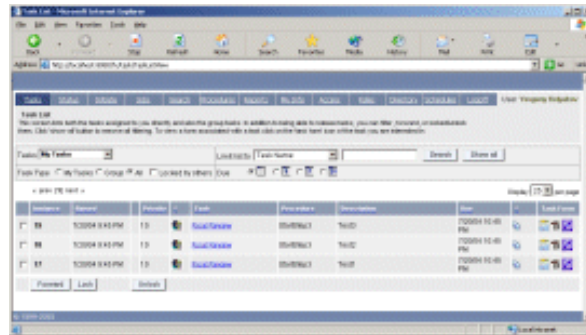


FlowRunner Server - Automating business processes with ease

In today's competitive markets the cost of running a business is important more than ever. Efficient business operations is a competitive advantage sought by everyone.

Business Benefits

- Reduce Costs
- Shorten Cycle Times
- Improve Visibility
- Improve Consistency
- Reduce Errors
- Improve satisfaction

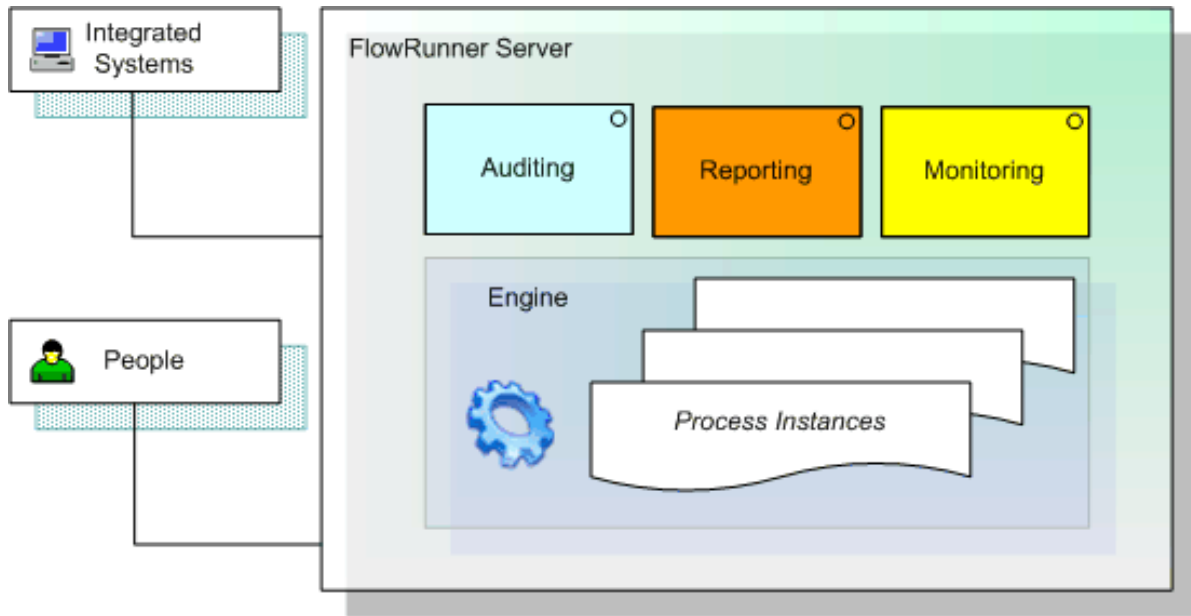


FlowRunner Server is a web based front end to FlowRunner Engine - a generic Java (J2EE) component that enables organizations to improve efficiency and reduce complexity by automating their business processes.

Efficiency starts with structure. A structured business process is a set of activities that performed on a document. A document may be an invoice, an order, an application, an approval request, an inquiry, an RFQ, or any business entity that has a predefined set of related data fields.

A business process, or a procedure, is defined graphically in a flowchart-like manner. It determines the individual steps or units of work in the process to be executed, by whom, and when. The participants of these activities are either human performers or prebuilt automated steps. FlowRunner Designer is an integrated environment for creating such business processes.

FlowRunner is a suite of products for defining the sequencing of steps across human activities, J2EE applications, legacy systems, and web services. This is also known as business process automation or workflow.



FlowRunner Server - Features

FlowRunner offers a unique set of features to streamline and web-enable business processes. All features are included in basic configuration, the software is usable stand-alone or as an integrated application.

A model of a business process is created using a workflow designer application.

Steps are dropped onto a palette and connected using transition arrows

Business rules are used to make decisions, to steer the execution of a process.

Pre-configured building blocks or *custom workflow steps* are used to interface with external systems.

Tasks are assigned to participants based on variety of criteria. Assignment can be static, such as user name or role, or dynamic - based on some expression involving one or more data field. Tasks can also be routed to users who share some common set of attributes, say location. Routing can start at any permissioned directory branch.

Exceptions, such as timeouts, are configured using exception transition arrows

Data definition is defined as set of data sources and typed fields. XSD is generated based on this data model.

User HTML forms are designed from within the builtin designer, using a powerful WYSIWYG editor. Data fields are simply dropped onto a form as standard HTML elements like input boxes, labels, dropdowns, etc.

Various validation rules can be assigned to form elements. FlowRunner supports both client and server side validation options. A example of a simple client-side validation rule is a required date input field

Arbitrary HTML fragments can be configured and dropped onto forms. Logos, disclaimers, navigation bars are examples of such elements. A built-in WYSIWYG HTML editor also supports direct HTML editing. All changes are reflected back into the WYSIWYG design view.

FlowRunner supports multiple form types: **HTML**, **PDF** and Microsoft **InfoPath**.

After a workflow model has been designed it can be tested from within the process designer. A powerful debugging and simulation feature allows testing of workflows as they would appear in a real production environment. This includes release of user forms and execution of agents. Any of these can be modified during the simulation, without the need to restart the running instance.

The design and simulation phases can work in a disconnected mode. Procedures reside on client computer only, there is no need to be connected to the server.

Out-of-the-box, FlowRunner server provides

(not an exhaustive feature list)

- Task releasing, using any of the supported form types
- Advanced task list sorting and filtering options
- Access to other people's tasks (for administrators)
- Access to system events (for administrators)
- Access to undelivered tasks (for administrators)
- Task locking/unlocking
- Task forwarding and auto-forwarding
- Auto-forwarding setup (out of office feature)

-
- Process initiation, using any of the supported form types or no form at all
 - Advanced process instance sorting and filtering
 - Advanced instance audit trail information, including the graphical audit trail using SVG technology
 - Detailed data audit trail
 - Advanced screen for data index searching
 - PDF report generation
-

- Process management and audit trail functionality
- Configurable user preferences (color scheme, formatting, page settings)
- Advanced web-based task alerting mechanism
- Customizable email notifications
- Granular access management functionality (for administrators)
- Roles and user directory management (for administrators)
- Advanced process scheduling using a builtin enterprise-level scheduler

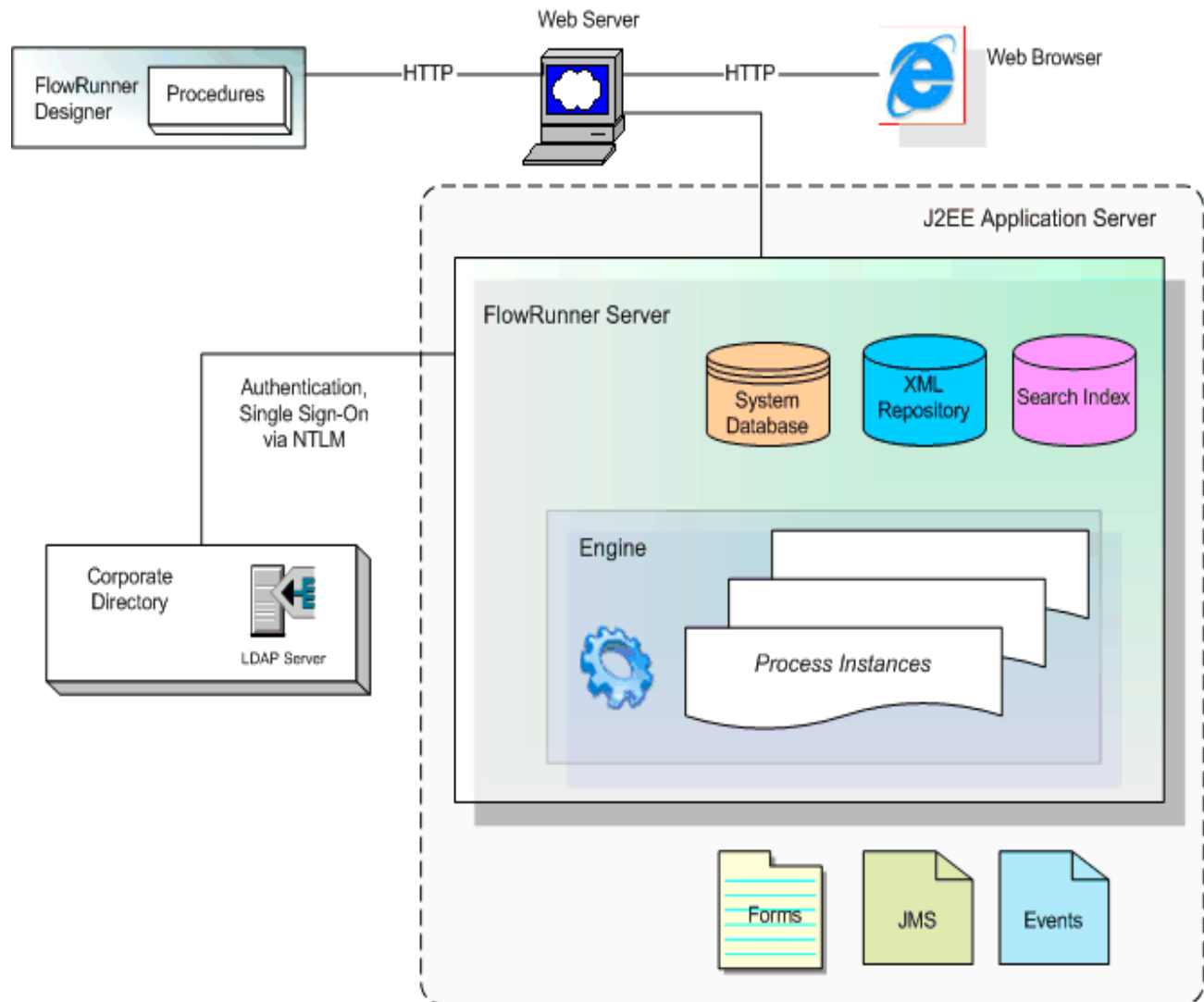
-
- Static or dynamic deadlines
 - Static or dynamic priority escalation
 - Configurable pre and post processor handler classes
 - Exception handling for automated (non-user) steps

-
- Multiple file attachments per procedure instance are supported

FlowRunner Server - Architecture

The software has been uniquely architected for maximum performance while maintaining minimal infrastructure costs.

FlowRunner Server is 100% Java application built from the ground up. It is architected as a true enterprise platform. The software is built on the latest J2EE technologies to ensure maximum flexibility and application server independence.



FlowRunner Server is a true web application. The client browser does not require any plugins or ActiveX controls (except for optional PDF and SVG viewers). Besides being a front end for FlowRunner Engine it provides many great features.

1. FlowRunner Engine is a collection of EJBs that reside inside the application server
2. The engine interfaces with database via JDBC
3. The pluggable data layer is implemented as an XML repository
4. JMS is used internally for all asynchronous operations

5. The engine orchestrates all data and activity auditing
6. The engine interfaces with the indexing component, via JMS events
7. The interface to user directory is completely factored out. LDAP is one of the available implementations
8. An authentication mechanism is completely factored out. NTLM is one of the available implementations
9. The Engine is responsible for task management via other EJBs
10. The FlowRunner Server supports a pluggable form processing functionality (HTML, PDF, Microsoft InfoPath)
11. All administrative functions, as well as role management are also handled by the FlowRunner Server
12. An optional IIS or Apache web server can be configured for serving static resources. Clients can connect to the application server directly

FlowRunner Server is an open framework that can be customized or extended to be integrated with other applications. The software is written in high quality Java code utilizing JDK 1.4 which can be licensed along with the software.

J2EE technologies used by the FlowRunner

JNDI	directory	
JDBC	database	
JTS/JTA	transactions	
JAAS	security	
JMS	messaging	
JMX	monitoring	
SOAP	web services	
COM Automation	integration	

FlowRunner - Engine

The workflow engine is 100% Java true J2EE message driven component designed for business process automation. It is application server neutral, capable of processing a large number of transactions per second. Its unique design, together with the application server that hosts it can offer a high level of salability and fault tolerance.

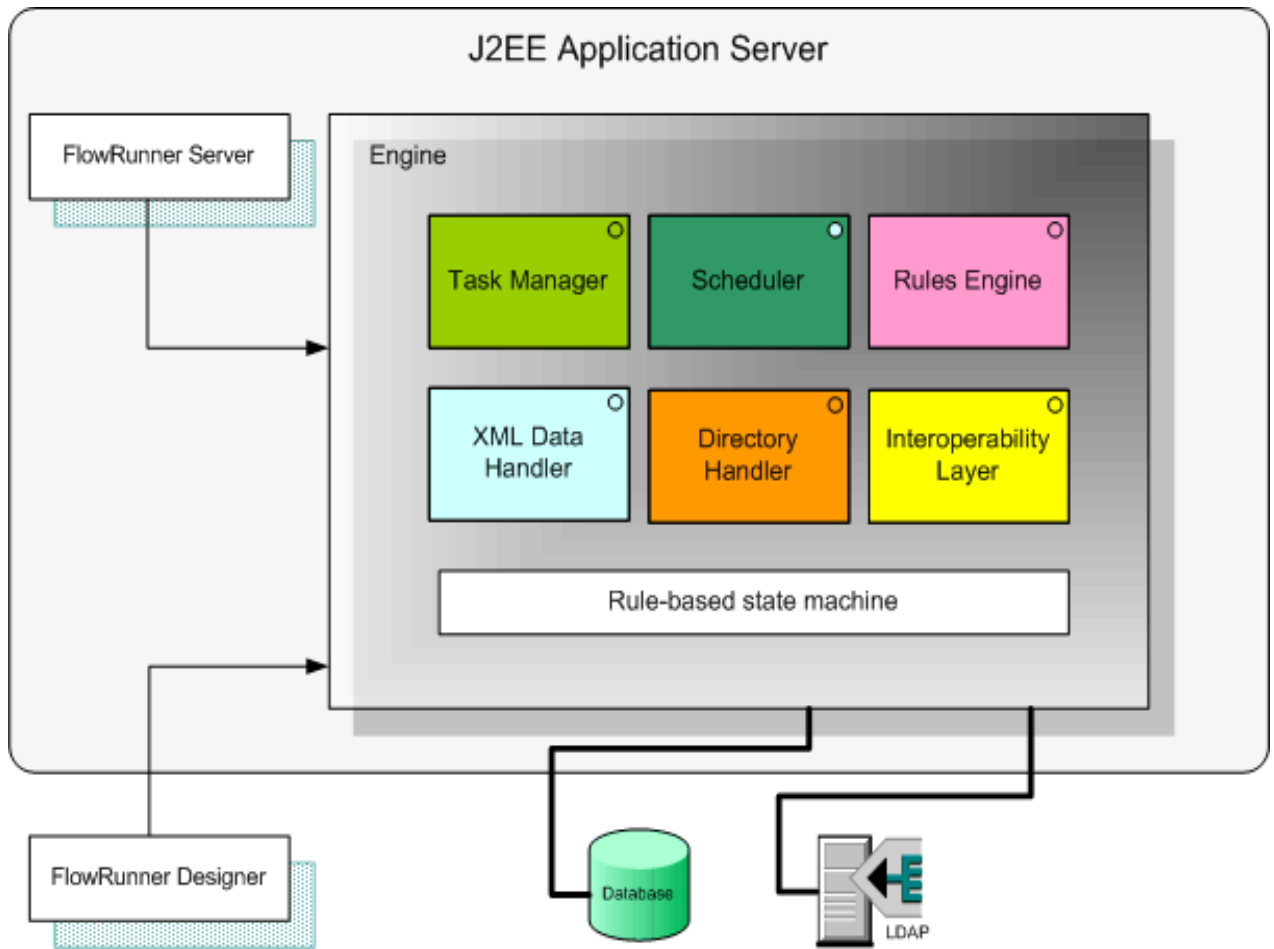
Some of the engine's features, among other things:

- Activity orchestration
- Task assignments
- Conditional branching based on business rules
- Managing instance data
- Audit trail recording

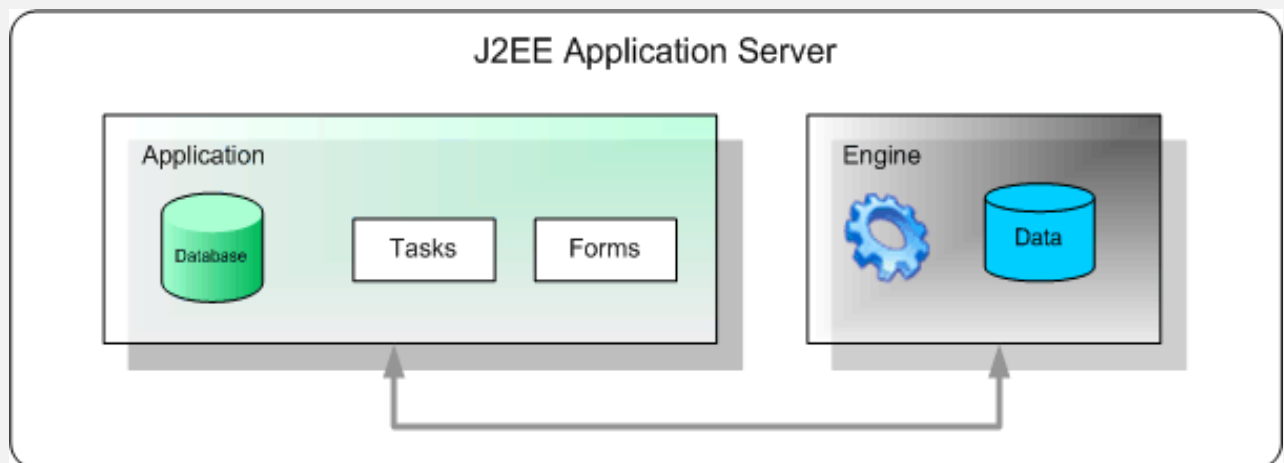
- Real-time monitoring
- Asynchronous event mechanism
- Directory server interface
- Process scheduling
- Execution of builtin and custom steps
- Builtin interoperability services with Microsoft COM

Various complex task addressing options are supported

- Static routing to a user
- Dynamic routing to all users sharing a set of common directory attributes
- Dynamic routing to all users sharing a set of common roles
- Exact and partial matches are supported
- Multiple search roots are supported





FlowRunner Engine can be embedded in other applications



FlowRunner - User Forms

The FlowRunner Server supports several different form types. Individual formats have their advantages and may be appropriate for various business use. A user step may have one or more different forms associated with it. Users may choose a task form formatted to their preference if multiple formats were set up.

For example, consider a corporate HR intranet. An intranet web site may contain three links for initiating "*Leave of absence*" process. One link is for people comfortable with HTML forms, others preferring PDF forms. The last link may invoke a Microsoft InfoPath form.

Form Format	Summary
 HTML	<ul style="list-style-type: none">• Builtin, easy to use WYSIWYG designer.• Direct HTML editing and preview modes are just a tab click away• Builtin and custom JavaScript validation support• Custom server-side validation is supported• No need for external viewer
 Adobe PDF	<ul style="list-style-type: none">• Industry standard format for complex forms• Different formatting and validating options are supported• External PDF editor is launched from within the designer• Custom server-side validation is supported



Microsoft InfoPath

- New XML based Microsoft Office format
- Supports rich content and complex formatting options
- Microsoft InfoPath editor is launched from within the designer
- XML data definition (XSD) is automatically imported to InfoPath editor
- Automated re-packaging of .xsn archives
- InfoPath application is launched by IE when clicked on a task

FlowRunner's flexible user e-form architecture allows other form technologies to be easily supported.

Please contact us if you need to discuss a form technology that is currently not supported.

FlowRunner Workflow - Directory Interface

The routing and addressing information needed to route work to the right people is often stored in a corporate directory. This directory of corporate users is usually stored in a custom database or in a system known as "Directory Services".

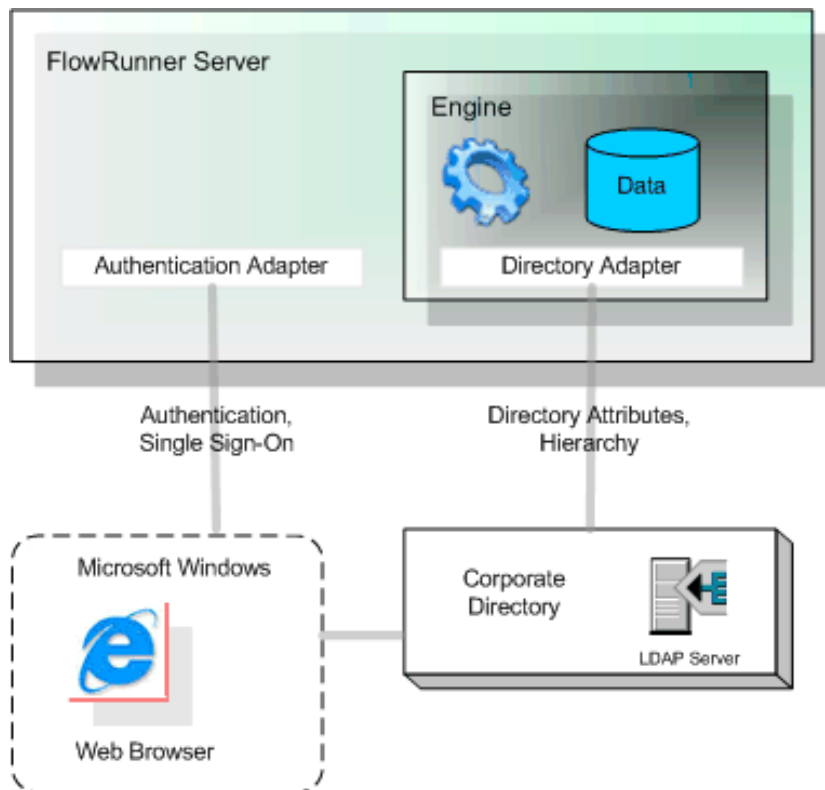
FlowRunner can support all systems for storing users, groups and attributes. This is because its directory interface has been carefully architected to be separate from the core system.

The directory interface is used for user task addressing. Users can be tasked based on their location in the organizational hierarchy, values of their attributes, their roles, or a combination of these. The same directory may also be used for authentication.

Enterprise Directory Services (LDAP)

The LDAP implementation of directory services is the most common in use today. Most organizations already have their organizational structure and user base residing in servers such as Microsoft Active Directory. FlowRunner can connect to any directory implementing LDAP protocol, such as Active Directory, Sun ONE Directory Server, and others.

The ability to work with LDAP-based directories is absolutely crucial for business applications involving hierarchies of people. FlowRunner actually links directly to your existing directory to query information in real-time; it is not simply a timer-based synchronization job. All directory changes become *immediately* available for task routing and security.



Internal directory

FlowRunner server also comes with a builtin user directory. It is database-based, capable of storing a multilevel organizational hierarchy of unlimited depth and breadth. It can be augmented to include custom attributes. A flexible web-based user interface is included to manage the directory.

XML based directory

A simple XML directory interface is provided with core installation. This reference implementation is capable of reading a complex XML structure containing corporate hierarchy of an arbitrary depth. The implementation uses XPath for searches and navigation. Adding a new user or a group with attributes is as simple as modifying a file.

Highlights

- Powerful task assignment search criteria. Multiple search criteria are supported, including partial matches.
»
- Both builtin and external directories can connect to more than one FlowRunner Server installation. For example, one directory can be configured to work with both a pilot and a production installations
- Custom attributes can easily be added to users, groups or companies to become immediately available for searches and task assignments
- New roles can be added for access control and task routing. Role-based task assignments are also supported
- Roles are can be assigned any user regardless of his location in the corporate hierarchy
- The directory is also used for authentication. A single sign on option is supported. For example, Microsoft Active Directory can be used for authentication (no password prompts if accessed from within the intranet). A pure Java NTLM filter is included to be used with AD.

- FlowRunner does not require a synchronization mechanism to download the directory data

External directories are accessed by the core system and the process builder through a simple API. This interface can be implemented to use any existing directory application such as HR database containing user information. Please contact us for more information.

FlowRunner - Security and Authentication

FlowRunner uses an industry standard set of security-related technologies to implement robust security and authentication.

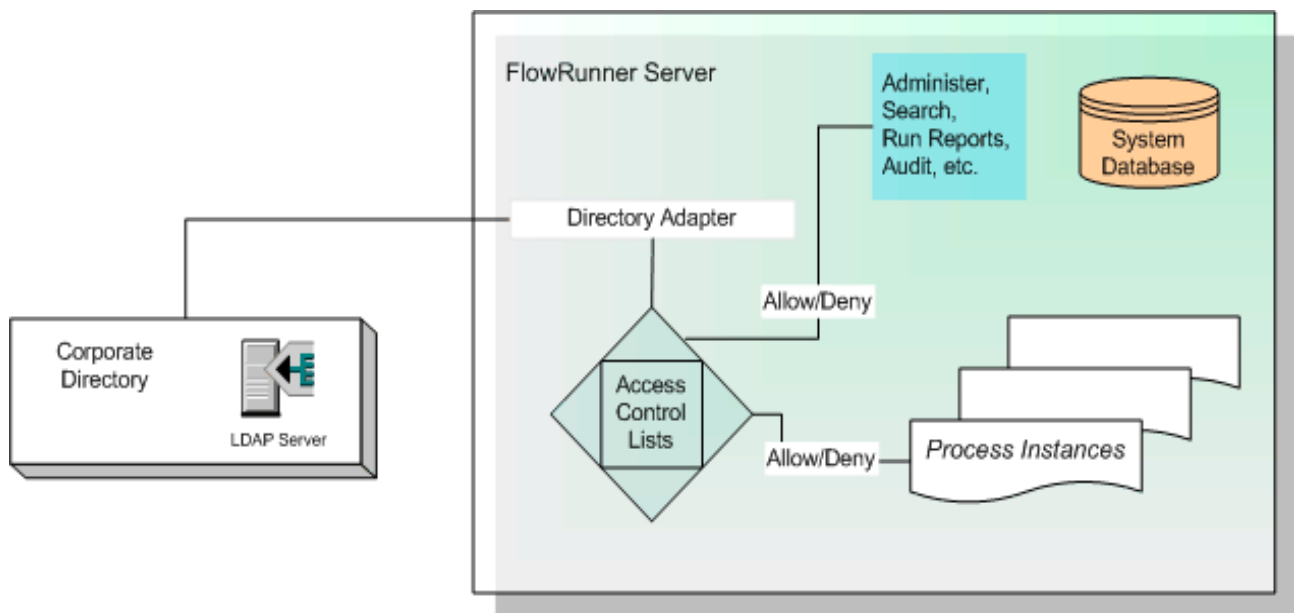
Authentication

Different authentication options can be configured with a standard installation

- Username / password combination
- Client certificate provided by the web browser
- Seamless logon for accounts configured on Microsoft Active Directory (NTLM)

Access control

FlowRunner access control model is among the most flexible in the industry. Access can be given or restricted to any functional area of the system based on user's identity or roles. The functionality is implemented using *access control lists* - a flexible paradigm similar to the security model of Windows® operating system.



Role-based security model

One of the ways to control access to individual functional areas or processes is by setting up custom roles. Roles are entities external to user directory. They are *virtual* sets of users responsible for a common task. For example, a role may be defined as "IT manager" to permit access to IT specific procedures. People that have this role do not have to be in any special location in the directory nor they have to share common attributes.

Summary

- Very granular access control
- Individual procedures can have their own access control lists
- Custom roles can be created
- Roles can be assigned to users regardless of their location in hierarchy

Security Audit

FlowRunner also supports security auditing. These are special logging facilities to identify users trying to gain unauthorized access. All relevant pieces of information are logged and made available to administrators so that appropriate measures can be taken.

Data security

- Secure Socket Layer (SSL) can be used for all data passing between web browser and web server
- No data is stored on the client
- Single sign-on can be configured for Intranet use
- Client certificates can be configured

FlowRunner - Auditing

Instance Auditing

Auditing and tracking is an integral part of any enterprise level software. It is imperative to always know the process state at any point in time, current user task assignments, and what are the workflow steps to follow. All of this, and more, is recorded and displayed in a friendly, comprehensive manner.

Text-based

- Current location of execution accompanied by graphical markers
- Parallel execution paths are shown clearly marked
- Graphical markers for exceptions
- Graphical markers for timeouts
- Failed custom steps will have a hyperlink to an error log entry which caused the failure
- Failed custom steps will have a hyperlink to script source which can be edited from the web interface
- Failed custom steps can be re-executed from the web interface (for administrators)

Graphical

A map of a process is displayed with currently executing steps

- Image-based audit trail that is based on designed process map definition
- Currently executing steps are highlighted
- Visited steps may be highlighted in alternate color
- Fully resizable, printer friendly SVG based graphic format
- Web browser plugin is needed. A free Adobe SVG viewer can be downloaded [here](#)
- Can be set up as part of the monitoring process



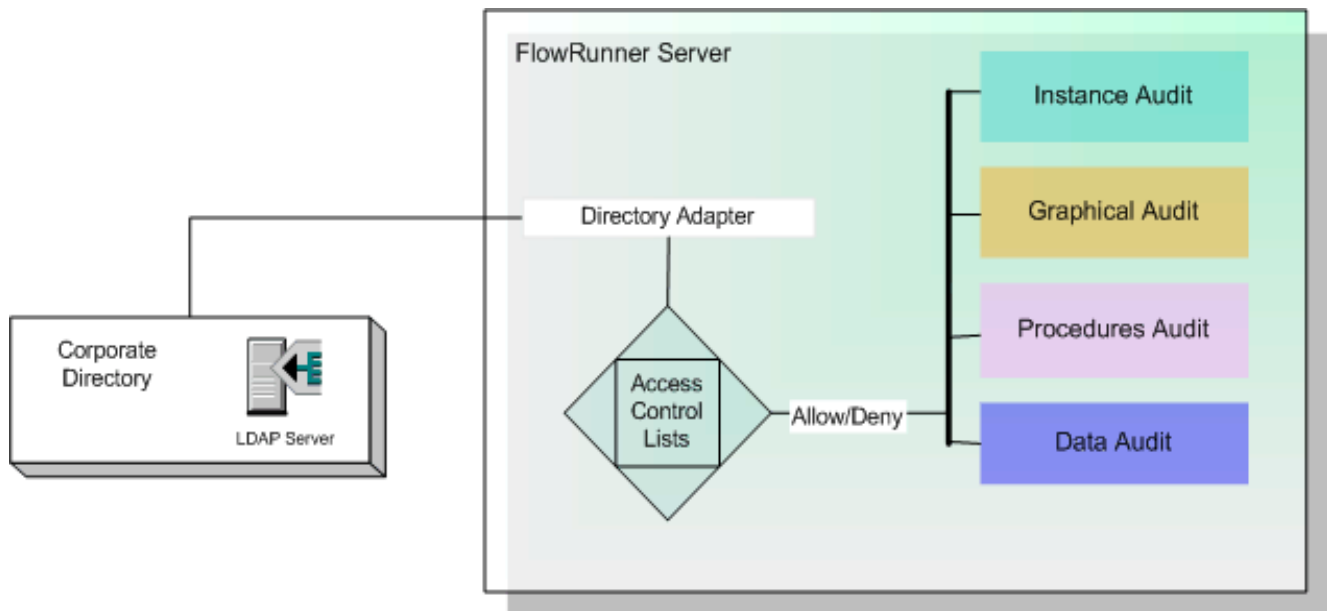
Detailed field-level audit trail

Data auditing may also be important in cases such as remittance processing or in any process where data change tracking is of importance. FlowRunner's data auditing capabilities track every data change and store them in the XML based data store. Any data field altered by any user or automated step is recorded and made available for immediate tracking and searching.

- All changes to individual fields are recorded for tracking and searching
- Detailed data audit screen displays both the previous value and the new value of all data fields that were altered
- Audit data is stored in XML for easier integration with other systems
- Only authorized users can view data audits

Procedure Auditing

- Procedure auditing functionality tracks all procedure modification on the server
- All prior versions of business processes are kept archived as ZIP files on the server
- All procedure related actions are logged. These are upload, download, publish, rename, delete, lock etc.

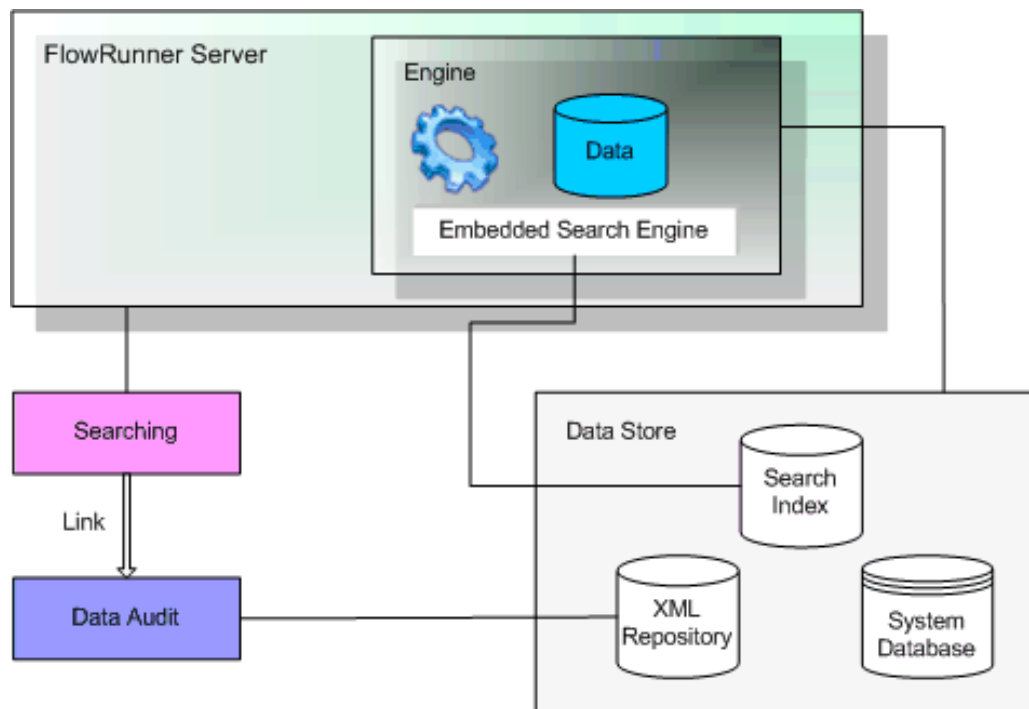


FlowRunner - Indexing and Searching

As workflow processes run they build a data store that can be of great value. FlowRunner data layer stores the field-level audit trail which is the most granular level possible.

Quite often the historical audit trail needs to be queried. FlowRunner provides a simple but powerful environment for querying instance data based on arbitrary data fields.

The software employs one of the leading *java open source* search engines in the industry. The searching technology is very advanced - it allows querying megabytes of data in seconds.



- FlowRunner operates by building a search index as procedures run and modify runtime data. All data changes are added to the index incrementally. This means if the value of a field was changed from "one" to "two" the search for either value will succeed returning the relevant audit trail entry that resulted in this change
- Incremental search index gets build automatically as instances progress
- Multiple versions of the same process are also indexed
- Indexed data becomes available for searching almost immediately
- Event-driven data indexing can be configured to take place after a step release or upon instance completion
- Size of the generated index is only a fraction of the actual data size
- Complex search criteria are supported
- Index can be rebuilt using included utilities

- Queries are extremely fast - take only seconds even on large data sets

FlowRunner - Reporting

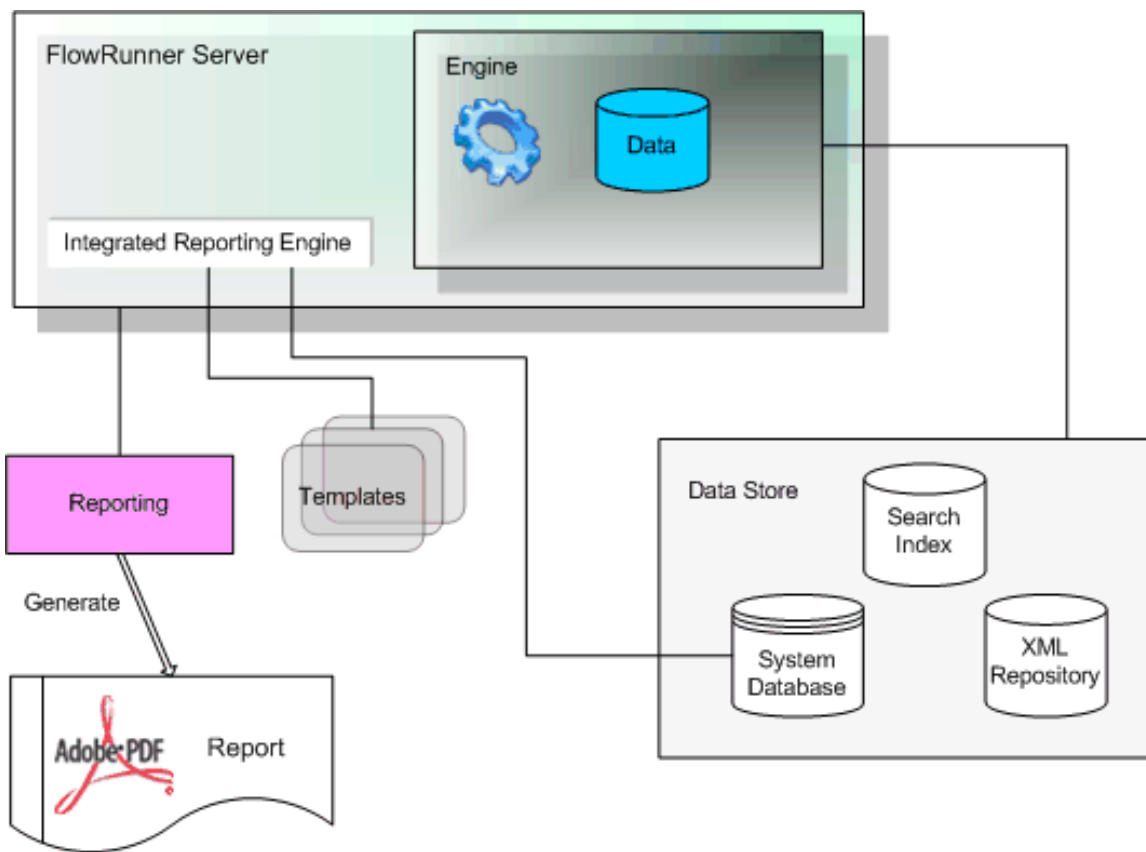
One of the incentives of having business processes automated is the ability to optimize them with ease. FlowRunner provides powerful reporting facilities that can bring your company workflows to a new level of productivity. FlowRunner's pluggable reporting architecture allows adding new reports with ease. Custom reports can include charts and information cross-referenced from external sources.

Report rendering is done Adobe PDF. Generated reports can be saved for future analysis.



Some of the included reports address the following issues

- Bottlenecks in processing
- Inefficiencies in services
- Overworked users
- Delays in external processing



Highlights

- Generated reports are in PDF format which can be saved and printed
- New reports can easily be added
- The underlying database can be exposed to be queried by customer's existing reporting infrastructure

FlowRunner - Business Process Monitoring

While reporting mechanisms help analyze the historical information about the business they do very little to assess the minute-by-minute state.

Business Process Monitoring (BPM) is the way to help managers and operators make timely decisions based on information about presently running business processes, not their historical snapshots. FlowRunner includes functionality to do just that.

FlowRunner provides a customizable *real-time* monitoring model that allows user-friendly dashboards to be connected to the system. Dashboard functionality provides managers with an easy-to-use, graphical interface that depicts a snapshot of a running system. It allows to make instant decisions to control the execution of business process to achieve the maximum efficiency.

For example, if there is a bottleneck in particular user activity, more resources can be shifted to this activity to distribute the work load.

Java Management Extensions (JMX)

is the technology behind the engine's monitoring capabilities.

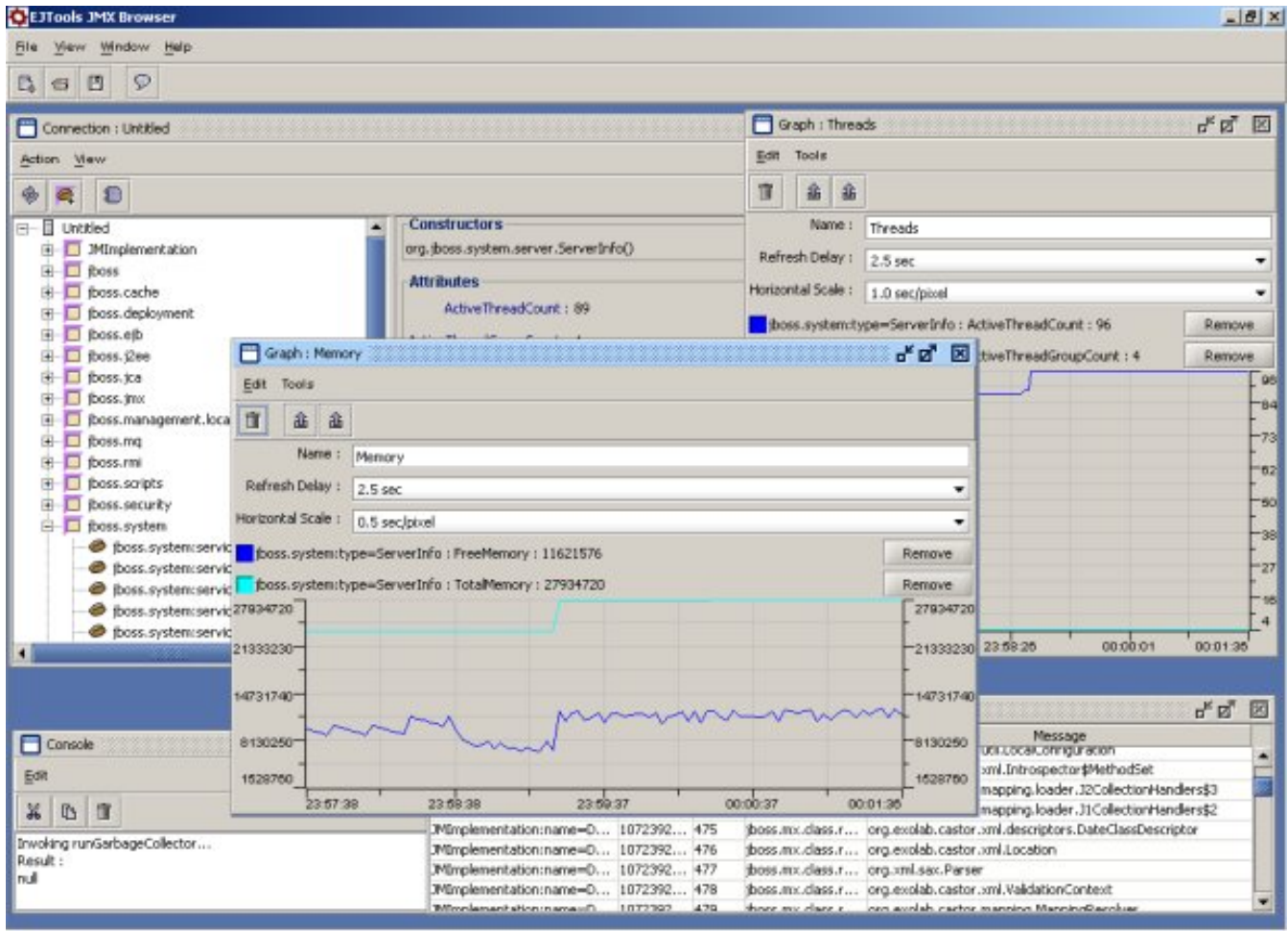
JMX-based monitoring setups will usually include external resources. These resources will be meaningful to the business, but not necessarily known to the FlowRunner. Together, the combined view may give a 100% visibility into the currently executing processes.

For example, a network latency may be monitored together with the responsiveness of certain activities. If there is a correlation the slowness of the activity may be the result of a slow network.

Keeping a consistent monitoring strategy helps achieve a coherent and uniform vision of the enterprise at work, helps being able to react to problems as they arise.

Any JMX-compliant monitoring software can be used to hook up to FlowRunner to monitor business processes. The JMX monitoring packages usually provide a certain level of customization to be tailored to company's business needs.

Here is a screenshot of EJTools' **JMX Browser** - a free open source JMX managing software. All EJTools's products are licensed under LGPL.

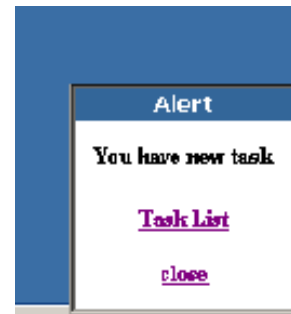


FlowRunner - Task Alerting

One of the features not found in other business management suites is the ability to alert a user about the arrival of new tasks. FlowRunner server does this with a regular web browser, without any ActiveX controls, plugins, or Java Applets.

As new tasks arrive a user might not refresh his task list to see if the state of his inbox has changed. With alerting functionality turned on he will get notified from a friendly popup box that will show up on his desktop. A hyperlink will bring him to the new tasks. This is a great time-saving technique that helps maximize work efficiency and ensures that all work items get attention in a timely matter.

- Alerting is a perfect feature for users who use the system infrequently
- Flexible architecture can be extended for other integrated features or external processes
- Does not require any downloaded client side components
- Works even if the browser is minimized
- User interface can be customized



Email notifications

Users can receive email notification when they receive a new task. The message text is completely configurable and can include instance data.

Addressee List
Mail Notifications

No not send email
 Send email when an addressee receives a task. Use this message template

Subject:

Hello, %Task_Addressee%,
 You have a task waiting at %System_URL%/task/TaskListView|

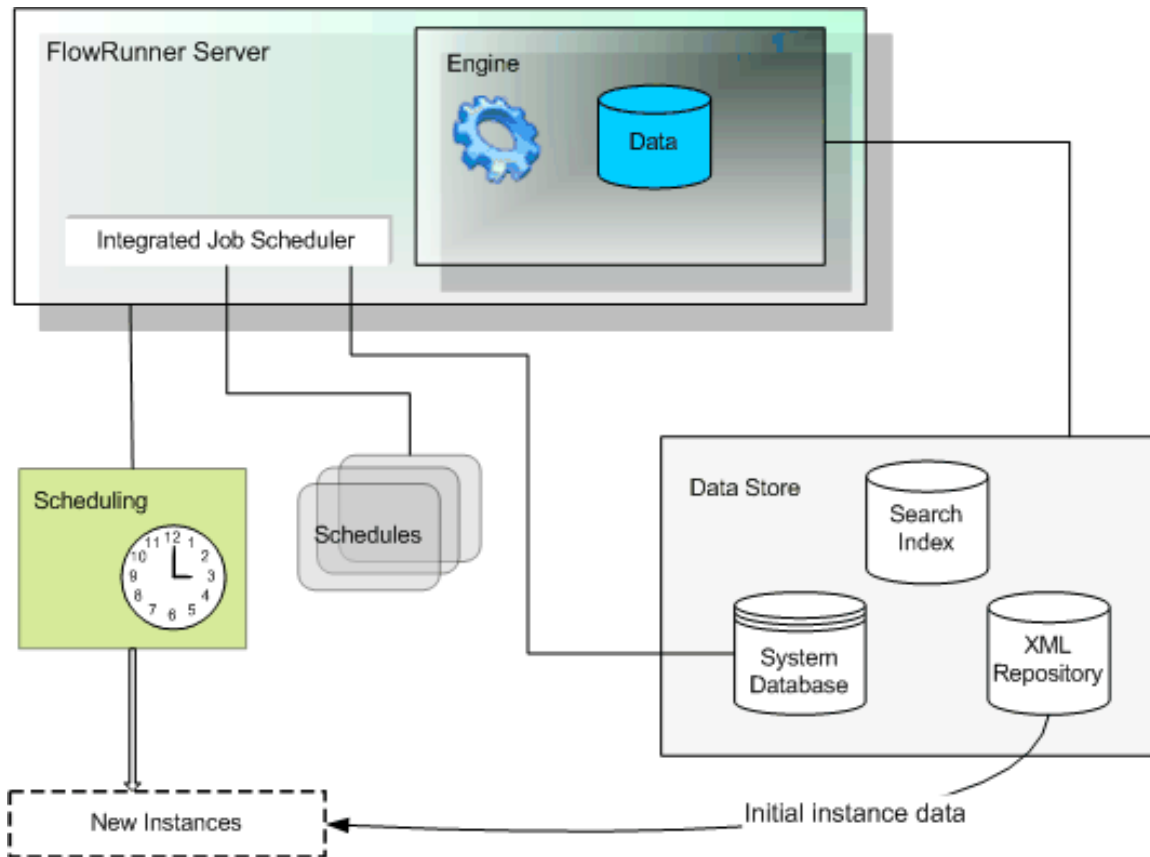
Highlights

- Configurable notification text may include any instance data
- The configuration is per user step. Different steps may have different text
- Default email handler uses SMTP

- Other notification mechanisms can be easily added to the notification chain

FlowRunner - Process Scheduling

There is often a need for process instantiation to be scheduled. FlowRunner comes integrated with an enterprise-level job scheduler. It allows users to configure job schedules and associate processes with them. The data to start a procedure instance can be configured with a custom form.



Highlights

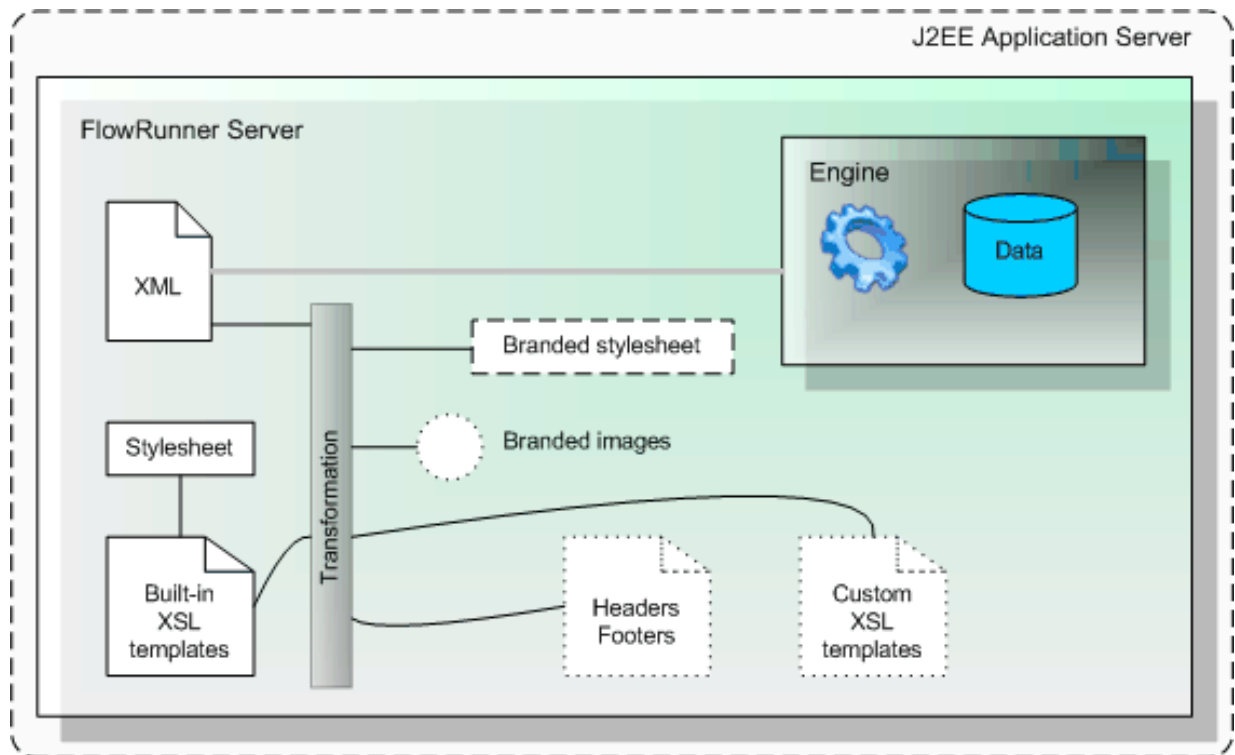
- Persistent, fault tolerant scheduling
- A single scheduled job may include multiple configured processes, each with its own initial start data
- Flexible recurring options: daily, weekly, monthly
- Start, End dates are supported, including an open end date
- Initial instance data can be configured with a designed form. All form types are supported
- Instance name and description can be specified
- Audit trail is updated to include a link to schedule that started the instance

FlowRunner - Branding

Branding is a customization process in which the software takes on the look and feel of the company's existing appearance and usability guidelines.

FlowRunner server allows various functional areas to be branded on any level. The software can alter its look and feel to in sync in any web application. The branded software, together with combined navigational structure and single sign on can become a part of the corporate intranet as a fully integrated solution.

Web page rendering is done using XSLT technology. The user interface layer generates XML documents which get transformed into HTML by applying XSLT pages. All colors and sizes are customizable using cascading style sheets (CSS).



Highlights

- Open, industry-standard XML and XSLT technologies
- Granular branding options
- Headers and footers are branded separately
- Images can be branded separately
- Cascading style sheets are used for colors and styles
- Users may choose their own style preferences if alternate style sheets were configured

FlowRunner provides a flexible environment for any integration or customization initiative. Almost any visual aspect of the software can be customized.

FlowRunner - Integration

The ability to integrate corporate data from disperse systems and technologies is a major challenge. A successful data integration solution is a subset of a business process integration problem domain. In addition to workflows that span human activities FlowRunner is capable of straight-thought processing (STP).

A FlowRunner hosted business process may be triggered by an external system. For example, a form may be scanned, recognized, and automatically exported into FlowRunner as a process instance.

Custom Steps

One of FlowRunner's most unique features is its extensibility model. The unique component-based workflow engine can be extended with simple, light-weight components that interface with other systems and technologies. These components can be designed, configured, and debugged separately to become available to a business process designer. Simply put, once designed and tested they will show as icons on the toolbar to be dragged onto a palette.



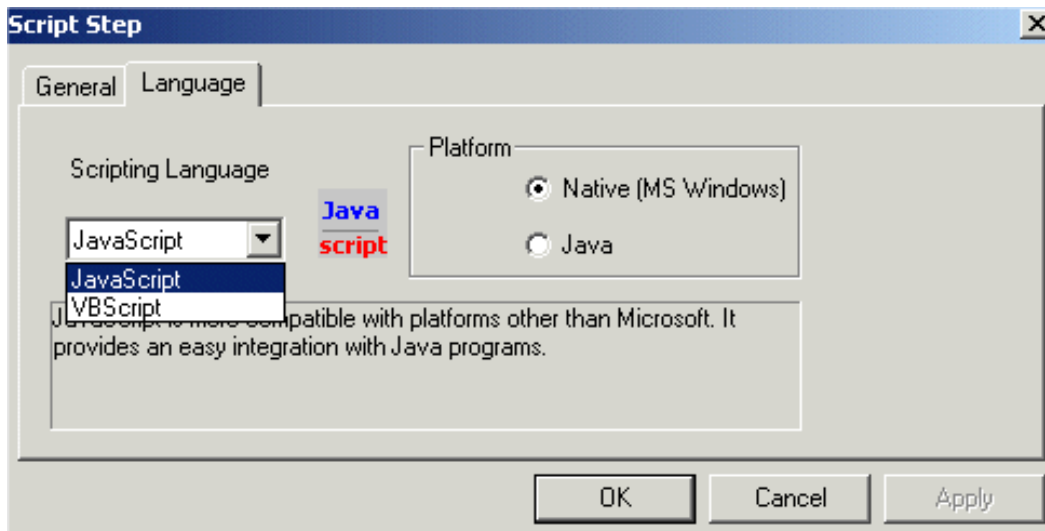
Custom steps functionality provides both design and run-time support. A custom step may have a configuration page, on which a process designer would set or map process data fields to custom step properties. An example of such custom step is a *mail step*. A mail step is a custom component that offers the functionality to send email to specified recipients. The step's configuration page lets a process designer specify step input parameters by mapping them to process data fields.

- Custom steps may have an optional configuration page (static HTML) at design time
- Custom steps can read or alter process data at run time
- Custom steps can influence the execution of a process by providing a return code that may be used conditional branching
- All process instance data modifications are auditable up to individual field values
- All process instance data modification are indexed to be later used for searching
- A custom step may be executed at design time by a simple keystroke or during a simulation session in FlowRunner Designer

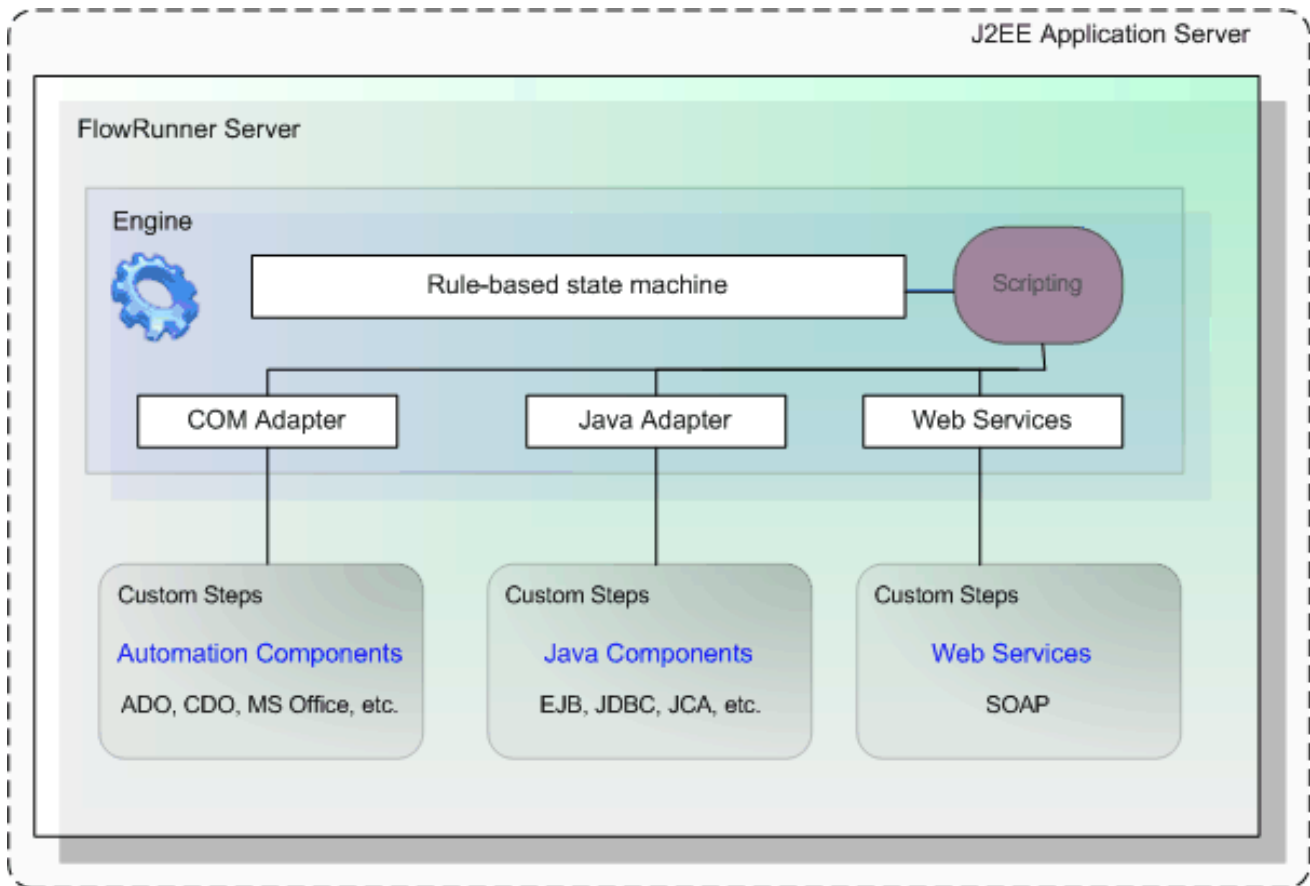
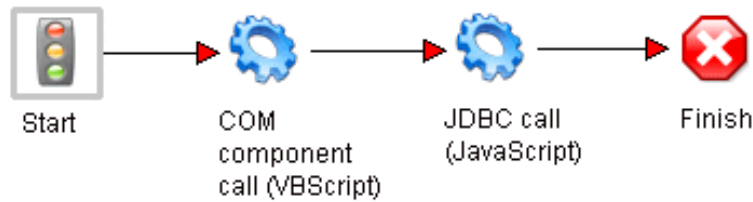
- Custom steps can have their own icons on the toolbar
- When dropped onto a palette custom steps may have their own image representation
- Custom steps can interact with a variety of technologies summarized below

Technology	Solution	Platform
COM	VBScript	Microsoft Windows Native
COM	JavaScript	Microsoft Windows Native
Java	JavaScript	Java Virtual Machine
Java	Java Component (JAR)	Java Virtual Machine
Web Services	VBScript, JavaScript, JAR	Any

Picking a technology is a simple configuration option. Microsoft Windows® adapter is part of the base installation.



This set of supported solutions provides an excellent platform/technology interoperability. A single FlowRunner installation can execute custom steps native to different technologies. For example, one step can be a VBScript calling a COM component, and the next step can be a Java component issuing database calls via JDBC. For organizations with multiple technologies in place FlowRunner provides a superb integration platform for maximum reuse of existing resources.



Pure XML Platform

FlowRunner has been architected as true J2EE, pure XML business process management platform. There are no proprietary binary formats, no legacy interoperability layers or any other overhead processing. Everything is XML. Period. If the target application supports XML the integration process should be a breeze.

- All data FlowRunner operates on is in XML format
- All process definition maps are in XML format

- All task addressee routing information is in XML format
- All form data is in XML format. Adobe PDF forms are generated based on internal XML format
- All brandable user interface items are in XML format
- All generated schema definitions are in XML format
- All web services calls are in XML format
- All configurations are in XML format

Process Designer Overview

FlowRunner Process Designer is the visual tool for building complete process automation solutions.

Its intuitive user interface enables you to create and deploy solutions by defining the sequence of steps, events and transitions as a comprehensive business processes or workflows. The steps can be either builtin or custom. They range from human activities such as filling a form to invoking a J2EE or a COM component.

The software lets you visually model and test business processes as they would run in production, including user interaction using builtin e-form processing, business rules, and execution of automated steps.

Target Audience

- Analysts, managers, business professionals for designing and testing business processes, routing logic, forms and validation
- IT staff for writing custom steps that interface with external systems

Design Process

Major steps involved in designing and rolling out a viable business process solution using FlowRunner Designer are outlined here

- *Define the underlying process data*

This may be the actual data processes operate on or it may be a set of keys to external systems that contain the actual data. FlowRunner supports both of these scenarios. See process data for more information

- *Define the process flow*

This is done by defining transitions between steps using the drag and drop editor. Steps are simply linked together using transition and exception arrows to form a coherent model

- *Design forms associated with users steps*

HTML, PDF, and Microsoft InfoPath forms are supported out of the box. See form editing for more information

- *Assign human performers to user steps*

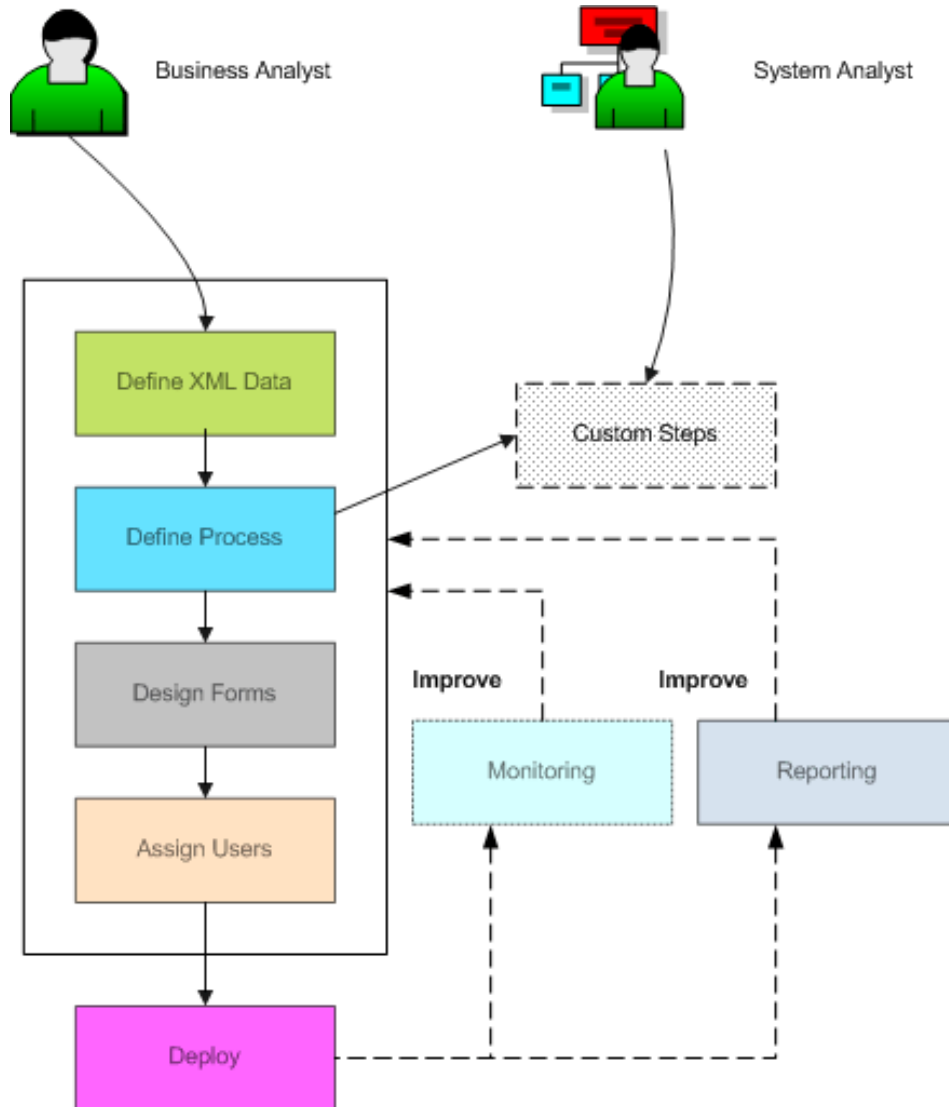
Users can be tasked based on their attributes, roles and location in the directory hierarchy. Complex task assignments are also supported. See directory support for more information

- *Test and verify the newly built process*

A newly built procedure is tested by simply clicking *Run* button. The process will run as if deployed to the actual users. HTML forms are invoked in-place and their data can influence the process flow. See simulation for more information

- *Deploy to FlowRunner Server*

This is done within the web browser with just a click. All uploaded procedures are versioned and archived. See deployment for more information



Most of the work involved in deploying a successful business process solution can be handled by a business person. Extensive technical knowledge is not necessary. A stand-alone prototype can be easily designed and deployed to users in an hour. No coding is required.

It is likely, however, that new or re-engineered business processes will interact with existing systems for reading, lookup or updating. In this case a system analyst can design a set of custom workflow steps that become available to other process designers. Customs steps will simply show up on the same toolbar as all built-in steps.

Process Data

Defining data for a new or re-engineered business process is an integral part of design process. The data is a set of typed attributes that a running process will operate on. These attributes, or fields, may change at run time by either human or automated steps.

FlowRunner natively supports the XML data. Process data is defined from within the process designer as a series of data sets with one or more fields.

<i>Supported fields types</i>	
FlowRunner	XSD
Numeric	xsd:integer
String	xsd:string
Double	xsd:double
Date	xsd:date
Time	xsd:time
DateTime	xsd:dateTime

Choice	xsd:string

The screenshot shows a software interface with two main panels. The top panel is a tree view showing a data model structure:

- DS1
 - ID: Numeric
 - Value: Choice
 - SSN: Choice
 - IDa: String
 - Field1: DateTime (highlighted)
- Mail
- System

Below the tree view are three tabs: Data, Form, and Toolbox. The 'Form' tab is active, showing a property editor for the selected 'Field1' field. The properties are as follows:

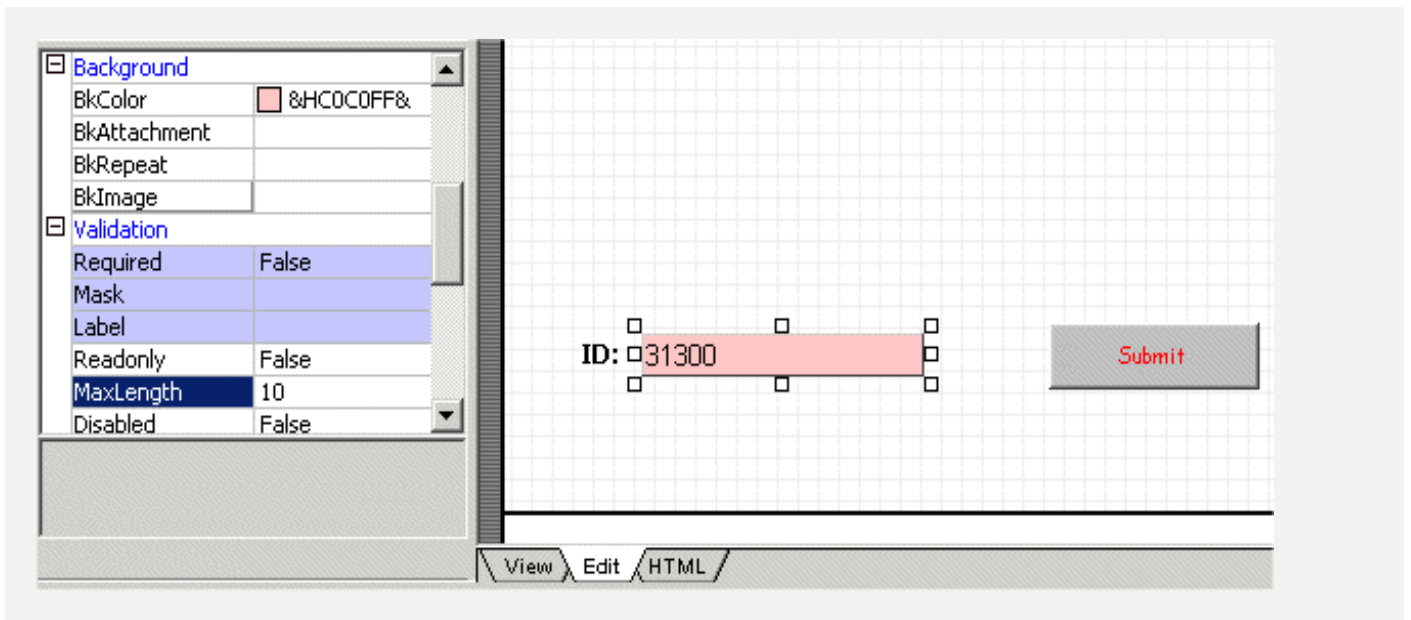
(Name)	Field1
Type	DateTime
Description	(Text)
Default	6/5/2004 3:37:41
HTML	Input
Border	
BorderStyle	ridge
BorderColor	■ &H0&
BorderWidth	1px
BorderTopWidth	1px
BorderBottomWidth	1px
BorderLeftWidth	1px
BorderRightWidth	1px
Background	
BkColor	□ &HFFFFFF&
BkAttachment	
BkRepeat	
BkImage	
Font	
FontFamily	sans-serif
FontSize	
FontStyle	
FontVariant	

Form Editing

FlowRunner Server supports several e-form technologies. For more information click [here](#).

FlowRunner Designer natively supports editing of HTML forms. The builtin HTML editor is a powerful WYSIWYG component that binds form elements to corresponding data fields as they get dropped onto HTML form background.

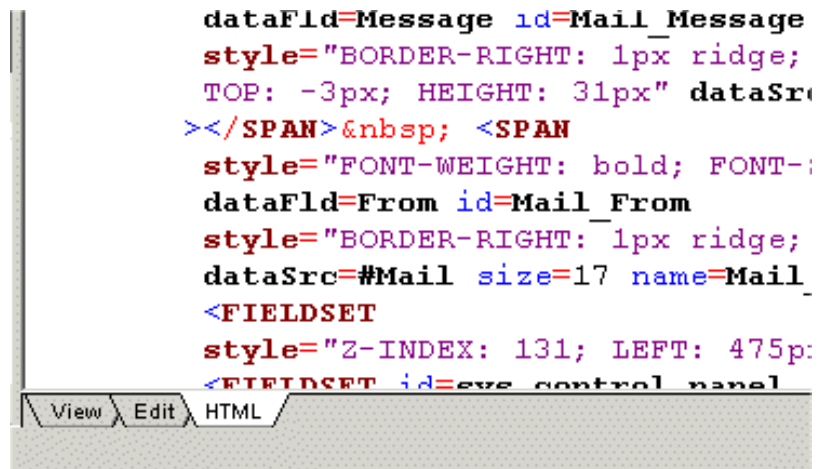
In addition to the usual HTML features such as editing of styles and colors, the environment also supports client side validation. HTML input elements can be configured to require user input using predefined or custom masks.



In some cases user's input must be validated against external data or proprietary business rules. FlowRunner also supports this use case via a custom form processor. [Click here](#) to jump to the architecture section that describes this functionality.

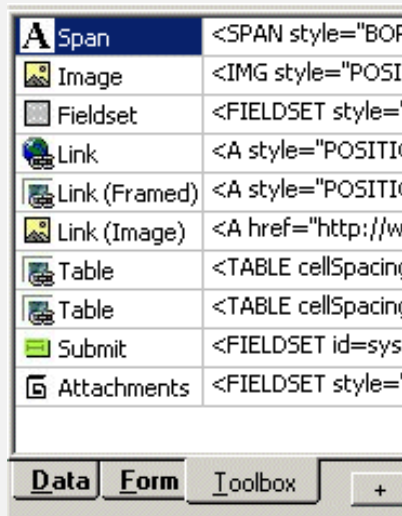
HTML Text editing

A visually designed form can also be modified as HTML text in a powerful color-coding editor. View, design, edit round tripping is fully supported.



Toolbox

A toolbox is a placeholder for commonly used HTML fragments that may be reused across procedures and forms. Some examples of toolbox items are logos, headers and footers, formatted text. This feature is configurable by a simple HTML file

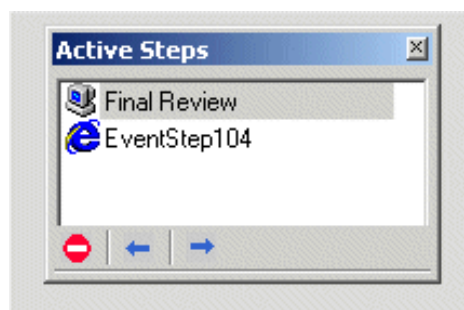


Process Simulation


FlowRunner Designer allows processes to be tested without having to deploy them to the server. The builtin debugger simulates process execution as it would run on the server, without having to deploy the procedure to the server or even being connected to one.

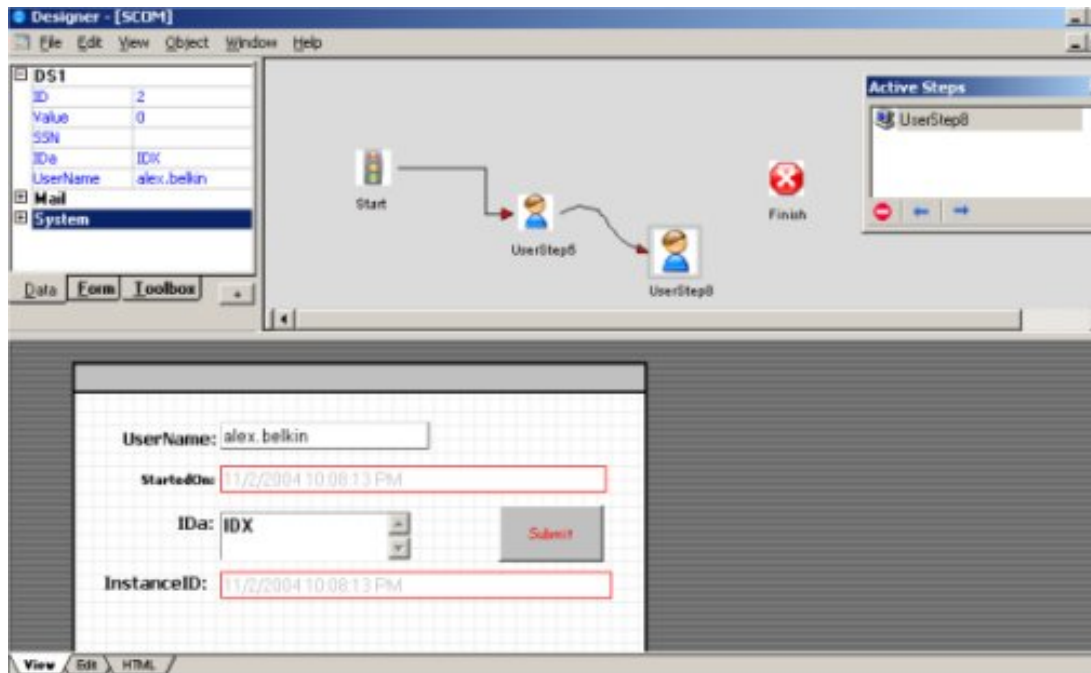
The process simulation feature is a final step of create / modify / test cycle that empowers a business user to design and test a complete business process in an integrated environment, without the need for external connectivity.

- Process execution is moved forward by selecting an active step
- Process execution stack can be undone (popped) by pressing *back button*
- Process execution can be



stopped at any time

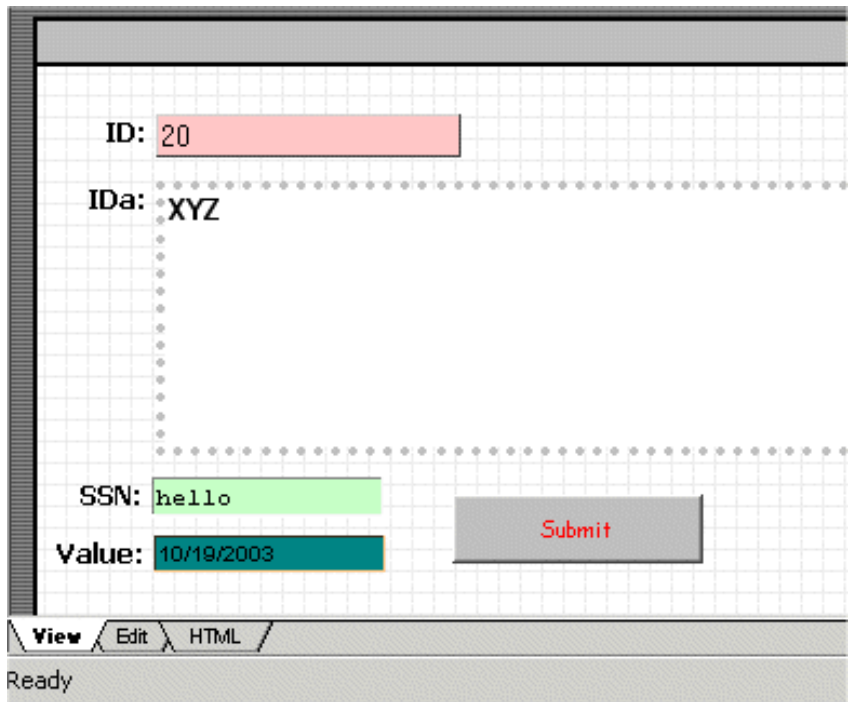
 When executing a process backwards (popping the execution stack) the data modified by the previous step is restored to its original state prior to step's execution. This work for both human and automated steps.



HTML user forms are available during simulation

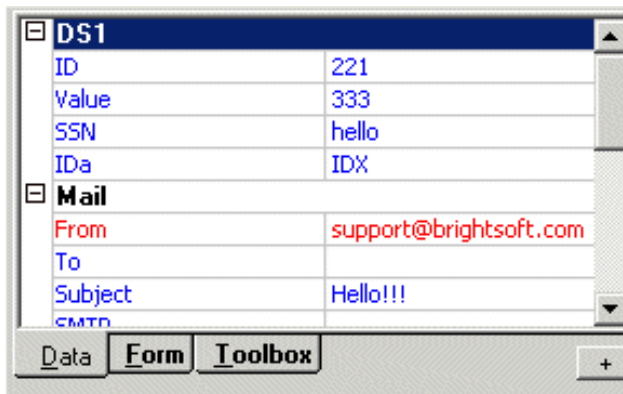
- Active HTML forms are fully operational to accept user input
- Filled forms update instance data during process simulation

- Client-side validation rules are effective as if deployed to the server
- HTML forms can be edited while the simulation is in progress
- Automated steps are editable. Scripts can be edited and saved during the simulation
- Automated steps can be executed at any time during the simulation, regardless of whether they are currently active or not



Runtime data view

As process is being simulated its runtime data may get modified. FlowRunner's *Data* tab will display the current runtime values. This is most useful when executing custom steps that modify instance data.



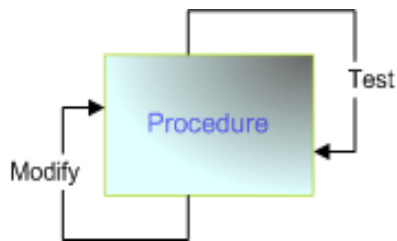
- Newly updated fields are

displayed in alternate
color

- Both human and system
steps are supported

Improved Test / Modify cycle

The ability to pause and undo
process execution coupled with
the ability to modify forms
during the simulation time
makes FlowRunner Designer a
superb development
environment.



All plausible execution paths of
a given business process can
be tested in a single simulation
session by traversing backward
(popping the execution stack),
altering form data and moving
forward.

This shortens the total design
time and minimizes the number
of future revisions when
deployed to the actual users.

Business Rules

A business process is steered to completion by a series of business rules that operate on its data.

These business rules vary in complexity but share a few characteristics

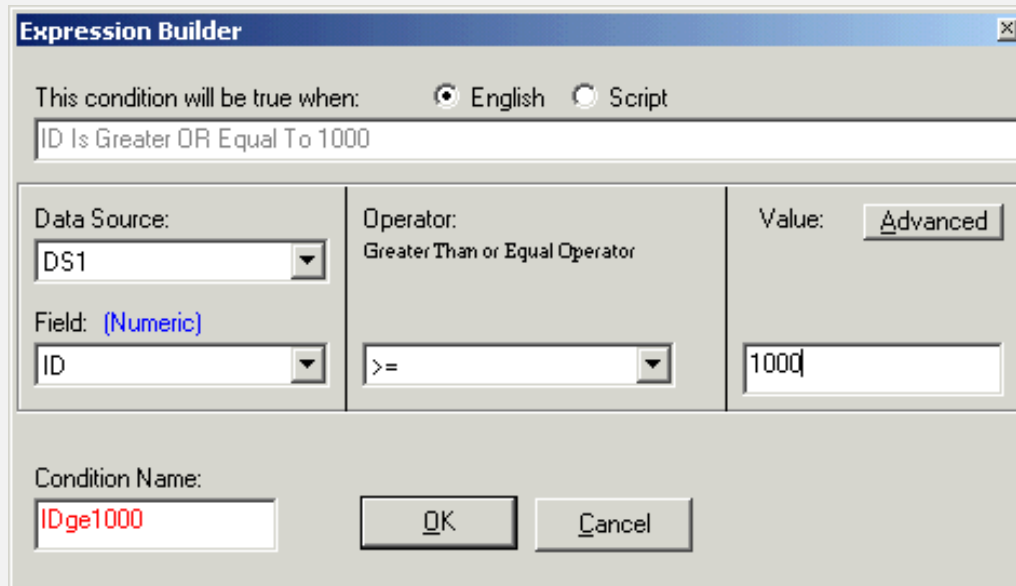
- An expression is applied to one or more process fields
- This expression may contain data fields on either side
- Data fields are compared to constants and literals
- Data operators are type specific (for example Strings may have an operator such as "Starts With", "Length", etc)
- Multiple simple expressions are usually grouped into a single complex expression using standard Boolean operators

Dealing with simple rules such as comparing a field to a constant presents no problem to a process designer. Typing in "Cost > 1000" into expression input box is easy. The complexity starts creeping up exponentially when multiple conditions make up a rule.

It's a little harder to come up with a rule such as *"if ((Cost > 1000) and (Region = 'NY')) or (Cost < 1000) and (RegionZip StartsWith '910')) "*

A user must learn the syntax of a scripting language, follow the precedence rules, and balance parenthesis correctly. For complicated expressions this is an error prone process.

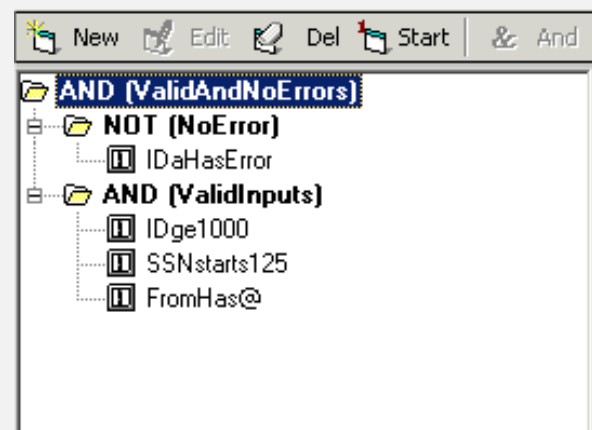
FlowRunner Designer includes a proprietary expression builder that helps build complex rules without the need to learn a new syntax or to balance parenthesis.



This is an example of a simple condition that compares a numeric field ID to a constant.

After all simple conditions have been defined they are combined into a tree structure that makes a rule

- Leaf nodes are simple expressions involving data fields
- Any other tree nodes involve either simple expressions or other non-leaf nodes



FlowRunner Designer provides a powerful environment for creating complex business rules without having to learn a new scripting language.

Rule editing functionality also provides a testing facility for evaluating rules against the current process data. Both the static (default values) and the dynamically generated (during simulation) scenarios are supported.

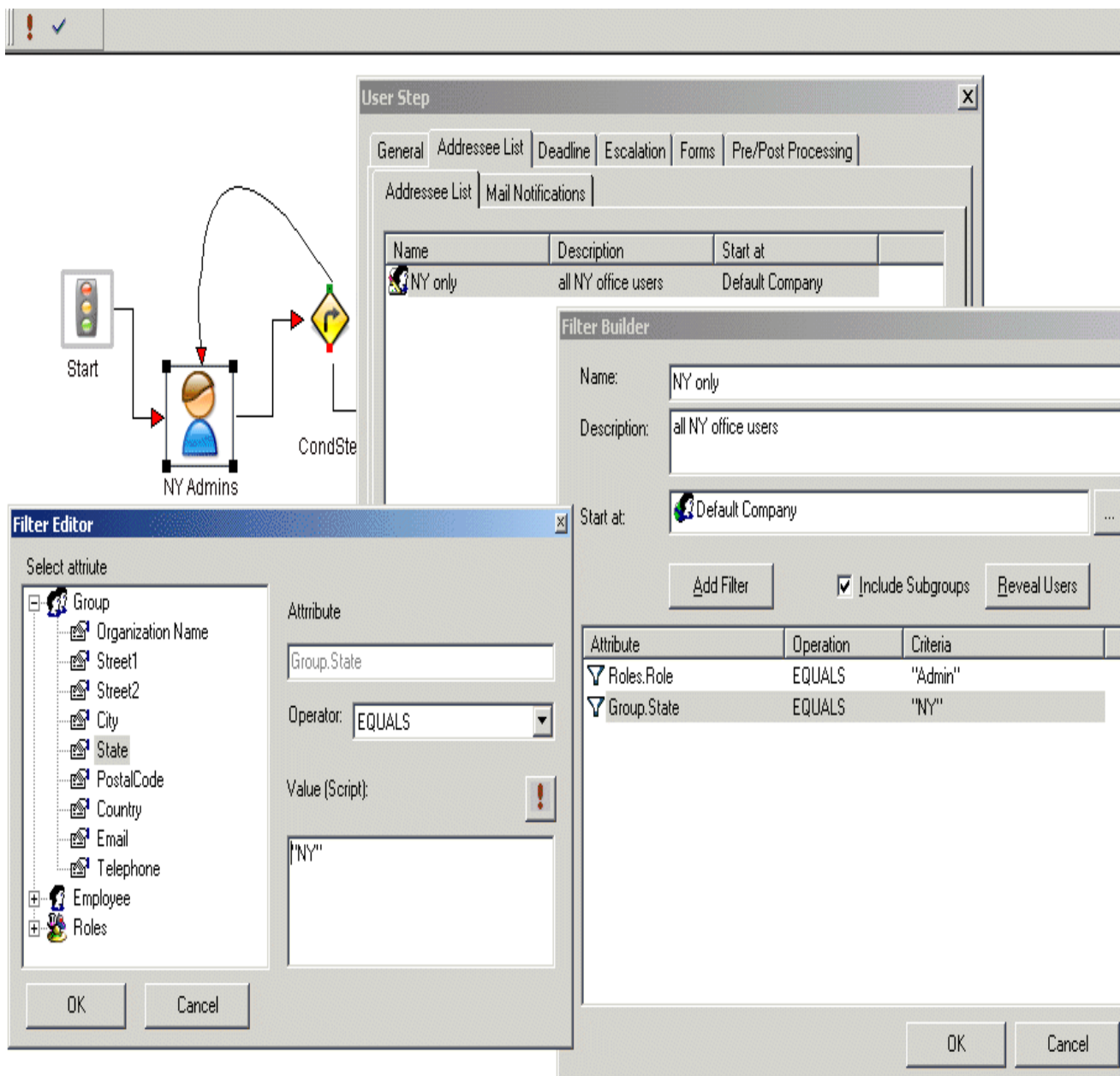
Directory Interface

Most real life use cases involving users in business processes are quite complex. Users are usually tasked based on their location in a corporate hierarchy, their responsibilities and domain knowledge. Very often the information used to make the decision whether to task a user is stored in a corporate directory.

Many other products require the user to simply type in a complex expression and hope it works when deployed. This is highly unlikely. Many things could go wrong. There could be an error in expression itself, or users might not exist, or there is a type mismatch in expression.

FlowRunner works with existing LDAP-based directory out of the box. Just configure and connect. Users, groups, attributes will simply become available for simple or complex task assignments.

Most of the complicated user addressing scenarios are handled with ease by one of a kind filtering capabilities available in FlowRunner Designer.



Highlights

- Multiple addressee items per user step. A task can be sent to multiple organizational branches at the same time
- Any directory item can be configured as a starting point of an individual addressee item
- Multiple search filters per addressee item are supported
- Directory attributes are typed. Type-specific operators are used when specifying individual search filters

- Search expressions can involve process data. This is needed for dynamic task assignments
- Scripted expressions can be specified in search filters

Reveal Users

Addressing a task to users can sometimes involve complex search criteria. To minimize errors at deployment time the task assignment rules need to be tested at design time.

Web Runner Designer offers *Reveal Users* button on both the addressee item level and on aggregated (step) level. When this button is invoked the software makes a directory request with parameters specified at design time. A dialog box containing the list of users is displayed. If the box comes back empty, there is a good chance the task will end up in the *undelivered* box.

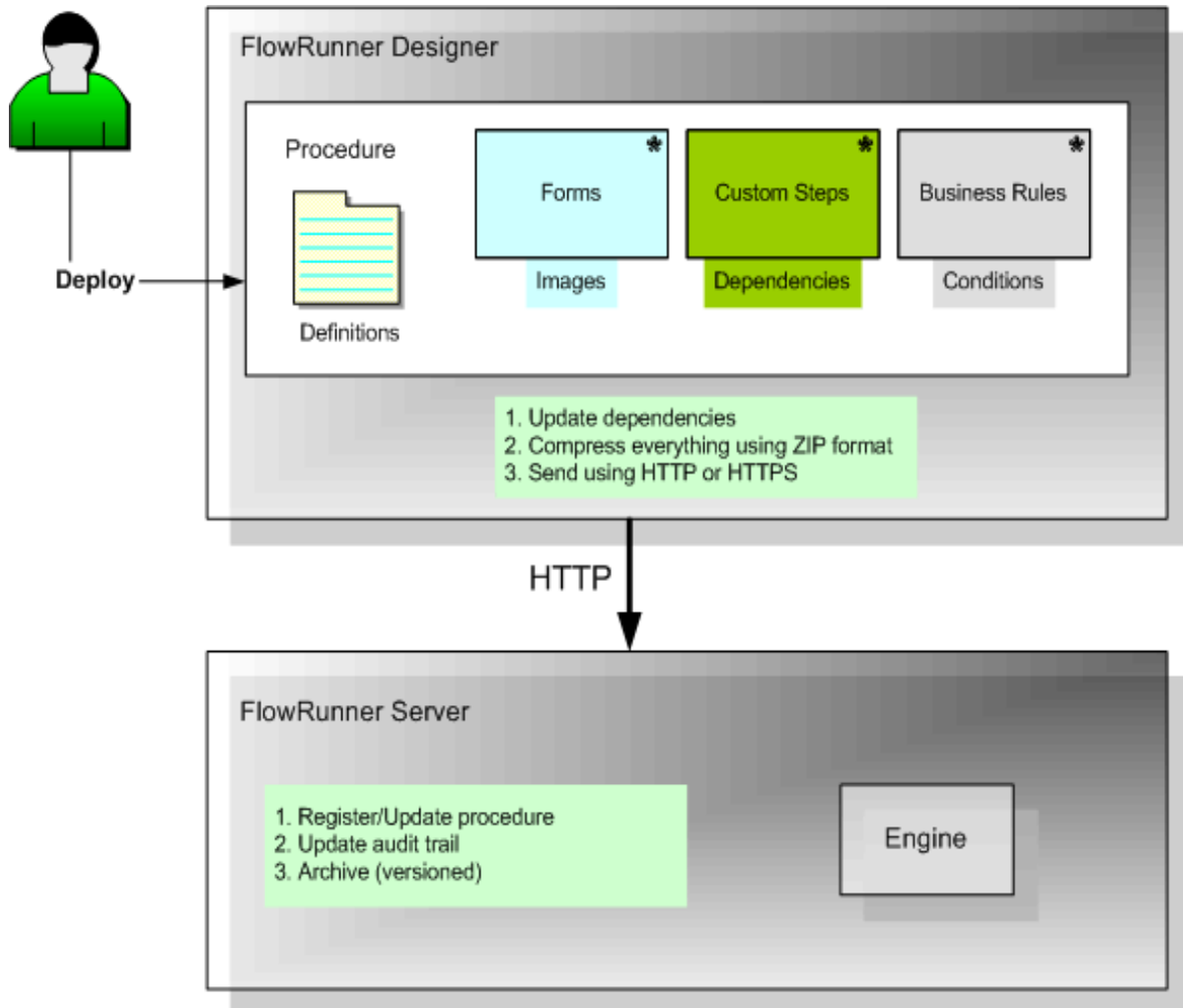
Process Deployment

FlowRunner is capable of delivering a complete, self-sufficient business process with just a few clicks. The deployed solution is delivered together with all its dependencies making usable immediately. There is no need to configure links, or to upload application archives separately, everything is packaged and delivered to the server in simple ZIP-compressed archive.

Some of the benefits of self-contained deployment supported by FlowRunner

- A single solution can be delivered to multiple process environments (for example staging and production)
- Multiple versions of the same process can run at the same time

- Multiple versions of the same java application archive (JAR) can run at the same time (via a custom ClassLoader)
- Solutions can be downloaded back to the client as ZIP files
- All prior versions are always available in their entirety



Process Versioning

Since multiple versions of the same process are supported it is important to follow well-defined compatibility rules. FlowRunner employs strong versioning rules to achieve maximum interoperability of running business processes.

- All procedures bear a three integer version number: MAJOR.MINOR.REVISION
- The version is manually editable, not generated
- Updates made to specific versions do not affect processes in progress
- Sub-Procedures can "stick" to a specific version

Procedure Options

Summary | Libraries

Author: Alex Belkin

Name: Process5

Comments:

Version: 1 2 36 <<
(major) (minor) (revision)

Correct version settings are important for upgrade and compatibility rules

OK Cancel Apply

Highlights

- Automatic packaging and deployment of an entire solution with all its dependencies: forms, images, scripts, etc.
- Strong versioning rules - multiple versions of the same procedure can be running at the same time
- Unlimited backups of all revisions kept to the server
- All communications between the client and the server are over HTTP(S)
- Ability to publish a single solution to multiple servers with a few clicks
- Ability to import / export a process as a ZIP file

System Requirements

FlowRunner Designer is a native Microsoft Windows® application. The software requires no *Java Runtime* or *.NET framework* installed. It is lightweight and fast, works well with other Microsoft Windows applications.

Requirements

- Microsoft Windows 2000, XP
- 128 MB Memory
- 20 MB Available disk space
- MS Internet Explorer 5.x or higher

Because FlowRunner Designer connects to FlowRunner Server using HTTP protocol it is not necessary to have a local installation of FlowRunner Server. Potential clients can connect to our demo server for the purpose of evaluating the software. Please contact us for more information.