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*Business Intelligence Technical Guide*

*BI/Query™ • BI/Analyze™ • BI/Web™ • BI/Broker™*

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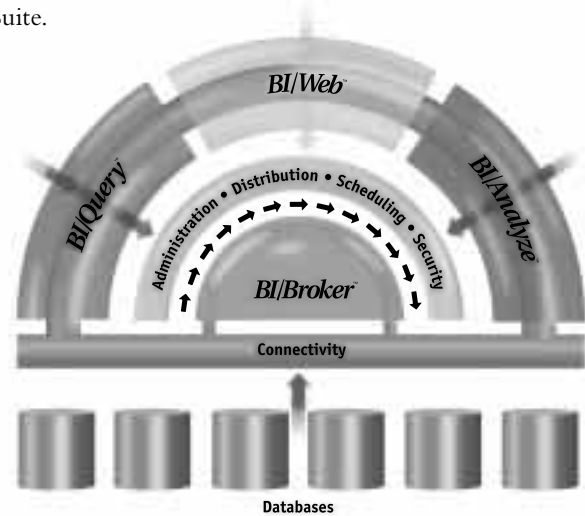
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# Introduction

## Hummingbird BI/Suite Empowers the Enterprise

Designed with your organization’s decision support needs in mind, BI/Suite is a fully integrated, scalable enterprise business intelligence (BI) solution. BI/Suite allows users to access and analyze information stored in transactional databases, data marts, data warehouses and enterprise resource planning (ERP) applications both on the desktop and over the Web. A flexible pricing model, ease of use, centralized administration and a scalable architecture ensures organizations a BI solution at the lowest cost of ownership. BI/Suite includes:

- BI/Query**, an enterprise query and reporting application.
- BI/Analyze**, an enterprise OLAP application that allows users to analyze information in multidimensional databases to spot trends, relationships and patterns in their business.
- BI/Web**, a thin-client solution that provides query, reporting and OLAP capabilities over the Web.
- BI/Broker**, an enterprise application server that provides security, scheduling, distribution, notification and centralized administration services to BI/Suite.



## Integrated Enterprise Business Intelligence

Now that business intelligence solutions are more mainstream, the deployment of BI applications to thousands of users within an organization is becoming common practice. An enterprise business intelligence suite based on a three-tier model is emerging as the standard for many organizations as IT looks to reduce the total cost of ownership of administering and maintaining BI installations.

Hummingbird BI/Suite is the only business intelligence offering that meets the varying needs of the organization with a single solution.

Characteristics of an Enterprise Business Intelligence Suite	Hummingbird BI/Suite — An Enterprise Business Intelligence Solution
Integrated Set of Applications	BI/Suite’s fully integrated suite of applications increases productivity by delivering the same user experience for every PC desktop and Web application component.
Distributed Computing (three-tier)	BI/Suite’s powerful application server, BI/Broker, employs CORBA, the robust industry standard for distributed computing.
Enterprise Scalability (load balancing)	BI/Broker distributes load among servers, meeting the growing user demand for business intelligence in an enterprise.
Centralized Administration	BI/Suite is the only business intelligence offering that administers both PC desktops and Web users from a single server.
Single Set of Content, Security, and User Profiles	Security profiles, queries, reports, OLAP data sources and semantic layers are created once and shared by users throughout the enterprise.
Middle-Tier Server for PC desktop and Web clients	BI/Suite is the only offering that serves PC desktop and Web clients, and all applications from a single application server to improve manageability.
Efficient Licensing Model	BI/Suite’s combined concurrent and named licensing model optimizes value by deploying business intelligence capabilities to casual users while guaranteeing access to power users.

## BI/Query

BI/Query is an enterprise-strength query and reporting application that helps users leverage corporate information by asking questions about the data and visualizing the answers for more effective decision-making.

### BI/Query supports connectivity to all major relational databases provided by:

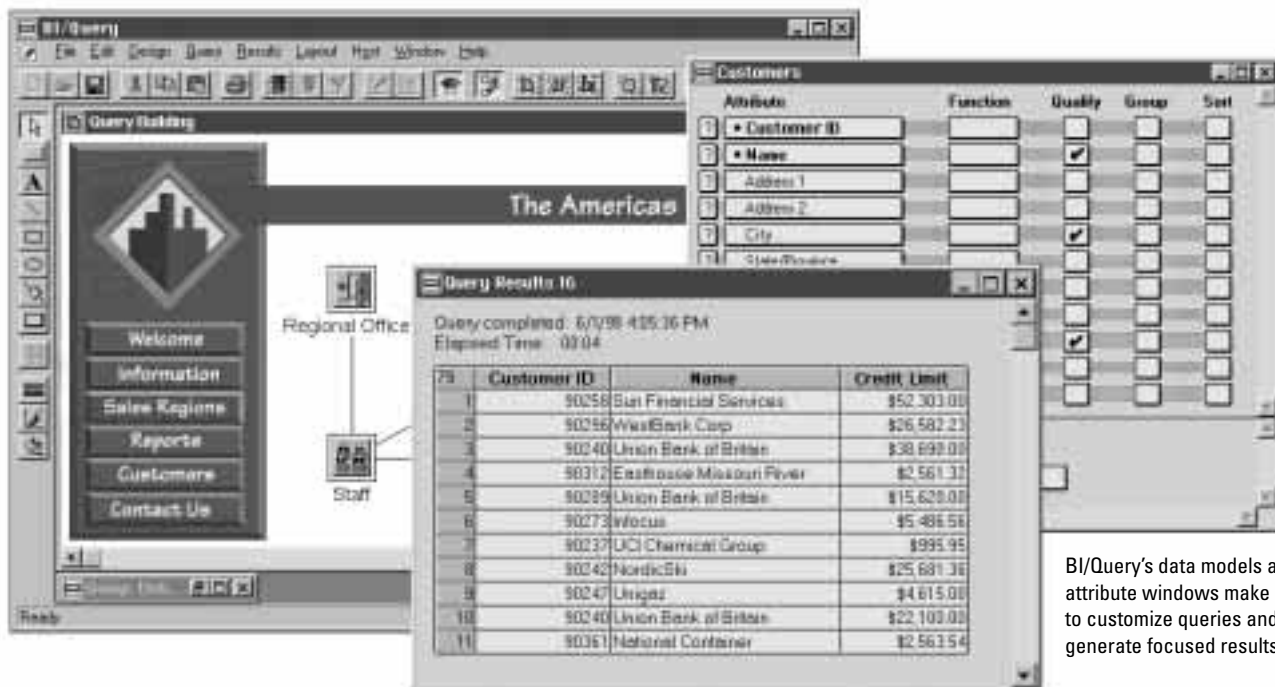
- Oracle
- NCR
- Informix
- Microsoft
- Computer Associates
- Sybase
- IBM
- Tandem
- Unidata

## BI/Query: Integrated and Flexible Architecture

Feature/Function	Specifications	Benefits
<b>Heterogeneous Connectivity in Data Models</b>	<ul style="list-style-type: none"><li>• Dynamically query multiple data sources and consolidate the results from each into a single report.</li></ul>	<ul style="list-style-type: none"><li>• <i>Simplifies</i> simultaneous access to many databases.</li></ul>
<b>Connectivity Application Service</b>	<ul style="list-style-type: none"><li>• Connect clients to databases using native connectivity or industry-standard middleware.</li></ul>	<ul style="list-style-type: none"><li>• Brings business intelligence to the <i>widest range of databases</i>.</li></ul>
<b>2-Tier and 3-Tier Options</b>	<ul style="list-style-type: none"><li>• Use BI/Query in a standard client/server configuration, with all data models, queries and reports saved on a local hard drive, or</li><li>• Use BI/Query in a distributed environment with BI/Broker, Hummingbird's middle-tier application server.</li></ul>	<ul style="list-style-type: none"><li>• <i>Flexibility</i> to choose between a client/server and/or a distributed environment.</li><li>• BI/Broker's central repository and security manager allows access to all content by BI/Query and BI/Web users <i>alike without needless duplication</i>.</li></ul>
<b>Extended Outer Join Support</b>	<ul style="list-style-type: none"><li>• Rich outer-join support for databases adhering to the SQL '92 standard.</li></ul>	<ul style="list-style-type: none"><li>• <i>Enhances functionality</i> by leveraging the full capabilities of databases.</li></ul>
<b>OLE Support and Integration</b>	<ul style="list-style-type: none"><li>• Import data, text, graphics, sound and video into data models and reports.</li><li>• As an OLE container, BI/Query allows administrators to embed an OLE object from another application (such as Microsoft Excel) into BI/Query data models and reports.</li><li>• Use the source application's tools to edit an object within BI/Query.</li></ul>	<ul style="list-style-type: none"><li>• <i>Create integrated decision support systems</i> by combining BI/Query with other desktop productivity applications, such as spreadsheets, statistics packages and word processors.</li></ul>
<b>OLE Automation</b>	<ul style="list-style-type: none"><li>• Automate routine tasks within BI/Query, such as running a number of standard weekly reports.</li><li>• Administrators and power users can control BI/Query using OLE-compliant development tools such as Microsoft Visual Basic for Applications and Visual C++.</li></ul>	<ul style="list-style-type: none"><li>• <i>Enables custom integration and automation</i> using industry-standard tools.</li></ul>
<b>Open API</b>	<ul style="list-style-type: none"><li>• Allows third-party programmers to develop BI/Query report extensions.</li><li>• BI/Query Custom SQL Check is a site-programmable extension that allows BI/Query to pass its SQL statement to a custom function provided by the administrator. The custom function may perform whatever checks or transformations are required before the SQL statement is forwarded to the host computer.</li><li>• Administrator can create a custom DLL to provide support for automatic authentication when a BI/Query user logs in to a DBMS.</li></ul>	<ul style="list-style-type: none"><li>• <i>Flexibility</i> to customize BI/Query to meet the specific needs of an enterprise infrastructure.</li></ul>

## BI/Query: Ease of Use

Feature/Function	Specifications	Benefits
<b>Intuitive Interface to Database Information</b>	<ul style="list-style-type: none"> <li>Administrators can create an easy-to-use “data model” of the complex underlying database.</li> <li>Includes aliasing tables and fields, and merging tables to create a denormalized view.</li> </ul>	<ul style="list-style-type: none"> <li><i>Reduces training time</i> by simplifying database views.</li> </ul>
<b>Point and Click Querying</b>	<ul style="list-style-type: none"> <li>Graphical user interface enables end-users to query without needing to understand SQL.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies</i> the creation of queries.</li> </ul>
<b>EIS Interface with Executive Queries and Reports</b>	<ul style="list-style-type: none"> <li>Executive buttons embedded in a data model allow users to launch preformatted queries (including super queries) or reports to obtain up-to-date results.</li> </ul>	<ul style="list-style-type: none"> <li><i>Satisfies</i> routine requirements quickly.</li> <li>Executive queries offer new users the ability to automatically launch complex processes <i>without prior training</i>.</li> </ul>
<b>Interactive Queries with Prompts</b>	<ul style="list-style-type: none"> <li>Users are prompted via a dialog box to provide values to requalify existing queries.</li> </ul>	<ul style="list-style-type: none"> <li><i>Enables</i> users to ask for specific information without needing to understand the complexity of the underlying database.</li> </ul>
<b>Export Query Data</b>	<ul style="list-style-type: none"> <li>Export results in Comma Separated Values (CSV) format for use in spreadsheets and other third-party applications.</li> </ul>	<ul style="list-style-type: none"> <li><i>Integrates</i> BI/Query with other enterprise applications.</li> </ul>
<b>Data Values</b>	<ul style="list-style-type: none"> <li>Administrators can: <ul style="list-style-type: none"> <li>Enable end-users to query against a field to see what values are present.</li> <li>Create a pop-down list of appropriate data values.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><i>Provides</i> users with valid data value options for improved accuracy of results.</li> </ul>
<b>Calculated Attribute</b>	<ul style="list-style-type: none"> <li>Calculated attributes added to a data object perform a user-defined calculation in a query.</li> </ul>	<ul style="list-style-type: none"> <li><i>Increases the value of the data</i> by applying additional business logic beyond what is stored in the DBMS.</li> </ul>



BI/Query's data models and attribute windows make it easy to customize queries and generate focused results.

## BI/Query: Content Creation

Feature/Function	Specifications	Benefits
<b>Super Queries</b>	<ul style="list-style-type: none"> <li>Administrators can combine the results of multiple queries, from the same or different data sources, into one result set and edit them afterwards.</li> </ul>	<ul style="list-style-type: none"> <li><i>Extends usefulness of data</i> by combining information from all appropriate data sources.</li> <li><i>Allows</i> content creators and power users to <i>make quick changes</i> to complex queries and reports.</li> </ul>
<b>Subqueries</b>	<ul style="list-style-type: none"> <li>Users can access data in more dynamic ways by qualifying a query with a nested query statement or subquery.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies</i> formulation of complex queries.</li> </ul>
<b>Variables</b>	<ul style="list-style-type: none"> <li>Administrators can provide users with a business variable such as “Last Month”, “Current Fiscal Period” or “Last Production Run” to integrate queries and reports with business, financial and production calendars. Providing business variables, maximizes the underlying strength of database “date and time” functions.</li> </ul>	<ul style="list-style-type: none"> <li><i>Facilitates</i> scheduling of queries when users are not available to answer parameters.</li> <li><i>Integrates</i> the Business Intelligence workspace with real business cycles.</li> </ul>
<b>Merge and Unmerge Tables</b>	<ul style="list-style-type: none"> <li>Content creators can develop denormalized data models by merging tables and enables the restoration of merged objects into separate objects.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies</i> data model creation and editing.</li> </ul>

## BI/Query: Using Reports

Feature/Function	Specifications	Benefits
<b>Extensive Charting</b>	<ul style="list-style-type: none"> <li>BI/Query Reports contains over 60 different chart styles, including: <ul style="list-style-type: none"> <li>two-dimensional bar, line, area, and pie charts</li> <li>3D charts</li> <li>scatter charts</li> <li>histograms</li> <li>spectral maps</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><i>Improves graphical representation of complex information</i> by enabling users to easily create high-impact charts to visualize data.</li> </ul>
<b>Spatial Mapping</b>	<ul style="list-style-type: none"> <li>Display spatial oriented numeric data using attractive, information-rich customized maps.</li> </ul>	<ul style="list-style-type: none"> <li>Enables decision-makers to <i>identify, isolate and analyze</i> their corporate data using maps.</li> </ul>
<b>Table Styles</b>	<ul style="list-style-type: none"> <li>Includes standard table styles, such as: <ul style="list-style-type: none"> <li>Columnar</li> <li>Free-form</li> <li>Stacked or Stacked-Indented</li> <li>User-defined</li> </ul> </li> <li>Break-point subtotals created automatically.</li> </ul>	<ul style="list-style-type: none"> <li><i>Accelerates report creation</i> by automating design.</li> </ul>
<b>Interactive Reports</b>	<ul style="list-style-type: none"> <li>Reports may contain “hot buttons” to requalify a report with new values that appear in a drop-down list and/or separate dialog.</li> </ul>	<ul style="list-style-type: none"> <li><i>Satisfies</i> common end-user requirements quickly.</li> <li>Enables new users to automatically requalify complex processes <i>without prior training</i>.</li> </ul>
<b>Optional Report Refreshes</b>	<ul style="list-style-type: none"> <li>Permissions to refresh reports can be specified by content creators.</li> </ul>	<ul style="list-style-type: none"> <li><i>Provides better control</i> of resources, by allowing refreshes only when necessary.</li> </ul>

## BI/Query: Creating Reports

Feature/Function	Specifications	Benefits
<b>Heterogeneous Reporting</b>	<ul style="list-style-type: none"> <li>Build reports that access and join data from two or more sources in a multi-vendor database environment.</li> </ul>	<ul style="list-style-type: none"> <li>Enables reporting against different data sources.</li> <li>Users can answer crucial business questions without worrying about where data is stored.</li> </ul>
<b>Reports Presentation Designer</b>	<ul style="list-style-type: none"> <li>Wizards present report writers with a step-by-step guide to create tables, charts and maps.</li> </ul>	<ul style="list-style-type: none"> <li><i>Accelerates report creation</i> by automating design.</li> </ul>
<b>Multiple Presentations</b>	<ul style="list-style-type: none"> <li>Display multiple data presentations from different query results sets within a single report.</li> </ul>	<ul style="list-style-type: none"> <li>Combines multiple query results sets and presentations within a report.</li> </ul>
<b>Drag-and-Drop Interface</b>	<ul style="list-style-type: none"> <li>Object-based approach.</li> <li>Mix and match drawing objects within a single report.</li> <li>Objects can overlap or be nested within other objects.</li> </ul>	<ul style="list-style-type: none"> <li><i>Improves report creation</i> through intuitive user interface.</li> <li>Drag-and-drop manipulation and object-based approach outstrips the tiled layout techniques of traditional reporting packages.</li> </ul>
<b>Visual Report Creation with Data</b>	<ul style="list-style-type: none"> <li>When customizing a report, users see the data rather than cryptic boxes and can view immediately whether column widths, report calculations and fonts are correct.</li> </ul>	<ul style="list-style-type: none"> <li><i>Ensures</i> the accuracy of a query before a report is built by visually displaying the report with the data.</li> </ul>
<b>Data Source Browser</b>	<ul style="list-style-type: none"> <li>Interface gives users a view of the relational and multidimensional data sources that are supplying data for a report.</li> </ul>	<ul style="list-style-type: none"> <li>Allows users to build on existing reports, automate control breaks, and select data to be displayed.</li> </ul>
<b>Exception Handling</b>	<ul style="list-style-type: none"> <li>Wizard which monitors data values in a report. If a value falls within predefined criteria, the formatting of the cells will change and/or a scheduled event defined in BI/Broker (such as reports, queries and notifications) will be triggered.</li> </ul>	<ul style="list-style-type: none"> <li><i>Highlights key information</i> for decision-makers and executes appropriate actions.</li> </ul>
<b>Powerful Calculation Engine</b>	<ul style="list-style-type: none"> <li>Select predefined calculations such as sum, average, percentage, maximum and minimum from a context-sensitive menu.</li> <li>Build complex custom calculations, including the use of nested rules.</li> </ul>	<ul style="list-style-type: none"> <li><i>Optimizes content creation</i> by making the most common business calculations easier to use.</li> </ul>



The Presentation Wizard in BI/Query Reports walks users through the report-creation process. Inserting maps, charts, tables and other data objects becomes a simple point-and-click affair.



## BI/Analyze

BI/Analyze arms users with enterprise-strength Online Analytical Processing (OLAP) functionality to access and analyze multidimensional data. Users can slice and dice, or drill up and down through successive layers of detail to discover trends, relationships and patterns.

### BI/Analyze offers connectivity to:

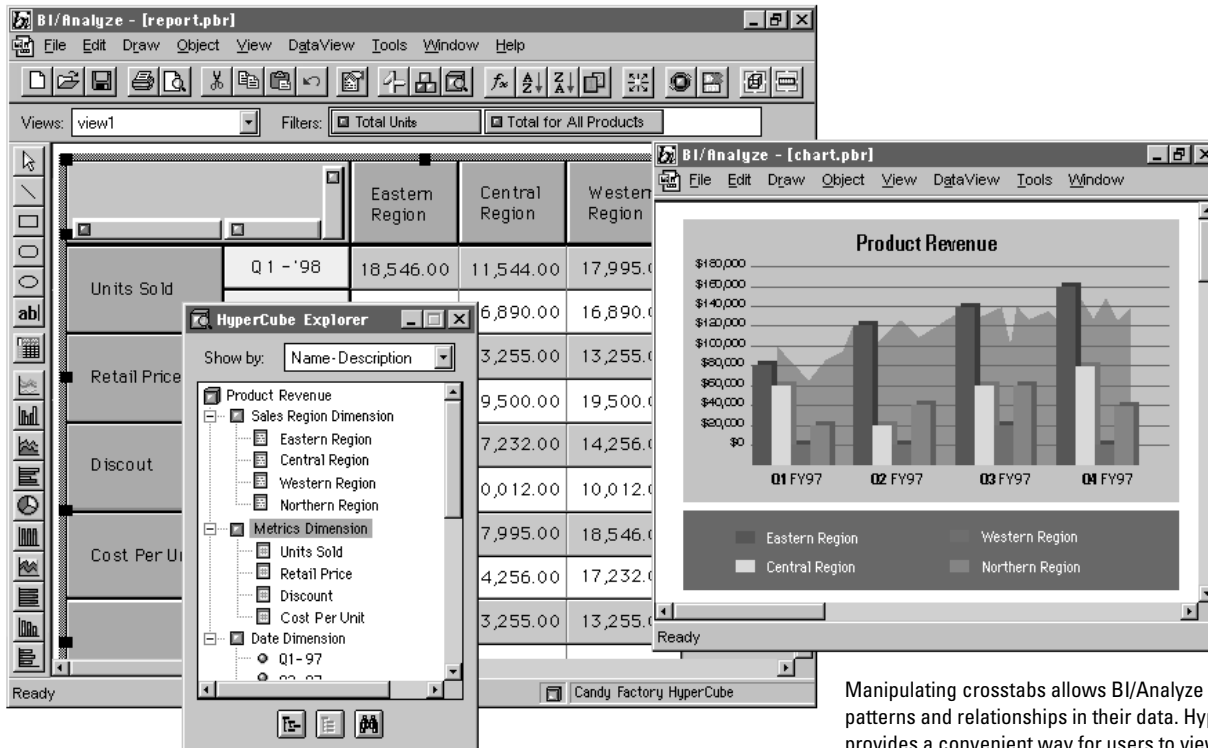
- HyperCubes
- Hyperion Essbase
- Informix MetaCube
- IBM DB/2 OLAP Server

### Support of OLE DB for OLAP for providing connectivity to:

- Microsoft SQL Server 7.0 OLAP Services
- SAP Business Information Warehouse
- NCR TeraCube
- WhiteLight

## BI/Analyze: Integrated and Flexible Architecture

Feature/Function	Specifications	Benefits
<b>Universal OLAP</b>	<ul style="list-style-type: none"> <li>• Native connectivity to all major multidimensional databases.</li> <li>• Support for OLE DB for OLAP.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Flexibility</i> to choose the most effective multidimensional database(s).</li> </ul>
<b>2-Tier and 3-Tier Options</b>	<ul style="list-style-type: none"> <li>• Use BI/Analyze in a standard client/server configuration, or</li> <li>• Use BI/Analyze in a distributed environment with BI/Broker, Hummingbird's middle-tier application server.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Flexibility</i> to choose between a client/server and/or a distributed environment.</li> <li>• BI/Broker's central repository and security manager allow access to data source information by BI/Analyze and BI/Web users <i>alike without needless duplication</i>.</li> </ul>
<b>Multiple Views of Different Data</b>	<ul style="list-style-type: none"> <li>• A single report can display multiple views of multidimensional data from one or more homogeneous or heterogeneous data sources.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Flexibility</i> to access and combine different types of data (eg., financial and marketing data in a single report).</li> </ul>
<b>Connection Wizard</b>	<ul style="list-style-type: none"> <li>• Wizard for creating and editing connections to data sources.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Assists users</i> through the complex process of connecting to databases.</li> </ul>
<b>Cube Creation</b>	<ul style="list-style-type: none"> <li>• Powerful cube building engine to create HyperCubes from: <ul style="list-style-type: none"> <li>– BI/Query result sets</li> <li>– flat files</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduces cost</i> for most organizations by eliminating the need to purchase a multidimensional database engine for departmental OLAP analysis.</li> </ul>
<b>Departmental Cube Creation</b>	<ul style="list-style-type: none"> <li>• Slice off portions of server-side cubes and store them as departmental cubes.</li> </ul>	<ul style="list-style-type: none"> <li>• Enables distribution of cube subsets while <i>optimizing performance and reducing storage overhead</i>.</li> </ul>
<b>Mobile OLAP</b>	<ul style="list-style-type: none"> <li>• Work with OLAP reports off-line by slicing off requested data from the server.</li> <li>• Data can be refreshed when reconnected to the data source.</li> </ul>	<ul style="list-style-type: none"> <li>• Allows mobile users to take their work with them when they travel.</li> </ul>
<b>Consolidation on the Fly</b>	<ul style="list-style-type: none"> <li>• Values can be calculated when the cube is accessed rather than at build time.</li> <li>• Extent of consolidation at build time can be customized.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduces build-time and size of HyperCubes</i> and prevents "data explosion" .</li> </ul>
<b>Asymmetric Hierarchies</b>	<ul style="list-style-type: none"> <li>• Different levels of detail in the same dimension.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Optimizes disk space</i> by storing less detail for older information.</li> </ul>
<b>Support for Large Databases</b>	<ul style="list-style-type: none"> <li>• Supports incremental metadata loading.</li> <li>• Loads the metadata in stages as it's needed, rather than all at once.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduces startup and load time</i> when accessing large data sources.</li> </ul>



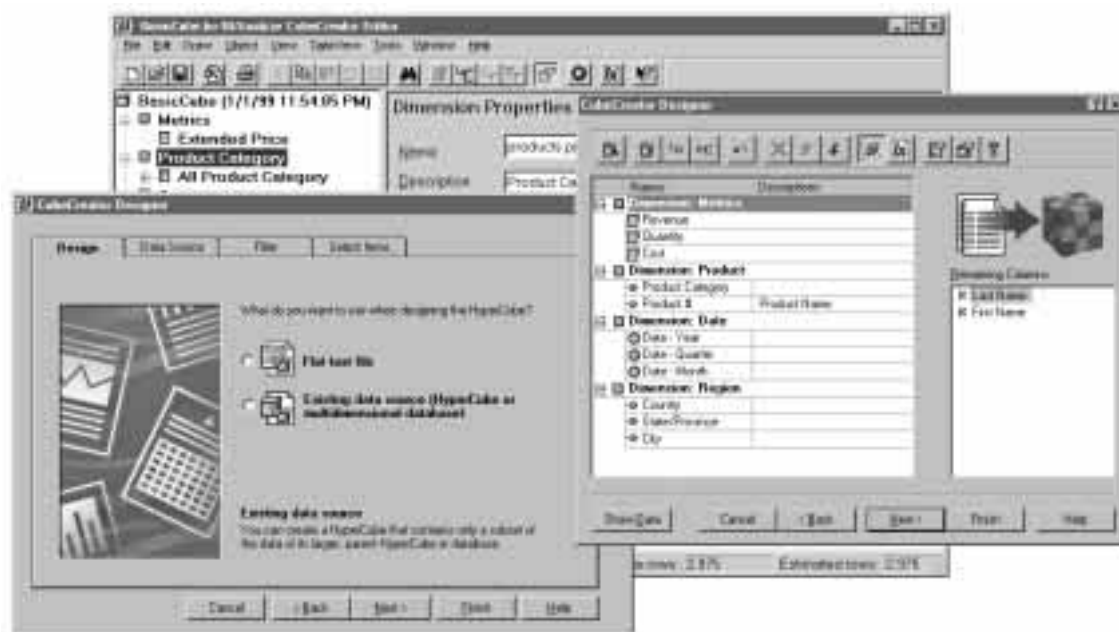
Manipulating crosstabs allows BI/Analyze users to spot trends, patterns and relationships in their data. HyperCube Explorer provides a convenient way for users to view and sort the data for analysis, and the variety of chart and graph styles in BI/Analyze provides users with flexible options for displaying results.

## BI/Analyze: Ease of Use

Feature/Function	Specifications	Benefits
<b>Data Navigator</b>	<ul style="list-style-type: none"> <li>A floating window for managing the arrangement of dimensions in a view.</li> <li>Includes lists for column, row and filter dimensions.</li> </ul>	<ul style="list-style-type: none"> <li>Allows users to rearrange rows and columns without pausing while BI/Analyze refreshes the view for each action.</li> </ul>
<b>Stacked or Nested Dimensions</b>	<ul style="list-style-type: none"> <li>Stack multiple dimensions in a single view.</li> </ul>	<ul style="list-style-type: none"> <li>Matches how users think about their data — in more than two dimensions.</li> <li>Users can visualize their data intuitively for their business requirements.</li> </ul>
<b>Easy Data Exploration</b>	<ul style="list-style-type: none"> <li>Intuitive visual way to access and analyze multidimensional data, from dragging and dropping dimensions to pivoting.</li> <li>Additional categories can be dragged from the filter bar and added to the crosstab.</li> <li>View and analyze data graphically using numerous chart styles.</li> </ul>	<ul style="list-style-type: none"> <li>Simplifies the process of navigating through successive layers of detail to discover trends, relationships and patterns.</li> </ul>
<b>Linked Presentations</b>	<ul style="list-style-type: none"> <li>Presentations can be linked together in two different ways: <ul style="list-style-type: none"> <li>Filter linking — If the filter member in a presentation is changed, the other linked presentations are updated.</li> <li>Full linking — Any operation applied to one presentation is reflected in the other linked presentations.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Allows decision-makers to manipulate their data in a number of different views simultaneously for more effective analysis.</li> </ul>

Feature/Function	Specifications	Benefits
<b>Ranking</b>	<ul style="list-style-type: none"> <li>Menu commands can be used to quickly rank members using preset values or create custom rankings.</li> <li>Supports server-side ranking functionality provided by multidimensional databases.</li> </ul>	<ul style="list-style-type: none"> <li>Provides top/bottom multidimensional analysis for more effective decision making.</li> </ul>
<b>"Keep Only"</b>	<ul style="list-style-type: none"> <li>Allows users to quickly eliminate unselected members from a crosstab view.</li> </ul>	<ul style="list-style-type: none"> <li><i>Fast, efficient analysis</i> of data by focusing views on the data that is required.</li> </ul>
<b>Exception Handling</b>	<ul style="list-style-type: none"> <li>Wizard to change the formatting of cells whose values fall within defined criteria.</li> </ul>	<ul style="list-style-type: none"> <li><i>Highlights key information</i> for decision-makers for more effective analysis.</li> </ul>
<b>Percent of Total Wizard</b>	<ul style="list-style-type: none"> <li>Creates a member that represents the percent of total for members in one dimension, using information from a second dimension.</li> </ul>	<ul style="list-style-type: none"> <li>Allows users to spot trends and patterns in their data quickly and easily.</li> </ul>

The Presentation Designer in BI/Analyze allows users to choose the presentation type, data source and arrangement of their data. CubeCreator provides a powerful cube building engine to create HyperCubes from BI/Query result sets and flat files.



## BI/Analyze: Creating OLAP Reports

Feature/Function	Specifications	Benefits
<b>Presentation Designer</b>	<ul style="list-style-type: none"> <li>Wizard helps users create new presentations or edit existing ones.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies OLAP report design</i> by enabling users to choose the presentation type, data source and arrangement of their data.</li> </ul>
<b>Predefined Calculated Metrics</b>	<ul style="list-style-type: none"> <li>Predefined calculations such as sum, average, percentage, maximum and minimum.</li> </ul>	<ul style="list-style-type: none"> <li><i>Optimizes analysis</i> by making the most common business calculations easier to access and incorporate.</li> </ul>
<b>Custom Calculated Metrics</b>	<ul style="list-style-type: none"> <li>Complex custom calculations can be built including those using nested rules.</li> </ul>	<ul style="list-style-type: none"> <li><i>Flexibility</i> to create custom analysis.</li> </ul>

# BI/Web

BI/Web is a true thin-client query, reporting, and OLAP application for conducting business intelligence tasks over the Web. Without any software or plug-ins to install and maintain, BI/Web users access and interact with the same queries, data models, reports and OLAP data sources as PC desktop users.

## BI/Web: Integrated Thin-Client Architecture

Feature/Function	Specifications	Benefits
<b>Java-based</b>	<ul style="list-style-type: none"> <li>Developed to the Java 1.1 standard.</li> <li>Compatible with any platform capable of running a Java 1.1 compliant Web browser.</li> </ul>	<ul style="list-style-type: none"> <li>Deploy to the widest range of platforms in the enterprise.</li> </ul>
<b>Content Rendering in Extensible Markup Language (XML)</b>	<ul style="list-style-type: none"> <li>XML is used to render all content (reports, data models and query result sets) to Web users.</li> </ul>	<ul style="list-style-type: none"> <li>Uses XML's markup enhancements over HTML to provide the same rich quality of presentation for both PC desktop and Web clients.</li> </ul>
<b>IOP (Internet Inter-Orb Protocol) Sessions</b>	<ul style="list-style-type: none"> <li>Sessions between BI/Web and BI/Broker utilize IOP.</li> <li>Provides a persistent, "stateful" IOP connection to circumvent the inherent statelessness of conventional Web sessions.</li> </ul>	<ul style="list-style-type: none"> <li><i>Provides enterprise scalability and optimizes performance</i> by eliminating the stateless nature of the Web.</li> </ul>
<b>User, Group, Role Level Security</b>	<ul style="list-style-type: none"> <li>BI/Web uses the same rich, object-level security model as PC desktop client counterparts.</li> <li>Multiple inheritance, and row- and member-level governance.</li> </ul>	<ul style="list-style-type: none"> <li><i>Lowered administration cost</i> because a single set of content can be created with security permission set for each class of user.</li> </ul>



BI/Web's OLAP interface (left) provides a rich analysis environment over the Web, while Interactive Reports (right) allow users to requalify reports with data more relevant to their needs.

Feature/Function	Specifications	Benefits
<b>Heterogeneous Queries and Reports</b>	<ul style="list-style-type: none"> <li>Web users can launch preformatted “super queries” and reports that access and join data from two or more sources in a multi-vendor database environment.</li> </ul>	<ul style="list-style-type: none"> <li>Enables querying against different databases.</li> <li>BI/Web users can get answers to crucial business questions without worrying where the data is stored.</li> </ul>
<b>Page-On-Demand Viewing of Query Results &amp; Reports</b>	<ul style="list-style-type: none"> <li>Query results and reports are prepared and managed in BI/Broker and served page-at-a-time to BI/Web users.</li> </ul>	<ul style="list-style-type: none"> <li><i>Preserves network bandwidth</i> by preventing the all-at-once download of large results sets and reports to the desktop.</li> </ul>
<b>Local Printing</b>	<ul style="list-style-type: none"> <li>Users can print to locally connected printers.</li> </ul>	<ul style="list-style-type: none"> <li><i>Maximum flexibility</i> to utilize corporate resources.</li> </ul>



BI/Web's Personal Portfolio (far left screen) allows users to view and organize queries, reports and OLAP data sources using a Windows Explorer-like interface. Users can also build ad hoc queries using data models over the Web.



## BI/Web: Functionality

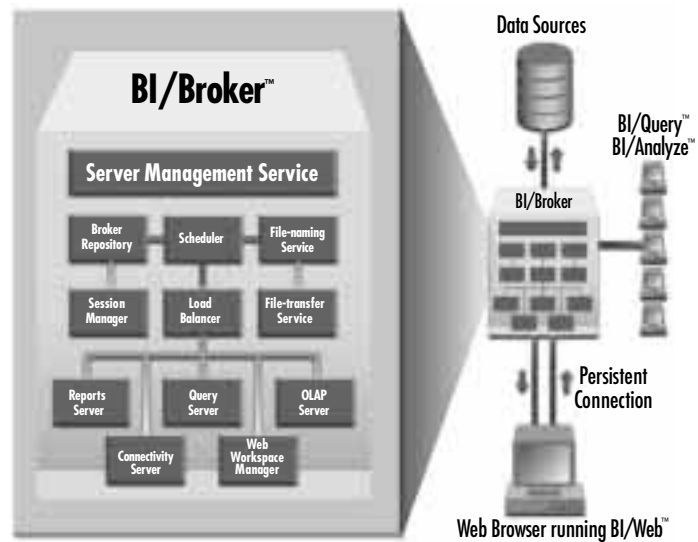
Feature/Function	Specifications	Benefits
<b>Personal Portfolio</b>	<ul style="list-style-type: none"> <li>Personal Portfolio is a customizable file-and-folder display of all content (data models, reports, queries and multidimensional data sources).</li> </ul>	<ul style="list-style-type: none"> <li>Enables users to <i>organize content</i> by creating new folders, drag-and-drop objects and sorting.</li> </ul>
<b>Single Stream of Content for PC Desktop and Web Clients</b>	<ul style="list-style-type: none"> <li>BI/Web users interact with the same visual data models as BI/Query users and utilize the same multidimensional data sources as BI/Analyze.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies</i> the complexity of users' interaction with data sources and provides consistency with BI/Query and BI/Analyze.</li> </ul>
<b>Executive Queries and Reports</b>	<ul style="list-style-type: none"> <li>Launch preformatted queries or reports by clicking an executive button.</li> <li>Includes super queries and heterogeneous reports.</li> </ul>	<ul style="list-style-type: none"> <li>Satisfies routine requirements quickly.</li> <li>New users can launch complex processes <i>without prior training</i>.</li> </ul>

## BI/Web: Functionality

Feature/Function	Specifications	Benefits
<b>Interactive Queries</b>	<ul style="list-style-type: none"> <li>• Queries may contain prompts that allow users to provide specific values to requalify the query.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Enables</i> users to ask for specific information without needing to understand the complexity of the underlying database.</li> </ul>
<b>Ad Hoc Queries</b>	<ul style="list-style-type: none"> <li>• Users can easily build ad hoc queries over the Web.</li> <li>• Utilizes the same interface as PC desktop clients, enabling users to qualify, group and sort as part of the query.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduced enterprise costs</i> by providing rich query features over the Web.</li> </ul>
<b>Interactive Reports</b>	<ul style="list-style-type: none"> <li>• Reports accessed via BI/Web may contain “hot buttons” to requalify the report.</li> <li>• Values appear in a drop-down list and/or separate dialog.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Enables</i> users to ask for specific information without needing to understand the complexity of the underlying database.</li> </ul>
<b>OLAP Analysis</b>	<ul style="list-style-type: none"> <li>• Interact with OLAP cubes created by BI/Analyze or other multidimensional data sources. <ul style="list-style-type: none"> <li>- Drilling up/down (on labels, data cells, and charts)</li> <li>- Filtering</li> <li>- Calculations</li> <li>- Sorting</li> <li>- Charting</li> <li>- “Keep Only” feature</li> <li>- Data Navigator</li> <li>- Saving OLAP presentations to the middle tier</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduces enterprise costs</i> by providing rich OLAP features over the Web.</li> </ul>
<b>Export Result Sets to Spreadsheets</b>	<ul style="list-style-type: none"> <li>• Export results in Comma Separated Values (CSV) format for use in spreadsheets and other third-party applications.</li> </ul>	<ul style="list-style-type: none"> <li>• Integrates with other enterprise applications for further analysis of data.</li> </ul>

## BI/Broker

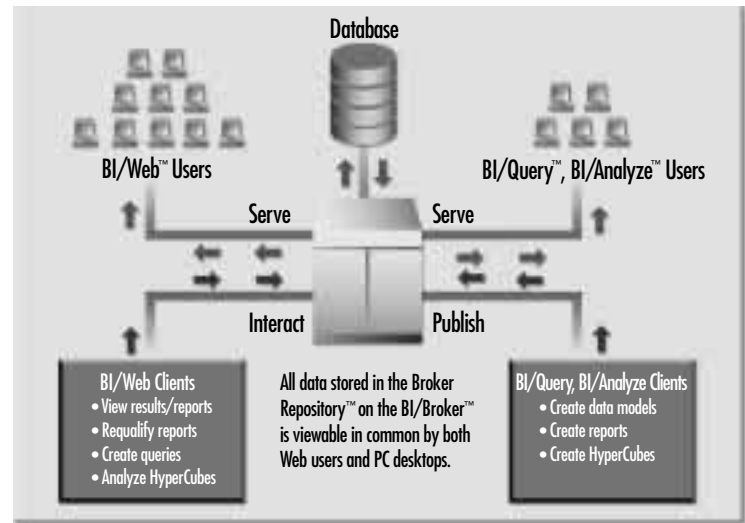
BI/Broker is an application server designed from the ground up to provide shared services and common content to both full-featured desktop clients and Web clients. BI/Broker offers IT a single point of administration for both desktop and Web clients alike.



### BI/Broker: Scalable Enterprise Architecture

Feature/Function	Specifications	Benefits
<b>Cross-Platform Support</b>	<ul style="list-style-type: none"> <li>Windows NT 4.0 and above.</li> <li>UNIX (Solaris, HP-UX and IBM-AIX).</li> </ul>	<ul style="list-style-type: none"> <li><i>Cross-platform support</i> enables customers to choose the best technology value.</li> </ul>
<b>Central Repository</b>	<ul style="list-style-type: none"> <li>Stores reports, data models, queries, data values, references to multidimensional data sources and all other objects used by BI/Query, BI/Analyze, and BI/Web.</li> <li>Stores security profiles, access control lists and object qualifiers.</li> </ul>	<ul style="list-style-type: none"> <li><i>Simplifies central management</i> of security and content so that users always get the most recent and valuable information.</li> </ul>
<b>CORBA Environment</b>	<ul style="list-style-type: none"> <li>Inprise Visigenic object request broker (ORB) to deploy application services as distributed objects over the network.</li> <li>De facto standard for three-tier distributed environments.</li> </ul>	<ul style="list-style-type: none"> <li><i>Robust proven technology</i> provides enterprise scalability, fault tolerance and maintainability.</li> <li>Ensures a <i>long life span</i> and <i>integration</i> with third-party products.</li> </ul>
<b>Load Balancing</b>	<ul style="list-style-type: none"> <li>Application services can be offloaded to support servers.</li> </ul>	<ul style="list-style-type: none"> <li><i>Increases scalability</i> in high performance, high-load environments.</li> <li><i>Optimizes performance</i> by balancing the load across many servers.</li> </ul>
<b>Concurrent and Named Licensing Model</b>	<ul style="list-style-type: none"> <li>Concurrent access licenses, shared on first-come-first-serve basis.</li> <li>Named access licences, designated to a specific user.</li> </ul>	<ul style="list-style-type: none"> <li>Enables the dissemination of business intelligence capabilities to occasional users via concurrent access licenses.</li> <li><i>Guaranteed access</i> for power users and decision-makers through named access licenses.</li> </ul>
<b>Session Management</b>	<ul style="list-style-type: none"> <li>Services tracking, dropped session detection and process optimization.</li> </ul>	<ul style="list-style-type: none"> <li><i>Optimizes performance</i> and security by managing state and providing access based on security permissions.</li> </ul>
<b>Connectivity Application Service</b>	<ul style="list-style-type: none"> <li>Provides connectivity to all major databases using native methods or through industry-standard middleware.</li> </ul>	<ul style="list-style-type: none"> <li>Brings business intelligence to the widest range of databases and business application software.</li> </ul>
<b>OLAP Services</b>	<ul style="list-style-type: none"> <li>Handles the interaction with the user when they are analyzing OLAP data over the Web.</li> </ul>	<ul style="list-style-type: none"> <li><i>Improves analysis capabilities</i> by enabling BI/Web users to do multidimensional analysis over the Web.</li> </ul>

The Repository in BI/Broker stores information in the BI/Suite environment. All data — queries, reports, cubes, graphics, and so on — in the Repository can be accessed by both PC desktop and Web clients, according to users' security privileges.



## BI/Broker: Enterprise Management Capabilities

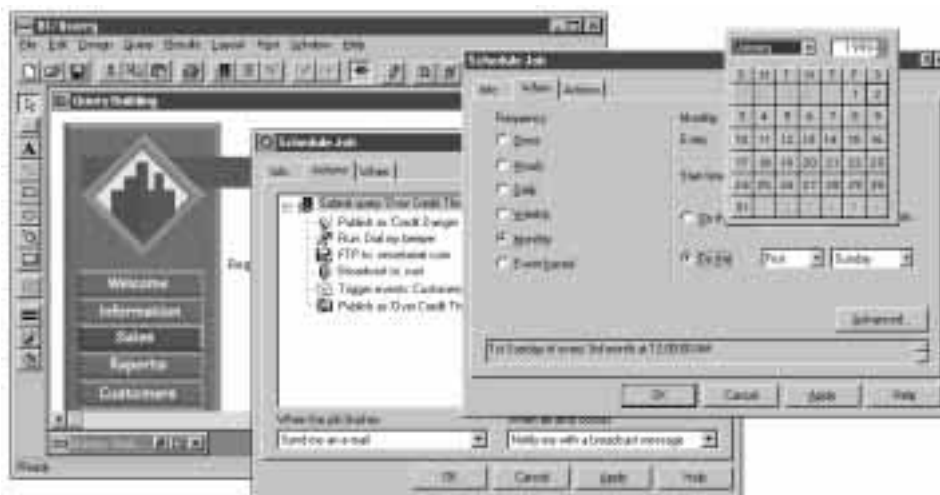
Feature/Function	Specifications	Benefits
<b>Performance Data Collection Service</b>	<ul style="list-style-type: none"> <li>Customized BI/Query data model to audit BI/Broker activity.</li> </ul>	<ul style="list-style-type: none"> <li>Allows administrators to adjust the BI/Broker configuration to meet enterprise demands.</li> </ul>
<b>Trace Utility</b>	<ul style="list-style-type: none"> <li>Monitor specific types of activity including the display of exceptions, errors and warnings.</li> </ul>	<ul style="list-style-type: none"> <li>Alerts administrators to problems and potential problems before they become critical.</li> </ul>
<b>Logs</b>	<ul style="list-style-type: none"> <li>Logging facility shows low-level activity of BI/Broker and the CORBA request broker.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces downtime by providing information for fast and effective troubleshooting.</li> </ul>

## BI/Broker: Scheduling

Feature/Function	Specifications	Benefits
<b>Query, Reports and HyperCube Scheduling</b>	<ul style="list-style-type: none"> <li>Query scheduling, report and cube refreshing at specific times and/or when specific events occur.</li> </ul>	<ul style="list-style-type: none"> <li>Maximizes database and server performance by scheduling during off-peak hours.</li> </ul>
<b>Time- and Event-based Scheduling</b>	<ul style="list-style-type: none"> <li>Query, report and cube refreshes can be scheduled once, periodically, based on a specific event (such as when the data warehouse or data mart is updated), or any combination of the above.</li> </ul>	<ul style="list-style-type: none"> <li>Flexibility to time queries and reports for business-specific purposes such as at the end of a quarter.</li> <li>Enhances notification by running queries and reports triggered by events.</li> </ul>
<b>Event-triggering Exceptions</b>	<ul style="list-style-type: none"> <li>Set exception(s) on a given value in a report that triggers other scheduled events defined in BI/Broker.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor values in the data warehouse and trigger queries, reports, or other actions when certain conditions are met (eg., sales falling below a certain threshold).</li> <li>Eliminates the need for scripting or third-party applications for timely notification of relevant business trends.</li> </ul>
<b>Enforced Query Scheduling</b>	<ul style="list-style-type: none"> <li>Force queries from a particular user, group of users or from a specific data model to be scheduled rather than submitted immediately to the database.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces database load for large or lower priority queries.</li> </ul>
<b>Static Web Reports</b>	<ul style="list-style-type: none"> <li>Schedule and distribute static web reports.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces cost by enabling the enterprise to satisfy information consumers.</li> </ul>



BI/Broker allows users to schedule reports, queries and cube refreshes to run at a specified time and/or when a specific event occurs.



## BI/Broker: Distribution and Notification

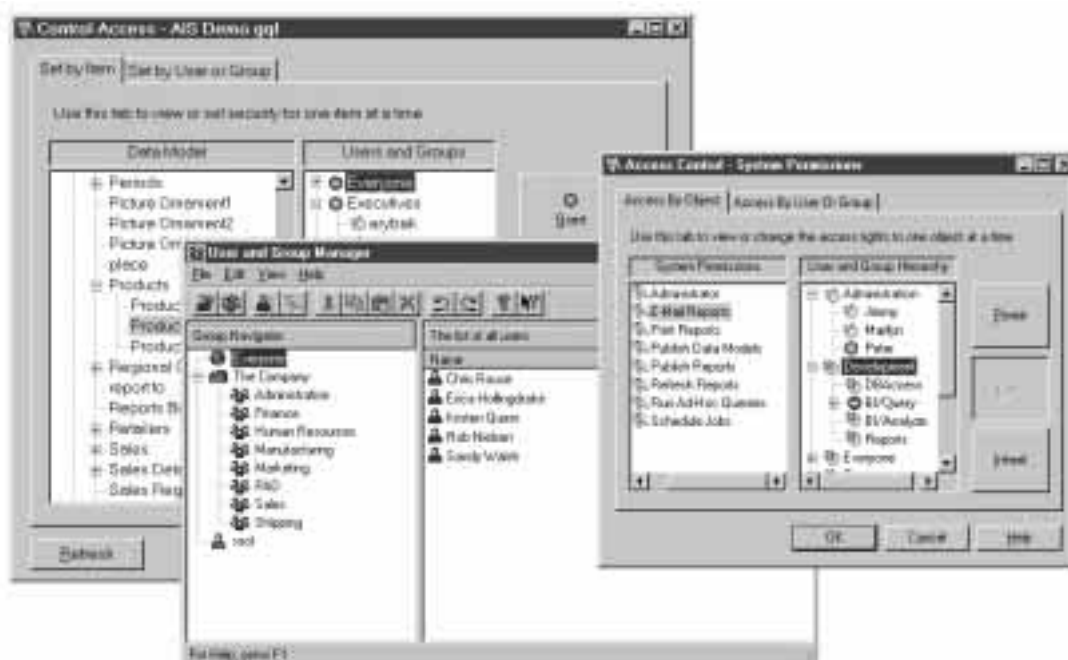
Feature/Function	Specifications	Benefits
<b>Content Publishing</b>	<ul style="list-style-type: none"> <li>Scheduled queries, reports and cubes can be published to specific users or groups of users.</li> </ul>	<ul style="list-style-type: none"> <li>Allows queries, reports and cubes to be shared throughout the enterprise.</li> </ul>
<b>Distribution of Reports via E-mail</b>	<ul style="list-style-type: none"> <li>Send query results and reports as e-mail attachments.</li> <li>Supports SMTP, VIM and MAPI mail standards.</li> <li>Load result sets directly in Microsoft Excel and other spreadsheet applications.</li> </ul>	<ul style="list-style-type: none"> <li>Maximizes enterprise communication methods by supporting e-mail for distribution.</li> </ul>
<b>Multiple Notification Options</b>	<ul style="list-style-type: none"> <li>Notification of scheduled event completion or errors during processing through: <ul style="list-style-type: none"> <li>E-mail</li> <li>Network broadcast</li> <li>Push channels such as PointCast or Microsoft Active Desktop (CDF) channel formats.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Displays status of scheduled jobs and delivers results through user-preferred methods.</li> </ul>
<b>External Program Support</b>	<ul style="list-style-type: none"> <li>Invoke external programs as part of a scheduled job.</li> <li>External programs must be present on the BI/Broker Server.</li> </ul>	<ul style="list-style-type: none"> <li>Improves custom and third-party software integration (eg., A Visual Basic script can be invoked to dial a user's pager upon completion of a scheduled job).</li> </ul>



BI/Broker can alert users about particular events, such as the completion of scheduled queries and reports. It also lets users distribute reports and queries using e-mail, FTP, push channels, or the Web.

## BI/Broker: Security

Feature/Function	Specifications	Benefits
<b>User, Group and Role Security</b>	<ul style="list-style-type: none"> <li>Control users' view and access to the BI environment, including databases, queries, reports and cubes according to a user's identity, membership in a group or role in the organization.</li> </ul>	<ul style="list-style-type: none"> <li><i>Lowers administration cost</i> since a single set of content can be created with security permission set for each class of user.</li> <li><i>Enhances security</i> over and above the database.</li> </ul>
<b>Multiple Inheritance</b>	<ul style="list-style-type: none"> <li>Users inherit security profiles from their membership in a group.</li> </ul>	<ul style="list-style-type: none"> <li><i>Reduces administrative burden</i> by enabling the inheritance of security by logical groups.</li> </ul>
<b>User and Group Manager</b>	<ul style="list-style-type: none"> <li>Drag-and-drop graphical user interface for administrators to create security profiles for users and groups.</li> </ul>	<ul style="list-style-type: none"> <li><i>Reduces administrative burden</i> by enabling centralized and remote administration for both PC desktop and Web users.</li> </ul>
<b>User and Group Import Facility</b>	<ul style="list-style-type: none"> <li>Import user and group information from: <ul style="list-style-type: none"> <li>Windows NT domain controller</li> <li>Database tables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><i>Reduces set up time</i> by using existing user and group information.</li> </ul>



The User and Group Manager offers a simple way for administrators to set up security profiles for everyone accessing BI/Broker. Profiles can be based on a user's identity as an individual, membership in a group, or role within an organization.

## Relational Database Connectivity













The following chart identifies the network connections to host relational database systems that **BI/Suite** supports. Given the changing nature of the database middleware market, please confirm connectivity options with Hummingbird Sales.

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ODBC <sup>1</sup>		Dependent on ODBC driver availability. Certified on Windows for AS400, Access, Informix, SQL Anywhere and more.												

1. ODBC supports other DBMSs not shown here. BI/Query supports ODBC Drivers Version 1 and 2 with API Conformance Level 2 and Extended SQL Conformance.
2. English Database support only.

## Multidimensional Database Connectivity

The following chart identifies the network connections to host multidimensional database systems that **BI/Suite** supports. Given the changing nature of the database middleware market, please confirm connectivity options with Hummingbird Sales.

	DBMS	Informix	Essbase	Microsoft's SQL 7 OLAP Services	Whitelight	IBM DB2 OLAP Services
 Windows® 95 32 bit  Windows NT®						
<b>Network Connection</b>						
Essbase			 NT  32			 NT  32
Metacube	 NT  32					
OLE DB for OLAP <sup>1</sup>			 NT  32	 NT  32		
ODBC	Dependent on ODBC driver availability.					

1. Dependent on OLE DB for OLAP driver availability.

## BI/Suite System Requirements

### BI/Query

- Pentium 166 MHz or faster CPU recommended
- Platforms supported: Windows NT/95/98
- Windows NT desktops: 64 MB RAM recommended
- Windows 95/98 desktops: 32 MB RAM recommended
- CD-ROM drive (required for installation only)

### BI/Web

#### Server Requirements:

- Microsoft Internet Information Server version 3 or later; or Netscape Enterprise Server version 3.0, 3.51 or later

#### Client Requirements:

- Platforms supported: Any Java version 1.1 capable Web browser
- Microsoft Internet Explorer:
  - Windows: version 4.01 SP1 (JVM version 2829)
  - UNIX and Macintosh: version 4.01
- Netscape Communicator:
  - Windows: version 4.05 with JVM 1.1.5 or version 4.06
  - UNIX and Macintosh: version 4.x

- Windows NT desktops: 64 MB RAM recommended
- Windows 95/98 desktops: 32 MB RAM recommended

### BI/Analyze

- Pentium 166 MHz or faster CPU recommended
- Platforms supported: Windows NT/95/98
- Windows NT desktops: 64 MB RAM recommended
- Windows 95/98 desktops: 32 MB RAM recommended
- CD-ROM drive (required for installation only)

### BI/Broker

- Pentium II 300 MHz or faster CPU recommended
- Platforms supported: Windows NT Server 4.0 SP3 or later
- 512 MB RAM recommended
- 4 GB Hard disk space recommended
- CD-ROM drive (required for installation only)

**Corporate Headquarters**

Hummingbird Communications Ltd.  
1 Sparks Avenue  
North York, Ontario  
Canada M2H 2W1

Phone +1-416-496-2200

Fax +1-416-773-5825

**North American Offices**

Los Angeles, California

Phone +1-310-643-4541

San Francisco, California

Phone +1-650-917-7300

Atlanta, Georgia

Phone +1-770-421-1140

Chicago, Illinois

Phone +1-630-684-2222

New York, New York

Phone +1-212-390-7000

Toronto, Ontario

Phone +1-416-496-2200

Dallas, Texas

Phone +1-972-387-7377

**International Offices**

Sydney, Australia

Phone +61-2-9929-4999

Paris, France

Phone +33-1-41-10-05-05

Hamburg, Germany

Phone +49-40-79-70-07-23

Munich, Germany

Phone +49-89-74-73-08-0

Mexico City, Mexico

Phone +52-5-628-1220

Basel, Switzerland

Phone +41-61-378-9221

London, United Kingdom

Phone +44-118-978-2800

**Contacting Hummingbird**

Web [www.hummingbird.com](http://www.hummingbird.com)

E-mail [getinfo@hummingbird.com](mailto:getinfo@hummingbird.com)



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