on CICS TS for VSE/ESA 1.1.1
  - A complete new build of CICS TS
  - Fully compatible with CICS TS for VSE/ESA 1.1.1
  - No recompile or re-link of CICS applications required
  - New APIs described in CICS Enhancements Guide
  - Migration considerations described in migration white paper available at z/VSE 6.1 GA

- Only available for z/VSE 6.1 and later, replaces CICS TS for VSE/ESA 1.1.1
  - CICS TS for VSE/ESA 1.1.1 still delivered with z/VSE Version 5

CICS TS for z/VSE 2.1 - Enhancements

- CICS Explorer update capability

- Channel & Container support - Lifts the 32K Commarea limitation

- CICS requirements
  - More current cypher suites (AES128/256) to CICS Web Support
  - Support for EXEC CICS INQUIRE SYSTEM OSLEVEL
  - Millisecond support in EXEC CICS ASKTIME
  - Millisecond option to EXEC CICS FORMATTIME

- CICS DDM (CICS Distributed Data Management) not supported
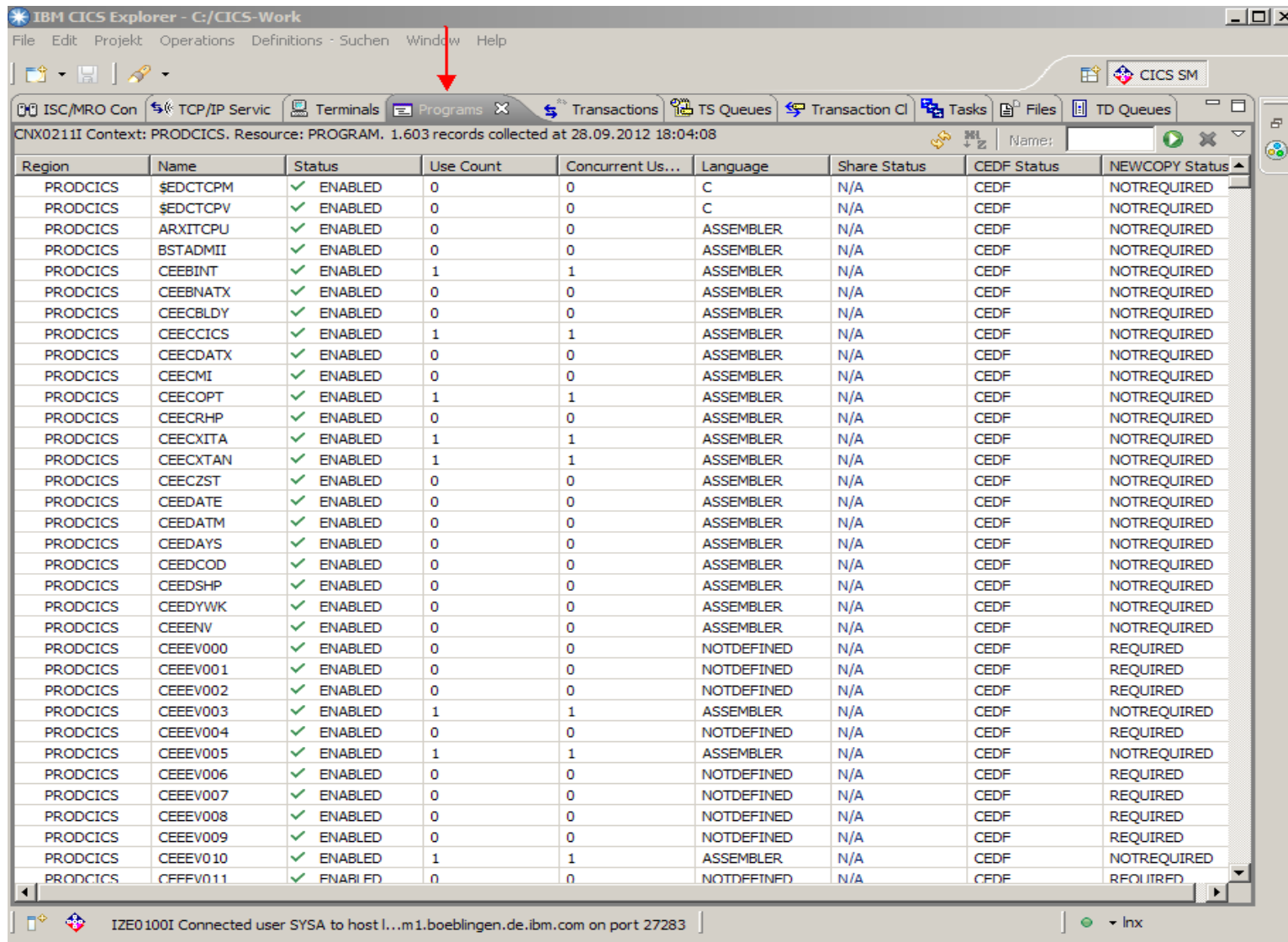
CICS Explorer

- Announced 04/03/2012, GA 06/15/2012, new enhancements in CICS TS for z/VSE 2.1

- CICS Explorer monitoring in z/VSE Version 5

  - System management framework for CICS TS
  - Consists of CICS Explorer client and a CICS TS server extension
  - CICS Explorer client
    - Read-only capabilities; Eclipse-based user interface on workstation
    - Connects to CICS TS via TCP/IP - Communication via HTTP requests
    - One CICS Explorer client for z/VSE and z/OS
  - CICS Explorer server extension
    - Delivered as PTF for CICS TS for VSE/ESA 1.1.1

- Integrated into CICS TS for z/VSE 2.1 (z/VSE 6.1)
  - CICS Explorer server extension integrated into CICS TS for z/VSE 2.1
  - Provides updates to CICS resources
    - Update and control CICS resources as you would do with transactions on your CICS terminal
    - Enable / disable CICS resources, change selected CICS definitions, …

CICS Explorer …
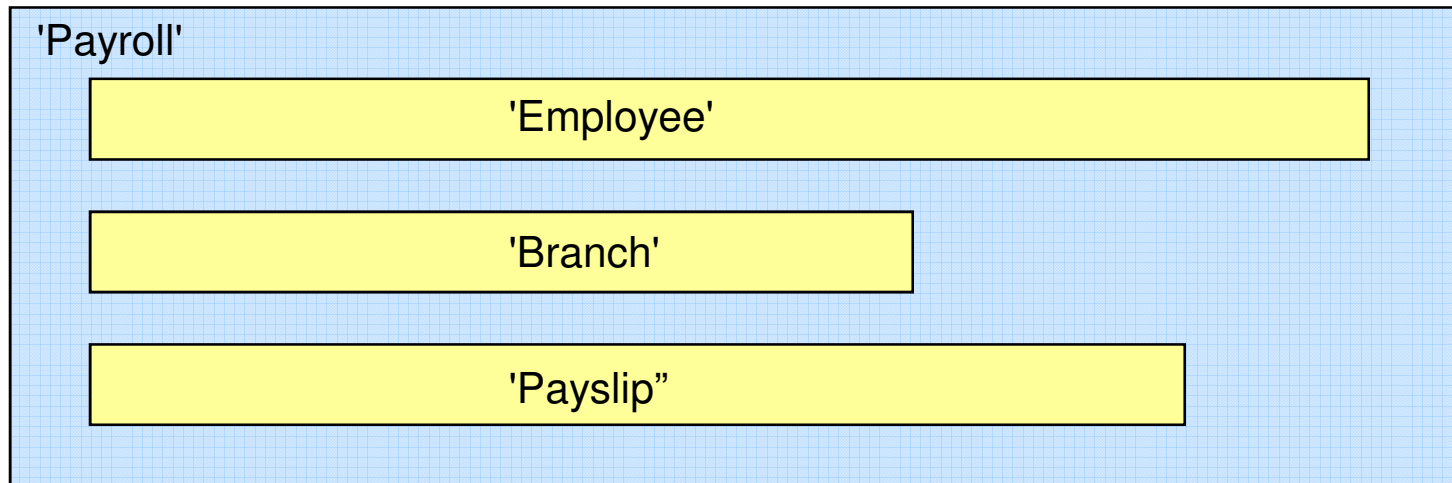
Channels and Containers

- z/VSE ported channel and container APIs from CICS TS for z/OS 3.1

- Channels and containers lift the 32K Commarea limitation
  - Applicable for both LINK and XCTL, Distributed Program Link (DPL)
  - Affects the exchange of data between CICS tasks
  - Local and transcation routing
  - START with data

- Language support is provided for C, COBOL, HLASM, and PL/I.

- Channels and Containers limitations
  - In 31 bit virtual storage only
  - No support for
    - External CICS Interface (EXCI), External Call Interface (ECI), CICS Web Support (CWS)

Containers

'Employee'

'Branch'

'Payslip'
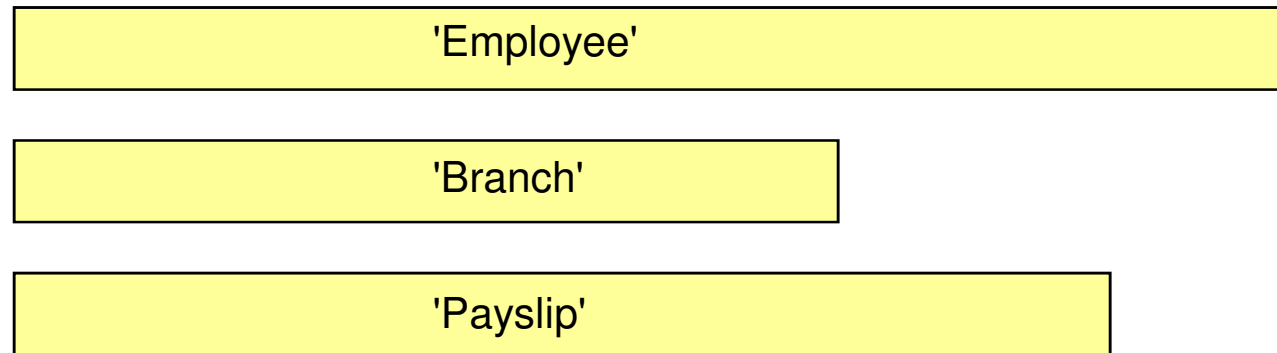
- To solve the 32K Commarea problem a new construct will be provided
- Named block of data designed for passing information between programs
  - Like named COMMAREAs
- CONTAINER API
  - Created using (EXEC CICS) PUT CONTAINER, defines the size of the container
  - Read   using (EXEC CICS) GET CONTAINER
  - Delete   using (EXEC CICS) DELETE CONTAINER, to free storage, if no longer required
- No CICS enforced size limitation
  - Containers are stored within the CICS EDSA (31 bit partition virtual storage)

Channels

- A group of Containers
  - No limit on the number of Containers in a Channel

- A Channel is a sort of program interface
  - Passed on LINK, XCTL, RETURN, and START commands

A Simple Example

PROGA

PUT CONTAINER('Employee') CHANNEL('Payroll') FROM(emp-data)

PUT CONTAINER('Branch') CHANNEL('Payroll') FROM(branch-data)

LINK PROGRAM('PROGB') CHANNEL('Payroll')

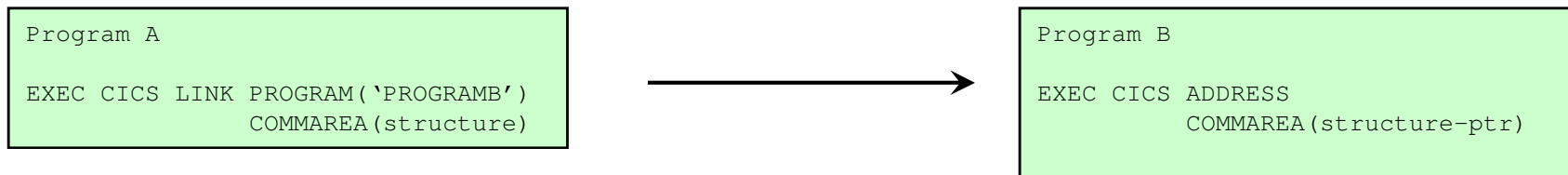GET CONTAINER('Payslip') CHANNEL('Payroll') INTO(pay-data)

PROGB

GET CONTAINER('Employee') INTO(emp-data)

GET CONTAINER('Branch') INTO(branch-data)

...

PUT CONTAINER('Payslip') FROM(pay-data)

'Payroll'

'Employee'

'Branch'

'Payslip'
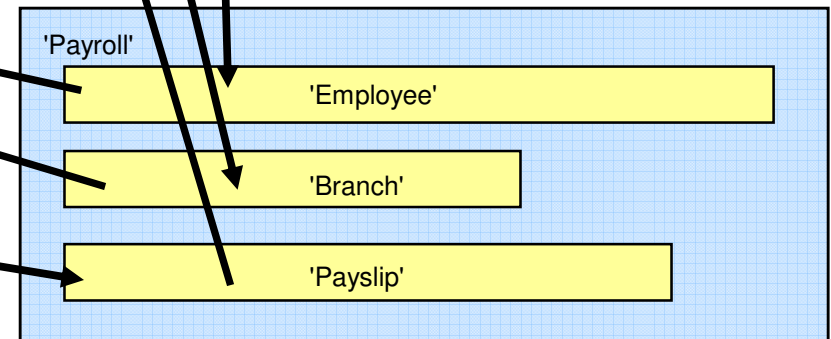
Migration of Programs Using LINK

- Existing application with COMMAREA

```
Program A

EXEC CICS LINK PROGRAM('PROGRAMB')
          COMMAREA(structure)
```

```
Program B

EXEC CICS ADDRESS
          COMMAREA(structure-ptr)
```

- Changed application using Channels

```
Program A

EXEC CICS PUT CONTAINER(structure name)
          CHANNEL(channel-name)
          FROM(structure)

EXEC CICS LINK PROGRAM('PROGRAMB')
          CHANNEL(channel-name)

EXEC CICS GET CONTAINER(structure-name)
          INTO(structure)
```

```
Program B

EXEC CICS GET CONTAINER(structure-name)
SET(structure-ptr)

EXEC CICS PUT CONTAINER(structure-name)
FROM(structure)
```
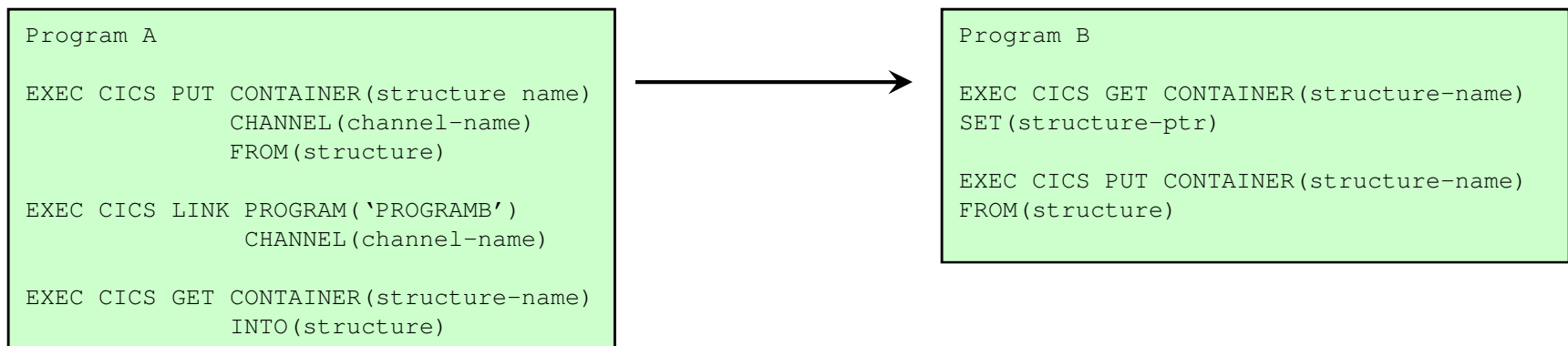
Note that, if Program B changes the Container data, it must PUT the Container back
before returning, or the changes will not be visible to the caller.

TCP/IP Connectivity for z/VSE

- TCP/IP stacks are provided by ISVs

- TCP/IP connectivity for IPv4 communication
  - IBM TCP/IP for VSE – licensed from CSI International
  - IBM IPv6/VSE – licensed from Barnard Software, Inc. (BSI)
  - Linux fast path (LFP)

- TCP/IP connectivity for IPv6 communication
  - IBM IPv6/VSE
  - Linux Fast Path

- All TCP/IP stacks can run concurrently within one z/VSE system
- IBM TCP/IP for VSE/ESA 1.5F and IBM IPv6/VSE 1.1 not supported on z/VSE 6.1

- Enhancements for for both TCP/IP stacks in z/VSE 6.1
  - IBM TCP/IP for z/VSE 2.1
  - IBM IPv6/VSE 1.2
  - Both are only supported on z/VSE 6.1

z/VSE 6.1 – IBM TCP/IP for z/VSE 2.1

- A new version of CSI's TCP/IP stack – only supported on z/VSE 6.1
  - Levelset based on TCP/IP for VSE 1.5F / 1.5G
  - Replaces IBM TCP/IP for VSE/ESA 1.5F on z/VSE 6.1

- New white-list firewall
  - Access denied unless
    an IP address is specifically allowed to communicate with the VSE system.
  - Firewall shield loaded during TCP/IP startup (in fail or warn mode - for logging only)
    - Configuration phase contains a list of IP addresses
      - Firewall configuration phase can be reloaded
      - To each IP address range you may specify VSE ports (TCP or UDP)
        and if ICMP (Ping) is allowed
      - Example:
        FIREWALL ALLOW,IPV4BEG=039.101.062.131,IPV4END=039.101.062.131,
        TCPPORTS=PORTGRPA,UDPPORTS=NONE,ICMP=YES
  - FIREWALL commands for administration
    - ON, OFF, LOAD PHASE=<phase name>
    - WARN, FAIL, DEBUGON | DEBUGOFF, MSGON | MSGOFF, REPORT

z/VSE 6.1 – IBM TCP/IP for z/VSE 2.1 …

- Cross memory services for external partition socket requests
  - Socket requests allocated in partition GETVIS instead of system GETVIS
  - TCP/IP partition uses cross memory services (XPCC) to process socket request
  - New program ($BSOCKET) loaded into partition to process external socket request

- New utilities for automation and TN3270 services
  - TN3270 improved recovery
  - External TN3270 server, outside the TCP/IP partition (SERV3270 utility)
  - Multiple TN3270 servers can run at the same time

- Enhanced TLS/SSL cryptography
  - RSA-SHA256 signatures supported
  - RFC5746 implemented to allow usage of
    TLS extensions to prevent the handshake renegotiation security exposure

- Internal processing improvements

z/VSE 6.1 – IBM IPv6/VSE 1.2

- A new release of BSI's TCP/IP stack – IBM IPv6/VSE 1.2 only supported on z/VSE 6.1

- New (basic) firewall
    - Examines IPv4 packets and IPv6 Ethernet frames
    - Enabled by default
    - VSE Librarian member contains the firewall rules table
        - To disable the firewall, just delete / rename the VSE Librarian member
    - Source IP address, packet protocol, TCP or UDP port, ICMP can be accepted / denied
        - Example: IN IP ALLOW IP 192.168.1.0 255.255.255.0
    - If a packet is denied, it is dropped. A message will be written to SYSLST
    - Default firewall rules allow all packets to be processed by the stack
    - Only Inbound (IN) rules are processed
    - Firewall commands via MSG <syslog id>
        - MSG <syslog id>,D=FIREWALL,RELOAD
        - MSG <syslog id>,D=FIREWALL,LIST
        - MSG <syslog id>,D=FIREWALL,LOGLEVEL n (0=no logging, 4=message to SYSLST)

z/VSE 6.1 – IPv6/VSE 1.2 …

- Automated OSA Express failover using hot swap devices for high availability
    - Automatically recover from OSA Express device failures by using a backup device

- Improved SSL support including TLS 1.2
  and Diffie Hellman (DH) / Elyptic Curve Cryptography (ECC) sockets
    - Update to the latest openSSL implementation
    - Support to establish up to 16 SSL sockets concurrently,
      can improve performance for applications that establish multiple connections
      to z/VSE including TN3270(E), CICS, and web services applications

- Virtual IP address support using virtual network devices
    - Multiple IP addresses can be defined for a single network interface
    - Virtual network interfaces share a single OSA Express device

- Improved stack CPU optimization

z/VSE 6.1 – Network enhancements

- Configurable output buffers for HiperSockets and OSA Express devices
    - May improve TCP/IP performance, if z/VSE sends faster than OSA card can transfer
    - Up to 64 QDIO (Queued Direct I/O) output buffers
    - To be configured in configuration file (IJBOCONF.PHASE)
    - Requires PFIXed partition 31 bit GETVIS space
    - For OSA-Express (CHPID OSD, OSX), HiperSockets (CHPID IQD)

- Configurable intput buffers for HiperSockets and OSA Express devices (since z/VSE 5.1)
    - May improve TCP/IP performance
    - Up to 64 QDIO output buffers
    - To be configured in configuration file (IJBOCONF.PHASE)
    - Requires PFIXed partition 31 bit GETVIS space
        - The limit for PFIX storage has to be defined with the JCL SETPFIX command

z/VSE 6.1 – Connector enhancements

- MQ trigger monitor
  - Extends the IBM WebSphere MQ Client for VSE functionality
  - It monitors an IBM WebSphere MQ server running on any platform.
  - If a message arrives on a WebSphere MQ server queue,
    the trigger monitor may start a CICS program.

- IBM WebSphere MQ for z/VSE V3.0 withdrawn from service by September 30, 2015
  - Service extensions possible
  - The WebSphere MQ Client for VSE togther with the MQ trigger monitor
    can be used as an alternative.

Migration to a supported z/VSE release

- Please migrate to a supported z/VSE release
  to get the latest software service, hardware exploitation and functionality

- The only supported releases by 11/27/2015 are z/VSE 5.1, 5.2, 6.1
  - z/VSE 5.1, 5.2 require z9 or higher
  - z/VSE 5.1 end of service effective June 30, 2016.
  - z/VSE 5.2 can still be ordered after z/VSE 6.1 GA, end of marketing not announced yet
  - Fast Service Upgrade (FSU) to z/VSE 5.1, 5.2 supported
  - z/VSE 6.1 requires an initial installation

  - Consider the Single Version Charging (SVC) requirements
    … and for z/VSE 6.1 Migration Price Option (MPO – see next page).

  - IBM System z software pricing:
    http://www-03.ibm.com/systems/z/resources/swprice/reference/

  - Migration white paper will be provided at z/VSE 6.1 GA

Migration Price Option (MPO)

- The Migration Price Option is available (see z/VSE 6.1 announcement letter for more details)::

  – While **z/VSE V5 (and/or z/VSE prior versions) and z/VSE V6** are running on the same machine and Licensed under the same IBM customer number.
  – During migration to z/VSE V6 and not to exceed **18 months** from the date of licensing z/VSE V6.

- When z/VSE V5 (and/or z/VSE prior versions) and z/VSE V6 are eligible for **Sub-Capacity pricing**, z/VSE V6 is charged at the combined concurrent peak MSUs for both versions, reported as z/VSE (ALL) on the customer's Sub-Capacity Report. The calculated MSUs apply for a period not to exceed 18 months from the date of licensing of z/VSE V6.

- When **full capacity** charges apply, charges for z/VSE V5 (and/or z/VSE prior versions) and z/VSE V6 are based on the MSU value at Full-Machine Capacity and billed at the z/VSE V6 price for a period not to exceed 18 months from the date of licensing z/VSE V6.

- The usage of a set of Programs, subject to the waiver, would be limited by terms of an IBM agreement such that the qualifying customers will be allowed to run only one SW application (either "from" or "to" Program) in a **single production LPAR**.

- The Migration Price Option should be requested when ordering z/VSE V6 when that will be replacing z/VSE V5 (and/or z/VSE prior versions) on the same Machine.

z Systems support

VSE Release	z800 / z900	z890 / z990	z9	z10 / z196 / z114 / zEC12 / zBC12 / z13	VSE EoS
z/VSE 6.1 (GA 11/27/2015)	No	No	No	Yes	tbd
z/VSE V5.2	No	No	Yes	Yes	tbd
z/VSE V5.1	No	No	Yes	Yes	06/30/2016
z/VSE V4.3	Yes	Yes	Yes	Yes	10/31/2014
z/VSE V4.2	Yes	Yes	Yes	Yes	10/31/2012
z/VSE V4.1	Yes	Yes	Yes	Yes	04/30/2011
z/VSE V3.1	Yes	Yes	Yes	Yes	07/31/2009
VSE/ESA V2.7	Yes	Yes	Yes	Yes	02/28/2007
VSE/ESA V2.6	Yes	Yes	Yes	Yes	03/2006
VSE/ESA V2.5	Yes	No	No	No	12/2003
VSE/ESA V2.4	Yes	No	No	No	06/2002
VSE/ESA V2.3	No	No	No	No	12/2001

z/VSE release / Hardware status: http://www-03.ibm.com/systems/z/os/zvse/about/status.html

New: z/VSE Knowledge Center

http://www-01.ibm.com/support/knowledgecenter/SSB27H/zvse_welcome.html

CICS TS for VSE Knowledge Center

http://www-01.ibm.com/support/knowledgecenter/SSB2JE_1.1.1/welcome.html

z/VSE Requirements

▪ You may submit requirements at conferences (GSE, zUniversity (Edge), VM Workshop, …)

▪ **z/VSE** requirements via the Request for Enhancements (RFE) database:
  • http://www.ibm.com/developerworks/rfe/

  – Please select the following for z/VSE requirements
    • *Brand = Servers and System Software*
    • *Product family = zSeries Software*
    • *Product = z/VSE*
    • *Component = General, z/VSE, VSE/AF, VSE/VSAM, VSE/POWER, VSE Unique Code, ...*
    • *Operating system = IBM z/VSE*
    • *Source = Share, IBM user group, IBM Conference, ..., Other*

▪ **CICS Transaction Server** requirements via the Request for Enhancement (RFE) database:
  • http://www.ibm.com/developerworks/rfe/
  – Please select the following for z/VSE-CICS requirements:
    • *Brand = WebSphere*
    • *Product family = Transaction Processing*
    • *Product = CICS Transaction Server*
    • *Component = Runtime or Explorer*
    • *Operating system = IBM z/VSE*

More Information

- VSE home page: http://ibm.com/vse
- z/VSE on Twitter: www.twitter.com/IBMzVSE
- Ingolf's z/VSE blog: https://www.ibm.com/developerworks/mydeveloperworks/blogs/vse
- VSE-L discussion list: https://groups.google.com/forum/?fromgroups#!forum/bit.listserv.vse-l

- Hints and Tips for z/VSE 5.2: http://www.ibm.com/systems/z/os/zvse/documentation/#hints

- 64 bit virtual information: IBM z/VSE Extended Addressability

- CICS Explorer: http://www.ibm.com/software/htp/cics/explorer/

- IBM Redbooks:
  - Introduction to the New Mainframe: z/VSE Basics
    http://www.redbooks.ibm.com/abstracts/sg247436.html?Open
  - Security on IBM z/VSE – updated
    http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/sg247691.html?Open
  - z/VSE Using DB2 on Linux for System z
    http://www.redbooks.ibm.com/abstracts/sg247690.html?Open
  - New: Enhanced Networking on IBM z/VSE
    http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg248091.html?Open

- Please contact z/VSE: https://www-03.ibm.com/systems/z/os/zvse/contact/contact.html
  or me – Ingolf Salm – salm@de.ibm.com – for any questions

Thank You

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