

# Transform Your Organization into a Mobile Enterprise with IBM Worklight

## IBM Redbooks Solution Guide

This IBM® Redbooks® Solution Guide focuses on the business transformation to mobile devices. Mobile applications are not a luxury anymore. Providing apps to connect immediately to customers, employees, and partners has become a necessity for companies to keep pace with competition and the rapidly progressing business environment. Much like technological advances of the past (such as the Internet, email, and e-commerce) access to business applications from a mobile device has transformed from an indulgence to an expectation.

The mobile enterprise offering from IBM is called IBM MobileFirst. IBM MobileFirst takes advantage of this mobile trend and is an end-to-end solution to facilitate your platform and application development, mobile security, mobile device management and analytics. IBM MobileFirst supplies all key elements needed for a successful mobile enterprise implementation and consequently customization.

An essential part of this integrated package is the application platform, IBM Worklight®, which provides application development, testing, management, security, and on-premises or managed service delivery. Creating and deploying a new mobile solution involves many groups, both inside and outside of the enterprise, such as employees, customers, and partners. To successfully establish end-to-end solutions, these components need to be determined and addressed (see Figure 1).

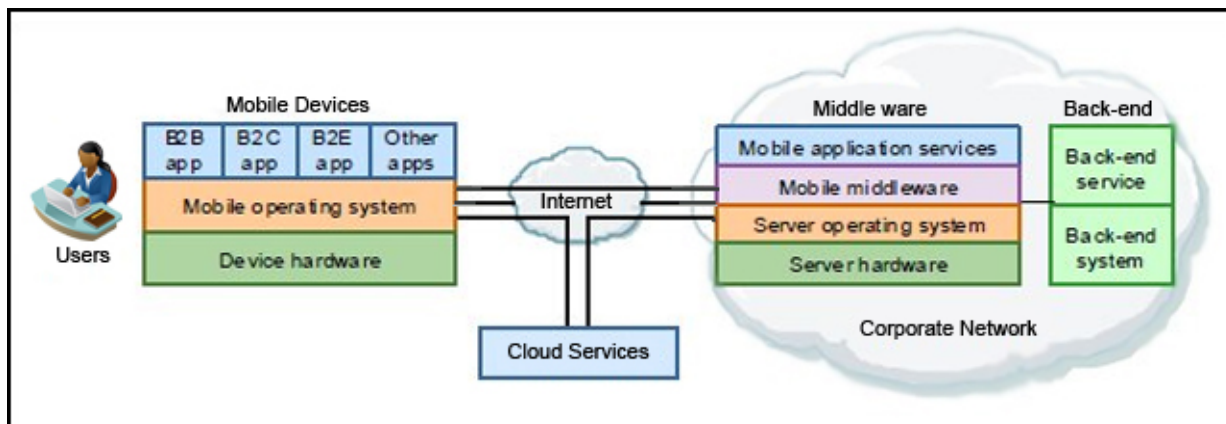


Figure 1. Mobile solution overview

### Did you know?

- 91% of mobile users keep their device within arm's reach 100 percent of the time
- 75% of mobile shoppers take action after receiving a location-based message
- 96% year to year increase in mobile cyber Monday sales from 2012 through 2013

(Source: <http://ibm.co/15WOsOH> )

## Business value

The proliferation and the pace of mobile devices require businesses to be able to respond with agility to upcoming technological improvements, such as new devices or operating system releases. IBM Worklight uses open standards, such as HTML, CSS, and JavaScript, and solutions such as Apache Cordova, Eclipse Foundation, and the Android and Apple SDKs. This provides flexibility in implementing your mobile communication channel and can reduce the time-to-market for a new version of an application that supports a newly released device.

Many business opportunities and challenges cannot be solved with prepackaged off-the-shelf software. This kind of software is designed to solve a particular general business need with limited flexibility in terms of customizing the application to satisfy individual business cases. IBM Worklight, instead, provides a set of tools to be customized to the individual business needs of your company, such as improving customer relationship, reducing paper-bound work, or intensifying marketing activities, and allows developers to build solutions even to the most unique requirements. IBM Worklight helps your enterprise reduce the effective distance to your customers and to engage your user base to accelerate real mobile interaction and communication..

## Solution overview

The IBM mobile solutions portfolio provides key elements of a mobile application platform with the management, security, and analytics capabilities necessary for a successful deployment of mobile technologies. With the IBM Worklight mobile application platform offering, you are able to develop, run, build, and manage mobile applications..

### Building mobile applications with IBM Worklight

Because of the pace at which variations between mobile devices are being introduced and the constant growing consumer demand, the IBM MobileFirst platform is built upon agile software development methodology. By using the SCRUM methodology, for example, a small set of features can go through the complete development lifecycle, including planning, implementation, and quality assurance, and can be delivered to users rapidly. In this way, mobile customers, partners, and employees get engaged with mobile applications and are able to execute the desired actions.

During application development, IBM Worklight separates the roles of native developer, hybrid developer, and web developer through its tooling. This helps to split the workload when a broad set of requirements requires expertise in UI, device capabilities, application logic, and so forth.

Actively seeking feedback about a new application or version through a pilot or beta group is a good way to ensure that your initial release does not fail and cause negative perceptions of your company. Gathering feedback is made easier by using an application store such as IBM Worklight Application Center, which enables you to offer a pre-release version of an application to a limited set of users.

- If you are developing your organization's first mobile application, you can find valuable early planning information at the following location:  
<http://public.dhe.ibm.com/common/ssi/ecm/en/raw14302usen/RAW14302USEN.PDF>
- Learn more about the IBM Mobile Development Lifecycle Solution:  
<http://www.ibm.com/software/products/us/en/imdls/>

### Connecting and running mobile applications

Most mobile applications connect to enterprise back-end services to provide any possible user-related function. Almost no mobile applications run strictly offline without any connection to an enterprise system

at all. IBM Worklight eases the integration and communication to back-end services, for example by push notifications, such as news application alerts, which send information to mobile devices even if the application is not being used. IBM Worklight includes a unified framework that enables the developer to send push notifications to each mobile platform without knowing the targeted device or platform details (Figure 2).

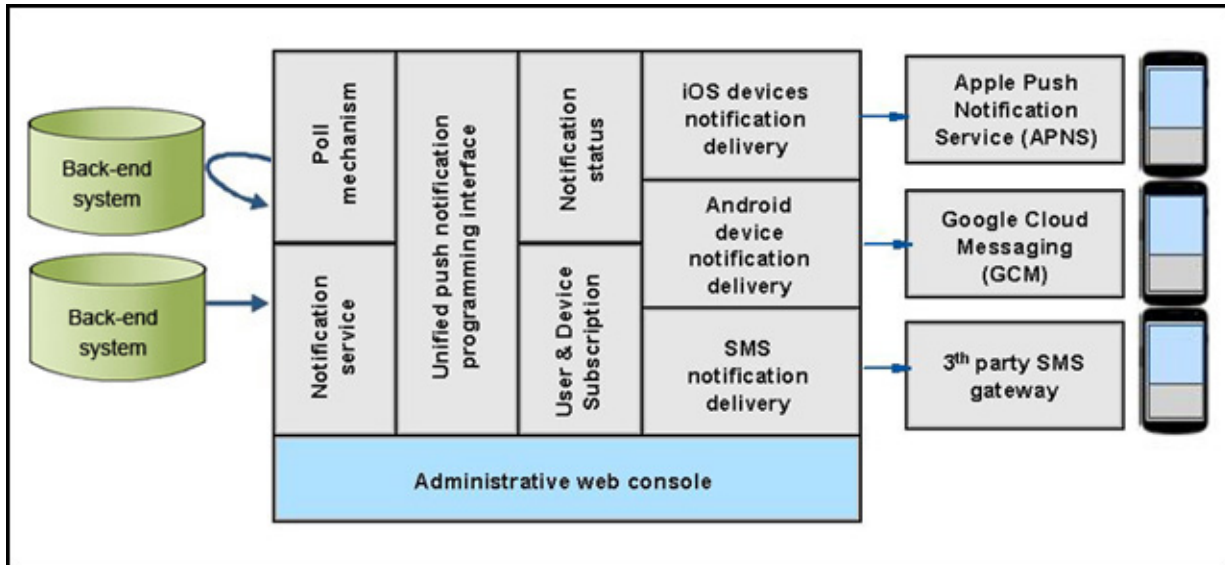


Figure 2. Unified Push Notification Architecture in IBM Worklight

An offline-enabled mobile application can be used when a mobile device lacks connectivity, but some functions might be limited. Therefore, when creating an offline-enabled mobile application, storing information on the mobile device that can help preserve its functionality in offline mode is very useful. IBM Worklight includes a data synchronization feature, called the JSON store, which provides a pattern for data exchange. After enqueueing each operation in offline mode, those operations are transferred to the server and performed against the source data when a connection becomes available (Figure 3).

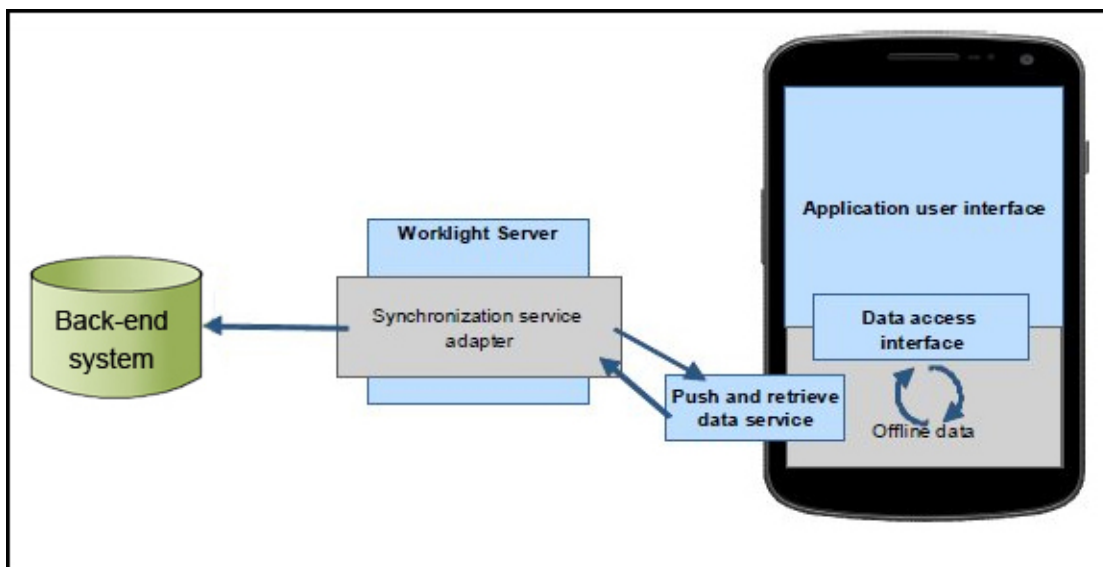


Figure 3. Offline data access and data synchronization using a JSON store

In addition, IBM Worklight simplifies version management and mobile application compatibility through application server communication. Using this server, IBM Worklight can determine the availability of a

newer version of the application and is able to automatically push updates and upgrades to the latest version of an application.

## Solution architecture

IBM Worklight consists of five core components. Each component provides a specific set of functions and supports a different stage in the lifecycle of a mobile application (Figure 4).

- **Worklight Studio:** An Eclipse-based development environment with a rich set of tools for developing cross-platform applications
- **Worklight Device Runtime:** A runtime environment with consistent application programming interfaces (APIs) that can work across different mobile platforms to access native device functionality and integrate with existing services and security
- **Worklight Server:** A runtime server that enables secure access to enterprise services, application version management, unified push notifications, and direct application updates
- **Worklight Console:** A web-based user interface for real-time analytics, push notification authoring, and mobile application version management
- **Worklight Application Center:** A private, cross-platform mobile application store that is tailored for the specific needs of an application development team

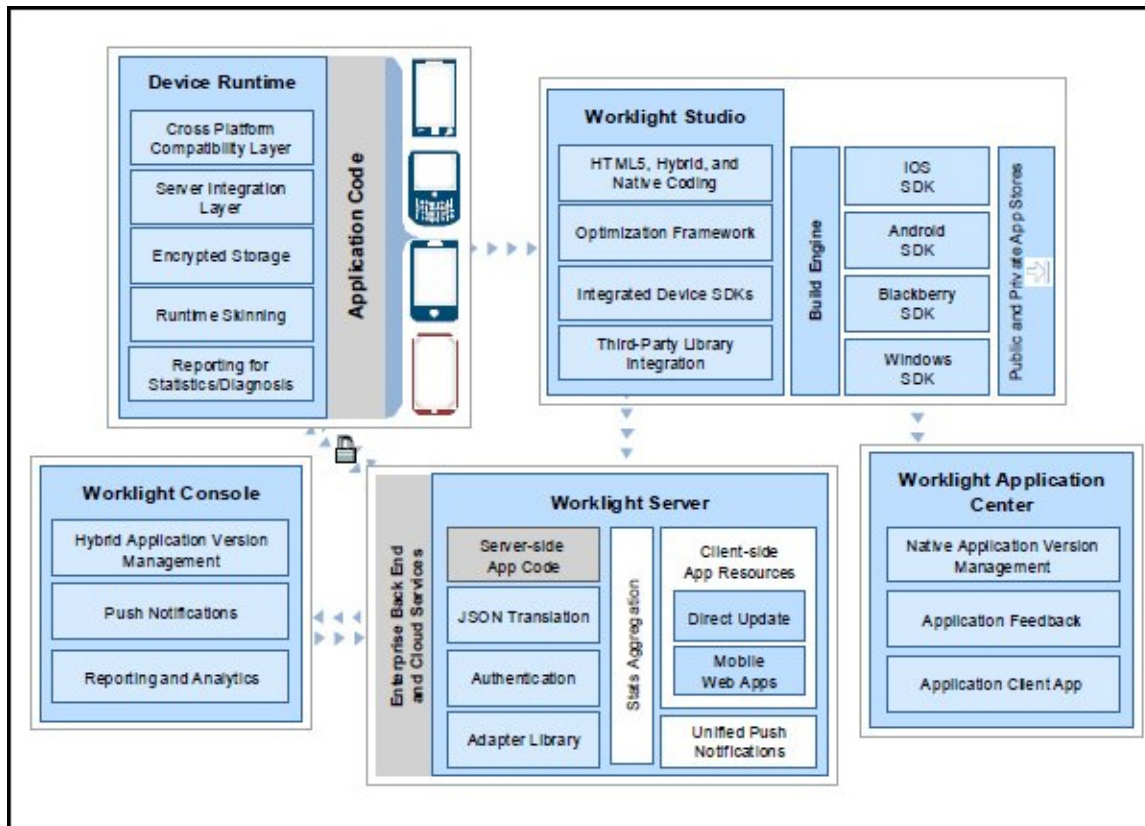


Figure 4. Worklight architecture overview

## Usage scenarios

There are several possible usage scenarios in the mobile application field. The following paragraphs describe the process that Fictional Airline Company A, a fictional enterprise, follows as it expands into the mobile space.

Airline Company A decided to launch a single, business-to-employee application for luggage tracking. This application would enable customer service representatives (CSRs) to view the current location of a passenger's luggage at any time. The usage scenario is as follows: A passenger travels from one city to another with one stop in between. Because of unforeseen problems at Stop 1, the bag is not transferred to the new airplane. Thus, the passenger contacts a CSR. The CSR is able to search for the location of the luggage by scanning the bar code on the passenger's luggage receipt or, if scanning fails, uses the device's keypad to enter the luggage identifier number manually (Figure 5).

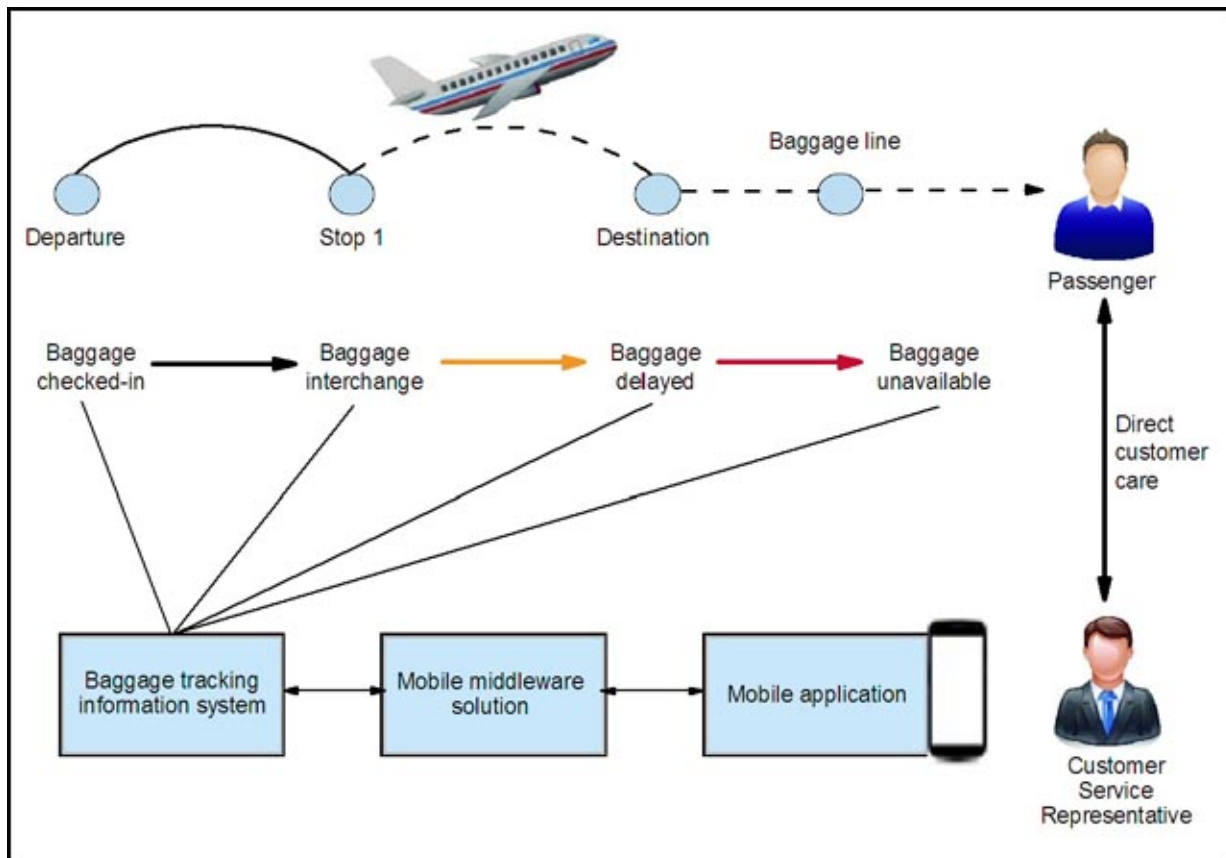


Figure 5. Usage scenario: Airline industry

To select the appropriate mobile platform, Airline Company A must define its mobile strategy.

### Mobile device selection

To reduce the initial investment, Airline Company A uses the bring your own device (BYOD) policy and has its CSRs run the new mobile application on their personally owned mobile devices. Most employees own Apple iOS or Google Android based mobile devices, so the initial application will support only these two platforms. In addition, the luggage tracking application will depend on using the native camera and geo-data applications present on most mobile devices.

## Mobile applications

The initial luggage tracking application is developed using a hybrid development approach. The following factors contribute to this decision:

- With a hybrid approach, the airline company can create the mobile application using existing skills in web application development, reducing development time and costs.
- This approach will allow the luggage tracking application to run on the required platforms; platform-specific capabilities, such as the camera or location services, can still be accessed without the cost of maintaining two separate native applications.
- The web portions of the mobile application can be updated using the Direct Update feature of Worklight, without requiring users to reinstall a new mobile application..

## Mobile integration

Airline Company A investigated its existing IT infrastructure and determined that some of the data that will be required by the mobile luggage tracking application, such as luggage identification and passenger information, is already available in existing systems. So a new integration layer will be created to access this existing data and impose strict guidelines on its use.

## Mobile operations

The airline company's IT department decided that mobile applications will access back-end services through the integration layer, using the existing security infrastructure. Authentication will be verified against the company's directory service using an IBM WebSphere® DataPower® XG45 appliance. The mobile application platform will assist Airline Company A's mobile team in regulating the release and update cycle of mobile applications. Support for users of the mobile application will be provided using a built-in feedback mechanism. Users will use the feedback mechanism to submit written questions that will be routed to the existing IT support team.

## Mobile application platform

When their mobile strategy is defined, Airline Company A is ready to select a mobile application platform. Airline Company A selected IBM Worklight as its base for the Mixed Mobile Application Platform (MMAP), primarily because Worklight features and capabilities support development, integration, and operations.

From a development perspective, Worklight offers these benefits:

- Fast and easy development of hybrid applications through IBM Worklight Studio.
- Applications run on multiple platforms using the IBM Worklight Device Runtime component.
- Enrichment of mobile applications with native components such as platform specific UI widgets .
- Graphical, rich text editor in IBM Worklight Studio to easily develop mobile application's user interface and possibility to integrate third-party libraries, such as jQuery Mobile and Dojo Mobile.
- Easy creation of the integration layer with the adapter editor in IBM Worklight Studio.
- Early and comfortable testing by integrated test server and mobile device simulator in Worklight.

From the integration perspective, Worklight offers these benefits:

- Easy integration of business services and connections to existing enterprise services with Worklight adapters
- Flexibility to integrate with a company's existing security infrastructure by security features, such as Lightweight Third Party Authentication (LTPA) and custom security mechanisms
- Support of lightweight data interchange formats, such as JSON to reduce the size of the data
- Unified cross-platform notification feature to send notifications to all devices that have the mobile application installed

From an operational perspective, Worklight offers these benefits:

- Internal application store to distribute mobile applications to the employees
- Central management of mobile apps by rolling out updates and remotely disabling outdated versions
- Integrated Application Center for collecting feedback from users
- Reporting and analytics capabilities to determine usage of individual functions within an application
- Integration with data caching products to allow temporary storage of data in the MMAP

## Integration

The IBM MobileFirst architecture is open and extensible by design, enabling organizations to choose the solution that integrates with their existing environment and solves their most pressing business needs. In addition to meeting mobile-specific requirements, the portfolio enables more rapid integration between social and cloud services and back-end technologies that help secure and manage strategic business processes by IBM WebSphere Cast Iron® Hypervisor and IBM WebSphere DataPower.

### IBM WebSphere Cast Iron Hypervisor Edition

WebSphere Cast Iron Hypervisor Edition is a virtual appliance for service integration. It provides connectivity to a variety of cloud-based and on-premises applications, databases, web services, messaging systems, and other endpoints. WebSphere Cast Iron Hypervisor Edition uses a configuration approach in which integration projects are configured instead of programmed. With a configuration approach, mobile applications can be connected to back-end systems without requiring a developer with programming knowledge to do it. Instead, you build the necessary integration flows using a graphical development environment in WebSphere Cast Iron Studio. Transforming data from its original format to another format can be done using a basic drag-and-drop method in the WebSphere Cast Iron Studio graphical mapping editor (Figure 6).

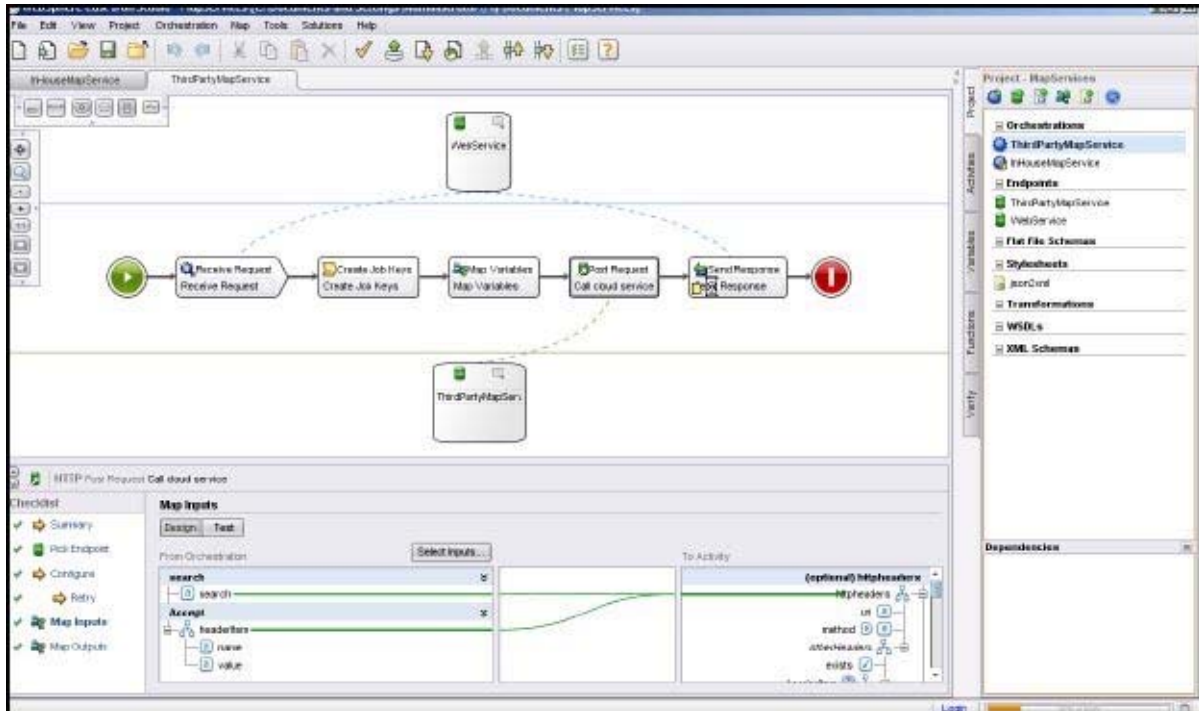


Figure 6. WebSphere Cast Iron Studio graphical mapping editor

## IBM WebSphere DataPower

IBM WebSphere DataPower appliances are designed to support the implementation of enterprise solutions by introducing security layers, providing application integration capabilities, and enhancing overall integration performance. The main advantage of WebSphere DataPower appliances is the easy integration into a network infrastructure, in which they provide a software-independent configuration and simplified functionality.

When used as the security layer provider, IBM WebSphere DataPower Appliances can run many critical security tasks by offloading them from the application server.

Key security-related capabilities of IBM WebSphere DataPower Appliances are as follows:

- Unloading HTTPS session handling from the web server
- Acting as web application and XML firewall
- Providing authorization, authentication, and auditing (known as AAA) in a single mechanism
- Implementing an enterprise single sign-on (SSO) function through the use of LTPA tokens

In terms of application integration and performance enhancement, IBM WebSphere DataPower Appliances provide the following functions:

- Unloading XML, XSLT, and XPATH processing from the application server to the DataPower appliance and performing data transformations with better response times
- Acting as an enterprise service bus (ESB) to provide integration between different architecture layers
- Accelerating data conversion and application integration
- Providing support for transmission of specialized business-to-business message traffic between partners



## Supported platforms

IBM Worklight supports multiple database management systems and application servers. For detailed system requirements, a list of supported operating systems, prerequisites, and optional supported software, with component-level details and operating system restrictions, and other information about Worklight Server Enterprise Edition and its installation, go to this address:  
<http://www.ibm.com/support/docview.wss?uid=swg27024838>.

## Ordering information

IBM Mobile Foundation V6.0 (product group: Application, Integration, Middleware) is available only through IBM Passport Advantage®. It can be sold only directly by IBM or by authorized IBM Business Partners for Software Value Plus.

- See the IBM Software Value Plus web page:  
[http://www.ibm.com/partnerworld/page/svp\\_authorized\\_portfolio](http://www.ibm.com/partnerworld/page/svp_authorized_portfolio)
- Locate an IBM Business Partner for Software Value Plus in your area and specific portfolio:  
<http://www.ibm.com/partnerworld/wps/bplocator/>

Ordering information is listed in Table 1.

Table 1. Ordering information

| Program name                             | PID number | Charge metric                            |
|--|------------|--|
| IBM Mobile Foundation Enterprise Edition | 5725-I41   | Client Device Install                    |
| IBM Mobile Foundation Consumer Edition   | 5725-I42   | Application                              |
| IBM Worklight                            | 5725-I43   | Client Device Install Application        |
| IBM Mobile Application Platform Pattern  | 5725-G24   | Client Device Application Virtual Server |

## Related information

For more information, see the following documents:

- IBM Worklight product page:  
<http://www.ibm.com/software/products/us/en/worklight/>
- IBM Worklight V6.0 technology overview:  
<http://ibm.co/16vbGzm>
- IBM Worklight V6.0 information center:  
<http://pic.dhe.ibm.com/infocenter/wrklght/v6r0m0/index.jsp>
- IBM Worklight V6.0 data sheet:  
<http://public.dhe.ibm.com/common/ssi/ecm/en/wsd14109usen/WSD14109USEN.PDF>
- IBM Offering Information page (to search on announcement letters, sales manuals, or both):  
[http://www.ibm.com/common/ssi/index.wss?request\\_locale=en](http://www.ibm.com/common/ssi/index.wss?request_locale=en)

On this page, enter `IBM Worklight`, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.



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