

April 2007



**A simple way to deliver your  
business application with  
middleware from IBM in a single  
easy-to-deploy package.**

**IBM Express Runtime V2.2 Technical Overview**

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## Introduction

The fastest-growing segment of IT spending today is in mid-size businesses, generally defined as companies with 100 to 1000 employees. Companies in this segment often address their IT needs by purchasing business applications from a solution provider (Independent Software Vendor, System Integrator). These business applications often require middleware consisting of a database server, an application server and a Web server.

IBM Express Runtime is an offering designed specifically for solution providers who need to quickly deliver a total solution to their mid-size customers. Express Runtime contains a choice of database servers, either DB2 Express or Informix Dynamic Server Express, an application server, WebSphere Application Server - Express, a web server, IBM HTTP Server, and simple yet powerful tools for creating and deploying business solutions - the middleware with an application - as a single deployable package. Express Runtime also provides a simple integrated console that makes it easy to monitor and manage the solution through one browser interface.

IBM Express Runtime enables solution providers to deploy their solutions quickly, reliably and flexibly on Windows, Linux and i5/OS (OS/400) platforms. Express Runtime allows solution providers to “drop in” the complete solution as a single package.

## ***Challenges facing solution providers***

Mid-size companies are looking for complete business solutions from vendors who know their businesses and specialize in a particular solution within their industry, such as warehouse management or supply chain management. As a solution provider, you need to find ways to deliver your application or solution and improve customer satisfaction while reducing your cost of doing business.

The underlying software needed to run many of the business applications for mid-sized companies typically consists of a database server, an application server and a Web server. These software components, which are not actually part of the application (but are required to support the application) are known as middleware. The process of obtaining, installing, configuring and supporting the middleware components often falls to the solution provider, who must absorb the cost of setting up the environment.

## ***The solution: IBM Express Runtime***

IBM Express Runtime is an offering designed specifically for solution providers who need to deliver a total solution to their customers. Express Runtime provides the full function, standards-based middleware required to deliver your business solution to mid-size customers. This market-leading middleware from IBM includes a choice of two database servers, an application server, and a Web server that you need to build and run secure, scalable and robust solutions. In addition, a simple management console allows you or your customer to monitor and manage the solution with a single browser. You can reuse your existing applications that run on these IBM middleware products, so you do not need to invest in new skills and technology.

Express Runtime delivers the functions that allow you to offer all of the middleware, or just the components you need, plus your application in a single, cohesive package that can be easily and quickly deployed on your customer's system either locally or remotely. In those cases where the middleware and the application are not deployed at the same time, Express Runtime can be used to just install the middleware components and you can add an application separately. And, in order to make it easier for you to do business and reduce your time to value, Express Runtime provides one license, one contact for support, and one competitive price that covers all the included IBM middleware components.

## ***IBM Express Runtime components***

### **Database Server**

Express Runtime contains a choice of two full function database products for use in your solution.

DB2 Express provides a standards-based hybrid database system (either relational or hierarchical XML data) specifically designed to support mid-size business applications. A member of the IBM DB2 family, DB2 Express is compatible with the other members of the DB2 family.

Informix Dynamic Server (IDS) Express provides an object-relational database that adapts to the unique needs of your application. A member of the Informix family, IDS Express is compatible with the other members of the Informix family.

### **Application Server**

Express Runtime contains WebSphere Application Server - Express, providing a standards-based J2EE application server that can support the delivery of Web components such as servlets and JavaServer Pages (JSP), as well as Enterprise JavaBeans (EJB) and Java Message Service (JMS).

### Web Server

Express Runtime contains the full standards-based IBM HTTP Server that provides a security-rich Web environment capable of handling fast, high-bandwidth transactions.

Express Runtime also includes the IBM HTTP Plug-in for WebSphere Application Server, which helps automate the configuration of the IBM HTTP Server and the WebSphere Application Server - Express.

### IBM Express Runtime Console

The Express Runtime console provides the ability for you or your customer to perform basic administration tasks for the solution, such as start/stop, backup, health checking through one browser interface, as well as email alerts. With a dashboard model, it is designed for a non-IT skilled user. The IBM Express Runtime console is designed to be extendable for your application to include management of the application. Overall solution management complexity is reduced because there is a single console that presents key tasks in an easy to navigate, consistent format.

The console can be extended using JSR-168 portlets, XML descriptors or other web content. Tools are available to help you write these portlets if you need to extend the console to meet the needs of your application and customer base.

### Solution Assembly Toolkit

Express Runtime contains a solution assembly toolkit that provides development and deployment tools for creating and delivering a complete solution package — containing the IBM middleware fully integrated with the business application.

The solution assembly toolkit makes it easy to “wrap” your application, so it can be deployed along with the middleware components. “Wrapping” an application consists of defining the processes and configuration steps that should be performed before, during and after application installation. With this environment, you use the pre-wrapped IBM middleware components and your application to produce a single, cohesive solution package that is customized to your specifications. Express Runtime provides all the wrappers for the IBM middleware in source form as samples, so you only need to focus on your application and how you want to customize the overall solution for your end customers.

The deployment wizard drives the deployment of the solution package. It is not a replacement for an installer (such as InstallShield), but is instead used to drive the prerequisite checking, existing installation process and post-install configuration actions required to deploy a complete solution. The deployment wizard also enables delivery to local or remote systems. For example, the database server may be deployed to one Linux® system, the web server deployed to another Linux system, with the application server and your application deployed to a Microsoft® Windows® system.

The development environment for the solution assembly toolkit plugs into any existing Eclipse-based development environment (or Eclipse will be installed if it is not already installed on your development system) so your development team does not have to learn a new tool technology.

### Pre-built solutions

Express Runtime provides functional solution wrappers that let you deploy all of the middleware to any of the supported platforms, right out-of-the box. For the solution provider or customer who only wants a simple way to deliver the required middleware components, Express Runtime provides a functional solution that does not require any additional development. The wrappers used to drive this deployment are provided as samples in the pre-built workspaces which come with the solution assembly toolkit development environment.

The sample application provides a pre-wrapped, sample document management application that can be deployed out-of-the box. You can use this sample as a model for your application deployment — helping to minimize set-up errors and delays. When the sample application is deployed, the solution deployment wizard will use the pre-built wrappers to install the database server, create the tables required for the sample application and populate the tables with data. Then it will install and configure the application server and a Web application to access the newly created tables, install the web server and configure the app server plug-in. The result is a functional sample application.

### Supported Operating Systems

IBM Express Runtime supports the following operating systems: Windows, Linux, and i5/OS (OS/400).

### End-to-end scenarios

The best way to understand Express Runtime is to examine the most typical usage scenarios. The first usage scenario is simplifying integration and deployment of a full solution with your application. The second scenario is delivering just the middleware infrastructure. We will cover each of these scenarios in more detail. First a few notes on your application.

#### Your application

With Express Runtime you can reuse your existing applications (Web application, database application, etc). Express Runtime uses the full function IBM Express middleware products, so you can leverage established skills in J2EE and WebSphere Application Server, DB2 and Informix data servers and Eclipse. You can use whatever tools you want to develop your application.

#### **Usage Scenario: Simplifying integration and deployment of a full solution**

This scenario (figure 1) provides a high level, end-to-end composite view of all the basic steps to create a complete solution.

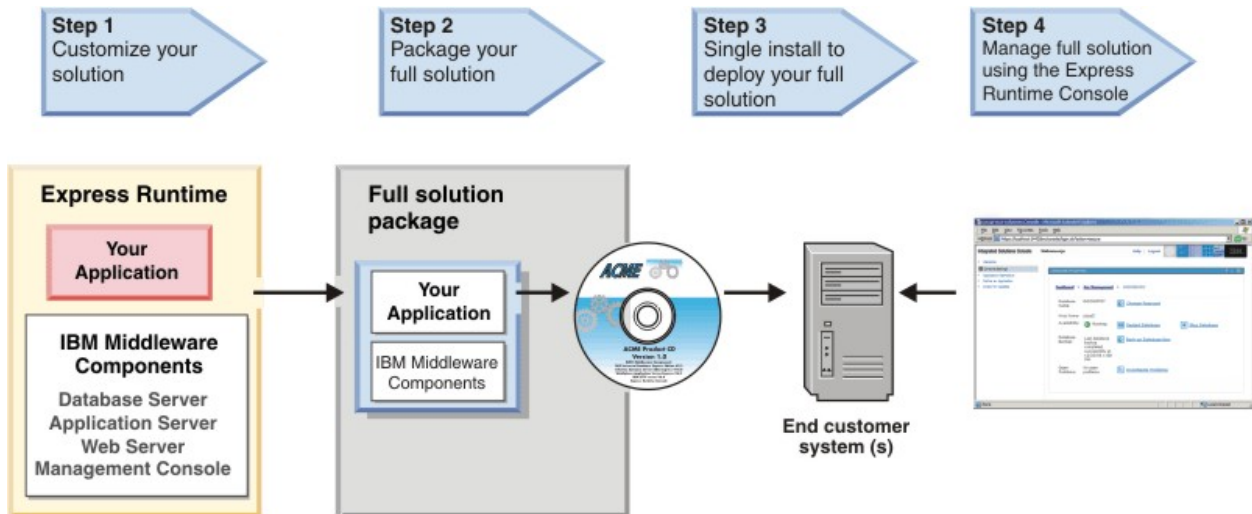
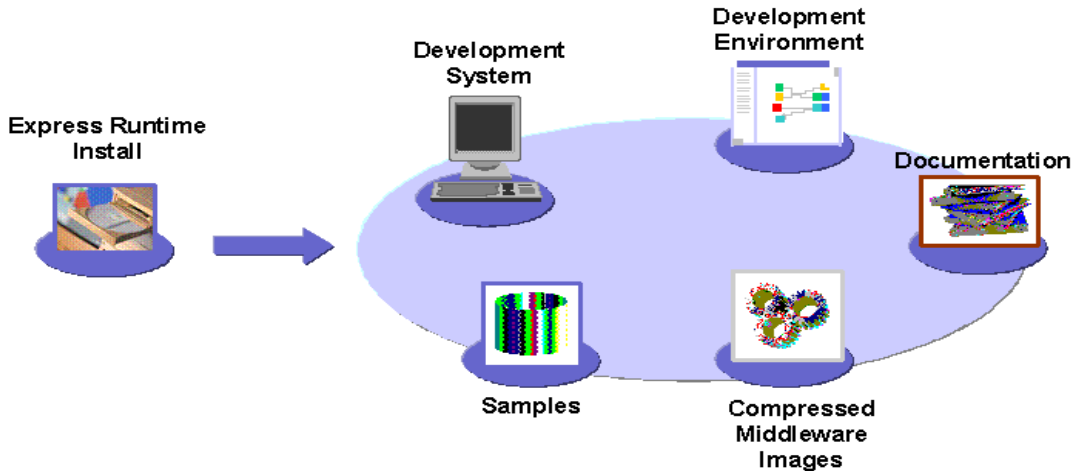


Figure 1: IBM Express Runtime end-to-end scenario

#### **Step 1: Installing Express Runtime and customize your solution**

Figure 2 describes the installation of IBM Express Runtime on your development system.



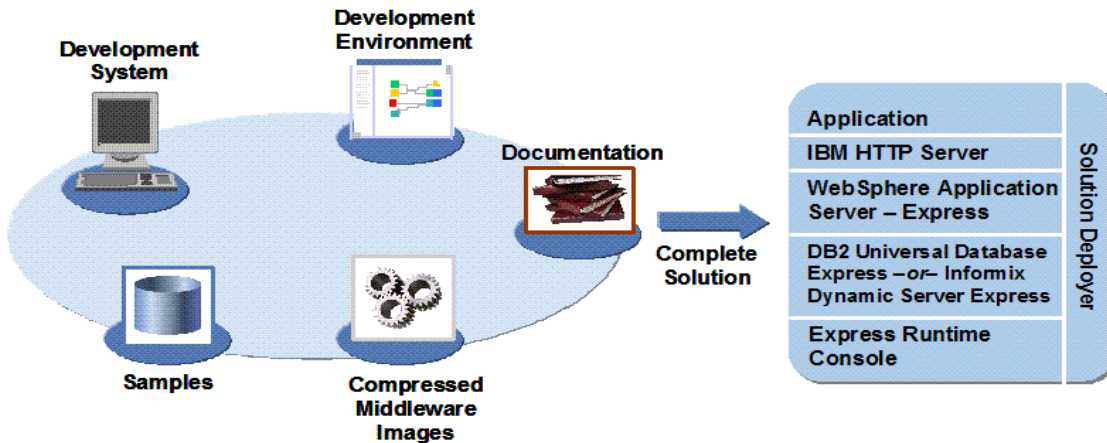
**Figure 2: Installing IBM Express Runtime**

When Express Runtime is installed on your development system, the following items are installed:

- The Express Runtime product itself, consisting of documents, license information and solution development environment
- The solution assembly toolkit environment including the preloaded workspaces with all the sample code
- The compressed images of the IBM middleware components (DB2 Express, IDS Express, WebSphere Application Server - Express, IBM HTTP Server). The compressed images are stored on the system and are not actually installed until the deployment process on the target system.

Figure 3 illustrates how to create a complete solution containing the required IBM middleware and your application for later deployment. In this step, it is assumed that you already have a completed application that requires some or all of the IBM middleware.

Using the development environment and the sample wrappers provided in the pre-built workspace as a guide, you can create a wrapper for the application itself and also a wrapper for the complete solution. The application and solution wrappers can be used to check for prerequisites drive the install process and perform post-install configuration activities such as creating application server data sources, establishing port configuration or creating database tables.



**Figure 3: Creating a solution**

Note that the wrappers do not replace the install technology (such as InstallShield) for the wrapped components. Instead they allow you to use the existing install technology along with additional non-install technology, such as configuration scripts, to drive the complete install and configuration process.

### Step 2: Packaging your solution

Once the application and solution wrappers are created, the complete solution can be packaged and burned to a CD/DVD. This package will then later be deployed to the customer's system (s).

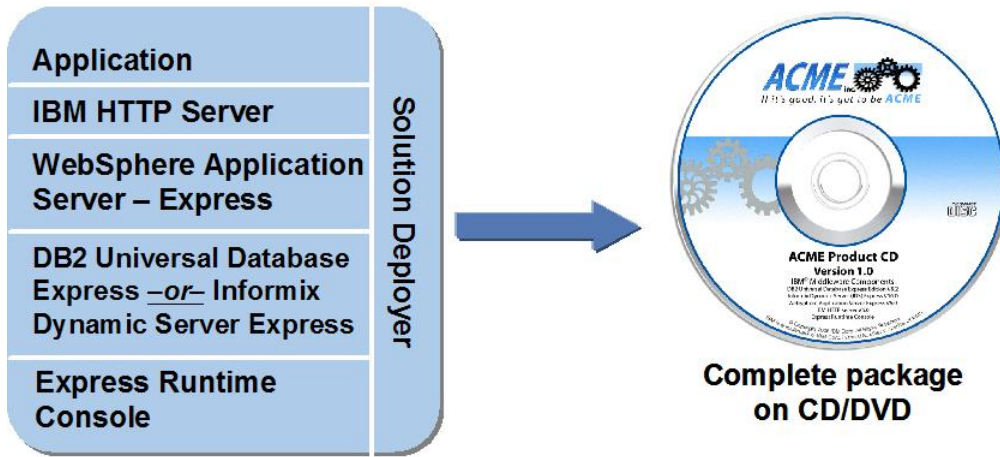


Figure 4: Packaging your complete solution

### Step 3: Deploying your solution

The scenario depicted in Figure 5 illustrates deployment to the customer's system of the package created in the previous step. The deployment wizard takes the user thru the deployment process, gathering the critical information required to complete the deployment and then drives the install and configuration. The components being deployed can be targeted either locally to the system where the CDs are loaded or to other remote systems in the network.

The deployment wizard supports the deployment of the solution to multiple systems with a single deployment process. For example, the implementation of a solution might dictate deployment of the database server, application server and your application to one system and deployment of the web server to a second system.

The deployment process also allows you to determine which components need to be installed. For example, you could build a solution package containing all the middleware components but at deployment time you could choose to install and configure only one of them.

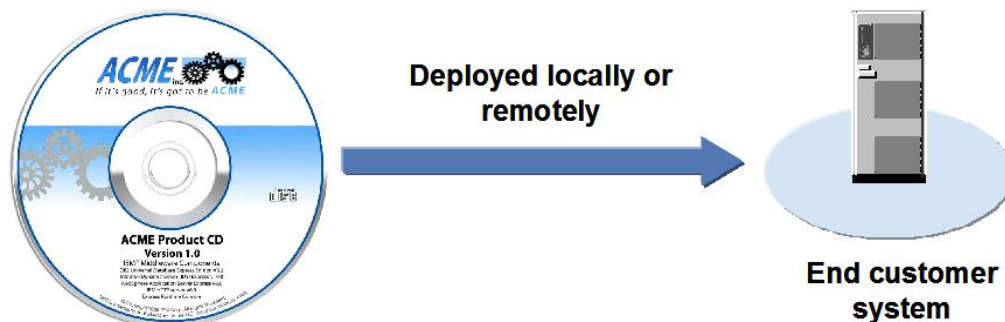


Figure 5: Deploying the solution to the end customer system

### Step 4: Managing the solution

The last step is managing the solution after it is deployed. The IBM Express Runtime console provides the ability to perform basic administration tasks for the solution in a single, integrated, Web-based administrative console. Using a lightweight, JSR-168 standards based framework, the console can be extended to include your application

As illustrated in Figure 6, the Express Runtime console delivers an integrated dashboard perspective for cross-product administration and problem determination.

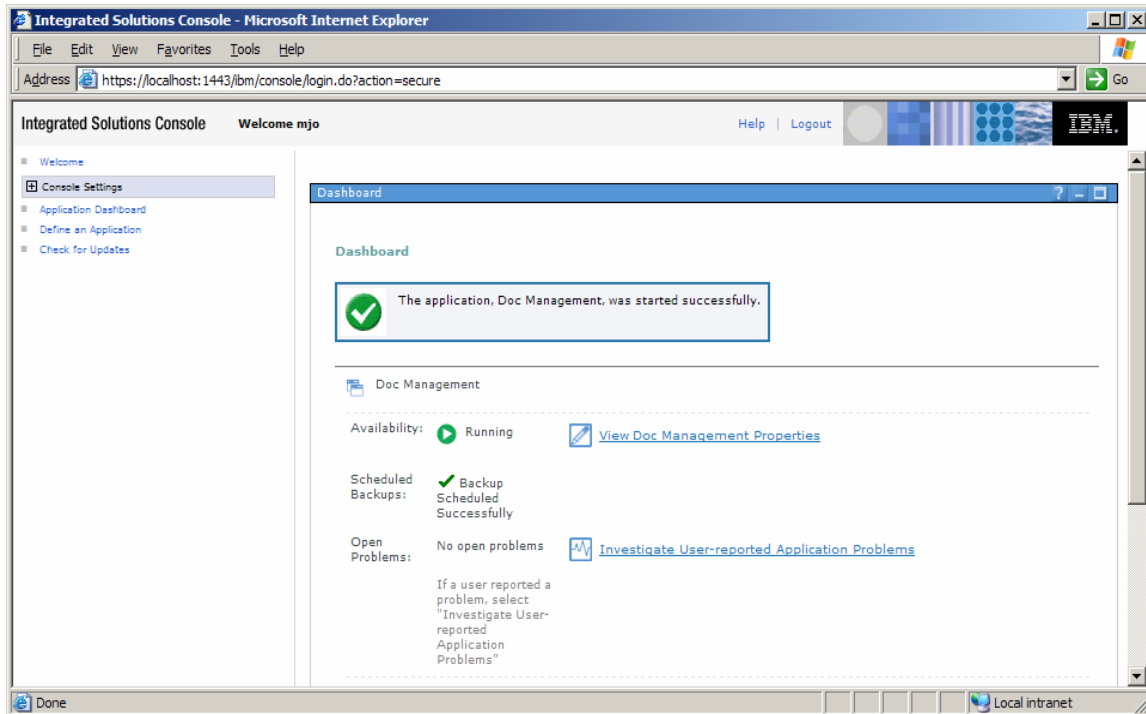


Figure 6: Express Runtime Console

### Usage Scenario: delivering just the middleware infrastructure

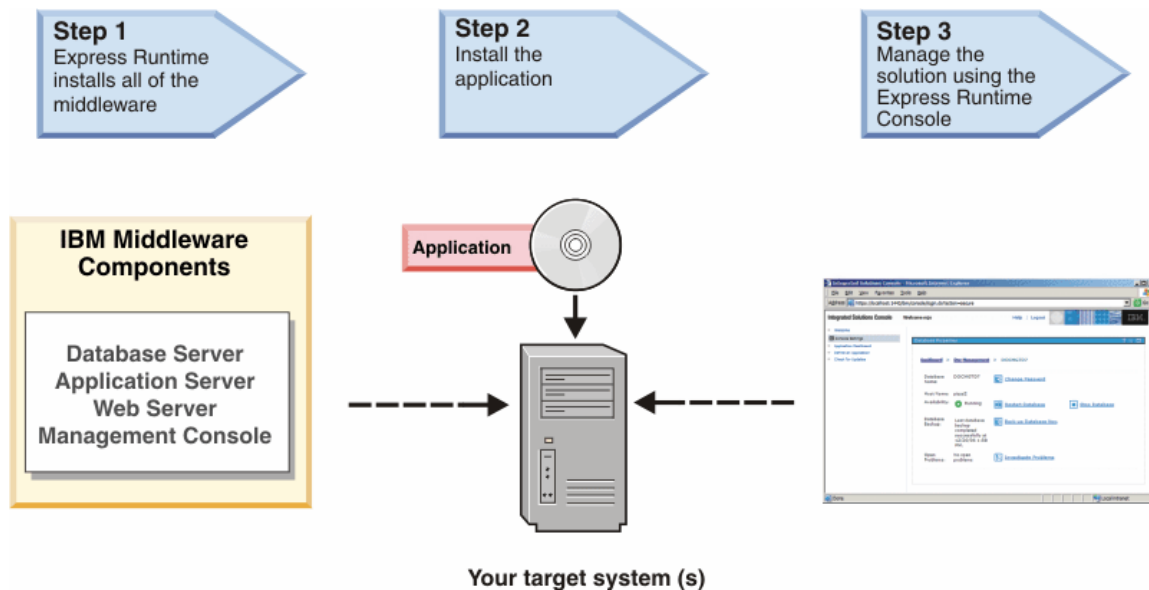


Figure 7: Express Runtime delivering just the middleware



### ***Step 1: Install Express Runtime configuring the middleware components***

When you start the Express Runtime product install, the wizard will ask you which install method you want to use. Select the “Install the Middleware for Production” option. The install wizard will prompt you to select which middleware components you want to install (all or some of the components) and several standard server install questions based on the middleware components (install directory, database userid and password, etc). As before, if the target systems are remote systems on the network, they will communicate through the simple agent provided with Express Runtime

### ***Step 2: Install the application***

Once the Express Runtime middleware install is complete you can deploy any application you like to this infrastructure.

### ***Step 3: Managing the solution***

The last step is managing the solution after it is deployed. The IBM Express Runtime console provides the ability to perform basic administration tasks for the solution in a single, integrated, Web-based administrative console. Using a lightweight, JSR-168 standards based framework, the console can be extended to include your application

As illustrated in Figure 6, the Express Runtime console delivers an integrated dashboard perspective for cross-product administration and problem determination.

## **Summary**

Designed to reduce the time to value for solution providers and their customers, IBM Express Runtime provides the functions that lets you deliver ease-to-deploy solutions with a single install of all IBM middleware, plus your application, that can be deployed locally on one system or remotely to one or more systems.

Express Runtime provides the full function execution environments for the market-leading, standards-based middleware products from IBM: a choice of database products, either DB2 Express 9 or Informix Dynamic Server Express, WebSphere Application Server - Express and the IBM HTTP Server and the Express Runtime console. These components are provided pre-wrapped and ready to deploy right out-of-the-box. IBM Express Runtime provides complete documentation, a standards-based development environment and samples. IBM Express Runtime lets you — and your customers achieve quick Return on Investment (ROI).

## **For more information**

Solution Providers: <http://www.ibm.com/partnerworld/expressruntime>

End Customers: <http://www.ibm.com/software/webservers/expressruntime>



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