

IBM z/VSE V6.2

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At a glance

The focus of z/VSE^(R) V6.2 is online transaction processing, security, and connectivity to improve the integration of z/VSE in a heterogeneous environment using web-based business solutions.

Together with hardware exploitation, ease-of-use functionality, and support of the latest IBM^(R) Z and IBM System Storage^(R) technology, z/VSE V6.2 delivers additional functionality that may provide additional benefits to z/VSE clients. It helps clients with growing z/VSE workloads, and allows them to better protect their investments in the z/VSE platform.

IBM z^(R)/VSE V6.2 is designed to deliver:

Exploitation of innovative IBM Z and IBM System Storage technology:

- An Architectural Level Set that requires IBM zEnterprise^(R) 196, IBM zEnterprise 114, or later.
- Transparent use of the High Performance FICON^(R) for z Systems^(R) (zHPF) protocol for user applications.
- IBM z14 and IBM z13^(R) Vector Facility (SIMD) support for user applications.
- Elliptic Curve Cryptography (ECC) acceleration with a Crypto Express6S in an IBM z14 or with a Crypto Express5S in an IBM z13 or IBM z13sTM.
- Use of features exclusive to IBM z14:
 - Configurable Crypto Express6S for data encryption and SSL acceleration.
 - FICON Express16S+.
 - OSA-Express6S family.
- FlashCopy^(R) Space Efficient (SE) support for Extent Space Efficient (ESE) volumes configured in an IBM DS8880.
- Transparent support of IBM TS7700 R4.1.1.

IBM CICS^(R) Transaction Server for z/VSE V2.2:

- Enhancements to CICS Explorer^(R) to more easily manage CICS resources.
- An upgrade of CICS Web Support (CWS) to HTTP 1.1 to support the latest web browsers and applications.
- CICS API enhancements.

Security enhancements:

- Clients can choose to use z/VSE's cryptographic services for their online and batch applications for enhanced data at rest and data in flight security and more flexibility.
- Clients can use secure connections for remote virtual tapes to help protect sensitive data during network transfer.

Connector enhancements:

- The z/VSE SOAP engine helps to meet the needs of CICS applications with growing data.
- A new z/VSE REST (Representational State Transfer) Engine provides JSON (JavaScript™ Object Notation) support.

Ease-of-use functionality for SCSI-only systems:

- Tape-less initial installation is also supported using SCSI and emulated FBA installation disks.
- Support for stand-alone dump on SCSI disks eliminates the need for a physical dump tape.

IBM DL/I VSE V1.12 enhancements:

- Elimination of the 4 GB limit of a segment type allows for growing DL/I databases.

IBM IPv6/VSE V1.3 and IBM TCP/IP for z/VSE V2.2

Overview

IBM announces z/VSE V6.2, the new release of z/VSE.

The focus of z/VSE V6.2 is online transaction processing, security, and connectivity to improve the integration of z/VSE in a heterogeneous environment using web-based business solutions.

Together with hardware exploitation, ease-of-use functionality, and support of the latest IBM Z and IBM System Storage technology, z/VSE V6.2 delivers additional functionality that may provide additional benefits to z/VSE clients. It helps clients with growing z/VSE workloads, and allows them to better protect their investments in the z/VSE platform.

Enhancements planned for z/VSE V6.2 include:

Exploitation of innovative IBM Z and IBM System Storage technology:

- z/VSE introduces an Architectural Level Set that requires IBM zEnterprise 196, IBM zEnterprise 114, or later.
- z/VSE transparently exploits the High Performance FICON for z Systems (zHPF) protocol for user applications and thus brings the benefits of IBM Z and IBM System Storage to z/VSE clients.
- Elliptic Curve Cryptography (ECC) will be accelerated with a Crypto Express6S in an IBM z14, or with a Crypto Express5S in an IBM z13 or IBM z13s.
- The Vector Facility for z/Architecture^(R) of a z14 or z13^(R), also referred to as Single Instruction Multiple Data (SIMD), may improve performance and is supported by z/VSE for user applications.
- Features exclusive to IBM z14 include:
 - Configurable Crypto Express6S on the z14 for data encryption and SSL acceleration.
 - FICON Express16S+.
 - OSA-Express6S family.

- FlashCopy Space Efficient (SE) support is provided for Extent Space Efficient (ESE) volumes configured in an IBM DS8880.
- z/VSE transparently supports the IBM TS7700 R4.1.1.

CICS Transaction Server for z/VSE V2.2:

CICS Transaction Server for z/VSE (CICS TS for z/VSE) V2.2 is the only release supported on z/VSE V6.2. This release replaces CICS TS for z/VSE V2.1 and delivers:

- Enhancements to the CICS Explorer to more easily manage CICS resources.
- An upgrade of CICS Web Support (CWS) to HTTP 1.1 for improved performance and security and to support the latest web browsers and applications.
- Enhancements to the CICS API.

Security enhancements:

- The OpenSSL component of z/VSE (z/VSE Cryptographic Services):
 - Is upgraded to OpenSSL 1.0.2h to benefit from newer SSL/TLS functions for enhanced data in flight encryption.
 - Transparently uses hardware acceleration for Elliptic Curve Cryptography (ECC), if available.
- Clients can choose to use OpenSSL for their online and batch applications for enhanced data at rest and data in flight security and more flexibility:
 - OpenSSL for CICS Web Support gives clients more flexibility and allows them to take advantage of the OpenSSL security.
 - The EZA 'Multiplexer' and the EZA OpenSSL support simplify the use of the EZA interface with any TCP/IP stack.
- The Basic Security Manager (BSM) simplifies the administration of batch resources.
- Clients can use SSL/TLS connections for remote VTAPes (virtual tapes) to help protect sensitive data during network transfer.
- LDAP sign-on support is enhanced to fulfill ease-of-use requirements.
- VSE/POWER^(R) enables TLS 1.0 (and higher) for PNET SSL connections.

Connector enhancements:

- The z/VSE SOAP (Simple Object Access Protocol) engine allows the transfer of large amounts of data to better meet the needs of CICS applications with growing data.
- REST (Representational State Transfer) has gained widespread acceptance across the web as an alternative to SOAP-based web services. The new z/VSE REST Engine with JSON (JavaScript Object Notation) support allows clients to provide RESTful web services running in a CICS environment, and develop CICS applications that consume RESTful web services that are hosted outside of z/VSE.
- The z/VSE database connector provides an ease-of-use batch and interactive interface that allows clients to perform database queries without the need to implement an application first.

Networking enhancements:

- The z/VSE Linux^(R) Fast Path (LFP) offers more connectivity options and allows LFP running as a z/VM^(R) guest to access the network via the z/VSE Network Appliance or via a Linux on z Systems (IBM Z) in an LPAR image.

Ease-of-use functionality for SCSI-only systems:

- Tape-less initial installation using a SCSI installation disk as well as stand-alone dump using a SCSI dump disk fulfills customer requirements. Clients may no longer be forced to include a physical tape volume in the configuration, and thus may reduce costs and simplify the configuration.

IBM DL/I VSE V1.12 enhancements:

DL/I introduces a partitioning function for hierarchical direct (HD) databases. This eliminates the 4 GB limitation of a segment type and thus allows clients to meet the needs for growing DL/I databases.

IBM IPv6/VSE V1.3:

IBM IPv6/VSE V1.3 replaces IBM IPv6/VSE V1.2. It delivers:

- New FTP server security interface to help simplify security definitions.
- Encrypted password facility for enhanced security.
- SSH (Secure Shell) copy facility to enable secure file transfer using SSH to and from z/VSE.
- TXT2PDF generation facility to convert a text file into a Portable Document Format (PDF) file.

IBM TCP/IP for z/VSE V2.2:

IBM TCP/IP for z/VSE V2.2 replaces IBM TCP/IP for z/VSE V2.1. It delivers:

- Support for the TLS 1.1 and TLS 1.2 protocols for enhanced security.

z/VSE V6.2 supports IBM Z:

- IBM z14 (z14)
- IBM z13 (z13)
- IBM z13s (z13s™)
- IBM zEnterprise EC12 (zEC12)
- IBM zEnterprise BC12 (zBC12)
- IBM zEnterprise 196 (z196)
- IBM zEnterprise 114 (z114)

z/VSE V6.2 can run in an LPAR image, or as a guest in any supported z/VM release. z/VSE V6.2 is the preferred follow-on product for clients with z/VSE V6.1, z/VSE V5, z/VSE V4, z/VSE V3, or VSE/ESA installed. Upgrading to z/VSE V6.2 can be done using initial installation or Fast Service Upgrade (FSU). FSU can be used only if upgrading from a z/VSE V6.1 system. Otherwise an initial installation is required.

z/VSE V6.2 offers Midrange Workload License Charge (MWLC) pricing metrics, including a sub-capacity option, for the z14, z13, zEC12, and z196 servers. IBM offers Advanced Entry Workload License Charge (AEWLC) pricing metrics, including a sub-capacity option, for the z13s, zBC12, and z114 servers. The entry models (capacity setting A01) of the z13s, zBC12, and z114 will be priced using z Systems Entry License Charge (zELC) for their IBM monthly license charge software.

IBM replaces Single Version Charging (SVC) with Multi-Version Measurement (MVM) for eligible z/VSE software programs, providing IBM Z clients with more flexibility for new software deployments and software upgrade cycles. MVM also replaces the Migration Pricing Option (MPO). See Software Announcement [217-093](#), dated February 14, 2017.

Key prerequisites

z/VSE V6.2 introduces an Architectural Level Set that requires IBM zEnterprise 196, IBM zEnterprise 114, or later. See the [Hardware requirements](#) and [Software requirements](#) sections for additional information.

Planned availability date

December 1, 2017

Description

The focus of z/VSE V6.2 is online transaction processing, security, and connectivity to improve the integration of z/VSE in a heterogeneous environment using web-based business solutions.

Together with hardware exploitation, ease-of-use functionality, and support of the latest IBM Z and IBM System Storage technology, z/VSE V6.2 delivers additional functionality that may provide additional benefits to z/VSE clients. It helps clients with growing z/VSE workloads, and allows them to better protect their investments in the z/VSE platform.

Enhancements for z/VSE V6.2 include:

Exploitation of innovative IBM Z and IBM System Storage technology:

- Increased performance using the High Performance FICON for z Systems (zHPF) protocol:
 - The zHPF channel Input/Output (I/O) architecture is designed to improve the execution of small block I/O requests. z/VSE translates applicable I/O commands into the zHPF protocol and thus transparently exploits the zHPF protocol for user applications. This brings the benefits of IBM Z and IBM System Storage to z/VSE clients. Selected I/O-intensive applications may especially benefit from a FICON Express16S+ on an IBM z14, or FICON Express16S on an IBM z13 or z13s with the zHPF protocol and IBM DS8880 storage.
 - z/VSE provides support for both the LPAR and z/VM guest environment. For z/VM guests the appropriate service level is required.
- The Vector Facility for z/Architecture of a z14 and z13 potential to improve performance:
 - The Vector Facility is also referred to as Single Instruction Multiple Data (SIMD). The z/VSE support allows user applications to use SIMD instructions and thus fulfills customer requirements. When using SIMD instructions in a z/VM guest environment the appropriate z/VM level is required.
- FlashCopy Space Efficient (SE) support for Extent Space Efficient (ESE) volumes:
 - FlashCopy SE allows clients to use an ESE volume as the target volume with the NOCOPY option.
 - To configure ESE volumes IBM DS8880 R8.1 is required.
- z/VSE supports the Crypto Express6S adapter in both IBM Common Cryptographic Architecture (CCA) coprocessor and accelerator mode. It can be used in an LPAR and z/VM guest environment.
- FICON Express16S+ on a z14:
 - FICON Express16S+ supports a link data rate of 16 gigabits per second (Gbps) and autonegotiation to 4 or 8 Gbps for synergy with existing switches, directors, and storage devices.
 - z/VSE transparently supports the FICON Express16S+ in three modes of operation:
 - CHPID type FC when utilizing FICON or Channel-to-Channel (CTC).
 - CHPID type FC for support of zHPF operations.
 - CHPID type FCP for use with FCP-attached SCSI disks.
- OSA-Express6S features - an Ethernet technology refresh:
 - The OSA-Express6S family of features is exclusive to the z14.

- z/VSE transparently supports four modes of operation:
 - CHPID type OSC for TN3270E and non-SNA DFT 3270 emulation.
 - CHPID type OSD for TCP/IP traffic with exploitation of two ports per CHPID.
 - CHPID type OSE for SNA and TCP/IP passthru traffic with exploitation of two ports per CHPID.
 - CHPID type OSX for access control to the IntraEnsemble Data Network (IEDN).
- FlashCopy Space Efficient (SE) support for Extent Space Efficient (ESE) volumes:
 - FlashCopy SE allows clients to use an ESE volume as the target volume with the NOCOPY option.
 - To configure ESE volumes IBM DS8880 R8.1 is required.
- z/VSE V5.2, and later transparently supports the TS7700 R4.1.1.

CICS Transaction Server for z/VSE (CICS TS for z/VSE) V2.2:

CICS TS for z/VSE V2.2 replaces CICS TS for z/VSE V2.1. This release is designed for use only with z/VSE V6.2 and delivers:

- Enhancements to the CICS Explorer to more easily manage CICS resources:
 - Define new CICS resources and modify or delete existing resources.
 - Monitor, control, and update dynamic storage areas and global temporary storage queue statistics.
 - Support "definitions" views for selected CICS resources.
- An upgrade of CICS Web Support (CWS) to HTTP 1.1:
 - CWS has been upgraded to comply with HTTP 1.1, providing support for the latest web browsers and applications. New function has been added, such as persistent connections, pipelining, and chunking, to improve performance and security.
- Enhancements to the CICS API to provide:
 - Support for UTF-8 and UTF-16, for use in data conversion, when using the channels and containers API.
 - Support for the APPEND parameter for PUT CONTAINER, to append specified data to existing container data.
 - Support for the BYTEOFFSET parameter for GET CONTAINER, to retrieve data at a specified offset in a container.
 - Support for date and time stamp formats that are in general use across the internet.
 - Support for Language Environment^(R) (LE) MAIN for Assembler applications.

Security enhancements:

- OpenSSL component of z/VSE (z/VSE Cryptographic Services):
 - The OpenSSL component is upgraded to OpenSSL 1.0.2h to benefit from newer SSL/TLS functions and provide enhanced data in flight encryption.
 - Elliptic Curve Cryptography (ECC) hardware acceleration with a Crypto Express6S in CCA coprocessor mode will be transparently used. If the hardware is not available, the ECC software implementation will continue to be used.
- Ability to use OpenSSL for CICS Web Support:
 - Clients using CICS Web Support with SSL/TLS will be able to choose between the OpenSSL component delivered as part of the z/VSE operating system and the SSL component of a TCP/IP stack. This may simplify the configuration, gives clients more flexibility, and allows them to take advantage of the OpenSSL security.
- EZA 'Multiplexer' and EZA OpenSSL support:

- The EZA 'Multiplexer' simplifies the use of the EZA interface with any TCP/IP stack. Clients can configure which EZA interface phase is to be used for a given TCP/IP stack ID.
- It also allows clients to use OpenSSL for the EZA SSL/TLS interface, independent of the used TCP/IP stack.
- Ability to use SSL/TLS connections for remote VTAPes to achieve transport layer encryption of sensitive tape data during network transfer.
- Basic Security Manager enhancements:
 - The z/VSE Basic Security Manager (BSM) distinguishes between repositories for online and batch security definitions. The repository to protect batch resources is the phase DTSECTAB. It contains library, sublibrary, member, and file definitions. Whereas online resources can be easily maintained using the dialogs of the Interactive User Interface (IUI), for each batch resource the DTSECTAB needs to be updated. To help simplify the administration of batch resources, z/VSE provides a common interface for both online and batch resources. An IUI dialog is offered that builds a DTSECTAB with the resources specified.
- Enhanced LDAP sign-on support:
 - z/VSE provides a RESET option for the LDAP user mapping tool to clear the cached password hash for a user. This forces a full LDAP sign-on to be performed next time the user signs in.
 - z/VSE provides wildcard support for the CHANGE and DELETE commands of the LDAP user mapping tool to allow modification or deletion of multiple user records with one command. This, for example, allows clients to generate a new VSE password for all mapped users with one command.

Connector enhancements:

- z/VSE SOAP Engine enhancement:
 - The existing z/VSE Simple Object Access Protocol (SOAP) implementation integrates z/VSE CICS applications in a heterogeneous environment using web services. User programs utilizing the z/VSE SOAP Engine are currently restricted by the COMMAREA and its 32K limitation. To help meet the needs of CICS applications with growing data, z/VSE exploits the CICS Channels and Containers API for the SOAP Engine. The Channels and Containers API has been available since z/VSE V6.1 and CICS TS for z/VSE V2.1. The use of Channels and Containers lifts the COMMAREA limitation and allows the transfer of large amounts of data also for the SOAP protocol. User programs utilizing the z/VSE SOAP Engine will still be able to use the COMMAREA interface for compatibility.
- New z/VSE REST Engine with JSON support:
 - An essential part of z/VSE's strategy is to integrate z/VSE in a heterogeneous environment. Representational State Transfer (REST) is a software architecture style consisting of guidelines and best practices for creating web services. REST has gained widespread acceptance across the web as a simpler alternative to, for example, SOAP-based web services. RESTful systems typically communicate over the Hypertext Transfer Protocol (HTTP), using JavaScript Object Notation (JSON) or XML for the payload. z/VSE provides a REST Engine that allows clients to provide RESTful web services running in a CICS environment. The REST Engine can also be used to develop CICS applications that consume RESTful web services that are hosted outside of z/VSE. The REST Engine supports various payload types including JSON and XML.
- z/VSE database connector enhancement:
 - The existing z/VSE database connector DBCLI (Database Call Level Interface) allows z/VSE applications to access a relational database on any suitable database server. The database server may run on a platform other than z/VSE. With the current functionality, clients need to implement their own applications using the DBCLI programming interface to access the database. z/VSE further enhances the z/VSE database connector DBCLI. For ease of use it provides

both a batch interface and an interactive interface that allow clients to perform database queries without implementing an application first.

- CICS REXX support is added to DBCLI.

Networking enhancements:

- The z/VSE Linux Fast Path (LFP) allows selected TCP/IP applications to access the network without requiring a TCP/IP stack on z/VSE. LFP is already available in a z/VM guest, or LPAR environment. To offer clients more connectivity options, LFP running as a z/VM guest can now also communicate with a TCP/IP stack in an LPAR or with the z/VSE Network Appliance.

Ease-of-use functionality for SCSI-only systems:

The enhancements for the z/VSE SCSI support fulfill customer requirements. Clients may no longer be forced to include a physical tape device in the configuration, and thus may reduce costs and simplify the configuration.

- Tape-less initial installation using a SCSI installation disk:
 - Starting with z/VSE V5.2, clients can create an installation disk from a DVD image or internet delivery and then perform initial installation using this installation disk. Currently, the support is available for 3390-type installation disks only. z/VSE now adds support for FCP-attached SCSI disks in an LPAR environment as well as emulated FBA and virtual FBA disks in a z/VM guest environment.
- Stand-alone dump using a SCSI dump disk:
 - Occasionally z/VSE support asks clients to take a stand-alone dump for further problem analysis. The stand-alone dump can be created on a tape or disk device. Currently, ECKD™ disks, and, in a z/VM guest environment, additionally FBA-type disks are supported. z/VSE now allows clients to create a stand-alone dump on an FCP-attached SCSI disk in an LPAR environment.

DL/I VSE V1.2 enhancements:

DL/I introduces a partitioning function for hierarchical direct (HD) databases. Partitioning of a database allows users to increase the database storage capacity for one segment type up to 8 gigabytes (GB). This eliminates the current limitation of 4 GB. The partitioning function allows DL/I applications to transparently handle growing data.

The partitioning function will be made available as a PTF for DL/I VSE V1.12 after general availability of z/VSE V6.2.

Operating system enhancements:

To exploit large processor storage and improve performance, z/VSE backs dataspace with megabytes (MB) frames if feasible. z/VSE internally decides when to resolve the MB frames to balance the system. The function was introduced with z/VSE V4.3. To allow users to create huge data spaces that will be released later, without taking away processor storage for other applications, z/VSE adds support to also free related MB frames when releasing a dataspace.

IBM IPv6/VSE V1.3:

IBM IPv6/VSE V1.3 replaces IBM IPv6/VSE V1.2 and delivers:

- New FTP server security interface:
 - FTP access to the z/VSE file system will be protected using the Basic Security Manager (BSM) or any other External Security Manager (ESM) product that clients may choose. This will allow clients to help simplify their security definitions by using the resource class FACILITY as a single source.
- Enhanced security through encrypted password facility:
 - Passwords are no longer stored as clear text on the system.

- SSH copy facility:
 - This facility uses a Linux pass-through image to facilitate an SSH connection to a remote host, enabling for secure file transfer using SSH to and from z/VSE. It is compatible with the IBM TCP/IP for z/VSE product, LFP, z/VM IP Assist, and the z/VSE Network Appliance.
- TXT2PDF generation facility:
 - This facility is based on the Open Source txt2pdf utility and converts a text file into a Portable Document Format (PDF) file. It provides many options to control the conversion, output appearance, and final presentation.

IBM TCP/IP for z/VSE V2.2:

IBM TCP/IP for z/VSE V2.2 replaces IBM TCP/IP for z/VSE V2.1 and delivers support for the TLS 1.1 and TLS 1.2 protocols for enhanced security.

IBM z/VSE Version 6 product content

z/VSE Version 6 base programs

The following is a complete list of z/VSE Version 6 base programs, including their release/modification levels.

Note that z/VSE is the successor to IBM's VSE/ESA product and that many products and functions supported on z/VSE may continue to use VSE/ESA in their product names.

Program Name	Version/ Release/ Mod	Program Number	Notes
z/VSE	6.02.00	5686-VS6	(1)
High Level Assembler for z/OS, z/VM, z/VSE	1.06.00	5696-234	(1)
VSE/EREP	3.05.00	5656-260	(2)
VSE/ICKDSF	1.17.00	5747-DS2	(2)
CICS Transaction Server for z/VSE	2.02.00	5655-VSE	
ACF/VTAM for VSE/ESA	4.02.00	5686-065	
- Client/Server (CS)			
- Multi Domain (MD)			
- Inter Enterprise (IE)			
DITTO/ESA for VSE	1.03.00	5648-099	
TCP/IP for z/VSE	2.02.00	5686-CS1	
- Application Pak Feature (App1 Pak)			
- GPS Feature			
IPv6/VSE	1.03.00	5686-BS1	
Db2 Server for VSE and VM	7.05.00	5697-F42	
- DataPropagator	7.04.01		(2)
Db2 Client Edition for VSE	7.05.00	5697-F42	

Notes:

(1) Mandatory product, not selectable. All others are optional. Some may have commercially available alternatives.

(2) No-charge product, not selectable.

z/VSE Version 6 optional programs

The following is a complete list of z/VSE Version 6 optional programs, including their release/modification levels.

Program Name	Version/ Release/ Mod	Program Number
Optional z/VSE Base Features:		
Encryption Facility for z/VSE	1.02.00	5686-VS6
High Level Assembler Tool Kit	1.06.00	5696-234
DITTO/ESA for VSE, VM Option	1.03.00	5648-099
ACF/VTAM Version 4 VM Options	4.02.00	5686-065
ACF/VTAM APPC for VM		

Db2 Server for VSE and VM	7.05.00	5697-F42
Db2 Client Edition for VSE	7.05.00	5697-F42
- Data Restore Feature		
- Control Center Feature		
- QMF for VSE		
- QMF for Windows		
System Control and Networking:		
VSE/ACLR	1.02.01	5746-XE7
Database and Utilities:		
DL/I VSE	1.12.00	5746-XX1
CICSVR/VSE	1.02.00	5686-011
DFSORT/VSE	3.04.00	5746-SM3
Languages and Compilers:		
COBOL for VSE - full function	1.01.00	5686-068
COBOL for VSE - alt. function	1.01.00	5686-068
PL/I for VSE - full function	1.01.00	5686-069
PL/I for VSE - alt. function	1.01.00	5686-069
C for VSE/ESA - full function	1.01.00	5686-A01
C for VSE/ESA - alt. function	1.01.00	5686-A01
CCCA for VSE	2.01.00	5686-A07
Rational COBOL RT for z/VSE	7.05.00	5648-F66
DOS/VS RPG II	1.03.00	5746-RG1
Application Development:		
SDF II	1.06.00	5746-XXT
Business Professional Support:		
GDDM VSE	3.02.00	5686-057
GDDM IMD	2.01.03	5668-801
GDDM PGF	2.01.03	5668-812
GDDM IVU	1.01.03	5668-723
Advanced Function Printing:		
PSF/VSE Comp. Fonts Base	2.02.01	5686-040
AFP Font Collection S/390	2.01.01	5648-B33
PPFA/370	1.01.00	5688-190

Section 508 of the US Rehabilitation Act

IBM z/VSE V6.2 is capable as of December 1, 2017, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be found on the IBM Accessibility website.

Product positioning

A primary objective of z/VSE V6.2 is to help clients protect their extensive existing investments in the z/VSE platform, such as z/VSE applications and data, as well as business processes and IT skills. For example, support for the latest IBM Z and IBM storage systems may help clients to benefit from innovative IBM technology, like accelerated data encryption, and improved network and SAN infrastructure. Functions like DL/I partitioning and web services address the needs of workloads with growing data.

Many clients use z/VSE in combination with other platforms. z/VSE V6.2 may improve the integration of z/VSE in a heterogeneous environment. With the focus on online transaction processing, web services, and enhanced security, clients can take advantage of web-based business solutions.

z/VSE enables clients to extend existing z/VSE solutions with connectors to access applications on Linux on z Systems (IBM Z), or any other platform, and to access z/VSE resources from other platforms. Connector enhancements, for example the z/VSE network appliance and JSON-based web services, may allow clients to include z/VSE in a modern IT environment.

This new release again shows IBM's commitment to z/VSE and dedication to clients' needs.

Hardware and software support services

SmoothStart/installation services

IBM SmoothStart Services and Installation Services are not provided.

Reference information

Refer to Software Announcements [217-091](#), dated April 11, 2017 and [217-351](#), dated October 10, 2017.

Availability of national languages

Description	Availability date	Language
z/VSE V6.2	12/01/17	English

z/VSE is delivered as an English version only.

Translation information, if available, can be found at the [Translation Reports](#) website.

Program number

Program number	VRM	Program name
5609-VSE	1.1.0	z/VSE SDO
5686-VS6	6.2.0	z/VSE
5686-CS1	2.2.0	IBM TCP/IP for z/VSE
5686-BS1	1.3.0	IBM IPv6/VSE

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBMid).

[BP Attachment for Announcement Letter 217-203](#)

Technical information

Specified operating environment

Hardware requirements

z/VSE V6.2 operates on:

IBM Z	LPAR Image	Guest under z/VM (1)
IBM z14	x	x
IBM z13	x	x
IBM z13s	x	x
IBM zEnterprise EC12	x	x
IBM zEnterprise BC12	x	x
IBM zEnterprise 196	x	x
IBM zEnterprise 114	x	x

x: Supported
(1) Supported z/VM release required

Hardware-assisted asymmetric key encryption (RSA only) requires:

- Crypto Express6S (in either coprocessor or accelerator mode) on a z14
- Crypto Express5S (in either coprocessor or accelerator mode) on a z13, z13s, or z14
- Crypto Express4S (in either coprocessor or accelerator mode) on a zEC12 or zBC12
- Crypto Express3 (in either coprocessor or accelerator mode) on a z196 or z114

Hardware-assisted symmetric key encryption requires the CPACF feature.

z13 or later is required for:

- z/VSE Network Appliance
- Vector Facility for z/Architecture, also referred to as Single Instruction Multiple Data (SIMD)

To support new functions and features, the appropriate machine change levels (MCLs) of IBM Z servers are required. Descriptions of the MCLs are available through the [Resource Link^{\(R\)}](#) website.

Software requirements

Many z/VSE clients choose to run under z/VM for operational flexibility or to supplement the capabilities of z/VSE. z/VSE clients who choose to run one or more z/VSE systems as guest systems under z/VM will require a supported z/VM release.

For specific functions and for the most current information on z/VM, go to the [z/VM](#) website.

z/VM allows users to exploit state-of-the-art virtualization technology for one or more of the following reasons:

- Multiple z/VSE production, development, or test images
- Multiple Linux on z Systems (IBM Z) images to exploit the potential of Integrated Facility for Linux (IFL) speciality engines
- Both z/VSE and Linux on z Systems (IBM Z) to extend the z/VSE capabilities with Linux on z Systems (IBM Z)

A z/VM mode logical partition (LPAR) allows clients to run z/VSE images on standard CPs and Linux on z Systems (IBM Z) images on IFLs, all in the same z/VM LPAR for enhanced staff productivity and resource efficiency.

If you install a Linux image on your own to use the Linux Fast Path function, a supported Linux distribution is required. If you are on a z13, z13s, or later, you can use the z/VSE Network Appliance alternatively.

For details, go to the [Linux on z Systems \(IBM Z\)](#) website.

Details of the system requirements for both the CICS Explorer and CICS Explorer SDK are available at the [z/VSE](#) website.

Details relating to service and support for CICS Explorer are available at the [Support](#) website.

Compatibility

Compatibility aspects include:

Installation:

- z/VSE V6.2 introduces an Architectural Level Set (ALS) and requires IBM z196, IBM z114, or higher.
- Starting with z/VSE V6.2, z/VSE can no longer be installed on disks of type 3380 (or 3390 disks in 3380 track compatibility mode). Disks of type 3380 are still supported as data disks.

Products and features:

- CICS TS for z/VSE V2.2 is the only CICS version that can be used with z/VSE V6.2.
 - It replaces CICS TS for z/VSE 2.1 and CICS TS for VSE/ESA V1.1.1.
- CICS Distributed Data Management (CICS/DDM) is not supported with CICS TS for z/VSE V2.1, or later.
- CICS/VSE V2.3:
 - CICS/VSE V2.3 is no longer supported (EOS).
 - CICS/VSE V2.3 cannot be used with z/VSE V6.2.
 - Starting with z/VSE V4.3, CICS/VSE V2.3 is no longer part of the z/VSE package and the CICS coexistence environment has been removed.
- Starting with z/VSE 6.2, CICS transactions can no longer be protected using table DTSECTXN. Use the Basic Security Manager (BSM) instead.
- Starting with z/VSE V4.3, DL/I VSE V1.12 is the only DL/I release that can be used with z/VSE.
 - It replaces DL/I VSE V1.11 and DL/I DOS/VS V1.10.
- IBM TCP/IP for z/VSE V2.2 replaces IBM TCP/IP for z/VSE V2.1.
 - IBM TCP/IP for z/VSE V2.2 is the only supported release on z/VSE V6.2.
- IBM IPv6/VSE V1.3 replaces IBM IPv6/VSE V1.2.
 - IBM IPv6/VSE V1.3 is the only supported release on z/VSE V6.2.

z/VSE V6.2 delivery:

- Starting with z/VSE V6.2, z/VSE tape delivery is dropped. The z/VSE distribution tape images can be ordered on DVD or downloaded from the internet using IBM Shopz.
- Starting with z/VSE V6.1, the z/VSE system is delivered as an English version only.

Configuration:

- After initial installation, the ACF/VTAM^(R) 31-bit I/O buffer support is enabled. It might be necessary to increase the number of copy blocks.
- The support for up to 512 VSE tasks has to be enabled explicitly. A compatibility mode is provided for applications that rely on the old 255 task limit.
- From z/VSE V4.1 onwards, the Label Area must reside on a virtual disk.

User group requirements

This announcement addresses or partially addresses requests for enhancement (RFE) from one or more of the worldwide user group communities. Groups include WAVV, COMMON, COMMON Europe, Guide Share Europe (GSE), InterAction (Australia/New Zealand), Japan Guide Share (JGS), and SHARE Inc. Requirements satisfied include:

RFE 58906	Start POWER PNET nodes of same type with one command
RFE 50906	
RFE 79183	Provide JCL Return Code on z/VSE Job Cancel

RFE 50467	Eliminate DTSECTAB. Not eliminated, but IUI dialog added for configuration
RFE 80364	LDAP mapping tool enhancements
RFE 56542	Attention Routine (AR)QUERY command: QUERY in-use devices
RFE 56551	Attention Routine (AR) VOLUME command enhancements
RFE 62407	Attention Routine (AR)QUERY command: QUERY Active Tapes
RFE 63393	Attention Routine (AR)QUERY command: QUERY by VOLSER
RFE 80364	Add wildcard support to z/VSE LDAP Mapping Tool CHANGE command
RFE 80363	Add RESET command to z/VSE LDAP Mapping Tool
RFE 83797	Do not drop VMCF interface for undefined users
MR0904134410	Provide JCL symbolic system parameter with LPAR name
RFE 59123	Tapeless installation of z/VSE using FBA installation disk
RFE 60724	Support FCP-attached SCSI disk as bootable z/VSE installation disk
RFE 67331	DL/I for VSE: Increase 4GB segment type size
RFE 61922	Exploit CICS Channels and Containers in Web Services (SOAP)
RFE 50582	Remove 32K limitation in z/VSE SOAP support
RFE 29423	Lift 32 KB data limit for web services (SOAP)
RFE 50583	Support HTTP/1.1 for CICS web Support
RFE 29302	CICS web Support: Support for CHUNK parameter
RFE 61923	UTF-8 support in CICS TS conversion services

Planning information

Customer responsibilities

Status of z/VSE V6.1:

- End of service has not been announced yet.
- When z/VSE V6.2 is available, z/VSE V6.1 will no longer be orderable.

Status of z/VSE V5.2:

- End of service will be effective October 31, 2018.
- End of marketing is effective since March 13, 2017.

Further information on the status of z/VSE and related programs can be found on the [IBM z/VSE](#) website.

Software key management

Product license keys can be generated and delivered on request for ordered products and key protected feature.

Product license keys from IBM and third-party vendors are different and are not interchangeable.

IBM IPv6/VSE V1.3

IPv6/VSE V1.3 (IPv6/VSE) is shipped with the z/VSE V6.2 Base and is installed during initial installation of z/VSE V6.2.

Clients who do not wish to use IBM IPv6/VSE are requested to run a product delete job, which is provided with z/VSE V6.2, to delete the product from their system.

IPv6/VSE requires a product license key. IPv6/VSE can be used for 30 days after activation without a key.

IBM TCP/IP for z/VSE V2.2

TCP/IP for z/VSE V2.2 is shipped with the z/VSE V6.2 Base and is installed during initial installation of z/VSE V6.2.

Clients who do not wish to use IBM TCP/IP for z/VSE are requested to run a product delete job, which is provided with z/VSE V6.2, to delete the product from their system.

TCP/IP for z/VSE includes two individual features, each requiring a unique product license key.

Both the Application Pak feature and the GPS feature are installed with the TCP/IP for z/VSE product.

Db2[®] Server for VSE and VM V7.5, Db2 Server for VSE Client Edition V7.5

Db2 Server for VSE and VM and Db2 Server for VSE Client Edition use an access/usage protection method that requires a password key to enable the software function. The password key will be generated and delivered by IBM on request.

ACF/VTAM for VSE/ESA V4.2

ACF/VTAM for VSE/ESA V4.2 uses an access and usage protection method that requires a password key to enable the software function. The following types may be ordered:

- Client/Server (CS)
- Multi Domain (MD)
- Inter Enterprise (IE)

The password key will be generated and delivered by IBM on request.

IBM Customer Key Center

If you require the product license key for an ordered and licensed product, you may contact the IBM Customer Key Center.

Note that the IBM Customer Key Center cannot handle product or license orders. You may contact them only if you already have a license for your software program.

Mail: WW Customer Support Sw License Team
Plaza Cronos 1
Madrid, M 28037
Spain

Telephone: Call our non-toll-free number +44 2392 289880

Email: wswkeys@dk.ibm.com

Installability

z/VSE V6.2 can be installed using initial installation.

Fast Service Upgrade (FSU) from z/VSE V6.1 to z/VSE V6.2 is supported.

- Older versions of z/VSE require initial installation.

- A z/VSE V6.1 running on a z10™ has first to be migrated to at least a z196 / z114 before performing an FSU to z/VSE V6.2.
- A z/VSE V6.1 system that is installed on disks of type 3380 (or 3390 disks in 3380 track compatibility mode) can not be upgraded to z/VSE V6.2.

Initial installation of z/VSE V6.2 supports these disk types:

- 3390
- FBA (including FCP-attached SCSI disks)

Packaging

Starting with z/VSE V6.2, physical tape delivery is dropped. Depending on the order, z/VSE V6.2 is packaged and delivered either:

- On DVD containing:
 - Db2 Server for VM and VSE Help Text
 - Readme File
 - z/VSE Base tape image
 - z/VSE Extended Base tape image
 - Installation files for tapeless initial installation
- Through electronic delivery (via Shopz) to be downloaded, containing:
 - z/VSE Base tape image
 - z/VSE Extended Base tape image
 - Help Text
 - Readme File
 - Installation files for tapeless initial installation

Depending on the order, the package contains one additional tape image or DVD with the ordered z/VSE V6.2 optional products.

Program directories and the publication entitlement sets of the ordered z/VSE base and optional programs will be shipped with the z/VSE package. The Program Directory for z/VSE V6.2 has the IBM form number: GI11-9706-02.

For further information, go to the [z/VSE](#) home page.

Security, auditability, and control

Some of the announced programs use the security and auditability features of the operating system software.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Order VM SDO and VSE SIPO through the internet

Shopz provides an easy way to plan and order z Systems software upgrades. This now includes VM and VSE. Using Shopz, you can quickly generate orders for VM SDOs and VSE SIPOs. Additionally, Shopz will ensure your order is technically correct (that is, ensures any corequisite or prerequisite or incompatibility conditions are resolved to ensure timely order placement and processing). Shopz is available in the United States and several countries in Europe. In countries where Shopz is not available yet, contact your IBM representative (or IBM Business Partner) to

handle your order through the traditional IBM ordering process. For more details and availability, go to the [Shopz](#) website.

New licensees

Orders for new z/VSE licenses will be accepted from November 28, 2017.

When z/VSE V6.2 is available, z/VSE V6.1 will no longer be orderable.

Registered customers can access IBMLink for ordering information and charges. Shipment will occur on the availability date.

New users of z/VSE V6.2 should specify:

Type:	5609	Model:	VSE	(SDO)
Type:	5686	Model:	VS6	(VSE)
Type:	5686	Model:	065	(ACF)
Type:	5648	Model:	099	(DITTO)
Type:	5696	Model:	234	(HLASM)
Type:	5686	Model:	CS1	(TCPIP)
Type:	5686	Model:	BS1	(IPv6)
Type:	5655	Model:	VSE	(CICS)
Type:	5697	Model:	F42	(Db2)

Note: IBM TCP/IP for z/VSE V2.2 (5686-CS1) and IBM IPv6/VSE V1.3 (5686-BS1) are part of the z/VSE V6.2 base package. Both products provide a TCP/IP stack for z/VSE and require an individual and unique product license key in order to be activated. The product license keys are not automatically delivered. In order to receive the product license key, follow the instructions provided within the Memo to Licensees. The Memo is made available for download with each order of IBM IPv6/VSE and IBM TCP/IP for z/VSE.

Graduated or processor-based charges: Not applicable.

Advanced Entry Workload License Charges (AEWLC)

Advanced Entry Workload License Charge (AEWLC) basic license

To order a basic license, specify the program number and quantity of MSUs.

Program name: z/VSE V6.2

Program PID: 5686VS6

Entitlement identifier	Description	License option/Pricing metric
S017VB7	z/VSE VSE V6.2	Basic MLC, AEWLC
S017VB6	Encryption Facility for z/VSE V1.2	Basic MLC, AEWLC
S01613M	IPv6/VSE V1.3	Basic MLC, AEWLC
S017VB5	TCP/IP for z/VSE V2.2 Appl Pak	Basic MLC, AEWLC
S01822R	TCP/IP for z/VSE V2.2 GPS	Basic MLC, AEWLC

Note:

- AEWLC is the only price metric available for z/VSE V6, IPv6/VSE V1.3, and TCP/IP for z/VSE V2.2 on z13s*, zBC12*, and z114* machines. FWLC and TWLC are not available for z/VSE V6, IPv6/VSE V1.3, and TCP/IP for z/VSE V2.2.
- Sub-capacity AEWLC pricing is available only to clients agreeing to the terms of the Attachment for IBM System z^(R) Advanced Entry Workload License Charges (Z125-8755).

* zELC is the only pricing metric for the z114-A01, the zBC12-A01, and the z13s-A01 capacity setting.

z Systems entry license charge (zELC)

To order zELC software, specify the zELC monthly license option.

Entitlement identifier	Description	License option/ Pricing metric
S017VB7	z/VSE V6.2	Basic MLC, zELC
S017VB6	Encryption Facility for z/VSE V1.2	Basic MLC, zELC
S01613M	IPv6/VSE V1.3	Basic MLC, zELC
S017VB5	TCP/IP for z/VSE V2.2 Appl Pak	Basic MLC, zELC
S01822R	TCP/IP for z/VSE V2.2 GPS	Basic MLC, zELC

zELC is the only pricing metric for the z114-A01, the zBC12-A01, and the z13s-A01 capacity setting.

Midrange Workload License Charges (MWLC) in IBM z/VSE

MWLC is a monthly license charge price metric that applies to z/VSE V6 and key VSE middleware programs.

Midrange Workload License Charge (MWLC) for z/VSE V6

Basic license structure

Entitlement identifier	Description	License option/ Pricing metric
S017VB7	z/VSE V6.2	Basic MLC, MWLC
S017VB6	Encryption Facility for z/VSE V1.2	Basic MLC, MWLC
S01613M	IPv6/VSE V1.3	Basic MLC, MWLC
S017VB5	TCP/IP for z/VSE V2.2 Appl Pak	Basic MLC, MWLC
S01822R	TCP/IP for z/VSE V2.2 GPS	Basic MLC, MWLC

Note:

- MWLC is the only price metric available for z/VSE V6, IPv6/VSE V1.3, and TCP/IP for z/VSE V2.2 on the following machines: z14, z13, zEC12, and z196. FWLC and TWLC are not available for z/VSE V6, IPv6/VSE V1.3, and TCP/IP for z/VSE V2.2.
- Sub-capacity MWLC pricing is available only to clients agreeing to the terms of the Attachment for IBM System z Midrange Workload License Charges (Z125-7452).

Basic machine-readable material

Orderable Supply ID	Description	Language
S0187SJ	z/VSE V6.2	US English
S0187SK	Encryption Facility for z/VSE V1.2	US English
S0187SM	IPv6/VSE V1.3	US English
S0187SP	TCP/IP for z/VSE V2.2 Appl Pak	US English
S0187SN	TCP/IP for z/VSE V2.2 GPS	US English

Distribution media: Electronic delivery and DVD.

Customization options

No customization options available.

Unlicensed documentation

Product documentation

z/VSE V6 documentation is provided in two ways:

- Online, through IBM Knowledge Center
- Downloadable PDF manuals, from IBM Publications Center

Online information in IBM Knowledge Center

Online documentation for z/VSE V6.2 is hosted in IBM Knowledge Center. IBM Knowledge Center provides information for over 2,500 IBM products. The information that was previously provided in product Information Centers is in IBM Knowledge Center. IBM Knowledge Center provides integrated tools for finding, filtering, customizing, saving, and sharing information.

Benefits include:

- Consolidation: IBM Knowledge Center is one place to go to find information about all IBM products.
- Consistency: There were differences in the presentation and function of Information Centers between products. IBM Knowledge Center provides the same set of functions for all product information.
- Customization: Clients can use IBM Knowledge Center filtering capabilities to select the information that is most relevant to them, and build that information into customized collections for viewing online or in PDF. IBM updates to the information are automatically reflected in such collections.

For more information about the features of IBM Knowledge Center, visit [IBM Knowledge Center](#).

For CICS TS for z/VSE V2.2, product documentation is available in IBM Knowledge Center after general availability.

Manuals in PDF format:

Publications that are available in PDF format are provided on the online collection kit that is available in compressed format for download from the IBM Publications Center (SK3T-8348).

Go to the [IBM Publications Center](#).

The IBM Publications Center is a worldwide central repository for IBM product publications and marketing material. Extensive search facilities are provided. Furthermore, a large number of publications are available online and can currently be downloaded.

Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as long as a license for this software remains in effect. A separate publication order or subscription is not needed.

Terms and conditions

The terms for z/VSE V6, as previously announced in Software Announcement [215-202](#), dated October 5, 2015, licensed under the IBM Customer Agreement are unaffected by this announcement except as noted below:

Single Version Charging (SVC) and Migration Pricing Option (MPO) have been replaced by Multi-Version Measurement (MVM).

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a lawful, comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective.

Important: IBM does not warrant that any systems, products, or services are immune from, or will make your enterprise immune from, the malicious or illegal conduct of any party.

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Now integrated into the base operating system of AIX^(R) V5.3, AIX V6.1, and AIX V7.1, Electronic Service Agent is designed to automatically and electronically report system failures and utilization issues to IBM, which can result in faster problem resolution and increased availability. System configuration and inventory information collected by the Electronic Service Agent tool also can be viewed on the secure Electronic Support web portal, and used to improve problem determination and resolution by you and the IBM support team. To access the tool main menu, simply type `smitty esa_main`, and select Configure Electronic Service Agent. In addition, ESA now includes a powerful web user interface, giving the administrator easy access to status, tool settings, problem information, and filters. For more information and documentation on how to configure and use Electronic Service Agent, go to the [IBM Electronic Support](#) website.

The IBM Electronic Support portal is a single internet entry point that replaces the multiple entry points traditionally used to access IBM internet services and support. This portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The My Systems and Premium Search functions make it even easier for Electronic Service Agent tool-enabled customers to track system inventory and find pertinent fixes.

Benefits

Increased uptime: The Electronic Service Agent™ tool is designed to enhance the Warranty or Maintenance Agreement by providing faster hardware error reporting and uploading system information to IBM Support. This can translate to less wasted time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. Its 24x7 monitoring and reporting mean intervention is not required to report errors.

Security: The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM. The Electronic Service Agent tool is designed to securely transmit through either the internet (HTTPS or VPN) or modem to provide customers a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into a customer's system.

For additional information, go to the [IBM Electronic Service Agent](#) website.

More accurate reporting: Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, you are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support: Using the IBMid entered during activation, you can view system and support information in the *My Systems and Premium Search* sections of the [IBM Electronic Support](#) page.

My Systems provides valuable reports of installed hardware and software using information collected from the systems by Electronic Service Agent. Reports are available for any system associated with your IBMid. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Electronic Service Agent information that has been collected from your system, you are able to see search results that apply specifically to your systems.

For more information on how to utilize the power of IBM Electronic Services, contact your IBM Systems Services Representative, or go to the [IBM Electronic Support](#) website.

Prices

For additional information and current prices, contact your local IBM representative or IBM Business Partner.

For additional product information, refer to Software Announcement [217-093](#), dated February 14, 2017.

Variable charges

The applicable processor based one-time charge will be based on the group of the designated machine on which the program is licensed for use. If the program is designated to a processor in a group for which no charge is listed, the charge of the next higher group listed applies. For movement to a machine in a higher group, an upgrade charge equal to the difference in the then-current charges between the two groups will apply. For movement to a machine in a lower group, there will be no adjustment or refund of charges paid.

Order now

To order, contact the IBM Digital Sales Center, your local IBM representative, or your IBM Business Partner. To identify your local IBM representative or IBM Business

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Phone: 800-IBM-CALL (426-2255)

Fax: 800-2IBM-FAX (242-6329)

For IBM representative: askibm@ca.ibm.com

For IBM Business Partner: pwcs@us.ibm.com

IBM Digital Sales Offices 1177 S Belt Line Rd Coppell, TX 75019-4642, US

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Note: Shipments will begin after the planned availability date.

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