The VSE Operating System State of the Union

BY JOHN LAWSON

IBM has made several announcements in recent years that affect which versions of the VSE operating system are still available to customers and which versions are still supported for service. This article reviews these announcements and their implications for the hardware platforms on which customers are still running VSE.

VSE History: A Hardware and Operating System Evolution

What we know today as the VSE operating system began more than 40 years ago. Throughout its history, VSE customers have had to make both hardware and operating system upgrades to take advantage of new technologies.

What follows is a brief review of some of those events which have preceded similar events that occurred this year.

As many of us know, it all began in 1965 when IBM announced revolutionary System/360 (S/360) processors and along with that announcement, an operating system to run on the smaller models of those processors. This new operating system was named Disk Operating System/360 (DOS/360), or as it was more commonly called, DOS (not to be confused with the PC operating system by the same name that came along much later). There are a few of us with gray hair still around who remember installing DOS on 24K and 32K S/360 systems. The DOS supervisor

took 6K and the remaining storage was available for program execution. When compared to today's most current version, z/VSE 4.1, with a supervisor of about 700K and support for up to 8GB of real storage, VSE users can definitely see how much their operating system has evolved and grown to support much larger systems than originally intended.

Each major name change in the VSE operating system was usually related to support of new processors or operating system capability. The announcement of a new version or release of VSE often included discontinuance of support for older technology processors. In 1972, IBM announced System/370 processors and virtual storage. DOS/VS was

announced to support that new processor family and its virtual storage capabilities, and customers experienced their first upgrades of hardware and operating systems to exploit new technologies.

In 1979, IBM announced the 4300 family of processors. DOS/VS was replaced by an "extended" version, DOS/VSE, to support these processors and to provide exploitation of the larger, real memory sizes of these systems with more partitions and virtual storage capabilities. The processor and VSE operating system evolution continued in 1986 with the announcement of the 9370 line of processors and VSE/Systems Package (VSE/SP). In the early '80s, S/370-XA (eXtended Architecture) was announced. This provided 31-bit support capabilities for MVS and VM systems; however, VSE/SP supported only S/370 24-bit (16MB) architecture.

In 1990, VSE/SP became VSE/ESA. This was the first VSE release to support Extended System Architecture/390 (ESA/390) and System/390 processors such as the 9021, 9121, and 9221 processors introduced with the ES/9000 processor family. VSE was extended to support 31-bit real and virtual addressing. VSE/ESA also still supported the ESA/370 mode and 370-mode of the earlier processors that VSE/SP Version 4 supported, except for the System/370 135 and 138 models. This new VSE version allowed customers to move to newer supported levels of the operating system without having to do a processor upgrade.

In 1994, IBM announced CMOS technology with the first generation of the S/390 Parallel Enterprise Server processor family or 9672. Several other generations followed along with the Multiprise 2000 processors for smaller users. Version 2 of VSE/ESA was announced in support of these new systems. The new turbo-dispatcher in this version allowed VSE to support and exploit multi-processors. Support for 370-mode processors was discontinued; thus, VSE/ESA V2 no longer ran on 9370, 4341, 4361, or selected 4381 processor models so customers on these systems had to eventually upgrade to new processors to remain on a supported VSE version.

VSE/ESA Version 2.4 was announced in 1998 and supported ESA/390 mode only. This included support for all the 9672 processors, ESA/390-capable ES9000 models, and the Multiprise 2000 processors, which were succeeded by the Multiprise 3000 the following year. VSE/ESA Version 2.4 dropped support for ESA/370 mode, so ESA/370 mode processors, such as the ES/3090 E/J/S models and ESA/370 mode 4381 models, were no longer supported and customers with those processors had to upgrade to ESA/390-capable systems to stay on current VSE releases.

VSE/ESA also was supported on some new entry-level systems that were introduced during this timeframe to replace smaller 4300 and 9370 systems. These were the PC Server 390 (P/390), R/390, and S/390 Integrated Server, which gave those customers who were still running on the older hardware with unsupported VSE releases an economical solution to upgrade their hardware and VSE software to supported levels. Many of these were later replaced by the FLEX/ES solution from Fundamental Software, Inc. This solution enabled emulation of S/390 architecture on Intel-based servers and provided another economical upgrade solution for smaller VSE customers.

As the 21st century began, and everyone breathed a sigh of relief that the year 2000 started quietly except for the usual fireworks and noise makers, IBM continued the mainframe hardware evolution. IBM eServer zSeries processors and 64-bit (z/Architecture) were announced, starting with the z900 and z800, and were followed by the z990 and z890 a few years later. New releases of VSE/ESA Version 2 also were announced, which exploited some of the functions of the new hardware.

VSE/ESA 2.6 was the last release to support some of the older technology processors, namely, the 9672 G3, G4, R1, R2, and R3 models, the Multiprise 2000 models and the P/390, R/390, and S/390 Integrated Server. VSE/ESA 2.7 dropped support for these and provided support for the new zSeries systems, the Multiprise 3000, the 9672 G5 and G6 processors, and equivalent systems that included the FLEX/ES solution mentioned earlier.

VSE/ESA caught up with the rest of the "z" operating systems from a naming standpoint when it was changed to z/VSE in the z/VSE Version 3.1 preview announcement in April 2004. With its general availability in March 2005, z/VSE 3.1 supported the same processors and new processor functions as VSE/ESA 2.7 and added support for SCSI drives attached to zSeries FCP channels.

IBM's latest mainframe processor technology, System z9, was announced later in 2005. Even though VSE/ESA 2.6 and 2.7 as well as z/VSE 3.1 supported zSeries and z9 processors, they didn't support 64-bit architecture and ran only in 31-bit mode (2GB real and virtual addressing) on these systems. This brings us to 2007 and the announcements and events this year that have changed the state of VSE/ESA and z/VSE.

VSE Today

Three important announcements and one event have occurred this year that will have a significant impact on VSE service support and availability.

First, z/VSE Version 4.1 was announced on Jan. 9, 2007, and became generally available on March 16, 2007. This newest z/VSE version is the first to operate in z/Architecture mode only. z/VSE 4.1 supports 64-bit real addressing with exploitation of up to 8GB of real memory but doesn't provide support for 64-bit virtual addressing. z/VSE 4.1 is supported on zSeries and z9 processors only and doesn't support the older technology processors. Mid-range Workload License Charges (MWLC) were announced for z/VSE 4.1 to provide VSE users the opportunity to reduce their software license charges when running z/VSE 4.1 on z9 processors.

Second, the last of the VSE/ESA releases, Version 2.7, was withdrawn from service on Feb. 28, 2007. This leaves z/VSE 3.1 and z/VSE 4.1 as the only supported VSE operating system versions. All previous VSE/ESA releases already have been withdrawn from service in prior years.

Third, on June 5, 2007, IBM announced plans to withdraw from marketing z/VSE 3.1 effective May 31,

	Withdrawal From Marketing		Withdrawal From Service	
	Announced	Effective	Announced	Effective
z/VSE 3.1	6/05/2007	5/31/2008	8/07/2007	7/31/2009
VSE/ESA 2.7	6/07/2005	9/30/2005	8/02/2005	2/28/2007
VSE/ESA 2.6	2/18/2003	3/14/2003	8/03/2004	3/31/2006
VSE/ESA 2.5		12/14/2001	8/06/2002	12/31/2003
VSE/ESA 2.4		9/29/2000	3/06/2001	6/30/2002
VSE/ESA 2.3	2/29/2000	6/30/2000	3/07/2000	12/31/2001

Figure 1: Withdrawal From Marketing/Service Dates for z/VSE and VSE

2008. While a withdrawal from marketing means only that a specific version or release of that product can no longer be ordered after the effective withdrawal date, what usually follows around that effective withdrawal date is a withdrawal of service announcement.

The last of the announcements, the withdrawal from service for z/VSE 3.1, recently occurred on Aug. 7, 2007. The effective date for this withdrawal from service is July 31, 2009. After this date, z/VSE 4.1 will be the only release supported of those that are currently available today and users would need to migrate to z/VSE 4.1 to be supported. Customers on older unsupported releases could still download PTFs for those releases if they are available, but they wouldn't be able to get defect support on new problems without having a special fee-based extended service contract from IBM in place. The table in Figure 1 summarizes the dates from these and prior announcements for VSE/ESA and z/VSE 3.1.

For VSE customers with zSeries or z9 processors, this isn't an issue, since z/VSE 4.1 supports those systems. For customers running VSE on Multiprise 3000 or 9672 G5 or G6 processors, an upgrade to z/VSE 3.1 would move them to a level that would be supported until July 31, 2009; however, when that version is withdrawn from service, they would need to upgrade to a zSeries or z9 processor first before they could upgrade to z/VSE 4.1. Customers using a FLEX/ES solution would need to do the same upgrades but there may be licensing issues involved in moving to z/VSE 4.1. For more on this issue, see "The State of IBM Mainframe Emulation" by Phil Smith III in the April/May 2007 issue of *z/Journal*.

An upgrade to z9 with z/VSE 4.1 may be the most economical because of the MWLC and sub-capacity software licensing available with MWLC. Even though the hardware costs may be more, they could be offset by the software license cost savings available with MWLC (see "MWLC for z/VSE 4.1: Can It Save You Software Costs?" by John Lawson in the April/May 2007 issue of *z/Journal*).

Upgrading mainframe processors has been part of the process necessary to stay on a current, supported version of VSE and to take advantage of new hardware technologies and new architecture. As the VSE history review shows, there have been several such transitions from S/360 architecture to S/370, from S/370 architecture to ESA/390, and now from ESA/390 to z/Architecture that require both processor and operating system upgrades. As the little DOS system grew to take advantage of the new hardware technologies, z/VSE 4.1 has continued the evolution by exploiting all it can of the z/Architecture technology.

For more on the history of VSE, see the history document on the IBM z/VSE Website at http://ibm.com/zseries/zvse, which, along with my own experiences, helped in the writing of this article. **Z**

About the Author

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