



IBM GPFS V3.5 offers improved file and data management support (PPA)

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At a glance

IBM® GPFS™ V3.5 offers improved file and data management support.

- Offers standard file system interfaces on UNIX™ and Microsoft™ Windows™ operating systems
- Allows concurrent reads and writes from multiple nodes
- Provides high-bandwidth data availability
- Supports failover and disaster recovery to minimize single points of failure
- Offers scalable information lifecycle management to allow flexible support of different disk classes through policy-driven automation and tiered storage management
- Provides multicluster support and use of multiple networks

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

Overview

The IBM General Parallel File System (GPFS) is a cluster file system designed for high-performance, parallel file access and management. GPFS delivers proven reliability, multicluster support, scalability and performance with automated failure recovery, and decentralized data management for simplifying administration. GPFS provides several essential services to allow you to effectively manage growing quantities of structured and unstructured data.

The new features in GPFS V3.5 allow you to manage very large amounts of unstructured file data better than ever before. With improved small file performance, finer granularity namespace management, increased performance for some administration tasks, and an innovative approach to expanding the global namespace, managing large volumes becomes tractable. New features include:

- **Active File Management.** For Linux™ nodes, GPFS introduces a scalable, high-performance remote file data caching solution integrated with the GPFS cluster file system. It leverages the inherent scalability of GPFS to provide a scalable, multi-node, consistent cache of data exported by a remote file system cluster.
- **IPv6 support** to address the growing number of addressable end-points on the Internet that require or create data.
- **Efficient file copy creation** through clones of files, including files in snapshots, without incurring the overhead of copying all of the data blocks.

- Snapshot support of filesets. Cloud computing customers can now carve out a piece of storage that looks more like an independent file system. These file system-like entities allow certain kinds of management on less than full file system granularity.
- Improved user and group quotas. Each fileset owner now has the ability to control quotas for users and groups of their fileset.
- Windows Native Port. Currently, GPFS on Windows requires the Subsystem for UNIX-based Applications (SUA) from Microsoft for its operation. This requirement is being reduced over time. In this release of GPFS, the GPFS daemon no longer uses SUA. The use of the Posix Threads (PThreads) API to provide an implementation of the POSIX standard thread API on Windows is introduced. SUA continues to be required for the use of GPFS administrative commands.

Key prerequisites

Refer to the [Hardware requirements](#) and [Software requirements](#) sections.

Planned availability date

April 20, 2012

Description

GPFS delivers file system services to parallel and serial applications. It gives parallel applications simultaneous access to the same or different files from any node that has the GPFS file system mounted, while managing a high level of control over all file system operations. GPFS is particularly appropriate in an environment where the aggregate peak need for data bandwidth exceeds the capability of a distributed file system server.

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

Section 508 of the US Rehabilitation Act

GPFS is capable as of April 20, 2012, 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 requested at

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

Product positioning

GPFS is ideal for a wide range of workloads where it is imperative to have high-speed, reliable access, or automated management of very large files, or a very large number of files:

- Scale-out data access. A high-performance scale-out file system for business applications that benefit from active/active data access from multiple nodes.
- A multicluster file system, providing a global namespace across clusters for parallel processing on compute clusters, featuring extreme scalability and throughput optimized for streaming workloads such as those common in Web

2.0, digital media, scientific, and engineering applications. Users are allowed shared access to files in either the cluster where the file system was created or other GPFS clusters. Each site in the network is managed as a separate cluster, while allowing shared file system access.

- HSM Platform. The built-in policy engine supports multiple tiers of storage, including tape, with powerful policy-driven file placement, migration, deletion, and reporting. This makes GPFS the perfect base for a content library or archival system by mixing cost-effective storage of infrequently accessed data with the global namespace for easy accessibility. The GPFS policy engine can handle billions of files and multiple petabytes of data.

The new features in GPFS V3.5 allow you to manage very large amounts of unstructured file data better than ever before. With improved small file performance, finer granularity namespace management, increased performance for some administration tasks, and an innovative approach to expanding the global namespace, managing large volumes becomes tractable.

Reference information

Refer to Software Announcement [212-047](#), dated April 10, 2012.

Program number

Program number	VRM	Program name
5724-N94	3.5	IBM General Parallel File System on x86 Architecture

Education support

The following classes are available:

Course code	Course title	Course type
AN810	GPFS System Administration	Classroom
AX810	GPFS System Administration	Instructor Led-Online
AN820	GPFS Performance Tuning	Classroom
AX820	GPFS Performance Tuning	Instructor Led-Online

IBM training provides education to support many IBM offerings. Descriptions of courses for IT professionals and managers are on the IBM training website

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

Call IBM training at 800-IBM-TEACH (426-8322) for catalogs, schedules, and enrollments.

Offering Information

Product information is available via the Offering Information website

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

Also, visit the Passport Advantage® website

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

Publications

No publications are shipped with this program.

The following publications are available from the web:

- IBM GPFS Concepts, Planning, and Installation Guide (GA76-0413)
- IBM GPFS Administration and Programming Reference (SA23-2221)
- IBM GPFS Advanced Administration and Programming Reference (SC23-5182)
- IBM GPFS Problem Determination Guide (GA76-0415)
- IBM GPFS Data Management API Guide (GA76-0414)

To access the above GPFS documentation, refer to the IBM Cluster Information Center website. This website contains the most recent GPFS documentation in PDF and HTML formats and is located at

<http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/index.jsp>

The IBM Publications Center

<http://www.ibm.com/shop/publications/order>

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. Payment options for orders are via credit card (in the US) or customer number for 50 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries, free of charge.

Technical information

Specified operating environment

Hardware requirements

GPFS on x86 Architecture is supported on all IBM ServerProven® servers with the minimum hardware requirements that follow, unless stated otherwise in the GPFS FAQs:

- System x®
- BladeCenter®
- xSeries®

See the IBM ServerProven site at

<http://www-03.ibm.com/systems/info/x86servers/serverproven/compat/us/>

GPFS for Linux and Windows on x86 Architecture, minimum hardware requirements:

- Intel™ EM64T processors, with a minimum of 1 GB of system memory
- AMD Opteron processors, with a minimum of 1 GB of system memory

Additionally, see the FAQs for supported connectivity, formally qualified disk subsystems, and use of GPFS on compatible non-IBM hardware.

The GPFS FAQs are available at

http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/topic/com.ibm.cluster.gpfs.doc/gpfs_faqs/gpfs_faqs.html

Software requirements

For GPFS V3.5, service update 3.5.0-1 is required (APAR IV15333).

It is suggested that you install the latest service update that is available at

<http://www-933.ibm.com/support/fixcentral/>

GPFS for Linux on x86 Architecture V3.5 is supported on the Red Hat Enterprise Linux (RHEL) and SUSE Linux Enterprise Server (SLES) distributions.

For currently supported release levels and the latest supported kernel levels, consult the GPFS FAQs at

http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/topic/com.ibm.cluster.gpfs.doc/gpfs_faqs/gpfs_faqs.html

GPFS for Windows on x86 Architecture V3.5 is supported on:

- Windows Server 2008 R2 x64
- Windows Server 2008 x64 (Service Pack 2)

Required software from Microsoft includes Utilities and SDK for UNIX-based Applications. The Utilities and SDK for UNIX-based Applications can be obtained from

<http://www.msdn.microsoft.com>

For heterogeneous clusters, required software from InteropSystems includes the SUA Community version of OpenSSH. OpenSSH can be obtained from

<http://www.interopsystems.com/community/>

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.

Companion products

Related products to GPFS are:

- IBM DS and DCS disk arrays
- Tivoli® Storage Manager
- Tivoli Provisioning Manager
- HPSS (High Performance Storage System)
- IBM System Storage® SAN Volume Controller

Compatibility

Nodes running GPFS V3.5 can coexist and interoperate with nodes running GPFS V3.4.

Limitations

For complete and up-to-date information regarding GPFS specifications and capacities, refer to the GPFS on x86 Architecture (5724-N94) Sales Manual, and to the GPFS FAQs available at

http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/topic/com.ibm.cluster.gpfs.doc/gpfs_faqs/gpfs_faqs.html

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

Planning information

Installability

For installation information, refer to the *GPFS Concepts, Planning, and Installation Guide*.

Packaging

IBM GPFS on x86 Architecture is distributed as a single package containing both Linux and Windows installation files and GPFS Client and GPFS Server installation code with the following:

- IBM International Program License Agreement in multi-language booklet (LC27-4301-00) and its License Information in multiple languages (L-LMUY-8P4LYE)
- Proof of Entitlement (POE)
- Product readme file that describes the program's specified operating environment and program specifications
- GPFS V3.5 program filesets:
 - Linux:
 - gpfs_install_3.5.0-0_x86_64
 - Windows:
 - gpfs-3.5-Windows-license.msi
 - gpfs-3.5.0.0-WindowsServer2008.msi

Publications are available online at

<http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/index.jsp>

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

General Parallel File System uses the security and auditability features of the operating system on which it is installed.

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

Software Services

IBM Software Services has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based, software services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an extensive portfolio of capabilities.

Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support a wide range of critical business needs.

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit

<http://www.ibm.com/software/sw-services/>

Ordering information

This product is only available via Passport Advantage. It is not available as shrinkwrap.

Product group: Other Software

Product Identifier Description (PID)

General Parallel File System on x86 Architecture (5724-N94)

Product category: System Software

Charge metric

Program name	Part number or PID number	Charge metric
GPFS on x86 Architecture	5724-N94	10 PVUs

Processor Value Unit (PVU)

PVU is a unit of measure by which the program can be licensed. The number of PVU entitlements required is based on the processor technology (defined within the PVU table by processor value, brand, type, and model number at the website below) and the number of processors made available to the program. IBM continues to define a processor, for the purpose of PVU-based licensing, to be each processor core on a chip. A dual-core processor chip, for example, has two processor cores. The PVU table can be found at

http://www.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

Licensee can deploy the program using either full capacity licensing or virtualization capacity (sub-capacity) licensing according to the Passport Advantage Sub-Capacity Licensing Terms (refer to the web page below). If using Full Capacity licensing, Licensee must obtain PVU entitlements sufficient to cover all activated processor cores¹ in the physical hardware environment made available to or managed by the program, except for those servers from which the program has been permanently removed. If using Virtualization Capacity licensing, Licensee must obtain entitlements sufficient to cover all activated processor cores made available to or managed by the program, as defined according to the Virtualization Capacity License Counting Rules at

http://www.ibm.com/software/lotus/passportadvantage/Counting_Software_licenses_using_specific_virtualization_technologies.html

¹

An activated processor core is a processor core that is available for use in a physical or virtual server, regardless of whether the capacity of the processor core can be or is limited through virtualization technologies, operating system commands, BIOS settings, or similar restrictions.

Notes:

- Some programs may require licenses for the program and what is being managed. In that case, the following applies. In addition to the entitlements required for the program directly, licensee must obtain PVU entitlements for this program sufficient to cover the processor cores managed by the program.

- Some programs may be licensed on a managed basis only. In that case, the following applies. Instead of the entitlements required for the program directly, licensee must obtain PVU entitlements for this program sufficient to cover the processor cores managed by the program.
- A few programs on an exception basis may be licensed on a referenced basis. In that case, the following applies. Rather than obtaining entitlements for the activated processor cores available to the program, licensee must obtain PVU entitlements for this program sufficient to cover the environment made available to the referenced program as if the program itself were executing everywhere the referenced program was executing, independent of the basis on which the referenced program is licensed.

The programs in this announcement all have Value Unit-Based pricing.

Program number	Program name	Value Unit exhibit
5724-N94	IBM GPFS on x86 Architecture	Processor

Passport Advantage

Program name/Description	Part number
IBM GPFS on x86 Architecture V3.5	BH040EN
GPFS Server 10 Processor Value Unit Lic + SW S&S 12 Mo	D091MLL
GPFS Server 10 Processor Value Unit Annual SW S&S Rnw1	E06VULL
GPFS Server 10 Processor Value Unit SW S&S Reinstate 12 Mo	D091NLL
GPFS Client 10 Processor Value Unit Lic + SW S&S 12 Mo	D091RLL
GPFS Client 10 Processor Value Unit Annual SW S&S Rnw1	E06VWLL
GPFS Client 10 Processor Value Unit SW S&S Reinstate 12 Mo	D091SLL

Passport Advantage customer: Media pack entitlement details

Customers with active maintenance or subscription for the products listed are entitled to receive the corresponding media pack.

Entitled maintenance offerings Description	Part number
Server	
General Parallel File System 10 Value Units LIC+SW MAINT 12 MO	D091MLL
General Parallel File System 10 Value Units ANNUAL SW MAINT RNWL	E06VULL
General Parallel File System 10 Value Units SW MAINT REINSTATE 12 MO	D091NLL
Client	
General Parallel File System 10 Value Units LIC+SW MAINT 12 MO	D091RLL
General Parallel File System 10 Value Units ANNUAL SW MAINT RNWL	E06VWLL
General Parallel File System 10 Value Units SW MAINT REINSTATE 12 MO	D091SLL
Media packs	
Description	Part number
IBM General Parallel File System V3.4 on x86 Architecture	BH03VEN
IBM General Parallel File System V3.3 Linux Media Pack	BH03REN
IBM General Parallel File System V3.3 windows	BH03QEN

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.

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

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 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, if available. 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 form number

L-LMUJ-8P4LYE

The program's License Information 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)

No

Passport Advantage applies

Yes, and through the Passport Advantage website at

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

Usage restrictions

Yes. GPFS has two types of licenses, a Server license and a Client license. For each node in a GPFS cluster (see *Permitted use of GPFS Server and GPFS Client* below), the customer determines the appropriate number of GPFS Server or GPFS Client licenses that correspond to the way GPFS is used on that node. A node is defined as one operating system instance on a single computer or running in a virtual partition.

During GPFS cluster configuration, the customer is prompted to identify whether a particular node is a GPFS Server or a GPFS Client. If a GPFS Client is chosen, function that requires a GPFS Server license will be disabled on this node. Because the node that acts as the GPFS cluster configuration server requires a GPFS Server designation, at least one node in the GPFS cluster requires a GPFS Server license.

Permitted use of GPFS Server and GPFS Client:

You may use the GPFS Server in order to perform the following GPFS functions:

- Management functions such as cluster configuration manager, quorum node, manager node, and Network Shared Disk (NSD) server
- Sharing data through any application, service protocol, or method, such as Network File System (NFS), Common Internet File System (CIFS), File Transfer Protocol (FTP), or Hypertext Transfer Protocol (HTTP)

You may use a GPFS Client license when the nodes are exchanging data between nodes that locally mount the same GPFS file system. The GPFS Client may not be used for nodes to share GPFS data through any application, service, protocol, or method, such as NFS, CIFS, FTP, or HTTP. For this use, entitlement to GPFS Server is required.

Note: Refer to the GPFS FAQs available from the following website for more information, including example configurations and license definitions regarding the new GPFS Server and GPFS Client model.

http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/topic/com.ibm.cluster.gpfs.doc/gpfs_faqs/gpfs_faqs.html

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 included with licenses purchased through Passport Advantage and Passport Advantage Express. Product upgrades and Technical Support are provided by the Software Subscription and Support offering as described in the Agreements. Product upgrades provide the latest versions and releases to entitled software and Technical Support provides voice and electronic access to IBM support organizations, worldwide.

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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, 7 days a week. 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 the applicable agreements.

For additional information about the International Passport Advantage Agreement and the IBM International Passport Advantage Express Agreement, visit the Passport Advantage website at

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

System i Software Maintenance applies

No

Variable charges apply

No

Educational allowance available

Not applicable.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

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

Prices

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

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