



IBM Spectrum Virtualize Software V7.5.0 introduces HyperSwap

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At a glance

Are your storage requirements growing too fast? Are the costs of managing this growth taking more and more of your IT budget? IBM Spectrum™ Virtualize Software V7.5 can help solve these problems, delivering a more flexible, responsive, and efficient storage environment.

IBM Spectrum Virtualize Software capabilities are offered across a variety of platforms, including SAN Volume Controller, Storwize[®] V7000 (Unified), Storwize V5000, Storwize V3700, and Storwize V3500. IBM Spectrum Virtualize products are designed to deliver the benefits of storage virtualization and advanced storage capabilities, including FlashCopy[®], replication, Real-time Compression™, and Easy Tier[®], in environments from large enterprises to small businesses and midmarket companies.

Overview

IBM Spectrum Virtualize Software V7.5 provides software-defined storage capabilities across a variety of platforms, including SAN Volume Controller, Storwize V7000 (Unified), Storwize V5000, Storwize V3700, and Storwize V3500. These offerings help customers reduce the complexities and cost of managing their storage by:

- Centralizing management of storage volumes to enable administrators to manage storage volumes from a single point
- Improving utilization of storage capacity with virtual volumes to enable businesses to tap into previously unused disk capacity
- Avoiding downtime for backups, maintenance, and upgrades
- Performing data migration without disruption to applications
- Enabling all storage devices to be organized into storage pools from which virtual volumes, whether standard, compressed, or thin-provisioned, are created with the desired characteristics
- Delivering automation of storage management with SmartCloud Virtual Storage Center, Tivoli[®] Storage Productivity Center (as applicable by platform), and Tivoli Storage FlashCopy Manager (as applicable by platform)
- Increasing the performance efficiency of storage pools with Easy Tier
- Restoring data access quickly with near and remote copy capabilities across Fibre Channel, Fibre Channel over Ethernet (FCoE), and IP networks

HyperSwap^(R) capability in IBM Spectrum Virtualize Software V7.5 delivers high availability and disaster recovery in one solution. HyperSwap reuses capital investments in order to achieve a range of recovery and management options which are transparent to host operations.

The ability to increase the number of FlashCopy relationships is supported with Spectrum Virtualize Software V7.5 by an increase in the bitmap space allocated for FlashCopy. Spectrum Virtualize Software V7.5 also now supports direct 16 Gbps Fibre Channel (except for AIX^(R)), MicrosoftTM Offloaded Data Transfer (ODX), VMware vSphere 6, and the underlying infrastructure for VMware Virtual Volumes (VVols).

Key prerequisites

Software requirements

IBM^(R) SAN Volume Controller V7.5 (5641-VC7 and 5641-CP7) has the same software prerequisites as IBM SAN Volume Controller V7.4.

IBM Storwize V7000 V7.5 (5339-CB7, 5639-XB7, 5639-EB7, 5639-VM7, 5639-EV7, 5639-RM7, and 5639-CP7) has the same software prerequisites as IBM Storwize V7000 V7.4.

Spectrum Virtualize Software V7.5 is not available for IBM Flex System^(R) V7000. IBM Flex System V7000 V7.2 (5639-NZ7, 5639-EX7, 5639-RE7, and 5639-CM7) has the same software prerequisites as IBM Flex System V7000 V7.1.

IBM Storwize V5000 V7.5 (5639-CT7, 5639-XT7, and 5639-ET7) has the same software prerequisites as IBM Storwize V5000 V7.4.

For all current storage systems and host environments supported with the IBM FlashSystem^(R) V840, refer to the support website

https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

Refer to the [Description](#) section and the announcements listed in the [Reference information](#) section for more information about these products and their software requirements.

Hardware requirements

IBM Spectrum Virtualize Software for SAN Volume Controller requires at least one pair of IBM System Storage^(R) SAN Volume Controller (2145-DH8) storage engines with integrated battery backup units, or at least one pair of IBM System Storage SAN Volume Controller (2145-CG8, 2145-CF8, 2145-8A4, or 2145-8G4) storage engines with dual uninterruptible power supplies for installation.

IBM Spectrum Virtualize Software for Storwize V7000 requires at least one IBM Storwize V7000 Control Enclosure (2076-524, 2076-112, 2076-124, 2076-312, or 2076-324) for installation.

Spectrum Virtualize Software V7.5 is not available for the IBM Flex System V7000. IBM Storwize Family Software for Flex System V7000 V7.2 requires at least one IBM Flex System V7000 (4939-A49, 4939-H49, or 4939-X49) Control Enclosure for installation.

IBM Spectrum Virtualize Software for Storwize V5000 requires at least one IBM Storwize V5000 control enclosure (2077-12C, 2077-24C, 2078-12C, or 2078-24C) for installation.

IBM FlashSystem V840 Software V7.4 (5639-FS7) requires an IBM FlashSystem V840 Storage System (9846-AC1 and 9846-AE1, or 9848-AC1 and 9848-AE1) for installation.

Current support summaries, including specific software, hardware, and firmware levels supported, are maintained at their respective support websites.

- For SAN Volume Controller
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

For information about IBM Spectrum Virtualize hardware platforms, refer to the announcements listed in the [Reference information](#) section.

Planned availability date

June 5, 2015

Description

IBM Spectrum Virtualize Software delivers a powerful solution for storage efficiency in environments where IBM is the primary storage. When used in combination with SAN Volume Controller, Storwize V7000 (Unified), Storwize V5000, Storwize V3700, and Storwize V3500, IBM Spectrum Virtualize provides the benefits of storage virtualization and advanced storage capabilities, including HyperSwap, vVol support, FlashCopy, replication, Real-time Compression, and Easy Tier.

HyperSwap for IBM Spectrum Virtualize

HyperSwap capability enables each volume to be presented by two I/O groups. The configuration will tolerate combinations of node and site failures, using a flexible choice of host multipathing driver interoperability based on that available for the IBM Spectrum Virtualize family of products already. The use of FlashCopy (no FlashCopy licensing is required for the use of HyperSwap) helps maintain *agolden imaged* during automatic resynchronization. As remote mirroring is used to support the HyperSwap capability, Remote Mirroring licensing is a requirement for using HyperSwap on the IBM Spectrum Virtualize family of products.

While the capabilities of HyperSwap have similarities to the SVC Stretch Cluster, they use different underlying technologies to obtain those similar results, and not all the environment configuration variations available with SVC Stretch Cluster are necessarily available for HyperSwap. Review your environment configuration needs with your IBM sales representative.

HyperSwap is available for use with the SAN Volume Controller, Storwize V7000, and Storwize V5000 hardware platforms.

VVols and vSphere 6.0

Spectrum Virtualize Software V7.5 supports vSphere 6.0 and also has the ability to provide VVols, a function made available in vSphere 6.0. A short explanation of VVols demonstrates the advantage; each virtual machine (VM) keeps different types of data each in a VVol, each of which is presented as a volume (logical unit is SCSI) by the IBM Spectrum Virtualize system. Therefore, each VM owns a small number of volumes. This places responsibility for space management in the Spectrum Virtualize system, enabling the VM to take direct advantage of the software functions in the Spectrum Virtualize system such as FlashCopy.

Refer to IBM Knowledge Center to determine which software functions are made available to VVols. Refer to the [Publications](#) section for more information about and links to the IBM Knowledge Center. The ability to manage VVols is subject to a forthcoming release of Spectrum Control Basic and a subsequent compatible modification level of Spectrum Virtualize Software V7.5 which will provide the appropriate vStorage APIs for Storage Awareness (VASA).

FlashCopy bitmap space increase

Copy Services features and RAID require that small amounts of volume cache be converted from cache memory into bitmap memory to enable the functions to operate. With Spectrum Virtualize Software V7.5, the maximum allocated bitmap space for FlashCopy is increased four times to 2048 MB, enabling customers to configure more FlashCopy instances in a Spectrum Virtualize system.

The increase in FlashCopy bitmap space is available for use with all models of the SAN Volume Controller, Storwize V7000 Generation 2 meaning the 2076-524 (prior models of Storwize V7000 are not compatible), and Storwize V5000 hardware platforms.

Direct 16 Gbps Fibre Channel support (except for AIX)

Spectrum Virtualize Software V7.5 allows you to directly connect host systems with the new 16 Gbps Fibre Channel ports with all host operating systems except AIX.

Microsoft Offloaded Data Transfer (ODX)

Windows™ Offloaded Data Transfer (ODX) is supported with Spectrum Virtualize Software V7.5. This functionality in Windows improves efficiencies by intelligently managing Spectrum Virtualize systems to directly transfer data within or between systems, bypassing the Windows host system.

Revised licensing rules for SVC Real-time Compression Software (5641-CP7)

Rather than using the volume size as the measure for determining how many terabytes of SVC Real-time Compression 5641-CP7 to license as previously announced, effective immediately for all licensed SVC Real-time Compression users, the measured terabyte capacity now applies to the actual managed disk capacity consumed by the compressed volumes.

For example, if you wish to store 500 TB of data where 300 TB of that data cannot be compressed (so it is not configured on compressed volumes), but 200 TB of that data can be compressed and is configured on compressed volumes; rather than needing to license 200 TB of Real-time Compression, the compression ratio (which can be obtained in advance using the Comprestimator tool, or can be later shown in the system as the actual amount of managed disk space consumed by those compressed volumes) can be applied to find out how much storage that 200 TB of volumes actually consumes. If, for example, the compression ratio is 3:1 for that 200 TB of data, meaning that only 1 TB of managed storage is consumed for every 3 TB of data, then the user would license only 1/3 of the 200 TB, or 67 TB of the 5641-CP7 license. The 5641-CP7 license continues to not be licensed to a specific SVC hardware device, but is licensed to the customer within a country, in the same way that SVC standard (5639-VC7) software is licensed today.

IBM Spectrum Storage™

IBM Spectrum Storage family naming, as introduced earlier in 2015 through IBM press releases, is replacing IBM Storwize Family naming. The Storwize Family Software naming previously used is being replaced with Spectrum Virtualize Software.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Product positioning

Customers today face a challenging business environment. There is a need to store more information to make their business more competitive and for IT to be responsive and support initiatives, all while controlling IT costs and limiting the amount of staff required to support IT.

IBM Spectrum Virtualize systems provide management of storage from entry and midrange up to enterprise disk systems, and enable hosts to attach through SAN, FCoE, or iSCSI to existing Ethernet networks. IBM Spectrum Virtualize is designed to be easy to use, enabling existing staff to start working with it rapidly. IBM Spectrum Virtualize uses virtualization, thin provisioning, and compression technologies to improve storage utilization and meet changing needs quickly and easily. In this way, Spectrum Virtualize products are the ideal complement to server virtualization strategies.

IBM Spectrum Virtualize also enables migration of data from existing storage systems to new ones, simplifying implementation and minimizing disruption. These are offerings for customers with existing SAN or FCoE networks who seek to reduce the complexities and costs of managing their storage.

IBM Spectrum Virtualize is a cross-industry offering for customers who are mainly focused on cost savings while dealing with complexity and increasing storage requirements. These customers also focus on scaling capability with reasonable costs, including disaster recovery functions (Remote Mirroring, FlashCopy, Stretched clusters) and performance features (SSD and Easy Tier).

Reference information

For more information about Storwize Family Software V7.4, refer to Software Announcement [AP14-0451](#), dated October 28, 2014.

For more information about IBM 2145-DH8 SAN Volume Controller Storage Engine, refer to Hardware Announcement [AG14-0084](#), dated May 6, 2014.

For more information about IBM Storwize V7000 2076-524, refer to Hardware Announcement [AG14-0051](#), dated May 6, 2014.

For more information about IBM FlashSystem V840, refer to Software Announcement [AP14-0430](#), dated October 28, 2014.

Availability of national languages

Planned and supported geography translations will be available for web download by June 5, 2015, at the following websites:

- For SAN Volume Controller
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

Program number

Program number	VRM	Program name
5641-VC7	7.5.0	IBM Spectrum Virtualize Software for SAN Volume Controller V7
5725-M19	7.5.0	IBM Spectrum Virtualize Software for SAN Volume Controller V7 (for Passport Advantage ^(R))
5641-CP7	7.5.0	IBM Spectrum Virtualize Software for SAN Volume Controller Real-time Compression Software V7
5725-H04	7.5.0	IBM Spectrum Virtualize Software for SAN Volume Controller Real-time Compression Software V7 (for Passport Advantage)
5639-VM7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000
5639-EV7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 External Virtualization Software
5639-RM7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 Remote Mirroring Software
5639-CP7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 Real-time Compression Software
5639-CB7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 Controller Software
5639-XB7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 Expansion Software
5639-EB7	7.5.0	IBM Spectrum Virtualize Software for Storwize V7000 External Data Virtualization Software

Program number	VRM	Program name
5639-CT7	7.5.0	IBM Spectrum Virtualize Software for Storwize V5000 Controller Software
5639-XT7	7.5.0	IBM Spectrum Virtualize Software for Storwize V5000 Expansion Software
5639-ET7	7.5.0	IBM Spectrum Virtualize Software for Storwize V5000 External Data Virtualization Software
5639-FS7	7.5.0	IBM FlashSystem Software V7
5639-FC7	7.5.0	IBM FlashSystem Real-time Compression Software V7
5639-FR7	7.5.0	IBM FlashSystem Remote Mirroring Software V7
5639-FV7	7.5.0	IBM FlashSystem External Virtualization Software V7

Product identification number

IBM Spectrum Virtualize Software for SAN Volume Controller V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5641-VC7	5641-VCA reg	5641-VCC reg
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5641-VCB reg	5641-VCD reg	5641-VCE reg

IBM Spectrum Virtualize Software for SAN Volume Controller Real-time Compression Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5641-CP7	5641-CS1 reg	5641-CS3 reg
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5641-CS2 reg	5641-CS4 reg	5641-CS5 reg

IBM Spectrum Virtualize Software for Storwize V7000 V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-VM7	5639-SM1 reg/ren	5639-SM3 reg
	5639-SM2 afl	5639-SM4 renewal
		5639-SM5 afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-SM6 reg	5639-SM7 reg	5639-SM8 reg

IBM Spectrum Virtualize Software for Storwize V7000 External Virtualization Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-EV7	5639-EVA reg/ren	5639-EVD reg
	5639-EVB afl	5639-EVE renewal
		5639-EVF afl

Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-EVC reg	5639-EVG reg	5639-EVH reg

IBM Spectrum Virtualize Software for Storwize V7000 Remote Mirroring Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-RM7	5639-RMA reg/ren	5639-RMD reg
	5639-RMB afl	5639-RME ren
		5639-RMF afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-RMC reg	5639-RMG reg	5639-RMH reg

IBM Spectrum Virtualize Software for Storwize V7000 Real-time Compression Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-CP7	5639-CS1 reg/ren	5639-CS3 reg
	5639-CS2 afl	5639-CS4 renewal
		5639-CS5 afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-CS6 reg	5639-CS7 reg	5639-CS8 reg

IBM Spectrum Virtualize Software for Storwize V7000 Controller Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-CB7	5639-CBA reg/ren	5639-CBC reg
	5639-CBB afl	5639-CBD renewal
		5639-CBE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-CBF reg	5639-CBG reg	5639-CBH reg

IBM Spectrum Virtualize Software for Storwize V7000 Expansion Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-XB7	5639-XBA reg/ren	5639-XBC reg
	5639-XBB afl	5639-XBD renewal
		5639-XBE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-XBF reg	5639-XBG reg	5639-XBH reg

IBM Spectrum Virtualize Software for Storwize V7000 External Data Virtualization Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-EB7	5639-EBA reg/ren	5639-EBC reg
	5639-EBB afl	5639-EBD renewal
		5639-EBE afl

Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-EBF reg	5639-EBG reg	5639-EBH reg

IBM Spectrum Virtualize Software for Storwize V5000 Controller Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-CT7	5639-CTA reg/ren	5639-CTC reg
	5639-CTB afl	5639-CTD renewal
		5639-CTE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-CTF reg	5639-CTG reg	5639-CTH reg

IBM Spectrum Virtualize Software for Storwize V5000 Expansion Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-XT7	5639-XTA reg/ren	5639-XTC reg
	5639-XTB afl	5639-XTD renewal
		5639-XTE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-XTF reg	5639-XTG reg	5639-XTH reg

IBM Spectrum Virtualize Software for Storwize V5000 External Data Virtualization Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-ET7	5639-ETA reg/ren	5639-ETC reg
	5639-ETB afl	5639-ETD renewal
		5639-ETE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-ETF reg	5639-ETG reg	5639-ETH reg

IBM FlashSystem Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-FS7	5639-FSA reg/ren	5639-FSC reg
	5639-FSB afl	5639-FSD renewal
		5639-FSE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-FSF reg	5639-FSG reg	5639-FSH reg

IBM FlashSystem Real-Time Compression Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-FC7	5639-FCA reg/ren	5639-FCC reg
	5639-FCB afl	5639-FCD renewal
		5639-FCE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-FCF reg	5639-FCG reg	5639-FCH reg

IBM FlashSystem Remote Mirroring Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-FR7	5639-FRA reg/ren 5639-FRB afl	5639-FRC reg 5639-FRD renewal 5639-FRE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-FRF reg	5639-FRG reg	5639-FRH reg

IBM FlashSystem External Virtualization Software V7

Program PID number	Maintenance 1 year PID number	Maintenance 3 year PID number
5639-FV7	5639-FVA reg/ren 5639-FVB afl	5639-FVC reg 5639-FVD renewal 5639-FVE afl
Maintenance 2 year PID number	Maintenance 4 year PID number	Maintenance 5 year PID number
5639-FVF reg	5639-FVG reg	5639-FVH reg

Education support

Web lecture courses are available to IBM and Business Partners.

Storage Technical Online Education courses on the IBM Spectrum Virtualize Software products are available to IBM and Business Partners on the IBM Systems College (formerly STG SMART Zone) site

- IBM
<http://lt.be.ibm.com/smartzone/storagetech>
- Business Partners
<http://www.ibm.com/services/weblectures/dlv/smartzone/storagetech>

Classroom courses are available to IBM, Business Partners, and customers.

Hands-on courses are available worldwide to all audiences for SVC:

Course number	Course title
SNV1G	SAN Volume Controller (SVC) Planning and implementation workshop

For more information and course schedules, visit the IBM training website

http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp_search

Search on the course number **SNV1G**.

SNV1Gfor IBM

[SNV1G](#)

SNV1Gfor Business Partners (worldwide)

http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=course_description&courseCode=SNV1G

More information is available at

<http://www.ibm.com/services/learning/>

or

<http://www.ibm.com/training>

IBM Global Services, IT Education Services, supports many IBM offerings.

For descriptions of courses for IT professionals and managers, visit

<http://www.ibm.com/services/learning/training.html>

Contact your IBM representative for course information.

Offering Information

Product information is available via the Offering Information website

<http://www.ibm.com/common/ssi>

Also, visit the Passport Advantage^(R) website

<http://www.ibm.com/software/passportadvantage>

Publications

No publications are shipped with these programs.

The following publications can be downloaded in PDF format from the websites that follow this list:

Title	Order number
IBM Spectrum Virtualize Software for SAN Volume Controller Read First Flyer	GA32-0843
IBM SAN Volume Controller Model 2145-DH8 Hardware Installation Guide	GC27-3923
IBM SAN Volume Controller Hardware Maintenance Guide	GC27-2283
IBM SAN Volume Controller Troubleshooting Guide	GC27-2284
IBM SAN Volume Controller Software Installation and Configuration Guide	GC27-2286
IBM SAN Volume Controller and Storwize V7000 Command-Line Interface User's Guide	GC27-2287
IBM SAN Volume Controller CIM Agent Developer's Guide	SG27-2288
IBM SAN Volume Controller Safety Notices	GA32-0844
IBM Multipath Subsystem Device Driver User's Guide	GC52-1309
IBM Storwize V7000 CIM Agent Developer's Guide	GC27-2292-02
IBM Storwize V7000 Read First	GC27-2293-01
IBM Storwize V7000 Quick Installation Guide	GC27-2290-02
IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide	GC27-2291-02
IBM Storwize V7000 Safety Notices	GC27-3924-00
IBM Storwize V5000 Quick Installation Guide	GI13-2861-00

Title	Order number
IBM Storwize V5000 Installation Poster	SC27-5923-00
IBM Storwize V5000 Read First Flyer	GI13-2860-00
IBM Systems Safety Notices	G229-9054-06

To view online information and link to a download site, visit IBM Knowledge Center, then see the Publications listed under the 7.5.0 release.

- For SAN Volume Controller
<http://www-01.ibm.com/support/knowledgecenter/STPVGU/welcome>
- For IBM Storwize V7000
<http://www-01.ibm.com/support/knowledgecenter/ST3FR7/welcome>
- For IBM Storwize V5000
<http://www-01.ibm.com/support/knowledgecenter/STHGJ/welcome>
- For IBM Storwize V3700
<http://www-01.ibm.com/support/knowledgecenter/STLM5A/welcome>
- For IBM Storwize V3500
<http://www-01.ibm.com/support/knowledgecenter/STLM6B/welcome>
- For IBM FlashSystem V840
http://www-01.ibm.com/support/knowledgecenter/ST2HTZ/landing/Flashsystem_V840.htm
- To order additional selected hardcopy publications for a fee or to download free PDF format publications, visit the IBM Publications Center website
<http://www.ibm.com/shop/publications/order>

To directly download publications in PDF format, visit the IBM product support website.

- For SAN Volume Controller
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521
- Contact your IBM representative.

The IBM Publications Center

Hardcopies of selected publications are available for a fee from the IBM Publications Center, as well as free softcopy publications. The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, and they can all be downloaded.

Technical information

Specified operating environment

Hardware requirements

IBM Spectrum Virtualize Software for SAN Volume Controller (SVC) requires at least one pair of IBM System Storage SAN Volume Controller 2145-DH8, 2145-CG8, 2145-CF8, 2145-8A4, or 2145-8G4 storage engines with dual uninterruptible power supplies.

As with SVC V5 and later, IBM Spectrum Virtualize Software for SVC V7 software cannot be loaded or run on SVC hardware engine model 2145-4F2.

IBM Spectrum Virtualize Software for Storwize V7000 requires at least one IBM Storwize V7000 Control Enclosure (2076-524, 2076-112, 2076-124, 2076-312, or 2076-324) for installation.

IBM Spectrum Virtualize Software for Storwize V5000 requires at least one IBM Storwize V5000 control enclosure (2077-12C, 2077-24C, 2078-12C, or 2078-24C) for installation.

IBM FlashSystem V840 Software V7.5 (5639-FS7) requires an IBM FlashSystem V840 Storage System (9846-AC1 and 9846-AE1, or 9848-AC1 and 9848-AE1) for installation.

Current support summaries, including specific software, hardware, and firmware levels supported, are maintained at the respective support website.

- For SVC
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

For information about the Spectrum Virtualize of products hardware platforms, refer to the announcements listed in the [Reference information](#) section.

Software requirements

Installation of IBM Spectrum Virtualize Software V7.5 can be done directly from systems running Storwize Family Software V7.1.

For current hardware and software interoperability dependencies, and other product environment and configuration information, refer to the respective support website.

- For SVC
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000

- <http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

IBM includes one year of software maintenance with each program license acquired. The initial period of software maintenance can be extended by the purchase of a renewal option when ordered through Passport Advantage or Passport Advantage Express^(R).

Note: Only IBM Spectrum Virtualize Software for SVC can be ordered through Passport Advantage.

When ordering using the program number with feature codes, software maintenance can be extended by selecting the applicable two-, three-, four-, or five-year software maintenance registration program number and features.

There are no software licenses required or available for the IBM Storwize V3500 and IBM Storwize V3700.

For the IBM Spectrum Virtualize Software for SVC software only, all Software Maintenance renewals will be managed and invoiced through Passport Advantage.

Refer to the [Description](#) section for new storage system and host environment support added by this release. For all current storage systems and host environments supported, refer to the respective support website.

- For SVC
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

Compatibility

For further information regarding currently supported environments and operating guidelines, visit the respective support website.

- For SVC
<http://www.ibm.com/storage/support/2145>

- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem V840
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

Limitations

This program only operates on specified storage hardware as detailed in the [Hardware requirements](#) section.

For hardware-associated limitations, refer to the announcements listed in the [Reference information](#) section.

For additional information, refer to [Usage restriction](#) section in the [Terms and conditions](#) section of this announcement, and to the License Information document that is available on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Additional information on configuration limitations and configuration guidelines is further documented in the README file accompanying the Spectrum Virtualize Software or in furnished publications for this product available at the support website.

- For SVC
<http://www.ibm.com/storage/support/2145>
- For Storwize V7000
<http://www.ibm.com/storage/support/storwize/v7000>
- For Storwize V5000
<http://www.ibm.com/storage/support/storwize/v5000>
- For Storwize V3700
<http://www.ibm.com/storage/support/storwize/v3700>
- For Storwize V3500
<http://www.ibm.com/storage/support/storwize/v3500>
- For IBM FlashSystem
https://www-947.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_high_availability_systems/ibm_flashsystem_v840?productContext=863560521

Encryption and other functions in this announcement may be subject to limitations and restrictions for supported configurations, environments, and use. Refer to the *V7.5 Configuration Limits and Restrictions* document for details.

To view this document, access the IBM Systems Support site at

<http://www.ibm.com/support>

Select the applicable product (such as Storwize V7000) in the **Product Finder** menu.

Enter "7.5 Configuration Limits and Restrictions" in the Search Support field and check the "Search only" box.

Planning information

Customer responsibilities

Planning for, and provision of, the power and environmental support of the required IBM Spectrum Virtualize product, including its storage engines, is a customer responsibility.

Refer to the announcements listed in the [Reference information](#) section.

Planning considerations for IBM Spectrum Virtualize Software are listed in the respective product's IBM Knowledge Center, which is available at

- For SAN Volume Controller
<http://www-01.ibm.com/support/knowledgecenter/STPVGU/welcome>
- For IBM Storwize V7000
<http://www-01.ibm.com/support/knowledgecenter/ST3FR7/welcome>
- For IBM Storwize V5000
<http://www-01.ibm.com/support/knowledgecenter/STHGJ/welcome>
- For IBM Storwize V3700
<http://www-01.ibm.com/support/knowledgecenter/STLM5A/welcome>
- For IBM Storwize V3500
<http://www-01.ibm.com/support/knowledgecenter/STLM6B/welcome>
- For IBM FlashSystem V840
http://www-01.ibm.com/support/knowledgecenter/ST2HTZ/landing/Flashsystem_V840.htm

Customers with a 5641-VC7 or 5641-CP7 license are responsible to combine the total terabytes managed for each function from individual SVC License Manager (cluster) reports to ensure they are within the enterprise license entitlement (within that country) for each function.

Customers with enclosure licenses for optional functions, such as Easy Tier and FlashCopy, are responsible to combine the total number of enclosures managed for each function to ensure they are within the enterprise license entitlement (within that country) for each function.

Installability

Refer to the [Software requirements](#) section for complete information.

Packaging

New order packaging

License information documents for IBM Spectrum Virtualize Software programs ship with the hardware on which these programs are preloaded.

The IBM Agreement for Acquisition of Support and Addendum for Support, Z125-6011, is shipped with each new Spectrum Virtualize Software order.

SVC

IBM Spectrum Virtualize Software for SVC V7 (5641-VC7 and 5641-CP7) is preinstalled on, and shipped with, the required IBM 2145 SVC Storage Engines.

After receipt of an order for IBM Spectrum Virtualize Software for SVC 5641-VC7, the Business Partner or customer will be required to register and accept Passport Advantage or Passport Express terms and conditions. Upon registration, the

customer will be authorized for the electronic download of software code updates. The product includes the license and one year of support, with up to four additional years available for purchase with the product.

In addition to the IBM Agreement for Acquisition of Software Maintenance, the following are shipped with each new IBM System Storage SVC order:

- License Information for IBM System Storage SAN Volume Controller V7.5, GI13-2841
- IBM System Storage SAN Volume Controller Read First file, GA32-0843
- License Information for IBM System Storage SAN Volume Controller Storage Replication Adapter for VMware SRM, GA76-0431

Storwize V7000

IBM Spectrum Virtualize Software for Storwize V7000 V7, (5639-VM7, 5639-EV7, 5639-RM7, and 5639-CP7) is preinstalled on, and shipped with, the required IBM 2076 Storwize V7000 Disk Systems.

In addition to the IBM Agreement for Acquisition of Software Maintenance, the License Information for IBM System Storage SVC and IBM Storwize V7000 Version 7, GI13-2841, is shipped with each new IBM Storwize V7000 Controller order.

Storwize V5000

IBM Spectrum Virtualize Software for Storwize V5000 (5639-ST7) is preinstalled on, and shipped with, the required IBM 2077 or 2078 IBM Storwize V5000 Disk Systems.

The paid invoice acts as Proof of Entitlement (PoE) for all orders of IBM Spectrum Virtualize Software V7. All associated media listed in the [Publications](#) section are also shipped with the new hardware order. One media set per IBM Spectrum Virtualize system will be shipped. Refer to the hardware announcements listed in the [Reference information](#) section for correlated hardware order features.

Subsequent media orders

For additional available publications, refer to the [Publications](#) section.

For assistance in placing orders with or without media features, contact your IBM representative.

Publications are in English.

This program, when downloaded from a website, contains the applicable IBM license agreement and License Information, if appropriate, and will be presented for acceptance at the time of installation of the program. For future reference, the license and License Information will be stored in a directory such as LICENSE.TXT.

Security, auditability, and control

IBM Spectrum Virtualize Software can use an existing LDAP for authentication (for example, interfacing with Microsoft Active Directory).

Use of supplementary antivirus software is recommended, but not required.

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 handling

The IBM Spectrum Virtualize Software for SAN Volume Controller products identified in this announcement (5641-VC7 and 5641-CP7) will be ordered through existing channels using existing configurator and ordering tools. However, the fulfillment processes have been modified to improve customer records management associated with Software Subscription and Support, often referred to as Software Maintenance. Software Subscription and Support will be entitled through Passport Advantage or Passport Advantage Express.

The products 5641-VC7 and 5641-CP7, when selected during the configuration process with each hardware system, will be enabled for the system unit for which the product was ordered. Optionally, software and license only configurations can be created for 5641-VC7 and 5641-CP7 based on existing supported hardware system units in the customer business environment. Offerings in this announcement are available exclusively through electronic download.

Passport Advantage customer: Media pack entitlement details

A Passport Advantage media pack will not be generated. Read first information, will be available with downloaded code updates from Passport Advantage.

Media pack information can be found on the Passport Advantage website

<http://www.ibm.com/software/passportadvantage>

Passport Advantage (PPA) allows greater flexibility to help customers manage their software licenses and Subscription and Support renewals. Customers can now have a common anniversary date for Subscription and Support renewals for all IBM software, under a PPA agreement, including IBM Storage software. The anniversary date, established at the order ship date for the initial product acquisition, will remain unchanged while their Passport Advantage or Passport Advantage Express agreement remains in effect.

To order a basic license, specify the program number and the one-time charge feature number in the quantity desired (maximum quantity of 250).

The program is available via electronic download only.

Charge metric

Program name	Part number or PID number	Charge metric
IBM Spectrum Virtualize Software for SAN Volume Controller V7	5641-VC7	Per terabyte increments
IBM Spectrum Virtualize Software for SAN Volume Controller V7 (for Passport Advantage)	5725-M19	Per terabyte increments
IBM Spectrum Virtualize Software for SAN Volume Controller Real-time Compression Software V7	5641-CP7	Per terabyte increments
IBM Spectrum Virtualize Software for SAN Volume Controller Real-time Compression Software V7 (for Passport Advantage)	5725-H04	Per terabyte increments

Program name	Part number or PID number	Charge metric
IBM Spectrum Virtualize Software for Storwize V7000 V7	5639-VM7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 External Virtualization software V7	5639-EV7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 Remote Mirroring software V7	5639-RM7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 Real-time Compression software V7	5639-CP7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 Controller software V7	5639-CB7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 Expansion software V7	5639-XB7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V7000 External data virtualization software V7	5639-EB7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V5000 Controller software V7	5639-CT7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V5000 Expansion software V7	5639-XT7	Per Storage Device
IBM Spectrum Virtualize Software for Storwize V5000 External data virtualization software V7	5639-ET7	Per Storage Device
IBM FlashSystem™ V840 Software V7.5	5639-FS7	Per Storage Device
IBM FlashSystem V840 Real-time Compression Software V7.5	5639-FC7	Per Storage Device
IBM FlashSystem V840 Remote Mirroring Software V7.5	5639-FR7	Per Storage Device
IBM FlashSystem V840 External Virtualization Software V7.5	5639-FV7	Per Storage Device

New orders for Spectrum Virtualize Software

For Spectrum Virtualize Software V7 program number orders, first order the appropriate hardware for the initial system or cluster, then order the Spectrum Virtualize Software license.

Note: Real-time Compression, External Virtualization, Remote Mirroring software product identifiers are optional, and are ordered along with or where there is already a complete Spectrum Virtualize system, like the SAN Volume Controller 2145 or the Storwize V7000 2076 hardware, in place with the appropriate required Spectrum Virtualize software license for that system.

New orders for IBM FlashSystem V840 Software V7.5 for FlashSystem V840

For new IBM FlashSystem V840 Software V7.5 orders, first order the appropriate hardware for the initial system or cluster, then order the IBM FlashSystem V840 Software V7.5 license.

Note: Real-time Compression, External Virtualization, and Remote Mirroring, software product identifiers are optional. They can be ordered at the same time as the IBM FlashSystem V840 Software V7.5 and the corresponding FlashSystem V840 hardware, or they can be ordered after the initial purchase, assuming the system is appropriately configured and licensed.

License metric definition

For SVC:

Terabyte (T/TB)

1 TB of managed storage = 2 to the power of 40 bytes = 1,099,511,627,776 bytes, trillion bytes.

For Storwize V7000, Storwize V5000, and FlashSystem V840.

Storage Device

Storage Device is a unit of measure by which the Program can be licensed. A Storage Device is an independently powered, channel-attached device that stores or controls the storage of data on magnetic disks or solid state drives, such as disk controllers and their respective expansion units, each constituting separate Storage Devices. Licensee must obtain entitlements for every Storage Device which runs, uses services provided by, or otherwise accesses the Program and for every Storage Device on which the Program is installed. Instead of the entitlements required for the Program directly, Licensee must obtain entitlements for this Program sufficient to cover the Storage Devices managed by the Program.

A storage device is equivalent to an enclosure, the term used most often when describing the Spectrum Virtualize Software product licensing and usage.

Customers requesting ESD

Downloading from the electronic software delivery website requires an active Software Maintenance Agreement for each product to be downloaded and registration with the ESS website.

Visit

<http://www.ibm.com/servers/eserver/ess>

Website registration requires:

- A valid customer number
- A software order number associated with the customer number

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

Licensing

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use. Part number products only, offered outside of Passport Advantage, where applicable, are license only and do not include Software Maintenance.

This software license includes Software Subscription and Support (also referred to as Software Maintenance).

Agreement for Acquisition of Software Maintenance

The IBM Agreement for Acquisition of Software Maintenance (Z125-6011) applies for Subscription and Support (also referred to as Software Maintenance) and does not require customer signatures.

These programs are licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. IBM includes one year of Software Subscription and Support (also referred to as Software Maintenance) with the initial license acquisition of each program acquired. The initial period of Software Subscription and Support (also referred to as Software Maintenance) can be extended by the purchase of a renewal option, if available.

The customer is responsible for ensuring they renew their SWMA coverage for all licensed features and capacities before expiration. Restarting SWMA after expiration will incur a higher charge for that renewal.

These programs have a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect.

License Information number

GI13-2841 License Information for:

- 5641-VC7 - IBM Spectrum Virtualize SAN Volume Controller Software V7.5
- 5641-CP7 - IBM Spectrum Virtualize SAN Volume Controller Compression Software V7.5
- 5639-VM7 - IBM Spectrum Virtualize V7000 Software V7.5
- 5639-EV7 - IBM Spectrum Virtualize V7000 External Virtualization Software V7.5
- 5639-RM7 - IBM Spectrum Virtualize V7000 Remote Mirroring Software V7.5
- 5639-CP7 - IBM Spectrum Virtualize V7000 Compression Software V7.5
- 5639-ST7 - IBM Spectrum Virtualize V5000 Software V7.5
- 5639-CB7 - IBM Spectrum Virtualize V7000 Controller Software V7.5
- 5639-XB7 - IBM Spectrum Virtualize V7000 Expansion Software V7.5
- 5639-EB7 - IBM Spectrum Virtualize V7000 External Data Virtualization Software V7.5

SC27-6420 License Information for:

- 5639-FS7 - IBM FlashSystem V840 Software V7
- 5639-FV7 - IBM FlashSystem V840 External Virtualization Software V7
- 5639-FR7 - IBM FlashSystem V840 Remote Mirroring Software V7
- 5639-FC7 - IBM FlashSystem V840 Real-time Compression Software V7

On or near the planned availability date, the current License Information documents will be available for review on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Limited warranty applies

Yes

Limited warranty

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge. For further information, consult the IBM Software Support Handbook found at

<http://www.ibm.com/support/handbook>

IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

Money-back guarantee

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.

For clarification, note that (1) for programs acquired under the IBM International Passport Advantage offering, this term applies only to your first acquisition of the program and (2) for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

Yes. Contact your IBM representative.

Passport Advantage applies

Yes, and through the Passport Advantage website at

<http://www.ibm.com/software/passportadvantage>

Usage restriction

Yes

SVC standard software (5641-VC7)

This program (5641-VC7) is licensed on a per-terabyte (with cumulative tiers) capacity basis. (Refer to the [Ordering information](#) section for information on charges for this program.) Users may only install this program on IBM System Storage SAN Volume Controller 2145-DH8, 2145-CG8, 2145-CF8, 2145-8G4, or 2145-8A4 Storage Engines, or subsequent IBM replacements of these.

IBM SAN Volume Controller standard software and its associated features are licensed to the customer (enterprise). Note that a customer who has physical sites in multiple countries may consolidate their licenses only within each country. Check with your sales representative and review all necessary conditions prior to licensing.

A customer's right to use the IBM FlashCopy for SAN Volume Controller and Metro/Global Mirror for SAN Volume Controller features of this program is also limited to the amount of authorizations obtained from IBM. The authorizations for FlashCopy and for Metro/Global Mirror cannot exceed the total capacity authorization for the amount of managed storage on all clusters. Use of FlashCopy features requires license authorizations for only the FlashCopy sources, not the targets.

Use of Metro/Global Mirror features requires license authorizations for both the Metro/Global Mirror source and target capacities in use.

This program is only supported for use with host servers, storage subsystems, and SAN configurations identified by IBM as being supported for attachment to the IBM System Storage SAN Volume Controller. This program is provided together with code provided under separate license agreements, including, but not limited to, open source license agreements.

Storwize V7000

The following Program Unique Terms apply. This program is licensed for use with the IBM Storwize V7000 system with which the program was delivered, and only to manage the capacity specified in the proof of entitlement document for that license. A separate license is required for each IBM Storwize V7000 storage enclosure. The following paragraph titled "Disabling device" applies to the use of the IBM Storwize V7000 Software components. The term "Program" in these paragraphs shall mean the IBM Storwize V7000 Software components.

Disabling device: The Program may include a disabling device that will prevent certain features from being used. You will not tamper with such disabling device or otherwise change the Program.

Transferability: The Program 5639-VM7, 5639-CB7, or 5639-XB7 are nontransferable between IBM Storwize V7000 systems and are only to be used on the IBM Storwize V7000 system for which it was purchased. If the system is transferred to a new owner, the program license transfers with the system. However, Software Maintenance does not transfer, and a new maintenance agreement must be purchased by the new owner.

For additional information, refer to the License Information document that is available on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/slabd.nsf>

Storwize V5000

The following Program Unique Terms apply. This program is licensed for use with the IBM Storwize V5000 with which the program was delivered and only to manage the capacity specified in the proof of entitlement document for that license. A separate license is required for each IBM Storwize V5000 storage enclosure. The following paragraph titled "Disabling device" applies to the use of the IBM Storwize V5000 Software components. The term "Program" in these paragraphs shall mean the IBM Storwize V5000 Software components.

Disabling device: The Program may include a disabling device that will prevent certain features from being used. You will not tamper with such disabling device or otherwise change the Program.

Transferability: The Programs 5639-ST7, 5639-CT7, or 5639-XT7 are nontransferable between IBM Storwize V5000 systems and are only to be used on the IBM Storwize V5000 system for which it was purchased. If the system is transferred to a new owner, the program license transfers with the system. However,

Software Maintenance does not transfer, and a new maintenance agreement must be purchased by the new owner.

For additional information, refer to the License Information document that is available on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Software Subscription and Support applies

Yes. Software Subscription and Support (also referred to as Software Maintenance), is now included in the Passport Advantage Agreement. Installation and technical support for the products announced in this announcement is provided by the Software Subscription and Support offering of the IBM International Passport Advantage Agreement. This fee service enhances customer productivity by providing voice or electronic access into the IBM support organizations.

IBM includes one year of Software Subscription and Support with the initial license acquisition of each program acquired. The initial period of Software Subscription and Support can be extended by the purchase of a renewal option.

While your Software Subscription and Support is in effect, IBM provides you assistance for your routine, short duration installation and usage (how-to) questions, and code-related questions. IBM provides assistance via telephone and, if available, electronic access, only to your information systems (IS) technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, consult your IBM Software Support Handbook at

<http://www.ibm.com/support/handbook>

Software Subscription and Support does not include assistance for the design and development of applications, your use of programs in other than their specified operating environment, or failures caused by products for which IBM is not responsible under this agreement.

For additional information about the Passport Advantage Agreement, visit the Passport Advantage website at

<http://www.ibm.com/software/passportadvantage>

All distributed software licenses include Software Subscription and Support for a period of 12 months from the date of acquisition, providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage, for a total of three years from date of acquisition, may be elected.

Variable charges apply

No

Educational allowance available

15% to qualified educational institution customers.

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 comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective. IBM does not warrant that systems and products are immune from the malicious or illegal conduct of any party.

Prices

SVC Passport Advantage

For Passport Advantage information and charges, contact your IBM representative or authorized IBM Business Partner.

Additional information is also available on the following Passport Advantage website

<http://www.ibm.com/software/howtobuy/passportadvantage>

Passport Advantage

For Passport Advantage information and charges, contact your IBM representative or authorized IBM Business Partner for Software Value Plus. Additional information is also available at

<http://www.ibm.com/software/passportadvantage>

For all local charges, contact your IBM representative.

IBM Global Financing

IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition, including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or visit

<http://www.ibm.com/financing>

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type, equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

Financing from IBM Global Financing helps you preserve cash and credit lines, enables more technology acquisition within current budget limits, permits accelerated implementation of economically attractive new technologies, offers payment and term flexibility, and can help match project costs to projected benefits. Financing is available worldwide for credit-qualified customers.

For more financing information, visit

<http://www.ibm.com/financing>

AP distribution

Country/Region	Announced
AP IOT	
ASEAN *	Yes
India/South Asia **	Yes

Country/Region	Announced
Australia	Yes
Hong Kong	Yes
Macao	Yes
New Zealand	Yes
People's Republic of China	Yes
South Korea	Yes
Taiwan	Yes
Japan IOT	
Japan	Yes

* Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Singapore, Thailand, Timor-Leste, and Vietnam

** Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka

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