

# IBM Open Enterprise SDK for Go 1.18 delivers enhancements to implement generics and workspaces support for Go programmers on the IBM z/OS platform

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## At a glance

IBM<sup>(R)</sup> Open Enterprise SDK for Go 1.18 enables organizations to run the Go programming language on the IBM z/OS<sup>(R)</sup> platform. Enhancements in this release include the following:

- Generics to allow Go programmers to represent functions and data structures in a generic form
- Workspaces to make it easier to work on multiple modules
- Fuzzing to make testing more comprehensive and easier

## Overview

Open Enterprise SDK for Go is the latest addition to the IBM family of compiler development tools. It offers a powerful framework for building fast and scalable applications for 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 the IBM Z<sup>(R)</sup> platform to increase throughput and reduce response time. You can control which data will be exposed externally, while keeping all your proprietary data secure inside the IBM Z platform.

New features in Open Enterprise SDK for Go 1.18 from the Go 1.18 open source community include the following:

- Generics to allow you to represent functions and data structures in a generic form
- Workspaces to improve working with multiple modules
- Fuzzing to provide for automated testing

Open Enterprise SDK for Go 1.18 is available at no charge from Shopz and is downloadable and installable through 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.

You have the flexibility to download and install Open Enterprise SDK for Go from a PAX (Portable Archive eXchange) file. See the [Open Enterprise SDK for Go](#) product page for a link to where you can download the PAX file. The PAX file for this offering is available at no charge. However, there is no service and support available for the PAX file. The optional IBM S&S is only available through Shopz.

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## Key requirements

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An IBM Z server that supports z/OS V2.4 (5650-ZOS), or later

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## Planned availability date

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June 24, 2022

Availability within a country is subject to local legal requirements.

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## Description

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Open Enterprise SDK for Go 1.18 includes the following new features from the Go open source community:

### Generics

Generics allow Go developers to represent functions and data structures in a generic form. With generics, Go developers can declare and use functions or types that are written to work with any of a set of types provided by calling code. They can add optional type parameters to type and function declarations.

### Workspaces

Go 1.18 adds the workspace mode to the compiler. Workspaces lets you work in multiple modules simultaneously without having to edit go.mod files for each module.

You can control all your dependencies by simply using a go.work file in the root of your workspace directory.

With Go workspaces, you can more easily identify and work with multiple modules in your src subdirectory that may be part of your many version control repositories which are part of the development of one of more of your source packages.

### Fuzzing

Fuzzing provides for automated testing where a fuzzing engine continuously generates inputs to a program in the fuzzing target.

With fuzzing, random data is run against your test to find issues such as bugs, vulnerabilities, or crash-causing inputs. For example, some examples of vulnerabilities that can be found by fuzzing are SQL injection, buffer overflow, denial of service, and cross-site scripting attacks.

With Go, fuzzing is fully integrated into its toolchain.

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### Value Unit-based pricing

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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 tools](#) website. Select "Download" under VU Converter to obtain the converter tool.

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.

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## Product positioning

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### Open Enterprise SDK for Go

Open Enterprise SDK for Go is the latest addition to the IBM family of compiler development tools. It offers a powerful framework for building fast and scalable applications for 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 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. You can also download the offering as a PAX file. See the product pages for information about where you can download the PAX file. Open Enterprise SDK for Go is implemented as a 64-bit application on z/OS UNIX<sup>®</sup> System Services.

### Benefits of Go

Open Enterprise SDK for Go brings another popular programming language to the z/OS platform. The capabilities and widespread use of Go make it a natural addition to z/OS as the IBM Z platform continues to advance and support application modernization. The benefits of Go include the following:

- Go is a compiled language. When you finish writing your application, your Go source code is converted to machine-level code that can be read directly by z/OS instead of being run through an interpreter every time your application is executed. Go applications typically are fast. Your source code is converted into

an executable file that can be distributed to run the program on other machines. This can enable 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 can help you 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 often need to handle many smaller subtasks 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.
- Goroutines. A *goroutine* is a function that can run 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. 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.
- Concurrency. The multitasking aspects of concurrency are possible in single-core processors. With multicore processors and with Go, you can raise the concept of concurrency to true parallel programming for increased scalability of your applications.
- Simplicity. Go is designed to be an easy-to-understand language. The language specification document is small, which can make the language easy to learn and to write.

### **Guiding principle of Go**

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

- 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 multicore power

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 do not 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. For instance, the typing is 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, cryptography, 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 Golang community websites. These packages have been contributed to the Go community by Go programmers.

With the rich ecosystem of modules in the Go standard library plus community-contributed modules, application developers can reuse 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**

IBM is a recognized leader in the development and dissemination of open source software. Thousands of IBM employees participate in open source projects to expand technologies and strengthen communities. IBM supports the belief that open source is the bedrock of modern computing.

IBM's open source involvement ranges from work with Linux<sup>(R)</sup>, Apache, and Eclipse in the early years of open source software to current work across all layers of the cloud stack, application development, blockchain, AI, machine learning, and quantum computing. IBM has delivered a broad portfolio of offerings based on open source software while helping to build sustainable thriving communities and ecosystems around open source projects that matter to clients.

The delivery of Open Enterprise SDK for Go demonstrates the longstanding support for open source software by IBM and its reputation for delivering enterprise-level compiler offerings. Support for Go is part of IBM's continuing effort to advance and modernize the z/OS platform.

Originally from Google, Go is now an open source language 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.

IBM maintains a high level of currency with releases from the Golang open source community. The IBM compiler technology team continually delivers full releases and interim releases under the continuous delivery model to enable you to obtain the latest functions and security functions from the Golang open source community.

## **Use cases for Open Enterprise SDK for Go 1.18**

From early adopters of Open Enterprise SDK for Go, several use cases have emerged, including the following:

- Modernization in place. Capability to develop APIs, plug-ins, and wrappers to extend business-critical applications using Go for faster delivery, ease of maintenance, and lower cost.
- Enable popular Go applications on z/OS. Capability of applications written in Go on another platform to run more efficiently, securely, and with higher performance on z/OS.
- Interoperate with middleware and applications written in other languages. Capability to communicate and integrate with existing middleware through z/OS Connect APIs and applications written in other languages with `cgo`.
- Develop new applications. Capability to build applications that are more lightweight, use less system resources, and provide better overall performance.

## **Modernization**

Modernization is about delivering the best value to your clients, more quickly. This includes reducing the cost of maintaining your existing applications by updating or extending them. With the latest version of Open Enterprise SDK for Go, IBM brings the benefits of the popular open source Go language to accelerate in-place modernization on z/OS. Go's lightweight characteristics can enable application modernization and development of cloud-native applications in addition to optimizing performance.

## Open Enterprise SDK for Go available through Shopz at no charge

Open Enterprise SDK for Go is orderable at no charge from Shopz and is downloadable and installable through the familiar SMP/E install tool. There is an option to receive service and support by ordering IBM Subscription and Support (S&S) for a charge. This means Open Enterprise SDK for Go from Shopz can be used for production environments because you can obtain service and support on any mission-critical extension application that you write in Go.

## Open Enterprise SDK for Go available as a Portable Archive eXchange (PAX) file at no charge

You have the flexibility to download and install Open Enterprise SDK for Go from a PAX file from the Open Enterprise SDK for Go product page. The PAX file has the same functionality as the version available from Shopz. The PAX file for this offering is available at no charge. However, there is no service and support available for the PAX file. The optional IBM S&S is only available through Shopz. For production deployments requiring IBM S&S, you should order the IBM Open Enterprise SDK for Go from Shopz and also order the optional S&S.

## IBM Service and Support

Open Enterprise SDK for Go offers optional IBM S&S. The IBM Service and Support organization is made up of teams of individuals working together to provide you with the responsive platform and cross-platform software support that you require.

The primary team supporting Open Enterprise SDK for Go is the IBM Compiler Service and Support team. For complex or code-related problems, IBM has specialized skilled service teams with access to the specialists in its development laboratories as required. Therefore, you have access to the right level of IBM expertise when you need it, regardless of where it is located. The vision of IBM Service and Support is to achieve a level of support excellence that exceeds client expectations and differentiates IBM in the marketplace.

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## Program number

Program number	VRM	Program name
5655-GOZ	1.18	IBM Open Enterprise SDK for Go

  

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

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## Offering Information

Product information is available on the [IBM Offering Information](#) website.

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## Publications

For documentation for Open Enterprise SDK for Go, see [IBM Documentation](#).

Additional documentation about the use of Go is available on [The Go Programming Language](#) website.

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## Services

### IBM Systems Lab Services

Systems Lab Services offers infrastructure services to help build hybrid cloud and enterprise IT solutions. From servers to storage systems and software, Systems Lab

Services can help deploy the building blocks of a next-generation IT infrastructure to empower a client's business. Systems Lab Services consultants can perform infrastructure services for clients online or onsite, offering deep technical expertise, valuable tools, and successful methodologies. Systems Lab Services is designed to help clients solve business challenges, gain new skills, and apply best practices.

Systems Lab Services offers a wide range of infrastructure services for IBM Power<sup>(R)</sup> servers, IBM Storage systems, IBM Z, and IBM LinuxONE. Systems Lab Services has a global presence and can deploy experienced consultants online or onsite around the world.

For assistance, contact Systems Lab Services at [ibmsls@us.ibm.com](mailto:ibmsls@us.ibm.com).

To learn more, see the [IBM Systems Lab Services](#) website.

## **IBM Consulting<sup>TM</sup>**

As transformation continues across every industry, businesses need a single partner to map their enterprise-wide business strategy and technology infrastructure. IBM Consulting is the business partner to help accelerate change across an organization. IBM specialists can help businesses succeed through finding collaborative ways of working that forge connections across people, technologies, and partner ecosystems. IBM Consulting brings together the business expertise and an ecosystem of technologies that help solve some of the biggest problems faced by organizations. With methods that get results faster, an integrated approach that is grounded in an open and flexible hybrid cloud architecture, and incorporating technology from IBM Research<sup>(R)</sup> and IBM Watson<sup>(R)</sup> AI, IBM Consulting enables businesses to lead change with confidence and deliver continuous improvement across a business and its bottom line.

For additional information, see the [IBM Consulting](#) website.

## **IBM Technology Support Services (TSS)**

Get preventive maintenance, onsite and remote support, and gain actionable insights into critical business applications and IT systems. Speed developer innovation with support for over 240 open-source packages. Leverage powerful IBM analytics and AI-enabled tools to enable client teams to manage IT problems before they become emergencies.

TSS offers extensive IT maintenance and support services that cover more than one niche of a client's environment. TSS covers products from IBM and OEMs, including servers, storage, network, appliances, and software, to help clients ensure high availability across their data center and hybrid cloud environment.

For details on available services, see the [Technology support for hybrid cloud environments](#) website.

## **IBM Expert Labs**

Expert Labs can help clients accelerate their projects and optimize value by leveraging their deep technical skills and knowledge. With more than 20 years of industry experience, these specialists know how to overcome the biggest challenges to deliver business results that can have an immediate impact.

Expert Labs' deep alignment with IBM product development allows for a strategic advantage as they are often the first in line to get access to new products, features, and early visibility into roadmaps. This connection with the development enables them to deliver First of a Kind implementations to address unique needs or expand a client's business with a flexible approach that works best for their organization.

For additional information, see the [IBM Expert Labs](#) website.

## **IBM Security<sup>(R)</sup> Expert Labs**

With extensive consultative expertise on IBM Security software solutions, Security Expert Labs helps clients and partners modernize the security of their applications, data, and workforce. With an extensive portfolio of consulting and learning services, Expert Labs provides project-based and premier support service subscriptions.

These services can help clients deploy and integrate IBM Security software, extend their team resources, and help guide and accelerate successful hybrid cloud solutions, including critical strategies such as zero trust. Remote and on-premises software deployment assistance is available for IBM Cloud Pak<sup>(R)</sup> for Security, IBM Security QRadar<sup>(R)</sup>/QRoC, IBM Security SOAR/Resilient<sup>(R)</sup>, IBM i2<sup>(R)</sup>, IBM Security Verify, IBM Security Guardium<sup>(R)</sup>, and IBM Security MaaS360<sup>(R)</sup>.

For more information, contact Security Expert Labs at [sel@us.ibm.com](mailto:sel@us.ibm.com).

For additional information, see the [IBM Security Expert Labs](#) website.

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## Technical information

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### Specified operating environment

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#### **Hardware requirements**

Open Enterprise SDK for Go 1.18 runs on IBM Z servers that support z/OS V2.4 (5650-ZOS), or later.

The required hard disk space is a minimum of 1400 MB.

#### **Software requirements**

Open Enterprise SDK for Go 1.18 requires z/OS V2.4, or later.

IBM Sub-Capacity Reporting Tool (SCRT) 28.1.2, or later, is required for creating sub-capacity reports for Open Enterprise SDK for Go 1.18 (5655-GOZ).

See the [Program Directory](#) for additional details.

#### **Companion products**

The following product could be purchased as an upsell or alternative to this product:

#### **IBM Z and Cloud Modernization Stack (5900-A8N)**

IBM Z and Cloud Modernization Stack delivers a foundational IBM Z application and data modernization solution that can enable clients to integrate and extend their IBM Z systems, applications, and data with hybrid cloud environments through the Red Hat<sup>(R)</sup> OpenShift<sup>(R)</sup> Container Platform.

In addition to the suite of essential development and deployment tools, clients also gain access to a core suite of programming languages. Python, Node.js, Go, and Java<sup>™</sup> are included at no additional charge. Clients can extend the capabilities of their current applications with modules written in these open enterprise languages. They can develop new microservices natively on z/OS, leverage the open source communities, and access a vast pool of developers worldwide.

#### **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](#).



## **Additional IBM support**

### **IBM Client Engineering for Systems**

Client Engineering for Systems is a framework for accelerating digital transformation. It helps you generate innovative ideas and equips you with the practices, technologies, and expertise to turn those ideas into business value in weeks. When you work with Client Engineering for Systems, you bring pain points into focus. You empower your team to take manageable risks, adopt leading technologies, speed up solution development, and measure the value of everything you do. Client Engineering for Systems has experts and services to address a broad array of use cases, including capabilities for business transformation, hybrid cloud, analytics and AI, infrastructure systems, security, and more. Contact Client Engineering for Systems at [sysgarage@ibm.com](mailto:sysgarage@ibm.com).

### **Planning information**

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#### **Packaging**

The Open Enterprise SDK for Go 1.18 package includes:

- Basic machine-readable material on the client-selected distribution medium
- Program Directory (GI13-5515-03)
- Licensed Information DVD (LCD7-7804-02)

#### **Security, auditability, and control**

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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.

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## **Ordering information**

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Consult your IBM representative or IBM Business Partner.

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

<b>Program number</b>	<b>Program name</b>	<b>Value Unit exhibit</b>
5655-GOZ	IBM Open Enterprise SDK for Go 1.18	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**

	<b>MSUs minimum</b>	<b>MSUs maximum</b>	<b>Value Units/MSU</b>
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 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 1.18 (5655-GOZ)

Program number	Feature description
5655-GOZ	IBM Open Enterprise SDK for Go 1.18

There is no new ordering information in this release. For available feature numbers, see Software Announcement [ZP21-0054](#), dated January 19, 2021.

## 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 1.18	L-JYIP-CE5NF8

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 1.18 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 1.18

### Program number: 5655-GOZ

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

The ordering information for value unit pricing, including the entitlement identifiers and orderable supply ID is the same as previously announced. For ordering information for IBM Open Enterprise SDK for Go, see Software Announcement

[ZP21-0054](#), dated January 19, 2021.

## **Customized Offerings**

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Product deliverables are shipped only through CBPDO and ServerPac. These customized offerings are offered for internet delivery. 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 the month following their availability in CBPDO. z/OS can be ordered through CBPDO and ServerPac on the planned availability date. Many products will also be orderable in a 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 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 within 3 business days after the planned availability date.
- ServerPac availability and shipments will begin within 3 - 4 weeks after the planned product availability date due to additional customization and data input verification.

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## **Terms and conditions**

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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<sup>(R)</sup> Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

## **Licensing**

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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.

## **Software Maintenance**

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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)

This program is licensed under the IBM International Program License Agreement (IPLA). If S&S is applicable, the associated Agreement for Acquisition of Software Maintenance applies. The associated Agreement for Acquisition of Software Maintenance provides for support with ongoing access to releases and versions of the program. This program has 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.

No

### License Information number

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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 1.18	L-JYIP-CE5NF8

Follow-on releases, if any, may have updated terms. See the [License Information documents](#) website for more information.

### Limited warranty applies

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Yes

### Limited warranty

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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 about 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

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#### Continuous delivery (CD) 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 Subscription and Support 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 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 12 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 about the CD support lifecycle policy, see the [IBM Continuous Delivery Support Lifecycle Policy](#) web page.

For additional information about the IBM Software Support Lifecycle Policies, see the [Standard and enhanced IBM software support lifecycle policies](#) website.

### Money-back guarantee

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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)**

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No

### **Passport Advantage applies**

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No

### **Software Subscription and Support applies**

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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.

For operating system software, the revised IBM Technology Support Services - Support Line for IBM Z offering provides usage and how-to support for those operating systems and associated products that are not available with the Software Subscription and Support (Software Maintenance) offering.

This can 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, see the [Supported Product List](#) website.

### **IBM Technology Support Services - Support Line for IBM Z**

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No

### **Variable charges apply**

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No

### **Educational allowance available**

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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**

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Yes, to qualified clients.

### **Multi-Version Measurement**

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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 a list of eligible programs, see the [IPLA Execution-Based](#) web page.

### **Sub-capacity terms and conditions**

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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 about the Value Unit Exhibit for the IBM Z IPLA program you selected, see the [Ordering information](#) section.

<b>Program number</b>	<b>Program name</b>	<b>Terms</b>	<b>Parent, if applicable</b>
5655-GOZ	IBM Open Enterprise SDK for Go 1.18	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 about mainframe MSU-rated capacities, go to the [IBM Z software pricing resources](#) web page.

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 about mainframe MSU-rated capacities, see the *IBM z Systems<sup>(R)</sup> Machines Exhibit*, Z125-3901, or see the Exhibits section on the [IBM Z software pricing resources](#) web page.

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 standalone machine or a qualified Parallel Sysplex<sup>(R)</sup>. 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<sup>(R)</sup> 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<sup>(R)</sup> (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](#) web page.

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<sup>(R)</sup> 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<sup>(R)</sup> 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.

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### 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.

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## 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.

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## Prices

For all local charges, contact your IBM representative.

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## Regional availability

**Europe:** Aland Islands, Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bouvet Island, British Indian Ocean Territory, Bulgaria, Union of the Comoros, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Falkland Islands (Malvinas), Faroe Islands, Finland, France, French Guiana, French Polynesia, French Southern Territories, Georgia, Germany, Gibraltar, Greece, Greenland, Guadeloupe, Guernsey, Holy See (Vatican City State), Hungary,



Iceland, Ireland, Isle of Man, Israel, Italy, Jersey, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Martinique, Mayotte, Republic of Moldova, Monaco, Montenegro, Netherlands, New Caledonia, Republic of North Macedonia, Norway, Pitcairn, Poland, Portugal, Reunion, Romania, Saint Barthelemy, Saint Helena Ascension and Tristan da Cunha, Saint Martin, Saint Pierre and Miquelon, San Marino, Serbia, Slovakia, Slovenia, South Georgia and the South Sandwich Islands, Spain, Svalbard and Jan Mayen, Sweden, Switzerland, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan, Vanuatu, and Wallis and Futuna

**Middle East and Africa:** Afghanistan, Algeria, Angola, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Republic of Cabo Verde, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Republic of the Congo, Republic of Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Kingdom of Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Iraq, Jordan, Kenya, Kuwait, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Oman, Pakistan, State of Palestine, Qatar, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, United Republic of Tanzania, Togo, Tunisia, Turkey, Uganda, United Arab Emirates, Western Sahara, Yemen, Zambia, and Zimbabwe

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