IBM Streams V4.2 extends stream processing to new markets

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At a glance

With IBM Streams, organizations can see events and trends as they are happening rather than react to them after they have passed. Thanks to its ability to bring meaning to unwieldy bodies of fast-moving data streams, the technology has already achieved success across a wide spectrum of industries. Any organization that requires immediate, accurate analysis and business decisions based on up-to-the-minute information can benefit from Streams.

IBM Streams V4.2 is poised for continued growth with new Python and Rules developer support, Internet of Things (IoT) Edge analytics, and Hyperstate Accelerator. Streams V4.2 offers the following benefits:

- Python developers can call the extensive Streams analytic libraries along with thousands of Python libraries to run on Streams, creating real-time analytic processing applications.
- Based on industry-leading capabilities from IBM Operational Decision Manager, Streams developers can now create rules that are compiled to run natively on Streams for superior runtime performance.
- New support for Apache Edgent enables Streams developers to create federated applications. These applications can optimize computing for IoT applications with Edgent at the edge, and Streams for central analytics. IBM Watson IoT Platform on Bluemix can be used as a management service.
- Speech to Text toolkit enables Streams to analyze English language speech and convert it to text for further analysis and insight.
- With its high-speed, Hyperstate Accelerator, Streams natively supports state management and event playback for processing at very high speed. The need for Stream processing has been growing quickly, as sensors and machines produce more and more data. You can now acquire, analyze, and act on data in real time to gain competitive advantage.

Overview

Streams: A leader in the stream processing marketplace

Part of a new generation of analytic processing methods, Streams offers a computing platform that helps organizations turn burgeoning, fast-moving volumes and varieties of data into insight. Streams delivers a programming language and an integrated development environment (IDE) for applications, a runtime system that can execute the applications on a single or distributed set of hosts, and analytic toolkits to speed development. You can use Java and Python to develop
applications for deployment to run time. Streams can ingest, filter, analyze, and correlate massive volumes of continuous data streams. These data streams can originate from any of the following:

- IoT devices and sensors
- Text files, spreadsheets, images, and video and audio recordings
- Email, chat, and instant messaging; web traffic, blogs, and social networking sites
- Financial transactions, customer service records, telephone usage records, and system and application logs
- Satellite data, GPS data, smart devices, sensors, network traffic, and messages

Streams fuses these heterogeneous data types to enable powerful data analysis with exceptional performance and impressive response times. In fact, Streams outperforms Apache Storm by 2.6 to 12.3 times in terms of throughput while simultaneously consuming 5.5 to 14.2 times less CPU time.

Scalable from a single server to an unlimited number of nodes, the platform offers a wide array of analytic operators and an advanced set of development tools to enable integration with existing infrastructures and applications.

**Powerful, real-time analytic processing made simpler**

Streams is designed to address the following stream processing objectives:

- Parallel, high-performance stream processing software platform capable of scaling over a range of hardware environments
- Development using a variety of languages, including Streams Processing Language (SPL), Java, Scala, and Python
- Automated deployment of stream processing applications to cloud or on-premises environments
- Incremental deployment without restarting to extend stream processing applications
- Secure and auditable execution environment

Streams is especially powerful in environments where traditional batch analysis might not be sufficient; for example, an environment that must process a large number of data streams at high rates.

**Scale-out architecture with high availability and no data loss**

Streams enables a clustered runtime environment that can easily handle anywhere from a few events per second through multiple millions of events per second with microsecond latency. Results can be achieved with near-zero latency.

Streams management services use Zookeeper to maintain the state of the Streams runtime and jobs. When management services or management nodes fail, standby services take over to enable continuous operations.

The consistent region support with the new Hyperstate Accelerator periodically checks the state of the application. If failures occur, that portion of an application can be restarted, state recovered, and events replayed to ensure processing of all records. Using Hyperstate Accelerator with IBM Flash systems enables persistent reads and writes at very high speed.

**Comprehensive tools for an agile development environment**

Streams makes it simple for data scientists, developers, and administrators to build applications that can analyze high-volume, high-velocity, and high-variety data in real-time.

**Development**
Streams Studio, an Eclipse-based IDE offers application developers editors, wizards, application structure graphs, and runtime monitoring that simplify the process of building and managing Streams applications. Founded on extensive IBM experience in delivering streaming applications for real-world clients, these assets are designed to help organizations quickly and easily extend their applications’ capabilities with sophisticated real-time data analytics.

The drag-and-drop graphical editor enables you to build applications by dragging and dropping operators while automatically synching graphical and SPL source code views. A developer can create an application in one area and a different user can update the application in another area simply by viewing the application in production.

With Java support, developers can call the Streams toolkits, compile them, and deploy them to a Streams runtime without learning SPL. Similarly, Scala programmers can use these Java APIs to deploy applications to Streams.

Data scientists can code in Python notebooks like Jupyter, then compile and deploy to a Streams runtime to build real-time analytic applications. Data scientists can use thousands of Python libraries and extend them with Streams advanced analytic toolkits.

**Deployment**

Streams includes a web-based Management Console that makes it easy to configure and manage applications, including features for automated placement and deployment of application components. Existing applications can be dynamically extended with new applications that can receive the same data streams or feed new data into existing applications.

An instance graph, available in both Streams Studio and the Management Console, enables visual monitoring of application health and metrics. Users can quickly identify issues using customizable views.

**User visualization**

With Streams data visualization, users can dynamically add new views to running applications with charts provided out of the box. Integration with IBM BigInsights<sup>®</sup> and IBM Watson Explorer enable you to easily transfer and visualize data.

Streams for Microsoft<sup>™</sup> Excel plug-in enables Excel users to select streaming data from the Streams run time for use in Excel. All the capabilities of Excel are available, including dynamic charting and combining with static data in other worksheets to explore data at rest and data in motion.

**Enterprise integration: Extending the power of Streams**

Integration with other products gives organizations access to all data and systems. These products offer the following benefits:

- **Apache Edgent (previously called Apache Quarks):** Create federated analytics between Streams and devices and gateways at the edge of networks running Apache Edgent. Communications can be performed natively with Streams or using a management service like Watson<sup>™</sup> IoT Platform on Bluemix.
- **Watson IoT Platform:** Use IoT device management capabilities of the IoT platform, and subscribe to device data to provide advanced analytics using Streams.
- **BigInsights:** Store streaming data in an enterprise-class Hadoop environment for additional analysis or historical retention. Streams can land data into BigInsights in many formats, including BigSQL, HDFS, Hive, HBase, Parquet, and Avro.
- **IBM InfoSphere<sup>®</sup> Governance Catalog:** Speed development by dragging and dropping data definitions onto Streams Studio to generate schema. Streams can also feed lineage data into Governance Catalog.
- **IBM Watson Explorer**: Visualize Streams data in the Watson Explorer CXO dashboard and add streaming data to the Watson Explorer index.

- **Microsoft Excel**: Analyze and visualize streaming data in Microsoft Excel worksheets. Business users can display streaming data directly in Excel by dragging and dropping onto a worksheet. The streaming data continually updates in the worksheet and can then be analyzed and visually represented through available features in Excel.

**Sophisticated analytics with toolkits and accelerators**

Streams includes integrated toolkits and sample applications that ease the development of solutions for particular industries or functions, including the Data Mining Toolkit, Financial Services Toolkit, and Standard Toolkit. They encompass an array of the most commonly used operators.

Streams includes these other toolkits:

- **Topology**: Enables development of applications in Java, Scala (when calling the Java APIs), and Python without requiring SPL coding. Streams toolkits can also be used. The applications are then compiled into SPL for deployment to the Streams run time.

- **Rules**: Based on IBM Offering Decision Management, Streams Studio now includes a Rules editor. After rules have been authored, they are compiled into Streams Processing Language (SPL) for inclusion with other SPL operators in a Streams application for superior runtime performance.

- **Speech to Text**: Transforms speech to text in real-time, which can then be analyzed by Streams for further understanding.

- **IBM SPSS**: Uses SPSS Modeler for developing and building predictive models and deploys models using the SPSS Scoring Operator. SPSS models can be dynamically refreshed in Streams without needing to suspend the running of Streams applications.

- **Rproject**: Allows R commands and applies complex data mining algorithms to help detect patterns of interest in data streams.

- **Spark MLlib**: Scores Spark Machine Learning Library (MLlib) models that have been trained offline in Spark.

- **Mining**: Predictive Model Markup Language (PMML) operators can read in PMML models and score using classification, clustering, regression, and associative rules algorithms.

- **Text**: Natural language processing of text extracts parts of speech from multiple languages and simplifies building applications that understand text.

- **Cybersecurity**: Uses IBM SPSS and machine learning to report on suspicious DNS behavior and predict if domains should be blacklisted.

- **Geospatial**: Often used in Transportation and Telecommunications industries, this toolkit enables location-based marketing. It uses high-performance analysis and processing of geospatial data.

- **Messaging**: Enables Streams to receive data from or send to IBM WebSphere MQ, Apache Kafka, MQTT, and Apache ActiveMQ.

- **Internet**: Uses protocols like HTTP and FTP to enable access to the internet.

- **Time Series**: Rich set of functions that includes generation (synthesizing or extracting), preprocessing (preparation and conditioning), analysis (statistics, correlations, decomposition, and transformation), and cognitive computing and modeling (prediction, regression, and tracking). These machine learning and anomaly detection algorithms "learn as you go" to build and continually update models on streaming data.

- **Telco Event Data Analytics**: Offers full application for transformation and analytics for telephone company call and event detail records. Supports real-time churn, revenue assurance, marketing, fraud detection, and other applications. Telecommunications companies can gain billing insights based on services, vendors, and business lines.

- **Complex Event Processing (CEP)**: Uses patterns to detect composite events in streams of simple events. Integration in Streams enables CEP-style processing with high performance and rich analytics. You can migrate old applications into a
Streams environment, taking advantage of higher scalability and process up to 10 times more events per second on the same hardware.

- **Database**: Access to popular SQL databases.
- **Distributed Process Store**: Access to popular NoSQL databases such as Redis and the new Streams Hyperstate Accelerator.
- **HDFS**: Access to Hadoop distributed file store systems such as IBM BigInsights.
- **HBase**: Access to HBase file systems in Hadoop.
- **Financial**: Sample applications and operators commonly called the Greeks to speed development of options and equity trading applications.

Some of these toolkits, plus many more, are now available on Github as part of the Streams Open Source initiative.

**Streams delivers unique value**

With Streams, organizations can see events and trends as they are happening rather than react to them after they have passed. Because of its ability to bring meaning to unwieldy bodies of fast-moving data streams, the technology has already achieved success across a wide spectrum of industries. Any organization that requires immediate, accurate analysis and business decisions based on up-to-the-minute information can benefit from IBM Streams.

**Key prerequisites**

Refer to the Hardware requirements and Software requirements sections.

**Planned availability date**

- September 23, 2016: Electronic availability
- October 21, 2016: Physical media

**Description**

IBM Streams V4.2 delivers these enhancements:

- Developers and data scientists can use Python to call the extensive Streams analytic libraries along with thousands of Python libraries to create real-time analytic processing applications that run on Streams.
- Based on industry-leading capabilities from IBM Operational Decision Manager, Streams developers can now create rules that are compiled to run natively on Streams for superior runtime performance.
- New support for Apache Edgent enables Streams developers to create federated applications to optimize computing for IoT applications with Edgent at the edge and Streams for central analytics. Watson IoT Platform on Bluemix can be used as a management service.
- With a high-speed, Hyperstate Accelerator capability, Streams natively supports state management and Consistent Region support for processing at very high speed. Consistent Region is a Streams capability that assures processing at very high speed.
- The speech-to-text toolkit enables developers to create applications that ingest voice, convert it to text, and then with Text Toolkit perform natural language processing applications.
- Interhost encryption enables you to automatically encrypt all data between hosts for additional security for streaming applications.
- Nested parallelism enhances the existing ability to create parallel processing by simply adding an annotation to the code. Developers can now add a nested region inside of another nested region.
• Administrative capabilities for serviceability improvements include single sign-on and Kerberos authentication.
• Submission time fusion and asynchronous check pointing help further extend Streams performance advantages over alternative stream computing platforms.

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Integration with other products gives organizations access to all data and systems. These products offer the following benefits:

• Apache Edgent (previously called Apache Quarks): Create federated analytics between Streams and devices and gateways at the edge of networks running Apache Edgent. Communications can be performed natively with Streams or using a management service like Watson IoT Platform on Bluemix.
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• Rules: Based on IBM Offering Decision Management, Streams Studio now includes a Rules editor. After rules have been authored, they are compiled into Streams Processing Language (SPL) for inclusion with other SPL operators in a Streams application for superior runtime performance.
• Speech to Text: Transforms speech to text in real-time, which can then be analyzed by Streams for further understanding.
• IBM SPSS: Uses SPSS Modeler for developing and building predictive models and deploys models using the SPSS Scoring Operator. SPSS models can be dynamically refreshed in Streams without needing to suspend the running of Streams applications.
• Rproject: Allows R commands and applies complex data mining algorithms to help detect patterns of interest in data streams.
• Spark MLib: Scores Spark Machine Learning Library (MLlib) models that have been trained offline in Spark.
• Mining: Predictive Model Markup Language (PMML) operators can read in PMML models and score using classification, clustering, regression, and associative rules algorithms.
• Text: Natural language processing of text extracts parts of speech from multiple languages and simplifies building applications that understand text.
IBM Streams offers an ultra-high performance analytics solution for real-time analytic processing (RTAP). RTAP extends online analytic processing (OLAP) by analyzing data-in-motion instead of data-at-rest. This enables higher volume and lower-latency analysis. Streams represents a new evolution in the business intelligence and complex event processing (CEP) markets. It is characterized by incredible throughput rates of disparate data types, including structured and unstructured information that must be processed with millisecond or microsecond latencies using complex correlations and powerful analytics.

A key difference between Streams and other business intelligence offerings, such as OLAP, is that the latter requires data to be at rest before running analytics. However, Streams analyzes data in-motion, a faster process, because disk storage is not required. This can lead to ultra-low latencies as compared to existing technologies. Streams can manage data or data subsets as the business demands.

In addition, while OLAP offerings are traditionally limited to supporting only structured data, Streams technology can support both structured and unstructured data. While being radically different from existing business intelligence solutions, Streams can efficiently extend and add value to existing business intelligence offerings. For example, Streams can reuse and continually refine existing analytics expressed in Predictive Model Markup Language (PMML) standards.

Streams comes standard with several real-time analytic toolkits to help provide quicker time to value. These include telecommunications event data, time series,
Streams serves the real-time analytics market. It can read in and process much higher discrete event throughput rates compared to other market offerings. Streams analyzes continuous streams of information such as audio feeds from hydrophones or video feeds from television. Furthermore, Streams can process unstructured data such as audio, video, text, and EKG/EEG waveforms.

Streams offers these unique benefits:

- Continuously analyze data-in-motion across real-time sources to deliver actionable insight.
- Immediately understand context in the business moment to dynamically adjust decisions and change course of action.
- Make real-time predictions and discoveries as data arrives to enhance and improve analytic models and cognitive systems.
- Deploy real-time analytics such as natural language processing, geospatial, predictive, and more to satisfy unique industry-specific requirements or use cases.
- Visualize data easily with drag-and-drop development tools to ensure rapid application deployment and ease for developers.
- Detect and respond to critical events faster compared to traditional techniques to stay ahead of the competition, analyzing millions of interactions or events per second.
- Choose cloud or on-premises deployment to manage costs and further speed deployment.

Streams is embedded in the following IBM offerings:

- IBM Now Factory Analytics V9.0
- IBM Customer Experience Analytics for CSP
- IBM Behavior Based Subscriber Insight for CSP
- IBM Automated Root Cause Analytics for CSP
- IBM Proactive Care Analytics for CSP
- IBM Trade Compliance Analytics for Financial Markets V1.0
- IBM Intelligent Operations Center V5.1.0.2
- IBM Industry Customer Intelligence Solutions V1.0.2
- IBM Interact Advanced Patterns V9.1.2
- IBM Operations Analytics - Predictive Insights V1.3.3
- IBM Sensemaking V1.2

Streams has connectors to the following offerings:

- On IBM Bluemix:
  - IBM BigInsights
  - IBM DashDB
  - IBM Cloudant®
  - IBM DB2® on Cloud
  - Redis by Compose
  - MongoDB by Compose
  - Apache Spark
  - DataWorks
  - Watson Internet of Things Platform
  - Message Hub
  - MQ Light
- Secure Gateway
- Predictive Analytics

- IBM on premises offerings:
  - IBM DB2
  - IBM Informix(R)
  - IBM Netezza(R)
  - IBM PureData(R) System for Analytics
  - IBM Cognos(R) Analytics
  - IBM SPSS
  - IBM BigInsights
  - IBM DataStage(R)
  - IBM Data Replication
  - IBM MQ
  - IBM Integration Bus
  - IBM Operational Decision Manager

## Program number

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## 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.

## Publications

No publications are shipped with this program.

## 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

- x86 architecture (64 bit) or IBM POWER7(R) or POWER8(R) architecture server with a minimum of 2 GB memory to run simple applications, such as the Commodity Purchasing Sample Application that is included with Streams.
- For Hyperstate Accelerator, a separate x86 architecture (64 bit) or POWER8 architecture server is required with a minimum of 8 GB memory. For persistence,
Hyperstate Accelerator requires an IBM FlashSystem® 840 or FlashSystem™ 900 (preferred) storage system.

**Software requirements**

IBM Streams V4.2 requires:

- One of the following:
  - Red Hat Enterprise Linux™ (RHEL) Server 6.6 or 7.x for 64-bit x86 architecture hardware
  - RHEL Server 7.1, or later, for 64-bit POWER8 architecture hardware
- Eclipse Platform SDK V4.5
- One of the following:
  - IBM SDK Java Technology Edition V8.x for x86 or POWER8 architecture hardware
  - Oracle Java SE V8.x SDK for x86 architecture hardware
- One of the following browsers:
  - Google Chrome 40, or later
  - Mozilla Firefox ESR 38, or later
  - Microsoft Internet Explorer 11, or later
- Optionally, for Streams for Excel, Microsoft Excel 2013 or 2010
- Optionally, for Hyperstate Accelerator, RHEL 7.1, or later

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

**IBM Electronic Support**

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

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

**Planning information**

**Packaging**

**Note:** Streams uses the security and auditability features of the Linux operating system and, optionally, may use Security Environment Linux (SE Linux).

Streams V4.2: IBM InfoSphere- DVD

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

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

**Packaging**

Streams V4.2: DVD

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**Security, auditability, and control**

Streams uses the security and auditability features of the Linux operating system and, optionally, may use Security Environment Linux (SE Linux).

Security and auditability features of Streams are:

- Pluggable authentication
- Public key infrastructure (PKI) authentication

Some of the security functions of Streams depend on SELinux.

The customer 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**

For ordering information, consult your IBM representative or authorized IBM Business Partner, or go to the Passport Advantage website.

This product is only available through Passport Advantage. It is not available as shrinkwrap.

These products may only be sold directly by IBM or by authorized IBM Business Partners for Software Value Plus.

More information can be found on the IBM Software Value Plus website.

To locate IBM Business Partners for Software Value Plus in your geography for a specific Software Value Plus portfolio, go to the Find a Business Partner page.

Product group: IBM Streams

Product: IBM Streams (5724-Y95)

Product category: IBM Streams

**Passport Advantage**

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**Passport Advantage customer: Media pack entitlement details**

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

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**Authorized User**

Authorized User is a unit of measure by which the program can be licensed. An Authorized User is a unique person who is given access to the program. The program may be installed on any number of computers or servers and each Authorized User may have simultaneous access to any number of instances of the program at one time. Licensee must obtain separate, dedicated entitlements for each Authorized User given access to the program in any manner directly or indirectly (for example, through a multiplexing program, device, or application server) through any means. An entitlement for an Authorized User is unique to that Authorized User and may not be shared, nor may it be reassigned other than for the permanent transfer of the Authorized User entitlement to another person.

**Note:** Some programs may be licensed where devices are considered users. In that case, the following applies. Any computing device that requests the execution of or receives for execution a set of commands, procedures, or applications from the program or that is otherwise managed by the program is considered a separate user of the program and requires an entitlement as if that device were a person.

**Resource Value Unit (RVU)**

RVU is a unit of measure by which the program can be licensed. RVU Proofs of Entitlement (PoEs) are based on the number of units of a specific resource used.
or managed by the program. Licensee must obtain sufficient entitlements for the number of RVUs required for licensee’s environment for the specific resources as specified in the program specific table. RVU entitlements are specific to the program and the type of resource and may not be exchanged, interchanged, or aggregated with RVU entitlements of another program or resource. Refer to the program specific RVU table.

Notes:

- Some programs may require licenses for the resources available to and the resources being managed by the program. In that case, the following applies. In addition to the entitlements required for the resources used by the program directly, licensee must obtain entitlements for this program sufficient to cover the resources managed by the program.
- Some programs may be licensed on a managed basis only. In that case, the following applies. Instead of the entitlements required for the resources used by the program directly, licensee must obtain entitlements for this program sufficient to cover the resources managed by the program.

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

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License Information number

<table>
<thead>
<tr>
<th>Program name</th>
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<tr>
<td>IBM Streams Developer Edition V4.2</td>
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<td>IBM InfoSphere Streams V4.2</td>
<td>5724-Y95</td>
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</tbody>
</table>
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.

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

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Technical support of a program product version or release will be available for a minimum of five years from the general 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 updates (modifications or fixes), releases, and versions 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.

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 (1) for programs acquired under the IBM International Passport Advantage offering, this term applies only to your first acquisition of the program and (2) 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

Yes, information is available on the Passport Advantage and Passport Advantage Express website.
**Software Subscription and Support applies**

Yes. Software Subscription and Support, also referred to as Software Maintenance, is included with licenses purchased through Passport Advantage and Passport Advantage Express. Product upgrades and Technical Support are provided by the Software Subscription and Support offering as described in the Agreements. Product upgrades provide the latest versions and releases to entitled software, and Technical Support provides voice and electronic access to IBM support organizations, worldwide.

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For additional information about the International Passport Advantage Agreement and the IBM International Passport Advantage Express Agreement, go to the Passport Advantage and Passport Advantage Express website.

**System i Software Maintenance applies**

No

**Variable charges apply**

No

**Educational allowance available**

Education allowance does not apply. Education software allowance does not apply. Special education prices are available for qualified customers through Passport Advantage.

**Statement of good security practices**

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a lawful, comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective.
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The IBM Electronic Support portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The My Systems and Premium Search functions make it even easier for organizations that are Electronic Service Agent tool-enabled to track system inventory and find pertinent fixes.

Benefits

Increased uptime: The Electronic Service Agent™ tool is designed to enhance the Warranty or Maintenance Agreement by providing faster hardware error reporting and uploading system information to IBM Support. This can translate to less wasted time monitoring the symptoms, diagnosing the error, and manually calling IBM Support to open a problem record. Its 24 x 7 monitoring and reporting mean human intervention is not required to report errors.

Security: The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM. The Electronic Service Agent tool is designed to securely transmit either through the Internet (HTTPS or VPN) or modem to provide organizations a single point of exit from their site. Communication is one way. Activating Electronic Service Agent does not enable IBM to call into an organization’s system.

For additional information, go to the IBM Electronic Service Agent website.

More accurate reporting: Because system information and error logs are automatically uploaded to the IBM Support Center in conjunction with the service request, you are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM, problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.
**Customized support:** Using the IBM ID entered during activation, you can view system and support information in the "My Systems" and "Premium Search" sections of the IBM Support Portal page.

My Systems provides valuable reports of installed hardware and software using information collected from the systems by Electronic Service Agent. Reports are available for any system associated with your IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Electronic Service Agent information that has been collected from your system, you are able to see search results that apply specifically to your systems.

For more information on how to utilize the power of IBM Electronic Services, contact your IBM Systems Services Representative, or go to the IBM Electronic Support website.

**Prices**

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**Passport Advantage**

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Corrections

(Corrected on September 29, 2016)
Revised Software requirements section.

(Corrected on September 23, 2016)
Revised Software requirements section.