IBM XL Fortran for Linux, V16.1 supports POWER9 servers and the OpenMP 4.5 specification for productive programming

At a glance

IBM$^{(R)}$ XL Fortran for Linux$^{(R)}$ is a standards-based, high-performance Fortran compiler with advanced optimizing features. XL Fortran for Linux, V16.1 delivers a number of features and benefits:

- Support for both the POWER8$^{(R)}$ and POWER9^{TM} servers that enable you to drive modern workloads, such as:
  - Data analytic
  - Cloud
  - Mobile
  - Social
- Generation of optimized code that uses mature IBM compiler technology
- Support for Fortran programming language standards which provides for increased function and easier portability of your source code
- Support for the OpenMP 4.5 industry specification
- Inclusion of the optimized IBM Mathematical Acceleration Subsystem (MASS) libraries that give you frequently used mathematical procedures
- Inclusion of the Basic Linear Algebra Subroutines (BLAS) that give you high-performance algebraic functions
- gcc compatibility for easier porting and integration of your code
- Superior IBM service and support

Overview

IBM XL compilers, such as XL Fortran for Linux, are designed to:

- Optimize and tune your applications for execution on IBM Power Systems^{TM}.
- Help unleash the full power of your IT investment.
- Create and maintain critical business and scientific applications.
- Maximize application performance.
- Improve developer productivity.

The performance gain from years of compiler optimization experience is available in the continuous release-to-release compiler improvements that support the IBM

Power[(R)] processors, which include the new IBM Power Systems which is built with POWER9 technology.

Over the course of multiple releases, XL Fortran for Linux offered new functions, enhancements, and standards conformance to provide the required tools to develop and maintain smarter applications to meet critical business needs.

Enhancements in this compiler release include:

- Improvements on the exploitation of the POWER9 architecture that is designed to improve the performance of your applications
- Support for the OpenMP 4.5 industry specification to help improve parallel programming capabilities

Key prerequisites

IBM Power Systems servers that are supported by:

- Ubuntu Server 16.04 for IBM POWER[(R)]
- Ubuntu Server 18.04 for IBM POWER
- SUSE Linux Enterprise Server 12 for Power (SLES 12)
- SUSE Linux Enterprise Server 12 Service Pack 3 for Power (SLES 12 SP3)
- Red Hat Enterprise Linux 7.3 for IBM Power (RHEL 7.3)
- Red Hat Enterprise Linux 7.4 for IBM Power (RHEL 7.4)
- Red Hat Enterprise Linux 7.4 for IBM Power Little Endian (POWER9)
- Red Hat Enterprise Linux 7.5 for IBM Power (RHEL 7.5)
- Red Hat Enterprise Linux 7.5 for IBM Power Little Endian (POWER9)

Required hard disk space is 330 MB.

Planned availability date

April 27, 2018

Description

XL Fortran for Linux, V16.1 delivers additional functionality and enhancements that include support for the OpenMP 4.5 specification along with new features, which are designed to improve application performance and capability.

Version of XL C/C++ for Linux matches that of XL Fortran at V16.1

IBM equates the version and release designation of XL C/C++ for Linux to be the same as that of its sister compiler, XL Fortran for Linux. This way, clients, who have both XL C/C++ for Linux and XL Fortran for Linux as part of their development environments, can easily acquire matching release levels. The version designation of this release of XL C/C++ for Linux is designated to be Version 16.1, which is the same as XL Fortran for Linux, V16.1.

Delivers support for POWER9 technology

The XL Fortran for Linux, V16.1 compiler improves the exploitation of the POWER9 architecture:

- Improved architecture and tune compiler options for POWER9 technology
  - The -qarch compiler option specifies the processor architecture for which the code is generated. The -qtune compiler option tunes instruction selection, scheduling, and other architecture-dependent performance enhancements to

run best on a specific hardware architecture. With the release of XL Fortran for Linux, V15.1.6, new architecture and tune compiler suboptions were available to specify code generation explicitly for the POWER9 architecture. The compiler option -qarch=pwr9 instructs the compiler to produce code that can fully exploit the POWER9 architecture. The compiler option -qtune=pwr9 enables optimizations specifically for the POWER9 architecture. With XL Fortran for Linux, V16.1, additional low level exploitation of the POWER9 architecture is implemented to improve the generated code.

– Compiling your application with the new -qarch=pwr9 and -qtune=pwr9 compiler options enable you to automatically exploit the new capabilities in the POWER9 architecture without having to rewrite the code.

– The existing -qarch=pwr8 now generates code that executes on both the POWER8 and POWER9 architectures. The existing -qtune=balance enables balanced tuning for both POWER8 and POWER9. Some of the code generated with these options is improved in this release with the additional, low level exploitation of the POWER9 architecture.

- Intrinsic compiler functions for POWER9 technology

– A number of new intrinsic functions are delivered in these releases to unlock POWER9 architecture instructions. They give you direct access to POWER9 features at the application level.

- Mathematical Acceleration Subsystem (MASS) Library enhancements

– The MASS libraries are an accelerated set of frequently used mathematical functions that provide improved performance over the corresponding standard system library functions. The highly tuned MASS libraries were enhanced in XL Fortran for Linux, V15.1.6 to support the POWER9 technology. With Version 16.1, additional performance improvements are implemented for MASS on POWER9.

Supports OpenMP 4.5 specification

OpenMP provides a high-level, directive-based API to parallelize applications. OpenMP is higher level programming model that allows for increased programmer productivity. Implementing your application with OpenMP provides source code, which is portable across multiple architectures and platforms. GPU support within OpenMP was initially delivered in XL Fortran for Linux, V15.1.5 . Code is optimized for both the POWER CPU and the NVIDIA GPU. Additional features and additional performance for OpenMP 4.5 were delivered in XL Fortran for Linux, V15.1.6. Additional features of OpenMP 4.5 are delivered in this new version:

- omp cancel

– Use the omp cancel directive to activate the cancellation of the innermost enclosing of the specified type.

- omp cancellation point

– Use the omp cancellation point directive to explicitly set cancellation points in the program. At cancellation points, the encountering task checks if cancellation of the innermost enclosing region of the specified type is activated.

- omp declare simd

– Apply the omp declare simd directive to a function to create one or more versions that can process multiple arguments by using SIMD instructions from a single invocation in a SIMD loop.

- omp taskgroup

– Use the omp taskgroup directive to specify a wait on completion of the child tasks of the current task and their descendent tasks.

NVIDIA CUDA Toolkit v9.2 with support for IBM Power LE (POWER9) is required for the compilation and linking process for programs that use OpenMP 4.5 or CUDA Fortran to offload computation to the NVIDIA GPU. CUDA Toolkit v9.2 with support for IBM Power LE (POWER9) is available from NVIDIA.

Supports IBM Advance Toolchain for Linux on Power 11.0

XL Fortran for Linux, V16.1 supports the IBM Advance Toolchain for Linux on Power 11.0, a set of open source development tools and runtime libraries. With IBM Advance Toolchain for Linux on Power, you can take advantage of the latest Power hardware features on Linux, especially the tuned libraries.

Supports additional Linux Distributions

XL Fortran for Linux, V16.1 now also runs on Red Hat Enterterprise Linux 7.5 (RHEL 7.5) and Ubuntu 18.04.

XL Fortran for Linux Community Edition (on little endian distributions) is updated

The Community Edition for XL Fortran for Linux (on little endian distributions) is updated to the latest XL Fortran for Linux, V16.1 level. The XL Fortran for Linux Community Edition is a no-charge, fully functional Fortran compiler. It can be used for production requirements although the Community Edition compiler is not warranted and does not provide for any subscription, service, or support. The fully supported XL Fortran for Linux compiler continues to be available for order.

The release of the Community Edition lets application programmers use the XL Fortran for Linux compiler to experience the advantages of IBM compiler technology on the POWER9 platform.

To obtain full warranty, full function, and support from IBM, you should license the full XL Fortran for Linux compiler. To download the XL Fortran for Linux Community Edition compiler, see the XL Fortran Compiler Family website.

Deprecation of XL Fortran for Linux for big endian distributions

As of version 16.1 of XL Fortran for Linux, the compiler component for big endian distributions is no longer being included with the package. Clients are still able to acquire the compiler for big endian distributions by ordering the previous versions that continue to be in marketing.

Accessibility by people with disabilities

A US Section 508 Accessibility Compliance Report containing details on accessibility compliance can be found on the Product accessibility information website.

Section 508 of the US Rehabilitation Act

XL Fortran for Linux, V16.1 is capable as of April 27, 2018, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Accessibility Conformance Statement can be requested on the Product accessibility information website.

Product positioning

With XL Fortran for Linux, V16.1 (on little endian distributions), you can create or port applications for execution on the latest POWER9 architecture. The POWER9 architecture supports the little endian architecture, and is designed to handle big data and to drive modern workloads for cloud, mobile, and social environments.

Unleash the full power of IBM processors

At a basic level, compilers are a bridge between your applications and the hardware architectures on which you run your business. IBM compilers are designed to unleash the full power of IBM processors, which include those for the different

architectures that are shipped in the popular Power Systems. IBM compilers exploit the POWER9 technology.

IBM compilers are designed to improve programmer productivity. The advanced compilation technology enables programmers to exploit leading-edge performance of new hardware without source code changes. Developers only need to focus on the business logic of the applications and let the compiler figure out the best way to transform and optimize the code generation for the systems on which the application will run.

Optimize powerful, no-hassle performance

Your well written and thoroughly debugged code, which is fully conformant to its language standard, can take maximum advantage of the optimizing technology in XL Fortran. This can deliver an increase in performance. The optimization and hardware features in XL Fortran help improve developer productivity. These compilers can generate code that exploits the leading-edge performance in existing and new hardware, often with minimal or no source code changes.

XL Fortran supports several levels of increasingly, aggressive code transformations. Advanced optimization techniques, such as inter-procedural analysis (IPA) and profile-directed feedback (PDF), are available only at high levels of optimization but can result in increased performance improvements. IPA analyzes and optimizes your application as a whole, rather than on a file-by-file basis. PDF generates information that instructs the optimizer to focus on trade-offs that favor code that executes more frequently.

Get more performance from the POWER platform with minimal or with no source code changes. Upgrade to the latest XL Fortran compiler, which incorporates the latest advances in optimization and hardware technology support.

OpenMP supports offloading computation and data to the Graphics Processing Unit (GPU) accelerator

When combined with the POWER9 architecture, the NVIDIA GPU provides a unique platform for heterogeneous, high-performance computing, which has proven to be highly efficient for running several technical computing workloads. This computational capability is built on top of massively parallel and multi-threaded cores within the NVIDIA GPUs and the IBM POWER9 architecture. Parallel operations within applications, such as data analysis or HPC (high-performance computing) workloads, can now be offloaded to GPUs.

To fully influence the computational power of the Power Systems with an NVIDIA GPU and to allow you to achieve a performance uplift for your applications, you need to offload highly parallel operations to the GPU accelerator. OpenMP provides for a high-level and homogeneous programming model to enable parallel computing to the GPU all within a single application that is compiled by the XL Fortran compiler. The OpenMP programming model, which is supported by the XL compilers, makes the underlying CPU and GPU hardware transparent to the programmer.

The XL compiler takes a holistic approach to optimize the POWER processor that is connected to the NIVIDA GPUs. In typical applications, some parts of the code are suitable for running on a GPU for acceleration while other parts continue to be suitable to run on the CPU. The architecture of the XL compiler implementation for OpenMP allows for the CPU code to be optimized by the existing XL compiler POWER optimizer while the GPU code is optimized by the NVIDIA Toolkit optimizer. Finally the linker is invoked to link the objects to create a single executable. The NVIDIA NVLink interconnect continues to support accelerated data transfer between the CPU and GPU.

The goal is to deliver higher performance and greater energy efficiency to companies and data centers.

The OpenMP API supports multiplatform, shared-memory, parallel programming in C, C++, and Fortran on many architectures that use UNIX$^{(R)}$ and Microsoft^{TM} Windows^{TM} platforms. OpenMP is a portable, scalable programming model that

gives programmers a simple and flexible, standard interface for developing parallel applications for platforms ranging from the desktop to the supercomputer.

This specification is defined by the OpenMP ARB, a group of leading hardware and software vendors and research organizations, including IBM. You can find more information about the OpenMP specifications at the openmp.org website.

CUDA supports XL Fortran (on little endian distributions)

With CUDA Fortran support within XL Fortran for Linux, you can create applications that exploit both the POWER9 architecture and the NVIDIA GPU, and compile the complete application with the IBM XL compiler. You can continue to obtain the benefits of the IBM optimization technology within the XL Fortran compiler while fully leveraging the highly parallel capability of the NVIDIA GPU.

XL Fortran for Linux, V16.1 (on little endian distributions) Community Edition is available

The release of XL Fortran for Linux Community Edition (on little endian distributions) provides no-charge, full function compilers to developers and partners. This community edition is available for download from IBM. The release of the community edition allows for convenient availability of the XL Fortran compilers so that developers can experience the advantages of IBM compiler technology on the POWER9 platform. Users, who require a fully warranted, and fully supported compiler, can license the XL Fortran for Linux compilers.

Delivers an infrastructure that matters

The XL family of compilers, in conjunction with Power Systems, continues to serve the HPC and commercial sectors. This makes the high-performing XL Fortran for Linux compiler (on little endian distributions) an optimal fit for the requirements of big data and data analytics.

One of the most discussed topics in the IT world is the migration of applications to a cloud environment. With an infrastructure that includes the POWER9, the latest Linux distributions and the XL Fortran for Linux compiler, the effort to implement a cloud environment is easier. Organizations that need to invest in open standards and open source-based architectures, should consider the new XL Fortran for Linux compiler as the backbone of their IT application development environment to drive competitive differentiation.

IBM Service and Support is available

The XL Fortran for Linux compilers are delivered with IBM Service and Support. The IBM Service and Support organization is made up of teams of individuals to provide the responsive platform and cross-platform software support that you require. For complex or code-related problems, there are specialized, and skilled IBM service teams with access to the experts in IBM development laboratories, as required. You have access to the right level of IBM expertise when needed and wherever the teams are located. The mission of IBM Service and Support is to achieve a level of support excellence that exceeds client expectations.

XL stands for exceptional

The acronym, XL was described as a short form for "exceptional" in the *Compiler User Guide.* The following original text continues to apply today.

The exceptional (XL) family of compilers provide consistency and high performance across multiple programming languages by sharing the same code optimization technology.

Program number

Program number	VRM	Program name
5765-J15	16.1	XL Fortran for Linux- AAS

Program number	VRM	Program name
5725-C75	16.1	XL Fortran for Linux- PA

Product identification number

Product	Program PID number	Subscription and Support PID number	S&S description
XL Fortran Linux, V16.1	5765-J15	5648-F55	SW S&S No-charge Registration/1-year Renewal
	5765-J15	5648-F56	SW S&S 3-year Renewal
	5765-J15	5648-F57	SW S&S 1 year after license
	5765-J15	5648-F58	SW S&S 3 year after license
	5765-J15	5648-F59	SW S&S 3-year Registration

Offering Information

Product information is available on the IBM Offering Information website.

More information is also available on the Passport Advantage(R) and Passport Advantage Express(R) website.

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to BP Attachment for Announcement Letter 218-199 for this announcement. A PartnerWorld ID and password are required (use IBMid).

Publications

Links to PDF manuals and HTML-based production documentation are available at the IBM XL Fortran for Linux Knowledge Center.

Effective April 27, 2018, softcopy publications for XL Fortran for Linux, V16.1 will be available at the above IBM Knowledge Center.

No hardcopy publications are shipped with these programs.

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

XL Fortran for Linux, V16.1

- System

  IBM Power Systems servers that are configured for the little endian architecture and supported by:

  - Ubuntu Server 16.04 for IBM POWER
  - Ubuntu Server 18.04 for IBM POWER
  - SUSE Linux Enterprise Server 12 for Power (SLES 12)
  - SUSE Linux Enterprise Server 12 Service Pack 3 for Power (SLES 12 SP3)
  - Red Hat Enterprise Linux 7.3 for IBM Power (RHEL 7.3)
  - Red Hat Enterprise Linux 7.4 for IBM Power (RHEL 7.4)
  - Red Hat Enterprise Linux 7.4 for IBM Power Little Endian (POWER9)
  - Red Hat Enterprise Linux 7.5 for IBM Power (RHEL 7.5)
  - Red Hat Enterprise Linux 7.5 for IBM Power Little Endian (POWER9)

- Disk space: 330 MB

Note: To compile CUDA Fortran programs or programs that contain code used to offload computation to the NVIDIA GPUs, you must use a system that satisfies the CUDA toolkit's installation requirements. See the NVIDIA CUDA Toolkit website for more information.

Software requirements

For XL Fortran for Linux, V16.1

- Supported operating systems
  - Ubuntu Server 16.04 for IBM POWER
  - Ubuntu Server 18.04 for IBM POWER
  - SUSE Linux Enterprise Server 12 for Power (SLES 12)
  - SUSE Linux Enterprise Server 12 Service Pack 3 for Power (SLES 12 SP3)
  - Red Hat Enterprise Linux 7.3 for IBM Power (RHEL 7.3)
  - Red Hat Enterprise Linux 7.4 for IBM Power (RHEL 7.4)
  - Red Hat Enterprise Linux 7.4 for IBM Power Little Endian (POWER9)
  - Red Hat Enterprise Linux 7.5 for IBM Power (RHEL 7.5)
  - Red Hat Enterprise Linux 7.5 for IBM Power Little Endian (POWER9)

- Instance of GNU Compiler Collection (GCC) and Perl
  - See the *XL Fortran for Linux Installation Guide* for required packages.

- Required software for documentation:
  - A graphical desktop environment (such as K Desktop Environment or GNOME) that supports web browsers and PDF viewers
  - A frames-capable HTML browser (to access help and other web pages)
  - PDF viewer (to access PDF documentation)

Note: To compile XL Fortran for Linux with CUDA Fortran code or programs that contain code used to offload computation to the NVIDIA GPUs, you must use a

system that satisfies the CUDA toolkit's installation requirements. See the NVIDIA CUDA Toolkit website for more information.

NVIDIA CUDA Toolkit v9.2 with support for IBM Power LE (POWER9) is required for the compilation and linking process for programs that use OpenMP 4.5 to offload computation to the NVIDIA GPU. CUDA Toolkit v9.2 with support for IBM Power LE (POWER9) is available from NVIDIA.

Planning information

Web information

See the XL Fortran Compiler Family website for more information.

Packaging

The XL Fortran for Linux, V16.1 package contains:

- One DVD-ROM containing the XL Fortran for Linux, V16.1 product
- XL Fortran for Linux, V16.1 Quickstart Guide
- Passport Advantage customer letter
- Passport Advantage media pack pointer sheet

This program, when downloaded from a website, contains the applicable IBM license agreement and License Information, if appropriate, which will be presented for acceptance at the time of installation of the program. For future reference, the license and License Information will be stored in a directory such as LICENSE.TXT.

Security, auditability, and control

XL Fortran for Linux, V16.1 uses the security and auditability features of the host hardware or 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

Product group: IBM XL Fortran

Product: XL Fortran for Linux (5765-J15, 5725-C75)

Product category: XL Fortran

Passport Advantage

Program name/Description	Part number
XL Fortran for Linux, V16.1 Media Package English	BA1ASEN
XL Fortran for Linux, Authorized User License + SW S&S 12 Months	D54L2LL
XL Fortran for Linux, Authorized User Annual SW S&S Renewal	E01M4LL
XL Fortran for Linux, Authorized User SW S&S Reinstatement 12 Months	D54L3LL
XL Fortran for Linux, Concurrent User License + SW S&S 12 Months	D043VLL
XL Fortran for Linux, Concurrent User Annual SW S&S Renewal	E04UALL
XL Fortran for Linux, Concurrent User SW S&S Reinstatement 12 Months	D043WLL

Passport Advantage trade-up

You must have previously acquired a license for the following precursor product to be eligible to acquire an equivalent license of the trade-up product.

Precursor product	Trade-up product	Trade-up part number
XL Fortran for Linux Authorized User single entitlement	XL Fortran for Linux Concurrent User single entitlement	D0DEXLL (to trade up from single Authorized User to single Concurrent User)

Consult your IBM representative if you have any questions.

ESW trade-up

Current licensees of the IPLA replaced programs with active Subscription and Support (S&S) are eligible to trade up to XL Fortran for Linux, V16.1. All IPLA replaced program entitlements to be traded in must be terminated. In some cases the IPLA replaced program entitlements may not be the same as the IPLA replacement program entitlement. For example, if the client has 100 Value Units entitlement of IPLA replaced program A and is trading up to 90 Value Units of entitlement to the IPLA replacement program, the client must terminate all 100 Value Units entitlement of IPLA replaced program A. Current licensees of the IPLA replaced programs interested in trading up to IPLA replacement programs should contact their IBM representative.

Program name: XL Fortran for Linux, V16.1

Program PID: 5765-J15

Entitlement identifier	Description	License option/Pricing metric
0003, 0001	XL Fortran for Linux, V16.1 (5765-J10 to 5765-J15)	Authorized User or Concurrent User

Orderable supply ID	Language	Distribution medium
0003, 0001	US English	3590 tape cartridge

Consult your IBM representative if you have any questions.

Passport Advantage client: Media pack entitlement details

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

Entitled maintenance offering description
XL Fortran for Linux

Media pack description	Part number
XL Fortran for Linux, V16.1 Media Pack English	BA1ASEN

Basic license: To order the programs described in this announcement for XL Fortran for Linux, V16.1 (5765-J15), specify the type-model number and the applicable features from the tables below. The medium feature (DVD-ROM) need only be specified as required. To request the media package (DVD-ROM), specify media supply feature number 5809.

When placing an Electronic Service Delivery (ESD) order in econfig, specify a billing feature, and the following ESD only feature numbers:

ESD only feature numbers
3450
3453
3470
3471

Program number	Description	One-time charge feature number	Medium	Medium feature number
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Authorized User	0003		
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Concurrent User	0001		
	Media package		DVD-ROM	5809
	Customization feature: Electronic delivery			3450 and 3453
	Customization feature: Do not ship publications			3470
	Customization feature: Do not ship media			3471

Program number	Description	One-time charge feature number	Medium	Medium feature number
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Authorized User	C2QV		
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Concurrent User	C2QT		
	Media package		DVD-ROM	5809
	Customization feature: Electronic delivery			3450 and 3453
	Customization feature: Do not ship publications			3470
	Customization feature: Do not ship media			3471

Program number	Description	One-time charge feature number	Medium	Medium feature number
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Authorized User	M8JTQE		
5765-J15	XL Fortran for Linux, V16.1 OTC with 1-year SW S&S per Concurrent User	M8JUQE		
			DVD-ROM	5809
				3450 and 3453
				3470
				3471

Electronic Software Update (ESU) orders

ESU is a way for clients to self order their POWER software release upgrades through the Entitled Software Support (ESS) website without the need to go to their seller to place the upgrade order. Entitled Software Update (ESU) orders for Electronic Software Delivery (ESD), will now be available in all countries. ESU orders for POWER software, which includes XL Fortran for Linux, V16.1, will be placed on the Entitled Software Support (ESS) website .

Clients should generally select electronic delivery when ordering through ESU, but do have the ability to select physical delivery. Programs ordered for ESD will have the same download images provided as provided on the DVD media shipped for physical orders.

ESU clients placing ESD software orders will receive an email with software order information. The ESU client can immediately proceed to the Downloads website support for program access, instead of waiting for delivery of a physical package shipped from IBM.

Clients who choose physical delivery will also have the electronic images available for ESD download.

See the ESD help for use instructions.

For ESD sign-in, see My Entitled Systems Support. (You must have a client number and POWER software entitlements to fully access this website.) .

For a list of POWER software products that are available for electronic download, see the Electronic Software Delivery help - Introduction.

Maintenance offering client: Media supply entitlement details

Clients with active Software Maintenance for XL Fortran for Linux are entitled to receive the media supply corresponding to XL Fortran for Linux, V16.1 or a previous level of the program as long as the level of the program continues to be active. Eligible customers should add the applicable DVD-ROM media supply feature number from the following table to their existing maintenance record. To request the media package (DVD-ROM), specify the media supply features 5809 and 3410.

When placing an ESD order in econfig, specify a billing feature, and the ESD only feature number 3450. Note that these ESD features are also applicable to the compiler products:

- XL Fortran for Linux, V15.1, (5765-J10)
- XL Fortran for Linux, V14.1, (5765-J05)

XL Fortran for Linux entitled maintenance offering description

Description	Medium	Feature number
XL Fortran for Linux, V16.1 (5756-J15)	DVD-ROM Media Supply	5809
Customization feature: Electronic delivery		3450 and 3453
Customization feature: Do not ship publications		3470
Customization feature: Do not ship media		3471

Description	Medium	Feature number
XL Fortran for Linux, V15.1 (5756-J10)	DVD-ROM Media Supply	5809
Customization feature: Electronic delivery		3450 and 3453
Customization feature: Do not ship publications		3470
Customization feature: Do not ship media		3471
Expedite fee charged to branch		3445

Description	Medium	Feature number
XL Fortran for Linux, V14.1 (5765-J05)	DVD-ROM Media Supply	5809
Customization feature: Electronic delivery		3450 and 3453
Customization feature: Do not ship publications		3470
Customization feature: Do not ship media		3471
Expedite fee charged to branch		3445

Trade up from Authorized User to Concurrent User

Clients who have originally acquired licenses for Authorized User can trade up their Authorized User licenses to an equivalent or appropriate number of Concurrent User licenses.

Below is a list of precursor products and their associated Authorized User part numbers for which you must have already acquired a license, in order to be eligible to acquire the equivalent Concurrent User licenses using the trade-up feature number.

Precursor product	Trade-up product	Trade-up feature number
XL Fortran for Linux Authorized User single entitlement	XL Fortran for Linux Concurrent User single entitlement	Is used to trade up from single Authorized User to single

Consult your IBM representative if you have any questions.

Description	One-time charge program number	Feature Number
XL Fortran for Linux, V16.1 trade up from single Authorized User entitlement to	5765-J15	0002

Description	One-time charge program number	Feature Number
single Concurrent User entitlement		

Description	One-time charge program number	Feature number
XL Fortran for Linux, V16.1 trade up from single Authorized User entitlement to single Concurrent User entitlement	5765-J15	C2QU

Description	One-time charge program number	Feature number
XL Fortran for Linux, V16.1 trade up from single Authorized User entitlement to single Concurrent User entitlement	5765-J15	ZIQTB2

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

Extending coverage for a total of three years from the date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the after license feature number.

Software license includes one-year Software Maintenance

IBM XL Fortran for Linux, V16.1 (5765-J15)

Feature description	Feature number
Per Authorized User with 1-year SW S&S	0003
Per Concurrent User with 1-year SW S&S	0001

Maintenance PID Description

Software Maintenance no charge one-year registration + one-year renewal (5648-F55)

Feature description	Feature number
Per Authorized User SW S&S 1-year registration	0001
Per Authorized User 1-year renewal	0002
Per Concurrent User SW S&S 1-year registration	0003
Per Concurrent User 1-year renewal	0004

Software Maintenance three-year registration (two-year uplift) (5648-F59)

Feature description	Feature number
Per Authorized User SW S&S 3-year registration	0001
Per Concurrent User SW S&S 3-year registration	0002

Software Maintenance three-year renewal (5648-F56)

Feature description	Feature number
Per Authorized User SW S&S 3-year renewal	0001
Per Concurrent User SW S&S 3-year renewal	0002

Software Maintenance one year after license (5648-F57)

Feature description	Feature number
Per Authorized User SW S&S 1 year after license	0001
Per Concurrent User SW S&S 1 year after liense	0002

Software Maintenance three years after license (5648-F58)

Feature description	Feature number
Per Authorized User SW S&S 3 years after license	0001
Per Concurrent User SW S&S 3 years after license	0002

Charge metric

Program name	Part number or PID number	Charge metric
XL Fortran for Linux, V16.1 build to order	5765-J15	Authorized User and Concurrent User
XL Fortran for Linux, V16.1 build to plan	5725-C75	Authorized User and Concurrent User

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Limited warranty

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Volume orders (IVO)

Yes. Contact your IBM representative.

Passport Advantage applies

Yes, information is available on the Passport Advantage and Passport Advantage Express website.

Usage restrictions

Yes

See the License Information documents for details.

Software Subscription and Support applies

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Variable charges apply

No

Educational allowance available

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

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Prices

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Passport Advantage

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For all local charges, contact your IBM representative or your authorized IBM Business Partner.

Program name

IBM XL Fortran for Linux, V16.1 (5765-J15)

Feature description	Feature number
Per Authorized User with 1-year SW S&S	0003
Per Concurrent User with 1-year SW S&S	0001
Trade up from single Authorized User entitlement to single Concurrent User entitlement	0002

Maintenance PID name and description

Software Maintenance no charge one-year registration + one-year renewal (56 48-F55)

Feature description	Feature number
Per Authorized User SW S&S 1-year registration	0001
Per Authorized User 1-year renewal	0002
Per Concurrent User SW S&S 1-year registration	0003
Per Concurrent User 1-year renewal	0004

Software Maintenance three-year registration (two-year uplift) (5648-F59)

Feature description	Feature number
Per Authorized User SW S&S 3-year registration	0001
Per Concurrent User SW S&S 3-year registration	0002

Software Maintenance three-year renewal (5648-F56)

Feature description	Feature number
Per Authorized User SW S&S 3-year renewal	0001
Per Concurrent User SW S&S 3-year renewal	0002

Software Maintenance one year after license (5648-F57)

Feature description	Feature number
Per Authorized User SW S&S 1 year after license	0001
Per Concurrent User SW S&S 1 year after liense	0002

Software Maintenance three years after license (5648-F58)

Feature description	Feature number
Per Authorized User SW S&S 3 years after license	0001
Per Concurrent User SW S&S 3 years after license	0002

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Corrections

(Corrected on February 13, 2019)

The Prices section is revised.