BEA WebLogic RFID Edge Server™

Using the Administration Console

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CHAPTER 1

Introduction and Roadmap

The following sections describe the contents, audience for, and organization of this guide—*Using the WebLogic RFID Edge Server Administration Console*.

Document Scope and Audience

This document describes how to use the RFID Administration Console to configure ECSpecs, ECSpec reports and subscribers, RFID devices, filters, and workflows.

The intended audience is developers, system administrators, operations staff, support engineers, and other personnel with an interest in WebLogic RFID Edge Server.

Guide to This Document

This document is organized as follows:

- This chapter, "Introduction and Roadmap," describes the scope of this guide, summarizes new features, and lists related documentation.
- "Using the Administration Console," describes how to use the RFID Administration Console, monitor Edge Servers, and export and import Edge Server configuration.

- "Working with ECSpecs," describes how to create, edit, test, and deploy ECSpecs and ECSpec subscribers, and how to use the ECSpec Editor.
- "Working With ECSpec Reports," describes how to create ECSpec reports, report filters, and report groups.
- "Configuring and Monitoring Readers," describes how to add, remove, and configure readers, filters, and composite readers, and how to monitor readers.

Related Documentation

The following BEA documents contain information that is relevant to *Using the WebLogic RFID Edge Server Administration Console*:

- *Product Overview* provides descriptive information about WebLogic RFID Edge Server, including use cases, key benefits, component architecture, functional overview, RFID concepts and terminology, and developer and RFID resources.
- *Installing WebLogic RFID Edge Server* describes how to install and configure WebLogic RFID Edge Server.
- *Programming with the ALE and ALEPC APIs* describes the Application Level Events (ALE) and Application Level Events Programming Cycle (ALEPC) programming interfaces (APIs) that you use to create applications that interact with WebLogic RFID Edge Server by reading and writing electronic product code (EPC) tags.
- *Using the Reader Simulator* describes how to use the reader simulator software included with RFID Edge Server. The Reader Simulator minimally simulates a ThingMagic Mercury4 RFID reader.
- *RFID Reader Reference* describes how to configure the RFID devices supported by the RFID Edge Server.
- *Workflow Reference* describes how to configure and use the workflow modules included with the WebLogic RFID Edge Server.

CHAPTER 2

Using the Administration Console

The following sections describe how to use the RFID Edge Server Administration Console.

Administration Console Overview

The RFID Edge Server Administration Console is a graphical Java application that you use to:

- Monitor the activities of multiple Edge Servers and readers.

  See "Monitoring Edge Servers" on page 2-6 and "Monitoring Readers" on page 5-7.

- Add, remove, and configure readers and composite readers.

  See "Editing Readers" on page 5-3 and "Working with Composite Readers" on page 5-3.

- Create, view, and edit ECSpec data objects and their subscribers.

  See "Working with ECSpecs" on page 3-1 and "Using the ECSpec Editor" on page 3-8.

- View real-time Edge Server and RFID device telemetry data.

See “Monitoring Edge Servers” on page 2-6 and “Monitoring Readers” on page 5-7.

- Dynamically configure RFID devices, filters, and workflows.

  See “Editing Readers” on page 5-3, “Working with Transient Filters” on page 5-5, and “Configuring Workflow Modules” on page 6-1.

- Export and import RFID Edge Server configuration objects.

  See “Exporting and Importing an Edge Server Configuration” on page 2-5.

Starting and Stopping the Administration Console

Prerequisite: WebLogic RFID Edge Server must be installed on your system. See *Installing WebLogic RFID Edge Server*.

Starting the Console

Start the RFID Edge Server and the Administration Console with individual scripts in the `RFID_EDGE_HOME/bin` directory, where `RFID_EDGE_HOME` is the directory where you installed the WebLogic RFID Edge Server software. See Starting and Stopping WebLogic RFID Edge Server in *Installing WebLogic RFID Edge Server*.

Stopping the Console

In the Administration Console, select **File > Exit**.

Administration Console Menus

The Administration Console has the following main menus:

- “File Menu” on page 2-2
- “View Menu” on page 2-4
- “Test Menu” on page 2-4
- “Help Menu” on page 2-4

File Menu

Table 2-1 describes the File menu options.

Table 2-1 File Menu Options

Name	Description

Configure Edge Servers	Adds an Edge Server instance to the Administration Console. For each Edge Server, you need to specify:
	Edge Server URL: The location of the Edge Server instance. Use the format:
	http://*host_name*:*port*
	where *host_name* is the host name of the machine where the Edge Server is running, and *port* is the port the Edge Server is listening on (configured when you installed the Edge Server).
	If you cannot remember the port you configured, you can find it in `RFID_EDGE_HOME/etc/edge.props`:
	`# The TCP port on which the ALE service listens.`
	`com.connecterra.ale.servicePort = 6060`

Preferences	**AutoRefresh Interval** Specifies how often to contact the Edge Server to update the ECSpec information displayed in the Administration Console (in milliseconds). Default: 2000 (every 2 seconds). **Alert History Length** Specifies how many alerts to store for each device. Default: 2000
Import	Imports a valid XML Edge Server configuration file. See "Importing an Edge Server Configuration" on page 2-5.
Export	Exports the following Edge Server objects to an XML file: • RFID Devices • Composite Readers • ECSpecs • ECSpec Subscribers • PCSpecs • PCSpec Subscribers • Workflow Modules See "Exporting an Edge Server Configuration" on page 2-5.
Exit	Quits the application.

View Menu

Table 2-2 describes the View menu options.

Table 2-2 View Menu Options

Name	Description
Refresh ECSpecs	Contacts the Edge Server and retrieves the list of all active ECSpec instances and additional information for each. This operation may take some time if there are many ECSpec instances with data to be retrieved. Typically the ECSpec information is automatically refreshed according to the value you set for the Auto Refresh Interval in **File > Preferences**. This option is useful if the auto-refresh interval is particularly long, or if you have made a change you want to see immediately.
Refresh Device Browser	Rebuilds the nodes shown in the left pane of the Console (Device Browser). Contacts each of the Edge Servers defined. If a particular Edge Server cannot be contacted, then the Device Browser shows the host name and port number (for example, `localhost:6060`) and an error indicator. This operation may take some time if there are many Edge Servers to scan, and if some Edge Servers are not responding.

Test Menu

Table 2-3 describes the Help menu options.

Table 2-3 Test Menu Options

Name	Description
Read Tags	Displays real-time tag data from the selected Edge Server and any configured reader. See "Reading Real-Time Tag Data" on page 5-11.

Help Menu

Table 2-4 describes the Help menu options.

Table 2-4 Help Menu Options

Name	Description
Help	Displays a link to the Administration Console Help.
About	Displays version and copyright information.

Exporting and Importing an Edge Server Configuration

Configuration exporting and importing lets you duplicate RFID Edge Server configurations on other Edge Servers. You select Edge Server objects to export to an XML file, and duplicate the configuration on another RFID Edge Server by importing that file.

Exporting an Edge Server Configuration

To export an RFID Edge Server configuration:

1. Select **File > Export**.
2. On the **Export Configuration** page, from the **Server** drop-down list, select the Edge Server from which to export configuration objects.
3. In the **Types** section, select the object types to export.
4. To select objects by name, enter the object name in the **Names** section.

   Note: Names are case-sensitive and must match the object name exactly. If there is no match, an empty XML file is created.

   Note: If you export ECSpec Subscribers and not the ECSpec they reference, you will get an error upon importing the ECSpec Subscribers file if the ECSpec does not exist on the target Edge Server to which you import the file.
5. Click **Export**.
6. In the **Open** dialog window, specify a file name *with* an XML extension and click **Open**.

   The XML file is saved with the name and location you specified.

Importing an Edge Server Configuration

To import RFID Edge Server configuration:

1. Select **File > Import**.
2. In the **Open** dialog window, select a configuration XML file to import and click **Open**.
3. On the **Import Configuration** page, from the **Server** drop-down list, select the target Edge Server to which to import configuration objects and click **Import**.

   The configuration file is imported and the configuration objects appear in the Console under the selected Edge Server node.

   Note: If you import configuration objects with the same name as objects that already exist on the Edge Server, the **Resolve Import Conflicts** page appears. Select which objects to replace with imported ones.

   Note: When you export all ECSpec Subscribers to an ECSpec, they appear in one XML file with the same name as the ECSpec. When you import an ECSpec and its ECSpec Subscribers objects, they appear with the same name in the **Resolve Import Conflicts** page. The first one listed is the ECSpec object and the second one is the ECSpec Subscribers object.

Monitoring Edge Servers

Using the Administration Console, you can examine configuration information for and messages generated by an Edge Server. Also, you can monitor how many event and programming cycles have completed since you started an Edge Server.

The following sections describe Edge Server monitoring data:

- "Displaying Edge Server Telemetry" on page 2-6
- "Displaying Edge Server Alerts" on page 2-7
- "Displaying Edge Server Attributes" on page 2-8

Displaying Edge Server Telemetry

The Edge Server Telemetry page displays information about the number of event and programming cycles that have completed since you started the Edge Server. To display RFID Edge Server telemetry:

1. In the left pane of the Console, select an Edge Server.
2. In the right pane, select **Telemetry** at the bottom of the page to display the **Edge Server Telemetry** page.

Note: Collapse telemetry graphs to improve presentation and performance; only the expanded (non-collapsed) views are updated.

For more information about event cycles and programming cycles, see Reading and Writing Tags in *Programming with the ALE and ALEPC APIs*.

– Table 2-5 shows when event cycles occurred.

– Table 2-6 shows when programming cycles occurred.

Table 2-5 eventCyclesCompleted

total	Total number of event cycles completed since the Edge Server was started.
horizontal axis	Time stamps for event cycles, in 24-hour time.
vertical axis	Number of event cycles completed within the telemetry interval configured in the Edge Server. When the telemetry interval is very short, this value is likely to be either zero (no event cycles) or one (one event cycle). If the telemetry interval is longer, larger values are displayed when many event cycles are completed within one telemetry interval.

Table 2-6 programmingCyclesCompleted

total	Total number of programming cycles completed since the Edge Server was started.
horizontal axis	Time stamps for programming cycles, in 24-hour time.
vertical axis	Number of programming cycles completed within the telemetry interval configured in the Edge Server.

Displaying Edge Server Alerts

To display RFID Edge Server alerts:

1. In the left pane of the Console, select an Edge Server.
2. In the right pane, select **Alerts** at the bottom of the page.

   The **Edge Server Alerts** page shows messages and alerts from the Edge Server.

   When you select an alert in the top pane, a preview pane opens at the bottom of the page that displays the complete text of the alert.

Table 2-7 Edge Server Alerts

Column	Description
Importance	• INFO (green) • WARNING (yellow) • SEVERE (red)
Date	Date and time the log entry was written.
Message	Text of the message.

Displaying Edge Server Attributes

To display RFID Edge Server attributes:

1. In the left pane of the Console, select an Edge Server.
2. In the right pane, select **Attributes** at the bottom of the page.

   The **Edge Server Attributes** page shows configuration information for this Edge Server.

Table 2-8 Edge Server Attributes

Column	Description
manufacturer	ConnecTerra
version	Version of the Edge Server.

CHAPTER 3

Working with ECSpecs

You use ECSpec data objects to tell the Edge Server what information you want from readers, and how you want that reader information reported.

The following sections describe what you can do with ECSpecs:

Working with ECSpecs in the Administration Console

Although ECSpec objects can be quite complex, the Administration Console provides an easy way to create and activate ECSpec objects, view the resulting reports, and modify your ECSpec design to meet the needs of the application you are developing.

Using the Administration Console, you can:

- Specify what data you want in a given report.
- Specify where to deliver the report; for example, an HTTP post to a Web address, to a file on your system, or to the Edge Server Console.
- Activate an ECSpec once and view the results.
- Examine the report to determine whether you are getting the information you want.
- Repeat these steps until you are satisfied with the results, then export your ECSpec information for programmatic integration into a production system.

The details of ECSpec objects are covered in *Programming with the ALE and ALEPC APIs*.

Displaying ECSpecs

To display ECSpecs:

1. In the left pane of the Console, expand an Edge Server node.
2. Under that Edge Server, select **ECSpecs.**

   The ECSpecs currently defined for this Edge Server are listed in the **ECSpecs** pane on the upper right.

   Table 3-1 describes the ECSpec status information.

Table 3-1 ECSpec Status Information

Column	Description
Name	The name of an ECSpec. You assign this name when you create the ECSpec.
Activation Count	An ECSpec is “activated” each time the start condition is met. This field shows how many times this ECSpec has been activated since its creation.

Table 3-1 ECSpec Status Information (Continued)

Column	Description
Last Activated	Last time this ECSpec was activated.
Last Reported	Last time this ECSpec generated a report. Not every ECSpec activation produces a report.
Subscriber Count	Number of subscribers associated with this ECSpec. If the ECSpec has been suspended, a (Suspended) notation appears next to the number of subscribers.

The data for the Name field is taken from the ECSpec object, while the other field data are taken from the ECSpecInfo object. For more information on these objects, see Reading Tags Using the ALE API in *Programming with the ALE and ALEPC APIs*.

Using the ECSpecs page, you can:

- Add, edit, and view ECSpecs. See "Using the ECSpec Editor" on page 3-8.
- Work with ECSpecs, including suspending, unsuspending, testing (via "Activate Once"), deleting, and showing subscribers.
- Add, remove, and edit subscribers associated with ECSpecs.

Testing ECSpecs Using Activate Once

To generate a test report for an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select the ECSpec.
3. Click **Activate Once**.

   A Report window displays the XML ECSpec report data from the Edge Server.

   A report appears after the ECSpec has completed one activation (for example, the Start and Stop conditions have been met). If the report does not appear quickly, a progress dialog appears. You can cancel the report from this dialog, if desired.

   Note: Activating an ECSpec turns on any readers used by that ECSpec.

   The Report window contains menu options to export the report to a file (**File > Export**), close the window (**File > Close**), and access Help (**Help > EC Report Help**).

Suspending ECSpecs

To suspend an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select the ECSpec.
3. Click **Suspend**.

   While the ECSpec is suspended, no information is sent to any of the subscribers associated with that ECSpec. The **Subscriber Count** column in the **ECSpecs** pane displays a parenthetical notation if the ECSpec is suspended.

   Note: Suspending an ECSpec may turn off any readers used only by that ECSpec.

Unsuspending ECSpecs

To unsuspend an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select the ECSpec.
3. Click **Unsuspend**.

   The ECSpec resumes sending information to subscribers, and the notation is removed from the **Subscriber Count** column in the **ECSpecs** pane.

   Note: Unsuspending an ECSpec turns on any readers used by that ECSpec when the Start condition is met.

Deleting ECSpecs

To delete an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select the ECSpec.
3. Click **Delete**.

   The ECSpec, all its reports, and all subscribers associated with that ECSpec are removed.

Viewing ECSpec Subscribers

To show subscribers for a given ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select the ECSpec.

   A list of subscribers (destinations for ECSpec report information) and associated status information appears in the bottom **Subscribers** pane.

   Table 3-2 describes the ECSpec subscriber status information.

Table 3-2 ECSpec Subscriber Status Information

Column	Description
URI	URI for this subscriber.
Last Succeeded	Last time the Edge Server succeeded in sending a report to this subscriber.
Consecutive Failures	Number of consecutive times the Edge Server failed in its attempts to send a report to this subscriber.

The URI field is taken from the ECSubscription object, while the other fields are taken from the ECSubscriptionInfo object. For more information on these objects, see Reading Tags Using the ALE API in *Programming with the ALE and ALEPC APIs*.

Creating and Removing Subscribers

To create a new subscriber and associate it with the selected ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec.
3. In the **Subscribers** pane, click **New.**
4. On the **Subscriber** page, select a subscriber type from the drop-down list.

   The subscriber type determines what other fields appear on the page.
5. Fill in a destination for the report information to be sent to this subscriber.

   Table 3-3 describes the report destinations for the various subscriber types.

Table 3-3 Subscriber Type Report Destinations

Subscriber Type	Destination Prompt	Description
XML on Edge Server Console	"Heading"	Enter a text comment to write the report to the Console in XML, preceded by the comment entered in the Heading field.
XML via HTTP POST	"http://"	Enter a URL to which to deliver the report using HTTP POST. Format: `host:port/remainder-of-URL` (The colon and port number may be omitted; the port number defaults to 80.)
XML via JMS Message	"TOPIC" or "QUEUE"	Enter the name of the topic that the JMS notification driver will publish to, or the name of the queue that the JMS notification driver will add to. The topic or queue entered must exist in the JMS server. See Table 3-4 for JMS subscriber properties.
XML File on Edge Server	"Directory or File"	Enter a directory path or file name to which to deliver the report by writing to the specified file.
TCP/IP	"Host" and "Port"	Enter a host name and port number to which to deliver the report using a client TCP socket.
Workflow Module	"Module"	Enter a destination workflow module name to which to deliver the report.
Other	"URI"	Enter a URI to which to deliver the report.

6. *(JMS only)* Fill in values for the JMS subscriber-specific properties shown in Table 3-4.

   Note: To configure SAF JMS notifications, see Configuring the Edge Server To Use Client-side SAF.

Table 3-4 Subscriber Page (JMS Options)

Name	Description
Connection Factory	JNDI name of the connection factory (from the JMS server) for obtaining a topic connection or a queue connection. Use a topic connection factory name when you publish to a topic. Use a queue connection factory name when you add to a queue.
Provider URL	Optional. URL for the JNDI Naming service.
User	Optional. User name used to create a JMS topic or queue connection.
Password	Optional. Password used to create a JMS topic or queue connection.
Security Principal	Optional. Security principal associated with the JNDI Naming Service.
Authentication	Optional. Authentication string associated with the security principal.
Credential	Optional. Security credential associated with the security principal.
Naming Service Message Properties	Optional. These are added to the `javax.naming.Context` environment when one is constructed, in order to access a naming service to perform the necessary JNDI lookups. **Name** is the naming service message property name. Names are prefixed with `jndi:` **Value** is the string value. **Note:** In general, the properties in a naming properties file are considered default values, and can be overridden by a notification subscription URI (by adding the equivalent property to the notification URI as a query parameter). However, when configuring a SAF client, you cannot override naming properties by using a notification subscription URI. SAF only uses the properties in the naming properties file.
JMS Message Properties	Optional. These are added to the `javax.jms.TextMessage as String` properties. **Name** is the text message property name. **Value** is the string value.

7. Fill in values for the **Failure Action** section.

If the delivery of a report to a subscriber fails on consecutive tries, the Edge Server can automatically unsubscribe that subscriber. The **Failure Action** section defines the conditions under which that can occur. You can use the default failure action (**Use defaults**) or override it (**Override defaults**).

If you chose to override the defaults, specify one or both failure actions by clicking the check box next to the action – unsubscribe after N consecutive failures, or unsubscribe after N milliseconds of consecutive failures. You also need to enter a reasonable number for each action selected.

8. Click **Subscribe** to save your changes and associate the new subscription with the ECSpec.

To remove a subscriber from an ECSpec:

1. In the **ECSpecs** pane, select an ECSpec.
2. In the **Subscribers** pane, select a subscriber.
3. Click **Delete**.

Editing Subscribers

To edit a subscriber:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec.
3. In the **Subscribers** pane, select a subscriber.
4. Click **Edit**.
5. On the Subscriber page, make any desired changes and click **Save**.

   Note: When the new subscriber is saved, the original subscriber is unsubscribed and the changed subscriber is saved. If the save fails, the original subscriber remains unsubscribed (removed).

Using the ECSpec Editor

Use the ECSpec Editor to:

- Add, edit, view, and deploy ECSpecs.
- Add and edit ECSpec reports, report filters, report groups, and user memory regions.

- Test an ECSpec.
- Import an ECSpec.
- Export an ECSpec to an XML file.

Displaying the ECSpec Editor

To display the ECSpec Editor:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec and click **Edit**.

   The ECSpec Editor is displayed with four main menus:

   – "File Menu" on page 3-9
   – "Tools Menu" on page 3-10
   – "View Menu" on page 3-10
   – "Help Menu" on page 3-10

File Menu

Table 3-5 describes the ECSpec Editor File menu options.

Table 3-5 File Menu Options

Name	Description
Deploy	Deploys this ECSpec using the current name (equivalent to `redefine` in the ALE API). This menu item is enabled if you have unsaved changes to a previously defined ECSpec.
Deploy As...	Deploys this ECSpec using another name. You are prompted for the name. This item is equivalent to `define` in the ALE API.
Revert	Resets the ECSpec being edited to the last deployed version, and discards any recent changes made using the ECSpec Editor. If you have imported an ECSpec and have not yet deployed it, reset the ECSpec being edited to the version you imported.
Export	Exports this ECSpec to an XML file.
Close	Closes the ECSpec Editor.

Tools Menu

Table 3-6 describes the ECSpec Editor Tools menu options.

Table 3-6 Tools Menu Options

Name	Description
Test	Tests this ECSpec. See "Testing ECSpecs" on page 3-13.

View Menu

Table 3-7 describes the ECSpec Editor View menu options.

Table 3-7 View Menu Options

Name	Description
ECSpec Editor	View the ECSpec in the ECSpec Editor. Use the ECSpec Editor to modify and deploy your ECSpecs.
As XML	View the ECSpec in XML format. Use the ECSpec Editor to make further changes.
As Text	View the ECSpec in text format. Use the ECSpec Editor to make further changes.

Help Menu

Table 3-8 describes the ECSpec Editor Help menu options.

Table 3-8 Help Menu Options

Name	Description
ECSpec Help...	Displays a link to the Administration Console Help.

Creating and Deploying ECSpecs

Note: You must create at least one ECSpec Report before deploying an ECSpec. See "Creating ECSpec Reports" on page 4-1.

To create and deploy an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, click **New**.
3. In the ECSpec Editor, move one or more logical readers from the **Available** list to the **Selected** list using the arrows between the lists.
4. Add a **Start** condition and one or more **Stop** conditions to the ECSpec, using the controls in the Start and Stop sections in the ECSpec Editor.

   When the ECSpec has an active subscriber, the readers specified in the ECSpec start reading tags when the start condition is satisfied, and stop reading tags when *any* of the stop conditions are satisfied.

   Table 3-9 describes ECSpec start conditions and Table 3-10 describes ECSpec stop conditions.

Table 3-9 ECSpec Start Conditions

Start Condition	Description
Continuous	Start the next event cycle as soon as the previous event cycle ends.
Repeat Period (Milliseconds)	Start the next event cycle after a specified amount of time has elapsed from the start of the previous event cycle.
Trigger URI	Start the event cycle when a trigger is received.

Table 3-10 ECSpec Stop Conditions

Stop Condition	Description
Duration (Milliseconds)	Stop reading tags after the stated number of milliseconds.
Duration (Read Cycles)	Stop reading tags after the stated number of read cycles.
Stable Set Interval (Milliseconds)	Stop reading tags after the stated number of milliseconds have elapsed with no new tags seen.
Stable Set Interval (Read Cycles)	Stop reading tags after the stated number of read cycles have elapsed with no new tags seen.

Table 3-10 ECSpec Stop Conditions (Continued)

Stop Condition	Description
Minimum Stable Count	Stop reading tags after the stated number of tags have been seen and, *for each report*, the stated number of tags are included in that report.
Trigger URI	Stop reading tags when a trigger condition is received.

5. Enter application-specific data in the Application Data field, if any.

   Data entered here is copied to every report generated from this ECSpec.

6. Add at least one report to the ECSpec: select the **Reports** node in the left pane and click the **New Report** button in the right pane.

   See "Creating ECSpec Reports" on page 4-1 for more information.

7. Deploy the finished ECSpec by clicking the **Deploy As** button on the ECSpec Editor toolbar, filling in a name for the ECSpec when prompted, and clicking **OK** to save your changes.

   You may want to test the ECSpec before deploying. See "Testing ECSpecs" on page 3-13.

Importing ECSpecs

To import an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, click **Import**.
3. Select the ECSpec file to import and click **Open**.

   The ECSpec Editor displays the imported ECSpec.

4. Edit the ECSpec, if desired, and add, remove, or edit its report information.
5. Deploy the ECSpec by clicking the **Deploy As** button on the ECSpec Editor toolbar (or by selecting **File > Deploy As**), filling in a name for the ECSpec when prompted, and clicking **OK**.

   You may want to test the ECSpec before deploying. See "Testing ECSpecs" on page 3-13.

Editing ECSpecs

To edit an existing ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec.
3. Click **Edit**.

   The ECSpec Editor displays the ECSpec.
4. Edit the ECSpec, and add, remove or edit reports and filter information.
5. Deploy the finished ECSpec by clicking the **Deploy** button on the ECSpec Editor toolbar (or by selecting **File > Deploy**) and clicking **OK**.

   You may want to test the ECSpec before deploying. See "Testing ECSpecs" on page 3-13.

Testing ECSpecs

To test an ECSpec:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec.
3. Click **Edit**.
4. Click the **Test** button on the ECSpec Editor toolbar (or select **Tools > Test**) to generate a test report.

   If the test is successful, a Report window displays XML report data from the Edge Server after the ECSpec completes one activation (for example, the Start and Stop conditions are met).

   If the report does not appear quickly, a progress dialog appears. You can cancel the report from this dialog, if desired.

   Note: Testing an ECSpec turns on any readers used by that ECSpec.

   The Report window contains menu options to export the report to a file (**File > Export**), close the window (**File > Close**), and access Help (**Help > EC Report Help**).

Viewing ECSpecs as XML or Text

To view an ECSpec as XML or text:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec.

3. Click **Edit**.

   The ECSpec Editor displays the ECSpec.

4. Select **View > As XML** or **View > As Text**.

   The ECSpec Editor displays the ECSpec in text or XML format.

Exporting ECSpecs

To export an ECSpec to an XML file:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.

1. In the **ECSpecs** pane, select an ECSpec.

2. Click **Edit**.

   The ECSpec Editor displays the ECSpec.

3. Click the **Export** button on the toolbar (or select **File > Export**) to export the ECSpec to an XML file.

4. Specify a file name and location, and click **Save**.

Working With ECSpec Reports

The following sections describe working with ECSpec Reports:

Creating ECSpec Reports

Every ECSpec contains specifications for one or more reports. A report is based on the tags that were detected by the specified readers during the event cycle. It may have more or less information, based on the conditions of the report specification and any report filters or groups that have been defined.

When an event cycle completes, a set of reports for an ECSpec (for example, an ECReports object) is generated and can be sent to subscribers or other clients. For more information on subscribers, see "Creating and Removing Subscribers" on page 3-5.

Note: An ECSpec must contain at least one report before being deployed.

To create an ECSpec report:

1. In the left pane of the Console, expand an Edge Server node and select **ECSpecs**.
2. In the **ECSpecs** pane, select an ECSpec to which you will add a report.

3. Click **Edit** to display the ECSpec Editor.
4. In the ECSpec Editor, expand the **Reports** node in the left pane.

   The right pane displays a list of report specifications for the current ECSpec.
5. Click **New Report**.

   The new report is added to the left pane, and the right pane displays the report properties.

   Each report you add corresponds to an ECReportSpec object. For more information on this object, see Reading Tags Using the ALE API in *Programming with the ALE and ALEPC APIs*.
6. Enter a unique report name.
7. Use the check boxes in the **Report Contents** section to specify the report contents.

Table 4-1 Report Contents

Name	Description
EPC List	EPCs represented as pure identity URIs according to the EPCglobal Tag Data Standards (urn:epc:id:…). A pure identity URI contains just the EPC, with no additional information such as tag type, filter bits, and so on.
Tag List	The tag field contains EPCs represented as tag URIs according to the EPCglobal Tag Data Standards (urn:epc:tag:…). A tag URI contains all information on the tag, including the EPC, tag type, and filter bits (when applicable).
Raw Hexadecimal List	Raw tag values represented as raw hexadecimal URIs.
Raw Decimal List	Raw tag values represented as raw decimal URIs (urn:epc:raw:…).
Count	Total number of EPCs.

8. Choose the report set (the set of tags to include in the report) by selecting radio buttons in the **Report Set** section.

Table 4-2 Report Set

Name	Description
Current	All EPCs read in the current event cycle.
Additions	EPC additions from the previous event cycle.
Deletions	EPC deletions from the previous event cycle.

9. Use the check boxes in the **Omit Report** section to define the behavior when the report is empty.

   If you select the check box labeled **If omitted, suppress all ECReports this cycle**, the existence of this particular report will control whether any reports are sent to subscribers. Specifically, if this report is omitted based on one of the other conditions (empty, or unchanged from last cycle), no reports will be sent for the current cycle.

10. Enter application-specific data in the **Application Data** field, if any.

    Data entered here is copied to every report generated from this ECSpec.

11. Add one or more filters to the report, if desired. See "Creating Report Filters" on page 4-4.

    The report remains visible in the ECSpec Editor. Changes are saved when you deploy the ECSpec.

12. One ECSpec can contain many reports. To add more reports to the current ECSpec, repeat steps 4-11.

13. When you finish adding reports to the ECSpec, deploy it as described in "Creating and Deploying ECSpecs" on page 3-10 or "Editing ECSpecs" on page 3-12.

Editing ECSpec Reports

To edit an ECSpec report:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.

2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.

3. Select a report.

The right pane displays a set of properties for the current report.

4. Make any desired changes here.

   The report remains visible in the ECSpec Editor. Changes are saved when you deploy the ECSpec.

5. To edit more reports, repeat the steps 2 - 4.

6. Deploy the ECSpec by clicking the **Deploy** button on the ECSpec Editor toolbar (or selecting **File > Deploy**).

Removing ECSpec Reports

To remove an ECSpec report:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1 - 3 of "Creating ECSpec Reports" on page 4-1.

2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.

3. Select a report.

4. Click **Delete Report**.

   Changes are saved when you deploy the ECSpec.

   If you delete all the reports, the ECSpec becomes invalid and cannot be deployed; at least one report specification must be given.

Creating Report Filters

Report filters allow you to specify which tags will be included in and excluded from the report. You can filter tags based on any fields for the chosen tag format.

If there are any Include filters, tags that match at least one include filter pattern will be included in the report (unless they also match an Exclude filter). If there are no Include filters, then tags will be included unless they match any Exclude filters.

The Include and Exclude filters together make up an ECFilterSpec object. See Reading Tags Using the ALE API in *Programming with the ALE and ALEPC APIs*.

To add a report filter to an ECSpec report:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has two filter nodes beneath it (**Include** and **Exclude**).
4. Select **Include Filters** or **Exclude Filters** to display a list of filters of that type in the right pane.
5. Click **New Filter**.

   The new filter is added to the left pane, and the right pane displays the filter properties.
6. Choose a **Tag Format** from the drop-down list. For more information on tag formats, see the *EPCGlobal Tag Data Standards*.
7. Fill in the fields for that tag format (the fields shown depend on the format chosen).

   For detailed information, see ECFilterSpec in *Programming with the ALE and ALEPC APIs*.

   The filter remains visible in the ECSpec Editor until you choose a different node in the left pane.
8. To add more report filters to the current ECSpec, repeat steps 4 - 7.

   Changes are saved when you deploy the ECSpec.
9. When you finish editing the ECSpec, click the **Deploy** button on the ECSpec Editor toolbar (or select **File > Deploy**).

Editing Report Filters

To edit a report filter:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the ECSpec Editor, expand the **Reports** node in the left pane.

   Each report for this ECSpec is listed beneath the **Reports** node.
3. Expand an individual report node.

Each report node has two filter nodes beneath it (**Include** and **Exclude**).

4. Expand a filter node and select a filter to display the filter properties in the right pane.
5. Edit the fields as desired.

   The filter remains visible in the ECSpec Editor until you choose a different node in the left pane.
6. To edit more report filters in the current ECSpec, repeat steps 3 - 5.

   Changes are saved when you deploy the ECSpec.

Removing Report Filters

To remove a report filter:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has two filter nodes beneath it (**Include** and **Exclude**).
4. Expand a filter node and select a filter to display the filter properties in the right pane.
5. Click **Delete Filter**.

   Changes are saved when you deploy the ECSpec.

Creating Report Groups

Report grouping enables you to specify how a set of tag data will be separated into subdivisions within a report. You can create a group based on any of the fields for the tag format chosen, and define a series of rules that will generate groups within a report. Both list and count data included in the report are grouped.

When you create report groups, every tag reported in an event cycle will be part of exactly one group. If a tag does not match any pattern URIs in the pattern list, it is included in a special "default group." As a special case of the preceding rule, if the pattern list is empty (or if no groups are defined), all tags will be part of the default group. See EPC Patterns in *Programming with the ALE and ALEPC APIs*.

The report group information (all the groups specified under a Grouping node in the left pane of the ECSpec Editor) constitutes an ECGroupSpec object. See Reading Tags Using the ALE API in *Programming with the ALE and ALEPC APIs*.

To add a report group to an ECSpec report:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has a **Grouping** node beneath it.
4. Select the **Grouping** node to display a list of report groups in the right pane.
5. Click **New Group**.

   The new group is added to the browser tree, and the right pane displays the group properties.
6. Choose a **Tag Format** from the drop-down list.
7. Fill in the fields for the sections that are displayed beneath the tag format (the sections shown depend on the chosen format). For more information on tag formats, see the *EPCGlobal Tag Data Standards*.

   Table 4-3 describes grouping behavior you can specify. Fields are inactive when a grouping behavior is disallowed for a particular section.

Table 4-3 Grouping Options

Name	Description
Any	All values belong to a single group (will appear on a single report).
Group By	Create a different group for each distinct value (generate a separate report for each value).
Specific	Create a group for the value specified (and a default group for all other values).
Range	Create a group for the range of values specified (and a default group for all other values).

The group remains visible in the ECSpec Editor until you choose a different node in the left pane.

8. To add more report groups to the current ECSpec, repeat the steps 5-7.

   Changes are saved when you deploy the ECSpec.

Editing Report Groups

To edit a report group:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has a **Grouping** node beneath it.
4. Expand the **Grouping** node and select a group to display the group properties in the right pane.
5. Edit the fields as desired.

   The group remains visible in the ECSpec Editor until you choose a different node in the left pane.
6. To edit more report groups in the current ECSpec, repeat the steps 4 and 5.

   Changes are saved when you deploy the ECSpec.

Removing Report Groups

To remove a report group:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has a **Grouping** node beneath it.

4. Expand the **Grouping** node and select a group.
5. Click **Delete Group**.

   Changes are saved when you deploy the ECSpec.

Specifying User Memory Regions

In your report specifications, you can specify a memory location on Gen 2 EPCglobal tags.

For detailed information on writing and reading Gen 2 tags, see *Programming with the ALE and ALEPC APIs*.

To specify a user memory location:

1. Open the ECSpec Editor and select an ECSpec as described in steps 1-3 of "Creating ECSpec Reports" on page 4-1.
2. In the left pane of the ECSpec Editor, expand the **Reports** node to display the reports for the selected ECSpec.
3. Expand an individual report node.

   Each report node has a **User Memory Region** node beneath it.
4. Select **User Memory Region** and click **New User Memory Region**.
5. Specify a user memory region as described in Table 4-4.

   Changes are saved when you deploy the ECSpec.

Table 4-4 User Memory Regions

Name	Description
URI	URI-formatted string representing the contents of the requested memory segment. The URI includes a selection for memory bank, an offset within the memory bank, and a length of the memory extent, in bits. `urn:connecterra:tagmem:@bankid.length[.offset]` Where `bankid` is one of three values: `epc`, `tid`, or `user`. Length and offset are decimal values in bits. The default value for offset is 0.

Table 4-4 User Memory Regions (Continued)

Name	Description
EPC	Tag EPC value.
Memory Bank	Valid values are: `epc`, `tid`, or `user`. Length and offset are decimal values in bits. The default value for length is 32 and offset (optional) is 0.

CHAPTER 5

Configuring and Monitoring Readers

A reader is a generic term for a hardware device, also referred to as a physical reader, which reads EPC values from or writes EPC values to RFID labels (tags). The reader has one or more antennas which emit radio waves and receive signals back from the tag.

You configure the RFID Edge Server to communicate with all supported readers as follows:

- Edit the reader configuration information on the RFID Devices page in the Administration Console. See "Editing Readers" on page 5-3.

  OR

- Edit the `RFID_EDGE_HOME/etc/edge.props` file directly to configure these devices, where `RFID_EDGE_HOME` is the directory in which you installed the RFID Edge Server software. For more information about the `edge.props` file, see *Configuring WebLogic RFID Edge Server*.

Note: These two methods of configuring supported readers are mutually exclusive. You define all readers either through the Administration Console *or* by editing the `edge.props` file. See Two Approaches to Configuring Readers: edge.props or Administration Console in *Installing WebLogic RFID Edge Server*.

The following sections describe how to configure and monitor readers:

Displaying Readers

To display readers:

1. In the left pane of the Console, expand an Edge Server node.
2. Select **RFID Devices** under that Edge Server.

   Using the **RFID Devices** page on the right, you can create, remove, and configure readers for the Edge Server you selected.

Creating, Copying, and Removing Readers

To add a new physical reader to the selected Edge Server:

1. In the left pane of the Console, expand an Edge Server node and select **RFID Devices** to display the **RFID Devices** page.
2. Click **New** to display the **Create Reader** page.
3. Enter a device name (which will appear in the left pane of the Console) and select a **Reader Type** to display reader-specific properties.
4. Fill in values for the reader-specific properties shown.

   Properties with an asterisk (*) to the right of the field label must be filled in. Refer to the *RFID Reader Reference* and the manufacturer's manual for your reader for more information on these properties and their allowable values.
5. Click **OK** to save your changes and add the new reader to the Edge Server.

To make a copy of an existing reader:

1. In the left pane of the Console, expand an Edge Server node and select **RFID Devices** to display the **RFID Devices** page.

2. Select a reader from the list on the **RFID Devices** page.
3. Click **Clone**.

   The **Create Reader** page displays the device definition and properties of the reader you selected.
4. Edit the existing device name, and change the values of the device-specific properties as needed.
5. Click **OK** to save your changes and add the reader to the Edge Server.

To delete a reader from the selected Edge Server:

1. In the left pane of the Console, expand an Edge Server node and select **RFID Devices** to display the **RFID Devices** page.
2. Select a reader from the list on the **RFID Devices** page.
3. Click **Delete**.
4. Confirm that you want to delete this device from the Edge Server.

Editing Readers

To reconfigure an existing reader:

1. In the left pane of the Console, expand an Edge Server node and select **RFID Devices** to display the **RFID Devices** page.
2. Select a reader from the list on the **RFID Devices** page.
3. Click **Configure**.

   The **Edit Reader** page displays the device name, device type, and properties.
4. Make configuration changes as necessary, and click **OK** to save the changed reader configuration to the Edge Server.

Working with Composite Readers

You create composite readers by combining existing *logical readers*. Logical readers refer to one or more physical readers or antennas that have a single logical purpose; for example, readers positioned around a door might be called DockDoor42. Logical readers can be considered

equivalent to “locations.” See Comparing Physical Readers and Logical Readers in *Installing WebLogic RFID Edge Server*.

Composite readers provide an easy way to add or remove logical readers when one or more ECSpecs have already been defined. For more information on composite readers, see Using Composite Readers in *Installing WebLogic RFID Edge Server*.

Displaying Composite Readers

To display composite readers:

1. In the left pane of the Console, expand an Edge Server node.
2. Select **Composite Readers**.

   Use the **Composite Readers** page to add, remove, and configure Composite Readers.

Creating a Composite Reader

To create a new composite reader for the selected Edge Server:

1. In the left pane of the Console, expand an Edge Server node and select **Composite Readers** to display the Composite Readers page.
2. Click **New**.
3. On the **Create Composite Reader** page, enter a reader name (which will appear in the list in the readers shown in the **Composite Readers** page and in the ECSpec Editor), and move one or more logical readers from the **Available Readers** list to the **Included Readers** list using the arrow controls between the lists.
4. Click **OK** to save your changes and add the new composite reader to the Edge Server.

Copying a Composite Reader

To make a copy of an existing composite reader:

1. In the left pane of the Console, expand an Edge Server node and select **Composite Readers** to display the **Composite Readers** page.
2. Select a composite reader from the list.
3. Click **Clone**.

   The **Create Composite Reader** page displays the reader information.

4. Fill in a new composite reader name, and change the included readers as needed.
5. Click **OK** to save your changes and add the cloned composite reader to the Edge Server.

Deleting a Composite Reader

To delete a composite reader from the selected Edge Server:

1. In the left pane of the Console, expand an Edge Server node and select **Composite Readers** to display the **Composite Readers** page.
2. Select a composite reader from the list.
3. Click **Delete**.
4. Confirm that you want to delete this composite reader from the Edge Server.

Editing a Composite Reader

To reconfigure an existing composite reader:

1. In the left pane of the Console, expand an Edge Server node and select **Composite Readers** to display the **Composite Readers** page.
2. Select a composite reader from the list.
3. Click **Configure**.

   The **Composite Reader Configuration** page displays the reader name and list of included readers.
4. Make configuration changes as necessary, and click **OK** to save the changed composite reader configuration to the Edge Server.

Working with Transient Filters

Transient filters allow you to "smooth out" the stream of raw data coming from the reader—filter out tags that appear only briefly, keeping those tags that are read several times within a specified interval of time. See Smoothing Read Cycles with Transient Filtering in *Programming with the ALE and ALEPC APIs*.

You can apply a transient filter to any reader antenna (for example, a logical reader). Different logical readers may share the same filter settings, or have different settings. For more information about transient filters, see Adding a Transient Filter in *Installing WebLogic RFID Edge Server*.

Creating a Transient Filter

To add a transient filter:

1. In the left pane of the Console, expand an Edge Server node and select **Filters**.

   The Filters page displays the transient filters configured for the selected Edge Server.

2. On the **Filters** page, click **New** to display the **Create Filters** page.

3. Enter a filter name and select **Transient Filter** from the drop-down list.

   For each transient filter you add, define the following required parameters.

Table 5-1 Transient Filter Properties

Name	Description
Minimum Tag Reads	The number of times a tag must be read before being included in the filter (visible to the event cycle).
Firm Interval	The maximum time (in milliseconds) allowed between reads that increase the Minimum Tag Reads count.
Expired Interval	The maximum duration (in milliseconds) for a tag not to be read before expiring from the filter.

4. Click **OK**.

5. To apply the filter to a logical reader, specify the filter name in the reader configuration properties. See "Editing Readers" on page 5-3.

   To apply the same filter to more than one logical reader, specify the same filter name for more than one reader. Even though more than one logical reader refers to the same filter name, each logical reader is processed by a different filter instance.

Copying a Transient Filter

To make a copy of an existing filter:

1. In the left pane of the Console, expand an Edge Server node, and select **Filters** to display the **Filters** page.

2. Select a filter.

3. Click **Clone**.

   The **Create Filter** page displays the filter definition and properties of the filter you selected.

4. Edit the existing filter name, and change the values of the filter properties as needed.

5. Click **OK**.

Deleting a Transient Filter

To delete a filter:

1. In the left pane of the Console, expand an Edge Server node, and select **Filters** to display the **Filters** page.

2. Select a filter.

3. Click **Delete**.

4. Confirm that you want to delete this filter from the Edge Server.

Editing a Transient Filter

To reconfigure an existing transient filter:

1. In the left pane of the Console, expand an Edge Server node, and select **Filters** to display the **Filters** page.

2. Select a filter.

3. Click **Configure**.

   The **Edit Filter** page displays the device name, device type, and properties.

4. Make configuration changes as necessary. See "Transient Filter Properties" on page 5-6.

5. Click **OK** to save the changed filter configuration to the Edge Server.

Monitoring Readers

Using the Administration Console, you can monitor how long read cycles are taking, and keep track of how many read cycles have occurred since you started the Edge Server. You can see how many tags each reader is reading.

Also, you can examine configuration information for each reader, and examine the messages and warnings that the reader generated.

- "Displaying Reader Telemetry" on page 5-8
- "Displaying Reader Alerts" on page 5-10
- "Displaying Reader Attributes" on page 5-10

Displaying Reader Telemetry

To display reader telemetry:

1. In the left pane of the Console, select an Edge Server.
2. Expand the Edge Server node and the **RFID Devices** node associated with that Edge Server.
3. In the left pane, select the name of a physical reader.
4. In the right pane, select **Telemetry** at the bottom of the page.

   Telemetry information for each logical reader (antenna) appears.

   Note: Collapse telemetry graphs to improve presentation and performance; only the expanded (non-collapsed) views are updated.

   – Table 5-2 shows when read cycles occurred.

   – Table 5-3 shows how much time each reader is taking for a read cycle (read cycle time).

   – Table 5-4 shows how many tags this reader read in the field (tags in field).

   – Table 5-5 shows when write cycles (programming cycles) occurred.

   – Table 5-6 shows how much time each reader or printer is taking for a write cycle (write cycle time).

Table 5-2 readCycles

total	Total number of read cycles completed since the Edge Server was started.

Table 5-2 readCycles (Continued)

horizontal axis	Time stamps, in 24-hour time.
vertical axis	Shows how many read cycles were completed within the telemetry interval configured for the Edge Server. When the telemetry interval is very short (as the default 250ms is), this value is likely to be either zero (no read cycles) or one (one read cycle). If the telemetry interval is longer, larger values will be displayed when many read cycles are completed within one telemetry interval.

Table 5-3 readCycleTime

current	Value from the most recent read cycle.
horizontal axis	Time stamps, in 24-hour time.
vertical axis	Minimum and maximum read cycle times, in milliseconds.

Table 5-4 tagsIn Field

current	Value from the most recent read cycle.
horizontal axis	Time stamps, in 24-hour time.
vertical axis	Shows how many tags this reader read during each read cycle.

Table 5-5 writeCycles

total	Total number of write cycles (programming cycles) completed since the Edge Server was started. A programming cycle is an interval of time during which a single tag is written and verified.
horizontal axis	Time stamps, in 24-hour time.
vertical axis	Shows how many programming cycles were completed within the telemetry interval configured in the Edge Server.

Table 5-6 writeCycleTime

current	The value from the most recent write cycle.
horizontal axis	Time stamps, in 24-hour time.
vertical axis	Minimum and maximum write cycle times, in milliseconds.

Displaying Reader Alerts

To display reader alerts:

1. In the left pane of the Console, select an Edge Server.
2. Expand the Edge Server node and the **RFID Devices** node associated with that Edge Server.
3. In the left pane, select the name of a physical reader.
4. In the right pane, select **Alerts** at the bottom of the page.

   The **Reader Alerts** page shows messages and warnings generated by the reader.

   When you select an alert in the top pane, a preview pane opens at the bottom of the page displaying the complete text of the alert.

Table 5-7 Reader Alerts

Column	Description
Importance	• INFO (green) • WARNING (yellow) • SEVERE (red)
Date	Date and time the reader generated the message.
Message	Text of the message.

Displaying Reader Attributes

To display reader attributes:

1. In the left pane of the Console, select an Edge Server.

2. Expand the Edge Server node and the **RFID Devices** node associated with that Edge Server.
3. In the left pane, select the name of a physical reader.
4. In the right pane, select **Attributes** at the bottom of the page.

   The **Reader Attributes** page shows configuration information for this reader. The reader sends this configuration information to the Edge Server.

Table 5-8 Reader Attributes

Column	Description
antennaCount	Number of antennas this reader has.
hostname	Hostname or IP address that the Edge Server is using to communicate with this reader.
manufacturer	Reader manufacturer.
model	Reader model.
tcpPort	TCP port that the Edge Server is using to communicate with this reader.

Reading Real-Time Tag Data

This testing feature reads real-time tag data from any configured logical reader for a selected Edge Server and displays the results in the Administration Console.

To read tag data:

1. In the Console, select **Test > Read Tags** to display the **Read Tags** page.
2. From the **Server** drop-down list, select an Edge Server.
3. From the **Reader Name** drop-down list, select a logical reader name.

   Tag data polling on the selected reader starts immediately, displaying the results in the Read Tags data table. Table 5-9 describes the Read Tags data.

Table 5-9 Read Tags Data

Column	Description
Tag Value	Tag format and numerical value of the EPC. **Note:** A red X appears to the left of the **Tag Value** column when a tag has left the reader's field. After five minutes have passed without the reader's detecting a tag, that tag is deleted from the list.
Read Count	Number of times the tag has been read (seen by the reader) since the test started.
% Seen	Calculated as a percentage of read cycles in which the tag has been detected since the tag was first seen. Thus, a tag starts out at 100%, and if the tag is removed from the field, its percentage will decrease until the tag entry expires from the list in five minutes. This data is most valuable for measuring intermittent tags.
Last Seen	Number of seconds, minutes, and hours since the tag was last seen.
User memory	When reading a Gen 2 tag, the first snippet of user memory (32 bits).

4. Click **Stop** to suspend reading tag data.

   The values in the **Read Tags** data table do not update while reads are suspended, and tags do not expire from the list. If a read returns an error, reading tag data is suspended.

5. Click **Start** to continue reading tag data, **Clear** to reset tag data to zero, or **Close**.

CHAPTER 6

Configuring Workflow Modules

The following sections describe workflow modules and describe how to configure them through the RFID Edge Server Administration Console.

Overview of RFID Workflow Modules

Workflows coordinate the receipt of RFID data with other kinds of device input and output, and use the Electronic Product Code Information Service (EPCIS) interface to communicate to enterprise applications. Often, workflow applications interact with users through stack lights, LEDs, and Console UIs. A workflow provides business context—it integrates raw RFID data into one step of an operational business process.

Workflows are constructed from *workflow modules*, user-configurable building blocks used to create workflows in the WebLogic RFID Edge Server. A module takes input messages (event cycle reports or output from other modules), and emits workflow messages according to embedded business logic.

To configure workflows, you configure the ECSpec whose reports provide input to the workflow, then configure each module used in the workflow. See Configuring and Using Workflows and Workflow Module Reference in *Workflow Reference*.

Configuring Workflow Modules

This section describes using the Administration Console to configure workflow modules:

1. In the left pane of the Console, expand an Edge Server node.
2. Under that Edge Server, select **Workflow Modules**.
3. Choose the type of operation to perform:
   a. To define a new module, click **New**.
   b. To create a copy of an existing module, select the module and click **Clone**.
   c. To edit an existing module, select the module and click **Edit**.
   d. To delete an existing module, select the module and click **Delete**.
4. Give the module you are creating a unique **Module Name**.
5. Choose the **Module Type** from the drop-down list.
6. Configure the workflow module by filling in values for the fields according to the information provided in Workflow Module Reference in *Workflow Reference*.
7. Click **OK**.

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