

# The Anatomy of BBJ

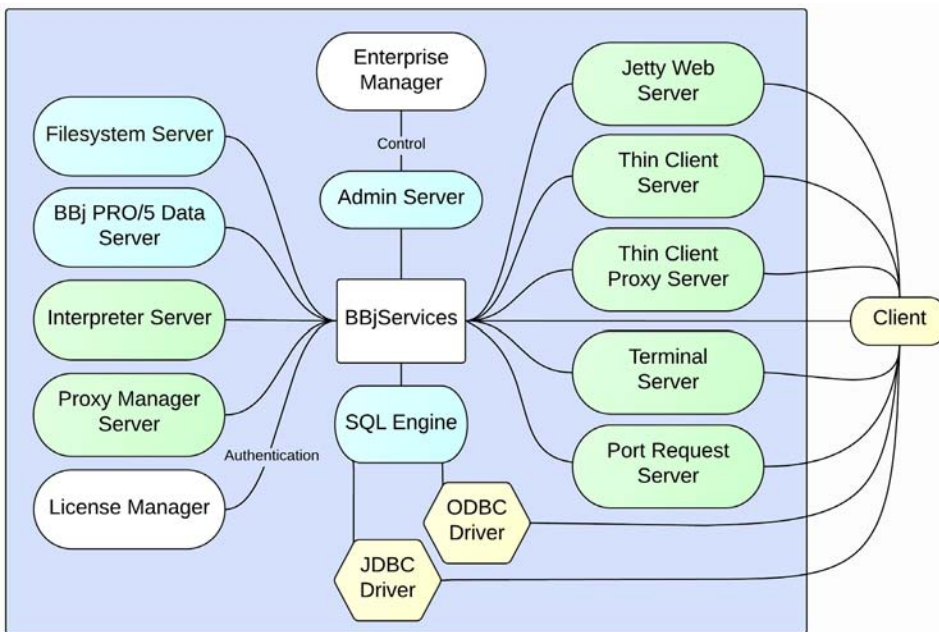
**A**s a new BBJ® user, you may find the landscape of participating processes and services confusing. Exactly what did I install on my server? What do all of these processes do anyway? In order to provide a firm grounding in the basics, let's look at a high-level overview of BBJ and its components.

## At the Heart of BBJ

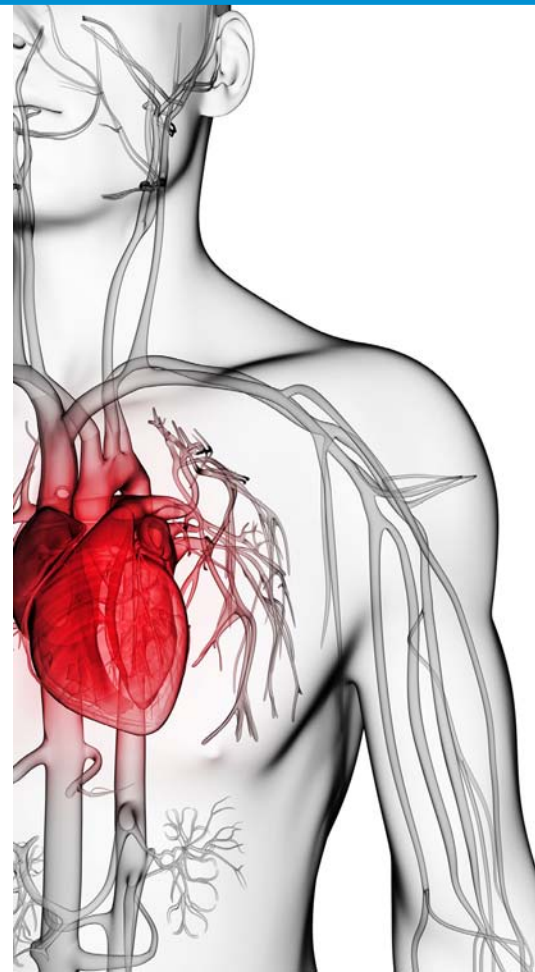
BBJServices is the core component of BBJ. It provides for central control and access to all data and BBJ programs, and provides local and remote file access, SQL processing, administration, user access, interpreter access and thin client support through these components:

- BBJ Data Server – Admin Server, Filesystem Server, SQL Engine, and the BBJ PRO/5 Data Server
- BBJ App Server – Interpreter Server, Terminal Server, Thin Client Server, Thin Client Proxy Server, Port Request Server, and the Jetty Web Server

See **Figure 1** for an overview of the BBJ components as they reside on the server "computer" with the remote client elsewhere. The BBJ Data Server components appear in blue; the BBJ App Server components are in green; client components are in yellow. Three core components appear in white – BBJServices, Enterprise Manager, and the License Manager.



**Figure 1.** The BBJ components and their relationships



## BBJServices

BBJServices offer the services of a data server (i.e. it listens on a given port for BBJ Data Server connection requests) and also offers the services of an app server (i.e. listens on a different port for BBJ App Server connection requests). When the App Server port receives a request, BBJServices starts an interpreter to process the request, but because the Interpreter and the Data Servers are running in the same process, they are able to communicate directly rather than across a socket. This provides a significant performance advantage over the configuration in which the Data Server and the App Server are running in separate processes.

Once BBJServices are running, users can access the services it offers in the same way that they would access the BBJ Data Server and BBJ App Server services if they had started either in separate processes. Although these services can be accessed in a manner that is 'pure Java,' the most common access is by typing BBJ at a command prompt.



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## Enterprise Manager

BBjServices is itself controlled or managed by an end user component, the Enterprise Manager (EM). The EM allows BBj administrators to configure and manage all the servers that make up your BBj enterprise. Administrators can configure the various servers, add users, define and maintain databases, configure database level permissions, setup and manage replication jobs, schedule tasks, create triggers, configure stored procedures, or any number of other tasks.

Two versions of the Enterprise Manager are available: a browser-based version and an Eclipse plug-in version. Installing BBj also installs a shortcut for the browser EM on each computer titled "Browser EM." You can also enter the URL <http://<localhost>:8888/bbjem/em> (replacing <localhost> with the hostname for your server) directly in a browser on any computer with network access to the BBj Server. The Eclipse EM plug-in is available to download and run within the Eclipse IDE development tool. Follow the installation and setting up instructions for the Eclipse version on the [Eclipse Plug-ins](#) web page.

## BASIS License Manager (BLM)

The BASIS License Manager (BLM) is a licensing control process that checks for and serves up a valid license each time users launch or connect to a BASIS product. The BLM then monitors the license based on its expiration date.

## BBj Data Server aka BASIS DBMS

**Admin Server** – The Admin Server is the server that does the following:

- Interacts with the BBj Enterprise Manager
- Allows for the configuration of BBjServices and network ports, and the logging of information
- Provides database configuration and user administration

**Filesystem Server** – The Filesystem Server handles access to all of the file types that BBj supports, both local and remote. It also manages data replication and change auditing.

**SQL Engine** – The SQL Engine provides server-side execution and processing of SQL statements. This allows for more efficient processing of multithreaded SQL statements than if the SQL Engine was part of the client-side ODBC driver. The SQL Engine uses an intelligent query optimizer that implements optimization strategies, including those for statements containing one or more ORs in WHERE clauses.

**BBj PRO/5 Data Server** – The BBj PRO/5 Data Server provides access to the BBj file system from Visual PRO/5® and PRO/5® clients replacing the PRO/5 Data Server®. Using the BBj PRO/5 Data Server users can now run their application with PRO/5, Visual PRO/5, and BBj simultaneously without data or licensing conflicts. This allows all clients to take advantage of BBj features such as directly accessing BBj ODBC data sources through the BBj SQL Engine, using stored procedures, triggers, database performance analysis, using extended SQL syntax, performing data replication and change auditing, and more.

## BBj App Server

**Interpreter Server** – The BBj Interpreter Server starts interpreter sessions on the clients' behalf. The BBj Interpreter is the parser and interpreter of programs written in the BBj language. It supports multiple-line IF statements, non-line number programs, embedded Java code, reserved words, register/callbacks, dynamic limits and memory allocation, and ASCII programs.

**Terminal Server** – The Terminal Server provides a TermConsole BBj Interpreter session under Unix. It also provides IO interpreter sessions under Unix and Windows.

**Thin Client Server** – In thin client mode, the Thin Client Server runs the application specified by the client and keeps in communication with the thin client for user activity and additional processing. Speed is the primary goal in running all of the interpreter sessions in one JVM. It would be very inefficient to run a JVM for each session because the majority of the speed loss in Java occurs in the loading of the JVM.

**Thin Client Proxy Server** – The Thin Client Proxy Server (TCPS) provides access to Thin Client Servers from a local BBj executable. The TCPS works with the Port Request Server provide for the efficient management of JVM's used by the thin clients running on local clients.

**Port Request Server** – The Port Request Server interacts as a local server with the Proxy Manager Server to provide port information about the various servers to a BBj session when it starts.

**Proxy Manager Server** – The Proxy Manager Server maintains a list of currently active Thin Client Proxy Servers running on the local machine and interacts with the Port Request Server to insure a BBj Thin Client session connects correctly.

**Jetty Web Server** – The Jetty Web Server is a configurable web server. It provides a powerful tool to bring your BBj applications to web-based clients. Jetty-based applications can be BUI applications or JNLP applets such as Web Start applications. The Jetty Web Server also supports web services and comes with two built-in web services: the BASIS Update Service (BUS) and the demo Chile Company Ordering System (CCOS).

## Clients

BBj Thin Clients connect to BBjServices and request that it run a BBj program on its behalf. BBj Thin Clients keep in communication with BBjServices and display the requested program's interface – either character user interface (CUI), graphical user interface (GUI), or browser user interface (BUI) – on the client machine. With BBj Thin Clients, BBj users can run any BBj program in thin client mode! You can also use BUI in a web browser on a variety of devices and machines. In this type of configuration, you can run a BBj application over the network without even having BBj installed on the user's machine or mobile device!

## Database Drivers

You must use a driver to access the BASIS database management system (DBMS). This driver communicates with the BASIS database, giving it instructions to perform. BBj includes two drivers to access the SQL Engine; an ODBC (Open Database Connectivity) Driver and a JDBC (Java Database Connectivity) Driver.

### BBj ODBC Driver

The BBj ODBC Driver provides an SQL interface to the BBj File System for third party applications running on Microsoft Windows. In previous releases of the ODBC Driver, the SQL process ran on the client. With the BBj ODBC Driver, the SQL engine is now part of BBjServices on the server, which makes the client-side driver very thin (small).

### BBj JDBC Driver

The BBj JDBC Driver provides an SQL interface to any third party Java application running on any platform BBj supports.

## Developer Tools and Application Building Blocks

**Eclipse Plug-in** – In order to develop BBj programs to run with BBjServices, use the Business BASIC Development Tools (BDT) plug-in for Eclipse. If you download and run BDT's CodeEditor, you will be able to create, edit, and debug BBj program code. Two new Eclipse plug-ins – AppBuilder and WindowBuilder (WB) – will be fully functional and available with the release of BBj 15.0. Leveraging the power of the Eclipse framework, these plug-ins offer a number of user-friendly utilities to make your development faster and easier.

- **CodeEditor** – provides an environment for BBj developers to create, edit, and debug their BBj code
- **WindowBuilder** – provides an easy-to-use rapid application development (RAD) GUI tool for BBj developers to do window design and layout (available in BBj 15.0)
- **AppBuilder** – provides a RAD GUI tool for BBj developers to create, edit, and manage event handlers for the UI created in WindowBuilder (available in BBj 15.0)

**Barista** – a GUI-only data dictionary-driven rapid application development environment and runtime engine, facilitates:

- New GUI application development
- Conversion of CUI applications to GUI
- Modernization of existing GUI applications

Refer to the Barista® [documentation](#) for a complete description of its features and components.

**AddonSoftware** – a set of enterprise resource planning (ERP) building blocks, is a full-featured and fully integrated business management solution powered by Barista and coded in BBj. It includes the following modules:

- **Accounting** – Accounts Payable, Accounts Receivable, and General Ledger
- **Distribution** – Inventory Control, Sales Order/Invoice Processing, Purchase Order Processing, and Sales Analysis
- **Manufacturing** – Bill of Materials and Shop Floor Control

## Getting Started

To get started, download BBj from the BASIS [download web page](#) and choose only BBj or BBj plus the Barista Application Framework, with or without AddonSoftware®.

## What's Next?

BBj continues to offer a number of flexible tools and options for the end user, and for the developer to design and manage a computing solution that fits the needs of their customers. This was a high-level overview of the landscape of participating processes and services that make up BBj to clearly explain what you installed on your server and what all of these processes do for you and your customers. ■