



IBM Software Group

IBM WebSphere Application Server V6

Calendar service



@business on demand.

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This presentation will discuss the Calendar programming model extension.

Goals

- Understand the Calendar Functionality
- Learn how you would use the Calendar programming model extension in your environment



The goals for this presentation are to understand the functionality provided by the Calendar programming model extension and how you would use it in your environment.

Agenda

- Overview
- Programming Model and Implementations
- Default Calendars
- Summary



This presentation provides an overview of the Calendar functionality. It also provides a description of the programming model and implementation, including the two default calendars provided in WebSphere Application Server.

Section

Overview



This section will discuss an overview of the Calendar programming model extension.

Calendars

- Provide the capability to calculate date-related values
- WebSphere Application Server supplies two default calendar implementations
 - ▶ Simple Arithmetic Calendar
 - ▶ CRON-based Calendar
- Users can define their own custom calendars
 - ▶ Default calendar implementations and custom calendar implementations can be used concurrently
- A calendar is implemented as a Java™ 2 Enterprise Edition (J2EE) stateless sessionbean that implements a standard remote interface
 - ▶ Home interface
 - `com.ibm.websphere.scheduler.UserCalendarHome`
 - ▶ Remote interface
 - `com.ibm.websphere.scheduler.UserCalendar`



Calendars provide the capability to calculate date-related values. WebSphere Application Server V6 supplies two default calendar implementations; a simple arithmetic calendar and a CRON-based calendar. You can provide your own calendars by writing a custom J2EE stateless sessionbean that implements the `UserCalendarHome` and the `UserCalendar` interfaces.

Programming interface

- User-defined calendars must implement these methods of the Remote Interface

▶ Used to validate a calendar name and interval

```
validate (  
    String calendarName,  
    String intervalString )
```

▶ Returns the result of applying the supplied interval to the base time

```
Date applyDelta (  
    Date baseTime, String calendarName,  
    String intervalString)
```



The UserCalendar remote interface exposes two methods, the validate method and the applyDelta method. The validate method is used to validate a calendar name and interval. The applyDelta method returns the result of applying the supplied interval to the base time.

Calendar implementations

- A single calendar bean may implement one or more named calendars
- Each calendar implemented by a bean has a unique String name
 - ▶ specified on the `validate()` and `applyDelta()` methods
- The full J2EE programming model is available to a calendar bean as it is simply a stateless session bean



A single calendar bean may implement multiple named calendars. For instance, a banking calendar could be different based on the country where a certain branch of the bank operates. Programmers can select the different implementations by specifying a String with the calendar name on the `validate()` and `applyDelta()` method calls. Because the calendar is a stateless sessionbean, the same J2EE programming model available to other sessionbeans is also available to the calendar.

Calendar implementations (cont.)

- WebSphere Application Server provides two default calendar implementations
 - ▶ One allows simple arithmetic type intervals to be specified
 - ▶ The other allows more complex CRON-like intervals to be specified
- Default calendars are provided in the SchedulerCalendars.ear system application



WebSphere Application Server provides two default calendar implementations, a simple-arithmetic calendar and a more complex CRON-like calendar. The default calendars are available in the SchedulerCalendars.ear system application. This application is available on all WebSphere Application Server V6 servers. These two default calendars are discussed on the following page.

Default calendars

- **Arithmetic Calendar**
 - ▶ Allows arithmetic-based intervals to be specified relative to 'now'
 - ▶ Examples: "2days", "2days 2hours"
- **CRON-based Calendar**
 - ▶ CRON-like syntax for calculating absolute times
 - ▶ Second Minute Hour Day Month DayOfWeek
 - ▶ Each term is a comma separated list of ranges. A range can be a number or an X-Y. * means all values. ? means ignore
 - ▶ 0 0 7-8,18-20 ? * MON-FRI
 - 7 and 8am, 18,19 and 20 every day from mon to fri.
 - ▶ 0 1/10 9-18 ? JAN-MAR,JUN-AUG,OCT,NOV MON,WED,FRI
 - on the minute and every 10 minutes thereafter from 9am to 6pm on mon,wed and fri in Jan,Feb,Mar,Jun,Jul,Aug,Oct,Nov
 - ▶ 0 0 18 L * ?18:00:00 hours
 - on the last day of every month.



Two default calendars are provided by WebSphere Application Server. The arithmetic calendar allows you to add simple time intervals to a date object.

The CRON-based calendar accepts more sophisticated interval definitions, based on the CRON standards that are familiar to UNIX® developers.

Deployment

- Calendars are deployed in an Enterprise Archive (EAR) file, just like any other stateless session bean
- Are retrieved by applications using JNDI names
- Can be clustered for availability and load balancing
- The Scheduler service allows for a pluggable calendar mechanism
 - ▶ Scheduler can utilize custom UserCalendar implementations
 - ▶ referenced by Scheduler using the setUserCalendar method on the TaskInfo interface



Calendars are stateless sessionbeans and are treated as such when it comes to packaging, deployment, and usage. They are deployed in an Enterprise Archive (EAR) file. Calendars are retrieved by applications using Java Naming and Directory Interface (JNDI) names. They can also be clustered for availability and load balancing. The scheduler service allows for plugging in custom-defined calendars. Businesses and localities may have very sophisticated calendar requirements, where local holidays, company customs, and variations in the duration of work periods need to be taken into account. A user-defined custom calendar will then be used by the scheduler to compute a point in time in the future based on a specified interval.

Section

Summary



This section will provide a summary of the Calendar programming model extension.

Summary

- Calendars provide the capability to calculate date-related values
- WebSphere Application Server provides two default calendar implementations
- Users may provide their own custom calendars
- Calendars are J2EE stateless sessionbeans



In this presentation you learned about the Calendar programming model extension. Calendars provide the capability to calculate date-related values. WebSphere Application Server provides two default calendar implementations, a simple Arithmetic calendar and a more complex CRON-like calendar. You may also implement your own user-defined custom calendar. Calendars are J2EE stateless sessionbeans; therefore, they have the full J2EE programming model available and they follow the J2EE deployment model.

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