IBM Open Enterprise SDK for Go 1.16 brings the popular Go programming language for quickly building scalable applications for the IBM z/OS platform

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At a glance

IBM$^{(R)}$ Open Enterprise SDK for Go 1.16 enables organizations to run the Go programming language on the IBM z/OS$^{(R)}$ platform. The solution includes:

- A native Go compiler to enable new and existing applications written in Go to run on z/OS
- The capability to create Go applications that provide for cross-platform consistency in application development and deployment
- Enablement of a recent Go release from the golang community to provide you with many of the latest features
- The Go Standard Runtime Library, which provides an extensive set of functions that can save development resources in creating applications
- Support for Go modules and multithreading
- Support for the standard UTF-8 Unicode
- Support for cgo, which enables Go to call C code
- Access to additional packages available from the GoPath directory, which enables more ready-to-use features
- Optional IBM Subscription and Support to provide access to the IBM Compiler Service and Support team for world-class support
- Program licenses available at no charge

Overview

Open Enterprise SDK for Go 1.16 is an industry-standard Go compiler for the z/OS platform. This offering makes available the popular Go programming language to z/OS application developers. It brings a powerful framework for quickly building scalable applications to the z/OS platform. A simple programming syntax, rich ecosystem of packages, capability to interact with other languages and platforms, and strong community support across multiple industries are driving the popularity of Go.

Open Enterprise SDK for Go 1.16 enables IBM Z$^{(R)}$ clients to take advantage of this burgeoning technology to power digital transformation on the IBM Z platform. Because of its relatively easy-to-learn syntax, it enables clients to access a wide variety of new talent for application development and modernization. The rich Go ecosystem of packages enables clients to develop and run applications, especially those that enable the cloud on z/OS. Because of the ecosystem of Go modules and

the small size of the language's syntax, application developers typically can deliver Go applications in a shorter time and with fewer new lines of code, resulting in lower costs.

As global economic conditions continue to accelerate the need for businesses to focus on digital transformation, the demand for fast, secure, and modern cloud-native applications on the platform continues to increase. This offering enables organizations to add new workloads and connect z/OS to their private cloud, accelerating their digital transformation and journey to hybrid cloud.

Go has emerged as the language of choice for many cloud-native operations. It forms the foundation for container orchestration such as Kubernetes, containerization technology such as Open Container Initiative, and container application platforms such as Red Hat[R] OpenShift[R].

Open Enterprise SDK for Go 1.16 is available without charge from Shopz and is downloadable and installable via the familiar System Modification Program Extended (SMP/E) install tool. There is an option to receive service and support by ordering IBM Subscription and Support for a charge. The ability to obtain service and support means Open Enterprise SDK for Go can be used for production environments.

This delivery demonstrates the longstanding support for open source software by IBM and its commitment to delivering enterprise-level compiler offerings. It also reflects IBM's ongoing effort to advance the z/OS platform.

Key requirements

IBM Z servers that support z/OS V2R4 (5650-ZOS), or later.

Planned availability date

March 12, 2021

Description

Open Enterprise SDK for Go

Open Enterprise SDK for Go is the latest addition to the IBM family of compiler development tools. It brings a powerful framework for building fast and scalable applications to z/OS, and provides the facility to write applications in support of cloud infrastructures. It can take advantage of the colocation of your data and existing applications on IBM Z to increase throughput and reduce response time. You can control which data will be exposed externally, while keeping all of your proprietary data secure inside the IBM Z platform.

Open Enterprise SDK for Go is available at no charge from Shopz and can be installed using the familiar SMP/E install tool. It is implemented as a 64-bit application on z/OS UNIX[R] System Services.

Benefits of Go

Open Enterprise SDK for Go brings another popular programming language to the z/OS platform. Application developers say that the Go programming language is the C for the 21st Century. The capabilities and widespread use of Go make it a natural addition to the z/OS as it continues to advance and support application modernization.

A compiled language. Go is a compiled language. When you finish writing your application, your Go source code is converted into machine-level code that can be

read directly by z/OS instead of being run through an interpreter every time your application is run.

Go applications are fast. Your source code is converted into an executable file that can be distributed to run the program on other machines. This makes for easier deployment of your applications.

Error checking. As a compiler, Go can check for errors such as variables that are not used, packages that are missing, and even incorrectly typed operators. As a compiler, Open Enterprise SDK for Go helps you to discover errors during the build process rather than at run time.

Garbage collection. One of the key features of the Go language is its capability to perform garbage collection, or automatic memory management. Go provides extensive control over memory allocation.

Scalability, concurrency, and parallelism. Go was designed to support scalability. As applications grow, they need to handle many smaller sub-tasks concurrently. This is especially true for web applications. Running multiple tasks within an application is called *concurrency*. Go has many built-in features designed to handle concurrency, most notably *goroutines* and *channels*.

A goroutine is a function that is capable of running concurrently with another goroutine. Goroutines can be thought of as lightweight threads. They are managed by the Go runtime instead of the operating system and can consume fewer resources.

Channels provide a way for goroutines to communicate with one another and synchronize their execution. Channels can prevent race conditions from occurring, especially when accessing shared memory using goroutines.

The multitasking aspects of concurrency are possible in single-core processors. With multi-core processors and with Go you can raise the concept of concurrency to true parallel programming for increased scalability of your applications.

Simplicity. Go is an easy-to-understand language. The language specification document is small, making the language easy to learn and easy to write.

The main goal of creating Go was to combine the best features of other programming languages, including:

- Ease of use, together with state-of-the-art productivity
- High-level efficiency, along with static typing
- Advanced performance for networking and the full use of multi-core power

Static typing. Go is a statically typed and strongly typed language. This enables Go to catch classes of bugs at compile time rather than at run time. Go has primitive types like **int** , **byte** , **string** , and **structs** . For your convenience, Go also has built-in types for lists and maps.

Although dynamically typed languages are more flexible and can save you time and space, statically typed languages don't wait until run time to show issues that are often difficult to debug. A statically typed language like Go can provide better performance at run time because the types do not have to be checked dynamically while executing (the typing was already checked before running). A statically typed language can provide better performance at run time because the knowledge of types enables machine code optimization.

Extensive standard library and growing list of third-party packages

Go offers an extensive set of standard libraries and additional third-party packages. Go's large set of standard libraries includes highly used programming tasks in areas like string operations, cryptology, archiving, mail operations, Unicode encoding and decoding, math routines, networking, error manipulation, operating system interfaces, and other popular functions. These packages encourage code reuse.

In addition to the standard library, there is a growing collection of freely available packages from the Go community. These modules are available from the GoPath directory that is accessible from the Golang community website. These packages have been contributed to the Go community by current Go programmers.

With the rich ecosystem of modules in the Go standard library and GoPath directory, application developers can make reuse of these modules to fulfill common programming tasks. Developers can implement business functions with fewer lines of code, which can help to shorten development times and reduce costs. The continued contribution of modules from the community ensures a steady stream of new libraries and tools.

IBM and open source

Originally from Google, Go is now open source and is continually being improved by the open source community. Go boasts an ever increasing and passionate community of coders and enthusiasts. Go's development and support have been driven by the collaboration of this community. There is continual refinement, which helps ensure that Go solutions are as mature as possible. This community also contributes numerous additional modules to the Go collection of packages.

With the initial release of Open Enterprise SDK for Go being an enablement of one of the latest Go community versions, IBM maintains a high level of currency with releases from the Golang open source community. In this way, z/OS clients can enjoy the functionality of latest Go release from Golang.

Value Unit-based pricing

Value Unit pricing for eligible IBM Z IBM International Program License Agreement (IPLA) programs enables a lower cost of incremental growth and enterprise aggregation. Each IBM 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 IBM 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 IBM Z IPLA program that you have acquired is referred to as **entitled license capacity** . If you wish to grow your entitled license capacity for an IBM Z IPLA program, the calculation to determine additional needed Value Units is based upon the number of Value Units already acquired.

For each IBM 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, see the IBM Z Software Pricing website.

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

To determine the required license capacity for the IBM Z IPLA program you selected, see the Terms and conditions section.

Program number

Program number	VRM	Program name
5655-GOZ	1.16	IBM Open Enterprise SDK for Go

Program number	Subscription and Support PID number
5655-GOZ	5655-GOS

Offering Information

Product information is available on the IBM Offering Information website.

Publications

Documentation for Open Enterprise SDK for Go can be found in IBM Knowledge Center.

Additional documentation on the use of Go is available at golang.org.

Services

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.

Technical information

Specified operating environment

Hardware requirements

Open Enterprise SDK for Go 1.16 runs on IBM Z servers that support z/OS V2R4 (5650-ZOS), or later.

Required hard disk space is a minimum of 1.3 GB.

Software requirements

Open Enterprise SDK for Go 1.16 requires z/OS V2R4, or later.

IBM Sub-Capacity Reporting Tool (SCRT) V28.1.2, or later, is required for creating subcapacity reports for Open Enterprise SDK for Go 1.16 (5655-GOZ).

See the Program Directory for additional details.

IBM Support

IBM Support is your gateway to technical support tools and resources that are designed to help you save time and simplify support. IBM Support can help you find answers to questions, download fixes, troubleshoot, submit and track problem

cases, and build skills. Learn and stay informed about the transformation of IBM Support, including new tools, new processes, and new capabilities, by going to the IBM Support Insider.

Planning information

Packaging

The Open Enterprise SDK for Go 1.16 package includes:

- Basic machine-readable material on the client-selected distribution medium
- Program Directory (GI13-5515-00)
- Licensed Information DVD (LCD7-7804-00)

Security, auditability, and control

Open Enterprise SDK for Go uses the security and auditability features of the host hardware.

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

Consult your IBM representative.

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

Program number	Program name	Value Unit exhibit
5655-GOZ	IBM Open Enterprise SDK for Go 1.16	VUE007

For each IBM 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 IBM 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

	MSUs minimum	MSUs maximum	Value Units/MSU
Base	1	3	1
Tier A	4	45	0.45
Tier B	46	175	0.36
Tier C	176	315	0.27
Tier D	316	+	0.20

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 IBM Z IPLA product, the applicable Value Units would be:

Tier	MSUs	Multiplied by Value Units per MSU	Equal Value Units
Base	3	1.00	3.00

Tier	MSUs	Multiplied by Value Units per MSU	Equal Value Units
Tier A	42	.45	18.90
Tier B	130	.36	46.80
Tier C	140	.27	37.80
Tier D	1,185	.20	237.00
Total	1,500		343.50

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

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.

IBM Configurator for e-business (e-config)

IBM Open Enterprise SDK for Go 1.16 (5655-GOZ)

Program number	Feature description
5655-GOZ	IBM Open Enterprise SDK for Go 1.16

Charge metric

The charge metric for this licensed product can be found in the following License Information document:

Program identifier	License Information document title	License Information document number
5655-GOZ	IBM Open Enterprise SDK for Go 1.16	L-JYIP-BWE4E9

Select your language of choice and scroll down to the Charge Metrics section. Follow-on releases, if any, may have updated terms. See the License Information documents website for more information.

Basic license

On/Off CoD

IBM Open Enterprise SDK for Go 1.16 is eligible for On/Off CoD with a temporary use charge calculated based on MSUs per-day usage.

Program name IBM Open Enterprise SDK for Go 1.16

Program number 5655-GOZ

Entitlement identifier	Description	License option/Pricing metric
S018JSG	IBM Open Enterprise SDK for Go 1.16	Basic OTC, Per MSU-day TUC, MultiVersion Measurement No Charge Value Units

Translation from MSUs to Value Units

	MSUs	Value Units/MSU
Base	1-3	1.00
Tier A	4-45	0.45
Tier B	46-175	0.37
Tier C	176-315	0.26
Tier D	316 or greater	0.20

To order, specify the program ID number and the appropriate license or charge option. To suppress shipment of media, select the license-only option in CFSW.

Program name: IBM Open Enterprise SDK for Go 1.16

Program ID: 5655-GOZ

Entitlement identifier	Description	License option/Pricing metric
S018JSG	IBM Open Enterprise SDK for Go	Basic OTC, per Value Units
		MultiVersion Measurement NC

Orderable supply ID	Language
S018JSH	US English

IBM recommends internet delivery. However, if you still require physical media, you can choose DVD.

Subscription and Support Program ID: 5655-GOS

Entitlement identifier	Description	License option/Pricing metric
S018JSK	IBM Open Enterprise SDK for Go Subscription and Support	**Pricing metric:** Value Units
		License options:
		Decline Subscribe and Suppt, No Charge
		MultiVersion Measurement S&S No Charge
		SW Subscription and Support Annual Support Charge
		SW Subscription and Support Monthly Support Charge
		Pricing metric: Per MSU
		License options:
		SW Subs and Sup Rgst, No Charge

Orderable supply ID	Language
S018JSL	US English

Subscription and Support

To receive voice technical support by 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 ID referenced above and the appropriate license or charge option.

IBM is also providing Subscription and Support for these programs with a separately purchased offering under the terms of the IBM International Agreement for Acquisition of Software Maintenance. This offering:

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

When Subscription and Support is ordered, the charges will automatically renew annually unless canceled 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 IBM 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.

Customized Offerings

Product deliverables are shipped only through CBPDO, ServerPac, SystemPac, FunctionPac, and ProductPac[(R)].

These customized offerings are offered for internet delivery from Shopz. For more details on internet delivery, go to the Help section on the Shopz website.

IBM recommends internet delivery. However, if you still require physical media, you can choose DVD.

Many products can be ordered in ServerPac, SystemPac, FunctionPac, and ProductPac the month following their availability in CBPDO. z/OS can be ordered through CBPDO, ServerPac, and SystemPac on the planned availability date. 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.

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

- CBPDO shipments will begin one week after the planned availability date.
- ServerPac, SystemPac, FunctionPac and ProductPac shipments will begin four weeks after the planned availability date 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[(R)] 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.

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

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 International 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 Operational Support Services - Support Line is an option if you desire added services.

License Information number

The following License Information document applies to the offering in this announcement:

Program identifier	License Information document title	License Information document number
5655-GOZ	IBM Open Enterprise SDK for Go 1.16	L-JYIP-BWE4E9

Follow-on releases, if any, may have updated terms. See the License Information documents 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 Support Guide.

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

Program technical support

Technical support of a program product version or release will be available for a minimum of two years from the planned availability date, as long as your Software Subscription and Support (also referred to as Software Maintenance) is in effect.

This technical support allows you to obtain assistance (by telephone or electronic means) from IBM for product-specific, task-oriented questions regarding the installation and operation of the program product. Software Subscription and Support (Software Maintenance) also provides you with access to versions, releases, and updates (CD releases, Long Term Support Releases or fixes) of the program. You will be notified, through an announcement letter, of discontinuance of support with six months' notice.

If you require additional technical support from IBM, including an extension of support beyond the discontinuance date, contact your IBM representative or IBM Business Partner. This extension may be available for a fee.

For additional information on the IBM Software Support Lifecycle Policy, see the IBM Software Support Lifecycle Policy website.

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 Support Guide.

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.

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

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 by telephone and, if available, electronic access, only to your information systems (IS) technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, go to the IBM Support Handbooks page.

Software Subscription and Support does not include assistance for the design and development of applications, your use of programs in other than their specified

operating environment, or failures caused by products for which IBM is not responsible under this agreement.

IBM Operational Support Services - Support Line

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 clients.

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

ESAP available

Yes, to qualified 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.

Sub-capacity terms and conditions

For each IBM 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 IBM 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 IBM Z IPLA program you selected, see the Ordering information section.

Program number	Program name	Terms	Parent, if applicable
5655-GOZ	IBM Open Enterprise SDK for Go 1.16	Execution-based	Not applicable

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 an IBM Z IPLA program with these terms equals the MSU-rated capacity of the machines where the IBM Z IPLA program executes.

For more information on mainframe MSU-rated capacities, go to the IBM Z software pricing resources webpage.

Reference-based: The required license capacity of a IBM 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 an IBM Z IPLA sub-capacity program with these terms equals the capacity of the LPARs where the IBM Z IPLA program executes.

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

Reference-based: The required license capacity of an IBM 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 an IBM Z IPLA program with full machine-based terms equals the MSU-rated capacity of the machines where the IBM Z IPLA program executes.

For more information on mainframe MSU-rated capacities, see the *IBM z Systems*$^{(R)}$ *Machines Exhibit*, Z125-3901, or see the Exhibits section on the IBM Z software pricing resources webpage.

IBM Z IPLA sub-capacity programs with reference-based terms add value to the parent program across the environment, regardless of where in the environment the IBM Z IPLA program executes.

An environment is defined as either a single or stand-alone machine or a qualified Parallel Sysplex$^{(R)}$. You may have one or more different environments across the enterprise. To determine the required license capacity for each IBM Z IPLA program with referenced-based terms, each environment should be assessed separately.

When an IBM Z IPLA sub-capacity program with reference-based terms is used in a qualified Parallel Sysplex environment, the required license capacity of the IBM Z IPLA program must equal the license capacity of the parent program across the Parallel Sysplex. Qualified Parallel Sysplex refers to one where MLC pricing is aggregated across the sysplex.

Sub-capacity eligibility

To be eligible for sub-capacity charging on select IBM Z IPLA programs, you must first implement and comply with all terms of one of the following:

• Sub-capacity Workload License Charges (WLC)
• Sub-capacity Entry Workload License Charges (EWLC)
• Sub-capacity Advanced Workload License Charges (AWLC)
• Sub-capacity Advanced Entry Workload License Charges (AEWLC)

To implement sub-capacity WLC, EWLC, AWLC, or AEWLC, a machine must be an IBM Z (or equivalent). On that machine:

• All instances of the OS/390 operating system must be migrated to the z/OS operating system.

- 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[R] (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, go to the IBM Z software pricing tools webpage.

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 z Systems[R] Workload License Charges* (Z125-6516).
- The complete terms and conditions for sub-capacity EWLC are defined in the *IBM Customer Agreement - Attachment for EWLC, TWLC, zELC, and z/OS.e License Charges* (Z125-6587).

You must comply with all of the terms of the AWLC or AEWLC offering, whichever is applicable:

- The complete terms and conditions for AWLC are defined in the *IBM Customer Agreement - Attachment for IBM System z[R] Advanced Workload License Charges* (Z125-8538).
- The complete terms and conditions for AEWLC are defined in the *IBM Customer Agreement - Attachment for IBM System z Advanced Entry Workload License Charges* (Z125-8755).

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

Sub-capacity utilization determination

Sub-capacity utilization is determined based on the product's own execution as reported to IBM in accordance with the requirements for reporting sub-capacity utilization for products.

On/Off 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 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 all local charges, contact your IBM representative.

Announcement countries

All European, Middle Eastern, and African countries, except Islamic Republic of Iran, Sudan, and Syrian Arab Republic.

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