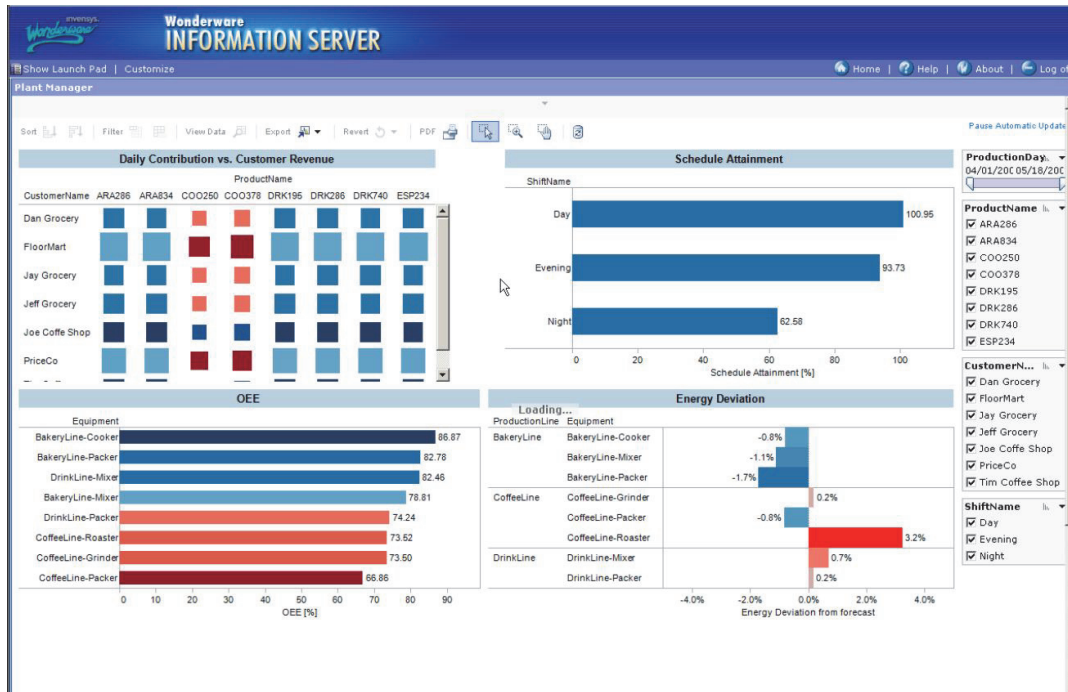


Wonderware® Information Server



The Wonderware® Information Server gathers designated information from many sources and integrates the presentation of that information in a way that supports the individual job performance.

OVERVIEW

Wonderware Information Server software offers a single Web solution for presenting operations and performance management information over the Web or company intranet. Using Wonderware Information Server enables workforce collaboration across the enterprise based on accurate, real-time information, anytime, anywhere, to solve process issues faster and discover hidden opportunities.

Wonderware Information Server minimizes the cost of publishing operations reports and web clients into your company network, by an IT friendly web server concept and configuration tools out of the box.

FEATURES

The Wonderware Information Server delivers industrial information content, including process graphics, trends, and reports to clients using standard Microsoft® Internet Explorer® browsers.

It acts as a unified web server source for all System Platform, Historian, Intelligence, Batch, and MES online client and reporting capabilities.

This enables employees across the enterprise to make better-informed decisions based on the real-time status information and historical data they need to improve operations.

Wonderware Information Server software also helps connect personnel with non-Wonderware data sources so that overall performance records can be accessed using single portal for information access. Wonderware Information Server Web Clients are designed for the more casual user who relies on a Web browser to access real-time dashboards and pre-designed reports of industrial activities, as well as the occasional requirement for ad-hoc reporting and analysis, or read-only or write back capabilities to the manufacturing process using HMI displays.

Wonderware Information Server is a component of the ArchestrA System Platform, and is also available as a stand-alone product.

Wonderware Information Server:

- ▶ Delivers information screens customized to meet the individual requirements of users in different roles across the enterprise.
- ▶ Integrates the information contained within a System Platform architecture and enables easy data analysis based on the data context.
- ▶ Extends the process graphics used by operations to an open, internet or intranet based audience in a secure manner, to extend the operational information in context to corporate users.
- ▶ Includes trend graphs from live plant information, historical databases or other external sources, reporting elements such as dashboards, charts, and tables and interactive drill-into capabilities.
- ▶ Implements role-based security groups and integrates with existing domain security.
- ▶ Uses commercial off the shelf software (Microsoft SQL Server®), facilitating maintenance and management by IT.

BENEFITS

Wonderware Information Server offers substantial reporting and analysis capabilities for process engineering and management personnel alike.

- ▶ Wonderware Information Server is simple to configure. Wonderware Information Server uses Microsoft Information Server and Microsoft SharePoint® services, features of today's server operating systems, to deliver content so configuration and maintenance is straightforward and can be done by non-process personnel (IT) if required.
- ▶ Access is possible from any Web-enabled PC. Using a standard browser access to the broad range of operations information delivered by the Web Content Server is enabled.
- ▶ Real-time visualization of the operations process can be viewed anywhere - via the Web or company intranet without needing to install HMI software.
- ▶ A Wonderware Information Server solution aggregates a wide range of operations performance information including process trends, Wonderware Intelligence dashboards, production reports, equipment downtime, equipment efficiency, operations events and history, including product traceability and genealogy information.

SYSTEM FUNCTIONALITY OVERVIEW

A Wonderware Information Server installation is typically used for a subset of the complete capabilities of Wonderware Information Server. In the following sections the capabilities of the Wonderware Information Server are discussed.

Installation

The first step in deploying Wonderware Information Server is to install and configure the web server computer that hosts the Wonderware Information Server web site. In general, use a fast server-class computer with sufficient power to handle the expected load on the web site. A suggested configuration is a 2.5GHz or faster server-class processor, 4GB or greater of system memory and adequate disk space for reports, process graphics and any other supporting databases or software tools (such as Wonderware Historian Client) that may be required.

Other non-Foxboro software is required to be installed prior to using the Wonderware Information Server installation CD. This includes:

- ▶ Microsoft Internet Information Services (IIS)
- ▶ ASP.NET
- ▶ Microsoft SQL Server
- ▶ Microsoft .NET Framework and Microsoft SharePoint.

Other software components may be needed depending on additional functionality requirements.

For full system specifications and pre-requisites, see the *Wonderware Information Server Installation Guide* and Readme on the Wonderware Information Server CD.

The purpose of a domain controller is simply to authenticate users in a Windows domain for security reasons. Although not essential for Wonderware Information Server to function, it is recommended that an existing domain controller be used, or that a new domain controller is installed on a separate machine. Installation of Wonderware Information Server is not supported on a domain controller computer.

The following features can be selected during the Wonderware Information Server installation.

- ▶ **Information Server.** Consists of core Wonderware Information Server system, which manages security, licensing, data sources, process graphics, factory alarms, customizing the portal, access panels, and Table Weaver contents. This is a required component.
- ▶ **MultiViews.** Supports SharePoint Web Part Pages that can combine several distinct types of information together in the same web page, which is arranged in a specific layout.
- ▶ **ActiveFactory Reporting.** Allows you to generate reports from published Wonderware Historian Client (or ActiveFactory) workbooks and trends using data from the Wonderware Historian.
- ▶ **ArchestrA Reporting.** Provides infrastructure and tools that extend SQL Server Reporting Services to better support report development and deployment.
- ▶ **Sample Content.** Includes sample configurations and reports to show the system's capabilities and accelerate application development. The sample content includes a process graphics demo, a SmartSymbol display, content unit samples, and ArchestrA report samples. Valid alarm and Wonderware Historian data sources must be configured to use the sample content.
- ▶ **ArchestrA License Server.** Provides support for licensing infrastructure on the Wonderware Information Server computer. An alternative is not to install this feature and use the License Server from a network location. The ArchestrA License Manager is used to set up a license server for Wonderware Information Server. For more information, see the ArchestrA License Manager documentation.

A full and complete guide to the installation process, including configuration of optional components, firewall and necessary ports, is available on the root folder of the Wonderware Information Server installation CD.

Licensing

Wonderware Information Server requires a license server using the ArcestrA License Manager. The license server can be set up on the same computer as the Wonderware Information Server software or on a different computer.

Wonderware Information Server supports concurrent, named user, and named device licensing. The licensing policy located on the server determines how many browsers can access Wonderware Information Server at any given time. All of the license information is managed by a dedicated license management component. When a client attempts to access Wonderware Information Server through the Internet Explorer browser, Wonderware Information Server checks to see if a license is available and grants or denies access to the client depending on license availability.

Enough client licenses are required for the number of users concurrently accessing the licensable areas of the Wonderware Information Server. Client access to these areas is on a first-come, first-served basis.

A session is created when a client user accesses the Wonderware Information Server home page, and a license is issued for the use of the core Wonderware Information Server applications, such as Process Graphics, Factory Alarms, and Historical Data. A user can access these and all custom areas and still only use one license.

All licenses are released for the user's session when the user clicks Log Off on the main menu bar. If a user closes the browser without logging off, the current license session times out after a certain length of time. By default, this is set to 20 minutes

and can be changed by the web server administrator for the Wonderware Information Server application using the Internet Information Services console application.

A license management feature enables monitoring of activity and usage on the Wonderware Information Server. Licensing information is displayed in text format to allow analysis of peak usage times and personnel.

Security

Wonderware Information Server can be, and indeed is often, deployed in an Internet environment. Since this connects sensitive industrial information to the Internet and can allow the enabling of write-back to plant controllers, the need for tight security is paramount. Wonderware Information Server controls access to plant floor information at the site, user, and data source levels, and uses several different security capabilities of the host operating system and web server.

The first level of security is access to the Wonderware Information Server web server itself. Access to the Wonderware Information Server is achieved by tight integration with Microsoft Windows security (Kerberos) and the security mechanisms employed by Internet Information Services.

Wonderware Information Server is installed in a "safe state." This means that the user who installs Wonderware Information Server will be the only person who has administrative privileges on Wonderware Information Server. Additional administrators can be configured if desired on installation is completed.

The second level of security determines what casual users (or groups of users) will be able to do after they access the site. The administrator can grant specific users (or groups) privileges by assigning them to pre-configured security roles.

The third level of security is for write-back capability for factory data sources, such as those used for InTouch® browser-based windows. Enabling write-back capability requires you to have a specific write-back license installed in the License Utility. Enabling write-back to factory floor resources should be done with caution, and after careful analysis and understanding of potential safety implications of this.

For additional security, the Wonderware Information Server also supports Secure Sockets Layer (SSL), password authentication, digital certificates, and Windows login dialog boxes.

Access to the web server is divided into two different categories:

- ▶ Authenticated access
- ▶ Anonymous access.

With authenticated access, users are allowed to access the site if they are valid members of the same Windows domain as the web server or a domain trusted by the web server domain and are a member of at least the Read-Only security role.

With anonymous access, everyone has access to the site, regardless of who they are, although they cannot access the administrative functions or write-back to factory data sources.

Anonymous access is not generally recommended for a Wonderware Information Server installation.

The Wonderware Information Server is designed to be "firewall compatible." It supports connections between itself and one or more clients through port 80 in a firewall, the standard HTTP port.

It is also DMZ-('demilitarized zone') compatible. The web server can exist in a secure zone between one outward facing firewall and one inward facing firewall. In this configuration, the inner firewall needs to open the SuiteLink port 5413 to access the plant floor I/O Servers on the secure plant floor network.

If SSL is enabled on the node, you must open port 443. If a remote database server is being used, the SQL TCP port 1433 should be opened.

The Wonderware Information Server administrator can give users privileges to read, write, or configure the Wonderware Information Server by assigning them to a pre-defined security role. Roles are authorization mechanisms used by applications within the site to determine user actions. A user assigned to a particular role inherits the authorization associated with that role, which may have a different context for different applications.

A number of pre-defined security roles are configured when the Wonderware Information Server is installed.

These are:

- ▶ Administrator
- ▶ Engineer
- ▶ Read-Only User
- ▶ No Access user.

Using Access Panels (covered in the next section) and security roles together provides an effective way of securely customizing a Wonderware Information Server portal.

Full details on these roles and other aspects of security are contained in the *Wonderware Information Server Administration Guide*.

Access Panels

An access panel is a logical grouping of navigation nodes (folders) and links that is only accessible to particular users assigned to it. Access panels allow you to segregate objects (for example, converted InTouch windows, alarm displays, and history reports) into groups of related information.

Each access panel can be configured to allow access by specific Windows users and user groups (for example, plant maintenance personnel, operators, or managers), so that each user or group

sees only the objects that are pertinent to their area of the plant or their user group.

For example, an Operators access panel shows InTouch graphics for a particular portion of the plant floor to just the plant operators assigned to that panel. A Maintenance access panel shows only historical trends of plant equipment tags to plant maintenance personnel.

When installed, Wonderware Information Server includes the System access panel. The System access panel shows all of the configuration and application folders and links that are available on the web site. The System access panel can be visible to all users or just to administrators, but the links within it to administration functions are only accessible to users assigned to the Administrators security role.

Data Sources

All external data sources configured for Wonderware Information Server use a common definition and configuration, called a shared data source, regardless of the component accessing the database. Shared data sources are shared by Wonderware Information Server components such as Wonderware Historian Client (ActiveFactory) reports, TableWeaver, Factory Alarms, and ArchedrA reporting. This lets you have a single data source and use it in multiple components.

Shared data sources are named and configured by the administrator and can then be referred to by name within Wonderware Information Server applications.

A number of pre-configured data source types are created when Wonderware Information Server is installed. These are:

- ▶ Alarm
- ▶ Historian
- ▶ Production

- ▶ OLE DB
- ▶ Other.

For details on configuring applications using these resources see the *Wonderware Information Server Administration Guide*.

Process Graphics

Wonderware Information Server can be used to show process graphics from an InTouch HMI or ArchedrA based application. There are two different types of graphics: HMI Windows from InTouch and ArchedrA Symbols.

Both ArchedrA Symbols and InTouch Windows can be converted and published using the ArchedrA Web Exporter to Wonderware Information Server. The ArchedrA Web Exporter can be installed from Wonderware Information Server. The ArchedrA Web Exporter is similar to the Win-XML Exporter delivered with previous versions of the Wonderware Information Server.

Note that a pre-requisite for this tool is the ArchedrA IDE, which must be installed prior to installing the ArchedrA Web Exporter. The ArchedrA Web Exporter is launched from the ArchedrA IDE toolbar.

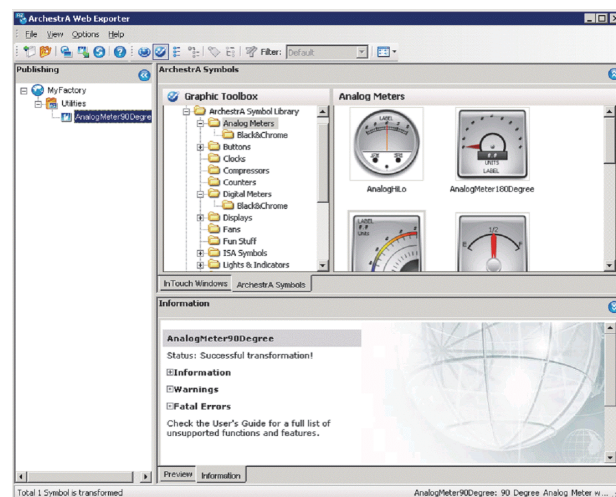


Figure 1. ArchedrA Web Exporter

The ArcestrA Web Exporter uses two different modes:

- ▶ **Offline mode:** Use this mode to transform and manage ArcestrA Symbols and InTouch Windows. The offline mode shows transformed content ready to be published and no live data. All operations in offline mode only affect the local configuration set.
- ▶ **Online mode:** Use this mode to connect to an Information Server portal and view how the published content appears. This mode can also be used to delete published content from the portal. All operations in online mode only affect published content to the portal.

Before publishing ArcestrA Symbols and InTouch Windows to the web, they must be transformed into a different graphical format using the ArcestrA Web Exporter.

Transformed ArcestrA Symbols and InTouch Windows are called "displays". Displays are Microsoft Silverlight® XAP files that can be directly opened in a web browser with an installed Silverlight plugin. If the Microsoft Silverlight plugin is not installed on the computer when a published display is opened, the Internet Explorer browser prompts to download the latest version from Microsoft.

Publishing displays to the portal requires membership in the Administrator role on the Wonderware Information Server.

Full details of using this utility are contained in the *ArcestrA Web Exporter User Guide*.

Multiviews

Using Wonderware Information Server together with Microsoft SharePoint, pre-configured web components, called Web Parts, can be used to quickly and easily assemble custom information panes called MultiViews. MultiViews are collections of Web Parts arranged in a specific layout. Web Parts

can be created by Wonderware features, such as Process Graphics or Alarm Windows. Native Microsoft Web Parts, and third party Web Parts can also be incorporated.

Customized web pages can also be created using Windows SharePoint that include Wonderware Information Server Content. Wonderware Information Server provides four web parts for use in Windows SharePoint:

- ▶ **InTouch:** For Process Views that have Wonderware Application Server References. Use this web part to allow configuring or real-time Application Object Reference switching through web part connections. This web part uses InTouch applications that have been published to Wonderware Information Server.
- ▶ **Page URL:** The Page URL Connector Web Part is a utility web part that is useful to pass query string information in the page URL to contained web parts. This is made possible by selectively passing query string information through a web part connection (as a row provider).
- ▶ **Content Viewer:** Displays Process Graphics, Factory Alarms, and Table Weaver Content.
- ▶ **Trend:** Displays Wonderware Historian Client (ActiveFactory) Trends, and published trends. You can also configure a trend. The Trend web part allows real-time switching of published trends or configuring the trend through web part connections.

For more information on configuring MultiViews and web parts, see the *Wonderware Information Server Administration Guide*.

Reporting

There are two main facets to reporting available in Wonderware Information Server: the ActiveFactory Reporting web site and ArcestrA Reporting.

The ActiveFactory Reporting Website is a preconfigured Wonderware Information Server component that allows web users to:

- ▶ Generate reports using data from the Wonderware Historian databases.
- ▶ Trend history data from the Wonderware Historian databases.
- ▶ Build and execute SQL queries against data from the Wonderware Historian and other databases.

ArchestrA Reporting is a set of features that publish reports using Wonderware Application Server, Wonderware Historian, and other system data. ArchestrA Reporting integrates Microsoft SQL Server Reporting Services with Wonderware Information Server.

Activefactory Reporting

The ActiveFactory Reporting Website can be accessed both directly or through Wonderware Information Server. When accessing the site directly, a custom starting page appears from which users can access the various Reporting Website features.

The ActiveFactory Report Manager provides an organized way to manage reports. When accessing through Wonderware Information Server, the Reporting Website features appear under the ActiveFactory node in the Launch Pad.

The ActiveFactory Report Manager allows definition and management of the following report types:

- ▶ Static reports
- ▶ On demand reports
- ▶ Scheduled reports.

The reports can be created and viewed from the ActiveFactory option within the system Launch Pad. Once created, reports can be published to the web site.

A connection to a Wonderware Historian is required to use the ActiveFactory Reporting Website. For generating reports, the ActiveFactory Reporting Website can use any Wonderware Historian connection that is defined as a data source for the "Historian" data source type in Wonderware Information Server. By default, the ActiveFactory Reporting Website uses the Historian data source specified during configuration. Client users can select any other Historian data source by clicking the Select InSQL node in the Launch Pad.

A scheduled report is periodically re-generated according to a specified time schedule. For example, a particular report may be required to be run every 15 minutes and posted to the website. When a scheduled report is run, the resulting report file is saved to disk on the web server. The archiving feature of the Reporting Website is used to configure which scheduled reports to keep and for how long.

Archestra Reporting

ArchestrA Reporting features can be used to provide reports on data stored by a variety of Wonderware products and to enable these reports to be viewed from Wonderware Information Server.

ArchestrA Reporting offers the following:

- ▶ **Common reporting database and data source:** All ArchestrA reports use the aaReports database as their data source. The reporting database contains replicated views pointing to "linked servers." The linked servers, in turn, refer to the actual hosts and databases from which you want to retrieve data. The reporting database serves as a central access point to data from various databases and servers. All default data sources defined in Wonderware Information Server are automatically added as linked servers

that the views in the reporting database can refer to. An example of an ArcestrA Reporting query extracting information from two separate sources is shown in Figure 2.

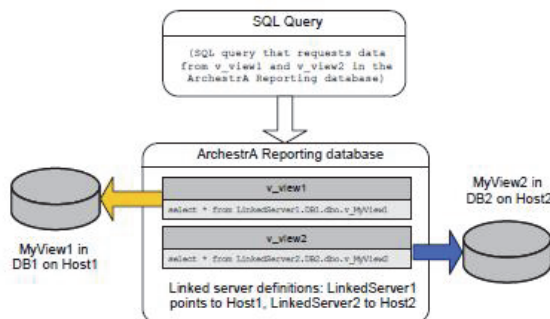


Figure 2. ArcestrA Reporting Query

- ▶ **Report Deployment Utility:** The ArcestrA Reports Deployment utility helps to deploy reports to a Wonderware Information Server system. It automatically adds a report file to a SQL Server Reporting Services folder, executes a SQL script that replicates views from the database that contains the data for reporting, and creates a linked server that points to that database. (Note that this deployment should not be confused with ArcestrA object deployment from within the IDE).
- ▶ **Integrated navigation:** Reports show as nodes in the Launch Pad and can be viewed within Wonderware Information Server.
- ▶ **Custom parameter input:** For passing Wonderware Historian tag names and start/end times to a report, the Tag Picker and Time Picker can be used instead of typing in values.
- ▶ **Executing reports from a script:** ArcestrA Reporting can execute and print reports from a Wonderware Application Server script or a Wonderware Historian event action. You can also execute reports using a URL, for example, to

open a parameterized report from a Table Weaver content unit.

Reports are managed from Wonderware Information Server using the standard functionality of SQL Server Reporting Services. For example, it is possible to delete reports, configure default parameter values, set snapshot options, and so on. The Report Manager is located in the Wonderware Information Server Administration node.

ArcestrA Reporting security relies on the SQL Server Reporting Services (SSRS) role model. The SSRS role membership of Wonderware Information Server users determines whether they can view, execute or create reports.

Users only see those reports in the Launch Pad that they are allowed to view based on their SSRS role. When Wonderware Information Server is installed, the following Windows user groups are configured on the Wonderware Information Server computer:

- ▶ **aaReportsAdministrators:** This group is assigned the SSRS "Content Manager" role and the Wonderware Information Server "Administrator" role.
- ▶ **aaReportsPowerUsers:** This group is assigned the SSRS "My Reports," "Report Builder," and "Publisher" roles and the Wonderware Information Server "Engineer" role.
- ▶ **aaReportsUsers:** This group is assigned the SSRS "Browser" role and the Wonderware Information Server "Read-Only User" role.

Windows user accounts can be added to these groups to give the desired level of access to reports.

Analysis

The Table Weaver feature makes it easy to present and navigate information from databases and related webpages.

Table Weaver provides the building blocks for customizing content, allowing you to establish content relationships, provide contextual navigation, and configure information displays in multiple formats. The Table Weaver Manager consists of six components, each giving the flexibility to build the content as needed. These are:

- ▶ Data sources
- ▶ Queries
- ▶ Content units
- ▶ Displays
- ▶ Links
- ▶ Key performance indicators (KPIs).

Each component is defined to build the content unit component, which brings all the defined settings into one place. These components are defined independently to make it easy to reuse portions of definition units across multiple content unit definitions.

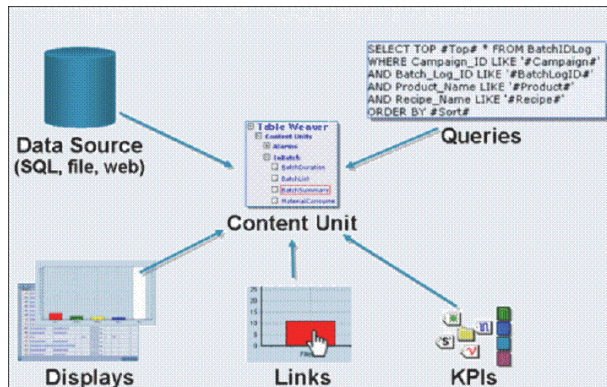


Figure 3. Content Units

Data source and query definition units are required to define a content unit. The data source defines the source of data or information. The query defines the conditions to retrieve the data from the data source.

Display formats are defined in the display's definition unit. It defines how data retrieved from a data source

is visualized to the user. The display types supported are:

- ▶ Chart
- ▶ Tabular
- ▶ Web Content
- ▶ Filter Entry
- ▶ SmartSymbol.

Each display type contains its own set of configuration options that allow you to customize the display. For example, the Sales per Category chart and table in Figure 4 are both configured from the same data source and query, but the different display format configurations provide different representations of the content.

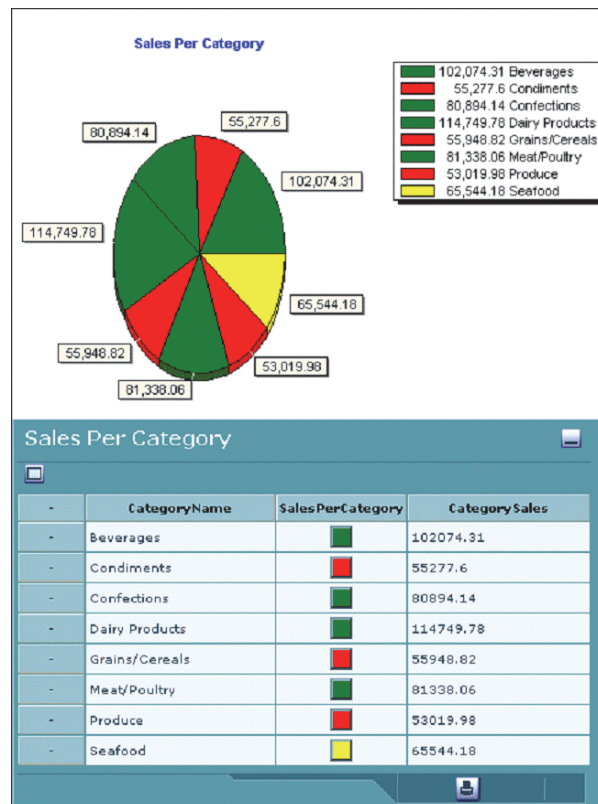


Figure 4. Table Weaver

Displays, Links, and KPIs (Key Performance indicators) are optional components. Links provide more navigation between a content unit and other contents. They provide related information regarding the selected item.

KPIs are visual indicators that express a value as a color or an icon. Each KPI has one or more targets with its own set of target conditions that show visual indicators when the target condition is met.

Examples of a Link and a KPI are shown in Figure 6.



Figure 5. Link and KPI

The Table Weaver Manager is used to define data sources, queries, displays, links, KPIs, and content units. The Table Weaver Manager is located under the System access panel in the Administration node.

For full details on configuring analysis using Table Weaver, see the *Wonderware Information Server Administration Guide*.

MAINTENANCE

During the lifecycle of a Wonderware Information Server installation, it is necessary to monitor the system and perform general maintenance tasks to ensure that users continue to have the best access possible to the information on the site.

Maintenance tasks include monitoring web server performance, monitoring usage, and obtaining feedback about the site itself, as well as routing backups.

Wonderware Information Server logs error messages to the Wonderware ArcestrA Logger, which is installed by default with Wonderware Information Server. The types of messages that are reported to the ArcestrA Logger can be customized using the LogFlag Editor utility.

For information on using the ArcestrA Logger and the LogFlag Editor, see the ArcestrA Logger documentation.

Microsoft Internet Information Server (IIS) automatically creates a log file to track user access to the site. This log file tells who was on the site, where they went in the site, how long they were on each page, and anything they looked at in the site. This file could be helpful for determining site usage and which areas are used more than others. The log file is stored in the Windows system directory in the \System32\LogFiles subdirectory.

Note that the log file can get very large very quickly and a standard operating procedure should be in place for either purging or archiving this file. The logging feature can also be disabled if it is not needed. For more information on IIS log files, see the IIS documentation.

Also, it is essential that site usage is monitored to determine if enough client licenses are installed. If not, consider whether the people that are logging on to the site during busy times could be asked to log in during slower times or whether a purchase of additional licenses is necessary. The License Manager is located under the Administration section of the Wonderware Information Server.

The Backup/Restore Manager allows creation of backups of the Wonderware Information Server configuration. A backup can be used to restore the original site. The Backup/Restore operation can be done only for the features that are installed and configured successfully. Installed and un-configured features are ignored during the Backup/Restore operation.

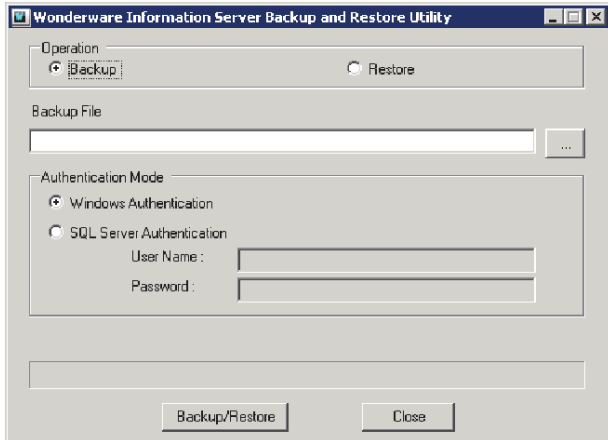


Figure 6. Backup and Restore Utility

Backups can only be done from an account with local administrator privileges of the Wonderware Information Server computer. In addition, the user credentials must also have SQL Server system administrator privileges.

A restore of a backup to the Wonderware Information Server must have the same virtual directory name for both the Wonderware Information Server and the ActiveFactory Reporting Website from which it was created.

A log file that can assist in troubleshooting backup or restore difficulties is created in the same location as the backup file. The log file has the same name as the backed up file, with the .log extension, such as MyBackup.log.

If a log file already exists with the same name, the existing log file is overwritten.