IBM Machine Learning for z/OS, V1.2 is designed to enhance the up and running experience and availability and scalability of the scoring service

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At a glance

IBM(R) Machine Learning for z/OS(R) offers a hybrid cloud approach to model lifecycle management and collaboration designed to help organizations innovate and transform on an enterprise scale. It helps data scientists more quickly develop, deploy, and monitor behavioral models that continually learn as new data is introduced. It helps data scientists through:

• Platform-agnostic model development
• Enterprise-grade, collaborative, extensible open source software
• Real-time insights embedded with transactions
• Reliability, availability, and encryption in a security-rich environment

Version 1.2 of Machine Learning for z/OS provides greater flexibility, enabling organizations to train and deploy models across platforms. For example, models can be trained on Linux(R) x86 and then deployed on IBM Z where transactions originate. Models can also be developed on premises, behind the firewall, and then saved and published to the IBM Cloud.

Overview

IBM Machine Learning for z/OS (IBM MLz) offers organizations the ability to leverage their enterprise data for use in analytics while benefiting from the qualities of services like security, reliability, and resiliency, of the IBM Z platform.

Capabilities delivered with IBM MLz include:

• A community and project management feature for sharing and facilitating ease of collaboration across teams
• Support for multiple programming languages, including Scala, Python, and R, to help ensure that data scientists can use the languages with which they are most familiar
• An integrated Jupyter notebook, providing a programmatic approach to model development
• A Visual Model Builder graphical user interface to provide a guided approach to model development for the persona with limited programming backgrounds
• A Model Management Dashboard to monitor the accuracy and health of deployed models
• An Administration Dashboard user interface for system programmers to use to manage system configurations, set up and monitor scoring services, provision user access and privileges, and configure available kernels.

IBM has designed version 1.2 to enhance the performance of the scoring engine in IBM MLz to help meet service level agreements for transactions originating from IBM CICS®. In addition to the performance of the scoring service, another area of investment is the flexibility that IBM MLz provides across platforms. For example, models can be trained and developed on open platforms like Linux and then deployed on IBM z®/OS for transactions that originate on IBM Z. The IBM MLz solution also has the ability to connect to Spark clusters outside of the program for additional computing power and data access when training a model off IBM Z. Models developed with IBM MLz can also be saved and published to the IBM Data Science Experience or IBM Watson® Machine Learning services on IBM Cloud. In this sense, IBM is providing a complete hybrid cloud solution for machine learning to help clients to create and deploy models based on their data strategy.

Since the general availability of version 1.1, IBM MLz has delivered new capabilities and enhancements in regular intervals. Noteworthy new features include:

• Ability to support the Predictive Model Markup Language (PMML). The PMML models that are created using IBM SPSS®, R, or other tools can be imported into IBM MLz for model lifecycle management and continuous learning capabilities, such as model evaluation, monitoring, and feedback data collection.

• Ability to provide high-performance online scoring engine optimization. This feature is a new scoring engine for Spark models based on the open source technology MLEAP. Each Spark model created within IBM MLz will be automatically converted to and saved in MLEAP format.

• Ability to provide high availability scoring service. This feature enables multiple scoring service clusters to be configured on a single IBM MLz system. Each scoring cluster can contain multiple scoring service instances across LPARs achieved through exploitation of the sysplex distributor and share port technology on IBM Z.

• Use of the model governance - role-based user access control and audit trace. This feature enables the system administrator to define multiple roles in IBM MLz, including model developer, model administrator, application developer, and system administrator. Each role has specific privileges, which enables effective collaboration and model governance. Furthermore, in version 1.2, users will be able to create audit traces for key events in the system to help address compliance requirements.

• Enables use of agile model version control. This feature enables IBM MLz users to create and maintain multiple versions for a single model. Different versions of a model can be deployed across multiple scoring services or clusters. For example, users can deploy a new version of a model to the test environment, while the prior version continues to run in the production environment. When testing completes, the model can be moved into production.

• Enables use of the Integrated Online Scoring Service in CICS. CICS is the transaction system of choice on IBM Z with Db2® for z/OS. For a CICS application to call the RESTful API of IBM MLz to trigger the scoring service, however, introduces latency. IBM MLz now enables the scoring services to execute within a CICS region, allowing COBOL developers to use LINK TO LIBERTY to call the scoring service. This can result in a significant performance boost for a scoring call from transactions running in CICS.

• The Db2 IT Operational Analytics (ITOA) solution template. The Db2 ITOA solution template delivers a System Health Tree sample application to give clients an example of a potential use case for IBM MLz. The solution template demonstrates how clients can apply machine learning technologies available through IBM MLz to operational data, such as SMF records, to gain additional insight into the health of their IBM Db2 for z/OS subsystems. By plugging in historical operational data to the solution template, the sample application can build dynamic base lines for Db2 for z/OS key performance indicators (KPI). These KPIs can then be visualized in the application user interface, giving users a way to monitor the health status of their Db2 for z/OS subsystems. With version
1.2, users can also plug in real-time IT operational data to monitor current Db2 for z/OS health status.

- Support for IBM z14 Model ZR1. IBM MLz supports the IBM z14 Model ZR1 taking advantage of this all-in-one solution that offers maximum security and flexibility, in an industry-standard footprint for entry-level enterprise server quality. The ZR1 announcement highlights not only the advances of the z14 in encryption and security technologies, but also the way businesses can realize the benefits of shared-everything scalability, capacity on demand, and flexibility across internal, external, and microservices platforms. For more information, see Hardware Announcement 118-018, dated April 10, 2018.

Key prerequisites

Machine Learning for z/OS, V1.2 requires:

- IBM z/OS V2.1 (5650-ZOS), or later
- IBM Open Data Analytics for z/OS, V1.1 (5655-OD1) for License and 5655-OD2 for Subscription and Support, with bash 4.2.53
- Any of the following Db2 for z/OS products:
  - IBM Db2 for z/OS, V12.1 (5650-DB2®)
  - IBM Db2 for z/OS Value Unit Edition, V12.1 (5770-AF3)
  - IBM Db2 for z/OS, V11.1 (5615-DB2), or later
  - IBM Db2 for z/OS Value Unit Edition, V11.1 (5697-P43), or later
  - IBM DB2 for z/OS, V10.1 (5605-DB2), plus APAR PI13725, or later
  - IBM DB2 for z/OS Value Unit Edition, V10.1 (5697-P31), plus APAR PI13725, or later
- IBM 64-bit SDK for z/OS, Java™ Technology Edition, V8 (5655-DGH), Refresh 4 Fix Pack 6, or later

Planned availability date

May 25, 2018

Description

Data scientists and the business teams that depend on them, want to get the most out of the models that they develop. To help data scientists more easily develop, deploy, and monitor behavioral models IBM introduced IBM MLz, an enterprise-grade, collaborative and extensible machine learning offering.

Through a hybrid cloud approach to model life-cycle management and collaboration IBM MLz gives data science teams the flexibility to train and evaluate their models on their platform of choice. And for organizations that develop models on other platforms, using Spark or Python, they can easily deploy these models on IBM Z, where most of their transactions occur and most of their enterprise data originates. Scoring can be integrated with transactional applications, without significant overhead, enabling insight at the point of interaction.

IBM MLz is built on open source components but delivers even more through IBM’s unique patented features that enable data science teams to collaborate productively.

- With IBM MLz, data engineers, application developers and data scientists can share assets, help simplify deployment with RESTful APIs, and help facilitate the management and monitoring of the hundreds to thousands of enterprise models.
- Leveraging modern RESTful APIs, IBM MLz makes it easy to deploy and call a model for scoring new data.
• IBM MLz supports data scientists with both a visual model building interface and a Jupyter notebook interface.
• IBM MLz can evaluate the performance of models as they are exposed to new data. Data scientists can set a threshold for when they want to be notified, if model performance deteriorates. They can also schedule regular model evaluations and feedback data can be stored for retraining.

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### Offering Information

Product information is available on the [IBM Offering Information](https://www.ibm.com) website.

### Business Partner information

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

**BP Attachment for Announcement Letter 218-111**

### Publications

The following publications are shipped with the product.

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Additional technical information can be found in [IBM Knowledge Center](https://www.ibm.com).

### Services

#### 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, contact your Lab Services Sales or Delivery Leader.

## Technical information

### Specified operating environment

#### Hardware requirements

The IBM MLz, V1.2 component on z/OS requires one of the following Z servers running IBM z/OS V2.1 (5650-ZOS), or later:

- IBM z14
- IBM z13(R)
- IBM zEnterprise(R) EC12

It is recommended that clients allocate four or more zIIP processors, one general purpose processor, and 100 GB or more memory to the LPAR where IBM MLz will operate.

The IBM MLz component on Linux requires an x86 hardware or IBM s/390x hardware and virtual environment.

To support IBM MLz on Linux x86, three x86 (virtual) systems with 8-core CPU, 32 GB memory, and 250 GB disk each is recommended with a minimum of 650 GB secondary storage for each server.

To support IBM MLz, V1.2 on Linux on Z, three s390x 64-bit servers with three IFL processors, 32 GB memory, and 250 GB disk each is recommended with a minimum of 650 GB secondary storage for each server.

1 This information provides only general descriptions of the types and portions of workloads that are eligible for execution on specialty engines (SEs). IBM authorizes clients to use IBM SEs such as zIIPs, zAAPs, and IFLs only to execute the processing of Eligible Workloads of specific programs expressly authorized by IBM as specified in the Authorized Use Table for IBM Machines (AUT). No other workload processing is authorized for execution on an SE. IBM offers SEs at a lower price than general processors and central processors because clients are authorized to use SEs only to process certain types or amounts of workloads as specified by IBM in the AUT.

#### Software requirements

**Mandatory installation requisites**

The IBM MLz, V1.2 component requires the following:

- IBM z/OS V2.1, or later

The IBM MLz component requires the following:

- Red Hat 7.2, or later
- One additional IP address as a proxy IP for the three Linux systems in the same subnet as the three Linux systems where it connects to the backend z/OS system

**Mandatory operational requisites**

The IBM MLz, V1.2 component requires the following:

- IBM Open Data Analytics for z/OS, V1.1 (5655-OD1 for License and 5655-OD2 for Subscription and Support) with bash 4.2.53
- Any of the following Db2 for z/OS products:
- IBM Db2 for z/OS, V12.1 (5650-DB2)
- IBM Db2 for z/OS Value Unit Edition, V12.1 (5770-AF3)
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- IBM Db2 for z/OS Value Unit Edition, V10.1 (5697-P31), plus APAR PI13725, or later
- IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (5655-DGH), Refresh 4 Fix Pack 6, or later
- Gzip 1.6
- IBM Tivoli(R) Directory Server for z/OS LDAP (a component of z/OS V2.1, or later)
- z/OS Integrated Cryptographic Service Facility (ICSF) (a component of z/OS V2.1, or later)

**Limitations**

Additional information can be found on the License Information documents web page found on the IBM Software License Agreement website.

**IBM Electronic Support**

The IBM Support Portal is your gateway to technical support. This includes IBM Electronic Support tools and resources, for software and hardware, to help save time and simplify support. The Electronic Support tools can help you find answers to questions, download fixes, troubleshoot, automate data collection, submit and track problems through the Service Request online tool, and build skills. All these tools are made available through your IBM support agreement. Read about the Electronic Support portfolio of tools on the IBM Electronic Support website.

You can also access the IBM Support Portal page and the online Service requests and PMRs tool for more support.

**Planning information**

**Packaging**

The program in this announcement is distributed with the following content:

- Basic machine-readable material
- Program Directory
- IBM International Program License Agreement (IPLA)
- IBM Agreement for Acquisition of Software Maintenance (IAASM)

**Security, auditability, and control**

The announced product uses the security and auditability features and functions of host hardware, host software, and application software.

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

**Ordering information**

**Ordering z/OS through the Internet**

Shopz 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). For more details and availability, go to the Shopz website.

Charge metric

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Basic license

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: IBM Machine Learning for z/OS, V1.2

Program PID: 5698-ML1

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Customized Offerings

Product deliverables are shipped only through CBPDO and ServerPac. 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, go to the Help section on the Shopz website.

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 the month following their availability in CBPDO. z/OS can be ordered through CBPDO and ServerPac 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 CFSW will determine the eligibility based on product requisite checking. For more details on the product ServerPac, go to the Help section on the Shopz website.

For additional information about the Product ServerPac option, see Software Announcement 212-272, dated July 31, 2012.

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 four weeks after general availability.

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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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.

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

Agreement for Acquisition of Software Maintenance

The following agreement applies for Software Subscription and Support (Software Maintenance) and does not require client signatures:
- IBM Agreement for Acquisition of Software Maintenance (Z125-6011)

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 z Systems® Operational Support Services - SoftwareXcel is an option if you desire added services.

License Information number

GC27-9132

See the License Information documents page on the IBM Software License Agreement website for more information.

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, see the IBM Software 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 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**

Yes. During the Software Subscription and Support period, for the unmodified portion of a program, and to the extent problems can be recreated in the specified operating environment, IBM will provide the following:

- Defect correction information, a restriction, or a bypass.
- Program updates: Periodic releases of collections of code corrections, fixes, functional enhancements and new versions and releases to the program and documentation.
- Technical assistance: A reasonable amount of remote assistance by telephone or electronically to address suspected program defects. Technical assistance is available from the IBM support center in the organization’s geography.

Additional details regarding Technical Assistance, which includes IBM contact information, are provided in the IBM Software 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.
- Failures caused by products for which IBM is not responsible under the IBM Agreement for Acquisition of Software Maintenance.

Software Subscription and Support is provided only if the program is within its support timeframe as specified in the Software Support Lifecycle policy for the program.
Variable charges apply

No

Educational allowance available

Yes. A 15% education allowance applies to qualified education institution clients.

Multi-Version Measurement

Multi-Version Measurement (MVM) replaces the previously announced Migration Grace Period time limit of six months and allows unlimited time for clients to run more than one eligible version of a software program. Clients may run multiple versions of a program simultaneously for an unlimited duration during a program version upgrade. Clients may also choose to run multiple versions of a program simultaneously for an unlimited duration in a production environment. MVM does not extend support dates for programs withdrawn from service.

For more information about MVM, including requirements for qualification, see the MVM web page. For a list of eligible programs, see the IPLA Execution-Based web page.

Statement of good security practices

IT system security involves protecting systems and information through intrusion 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 regulatory compliant, comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective.

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

Prices

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

Registered external customers and IBM Business Partners can access IBMLink to view pricing information.

Specify "Price type," "Search type," and "Search value," then click "Search."

Note: Enter program number in the "Search value."

Order now

To order, contact the IBM Digital Sales Center, your local IBM representative, or your IBM Business Partner. To identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968). For more information, contact the IBM Digital Sales Center.

Phone: 800-IBM-CALL (426-2255)
The IBM Digital Sales Center, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

**Note:** Shipments will begin after the planned availability date.

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