IBM InfoSphere Streams V3.0 delivers a wide range of features and functions designed to improve usability, and simplify application development

At a glance

IBM® InfoSphere® Streams V3.0 delivers:

- Common application deployment to create very sophisticated analytic applications that fuse multimodal data to provide integrated view of real world events
- Improved usability with intuitive, visual programming model for analytic applications:
  - Drag-and-drop application composition
  - Data visualization
  - XML data type support that allows for simpler application development with complex data types
- IBM Information Server adapter that allows exchange of information with IBM InfoSphere DataStage®
- Five new accelerators to speed development of custom applications
  - Time Series Accelerator
  - Geospatial Accelerator
  - IBM Accelerator for Telecommunications Event Data Analytics
  - IBM Accelerator for Machine Data Analytics
  - IBM Accelerator for Social Data Analytics

Overview

IBM InfoSphere Streams V3.0 delivers a wide range of new features and functions designed to improve usability and simplify application development. A new common application deployment, with rich UI, accelerates development time, helps gather run-time insights, and allows for easy expansion into the big data platform. Drag-and-drop application composition allows for intuitive, faster, easier programming and development. Data visualization allows users to see what their data looks like by providing the standard ability to easily route all streaming records to a single operator and display them in a variety of ways on a dashboard. With InfoSphere Streams, you get enhanced support for complex data types, such as XML, that allows developers to fuse a broader range of traditional and nontraditional data.
The Message Queuing adapter allows InfoSphere Streams to handle an even broader variety of data, by communicating with other systems using this messaging standard. A complex event processing operator simplifies development of complex event processing applications.

A new adapter, that interfaces with IBM InfoSphere Information Server and IBM InfoSphere DataStage, allows users to provide better governance of their streaming data and related applications.

Enhancements in connection health monitoring and logging mean less downtime for users.

Five new accelerators enhance the ability to manage the volume, velocity, and variety of data. These accelerators provide new analytic operators or sample applications that can be used as design templates for new applications.

- Time Series Accelerator has over 20 operators and includes many machine learning algorithms that help to perform predictive analytics, regressions, smoothing, filtering and transformation on time series data. Time series data is data that arrives periodically from things like sensors or stock market trades, which continuously provides data.
- Geospatial Accelerator calculates distance with many techniques and map matching functions to enable users to determine if a point is within a given area.
- IBM Accelerator for Telecommunications Event Data Analytics provides a full application for transformation and analytics for telephone company call and event detail records, used for applications such as revenue assurance or fraud detection in real time.
- IBM Accelerator for Social Data Analytics provides the ability to analyze various types of social media data to provide key insights around consumer sentiment and purchase intent. This information can then be leveraged to build applications around lead generation and brand management.
- IBM Accelerator for Machine Data Analytics provides the ability to analyze various types of machine data to provide business insights. It provides ability to ingest, parse, and extract machine data. It can then analyze the data to provide insights such as patterns and correlations. It provides faceted search capability to easily find and navigate through large volumes of machine data. It also provides for visualization of the data and the results of the analysis.

**Key prerequisites**

Refer to the Hardware requirements and Software requirements sections.

**Planned availability date**

November 16, 2012: Electronic availability

December 14, 2012: Media availability

**Description**

IBM InfoSphere Streams V3.0 radically extends the state of the art in information processing by simultaneously addressing several technical challenges including:

- Sub millisecond response time to events and changing requirements
- Continuous analysis of data at rates significantly higher than existing systems
- Ability to seamlessly extend existing applications with new analytics
- Ability to deploy existing data mining models for real-time insights
Improved performance enables handling higher volumes at increased velocity

InfoSphere Streams V3.0 continues to improve performance to help companies deal with increased volume of information and need to increase velocity through:

- New IBM Netezza® loader to improve performance when loading data into Netezza
- Improved windowing techniques for aggregation operators
- New filtering support for import and export between jobs, which improves overall performance by eliminating unnecessary records

Improved systems administration lowers administrative costs and helps improve runtime capacity

Many new and improved capabilities can simplify administrator workloads as they strive to maintain optimal usage of the InfoSphere Streams runtime.

- New Streams Console Application Graph offers similar visualization of applications for Streams Administrators as has been available for developers in the Streams Live Graph capability.
- Health metrics available programmatically to facilitate application performance and availability improvements.
- More granular health metrics and operator capabilities to help create high performance applications.
- Application parameters enable customized execution of applications without recompilation.
- Instance agnostic and relocatable applications to help improve runtime capacity.
- Dynamic allocation of host pools to add agility to the runtime platform.
- New ex-location and isolation constraints via host tagging to simplify job deployment.
- Runtime APIs for programmatic manipulation of import subscriptions.
- Runtime and code-generation APIs for generic windowing manipulations.
- Administrative console with new operator-level information.

IBM Accelerator for Telecommunications Event Data Analytics

IBM Accelerator for Telecommunications Event Data Analytics is a template that enables real-time processing and analytics of Call Detail Records and Event Detail Records using IBM InfoSphere Streams. The template is a collection of assets that must be configured for a specific use case, such as:

- Defining how to parse Call Detail Records
- Customer specific rules for transformation of Call Detail Records into processed Call Detail Records
- The location of the external repository
- An evolution of an asset that you may have already installed using the template
- Including a demonstration application, which is a configuration of the template with a set of example rules
- Helping you accelerate application development, with ability for you and partners to create derivative work

Customization may be required for specific customer deployments, including writing or changing SPL code, C++ code, or scripts. Customization may include changes to input files, containing sets of CDRs IPDRs, Event Detailed Records (referred to as xDRs), generated by switches, networking equipment, or external systems. Customization may include changes to functions in the template, such as:

- **File error processing** - The incoming xDR file is checked for file-level duplicate, badly formatted files, or zero byte files.
- **xDR parsing** - Ability to accept input xDR files in a range of switch formats.
• **Rules processing** - Changing rules that describe transformation of the xDR.
• **Duplicate xDR detection** - Settings allow the user to decide tradeoffs between memory requirements and overall processing performance.
• **Business dashboards** - Real-time dashboards can be customized to show different metrics.
• **Reporting** - Reports may be customized.

Finally, customization may be done for output, such as changing the external xDR repository.

**New Accelerator for Social Data Analytics** enables monitoring of internet social media.

The Social Data Accelerator, extracts relevant information from Tweets, Boards, and Blogs, and builds your social profiles based on a specific use case and industry. Standard analysis on Buzz, Sentiment, Intent to Buy, Intent to Attend, Customer Of, Ownership is provided in context of the social profile dimensions, such as gender, location, parental status, marital status, product interest, employment.

**New Accelerator for Machine Data Analytics** simplifies development of geospatial applications.

**New Accelerator for Geospatial Data Analytics**

The Geospatial Data Analytics Accelerator will provide ability to interpret location data (for example GPS data) and display on a map. It also provides geofencing, the ability to see if a location exists in or around the vicinity and area of interest. This accelerator can be used in conjunction with city maps to point various moving traffic points as long as they are transmitting GPS data.

**New Accelerator for Time Series Data Analytics** improves decision making with cognitive and predictive analytics.

The Accelerator for Time Series Data Analytics has been used many years as a research asset in healthcare applications, scientific applications, and transportation applications. The new Time Series accelerator Data Analytics provides a number of statistical and predictive analytic operators to speed development of analytic applications.

Operators include:

• **Windowing**: Weighting or tapering of a time series given a specified duration (functions include Hamming, Hanning, Blackman, Cosine, and Triangle)
• **CrossCorrelate**: Estimating the degree to which two time series are correlated.
• **Convolve** is a mathematical operation similar to correlation that produces a third time series
• **Fast Fourier Transform (FFT)**: Compute the FFT.
• **DSPFilter**: Performs digital filtering (low-pass, high-pass, band-pass) on the data.
• **HoltWinters**: Predicts future values of the time series based on the additive HoltWinters algorithm.
• **Normalize**: Estimates means and variance or normalize time series to zero mean and unit variance.
• **Linear Predictive Coding (LPC)**: Uses an auto-regressive modeling technique to model the data and do forecasting.
• **SeasonAdjust**: Removes seasonal components in time series.
• **Faded Memory Polynomial filter**: Faded Memory Polynomial filter that tracks time series and can be used to predict future values.
• **Vector autoregression (VAR)**: A model using regression techniques on multiple variables.
• **Autoregressive Integrated Moving Average (ARIMA)**: ARIMA modeling for forecasting.
• **Gaussian Mixture Modeling (GMM):** GMM of the time series data.

• **Season Trend Decomposition:** Implements seasonal trend decomposition and transforms an input time series into three time series representing the season, the trend, and the residuals.

• **Function Evaluator:** Applies a specified function to each element of a time series.

• **Recursive Least Square:** Fits a linear regression model to a series of covariates and dependent variables.

• **GAMLearner and GAMScorer:** Apply a Generalized Additive Model (GAM) to a stream of categorical or continuous time series data.

**New toolkit for Complex Event Processing**

A new complex event processing operator makes it much simpler to create complex event processing applications.

**New toolkit for IBM InfoSphere Server integration** improves interoperability between Extract, Transform and Load (ETL) jobs and Analytic jobs.

**IBM InfoSphere DataStage Integration Toolkit**

IBM InfoSphere DataStage Integration Toolkit provides operators and commands that facilitate integration between IBM InfoSphere Streams and IBM InfoSphere DataStage.

Integration of InfoSphere DataStage and InfoSphere Streams applications involves flowing data streams between the applications and configuring them to use the data.

By sending data to InfoSphere Streams from IBM InfoSphere DataStage, InfoSphere Streams can perform near real-time analytic processing in parallel to the data being loaded into a warehouse by IBM InfoSphere DataStage. Alternatively, when sending data from InfoSphere Streams to IBM InfoSphere DataStage, the InfoSphere Streams job performs real-time analytic processing, and then forwards the data to IBM InfoSphere DataStage to enrich, transform, and store the details for archival and lineage purposes.

IBM InfoSphere Streams Advanced Text Accelerator provides an operator for running Annotation Query Language (AQL) queries over text documents and plugins for developing AQL queries.

AQL specifies rules for extracting information from text documents. Other IBM products, such as IBM InfoSphere BigInsights™, also support AQL queries. AQL can be compiled into an Annotation Operator Graph file (AOG file). (.aog file), which is an internal representation of the operator graph that is used by the text analytics engine to annotate the document at run time.

Financial Accelerator continues to provide benefits such as faster time to value, better performance, and greater simplicity for applications used in Financial Services. The Financial Accelerator includes:

• A set of industry-specific adapters, each implemented as an InfoSphere Streams Processing Language operator, that allow InfoSphere Streams applications to interoperate with many generic financial services infrastructure and external protocols.
  
  - Bidirectional connectivity between InfoSphere Streams applications and Financial Information eXchange (FIX) version 4 gateways for order execution, confirmation, and other tasks performed through the FIX protocol.
  
  - Bidirectional connectivity between InfoSphere Streams applications and the WebSphere® Front Office platform, including support for its Reliable Multicast Messaging option for consumption of market data feeds, use of order books, and access to other functions provided by WebSphere Front Office.
  
  - Capability to send messages via WebSphere MQ Low-Latency Messaging for access to a low-latency message-oriented middleware platform. This supports
InfiniBand communications hardware, with significantly higher data rates than existing Ethernet-based communications hardware.

- A set of built-in functions and analytics that are routinely used for typical trading applications in the financial services domain. They are:
  - InfoSphere Streams Processing Language operators who help integrate InfoSphere Streams applications with QuantLib - a popular open-source financial analytics package. The InfoSphere Streams operators provide access to two QuantLib engines that compute valuations for European-style and American-style Equity Options from within an InfoSphere Streams application.
  - A set of library functions accessible from InfoSphere Streams Processing Language that help calculate a set of equity option derivative values known as The Greeks, such as delta, theta, rho, vega, gamma, vanna, zomma, and charm.
  - A set of library functions that help calculate theoretical put-and-call option values based on Black-Scholes options valuation model. These functions further demonstrate how customer-proprietary analytic functions, outside of InfoSphere Streams environment, can be accessed from a InfoSphere Streams application.
- The Financial Services Accelerator that also includes two starter applications to illustrate how InfoSphere Streams can be used to develop powerful proprietary applications for two popular High-Frequency Trading (HFT) scenarios namely Equities Trading and Options Trading. Each application is designed to be a starting point, providing a more easily extensible model or template for further customization based on proprietary analytics.

**Accessibility by people with disabilities**

A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the IBM website


Accessibility features supported by InfoSphere Streams V3.0:

- Supports interfaces commonly used by screen readers
- Can be operated using only the keyboard
- Supports customization of display attributes such as color, contrast, and font size
- Communicates all information independently of color
- Provides documentation in an accessible format
- Allows the user to access the interfaces without inducing seizures due to photosensitivity

**Section 508 of the US Rehabilitation Act**

IBM InfoSphere Streams is capable as of December 14, 2012, when used in accordance with IBM’s associated 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 Voluntary Product Accessibility Template (VPAT), containing details on the products accessibility compliance, can be requested on the following website


**Product positioning**

IBM InfoSphere Streams offers an ultra-high performance-in-motion analytics platform for the real-time analytic processing market. Real time analytic processing is an extension of the online analytic processing (OLAP) market by doing analysis on data in motion instead of on data at rest to provide higher volume and lower latency analysis. It represents a new evolution in the business intelligence market characterized by incredible throughput rates of disparate types of structured and
unstructured information that must be processed with millisecond or microsecond latencies using complex correlations and powerful analytics.

A key difference between InfoSphere Streams and other business intelligence offerings, such as OLAP, is that the latter requires data to be at rest before running analytics. However, InfoSphere Streams analyzes data in-motion -- a faster process, since it does not need to be stored on disk. This can lead to ultra-low latencies as compared to existing technologies.

InfoSphere Streams also allows persisting subsets of data or complete data as business demands. In addition, while OLAP offerings are traditionally limited to supporting only structured data, InfoSphere Streams technology can support both structured and unstructured data. While being radically different from existing business intelligence solutions, InfoSphere Streams can efficiently extend and add synergy to existing Business Intelligence offerings. For example, InfoSphere Streams can reuse and continually refine existing analytics expressed in Predictive Model Markup Language (PMML) standards.

InfoSphere Streams V3.0 comes standard with several toolkits and accelerators to help provide quicker time to value. These include Financial Toolkit, Mining Toolkit, Telecommunications Event Data Analytics, Machine Data Analytics, Social Media Analytics, Messaging Toolkit, Internet, Big Data, Complex Event Processing Toolkit, and Advanced Text Analytics.

The real-time analytic market overlaps with the Complex Event Processing marketplace. InfoSphere Streams extends this market by providing the capability to read in and process much higher discrete event throughput rates and continuous streams of information, such as audio feeds from hydrophones or video feeds from television with ultra-low latencies. Furthermore, InfoSphere Streams also provides the incremental capabilities to process unstructured data such as audio, video, text, and EKG.

### Availability of national languages

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### Offering Information

Product information is available via the Offering Information website

http://www.ibm.com/common/ssi

Also, visit the Passport Advantage® website

http://www.ibm.com/software/passportadvantage
Publications

No hardcopy publications are shipped with this product.

Soft copy publications shipped with this product include:

- Release Notes
- What's New (Note: This will not be included in the install image, but only available from the information center.)
- Installation and Administration Guide
- IBM Streams Processing Language (SPL) documentation:
  - SPL Introductory Tutorial
  - SPL Compiler Usage Reference
  - SPL Config Reference
  - SPL Specification
  - SPL Operator Model Reference
  - SPL Standard Toolkit Reference
  - SPL Toolkit Development Reference
  - SPL Streams Debugger Reference
  - SPL User-Defined Operators Javadoc-based documentation
    -- Java™ Operator API for InfoSphere Streams
    -- Deprecated Java Operator API
    -- Samples for the Java Operator API
  - SPL Code Generation and Runtime API documentation (Doxygen-based.
    -- SPL Operator Code Generation API Documentation
    -- SPL Runtime C++ API Documentation
    -- SPL Standard Toolkit Types and Functions
- Studio Installation and User's Guide
- Getting Started with the IBM InfoSphere Streams Trial
- Financial Services Toolkit
- Mining Toolkit
- Database Toolkit
- Internet Toolkit
- Big Data Toolkit
- Complex Event Processing Toolkit
- Geographic Information Systems Toolkit
- InfoSphere DataStage Integration Toolkit
- Messaging Toolkit
- Text Toolkit
- Learning About Streams Using the Commodity Purchasing Sample Application

The IBM Publications Center

http://www.ibm.com/shop/publications/order

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. Payment options for orders are via credit card (in the U.S.) or customer number for 20 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries.
Technical information

Specified operating environment

**Hardware requirements**
- X86 32-bit or 64-bit systems with a minimum of 500 MB memory
- 2 GB memory to run simple applications, such as the Commodity Purchasing Sample Application that is included with InfoSphere Streams

**Software requirements**
- Red Hat Enterprise Linux™ V5.3, or later, or V6.0, or later
- CentOS Linux V6.0, 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.

**Compatibility**
InfoSphere Streams V3.0 is compatible with applications that were developed for use on InfoSphere Streams V2.0.

**Performance considerations**
Performance of InfoSphere Streams applications is dependent on many things, including, but not limited to:
- Application design
- Analytic complexity
- Server hardware, including number of cores, CPU speed, and memory size
- Server cluster communications bandwidth
- Number of InfoSphere Streams jobs running simultaneously

InfoSphere Streams V3.0, using quadcore x86 3.0 GHz machines in a cluster, an application with simple analytics, and WebSphere MQ Low Latency Messaging using InfiniBand (IB), with 256-byte tuples, achieved a throughput of over one million tuples with just two machines instead of using six machines as in V1.0.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

**Planning information**

**Customer responsibilities**
Successful application operation and management of InfoSphere Streams is the responsibility of the user. Examples of those responsibilities include:
- Confirming the validity of the proposed equipment and programs
- Developing appropriate system procedures
- Incorporating protective measures to safeguard the privacy of data from unauthorized modification, destruction, or disclosure
• Incorporating sufficient checkpoints, balances, and controls into the application
design to satisfy accuracy, restart, and audit requirements
• Establishing adequate backup contingency plans
• Preparing adequate documentation
• Providing qualified personnel to obtain the desired results

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 (also referred to as Software Maintenance)
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.

IBM includes one year of Software Subscription and Support (also referred to as
Software Maintenance) with each program license acquired. The initial period of
Software Subscription and Support (also referred to as Software Maintenance) can
be extended by the purchase of a renewal option, if available.

Packaging

Note: InfoSphere Streams includes development tools (InfoSphere Streams
Studio), runtime (InfoSphere Streams Runtime), and toolkits (mathematics, text,
mining, and financial markets toolkits).

IBM InfoSphere Streams V3.0
• IBM InfoSphere Streams - DVD
• IBM DB2® - DVD

Security, auditability, and control

IBM InfoSphere 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 IBM InfoSphere Streams are:

• Pluggable authentication
• Optional labeling of data exiting InfoSphere Streams

Some of the security functions of IBM InfoSphere Streams depend on SE Linux.

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

Ordering information

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

Product Information

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**Charge metrics definitions**

**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 accessing the program in any manner directly or indirectly (for example, via 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 the unit of measure by which this program is licensed. RVU entitlements are based on the quantity of a specific designated measurement for the given program. A Proof of Entitlement (PoE) must be obtained for the appropriate number of RVUs required for your environment as defined by the specific program terms. The RVU entitlements are specific to the program and may include, but are not limited to the following: Client Devices, data source records, messages, and servers, and may not be exchanged, interchanged, or aggregated with RVU entitlements of another program. To understand these benefits of RVU licensing, and to determine how many RVUs to obtain for the program, contact your IBM representative.

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**Passport Advantage program licenses**

**IBM InfoSphere Streams**

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Part description                              Part number

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IBM InfoSphere Streams per Resource Value Unit SW S&S Reinstate 12 Mo D0V9HLL

IBM InfoSphere Streams

Part description                              Part number

IBM InfoSphere Streams for Non-Production Environment InfoSphere Streams Non-Production Environment RVU E0F5YLL
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InfoSphere Streams Non-Production Environment RVU SW S&S Reinstate 12 Mo D0V9FLL

Passport Advantage supply

Program name/description                          Part number

Developer Edition V3.0.0
IBM InfoSphere Streams Developer Edition V3.0 for Linux English Media Pack BB1DFEN
IBM InfoSphere Streams NPE V3.0.0
IBM IS Streams for Non-Production Environment V3.0 Linux English Media Pack BB1DEEN
IBM InfoSphere Streams V3.0.0
IBM InfoSphere Streams V3.0 for Linux English Media Pack BB1DDEN

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.

IBM InfoSphere Streams V3.0.0

Entitled maintenance offerings description Media packs description Part number

IBM InfoSphere Streams per Resource Value Unit IBM InfoSphere Streams V3.0 for Linux English Media Pack BB1DDEN

IBM InfoSphere Streams NPE V3.0.0

Entitled maintenance offerings description Media packs description Part number

IBM InfoSphere Streams for Non-Production Environment per Resource Value Unit IBM IS Streams for Non-Production Environment V3.0 Linux English Media Pack BB1DEEN

Developer Edition V3.0.0

Entitled maintenance offerings description Media packs description Part number

IBM InfoSphere Streams Developer Edition V3.0.0 IBM InfoSphere Streams Developer Edition V3.0 for Linux English Media Pack BB1DFEN
**Withdrawal of previous Passport Advantage part numbers**

Effective November 16, 2012, IBM will withdraw from marketing the following products licensed under the IBM International Program License Agreement. A replacement product and availability date is listed if one is available.

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