IBM Multi-site Workload Lifeline V2.0 enables enhanced intelligent load balancing of TCP/IP workloads to support active-query configurations

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At a glance

IBM® Multi-site Workload Lifeline V2.0 is designed to enable enhanced load balancing of TCP/IP-based z/OS® workloads to support the active-query configuration of GDPS® continuous availability active-active.

Key functions

- Ability to build routing recommendations across two sites (for example, sysplexes) and route selected workloads across both sites (active-query)
- Ability to receive latency metrics from IM replication products and use the metrics to influence routing recommendations
- Ability to support secure communication and authentication between Advisors, Agents, and external Load Balancers using SSL
- Ability to support the use of non-SASP load balancing with DB2® and IMS™ Connect

Overview

With IBM Multi-site Workload Lifeline, you can load balance TCP/IP-based workload requests across two sites at nearly unlimited distances, when both sites are running the same server applications and have the same data sources. As a result, it is designed to deliver:

- Increased performance: Response time can be reduced by aligning new workload connections with the most capable applications and systems
- Increased availability: New workload connections can be routed to other available applications in the event of application, system, or site outages. Outages for maintenance updates or other planned events can be minimized.
- Increased scalability: Application instances can be added on-demand
- Improved recovery time: Recovery time can be reduced from hours to minutes
- Workload migration: Workloads can be routed from one site to another with minimal disruption
- Improved system utilization: Connections for query workloads can be distributed to both sites simultaneously

Multi-site Workload Lifeline consists of Lifeline Advisors and Lifeline Agents. The primary Lifeline Advisor communicates with external load balancers by using the
Server-Application State Protocol (SASP), one or more Lifeline Agents, and possibly a secondary Lifeline Advisor.

The primary Lifeline Advisor provides recommendations that are used by a first-tier, external load balancer to determine how to select a target site for new requests and routes each request to a second-tier load balancer. The second-tier load balancer then routes each request to a target z/OS system within the site to select a target server application.

The Lifeline Agent gets a list of server applications that are configured to receive workload requests from registered external load balancers. The Lifeline Agent gathers data about these server applications and returns the information to the Lifeline Advisor.

For additional information on how Multi-site Workload Lifeline supports the active-standby and active-query configurations of Geographically Dispersed Parallel Sysplex™ (GDPS) active-active sites, refer to Services Announcement ZS13-0078, dated October 22, 2013.

### Key prerequisites

z/OS V1.12, or later, with the z/OS Communications Server configured as the active TCP/IP stack

For additional details, refer to the Hardware requirements and Software requirements sections.

### Planned availability date

October 25, 2013

IBM Multi-site Workload Lifeline V1.1 software withdrawal from marketing and discontinuance of support

Effective October 22, 2013, IBM will withdraw from marketing IBM Multi-site Workload Lifeline V1.1, (5655-U24), licensed under the IBM International Program License Agreement. The replacement product is IBM Multi-site Workload Lifeline V2.0, (5655-UM4).

Effective September 30, 2014, IBM will discontinue support for IBM Multi-site Workload Lifeline V1.1, (5655-U24), licensed under the IBM International Program License Agreement.

### Description

Multi-site Workload Lifeline defines two tiers of load balancing. The first-tier load balancer determines which site to route a new workload request to and forwards the request to a second-tier load balancer. The second-tier load balancer determines which server application within the site to route the workload request to and forwards it to the z/OS system where the server application is running.

Multi-site Workload Lifeline provides the first-tier load balancer with site routing recommendations based on the availability and health of the server applications and the z/OS systems within each site. If the second-tier load balancer is not a z/OS sysplex distributor, Multi-site Workload Lifeline also provides the second-tier load balancer with server application routing recommendations based on the availability and health of the server applications and the z/OS systems within the site. If customized load balancing, called an intermediary node, was built into the workload itself, then Multi-site Workload Lifeline will only provide site routing recommendations to the first-tier load balancer.
Multi-site Workload Lifeline consists of Lifeline Advisors and Lifeline Agents. The primary Lifeline Advisor communicates with external load balancers by using the Server/Application State Protocol (SASP), one or more Lifeline Agents, and possibly a secondary Lifeline Advisor.

If the Advisor detects that system images (that make up a site where the workloads are running) are no longer available, then the product is designed to declare a site failure. If the applications making up the active-standby or active-query workloads are down or unhealthy, the product is designed to declare a workload failure. In either case, new workload requests can be routed to the other site. If the database replication latency for the active-query workload exceeds a threshold, the product is designed to declare a workload failure on the one site where the threshold was reached. Instead of using both sites, all workload is routed to the other site.

In the event that you want to power down a site for a power check or apply maintenance, the offering allows you to perform a graceful movement of workloads from one site to the other through the use of commands that override routing.

Multi-site Workload Lifeline provides an interface for Network Management Applications to extract information such as the status of the workloads, sites, and more.

**Lifeline Advisors**

The primary Lifeline Advisor provides recommendations that are used by a first-tier, external load balancer to determine how to select a target site for new requests and routes each request to a second-tier load balancer (or intermediary node). The second-tier load balancer (or intermediary node) then routes each request to a target z/OS system within the site to select a target server application.

The second-tier load balancer can be either another external load balancer or a z/OS sysplex distributor on a specific z/OS system in the site. If the second-tier load balancer is an external load balancer, it also uses the Lifeline Advisor recommendations to determine how to route these new requests to the target server applications in the z/OS site.

If the second-tier load balancer is a z/OS sysplex distributor, it creates its own recommendations that are similar to the ones that the Lifeline Advisor creates to determine how to route these new requests to the target server applications in the z/OS site. If an intermediary node is being used, all routing decisions within the site are made by the intermediary node, without Lifeline providing any recommendations.

**Lifeline Agents**

The Lifeline Agent receives from the Lifeline Advisor a list of server applications that are configured to receive workload requests from registered external load balancers. The Lifeline Agent gathers data about these server applications and returns the information to the Advisor.

**External load balancers**

External load balancers use Server/Application State Protocol (SASP) to obtain recommendations and topology information related to server applications and systems in a clustered environment. A second-tier load balancer can be an external load balancer that is SASP-enabled or a z/OS sysplex distributor on a z/OS system in the site.

**Internal load balancers**

An internal load balancer, also known as z/OS sysplex distributor, resides on a z/OS system in the site. It uses z/OS Communications Server functions to obtain recommendations and topology information related to server applications in a sysplex environment.
Intermediary nodes

An intermediary node does not communicate directly with the Lifeline Advisor, but it replaces the function of a second-tier load balancer. It is used in cases where customized load balancing has been built into a workload, for example, with DB2 or IMS Connect.

Active-standby configuration

An active-standby workload managed by IBM GDPS active-active sites will be active in one site, receiving connections routed to it by the two tiers of load balancers, with recommendations from Multi-site Workload Lifeline, the workload distribution mechanism. When database updates are made, database software replication transmits those changes asynchronously from the active instance of the workload to the standby instance of the workload. At the standby site, the standby instance of the workload is active and ready to receive work. The updated data from the active site is applied to the database subsystem running in the standby site in near real time.

Active-query configuration

An active-query workload managed by IBM GDPS active-active sites will be in one or both sites, receiving connections routed to it by the two tiers of load balancers, with recommendations from Multi-site Workload Lifeline, the workload distribution mechanism. When database updates are made by the associated active-standby workload, database replication latency is monitored to ensure connections are not routed to the site if the replicated database contains data that is too out of date with the database on the active site.

New in Multi-site Workload Lifeline V2.0

Multi-site Workload Lifeline supports GDPS active-query configuration as follows:

- Ability to build routing recommendations across two sites (for example, sysplexes) and route query-only workloads across both sites (active-query)

  Because an active-standby workload makes updates to a database, it must only be active on one site to prevent data corruption. Lifeline V2.0 introduces the concept of an active-query workload. An active-query workload is associated with an active-standby workload, but only handles query (read-only) transactions. Consequently, an active-query workload can be active on both sites.

- Ability to receive latency metrics from IM replication products and use these metrics to influence routing recommendations

  When used as part of the IBM GDPS active-active continuous availability solution, Lifeline can monitor the database replication latency state between the sites. If a configured latency threshold is exceeded, Lifeline is designed to modify the active-query workload distribution to ensure that query connections are not accessing stale data.

- Ability to support secure communication and authentication between Advisors, Agents, and external load balancers using SSL

  Lifeline V2.0 supports the use of AT-TLS policy to provide additional authentication and secure communication between Lifeline Advisors, Agents, and load balancers.

- Ability to support the use of non-SASP load balancing with DB2 and IMS Connect

  Lifeline V2.0 supports the use of customized load balancers. For some workloads, site-level load balancing is handled by an application, such as DB2 Connect™. Lifeline supports the use of these customized load balancers by defining them as intermediary nodes.
Accessibility by people with disabilities

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


Value Unit-based pricing

Value Unit pricing for eligible IBM System z® IBM International Program License Agreement (IPLA) programs enables a lower cost of incremental growth and enterprise aggregation. Each System z IPLA product with Value Unit pricing has a single price per Value Unit and a conversion matrix, called Value Unit Exhibit, for converting from some designated measurement to Value Units. Most commonly, Millions of Service Units (MSUs) is the measurement designated by IBM to be converted to Value Units. Some other measurements are engines or messages. Since MSUs are the most common measurement, that measurement will be used for the remainder of this description.

Value Unit pricing offers price benefits for you. For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the required license capacity. Each of the various Value Unit Exhibits stipulate that the larger your required license capacity, the fewer Value Units per MSU you will need. Value Unit Exhibits are uniquely identified by a three digit code and referred to using the nomenclature VUExxx, where xxx is the three digit code.

Subsequent acquisitions of Value Unit priced programs offer additional price benefits. The quantity of each System z IPLA program that you have acquired is referred to as entitled license capacity. If you wish to grow your entitled license capacity for a System z IPLA program, the calculation to determine additional needed Value Units is based on the number of Value Units already acquired.

For each System z IPLA program with Value Unit pricing, you should:

- Determine the required license capacity, in MSUs.
- Aggregate the MSUs across the enterprise.
- Convert the total MSUs to Value Units, using the applicable Value Unit Exhibit.
- Multiply the price per Value Unit by the total number of Value Units to determine the total cost.

To simplify conversion from the designated measurement to Value Units or vice-versa, use the Value Unit Converter Tool. For additional information or to obtain a copy of the Value Unit Converter Tool, visit the Value Unit Converter Tool website

http://ibm.com/zseries/swprice/vuctool

Note that Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

To determine the required license capacity for the System z IPLA program you selected, refer to the Terms and conditions section.

Product positioning

Multi-site Workload Lifeline is an integral part of the active-standby configuration of IBM GDPS active-active continuous availability.

GDPS active-active continuous availability is the next generation of GDPS and a fundamental paradigm shift from a failover model to a near continuous availability model. IBM GDPS active-active continuous availability combines the best attributes of the existing suite of GDPS services and expands them to allow you to achieve
unlimited distances between your data center sites with recovery time objectives measured in seconds.

GDPS active-active continuous availability is a solution for an environment consisting of two sites, separated by unlimited distances, running the same applications and having the same data with cross-site workload monitoring, and balancing. IBM GDPS active-active continuous availability, as with previous GDPS solutions, provides a complete set of services to help achieve near continuous availability. This solution, which is an integration of IBM products and GDPS control software, is delivered through an IBM service engagement which includes project management throughout the implementation cycle.

Multi-site Workload Lifeline is not only integral in providing support for disaster recovery as part of GDPS, it can also be used to drastically reduce downtime during planned outages. Multi-site Workload Lifeline can be used to shift workloads from one site to another during planned outages, such as maintenance. Work can be performed on the second site while maintenance is applied to the production site. Once complete, the workload can be moved back.

Reference information

For additional information on how Multi-site Workload Lifeline supports the active-standby configuration of Geographically Dispersed Parallel Sysplex (GDPS) active-active, refer to Services Announcement ZS13-0078, dated October 22, 2013.

Program number

<table>
<thead>
<tr>
<th>Program number</th>
<th>VRM</th>
<th>Program name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-UM4</td>
<td>2.0.0</td>
<td>IBM Multi-site Workload Lifeline</td>
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<tr>
<td>5655-U25</td>
<td>1.1.0</td>
<td>IBM Multi-site Workload Lifeline - Software Subscription and Support</td>
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Product identification number

<table>
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<tr>
<th>Program PID number</th>
<th>Subscription and Support PID number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-UM4</td>
<td>5655-U25</td>
</tr>
</tbody>
</table>

Offering Information

Product information is available via the Offering Information website

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

Publications

- License Information Document (LC14-7596)
- IBM Multi-site Workload Lifeline V2.0 User's Guide (SC27-4653)
- Program Directory (GI11-9498)

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 U.S.) or customer number for 20 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
Multi-site Workload Lifeline V2.0 runs on the following System z servers:

- z196
- z12 EC
- z10 EC
- z10 EC
- z10 BC
- z9 EC
- z9 BC
- z990
- z890
- z900
- z800

Software requirements
Multi-site Workload Lifeline V2.0 requires z/OS V1.12, or later that also has the z/OS Communications Server configured as the active TCP/IP stack.

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.

Planning information

Packaging
Program components are delivered by traditional z/OS fulfillment:

- CBPDO
- ServerPac

The following items are delivered:

- License Information Document (LC14-7596)
- 3590 tape cartridge

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

Multi-site Workload Lifeline V2.0 uses the security and auditability features of the base operating system under which it is operating. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.
**Global Technology Services®**

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings for the efficient installation, implementation, or integration of this product.

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**Ordering information**

Consult your IBM representative.

**Ordering z/OS through the Internet**

ShopzSeries provides an easy way to plan and order your z/OS ServerPac or CBPDO. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order (including determination of whether all product requisites are satisfied). ShopzSeries is available in the U.S. and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries website at


<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>PID number</th>
<th>Charge metric</th>
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<tbody>
<tr>
<td>5655-UM4</td>
<td>IBM Multi-site Workload Lifeline V2.0</td>
<td>5655-UM4</td>
<td>per Value Unit</td>
</tr>
<tr>
<td>5655-U25</td>
<td>IBM Multi-site Workload Lifeline Software Subscription and Support</td>
<td>5655-U25</td>
<td>per Value Unit</td>
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</table>

**Charge metric**

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

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>Value Unit exhibit</th>
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</thead>
<tbody>
<tr>
<td>5655-UM4</td>
<td>IBM Multi-site Workload Lifeline V2.0</td>
<td>VUE007</td>
</tr>
</tbody>
</table>

For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the **required license capacity**. Your required license capacity is based upon the following factors:

- The System z IPLA program you select
- The applicable Value Unit Exhibit
- The applicable terms
- Whether your current mainframes are full capacity or sub-capacity
**Value Unit exhibit VUE007**

<table>
<thead>
<tr>
<th>MSUs</th>
<th>MSUs</th>
<th>Value Units/MSU</th>
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</thead>
<tbody>
<tr>
<td>minimum</td>
<td>maximum</td>
<td></td>
</tr>
<tr>
<td>Base</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Tier A</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>Tier B</td>
<td>46</td>
<td>175</td>
</tr>
<tr>
<td>Tier C</td>
<td>176</td>
<td>315</td>
</tr>
<tr>
<td>Tier D</td>
<td>316</td>
<td>+</td>
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</table>

Value Units for mainframes without MSU ratings:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Value Units/machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3000 H30</td>
<td>6</td>
</tr>
<tr>
<td>MP3000 H50</td>
<td>8</td>
</tr>
<tr>
<td>MP3000 H70</td>
<td>12</td>
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<td>ESL models</td>
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</table>

**Ordering example**

The total number of Value Units is calculated according to the following example.

If your required license capacity is 1,500 MSUs for your selected System z IPLA product, the applicable Value Units would be:

Translation from MSUs to Value Units

<table>
<thead>
<tr>
<th>MSUs</th>
<th>Value Units/MSU = Value Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>3 * 1.00                     = 3.00</td>
</tr>
<tr>
<td>Tier A</td>
<td>42 * .45                     = 18.90</td>
</tr>
<tr>
<td>Tier B</td>
<td>130 * .36                    = 46.80</td>
</tr>
<tr>
<td>Tier C</td>
<td>140 * .27                    = 37.80</td>
</tr>
<tr>
<td>Tier D</td>
<td>1,185 * .20                  = 237.00</td>
</tr>
</tbody>
</table>

Total 1,500 343.50

When calculating the total number of Value Units, the sum is to be rounded up to the next integer.

**Basic license**

**On/Off CoD**

Multi-site Workload Lifeline V2.0 is eligible for On/Off CoD with a temporary use charge calculated based on MSUs per-day usage.

Program name: Multi-site Workload Lifeline V2.0
Program PID: 5655-UM4

<table>
<thead>
<tr>
<th>Entitlement identifier</th>
<th>Description</th>
<th>License option/Pricing metric</th>
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</thead>
<tbody>
<tr>
<td>S017CG1</td>
<td>Multi-site Workload Lifeline V2.0</td>
<td>Basic OTC, Per MSU-day TUC</td>
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Translation from MSUs to Value Units

<table>
<thead>
<tr>
<th>MSUs</th>
<th>Value Units/MSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>1-3</td>
</tr>
<tr>
<td>Tier A</td>
<td>4-45</td>
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<tr>
<td>Tier B</td>
<td>46-175</td>
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<tr>
<td>Tier C</td>
<td>176-315</td>
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<tr>
<td>Tier D</td>
<td>316+</td>
</tr>
</tbody>
</table>
To order, specify the program product number and the appropriate license or charge option. Also, specify the desired distribution medium. To suppress shipment of media, select the license-only option in CFSW.

**Program name:** Multi-site Workload Lifeline V2.0  
**Program PID:** 5655-UM4  
**Entitlement identifier**  
**Description**  
**License option/Pricing metric**  
S017CG1 Multi-site Workload Lifeline V2.0 Basic OTC, Value Units  
**Orderable supply ID**  
**Language**  
**Distribution medium**  
S017CG0 US English 3590 Tape Cartridge  

Note: Additional media type selections (3480 compressed, 3490E, 3590, 3592) are offered during Custom Build Offering ordering.

**Subscription and Support PID:** 5655-U25  
**Entitlement identifier**  
**Description**  
**License option/Pricing metric**  
S016M9K Multi-site Workload Lifeline Subscription and Support Basic MSC, Value Units SW S&S No charge, decline SW S&S Per MSU SW S&S Registration  
**Orderable supply ID**  
**Language**  
**Distribution medium**  
S016M9J English Paper  

**Subscription and Support**  
To receive voice technical support via telephone and future releases and versions at no additional charge, Subscription and Support must be ordered. The capacity of Subscription and Support (Value Units) must be the same as the capacity ordered for the product licenses.  
To order, specify the Subscription and Support program number (PID) referenced above and the appropriate license or charge option.  
IBM is also providing Subscription and Support for these products via a separately purchased offering under the terms of the IBM International Agreement for Acquisition of Software Maintenance (IAASM). This offering:

- Includes and extends the support services provided in the base support to include technical support via telephone.
- Entitles you to future releases and versions, at no additional charge. Note that you are not entitled to new products.

When Subscription and Support is ordered, the charges will automatically renew annually unless cancelled by you.

The combined effect of the IPLA license and the Agreement for Acquisition of Software Maintenance gives you rights and support services comparable to those under the traditional ICA S/390® and System z license or its equivalent. To ensure that you continue to enjoy the level of support you are used to in the ICA business model, you must order **both** the license for the program and the support for the selected programs at the same Value Unit quantities.
Delivery services - Custom QuickShip Program

This product is eligible for the IBM Custom QuickShip Program.

Custom QuickShip combines flexible configurations with fast delivery. Customers and Business Partners are able to create product configuration of their choice by using a combination or stand-alone selection of hardware, software, and a menu of additional features, including the option for software preload. The inclusion of feature number 1748 will ensure Custom QuickShip delivery of the complete product configuration or stand-alone order.

The committed response time under Custom QuickShip is six business days from order acceptance by IBM to customer delivery.

Customized Offerings

Product deliverables are shipped only via CBPDO, ServerPac, SystemPac, FunctionPac, and ProductPac®.

All of these customized offerings are offered for Internet delivery in countries where Shopz product ordering is available. Internet delivery reduces software delivery time and allows you to install software without the need to handle tapes. For more details on Internet delivery, refer to the Shopz help information at

http://www.software.ibm.com/ShopzSeries

You choose the delivery method when you order the software. IBM recommends Internet delivery. In addition to Internet and DVD, the supported tape delivery options include:

- 3590
- 3592

Most products can be ordered in ServerPac, SystemPac, FunctionPac, and ProductPac the month following their availability in CBPDO. z/OS can be ordered via CBPDO, ServerPac, and SystemPac at general availability. Many products will also be orderable in a Product ServerPac without also having to order the z/OS operating system or subsystem. Shopz and CFS will determine the eligibility based on product requisite checking. For more details on the Product ServerPac, visit the Help section on the Shopz web site at


Production of software product orders will begin on the planned general availability date.

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after general availability.
- SystemPac, FunctionPac and ProductPac shipments will begin four weeks after general availability due to additional customization, and data input verification.

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.

Agreement for Acquisition of Software Maintenance

The IBM Agreement for Acquisition of Software Maintenance (Z125-6011) applies for Software Subscription and Support (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. 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.

IBM System z Operational Support Services - SoftwareXcel is an option if you desire added services.

License Information form number

IBM Multi-site Workload Lifeline V2.0

License form number: L-JLSH-96TP3N

The program's License Information will be available for review on the IBM Software License Agreement website


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).

Program support

Enhanced support, called Subscription and Support, includes telephone assistance, as well as access to updates, releases, and versions of the program as long as support is in effect. You will be notified of discontinuance of support with 12 months' notice.
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 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
No

Software Subscription and Support applies
No. For operating system software, the revised IBM Operational Support Services - SoftwareXcel offering will provide support for those operating systems and associated products that are not available with the Software Subscription and Support (Software Maintenance) offering.

This will ensure total support coverage for your enterprise needs, including IBM and selected non-IBM products. For complete lists of products supported under both the current and revised offering, visit

http://www.ibm.com/services/sl/products

Other support
SoftwareXcel

System i® Software Maintenance applies
No

Variable charges apply
No

Educational allowance available
Yes. When ordering through the program number process, a 15% education allowance applies to qualified education institution customers.

Education Software Allowance Program applies when ordering through the program number process.

ESAP available
Yes, to qualified customers.

Sub-capacity terms and conditions
For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the required license capacity. Your required license capacity is based upon the following factors:

- The System z IPLA program you select
• The applicable Value Unit Exhibit
• The applicable terms
• Whether your current mainframes are full capacity or sub-capacity

For more information on the Value Unit Exhibit for the System z IPLA program you selected, refer to the Ordering information section.

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>Terms</th>
<th>Parent, if applicable</th>
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<tbody>
<tr>
<td>5655-UM4</td>
<td>Multi-site Workload</td>
<td>Execution-based</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Lifeline V2.0</td>
<td></td>
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</tbody>
</table>

**Full-capacity mainframes**

In cases where full capacity is applicable, the following terms apply.

Execution-based, z/OS-based, full-machine-based: The required capacity of a System z IPLA program with these terms equals the MSU-rated capacity of the machines where the System z IPLA program executes.

For more information on mainframe MSU-rated capacities, visit


Reference-based: The required license capacity of a System z IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

**Sub-capacity mainframes**

In cases where sub-capacity is applicable, the following terms apply.

Execution-based: The required capacity of a System z IPLA sub-capacity program with these terms equals the capacity of the LPARs where the System z IPLA program executes.

z/OS-based: The required license capacity of a System z IPLA program with these terms equals the license capacity of z/OS on the machines where the System z IPLA program executes.

Reference-based: The required license capacity of a System z IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

Full-machine-based: The required license capacity of a System z IPLA program with full machine based terms equals the MSU-rated capacity of the machines where the System z IPLA program executes.

For more information on mainframe MSU-rated capacities, refer to The IBM System z Machines Exhibit, (Z125-3901), or visit the Mainframes section of the System z Exhibits website


For more information on sub-capacity System z IPLA terms and conditions, refer to Software Announcement ZA04-0227, dated August 10, 2004.

For additional information for products with reference-based terms, System z IPLA sub-capacity programs with reference-based terms adds value to the parent program across the environment, regardless of where in the environment the System z IPLA program executes.

An environment is defined as either a single or stand-alone machine or a qualified Parallel Sysplex®. You may have one or more different environments across the
enterprise. To determine the required license capacity for each System z IPLA program with referenced-based terms, each environment should be assessed separately.

When a System z IPLA sub-capacity program with reference-based terms is used in a qualified Parallel Sysplex environment, the required license capacity of the System z IPLA program must equal with the license capacity of the parent program across the Parallel Sysplex. Qualified Parallel Sysplex refers to one:

- That meets the criteria defined in Hardware Announcement ZA98-0120, dated January 13, 1998
- Where MLC pricing is aggregated across the sysplex

**Sub-capacity eligibility**

To be eligible for sub-capacity charging on select System z IPLA programs, you must first implement and comply with all terms of either sub-capacity Workload License Charges (WLC) or sub-capacity Entry Workload License Charges (EWLC). To implement sub-capacity WLC or EWLC, a machine must be System z (or equivalent). On that machine:

- All instances of the OS/390® operating system must be migrated to the z/OS operating systems
- Any licenses for the OS/390 operating system must be discontinued
- All instances of the z/OS operating systems must be running in z/Architecture® (64-bit) mode

For that machine, you must create and submit a Sub-Capacity Report to IBM each month. Sub-Capacity Reports must be generated using the Sub-Capacity Reporting Tool (SCRT). For additional information or to obtain a copy of SCRT, visit the System z Software Pricing website

http://ibm.com/zseries/swprice

You must comply with all of the terms of the WLC or EWLC offering, whichever is applicable:

- The complete terms and conditions of sub-capacity WLC are defined in the IBM Customer Agreement - Attachment for System z Workload License Charges (Z125-6516).
- The complete terms and conditions for sub-capacity EWLC are defined in the IBM Customer Agreement - Attachment for IBM System z 890 and 800 License Charges (Z125-6587).

Additionally, you must sign and comply with the terms and conditions specified in the amendment to the IPLA contract - *Amendment for IBM System z9® and System z Programs Sub-Capacity Pricing* (Z125-6929). Once the amendment is signed, the terms in the amendment replace any and all previous System z IPLA sub-capacity terms and conditions.

IBM Getting Started Sub-capacity Pricing for z/OS IPLA Software applies.

**Sub-capacity utilization determination**

Sub-capacity utilization is determined based on the utilization of an eligible operating system and machine (for example, z/OS running in z/Architecture (64-bit) mode on a System z ((or equivalent) server).

**On/Off Capacity on Demand (CoD)**

To be eligible for On/Off CoD pricing, you must be enabled for temporary capacity on the corresponding hardware, and the required contract, Attachment for IBM System z On/Off Capacity on Demand (Z125-7883) must be signed prior to use.
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

For all local charges, contact your IBM representative.

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