DISTILLERY SOFTWARE

making our world a safer place

Integration Options

Integration Options

Data Integration Scenarios

The Distillery Software product suite offers a number of technologies that can be combined to provide interoperability with external systems. This document gives an overview of the available data integration facilities and scenarios that make use of these capabilities. This document is intended for use by solutions architects looking at techniques to integrate Distillery Software products with external applications and data repositories.

Document Structure

Product Architecture (page 3) is an overview of the overall logical architecture of the Distillery Software product suite. This section provides the context for the products and components described in the remainder of the document.

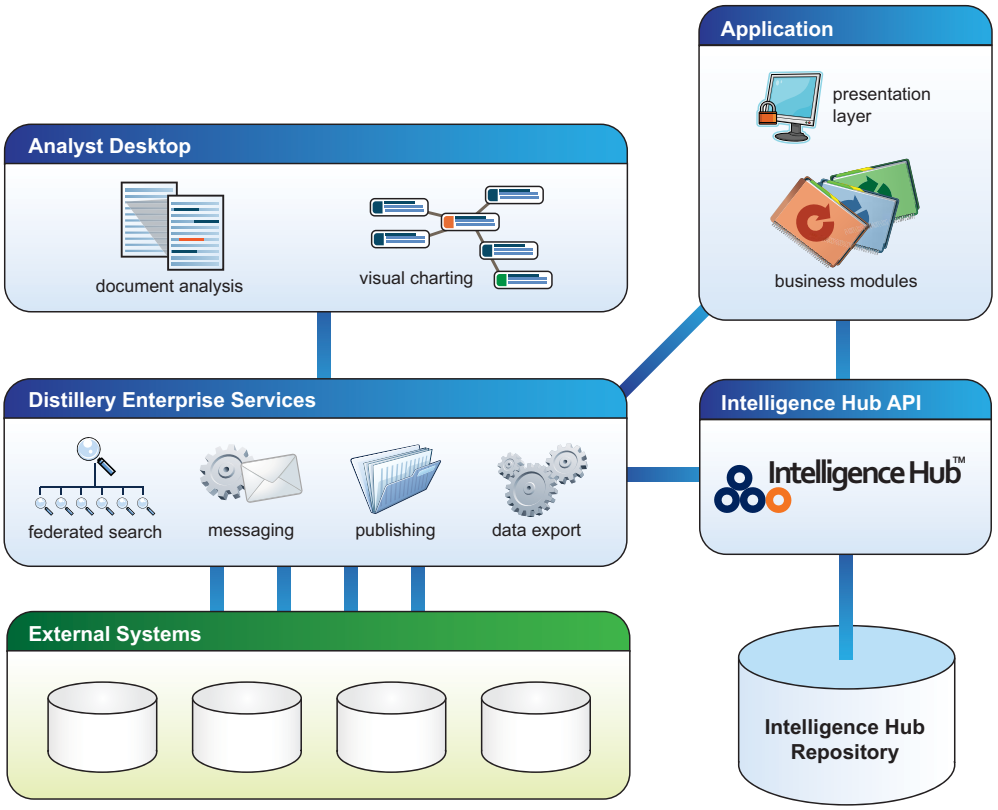
Data Related Services (page 4) provides a summary of the services provided in the Distillery Enterprise Services suite that are relevant for integration with external systems.

Intelligence Hub System Interfaces (page 6) outlines the specific features provided by Intelligence Hub to enable Intelligence Hub applications to integrate with external systems and that enable external systems to access data in the Intelligence Hub repository.

Intelligence Hub Integration Scenarios (page 9) describes examples of typical Intelligence Hub integration scenarios that make use of the services and features outlined in Data Related Services and Intelligence Hub System Interfaces.

Product Architecture

The diagram below shows the high level conceptual architecture of the Distillery Software product suite.



Distillery Intelligence Hub is the repository system that manages the data for an Intelligence Hub application. Intelligence Hub provides the storage and retrieval functions for the underlying entity-association model as well as the other features of the Intelligence Hub repository system, such as security, audit, PAMS, etc. These repository functions are made available to other applications through the Intelligence Hub API.

An Intelligence Hub application for a particular business requirement is typically developed using Oracle PLSQL, which implements the business logic for the application as well as to generate the main elements of the applications' web interface. The Intelligence Hub application accesses the repository via the Intelligence Hub API.

The presentation layer of an Intelligence Hub application is web-based and generally utilises web technologies such as HTML, CSS and AJAX.

Distillery Enterprise Services (DES) is a collection of services and common infrastructure used by components of the Distillery Software product suite. This layer is being developed as the primary interface for integrating the Distillery Software product suite with external systems.

Analyst Desktop is a workbench integrating productivity tools used by information analysts. It is a client application that makes use of DES to communicate with an Intelligence Hub application and with external systems.

Data Related Services

Data Export Service

The Data Export service provides a flexible capability to publish Intelligence Hub data into any structured format. This service makes use of XSLT transforms to convert data in a standard Intelligence Hub XML format (IQXML) into a target format. Solutions developers can develop XSLT transforms as required to meet specific business requirements. Distillery Software is building a library of utilities and transforms to assist developers implement data export solutions for their applications. In particular, Distillery Software is developing data mapping utilities and transforms to map IQXML to the ACC ACID SIEF format (possible availability around April 2008).

Intelligence Repository Service

The Intelligence Repository Service provides an abstract programming interface containing structured data storage and retrieval concepts that are required by Analyst Desktop. Analyst Desktop can access an external data repository via an adaptor that implements the intelligence repository interface. The operations that Analyst Desktop can apply against the target repository are dependent on the functionality implemented by the adaptor.

Adaptors implementing the Intelligence Repository abstract interface are also the recommended means for integrating Intelligence Hub applications with external data repositories. By using this standard interface, developers will be able to take advantage of existing infrastructure as well as protect applications against future changes to the external repositories.

Document Repository Service

The Document Repository Service provides an abstract programming interface containing document storage and retrieval concepts that are required by Analyst Desktop. Analyst Desktop can access an external document repository via an adaptor that implements the intelligence repository interface. The operations that Analyst Desktop can apply against the target repository are dependent on the functionality implemented by the adaptor.

Adaptors implementing the Document Repository abstract interface are also the recommended means for integrating Intelligence Hub applications with external document repositories. By using this standard interface, developers will be able to take advantage of existing infrastructure as well as protect applications against future changes to the external repositories.

Federated Search Service

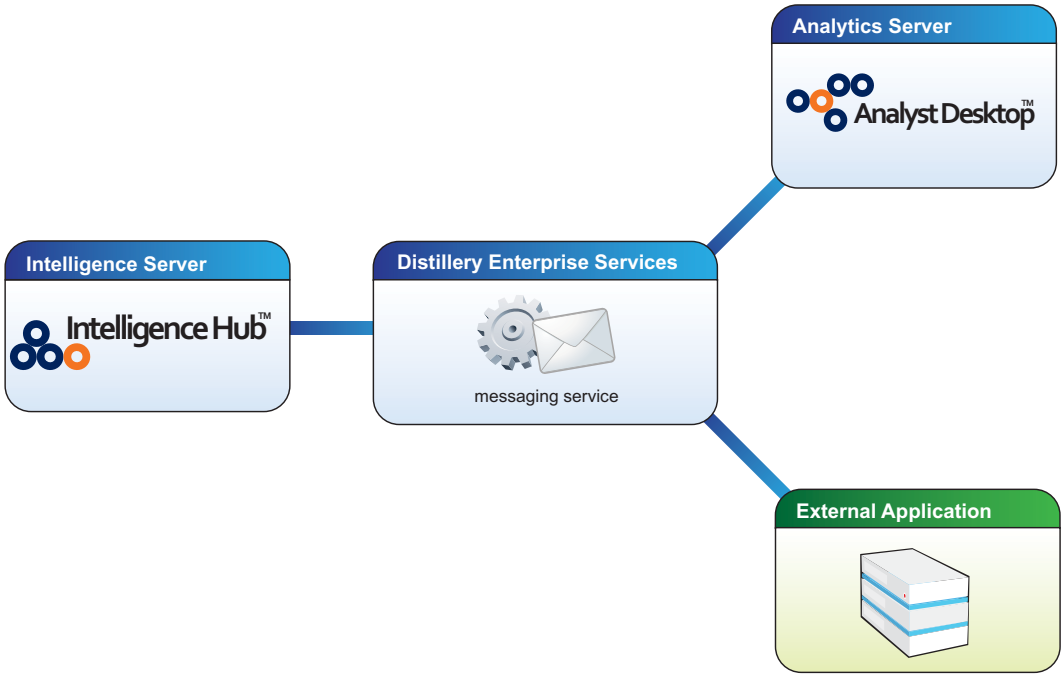
The Federated Search Service provides a standard facility for Analyst Desktop and Intelligence Hub applications to search external data repositories. Currently the service allows Intelligence Hub applications and Analyst Desktop to search an additional data repository as well as the underlying Intelligence Hub data repository. To integrate a target repository, an adaptor is required, implementing the interface required by the service.

The current implementation of the service does not support multiple repository searching. However, it is possible to extend the service implementation to fully support federated searching by integrating a third party federated search engine, such as Oracle Secure Enterprise Search.

Messaging Service

The Messaging Service is a DES component that allows an Intelligence Hub application to export networks, entities, embedded binary objects, and text field values to external systems. Currently it is primarily used to pass data between Intelligence Hub and Analyst Desktop, but it could be used to pass values to other applications.

Other applications would need to register with the service and deploy any required handlers.



Intelligence Hub System Interfaces

This section outlines the specific techniques provided in Intelligence Hub to enable Intelligence Hub applications to interoperate with external systems.

The Intelligence Hub API

The Intelligence Hub Application Programming Interface (API) forms the core of many of the interfaces between Intelligence Hub and other systems. The API allows an externally developed program to perform the majority of tasks that might be performed by an online user during a standard InterQuest user session, but within the confines of the Intelligence Hub Security Framework.

The API provides facilities such as:

- Session creation (to initialise a security context)
- Execute a search and create or manipulate result sets
- Create, modify, retrieve and index data
- Create relationships (or links) between data entities
- Extract or Modify metadata information

The security context is an important aspect of the Intelligence Hub API. It represents security context within which an online user would operate after they successfully authenticate to the system. The security context is used by Intelligence Hub to determine what data is accessible to, and what functions can be performed by, the various calls to the API.

The native Intelligence Hub API is developed in Oracle PLSQL and can be invoked by calls to PLSQL packages. Web services and Java invocation facilities are also available.

User Exits

A User Exit is a call to externally developed programs and provides a general means for an Intelligence Hub application to interface with external systems. A User Exit can be associated with various Intelligence Hub operations, including Calculations and Triggers.

A User Exit can be used to send or retrieve data from external systems as well as to retrieve and push data to the Intelligence Hub repository. If a User Exit accesses the Intelligence Hub repository, it must be via the Intelligence Hub API.

Triggers

A trigger is a predefined condition that causes some action to take place automatically when a particular condition is met.

Trigger conditions include when a particular field is given a particular value, when a record reaches a certain point in its life-cycle, when some action is performed on a record (such as update or deletion), and so on.

The sorts of actions that can take place include sending an email message, updating the triggering response, or some other response, executing some background process to update some external system, and so on. Coupled with the User Exit capability and the Intelligence Hub API, the possible actions are virtually limitless.

ERIQ

Data is stored in Intelligence Hub in a proprietary format, designed to optimise Intelligence Hub's advanced searching capabilities and configurability. This proprietary structure is generally not accessible using standard relational access methods.

ERIQ is used to enable external systems to access Intelligence Hub data using standard relational access methods. ERIQ stands for Entity-Relational Intelligence Hub. It presents a fully normalised read-only view of the data held in Intelligence Hub, completely hiding the proprietary structure from the end user, and with full observance of the Intelligence Hub Security Framework.

Each Intelligence Hub User has their own set of ERIQ views for the same data model, and through these views can only see the data they are permitted to see. Intelligence Hub users can use ODBC compliant relational data access tools to connect the Oracle Database where Intelligence Hub is running and query the ERIQ views, just as though the data was held in relational tables.

ROSE

ROSE (the Rule Oriented Selection Engine) is used to process data from external sources against the Intelligence Hub datastore using a series of predefined rules. ROSE is frequently used to load or update information into Intelligence Hub based on files of information from an external system. ROSE can also be used to provide a batch vetting facility, where records from an external system are checked against Intelligence Hub and annotated in accordance with whatever rules are defined, and then handed on for further processing elsewhere.

Data Files input to ROSE must be ASCII text, containing variable length columns, and optional header record, and delimiters between both columns and records.

Data Loader

Data Loaders provide configurable data processors which can load and update records and links from flat file datasets into the Intelligence Hub repository. A loader can create or update entities (such as people, organisations, locations, etc) and create links between those entities to represent the role(s) they play within the source data set. Data Loaders support serial reprocessing of fresh copies of a source data set, enabling one-way synchronisation of data from a source system into the Intelligence Hub repository.

Configuration is via an XML load specification which maps columns in the data source onto entities (records) and attributes (fields) in the Intelligence Hub repository, and specifies the associations between the mapped entities.

When re-processing an updated copy of a previously supplied data set, the data loader attempts to resolve each incoming entity against the records it already has in the Intelligence Hub repository. When an existing record is found, it is updated with the new values from the incoming dataset. If no record is found, a new one is created.

Very large datasets will be segmented for processing in smaller units of configurable size. The number of these segments that will be processed simultaneously can also be controlled.

Summary Forms and Publishing

Summary Forms provide the ability to collect information in the Intelligence Hub repository into a single form. A snapshot of this consolidated information at a particular time can then be recorded as an Edition. The contents of an Edition are specified by the Summary Report template. In particular, a report template can be developed that represents the collected information in an XML format.

Editions can be published to the Data Export service, which can then transform the Edition to a format supported by the available XSLT transforms. In particular, a transform could be developed to transform the data into a target XML format that would allow it to be loaded into another system.

VAT Export

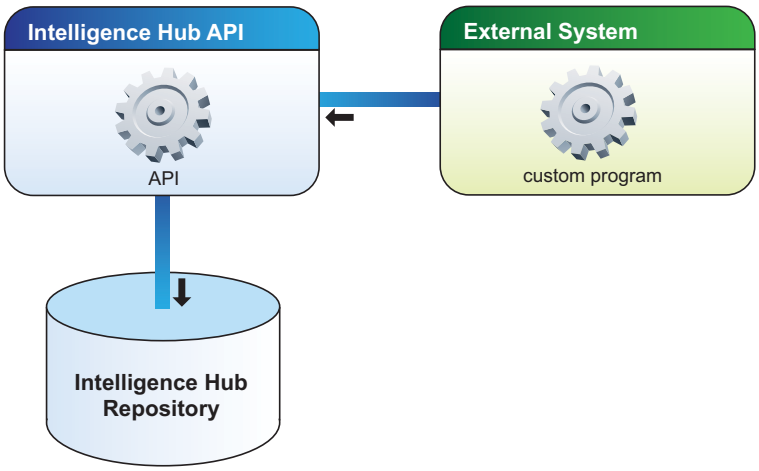
Intelligence Hub provides a facility to export records and its links to a VAT (Visual Analysis Tool) file. This export facility is not as flexible or generalised as Summary Forms publishing. However, it is a practical easy to use facility to export data to a file for importing to an external application such as I2's Analyst Notebook for visualisation.

Intelligence Hub Integration Scenarios

There are many possible scenarios for interaction between computer systems. The following scenarios provide some examples of the different types of interaction that are possible between Intelligence Hub and other systems.

Sending Data From Other Systems Into Intelligence Hub in Real Time

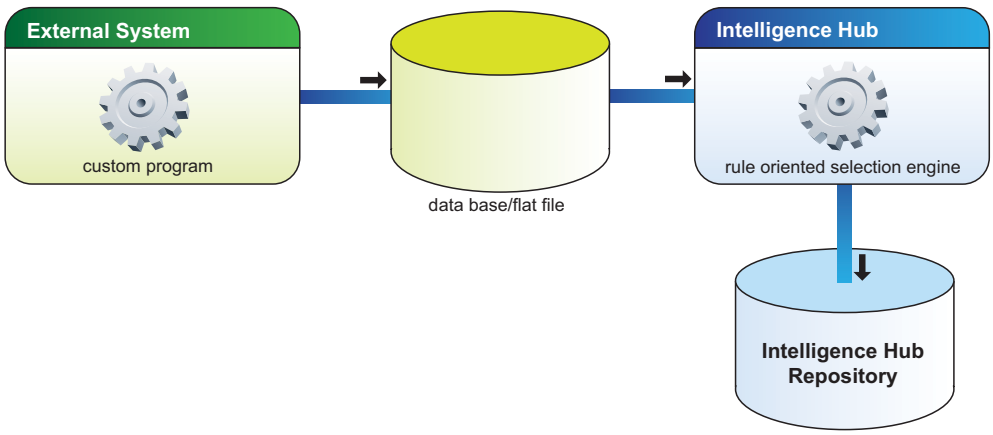
The Intelligence Hub API can be used to load information into the Intelligence Hub repository in Real Time.



A custom built program will be required to push data from the “other” systems, and formulate Intelligence Hub API calls to load the data into the Intelligence Hub repository. These API calls can be to simply load new data, or to update existing data. In this scenario the custom built program would be executed from within the “other” system.

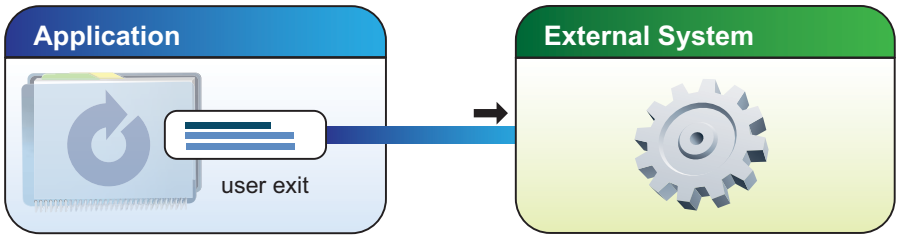
Sending Data from Other Systems into Intelligence Hub in Batch Mode

The Intelligence Hub module ROSE can be used to load data sent from another system into the Intelligence Hub repository. See the full description of ROSE for details.



Updating Other Systems from Intelligence Hub

User Exits can be used in Intelligence Hub applications to execute database queries and to call external programs. They can be triggered when information changes, or when a predefined condition is met. User Exits will form the basis of any interfaces that require data to be loaded from an Intelligence Hub repository into other systems.



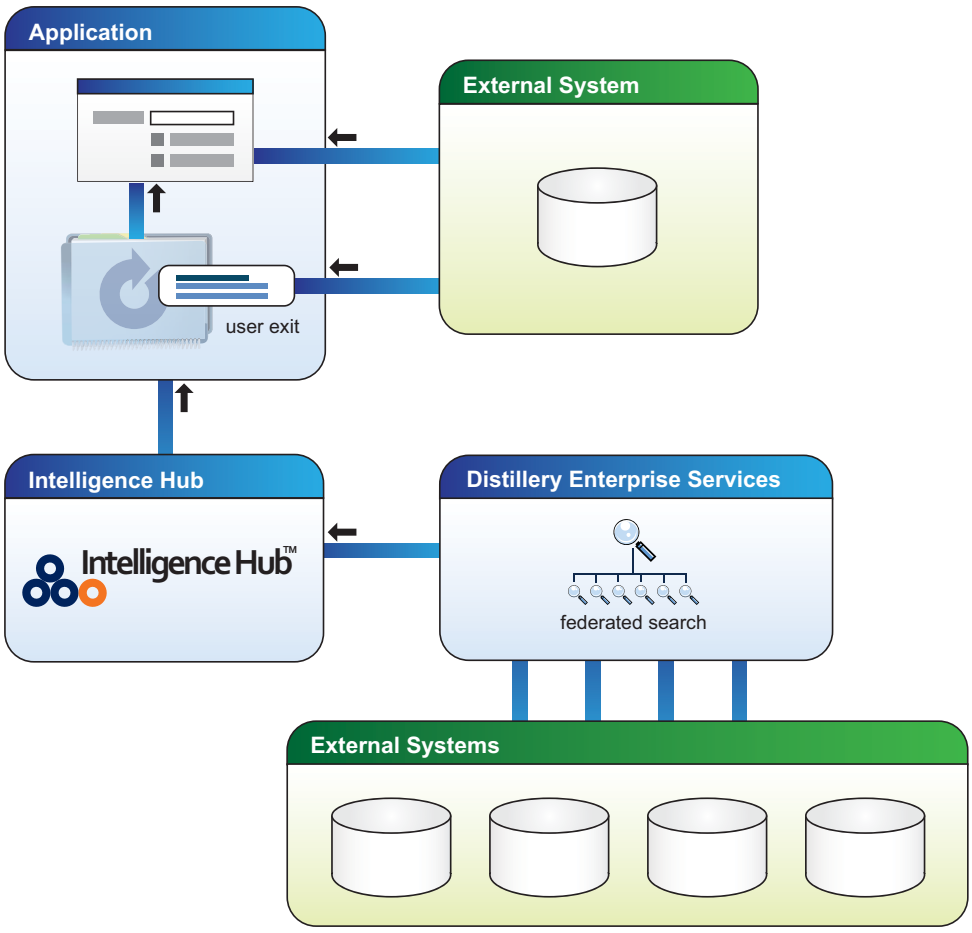
A custom program will be required to send data to the “other” systems. These programs may receive data directly from Intelligence Hub through the User Exit call, and may also use the Intelligence Hub API to retrieve additional data. This method can be used to send new data out to the other systems, or to update data that the other systems already hold.

Displaying Data from Other Systems in Intelligence Hub

An Intelligence Hub application can use User Exits from the business logic layer to retrieve data from external systems, which can then be displayed in the Intelligence Hub UI. Alternatively, information can be retrieved directly from the Intelligence Hub web presentation layer directly via web techniques such as AJAX.

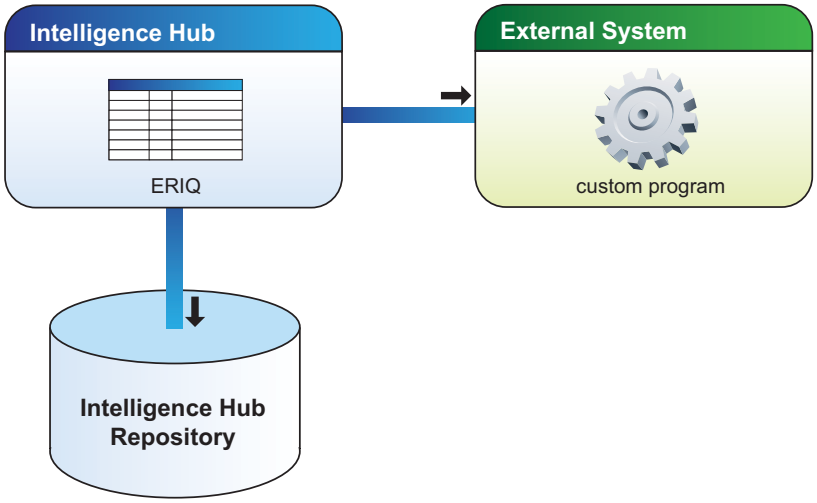
The retrieved data would then be available to the Intelligence Hub application to operate on, including to copy & paste and to store to the Intelligence Hub repository.

Intelligence Hub also provides a federated search facility that makes use of the Federated Search Service. This facility allows an Intelligence Hub application to search and display data from external repositories



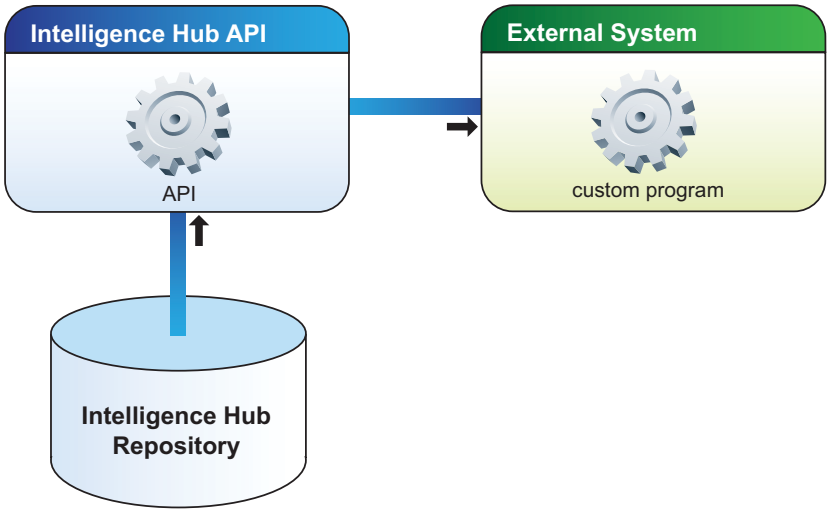
Allowing External Data Analysis of Intelligence Hub

The Intelligence Hub module ERIQ is designed to allow SQL compliant queries of the IQML. See the full description of ERIQ for details.



Displaying Intelligence Hub Data within Other Systems

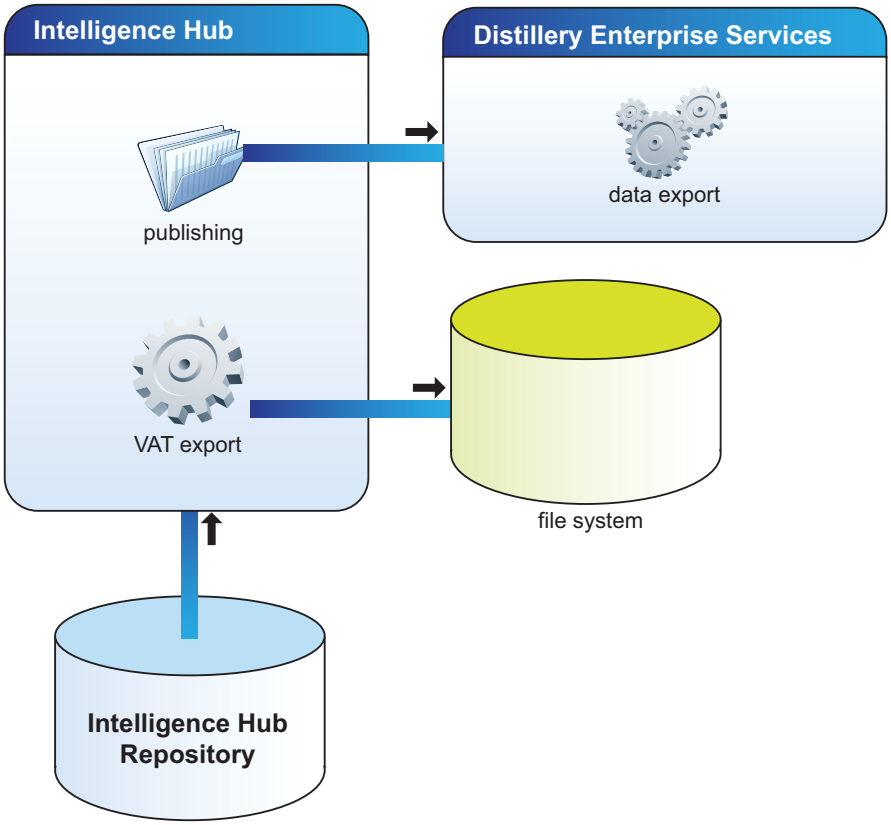
An external system can retrieve data via the Intelligence Hub API. For example, an enterprise portal can display data from an Intelligence Hub repository by using the web services interface to the Intelligence Hub API.



Exporting Data from Intelligence Hub

The VAT export facility provides an easy to use method to export data from an Intelligence Hub repository to a file format that can then be loaded to external systems, including visual analysis tools such as i2 Analyst's Notebook.

For more complex data export requirements, the Summary Forms and Publishing facility combined with the Data Export Service provides the capability to produce data in any structured format. This can be used, for example, to export data in XML formats required in inter-agency data exchanges.



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