

introducing  
**hp process manager**  
interactive edition

Version 1.3  
28 September 2001



web: [www.hp.com/go/e-process](http://www.hp.com/go/e-process)  
email: [eprocess@hp.com](mailto:eprocess@hp.com)



i n v e n t



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## executive overview

### what is hp process manager interactive edition?

HP Process Manager Interactive Edition is a new generation of process technology that provides lightweight process control logic to enable you to quickly develop composite applications for web-based and mobile e-services. Composite applications are applications that are composed of other applications and services. HP Process Manager Interactive Edition provides the business logic that drives the interactions, making it easier to create, integrate and deploy interactive applications. HP Process Manager Interactive Edition is based on J2EE and hosted within an application server, giving it a small footprint and making it highly suited to customers wanting to embed the technology in their own solutions, in particular for:

- Creating aggregated services
- Developing interactive applications
- Embedding process in applications

### aggregating components

HP Process Manager Interactive Edition makes it simple to use the functions of existing components (such as web services, JavaBeans, Enterprise JavaBeans etc.), thus enabling a quick and easy way of aggregating components to create new and modified applications and services, which can then be used and reused by business solutions.

#### *example 1 – a payment service*

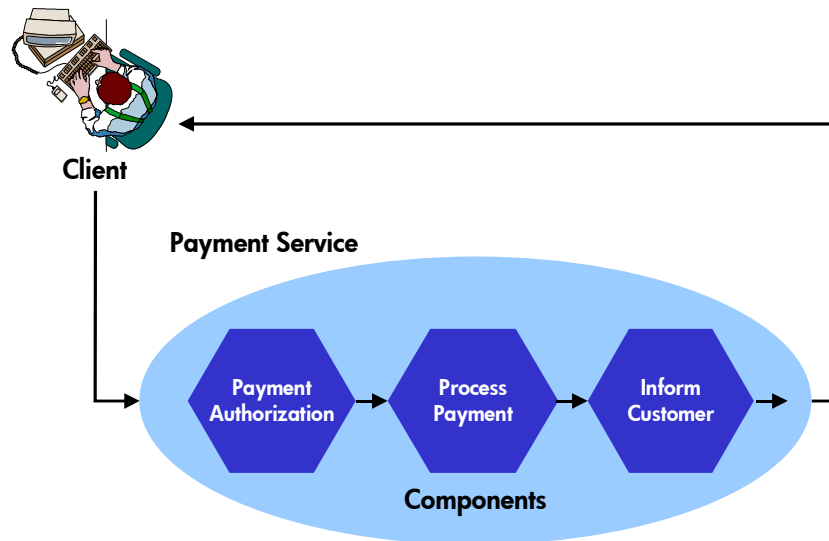
For example, a “Credit Card Payment” service could be made up from some lower level components, such as:

- Payment Authorization
- Process Payment
- Inform Customer

These components might take the form of JavaBeans or Enterprise JavaBeans that make use of in-house systems, or of web services that make use of third-party services offered by business partners. Business developers can combine these services into their own services, such as the ‘payment’ service in figure 1, using the graphical process definition tool and then offer these services to customers as part of an online interaction.

**figure 1**  
service creation through the  
composition of components

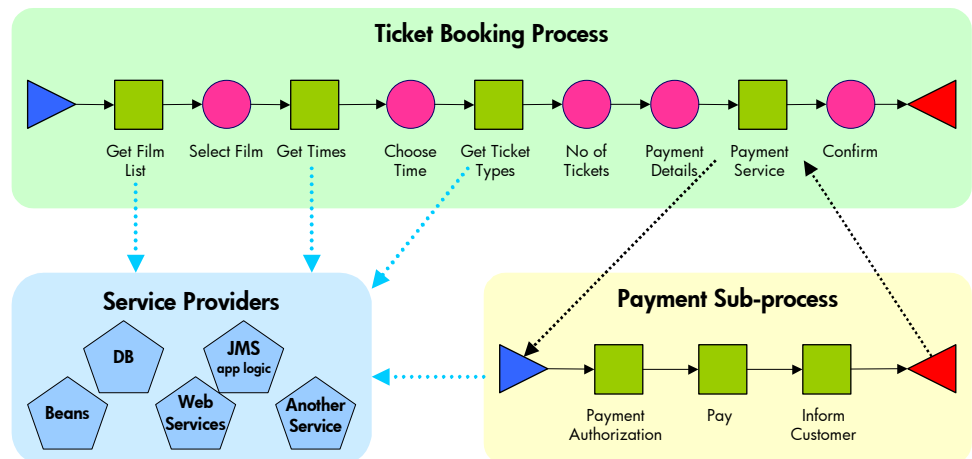
HP Process Manager  
Interactive Edition can be  
used to create the Payment  
service from individual  
component services.



For example, the 'payment' service might be offered as part of a cinema booking process, where the user is led through a series of screens on their mobile phone to select and book a film (figure 2).

**figure 2**  
combining user interaction  
with services

Here we see a more detailed  
example of the cinema  
booking process. Note the  
use of both interactive nodes  
(pink circles) that show the  
interactions with the user and  
the use of work nodes (green  
squares) that show the use of  
supporting services and sub-  
processes.



Aggregating these services into a higher-level 'payment' service has two benefits:

- You can present the service as part of a number of different online processes. For example, an "Out and About" web site might offer range of recreational services, of which the cinema booking process is the first. Subsequent processes – a process that offers boat trips, say – can simply reuse the payment service as a tried and tested component.
- You can change the service definition and all the processes will use the new service. For example, initially the payment service could be an in-house process with some manual steps, such as phoning the bank for authorization. Later this could be replaced by a third party payment e-service through a software interface. The processes that use this service would remain unaffected – other than a general improvement in efficiency, of course.

By using HP Process Manager Interactive Edition to aggregate services you are able to concentrate on creating a portfolio of flexible services that you can offer to your customers, taking advantage of the visual programming paradigm.

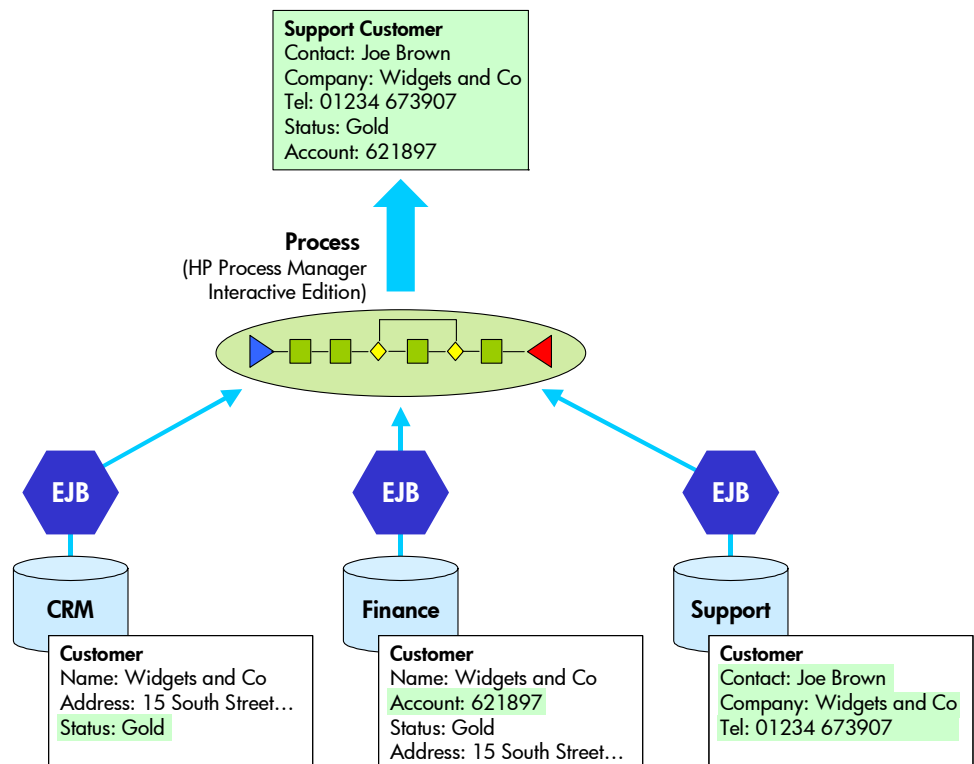
*example 2 – coordinating data*

Another example of an aggregated service is where you have information about a customer stored in a CRM system, a financial system and a support subscription database, each controlled by its own EJB. By tying the EJBs together into one HP Process Manager Interactive Edition process you can create an aggregated service that co-ordinates access to the three databases.

This would allow you, say, to create a composite “customer” entity that is a logical amalgamation of the customer details held in all three databases, so, for example, the “support customer” as seen in the process combines account details with support details. Furthermore, if the customer’s address changes, the process could also synchronize the updates to the individual databases so that they are kept up to date with each other.

**figure 3**  
using hp process manager  
interactive edition to  
coordinate databases

The HP Process Manager Interactive Edition process is used to build a composite Support Customer entity that is combines data from the CRM, Finance and support databases. This Support Customer entity is then available to other higher-level processes.



**developing interactive applications**

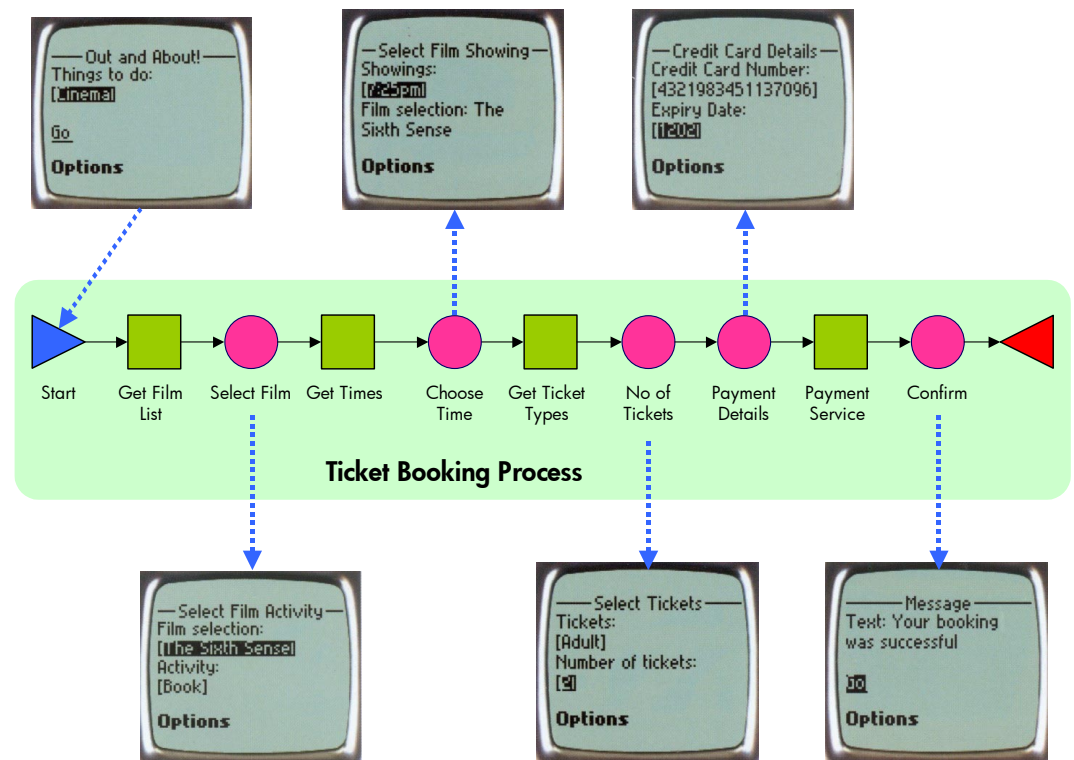
The demand for mobile e-services is greater than ever before and the race is on to provide new and more exciting services that are personalized. Services will no longer be the static “one size fits all” offerings. Instead, customers want to receive information that is individualized and pertinent only to them. In order to meet this customer desire and capitalize on new revenue opportunities, your organization will need to be able to react quickly. For this, you will need an agile development environment that enables you to create, integrate and deploy new services – fast.

HP Process Manager Interactive Edition is a tool that provides a new development approach, which enables people who understand the business to quickly create new services. HP Process Manager Interactive Edition can be used to control the interaction with a human through interactive web pages or WAP access on behalf of an application, for example as a front end to an e-commerce application.

HP Process Manager Interactive Edition enables you to abstract your business logic from the presentation logic, thus providing device-independent user interaction. Specifically, HP Process Manager Interactive Edition provides the business logic that drives the interaction and thereby makes it easier to create, deploy and integrate on-line, interactive applications. Now you no longer need to resort to traditional coding techniques using dedicated programmers. Business Managers can specify the business logic diagrammatically using the graphical process definer and the user interactions are created automatically.

**figure 4**  
user interaction with hp  
process manager interactive  
edition

This figure gives a simplified view of an interactive process that allows a user to book cinema film tickets using a WAP-enabled mobile phone. Note how the interactive nodes are shown as pink circles in the process definition and how other (work) nodes that call services are shown as green squares.



HP Process Manager Interactive Edition also offers in-built control of browser back-button and history capabilities. A web browser provides the user with the ability to jump to any page they like. This is not an issue when a page consists entirely of information. However, it is an issue when the page is part of an on-line process and the order of the pages is critical.

For example, consider the situation in which the user is following the interactive process shown in figure 4 in order cinema tickets and is asked to specify a time but decides instead that they want to change the film. If the user revisits the page where they specified the film and then resubmits the form, the process has to be able to cope with receiving a request for a different film when it was expecting a reply about the time.



HP Process Manager Interactive Edition is designed to perform these checks – automatically! If a process receives an out of sequence response HP Process Manager Interactive Edition will work out what has been done since that response was last received and the point the user actually reached and redo the steps in the process accordingly. With other development tools, processes typically proceed in a forward manner only and steps can only be re-run as part of a loop within the process logic. Such processes would need to include additional checks in the process to cope with the potential need to redo steps in the process, which clutters up the process definition with extra test nodes.

Using HP Process Manager Interactive Edition to develop interactive applications therefore provides full control of the interaction as it allows for interactive web applications *by design*. This means that you can give your end users the freedom to use the process as they wish, moving from web page to web page using the Back button and History list, whilst ensuring that your process remains in control at all times.

## embedded processes in applications

HP Process Manager Interactive Edition is ideally suited to embedding within an application and enabling ISVs to extend their applications with process or workflow technology. Its modular design enables you to take as much or as little of the product as you need. The components are all J2EE based, have a small memory footprint and the interfaces are XML. These open standards make it easy to plug in new or modified components where required and allow ISVs to concentrate on their application or domain expertise. There is no complex architecture to understand in order to use the technology.

## benefits of hp process manager interactive edition

- **controls the interaction**

HP Process Manager Interactive Edition allows for interactive web applications by design. This means that users can be given the freedom to use the process as they wish, moving from web page to web page using the Back button and History list, whilst ensuring that your process remains in control at all times.

- **process becomes part of the internet operating environment**

As process management becomes an increasingly essential component, it will play a key role at the heart of the enterprise. HP Process Manager Interactive Edition's small footprint and modular architecture will allow it to become a core component that is seen as part of the operating environment within the enterprise and not as an optional extra.

- **integration**

HP Process Manager Interactive Edition enables you to develop processes that control integration logic on a message bus, such as through JMS. This enables HP Process Manager Interactive Edition to provide essential process logic within enterprise applications. In particular HP Process Manager Interactive Edition can be used to develop fully featured services, for example for use by HP Process Manager 5.0 enterprise-level processes. Integration is achieved through service providers, which provide access to configurable services. You can use the published interfaces to develop your own service providers if the supplied service providers are insufficient for your needs.



- **web services**

Over time companies will increasingly seek ways of delivering applications or business processes as web services across the Internet for access by customers and business partners – anywhere, anytime. These web services will typically be implemented as J2EE-based, modular services that are either purpose built or consist of an aggregation of other web services. As these standards evolve, and web service platforms are put in place, HP Process Manager Interactive Edition will play a growing role in a company's web services strategy, both as a tool to aggregate web services into processes and as a mechanism to offer business processes as web services within and beyond the company boundary.

### **further information**

For more information on HP Process Manager Interactive Edition visit [www.hp.com/go/e-process](http://www.hp.com/go/e-process).





## technical features

This section summarizes the main technical features of HP Process Manager Interactive Edition.

### graphical e-service creation

Business developers can use a graphical process design tool to create their processes; the visual programming paradigm finally realized.

### automatically generated user interfaces

HP Process Manager Interactive Edition automatically generates forms for web or WAP interaction from the process data. This makes development very fast, easy to modify and user interfaces can be built with no coding involved.

### device independent solutions

HP Process Manager Interactive Edition makes no assumptions about how data is displayed to the user. The separation of process logic from presentation enables the process to handle the process data and business logic, and the presentation to be generated separately from the process information that is sent to the user. This enables device independence for solutions.

### fast creation of aggregated e-services

HP Process Manager Interactive Edition is the ideal tool to design, modify, aggregate and perform mobile e-services. Business developers can design their services using the graphical process definer and then offer this as an e-service. Business developers will also be able to aggregate e-services into new and modified services; for example, by aggregating a location-based service with a credit card payment service, you can enable consumers to use their WAP-enabled phones to locate local restaurants, shops and cinemas and then pay for the services ordered.

### modular architecture

HP Process Manager Interactive Edition has a component-based architecture in which the layers between the components are exposed as APIs. This highly modular architecture enables you to take as much or as little of the solution as you need, and also enables you to easily integrate it into your own solutions.

## standards-based

HP Process Manager Interactive Edition is based on J2EE and XML, which enables you to use your own choice of development tools and fit HP Process Manager Interactive Edition process development into your current development strategy. This ensures that you are not locked into a proprietary solution.

## predictable latency

HP Process Manager Interactive Edition has a predictable latency between process steps which makes it ideal for interactive web processes, which are typically short and quick – taking minutes to complete. This is important for processes that drive web pages as the users expect responses that take no longer than a few seconds.

## anonymous use

Interactive web applications are typically available on a public web site where anonymous users use them. HP Process Manager Interactive Edition therefore does not insist that users must log in to the system in order to run a process.

## dynamic process initiation

Processes are started from the Interactive API. Providing a programmatic interface to start processes means that you can control how and when processes are started, for example as part of a larger solution. For example, an on-line order system could check to see if a shopping basket exists and if not run an HP Process Manager Interactive Edition process to create the shopping basket before allowing the customer to purchase items.

## processing order of tasks

HP Process Manager Interactive Edition allows for the execution of synchronous and asynchronous nodes in parallel branches of a process.

Route nodes are always synchronous, so only one route node will be executed at a time for each process instance. Work nodes, however, can be either synchronous or asynchronous in nature. If the process includes interactive nodes these are executed before other work nodes wherever possible.

## sub-processes

HP Process Manager Interactive Edition allows a work node to call a sub-process as a synchronous service. This sub-process is another process instance with its own associated process definition but, unlike a process, is able to return data on completion. This makes sub-processes ideal for performing useful services within a process, such as information gathering or resource allocation resolution.



## auditing

HP Process Manager Interactive Edition is supplied with an example implementation of an audit logger that can be used to read information in XML format from a JMS queue.

You can use audit nodes in the process definition to indicate the points in the process at which audit information should be collected.

## internationalization and localization

By default HP Process Manager Interactive Edition uses Unicode, both internally and as the character set for its APIs. This allows localized textual messages to be easily loaded from Java Resource Bundles, thus making HP Process Manager Interactive Edition fully localizable.

## dynamic loading and running of process definitions

HP Process Manager Interactive Edition provides what can be considered the traditional way of deploying a process. That is, you use the process definer tool to draw your process, you load the definition into the engine and then you run the process on demand. However, HP Process Manager Interactive Edition also provides the ability to do this through the API. Thus an application can dynamically generate the process definition, load it into the engine and then run it without any human intervention.

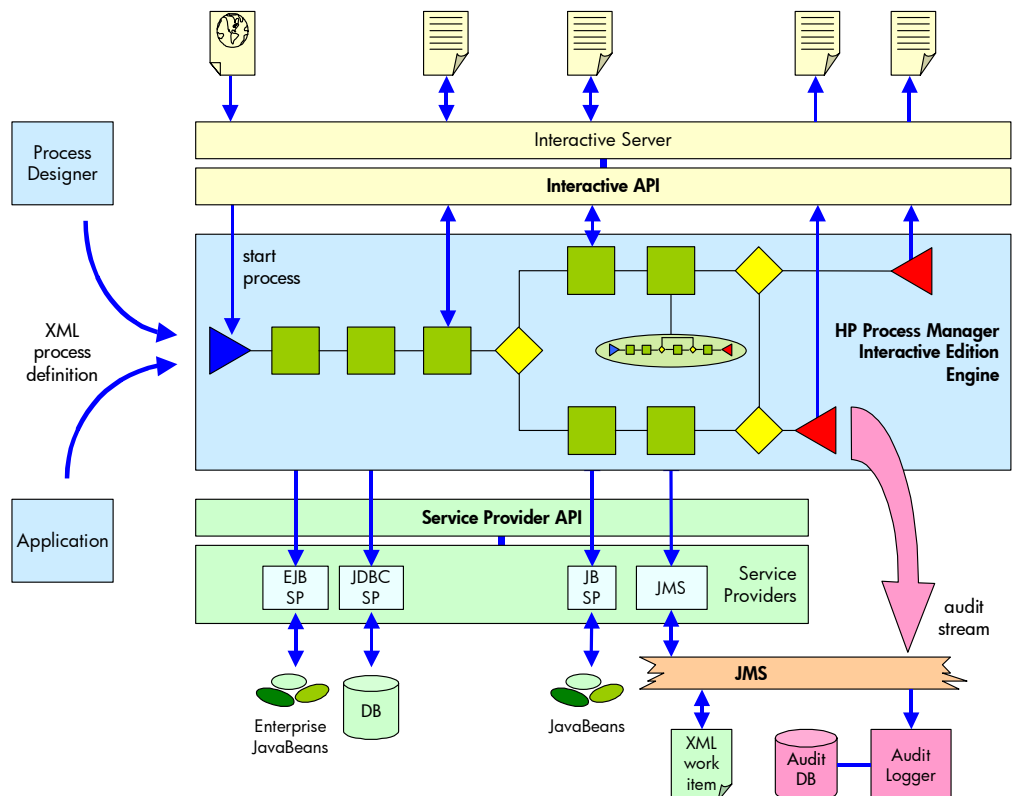
## architecture

HP Process Manager Interactive Edition has a J2EE-based architecture that runs on an application server. This allows it to exploit many of the features of an application server environment, such as multi-platform support, load balancing, application management and database independence.

### a run-time scenario

An example HP Process Manager Interactive Edition process is shown in figure 5. This shows a scenario based on an interactive process and illustrates the key components of the HP Process Manager Interactive Edition architecture. Note that although HP Process Manager Interactive Edition can be used to build other types of processes (for example, non-interactive process that combine EJB services), showing an interactive process, as here, demonstrates the full capabilities of HP Process Manager Interactive Edition.

**figure 5**  
hp process manager  
interactive edition run-time  
flow



The key aspects to note from figure 5 are:

- The process definition is loaded into HP Process Manager Interactive Edition from the process definer.
- A web page is used to start the process and the data from the user is passed to the start node of the process and used to run the process. As the process runs, further interactive web pages are displayed as necessary. An interactive server is responsible for handling the interaction of these web pages with the user.
- Other nodes in the process call the various service providers, specifically the EJB service provider, the JDBC service provider and the JMS service provider. Note that in this example that one node calls another HP Process Manager Interactive Edition sub-process as a service.
- Audit information is generated during the execution of the process and this is fed to an audit logger over the JMS bus.

### core APIs

HP Process Manager Interactive Edition has two core APIs that allow direct control of the software via fixed Java library calls. These APIs are:

- Interactive API

This handles the execution and storage of process instances, for example:

- Getting a description of the data required to start a process
- Starting a new process instance
- Feeding data back to interactive nodes so the process can continue execution
- Getting the final output of the process instance
- Querying the status of the process instance
- Intervening with the process instance (suspend, single step, etc)

- Service Provider API

This is used by HP Process Manager Interactive Edition to invoke service providers in the high-level service provider layer.

### service providers

The service providers are high-level service interfaces that invoke configurable services with a “Work Item” over different types of transport. For example, a service provider could access XML over JMS, access a database via JDBC, or access a JavaBean.

The following generic service providers are provided:

- JavaBean Service Provider

Allows most JavaBeans to be called to perform the service request.

The Java Bean Service Provider interprets a script contained within the work item in order to perform the appropriate actions on the JavaBean. Alternatively, the script can be contained within the definition for the Service.

- EJB Service Provider  
Allows most EJBs to be called to perform the service request.  
The EJB Service Provider interprets a script contained within the work item in order to perform the appropriate actions on the EJB. Alternatively, the script can be contained within the definition for the Service.
- JDBC Service Provider  
Allows most JDBC compliant databases to be accessed to perform the service request.  
The JDBC Service Provider interprets an SQL statement contained within the work item in order to perform the appropriate query on the JDBC database. Alternatively, the SQL statement can be contained within the definition for the Service. This is similar to the ODBC adapter in HP Process Manager 5.0.
- JMS Service Provider  
Allows service requests to be sent over the JMS bus to a JMS receiver that will perform the service request.  
The JMS Service Provider sends the work to a JMS queue (or topic) in the form of a XML Work Item. This service provider is implemented as two separate parts: an in part and an out part.

Customers or third parties may write additional service providers to extend the capability of the HP Process Manager Interactive Edition system.

### interactive server

In order for the interactive process to communicate with the user via interactive web pages, it is necessary to have an interactive server that receives work items from the process, constructs the web pages and forwards them to the user. The advantage of using a server is that it separates the presentation logic from the process logic. You can therefore change the presentation logic without affecting the process, and vice versa.

The interactive server is Java code that interfaces with the Interactive API. You have two options:

- Use the example Interactive Server provided.
- Write your own server, for example as a Java application or using JSPs. Advice and examples of how to do this are given in the training note (PTN) distributed with the HP Process Manager Interactive Edition product.

Note that the clients themselves are not part of HP Process Manager Interactive Edition.

### other components needed

HP Process Manager Interactive Edition makes use of several components that are not strictly part of the HP Process Manager Interactive Edition API architecture but are nevertheless needed to use HP Process Manager Interactive Edition. These are:

- Process Definer (for defining processes)
- JMS bus
- Web browser
- Databases, JavaBeans and EJBs (that is, enterprise objects)

## process definer

One essential component for HP Process Manager Interactive Edition, although not strictly speaking part of it, is a graphical process definer.

Note that both HP Process Manager Interactive Edition and HP Process Manager 5.0 will use the same Cepp package files for compatibility.

## reference audit logger

An HP Process Manager Interactive Edition process has the ability to write audit information to one or more audit loggers that have already registered an interest. These audit loggers record information about the state of the process as it is executed so that it is possible to derive statistics, historical tracking, and so on, from the information.

HP Process Manager Interactive Edition is supplied with a reference implementation of an audit logger that can be used to send information in an XML format to a JMS queue.

## process model

Process definitions in HP Process Manager Interactive Edition can contain the following types of nodes:

- Work node

A work node represents the use of a service to perform a task. (HP Process Manager users will already be familiar with the concept of a work node.)

HP Process Manager Interactive Edition allows you to specify an 'Undo Action' for the node for use in interactive processes. This specifies what action will be taken when a node is undone due to the user re-entering the process an earlier point. Possible actions are to leave the data in its current state or to perform a Data Reset, in which case the engine restores the case packet to the state it was in before the node was executed.
- Interactive node

This is similar to the work node except that it indicates a dialog with the user, typically presenting a web page to the user and receiving a response in reply. Having a specialized interactive node allows interactive nodes to have additional functionality not found in normal work nodes, such as handling out-of-sequence responses from the user.
- Route node

A route node performs a routing operation on the process. It typically represents a point at which the process splits or merges and gives the conditions for the routing. For example, a split route node includes the conditions that must be met for a particular branch of the process to be followed.
- Start and End nodes

These represent the start and end points of the process.
- Audit node

An Audit node represents a point in the process where audit information must be recorded. The node allows the process designer to select what information should be logged. This information is passed to an audit JavaBean. An example audit logger is supplied that writes the audit information to a JMS queue.



## resource allocation

HP Process Manager 5.0 is designed for enterprise processes that may involve people and therefore has a rule-based resource allocation mechanism that allows it to perform complex resource allocations at run time.

HP Process Manager Interactive Edition on the other hand is not intended for employee-based processes. Instead the work nodes typically have very simple resource allocation requirements, such as locating a middleware adapter and resource allocation can therefore be a much simpler mechanism.

In HP Process Manager Interactive Edition, therefore, you simply specify a resource name instead of a resource rule. This is then looked up in a directory and mapped to a resource address. This provides a very rapid resource resolution mechanism for services.

If more complex resource allocation is required, then this can be achieved within a service. For example, imagine a banking process that prints customer statements using a printing service that requires a printer as a resource. The bank has more than one printer that can be used and these are allocated using a suitable load-balancing algorithm. The banking process therefore calls a resource allocation service in order to determine which actual printer will be used for a particular process instance.

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Hewlett-Packard Company  
3000 Hanover Street  
Palo Alto, CA 94304, USA

