

IBM Intelligent Water  
Version 1 Release 5

*IBM Intelligent Water Efficiency  
Analytics  
Product Documentation*

**IBM**



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Version 1 Release 5

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Analytics  
Product Documentation*



**Note**

Before using this information and the product it supports, read the information in "Notices" on page 163.

This edition applies to IBM Intelligent Water Efficiency Analytics version 1, release 5, modification 1. This edition applies to all subsequent releases and modifications until otherwise indicated in new editions.

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## Chapter 1. Solution overview

IBM® Intelligent Water Efficiency Analytics is a product in the IBM Intelligent Water Family from the IBM Smarter Cities® Software Solutions portfolio, which is a collection of industry solutions software designed for effective supervision and coordination of operations.

IBM Intelligent Water Efficiency Analytics is built on the IBM Intelligent Operations for Water 1.5 release. The solution provides an intelligent dashboard for a water management organization. It displays information on water infrastructure and events. Underlying the solution is a set of carefully constructed variability points, including programming and data models, that can be programmed and configured to meet the needs of different types of water management scenarios and organizations. IBM Intelligent Water Efficiency Analytics enables water operators to reduce water loss, prevent network disruptions, and make informed system-level decisions.

IBM Intelligent Water Efficiency Analytics provides a proactive systems response to real and apparent challenges in the non-revenue water domain. As a management solution, IBM Intelligent Water Efficiency Analytics is used to control leakages, optimize repairs, manage excessive pressure, upgrade pipe infrastructure, and manage associated work processes. IBM Intelligent Water Efficiency Analytics applies asset optimization and business analytics to the non-revenue water domain, by focussing on three key areas: pressure management, pipeline failure, and asset management.

### Pressure management

IBM Intelligent Water Efficiency Analytics consolidates data from a variety of sources to provide constant visibility and understanding of pressure status. Data such as pressure readings, tanks levels, and pressure loggers is taken from SCADA sources and made visible in the IBM Intelligent Water Efficiency Analytics interface.

Working with data such as Pressure Reducing Valve (PRV) and water pressure meter readings, IBM Intelligent Water Efficiency Analytics provides real-time alerts on pressure anomalies and provides detailed trend information. Using IBM Intelligent Water Efficiency Analytics, you can monitor and manage pressure status and gain insight on historical pressure key performance indicators and trends.

IBM Intelligent Water Efficiency Analytics provides an interactive pressure optimization wizard that enables operations personnel to manage and control conflicting pressure management objectives. Using the wizard, personnel can work in a simulated setting to examine and predict the impact of changes to pressure reducing valve and water pressure meter readings on the water network. The wizard provides recommendations for how to adjust pressure release valve readings to meet required pressure at critical points.

IBM Intelligent Water Efficiency Analytics displays the predicted pressure readings against requested goals. By using these capabilities, you can efficiently optimize flow and manage pressure to reduce leakage in the system under specific conditions. By gaining greater insight to pressure management strategies, utilities can identify, measure, reduce or potentially eliminate loss from the water distribution system.

### Pipe failure prediction

IBM Intelligent Water Efficiency Analytics enables utilities to analyze, monitor, and manage the pipe infrastructure. IBM Intelligent Water Efficiency Analytics provides technology that enables operations personnel to build a prediction model from historical maintenance records. Using pipe failure prediction technology, operations personnel can validate the existing model based on historical data, and visualize on a map the pipes with highest probability of failure based on the evaluation result. Using the

predictions, supervisors can proactively plan work on the pipeline network so that preventive action is taken in advance of any predicted leakage event.

## Asset management

IBM Intelligent Water Efficiency Analytics provides asset management technology.

Using the knowledge gained from pressure management and pipe failure prediction technologies, IBM Intelligent Water Efficiency Analytics enables you to synchronize work orders with preventive asset maintenance tasks by offering the Maximo® Asset Management integration service through the IBM Intelligent Operations for Water SDK.

By using the Maximo Asset Management integration service, supervisors can engage with enterprise asset management systems to perform preventive maintenance. Operations personnel can view asset details, create work orders, and view work order status.

IBM Intelligent Water Efficiency Analytics can help provide a common view of operations that transcends individual systems, devices and departments, aggregating and integrating data from various sources. Once data is reconciled and collated, water operational and executive personnel can visualize information in an intuitive fashion to quickly identify anomalies, trends, and patterns. Personnel can view information about a map that shows critical events and monitors key resources.

IBM Intelligent Water Efficiency Analytics can be deployed in two ways: either on premise or as a cloud-based offering. IBM Intelligent Water Efficiency Analytics can also be integrated with other products in the IBM Smarter Cities Software Solutions portfolio.

---

## Intended audience

This information center is intended for people who are using, installing, administering, and maintaining IBM Intelligent Water Efficiency Analytics. It also contains implementation documentation for customizing the solution and integrating the external water management systems that IBM Intelligent Water Efficiency Analytics requires.

This information center assumes that users have prior knowledge of, or proficiency with, the prerequisite software. Training for these base products is outside the scope of this information center. If you require training for these products, ask your systems integrator or IBM representative where you can obtain information about base component training opportunities.

You can find links to the component product documentation in the “Additional information” on page 161 page of the References section.

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## Features

IBM Intelligent Water Efficiency Analytics provides water management information and analytics that help monitor and manage water infrastructure, optimize reliability and performance, reduce operating expenses, and improve service provision to city, corporate and domestic water users.

IBM Intelligent Water Efficiency Analytics provides you with real time, map-based information, and spatial-temporal analytics that you can use to analyze the performance of your water management systems, assets, and networks. The available information and analytics help you to manage water maintenance initiatives and to identify potential problems before they occur.

IBM Intelligent Water Efficiency Analytics is prepackaged with implementation content and sample data that can be used to familiarize you with end-to-end data flows. The simulated environment provides education and shortens the adoption and implementation cycle.

The following table describes the features of IBM Intelligent Water Efficiency Analytics in more detail.

*Table 1. The features of IBM Intelligent Water Efficiency Analytics.*

Feature	Capabilities
Dashboard	<ul style="list-style-type: none"> <li>• Use a role-based dashboard to provide quick views of the critical operating alerts and Key Performance Indicators (KPIs).</li> <li>• Manage day-to-day operations and improve longer term planning.</li> <li>• Current and historical data views.</li> <li>• Centralized, comprehensive, and configurable platform.</li> <li>• Provides on-demand geographical visibility, analysis, and reporting, for current, future, and historic water data.</li> </ul>
Performance and optimization	<ul style="list-style-type: none"> <li>• Take advantage of sensor-based data which is collected in a data warehouse and optionally displayed on a dashboard.</li> <li>• Monitor performance and optimization of SCADA systems to track real time data on water management and to identify cost savings opportunities.</li> <li>• Use advanced statistical analysis along with best practices to enable the identification of areas of improvement and potential for optimization of water management.</li> <li>• Gain insight and ability to analyze historical patterns of water conditions in critical link areas.</li> </ul>
Asset management	<ul style="list-style-type: none"> <li>• Display information about equipment, water assets, network and infrastructure.</li> <li>• Interrogate water related assets to obtain status.</li> </ul>
Workflow management	<ul style="list-style-type: none"> <li>• My Activities portlet - view role-based activities and standard operating procedures as a gateway to handling incidents and work orders.</li> <li>• Maximo Asset Management gateway to handling enterprise asset management.</li> </ul>
Collaboration	<ul style="list-style-type: none"> <li>• Immediate access to a contact list on all pages enabling team collaboration and city wide communication.</li> <li>• Visibility of notifications - view changes in KPI that are available in interface. Related and unrelated events display in an area available for view on a map.</li> </ul>
Security	<ul style="list-style-type: none"> <li>• Integrates with historians not directly with SCADA systems.</li> <li>• Uses a role-based single sign on.</li> </ul>

Table 1. The features of IBM Intelligent Water Efficiency Analytics. (continued)

Feature	Capabilities
Data integration and storage	<ul style="list-style-type: none"> <li>• Integrates data from disparate water and data capture systems by using integration protocols recognized by the industry.</li> <li>• Water information model core and basic platform for visualization and analysis of water and event data.</li> <li>• Model manager integrates multiple SCADA, meter, and sensor systems in network.</li> <li>• Model manager provides a metadata view of the water infrastructure and defined KPIs.</li> </ul>
Extendable highly customizable model	<ul style="list-style-type: none"> <li>• Programming model is extendable to support future unknown facets of the water management world.</li> <li>• Scalability and reusability of Intelligent Cities products.</li> </ul>
Visualization	<ul style="list-style-type: none"> <li>• View system maps and filters on the map.</li> <li>• Turn on and off layers for display on a map.</li> <li>• Visualize and filter assets by district metered areas.</li> <li>• View ingested GIS data representing asset types that are defined in the model manager.</li> <li>• View pipe network, meter turnouts, sewer network, pumping station location, individual meter location.</li> <li>• View key performance indicators to monitor events such as: waste water removal, dry weather overflows, wet weather maximization, efficiency of collection systems. Track key measurements like Flow, Water Quality, Energy Consumption, Pump Efficiency, Pressure.</li> <li>• View work order location, pipe prediction failure location.</li> </ul>
Installation utility	<ul style="list-style-type: none"> <li>• The installation program logs all steps executed by the installer and, when finished, returns a successful log message.</li> <li>• A post-installation validation check is automatically carried out to ensure that the installation was successful.</li> </ul>
Globalization	<p>In addition to English, the IBM Intelligent Operations for Water product and online help is available in the following languages: Brazilian Portuguese, French, German, Korean, Simplified Chinese and Traditional Chinese, Spanish, Japanese, and Italian. The information center is available in the following languages: Brazilian Portuguese, French, German, Korean, Simplified Chinese and Spanish.</p>

## Users and benefits

IBM Intelligent Water Efficiency Analytics is designed for water operations and management personnel to help optimize and more efficiently manage water systems, assets, and networks across a geographically dispersed infrastructure.

The following table describes the users and associated benefits of using IBM Intelligent Water Efficiency Analytics.

*Table 2. Benefits of IBM Intelligent Water Efficiency Analytics*

If you are an ...	This software can help you ....
Operator or Supervisor	<ul style="list-style-type: none"> <li>• Identify and act on conflicts and issues shown on maps, dashboards, and alerts.</li> <li>• Manage events by adding new events, editing existing events, canceling events, and escalating events to incidents.</li> <li>• Monitor assets and key performance indicators (KPIs).</li> <li>• Communicate quickly and easily on matters of importance.</li> <li>• Monitor status, create and edit events and incidents to be shown in lists.</li> <li>• Identify the geographical location of work orders</li> <li>• Efficiently schedule maintenance work</li> <li>• Create and view information about work orders</li> <li>• Manage and monitor optimized pressure level and run simulations</li> <li>• Notify appropriate manager or executives and issue alerts.</li> <li>• Communicate quickly and easily in emergencies and other situations requiring a response.</li> </ul>
Executive	<ul style="list-style-type: none"> <li>• Gain an executive level summary of events and incidents through maps, dashboards, and alerts.</li> <li>• Determine measures of organizational success with KPIs.</li> <li>• Identify and track issues using reports.</li> <li>• Direct priorities and implementation of policy using data provided.</li> </ul>
Supervisor	<ul style="list-style-type: none"> <li>• Gain an executive level summary of events and incidents through maps, dashboards, and alerts.</li> <li>• Determine measures of organizational success with KPIs.</li> <li>• Identify and track issues using reports.</li> <li>• Direct priorities and implementation of policy using data provided.</li> </ul>
Planner	<ul style="list-style-type: none"> <li>• Identify water asset failures</li> <li>• Gain a summary of predicted water asset events and incidents through maps, dashboards.</li> <li>• Provide input to water pipeline failure models</li> </ul>
Consumer	<ul style="list-style-type: none"> <li>• View resource consumption and use.</li> </ul>
Administrator	<ul style="list-style-type: none"> <li>• Perform system and product administration tasks</li> <li>• Manage system access and security</li> <li>• Support Pipe Failure Prediction model builders</li> </ul>

---

## Components

IBM Intelligent Water Efficiency Analytics is built on concepts of visualization, information services, and data integration.

The following table describes the functional components that are specific to IBM Intelligent Water Efficiency Analytics.

*Table 3. IBM Intelligent Water Efficiency Analytics functional components and their capabilities*

Functional component	Capability
Model manager	Extends the core IBM Intelligent Operations for Water semantic model to allow meaningful queries and granular filtering validation.
Reporting (Cognos)	Generates customized reports that are generated from stored data.
Event engine (event and KPI preprocessor)	Integrates the key performance indicators (KPIs) that relate to a specific environment. <b>Note:</b> These KPIs can be atomic or roll-up. An atomic KPI must be capable of being calculated (typically) from information that a sensor or meter provides.
Standard operating procedures	Provides access to water-related standard operating procedures.
Historical reporting data store	Creates reporting and operational data stores that are based on the sensors and their measurement types and measurement values.
Messaging infrastructure	Implements streams, such as data from devices, sensors, and meters, as well as the measurement type and measurement values that these sensors provide.

Figure 1 on page 7 shows the IBM Intelligent Water Efficiency Analytics functional components and their relationships.



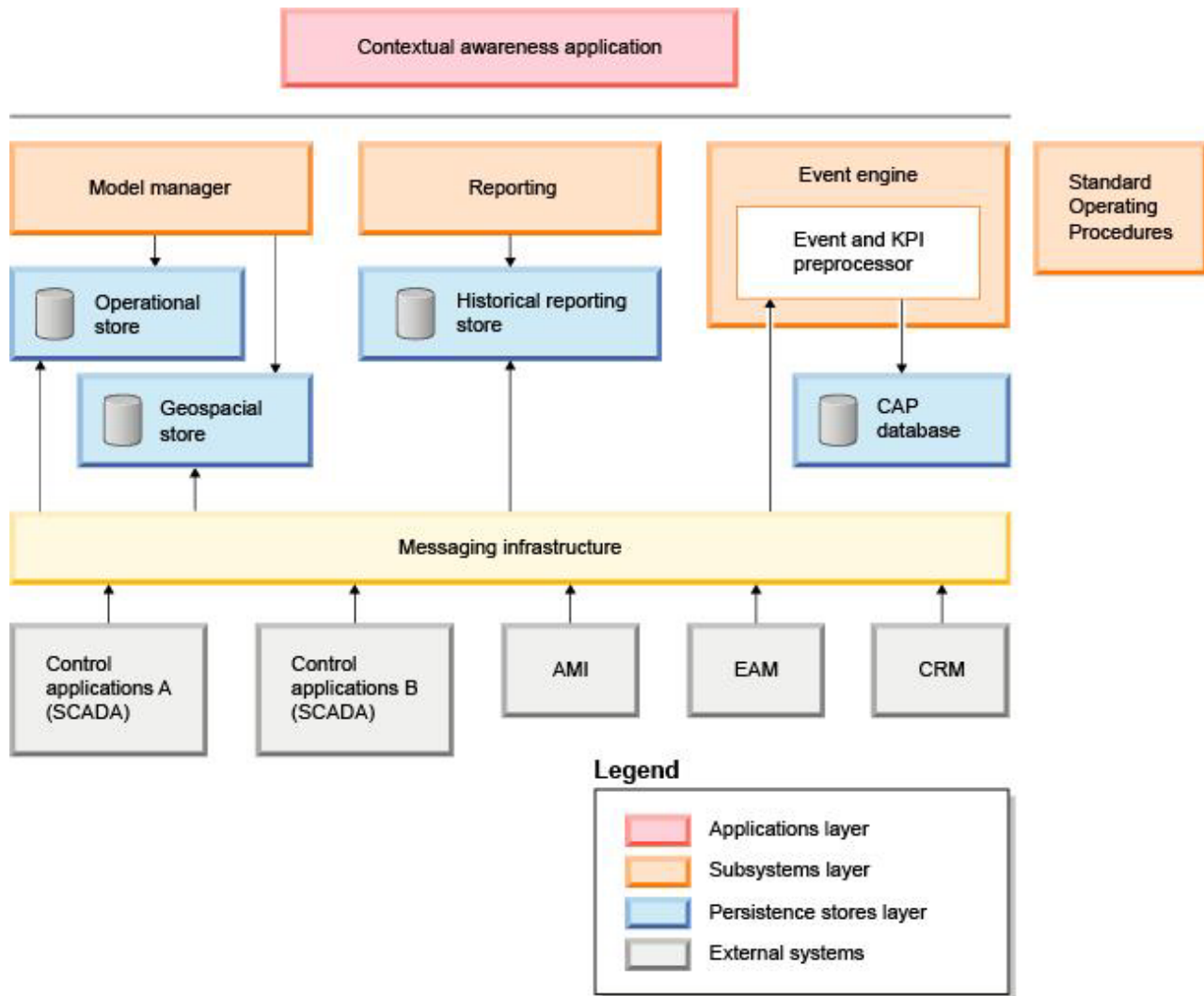


Figure 1. IBM Intelligent Water Efficiency Analytics functional components and their relationships

## Content packs

IBM Intelligent Water Efficiency Analytics is prepackaged with implementation content packs and sample data that can be used to familiarize you with end-to-end data flows. The content pack simulated environment facilitates learning and shortens the adoption and implementation cycle.

The IBM Intelligent Water Efficiency Analytics system comes with an optional sample set of data illustrating its use for water operations. The provided data allows for validation of the installed IBM Intelligent Water Efficiency Analytics by exercising all the customizable points within the programming model.

**Related concepts:**

Chapter 4, “Working with the content packs,” on page 17

IBM Intelligent Water Efficiency Analytics provides content packs that have been harvested over multiple projects. The content packs are made available with the IBM Intelligent Water Efficiency Analytics base product and installed into the platform to make IBM Intelligent Water Efficiency Analytics content aware.

**Related information:**

Semantic model

Asset types

Sample KPIs in Intelligent Operations Center

---

## Chapter 2. Installing and configuring

IBM Intelligent Water Efficiency Analytics is a solution that runs on top of the IBM Intelligent Operations for Water 1.5 and IBM Intelligent Operations Center. IBM Intelligent Water Efficiency Analytics provides a command line deployment utility that installs the package into the existing IBM Intelligent Operations for Water, IBM Intelligent Operations Center and underlying environment. After deploying the IBM Intelligent Water Efficiency Analytics, some additional configuration is required.

---

### Preparing to install

Before you install IBM Intelligent Water Efficiency Analytics, understand the system configuration and ensure that the prerequisites are met for the environment.

#### Before you begin

Ensure that the following software is installed and operational.

- IBM Intelligent Operations Center 1.5.
- IBM Intelligent Operations for Water 1.5.
- IBM Intelligent Operations for Water APAR PO00035.
- IBM Intelligent Operations for Water APAR PO00170.
- IBM Intelligent Operations Center APAR PO00211.

#### Procedure

1. Log on to IBM Intelligent Operations for Water 1.5.
2. Ensure that the IBM Intelligent Operations for Water system is working and all system services are operational.
3. Log on to WebSphere® Application Server at the following URL:  
`https://appserver:9043/ibm/console`
4. Access the application server and the management server. Ensure that all services are operational including WebSphere Portal Server, and WebSphere Business Modeler clusters. Ensure that the Cognos® and IBM Integrated Information Core servers can restart successfully.
5. Restart all servers before you install IBM Intelligent Water Efficiency Analytics.
6. Check the Cognos server has initialized by doing the following.  
`http://appserver:9081/ServletGateway/servlet/Gateway`  
`http://appserver:9082/p2pd/servlet/dispatch/ext`
7. Clear all source control file locks on the Tivoli® Netcool/Impact server.
  - a. Log on to the Tivoli Netcool/Impact server.  
`http://eventserver:9080/nci/login_main.jsp`
  - b. Select the **Global** tab and enable the option to **Clear all Source Control File Locking**.
8. Ensure that the WIH\_BROKER is started by completing the following steps.
  - a. Log on to the event server as mqmconn. If you are logged in as root, run the command `su - mqmconn`.
  - b. Run the following commands:  
`cd /opt/IBM/mqsi/8.0.0.0`  
`source bin/mqsiprofile`  
`bin/mqsilist`  
The following output is displayed.

```
BIP1284I: Broker 'WIH_BROKER' on queue manager 'WIH.MB.QM' is running.
BIP1284I: Broker 'IOC_BROKER' on queue manager 'IOC.MB.QM' is running.
BIP8071I: Successful command completion.
```

**Note:** The IOC\_BROKER is controlled by the Platform Control Tool; however the WIH\_BROKER is not.

- c. If the WIH\_BROKER is not running, run the following command, while logged on as mqmconn.

```
bin/mqsistart WIH_BROKER
```

9. Ensure the WATER\_WIH Tivoli Netcool/OMNIBus probe is started by completing the following steps.

- a. Log on to the event server as root.

- b. Run the following command:

```
ps -ef|grep water_wih
```

The two Product Identifier Descriptions (PIDs) are displayed.

```
root      14586      1  0 Feb22  ?
00:00:05 /opt/IBM/netcool/omnibus/probes/linux2x86/nco_p_nonnative
/opt/IBM/netcool/platform/linux2x86/jre_1.6.7/jre/bin/java -server -cp
/opt/IBM/netcool/omnibus/probes/java/nco_p_xml.jar:/opt/IBM/netcool/omnibus
 /probes/java/NSProbe.jar:
/opt/IBM/netcool/omnibus/java/jars/TransportModule.jar:
/opt/IBM/netcool/omnibus/java/jars/Transformer.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.ejb.thinclient_7.0.0.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.sib.client.thin.jms_7.0.0.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.messagingClient.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.mqjms.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.mq.jar:
/opt/IBM/netcool/omnibus/probes/java -Xrs -DOMNIHOME=/opt/IBM/netcool
 /omnibus nco_p_xml -name water_wih -propsfile
/opt/IBM/iss/iow/omnibus/xmlprobe/water_wih.props

root      14619 14586  0 Feb22  ?
00:00:18 /opt/IBM/netcool/platform/linux2x86/jre_1.6.7/jre/bin/java -server -cp
/opt/IBM/netcool/omnibus/probes/java/nco_p_xml.jar:/opt/IBM/netcool/omnibus
 /probes/java/NSProbe.jar:
/opt/IBM/netcool/omnibus/java/jars/TransportModule.jar:/opt/IBM/netcool/omnibus
 /java/jars/Transformer.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.ejb.thinclient_7.0.0.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.sib.client.thin.jms_7.0.0.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.ws.messagingClient.jar:
/opt/IBM/netcool/omnibus/java/jars/com.ibm.mqjms.jar:/opt/IBM/netcool/omnibus
 /java/jars/com.ibm.mq.jar:
/opt/IBM/netcool/omnibus/probes/java -Xrs -DOMNIHOME=/opt/IBM/netcool
 /omnibus nco_p_xml -name water_wih -propsfile
/opt/IBM/iss/iow/omnibus/xmlprobe/water_wih.props
```

- c. If there is no PID returned, run the following command.

```
cd /opt/IBM/iss/iow/omnibus/
./startXmlProbe.sh
```

**Note:** Check the progress of the startXmlProbe.sh command in the /opt/IBM/iss/iow/omnibus/water\_wih.log file. You must start the WIH\_BROKER before you start the WATER\_WIH Tivoli Netcool/OMNIBus probe.

**Note:** Follow the steps in this procedure after you use the Platform Control Tool to check that all components are started and that IBM Intelligent Operations for Water is fully operational. Both WIH\_BROKER and WATER\_WIH must be started manually as described in steps 8 and 9 after the event server system restart. You must complete the steps even if IBM Intelligent Water Efficiency Analytics is already installed.

## What to do next

Download IBM Intelligent Water Efficiency Analytics 1.5.1 from Fix Central.

### Related information:

Installing IBM Intelligent Operations for Water 1.5

Installing IBM Intelligent Operations Center 1.5

Controlling the services in IBM Intelligent Operations Center 1.5

Performing system verification checks

 [IBM Intelligent Operations for Water APAR PO00035](#)

 [IBM Intelligent Operations for Water APAR PO00170](#)

 [IBM Intelligent Operations Center APAR PO00211](#)

---

## Deploying from the command line

Use the command line utility to deploy the IBM Intelligent Water Efficiency Analytics solution.

### Procedure

1. Download the IBM Intelligent Water Efficiency Analytics 1.5.1 package from Fix Central.
2. Place the build package on the installation server which was used for IBM Intelligent Operations for Water 1.5. For example, use the /IOW151\_build folder.
3. Start a terminal session and run the following command.

```
cd /opt/IBM/IOC/BA/ioc /bin
export JAVA_HOME= /opt/ibm/java-i386-60
```
4. Import the IBM Intelligent Water Efficiency Analytics solution.

```
./ba.sh importSolution -f /IOW_151_build/IOW_151.zip -p <topology password>
```
5. Install the IBM Intelligent Water Efficiency Analytics solution.

```
./ba.sh installSolution -s IOW_151 -p <topology password>
```

The installation process begins.
6. If an error is displayed, check the install.log file for details. Correct any errors. Rerun the command.

### What to do next

Log on to the portal to verify that IBM Intelligent Water Efficiency Analytics was successfully deployed.

### Related concepts:

“Known problems and solutions” on page 151

Some common problems with IBM Intelligent Operations for Water are documented, along with their solutions or workarounds. If you have a problem with IBM Intelligent Operations for Water, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing. The problem-solution topics are categorized according to the type of issue.

---

## Post-installation configuration

After successfully completing the installation of IBM Intelligent Water Efficiency Analytics, additional steps are required to configure the solution.

**Related concepts:**

[“Installing the water conservation content pack” on page 24](#)

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

[“Installing the Pipe failure prediction content pack” on page 33](#)

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

[“Customizing the pressure optimization content pack” on page 43](#)

When you install the content pack, you can customize the data and features provided so that they meet your pressure optimization requirements.

[“Installing the Maximo content pack” on page 51](#)

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

---

## Chapter 3. Securing the solution

Securing IBM Intelligent Water Efficiency Analytics is an important consideration. To ensure that the system is secure, you must manage who can access the system and assign the correct level of access within the solution.

### Securing the base architecture

Because IBM Intelligent Water Efficiency Analytics is a solution that runs on top of the IBM Intelligent Operations Center, set the high-level security settings through the IBM Intelligent Operations Center. For details on the various options available, see the security section of the IBM Intelligent Operations Center Information Center.

### Securing the data import

The importing of data into IBM Intelligent Water Efficiency Analytics is performed on the management server. Ensure that the method used to connect and transfer data on to this server is secure. For more information, see the related links at the end of this topic.

### Securing the portal

The following topics explain how to secure the solution and manage user access to the IBM Intelligent Water Efficiency Analytics portal.

#### Related information:

- Securing the solution
- Adding users and groups
- Viewing or modifying group membership
- Removing users or groups
- Viewing or modifying user profiles
- Setting the password policy
- Securing the IBM Intelligent Operations Center
- Cyber hygiene
- Securing the model

---

## User roles and responsibilities

IBM Intelligent Water Efficiency Analytics implements security by limiting access to features and data based on user roles.

The security model and user access roles of IBM Intelligent Water Efficiency Analytics are consistent with the IBM Intelligent Operations Center and other IBM Smarter Cities Software Solutions.

To use a specific feature of IBM Intelligent Water Efficiency Analytics, a user must be a member of a user role group that provides the required access level to use that feature. A user is made a member of a user role group by the administrator.

Table 1 shows the authorized pages, portlets, and responsibilities of the user roles of IBM Intelligent Water Efficiency Analytics.

Table 4. The roles of IBM Intelligent Operations for Water.

User role (role group)	Authorized pages	Authorized main responsibilities
Water Executive	Executive: Status view	The user role can access only the Executive: Status view.
Water Supervisor	None	The user role protects backed services. It is not authorized to view any pages. If a user is added to the Potable Water Operator or Waste Water Operator group, the user must also be added to the Water Supervisor group.
Water Operator	None.	The user role protects backed services. It is not authorized to view any pages. If a user is added to the Potable Water Operator or Waste Water Operator group, the user must be added to the Water Operator group.
Water Planner	None.	The user role protects backed services. It is not authorized to view any pages. If a user is added to the Potable Water Operator or Waste Water Operator group, the user must be added to the Water Planner group.
Water Administrator	City: Water Conservation view Citizen: Water Conservation view	The user role has all preceding responsibilities. Additionally, this user role can configure the page layout, the base map, and the map starting point. The role can also configure portlets, including Map, Details, Status, Key Performance Indicator drilldown, Notification, My Activities, Contacts. <b>Note:</b> Users that have been solely assigned the Water Administrator role cannot access the Citizen View portlet on the Citizen: Water Conservation view. To create access for the users, you must assign the System Administrator role to them by creating a user record in the WCP.ACCOUNT table of the Water Conservation Portal database.
Waste Water Supervisor	Supervisor: Status view	There are two Supervisor: Status views: one for waste water and one for portable water. The user role can access only the Supervisor: Status view for waste water.
Waste Water Operator	Operator: Operations view	This user role can access the Operations view of waste water. It is not authorized to view City View: Water Conservation, which is accessed only by the Potable Water Operator.



Table 4. The roles of IBM Intelligent Operations for Water. (continued)

User role (role group)	Authorized pages	Authorized main responsibilities
Potable Water Supervisor	Supervisor: Status view	This user role can access the Supervisor: Status view for potable water. It can access the Status, Key Performance Indicator drilldown, Notifications, My Activities, and Contacts portlets. The role is not authorized to view the map and its details.
Potable Water Operator	Operator: Operations view City: Water Conservation view	This user role can access the Operator: Operations view for potable water, and the City View: Water Conservation view.
Potable Water Planner	Planner: Analysis view	This user role can access the Planner: Analysis view.
Water Consumer	Citizen: Water Conservation view	The user role is a feature that is available when Interim Feature 2 is installed.

**Related information:**

Adding users and groups

---

## Sample users

During the deployment of IBM Intelligent Water Efficiency Analytics, sample users are created with corresponding responsibilities and access permissions.

IBM Intelligent Water Efficiency Analytics includes the following sample users.

User role	User ID	User name
Water Executive	jharckness	Jack Harckness
Water Supervisor	gkooper and edrummand	Gwen Kooper and Esther Drummand
Water Operator	gkooper and edrummand	Gwen Kooper and Esther Drummand
Water Planner	gkooper and edrummand	Gwen Kooper and Esther Drummand
Water Administrator	eharper	Eoin Harper
Waste Water Supervisor	gkooper	Gwen Kooper
Waste Water Operator	gkooper	Gwen Kooper
Waste Water Planner	gkooper	Gwen Kooper
Potable Supervisor	edrummand	Esther Drummand
Potable Operator	gkooper	Gwen Kooper
Potable Planner	gkooper	Gwen Kooper
Water Consumer	tmorgan	Tom Morgan

By default, the sample users only have access to the IBM Intelligent Water Efficiency Analytics solution.

If the sample users require access to the IBM Intelligent Operations Center and other IBM Smarter Cities Software Solutions installed in this environment, they must be added to the relevant user roles for those solutions.

**Related information:**

Deleting sample users

User roles and access in the IBM Intelligent Operations Center

---

## Chapter 4. Working with the content packs

IBM Intelligent Water Efficiency Analytics provides content packs that have been harvested over multiple projects. The content packs are made available with the IBM Intelligent Water Efficiency Analytics base product and installed into the platform to make IBM Intelligent Water Efficiency Analytics content aware.

IBM Intelligent Water Efficiency Analytics provides content packs as a collection of industry best practices, key performance indicators (KPIs), reports, and standard operating procedures (SOPs). Content pack elements are depicted by specific icons and interface artifacts and are used to serve a particular water industry segment.

In the IBM Intelligent Operations for Water 1.5 release, content packs were used to provide content for an entire water vertical such as waste water. In IBM Intelligent Operations for Water 1.5.0.2, with the release of the IBM Intelligent Operations for Water SDK, content packs are provided to support application development in a model view controller paradigm (MVC) pattern. Each application released in IBM Intelligent Water Efficiency Analytics 1.5.1 builds on the model view controller paradigm.

Each application is provided with its own content pack. For example, the pressure optimization content pack is built on top of the IBM Intelligent Operations for Water Software Developer Toolkit (SDK). The content pack provides external data sources, data extensions for the model, events and correlations, and customer reports. The content packs define the algorithms that the application uses and the standard operating procedures (SOPs) used. Developers can work with the supplied content packs to upgrade, enhance or customize the IBM Intelligent Water Efficiency Analytics application provided.

### Related concepts:

“Content packs” on page 7

IBM Intelligent Water Efficiency Analytics is prepackaged with implementation content packs and sample data that can be used to familiarize you with end-to-end data flows. The content pack simulated environment facilitates learning and shortens the adoption and implementation cycle.

---

## Waste water content pack

IBM Intelligent Water Efficiency Analytics 1.5.1 comes with an optional sample set of data illustrating its use for waste water operations. The waste water samples were first provided in IBM Intelligent Operations for Water 1.5. The data allows for validation of the installed IBM Intelligent Water Efficiency Analytics 1.5.1 by exercising all the customizable points within the programming model.

The following samples are provided in the content pack.

- An extension to the initial semantic model that provides asset types for waste water. For example, River Gauges, Rain Gauges, Waste Water Plants, Combined Sewer Overflow (CSO) Diversion Structures, Trunk Line Monitors, and Lift Stations.
- A set of connected resources (connected sewers) to display on the Map in the form of Resource Description Framework (RDF) files.
- A set of sample assets is provided based on the above asset types.
- Linkages are provided to measurement and measurement values for the above assets.
- Waste water table structures are provided for managing alerting and events.
- Sample Key Performance Indicators (KPIs) are provided based on Storm Water Overflow Management, Fixed Asset Repair and Management and Waste Water Treatment and Recycling.
- Sample standard operating procedures are provided that are automatically triggered on certain waste water related events. For example, a CSO Diversion Structure high water level.

- Sample Tivoli Netcool/Impact policies are provided that handle incoming reading values, and trigger alerts, events, sample KPIs and standard operating procedures. The Tivoli Netcool/Impact policies are available on the event server.

The waste water sample files are available in the: /opt/IBM/iss/iow/samples directory on their respective servers. For example, the model manager files are available on the management node, and the monitor samples are available on the application server. If you load the sample data during the installation process, the files are deployed and available for your education and learning.

Samples provided by IBM Intelligent Operations Center are also available to IBM Intelligent Operations for Water. IBM Intelligent Operations for Water also provides sample users for security configuration. All samples are available to further understand the capabilities of IBM Intelligent Operations for Water and to ensure that the installed system operates correctly.

## Asset samples

Sample waste water asset types, sample assets based on those types, and sample measurement and measurement values for assets are provided when you install the waste water content pack. The data provides a model instance of data in a geographic region. The data consists of 57 items of the various asset types that are listed. A sample pipeline asset instances RDF file that describes the pipe network is also provided.

Table 5. Sample asset data

Sample	Description
Asset types	Transmitter Level, Indicator Flow, Pump Centrifugal, Flow Meter, CSO Diversion Structure, Pipe, Junction
Asset measurements	CSO Level, Rain Gauge, Waste water plant influent flow rate, CSO overflow volume year to date
Measurement status	No reading, Critical, Caution, Acceptable
Logical zones	Zone 1, Zone 2

## Alert and event samples

Sample waste water table structures for managing alerting and events are provided when you install the waste water content pack. The sample data includes alert and event samples for, for example, Combined Sewer Overflow (CSO). An event is posted when a CSO reaches 70 percent of its overflow height and when a CSO reaches 100 percent of its overflow height.

## KPI samples

Sample waste water KPIs are provided when you install the waste water content pack.

Table 6. Summary of Sample KPIs

Sample	KPI Description
Storm Water Overflow Management	<ul style="list-style-type: none"> <li>• Dry weather sewer overflows</li> <li>• Dry weather sewer overflows prevented</li> <li>• Wet weather collection system maximization</li> </ul>
Waste Water Treatment and Recycling	<ul style="list-style-type: none"> <li>• Total volume of waste water treated</li> <li>• Volume of waste water treatment plant effluent recycled</li> <li>• Wet weather waste water plant maximization</li> </ul>

Table 6. Summary of Sample KPIs (continued)

Sample	KPI Description
Fixed Asset Repair and Management	<ul style="list-style-type: none"> <li>• Cumulative number of pump starts and stops</li> <li>• Cumulative pump runtime</li> <li>• Number of feet of sewer inspected</li> </ul>

## Storm Water Overflow Management

Storm Water Overflow Management groups three KPIs:

1. Dry weather sewer overflows
  - *Overflow volume the past seven days* counts the number of dry weather sewer overflows that have occurred during the past seven days.
  - *Overflow volume this month* counts the number of dry weather sewer overflows that have occurred during the current month.
  - *Overflows the past seven days* totals the discharge volume for all dry weather sewer overflows that have occurred during the past seven days.
  - *Overflows this month* totals the discharge volume for all dry weather sewer overflows that have occurred during the current month.
2. Dry weather sewer overflows prevented
  - *Overflows prevented the past seven days* counts the number of dry weather sewer overflows that have been prevented during the past seven days.
  - *Overflows prevented this month* counts the number of dry weather sewer overflows that have been prevented during the current month.
3. Wet weather collection system maximization
  - *Actual compared to typical overflow volume* calculates the percentage the corrected combined sewer overflow volume amount (by rainfall) is over or under the typical combined sewer overflow volume amount.
  - *Actual compared to typical overflow volume as a percentage* calculates the difference between the corrected combined sewer overflow volume amount (by rainfall) and the typical combined sewer overflow volume amount.

## Waste Water Treatment and Recycling

Waste Water Treatment and Recycling groups three KPIs:

1. Total volume of waste water treated
2. Volume of waste water treatment plant effluent recycled
3. Wet weather waste water plant maximization
  - *Discharge volume the past seven days* counts the volume of waste discharged during the past seven days.
  - *Discharge volume this month* counts the volume of waste discharged during the past month.
  - *Waste water treatment plant discharge less than specified volume the past seven days* calculates the discharge flow rate during the past seven days.
  - *Waste water treatment plant discharge less than specified volume the past month* calculates the discharge flow rate during the past month.

The Wet weather waste water plant maximization KPI counts the number of times the Waste Water Treatment Plant does not reach a specified discharge flow rate during wet weather and an overflow condition at the Combined Sewer Overflow (CSO). KPIs are processed in the following way.

- Rain gauge, waste water treatment plant, and sewer overflow data readings are collected from sensors and meters.
- When a rain gauge reading is received, a policy that is defined in Tivoli Netcool/Impact determines if it is wet weather now, and sets the wet weather indicator.
- When a waste water plant reading is received, the policy that is defined in Tivoli Netcool/Impact calculates the plant flow rate and stores the rate temporarily.
- When a reading from the defined CSO diversion structure is received, the policy defined in Tivoli Netcool/Impact calculates the overflow volume of the CSO, composes a CAP event and sends the event to IBM WebSphere Business Monitor .
- IBM WebSphere Business Monitor calculates the KPI and sends the notification to WebSphere Portal for display in the portal.

## Fixed Asset Repair and Management

Fixed Asset Repair and Management groups three KPIs:

1. Cumulative number of pump starts and stops
2. Cumulative pump runtime
3. Number of feet of sewer inspected

## Standard Operating Procedure samples

Sample standard operating procedures, workflows, and resources are provided when you install the waste water content pack.

Table 1 describes the samples.

*Table 7. Standard Operating Procedure samples*

Standard Operating Procedure	Description
PLUSIDWSOP	Process to prevent dry weather sewer overflow. A procedure that is invoked to prevent a Combined Sewer Overflow (CSO) from occurring. It is automatically invoked if a 70 percent CSO weir height event is triggered.
PLUSIDWSOC	Dry weather sewer overflow confirm. A procedure that is invoked after an overflow occurs in a CSO. The procedure allows the manager to confirm that the overflow has occurred.

## Using the waste water content pack

When the waste water content pack is installed, you can view waste water content in your installation and begin to perform executive or operator role-based tasks depending on your login credentials.

### Operator: Operations view

Use the Operator: Operations view to maintain awareness of the status of water assets, measurement readings, water events, and their location. The Operator: Operations view is intended for operators, managers, or others monitoring and responding to current water infrastructure events.

The Operator: Operations view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the operations level.

Table 8. Operator: Operations view portlets

Portlet	Description
<p>“Map” on page 94</p>	<p>A <b>Geospatial Map</b> of the geographical region that contains event and resource markers, water asset and status, logical zones and layers.</p> <p>A filter form to select the categories of events to be shown on the map and in the <b>Events and Incidents</b> tab on the Details portlet.</p> <p>A filter form to select the asset types to be shown on the map and in the <b>Assets</b> tab on the Details portlet.</p> <p>A filter form to select the logical zones to be shown on the map.</p> <p>A filter form to select the layers to be shown on the map. Use the layers to filter assets to display on the map, for example by virtual group or pipe network.</p> <p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p> <p>A <b>Logical Map</b> of the logical structure that contains a graphical view of the model. The model shows topics, topic associations, and linkages in the model.</p>
<p>“Details” on page 101</p>	<p>The Details portlet is an interactive list portlet. All the events that you are authorized to see are visible on the events list and on any map portlet that is linked to the Details portlet. Events and incidents and asset details are displayed. Resources in the vicinity of an event can be displayed in a resource list and on a map. Key asset measurements, including current and historical values can be displayed.</p> <p>Work orders that you are authorized to see are visible on the work order list and on any map portlet that is linked to the Details portlet.</p>
<p>“Notifications” on page 107</p>	<p>The Notifications portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.</p>
<p>“My Activities” on page 109</p>	<p>The My Activities portlet displays a list of activities that are owned by the person currently logged on to IBM Intelligent Operations for Water. In the My Activities portlet, the activities are grouped by their parent Standard Operating Procedures. Each Standard Operating Procedure corresponds to an individual event.</p>
<p>“Contacts” on page 111</p>	<p>The Sametime portlet provides a contacts list that is organized by group. It can be customized based on the people you communicate with. You can chat with people and modify your online status, contacts, or groups.</p>

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

## Administrator

### Customizing a portlet

As an administrator you can change portlet settings by clicking the upper right corner of the portlet, and selecting an option from the portlet menu.

There are two possible modes of customization, each changing the portlet settings for all users:

- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

## Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

### Executive: Status view

Use the Executive: Status view to obtain a consolidated view of key performance indicators (KPIs) and key events. The Executive view enables users with cross-organization responsibility to monitor, manage, and respond to status changes in key areas of organizational performance.

The Executive: Status view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the executive level.

Table 9. Executive: Status view portlets

Portlet	Description
"Status" on page 105	The Status portlet provides an executive-level summary of the status of KPIs across the organizations that you have permission to view. Use this portlet to view up-to-date changes in the KPI status so that you can plan and act if necessary.



Table 9. Executive: Status view portlets (continued)

Portlet	Description
“Key Performance Indicator Drill Down” on page 107	To focus on a specific KPI category, click the category in the Status portlet. This category is then displayed in the Key Performance Indicator Drill Down portlet. You can use the list to inspect the underlying KPIs until you reach details of the KPI that caused the status change.
“Notifications” on page 107	The Notifications portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.
“My Activities” on page 109	The My Activities portlet displays a list of activities that are owned by the person that is currently logged on. In the My Activities portlet, the activities are grouped by their parent Standard Operating Procedures. Each Standard Operating Procedure corresponds to an individual event.
“Contacts” on page 111	The Sametime portlet provides a contacts list that is organized by group. It can be customized based on the people you communicate with. You can chat with people and modify your online status, contacts, or groups.

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- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

### Administrator

## Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

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## Water conservation content pack

IBM Intelligent Water Efficiency Analytics comes with an optional sample set of data illustrating its use for water conservation operations.

The water conservation content pack integrates water consumption analysis in the dashboard. Both the City: Water Conservation and Citizen: Water Conservation views are displayed as tabs in the user interface. City: Water Conservation view provides a geographical view of aggregated household water consumption data. Citizen: Water Conservation view provides targeted individual household consumption data for a selected account. By monitoring water consumption and trends, both consumers and utilities can detect and act on problems such as water leaks and wastage.

## Installing the water conservation content pack

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

### Related tasks:

“Post-installation configuration” on page 11

After successfully completing the installation of IBM Intelligent Water Efficiency Analytics, additional steps are required to configure the solution.

### Related information:

 [IBM Intelligent Operations for Water 1502 documentation](#)

## Data import

Meter, account, and billing source data is required for the Water Conservation Portal component. Sample data is provided to help you familiarize with the process of data ingestion.

IBM Intelligent Water Efficiency Analytics uses multiple heterogeneous input data sources. In a typical deployment, static and dynamic data is gathered from household or community-based water metering infrastructure. Meter readings are captured at specified intervals and the data that is gathered is transmitted to wireless gateways at specified intervals and uploaded to an FTP site.

The data that is gathered from the advanced metering infrastructure is the basis for fine-grained consumption analyses to improve both consumption and demand management.

Data that is gathered is extracted, transformed, and loaded to a trusted data source on the Data server. The secure data is used by Water Conservation Portal to produce advanced water consumption analysis and leak alerts.

**Important:** Sample data is provided to help you familiarize with the process of importing and configuring data ingestion. The sample data that is provided within is generated both randomly and in and around the city of South Bend for the purposes of illustrating the Water Conservation Portal.

## Importing user information

Scripts are provided to simplify the import of data from CSV file sources into the database. Importing LDAP authentication and authorization data is also facilitated by providing an XML file sourced in the database.

## Procedure

1. Log on to the Data server as root.
2. Locate the scripts to import user information into the database from the CSV file. The scripts are in the /opt/IBM/iss/iow/wcp folder.
3. Use the sample user data available (account.csv, meter.csv, household.csv, household\_meters.csv) to test your data import flow. Run the command:

```
./import_users.sh /opt/IBM/iss/iow/wcp/account.csv /opt/IBM/iss/iow/wcp/meter.csv  
/opt/IBM/iss/iow/wcp/household.csv /opt/IBM/iss/iow/wcp/household_meters.csv
```

The following data columns are created by the installer for the account.csv sample user data and populated by running the script. Data from account.csv file are populated into the WCP.ACCOUNT table  
ACCOUNT\_ID(NOT NULL), ADDRESS, CITY, STATE, ZIPCODE, TYPE, EMAIL, ROLE(NOT NULL), CLASSIFICATION

**Note:** ACCOUNT\_ID is unique. A role can be uadmin or PM.

The following data columns are created by the installer for the meter.csv sample user data and populated by running the script. Data from the meter.csv file are populated into the WCP.METER table.  
METER\_ID(NOT NULL), METER\_MODEL, METER\_TYPE, MULTIPLIER(NOT NULL)

**Note:** METER\_ID is unique. MULTIPLIER is a number.

The following data columns are created by the installer for the household.csv sample user data and populated by running the script. Data from the household.csv file are populated into the WCP.HOUSEHOLD table.

HOUSEHOLD\_ID(NOT NULL), HOUSEHOLD\_NAME, LATITUDE, LONGITUDE, ACCOUNT\_ID(NOT NULL)

**Note:** HOUSEHOLD\_ID is unique, A household only belongs to one account.

The following data columns are created by the installer for the household\_meter.csv sample user data and populated by running the script. Data from the household\_meter.csv file are populated into the WCP.HOUSEHOLD\_METERS table.

METER\_ID, HOUSEHOLD\_ID

**Note:** The relationship between household and meters are described in this CSV. A meter only belongs to one household.

4. To import LDAP authentication and authorization data, log on to the IBM Intelligent Operations Center 1.5 portal.  
http://<appserver> with wpsadmin user
5. Navigate to **Administration > Portal settings > Import xml**. The default password for all sample users is *passwd0rd*. You can change the password in the XML file before you import the XML file.
6. Import the file iow\_wcp\_portaluser.xml located at /opt/IBM/iss/iow/wcp/portalexml on the data server. The /opt/IBM/iss/iow/wcp/portalexml/iow\_wcp\_portaluser.xml file, from the data server, is provided as an example and can be used to import users defined in the sample account.csv file in step 3 above.

## Configuring data ingestion for meters

The Tivoli Directory Integrator software is used to facilitate the import and configuration of meter reading and billing data.

## Procedure

1. Log on to the Management server.
2. Edit the TDI\_WCP.properties file in the /home/ibmadmin/TDI/configs folder.
3. Verify that the database details are correct:

```
JDBC URL: wcp.db.jdbc.url  
Username: wcp.db.username  
Password: wcp.db.password
```

4. Update the FTP details.

```
Hostname: wcp.ftp.hostname
Port: wcp.ftp.port
Username: wcp.ftp.username
Password: wcp.ftp.password
Billing data file path: wcp.ftp.path.billing-data
Meter data file path: wcp.ftp.path.meter-reading-data
```

5. Copy the CSV files onto the FTP server.

6. After ingestion of a large amount of historical meter reading data it is recommended to manually execute RUNSTATS on the meter reading table to ensure good performance is maintained.

```
DB2 CONNECT TO WCPDB
DB2 RUNSTATS ON TABLE WCP.METERREADING ON ALL COLUMNS WITH DISTRIBUTION ON ALL COLUMNS
AND INDEXES ALL ALLOW WRITE ACCESS
DB2 CONNECT RESET
```

## Results

The data is imported into the database when the Cron task is triggered.

## Example

Sample CSV files are available for reference in the /opt/IBM/iss/iow/tdi/tdi\_csv folder on the Management server.

### Configuring Tivoli Directory Integrator to import meter data: About this task

You can optionally run the Tivoli Directory Integrator configuration to import meter reading and billing data separately. You must run the analysis program manually to complete the steps.

### Procedure

1. Log in as administrator: `su - ibmadmin`.
2. Set the path export `TDIPATH=/opt/IBM/TDI/V7.1` command.
3. Set the solution directory path: `export TDISOLDIR=/home/ibmadmin/TDI` command.
4. Run the `${TDISOLDIR}/TDI_start_assembly_line.sh "Import Meter Reading Data"` script.
5. Run the `${TDISOLDIR}/TDI_start_assembly_line.sh "Import Billing Data"` script.
6. Log on to the Management server.
7. Locate the analysis program in the /opt/IBM/iss/iow/wcp/analysis folder.
8. Log in as administrator: `su - ibmadmin`.
9. Run the `./run.sh [StartDate(YYYY-MM-DD)] [EndDate(YYYY-MM-DD)]` command after you import the new meter reading. The time period must cover all new meter readings.

**Note:** This task is added into the Cron tasks with Tivoli Directory Integrator configuration, so it can be run automatically after the new meter reading and billing data are imported. Run it to initialize the database for a time after you import the sample data provided. Example: `./run.sh 2010-06-01 2012-10-31`.

10. If running the analysis program for a wide date range it is recommended to manually execute RUNSTATS on the metric numeric table to ensure good performance is maintained.

```
DB2 CONNECT TO WCPDB
DB2 RUNSTATS ON TABLE WCP.METRICNUMERIC ON ALL COLUMNS WITH DISTRIBUTION ON ALL COLUMNS
AND INDEXES ALL ALLOW WRITE ACCESS
DB2 CONNECT RESET
```

## Modifying the database configuration for JDBC connections

Complete the steps to modify the database configuration for JDBC connections.

### Procedure

1. Log on to the application server or management server.
2. Edit the WCP.properties file in the /opt/IBM/iss/iow/wcp folder to update system properties.

```
DB2_HOSTNAME=  
DB_NAME=  
FACTOR_DOL_GAL=  
PORT=  
USER=  
PASSWORD=
```

To apply the updates, you must restart the application `iow_wcp_portal_ear` from WebSphere Application Server administrative console on the Application server

3. If you changed the value for the property `PASSWORD` with a plain string entry in the /opt/IBM/iss/iow/wcp/wcp.properties file, you must manually run the following command to encrypt the password string again.

```
./encryptProperty.sh /opt/IBM/iss/iow/wcp/wcp.properties PASSWORD
```

## Modifying the system global configuration

Complete the steps to update the global system configuration properties.

### About this task

To change the default values for configuration properties in the `WCP_GLOBAL_CONFIG` table, you must use a DB2 client to connect to the database. You can then modify the values from the client directly.

### Example

Table 10. WCP\_GLOBAL\_CONFIG table properties

Property	Description
MAP_CENTER_LONGITUDE	Map center longitude.
MAP_CENTER_LATITUDE	Map center latitude.
FACTOR_GAL_DOL	Factor for transferring gallons to dollar and used in the Citizen view page.
MAP_BASELAYER_TYPE	Base layer type. Value for the type of the base map.
MAP_BASELAYER_URL	URL of the base map. The URL must contain, in the correct order, the placeholders that represent the x, y, and z coordinates of the map. You can select a map from your installed ESRI GIS server or a publicly available GIS service.
FACTOR_VOLUME_IMPERIAL_TO_METRIC	Factor for transferring cubic-feet to gallons. It is used in Tivoli Directory Integrator configuration.
DAYS_CHAT_HISTORY	Loading chat history in specific days. Default is 7 days.
INTERVAL_FOR_SYNCH_CHAT	Time interval (in seconds) for the timer used to synchronize chat messages with the server. The default value is 30 seconds.

## Using the water conservation content pack

When the waste conservation content pack is installed, you can view water conservation content and functionality in your installation and begin to perform role-based tasks depending on your login credentials.

## City: Water Conservation

Use the City: Water Conservation portal to obtain a consolidated view of resource consumption and use in a city. The City: Water Conservation portal enables users with cross-organization responsibility to monitor, manage, and respond to status changes in key areas of organizational performance.

The City: Water Conservation portal is an interactive web page and provides you with a visual representation of water consumers on a map or list and information about their consumption behavior. Use the City: Water Conservation portal together with the Citizen: Water Conservation portal to identify locations, patterns of consumption, conflicts, issues, and synergies.

You can select in the City: Water Conservation portal the household you want to view from the Map. Your selection affects what is displayed in the other sections of the portal.

### Interface element

The City: Water Conservation portal has interactive interface elements as shown in the following table:

Table 11. City: Water Conservation interfaces

Interface element	Description
Map	<p>A map of the geographical region that contains resource markers (households, parks, assets, zones). Shows your monitored community area.</p> <p>A filter to select the view. You can toggle between the <b>Map</b> or <b>List</b> view.</p> <p>The resources are shown on the map, for example household. Click the resource to view the metrics for that resource. A popup is displayed when the resource is selected. The popup contains the key metrics for the monitored resource that includes number of meters, home owner, location, last weekly usage and trend as a percentage, last daily usage trend as a percentage (use today), average usage, peak time, and number of leaks reported.</p>
List	<p>A table that contains a list of resource markers (households, parks, assets, zones) in the geographic map and their associated properties (name, number of meters, location, contact).</p>
Trend	<p>Compares and charts historic with current usage data for a monitored resource in a monitored community. You can toggle between the <b>Chart View</b> and <b>Table View</b>.</p>

Initially, the page opens with the City: Water Conservation portal that shows all the households that are relevant to you. The map uses latitude and longitude values to show the location. A point marker or shape outlines the household. You can display more detail on a household by clicking the marker on the map. If there is more than one household clustered at the same location, the number is indicated when you click the marker. The headline of each household is also displayed.

You can use the **List view** to see the household information in table format.

**Note:** If a household has no coordinates, it is displayed only in the portlet list; it is not displayed in the Map.

## Map markers

The map represents the location of households with the following type of marker.

Table 12. Map markers

Marker Type	Color	Description
Icon	Red or Green	Pinpoints on the map the location of a household by using a circular icon for each. A red icon indicates that there is an incident associated with the household, for example a water leak. A green margin icon indicates that there are no incidents associated with the household.

## Selecting the households on the map

To review water consumption in a household, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review consumption measures.
4. In the City: Water Conservation, view the Trend area to review the two-year trend charts.

## Detecting leaks

To detect water leaks in a household, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review the number of detected leaks.

## Viewing household consumption data

To view household consumption data, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review household consumption data.
4. In the City: Water Conservation, view the Trend area to review the two-year trend charts.

## Viewing consumption trends

To view household consumption trends, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the Trend area to review consumption measures.

## Using the map controls

You can move the cursor around the map by using your mouse or keyboard.

## Controls at the top of the map

The following controls are available at the top of the map:

- Pan arrows (up, down, left, right)
- Zoom in
- World view (zooms out to the maximum extent)
- Zoom out

## Controls for moving around the map

To move around the map, you can use the following controls:

- Click and drag the map by using the mouse
- Press the up pan arrow, or the up arrow key on the keyboard, to pan north
- Press the down pan arrow, or the down arrow key on the keyboard, to pan south
- Press the right pan arrow, or the right arrow key on the keyboard, to pan east
- Press the left pan arrow, or the left arrow key on the keyboard, to pan west

## Zoom controls for magnifying or reducing the scale of the map

To zoom in and out of the map, you can use the following controls:

- Click the + map icon to zoom in, or the - map icon to zoom out of the center of the map
- Double-click the mouse to center the map and zoom in to the selected location
- Click the **World view** icon to maximize the zoom out to show the world view
- Press the + key on the keyboard to zoom in
- Press the - key on the keyboard to zoom out
- Press Shift while you use the mouse to draw a rectangle around the area to zoom in on

## Customizing the City: Water Conservation

### Administrator

An administrator can change City: Water Conservation settings by clicking the upper right corner of the portlet, and selecting options from the menu that is displayed.

- To change settings for all users and the instance of the City: Water Conservation portlet on the current portal page, click **Edit Shared Settings**.

The settings that you can change for the portlet are as follows:

- Default help
- Portlet height
- Portlet maximum height
- Portlet title
- Report URL

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Citizen: Water Conservation

Use the Citizen: Water Conservation portal to obtain a consolidated view of resource consumption and use. The Citizen: Water Conservation portal enables users to analyze individual consumption and



monitor water leakages. The view provides a water report. By using the report, you can plan for changes to behavior, usage patterns, or changes to individual water equipment to actively engage in water conservation.

The Citizen: Water Conservation portal is an interactive web page. The view contains the following independent sections of the page that cooperate with one another to provide comprehensive information about resource consumption for a citizen.

## Interface elements

The Citizen: Water Conservation portlet has interactive interface elements as shown in the following table.

*Table 13. Citizen: Water Conservation portal display*

Interface element	Description
Profile area	Shows the profile name for the report. The profile name might be a park, a marina, or a household. You can select from the list. Below the profile name is the one or multiple meters in the account. If you have multiple meters, you can select from the list to see the consumption of each meter.
Progress area	Shows your progress, such as your <b>Usage Trend</b> , <b>Monthly Year to Date Variance</b> in dollars and in gallons. Shows your water conservation progress in relation to other participants. The <b>Rank</b> shows your position in relation to other participants in your community. The <b>Green Points</b> shows the number of points earned. Green points are awarded for reductions in water consumption and determined by weekly readings from your water meter.
Daily usage area	Shows your daily water usage for the past several months in 2 usage units: gallons and dollars. Using the slider bar, you can move along a 12 month calendar to see the total water consumption each day. When you move the slider bar, the data and usage unit also change in the two views in the Details area: <b>Hourly Usage</b> and <b>Weekly Usage</b> . Hover over each bar to see the actual amount for weekly usage
Details area	Compares hourly and weekly usage in a chart. The following views are available for display: <ul style="list-style-type: none"> <li>• Hourly Usage - toggle to display in a graph or table the hourly water usage in a specific day.</li> <li>• Weekly Usage - toggle to display in a graph or table the water usage for a four week period.</li> <li>• Compare Usage - toggle to display in a graph or table a comparison of water usage for each day over weekly intervals.</li> <li>• This weeks game - toggle to display in a graph or table a comparison of your water usage with usage by others in your community.</li> </ul>
Team Chat / Pilot Chat	Communications facility to chat with other users and pilot participants in your community.

Initially, when you open Citizen: Water Conservation, the portal shows your household data. If your household comprises a number of accounts, you can select to display the data for each account.

The lists are refreshed regularly with updates, subject to any filters you set to limit the categories that are shown.

## Comparing usage

In the Citizen: Water Conservation portal, you can monitor and compare resource usage.

## Procedure

- Log on to the Citizen: Water Conservation portal.
- View the water report to review the **Usage trend** and **Monthly Variance** figures.
- Drag the slider to view the water usage by day.
- Toggle to select to view data in gallons or dollars.
- Select the **Hourly Usage** tab to view hourly usage.
- Select the **Weekly Usage** tab to view weekly usage.

## Customizing the Citizen: Water Conservation

### Administrator

As an administrator, you can customize the portlet by clicking the menu on the upper right corner of the portlet and configuring the portlet settings.

Click the **Edit Shared Settings** option to set the following parameters.

- Default help JSP
- Portlet height, titles
- Report URL
- Resource bundle
- Show URL field on page

When you set parameters for the Citizen: Water Conservation portal you can

- Specify the Cognos Report URL.
- Specify column layout, headings, sort order, and priority.
- Specify the additional conditions to filter the events or resources displayed.
- Specify a group name to enables communication with other map and Details portlets.
- Acknowledge or ignore event creation.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

---

## Pipe failure prediction content pack

IBM Intelligent Water Efficiency Analytics 1.5.1 system comes with an optional sample set of data illustrating its use for pipe failure prediction operations.

Use the pipe failure prediction content pack to analyze, monitor, and manage water leakage in the pipe infrastructure for your entire water network in IBM Intelligent Water Efficiency Analytics. The pipe failure prediction content pack works with prediction models. The models use historical data. Working with the data records, you can customize the model to predict the probability of pipe leakage in the specified timeframe. Using the predictions, you can proactively plan work activity so that preventive action is taken in advance of any predicted leakage event.

Five steps are performed when using the pipe failure prediction in IBM Intelligent Water Efficiency Analytics:

- Import historical data
- Build the prediction model
- Verify the prediction model
- Run the prediction
- Visualize the prediction results in IBM Intelligent Water Efficiency Analytics

## Installing the Pipe failure prediction content pack

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

### Related tasks:

“Post-installation configuration” on page 11

After successfully completing the installation of IBM Intelligent Water Efficiency Analytics, additional steps are required to configure the solution.

## Installing and configuring SPSS Modeler

Pipe failure prediction uses the IBM SPSS Modeler data mining workbench. Use the information in this topic to install and configure SPSS Modeler for use with the pipeline failure prediction content pack.

### Before you begin

IBM SPSS Modeler is not installed as part of the IBM Intelligent Water Efficiency Analytics 1.5.1 installation. You must purchase IBM SPSS Modeler as a separate product.

### Procedure

1. Copy the following image files to the /tmp folder of the analytics server

```
spss_mod_svr_64b_15.0_linux_ml.bin
spss_dap_6.1_sp3_mp_en.zip
```

2. Log on to the analytics server using vnc as root. Start a terminal session and run the following commands.

```
> chmod +x /tmp/spss_mod_svr_64b_15.0_linux_ml.bin
> /tmp/spss_mod_svr_64b_15.0_linux_ml.bin
```

3. Accept license terms and use default parameters to complete the installation of the SPSS modeler server.

4. Start the SPSS DAP installer by running the following commands

```
> mkdir /tmp/spss_dap
> cd /tmp/spss_dap
> unzip /tmp/spss_dap_6.1_sp3_mp_en.zip
> chmod +x /tmp/spss_dap/Linux/SDAP_6.1_Linux64.bin
> /tmp/spss_dap/Linux/SDAP_6.1_Linux64.bin
```

5. Set up ODBC environments by running the following commands

```
> cd /usr/IBM/SPSS/SDAP61
> tar -xvf ./sdap_6.1_linux64.tar.gz
> ./setodbcpath.sh
```

6. Edit the /usr/IBM/SPSS/SDAP61/odbc.sh file to add the `LD_LIBRARY_PATH_64` environment variable. Ensure your settings are as specified in bold in the example.

```
if [ "$LD_LIBRARY_PATH" = "" ]; then
  LD_LIBRARY_PATH=/usr/IBM/SPSS/SDAP61/lib
else
  LD_LIBRARY_PATH=/usr/IBM/SPSS/SDAP61/lib:$LD_LIBRARY_PATH
fi
export LD_LIBRARY_PATH

if [ "$LD_LIBRARY_PATH_64" = "" ]; then
  LD_LIBRARY_PATH_64=/usr/IBM/SPSS/SDAP61/lib
else
  LD_LIBRARY_PATH_64=/usr/IBM/SPSS/SDAP61/lib:$LD_LIBRARY_PATH_64
fi
export LD_LIBRARY_PATH_64
if [ "$PATH" = "" ]; then
  PATH=/usr/IBM/SPSS/SDAP61/tools
else
```

```
PATH=/usr/IBM/SPSS/SDAP61/tools:$PATH
fi
export PATH
```

```
ODBCINI=/usr/IBM/SPSS/SDAP61/odbc.ini
export ODBCINI
ODBCINST=/usr/IBM/SPSS/SDAP61/odbcinst.ini
export ODBCINST
```

7. Edit the /usr/IBM/SPSS/SDAP61/odbc.ini file to define the ODBC datasource. Ensure your settings are as specified in bold in the example.

```
[ODBC Data Sources]
WIHDS=IBM Corp. 6.1 DB2 Wire Protocol

[ODBC]
IANAAppCodePage=4
InstallDir=/usr/IBM/SPSS/SDAP61
Trace=0
TraceFile=odbctrace.out
TraceDll=/usr/IBM/SPSS/SDAP61/lib/XEtrc25.so
```

```
[WIHDS]
Driver=/usr/IBM/SPSS/SDAP61/lib/XEdb225.so
Description=IBM Corp. 6.1 DB2 Wire Protocol
AccountingInfo=
AddStringToCreateTable=
AlternateID=
AlternateServers=
ApplicationName=
ApplicationUsingThreads=1
AuthenticationMethod=0
BulkBinaryThreshold=32
BulkCharacterThreshold=-1
BulkLoadBatchSize=1024
CatalogSchema=
CharsetFor65535=0
ClientHostName=
ClientUser=
#Collection applies to z/OS and iSeries only
Collection=
ConcurrentAccessResolution=0
ConnectionReset=0
ConnectionRetryCount=0
ConnectionRetryDelay=3
CurrentFuncPath=
#Database applies to DB2 UDB only
Database=WIHDB
DefaultIsolationLevel=1
DynamicSections=200
EnableBulkLoad=0
EncryptionMethod=0
FailoverGranularity=0
FailoverMode=0
FailoverPreconnect=0
GrantAuthid=PUBLIC
GrantExecute=1
GSSClient=native
HostNameInCertificate=
IpAddress=<IP address of ioc database server>
KeyPassword=
KeyStore=
KeyStorePassword=
LoadBalanceTimeout=0
LoadBalancing=0
#Location applies to z/OS and iSeries only
Location=LogonID=
MaxPoolSize=100
```

```

MinPoolSize=0
Password=
PackageCollection=NULLID
PackageNamePrefix=DD
PackageOwner=
Pooling=0
ProgramID=
QueryTimeout=0
ReportCodePageConversionErrors=0
TcpPort=50000
TrustStore=
TrustStorePassword=
UseCurrentSchema=1
ValidateServerCertificate=1
WithHold=1
XMLDescribeType=-10

```

8. Edit the `/usr/IBM/SPSS/ModelerServer/15.0/modelersrv.sh` file. Add the following line below the line that defines `SCLEMDNAME`

```
. /usr/IBM/SPSS/SDAP61/odbc.sh
```

9. Go to `/usr/IBM/SPSS/ModelerServer/15.0/bin` and run the following commands.

```

> cd /usr/IBM/SPSS/ModelerServer/15.0/bin
> rm -f libspssodbc.so
> ln -s libspssodbc_datadirect.so libspssodbc.so

```

10. Start the SPSS server.

```
> /usr/IBM/SPSS/ModelerServer/15.0/modelersrv.sh start
```

11. Go to IOC application server and edit the Jython script file `/opt/IBM/iss/iow/pfp/sample/create_auth_alias.py` to input password in it for root and db2inst1.

```

AdminTask.createAuthDataEntry('[-alias SPSS_OS_AuthAlias -user root -password
<root_passw0rd> -description ]')
AdminTask.createAuthDataEntry('[-alias SPSS_DS_AuthAlias -user db2inst1 -password
<db2inst1_passw0rd> -description ]')
AdminConfig.save()

```

12. Create the authentication alias. Go to IOC application server and run the command:

```

> cd /opt/IBM/WebSphere/wp_profile1/bin
> ./wsadmin.sh -lang jython -f /opt/IBM/iss/iow/pfp/sample/create_auth_alias.py
-user waswebadmin -password <password>

```

13. Copy `spss_mod_btch_32b_15.0_linux_ml.bin` to `/tmp` folder of the IOC application server. Accept all the default parameters to install SPSS modeler batch.

```

> chmod +x spss_mod_btch_32b_15.0_linux_ml.bin
> ./spss_mod_btch_32b_15.0_linux_ml.bin

```

14. Edit the file `/opt/IBM/WebSphere/wp_profile1/installedApps/cell1/water_pfp_ear.ear/water_pfp_web.war/WEB-INF/classes/water_pfp_analytics.properties` to enter the correct hostname of the SPSS Modeler Server as displayed in the example.

```

HOSTNAME=<IP address of SPSS Modeler Server>
PORT=28052
OSAUTHALIAS=DmgrNode/SPSS_OS_AuthAlias
DATASOURCE=WIHDS
DSAUTHALIAS=DmgrNode/SPSS_DS_AuthAlias
EXECUTABLE=/usr/IBM/SPSS/ModelerBatch/15.0/c1emb
STREAMDIR=/opt/IBM/iss/iow/pfp/stream
MODELDIR=/opt/IBM/iss/iow/pfp/model
LOGDIR=/opt/IBM/iss/iow/pfp/log
#####
# Please read document about how to change the following parameter
# It controls what factors are used for pipe failure prediction
#####
MODEL_FACTOR=LENGTH DIAMETER MATERIAL ZONEIMPACT HIGHWAYIMPACT AVERAGERAINFALL NUMBEROFJOINT COATTYPE

```

## Customizing the Pipe failure prediction content pack

When you install the content pack, you can customize the data and features provided so that they meet your pipe failure prediction requirements.

### Defining data requirements

Pipe failure prediction models require data on pipes, maintenance records, regional data and networks. Use the information in this topic to understand and define your data requirements.

### About this task

Pipe failure prediction models require data on pipes, maintenance records, regional data, and networks. The following tables define the data requirements for each area.

Table 14. Pipe data

Header	Header	Header
Pipe ID	VARCHAR	The unique identity of a segment of pipe.
Length	DOUBLE	The length of pipe, in meter.
Diameter	DOUBLE	The diameter of pipe, in meter.
Material	VARCHAR	The material of pipe, for example PVC
Zone Impact	VARCHAR	The zone factor to pipe failure, can be 'H', 'M' or 'L'. It is assign by experience.
Highway Impact	VARCHAR	Is the pipe impacted by highway, can be 'H', 'M' or 'L'.
Buried	VARCHAR	Is the pipe buried, can be 'T' or 'F'.
Average Rain	DOUBLE	The average amount of rainfall.
Average Turbidity	DOUBLE	The average amount turbidity of water in pipe.
Number of Cross	INT	The number of pipes that cross this pipe.
Number of Joints	INT	The number of joints connected to this pipe.
Completion Data	DATE	The date when this pipe is constructed.
Abandon Date	DATE	The date when this pipe is abandoned.
Status	VARCHAR	The status of this pipe. Can be 'Active' or 'Abandon'
Soil Type	VARCHAR	Does soil impact the pipe failure. It can be 'T' or 'F'
Coat Type	VARCHAR	The coat type of pipe.
Network Type	VARCHAR	The network type of this pipe. It's valid values are defined in 'NETWORKTYPE' table by 'code' field.
Region	VARCHAR	The region of this pipe. It's valid values are defined in 'REGION' table by 'code' field.

Table 14. Pipe data (continued)

Header	Header	Header
X, Y coordinates	DOUBLE	The longitude of start point (X1). The latitude of start point (Y1). The longitude of end point (X2). The latitude of end point (Y2).

Table 15. Maintenance record data

Header	Header	Header
Pipe ID	VARCHAR	The unique identity of a segment of pipe
Fault type	VARCHAR	The type of pipe failure, only 'LEAKAGE' is valid value now.
Maintenance Data	DATE	Which date is the pipe maintained.

Table 16. Region table

Header	Header	Header
Code	VARCHAR	The code number of a region.
Description	VARCHAR	The display text for a region.

Table 17. Network type table

Header	Header	Header
Code	VARCHAR	The code number of a network type.
Description	VARCHAR	The display text for a network type.

#### Related tasks:

“Customizing prediction factors” on page 38

You can customize the factors that are used to build the prediction model. Use the information in this topic to update the pipe database table.

“Deploying the EPANET model” on page 46

Use the information in this topic to deploy the EPANET model.

### Importing data required to build the model

Use the information in this topic to import the data required to build the prediction model.

#### Procedure

1. Create four data exchange files named as in the example. Put the files in the /tmp directory on the IBM Intelligent Operations Center data server.

```
/tmp/water_pfp_pipe_data.txt
/tmp/water_pfp_main_data.txt
/tmp/water_pfp_networktype_data.txt
/tmp/water_pfp_region_data.txt
```

2. Copy /opt/IBM/iss/iow/pfp/sample/water\_pfp\_import\_data.dd1 from the IBM Intelligent Operations Center application server to /tmp/water\_pfp\_import\_data.dd1 on the IBM Intelligent Operations Center data server.

3. Run the command (as db2inst1).

```
db2 -tvf /tmp/water_pfp_impirt_data.dd1
```

## Example

The `water_pfp_pipe_data.txt` is a data exchange file containing pipe data. Each line describes a pipe. The fields are comma separated.

Example:

```
PIPEID,LENGTH,DIAMETER,MATERIAL,ZONEIMPACT,HIGHWAYIMPACT,BURIED,AVERAGERAINFALL,AVERAGECONDUCTIVITY,
AVERAGETURBIDITY,NUMOFCROSS,NUMBEROFJOINT,COMPLETIONDATE,ABANDONEDDATE,STATUS,SOILTYPE,COATTYPE,
NETWORKTYPE,REGION,X1,Y1,X2,Y2
"SAA999-AFSEBAB-SABAAA-AFSEBAB",+1.49300000000000E+000,+1.50000000000000E+002,"DI","M","L","F",
+2.01160900000000E+003,+3.77359610000000E+004,+1.77700000000000E+001,3,1,20070518,,"Active","F",
"epoxy","SW","District-2",-8.64090565739637E+001,+4.16324535787584E+001,-8.64329148503308E+001,
+4.15900653959255E+001
```

(String values need be quoted using "")

The `water_pfp_main_data.txt` file contains maintenance data. Each line of it is a maintenance record.

Example:

```
PIPEID,FAULTTYPE,MAINTENANCEDATE
"SAAADH-BBNWCAB-SAAABK-BBNWCAB","LEAK",20040108
```

The `water_pfp_networktype_data.txt` file contains the network type data. Each line of it is a network type.

Example:

```
CODE,DESCRIPTION
"SW","SW"
```

The `water_pfp_region_data.txt` file contains the information for regions. Each line of it is a region.

Example:

```
CODE,DESCRIPTION
"District-1","District-1"
```

## Customizing prediction factors

You can customize the factors that are used to build the prediction model. Use the information in this topic to update the pipe database table.

### Procedure

1. Open the file: `/opt/IBM/WebSphere/wp_profile1/installedApps/cell1/water_pfp_ear.ear/water_pfp_web.war/WEB-INF/classes/water_pfp_analytics.properties`
2. Edit the last line of the file to update the `MODEL_FACTOR` parameters.  
`MODEL_FACTOR=LENGTH DIAMETER MATERIAL ZONEIMPACT HIGHWAYIMPACT AVERAGERAINFALL NUMBEROFJOINT COATTYPE`

**Note:** Refer the related information for an explanation of the model factor parameters.

### Related tasks:

“Defining data requirements” on page 36

Pipe failure prediction models require data on pipes, maintenance records, regional data and networks. Use the information in this topic to understand and define your data requirements.

## Using the Pipe failure prediction content pack

Use the information in this topic to work with the Pipe failure prediction content pack.



## Water Pipe Failure Prediction Model Management

Use the Water Pipe Failure Prediction Model Management portlet to build, verify, and monitor pipe failure prediction models in the IBM Intelligent Operations for Water.

With prediction models, you can see those sections of pipe network most at risk of failure in report table and GIS view. A model simulates the predicted failure results for pipes that are constructed between a selected timeframe. To validate the model with sample data, the model uses the maintenance records, or pipe failure results, that occurred in a selected year. After which, you can run the prediction on a future year and visualize the result.

The Water Pipe Failure Prediction Model Management portlet is an interactive list portlet. All the models that you are authorized to see and work with are visible on the portlet.

## Water Pipe Failure Prediction Model Management

The Water Pipe Failure Prediction Model Management portlet has interactive interface elements as shown in the following table:

Table 18. Pipe Failure Prediction Model Management portlet display

Interface element	Description
Model List	Lists the models and the prediction results associated with each model in a table.
Model actions	Perform model prediction tasks with the following user controls: <b>Build, Verify, Predict, Delete, View Log, Refresh</b> ). Line graphs display the model prediction outcomes.

A counter in the left corner of the action bar at the end of the list indicates the number of items displayed and the total number of items. In the center of the action bar, you can select the number of items to be displayed at one time. If there are more rows than can be displayed at one time, you can page forward or backward by clicking the buttons in the right corner of the action bar.

## Water Pipe Failure Prediction Model Management properties

The following table outlines the properties that describe Water Pipe Failure Prediction Model Management.

Table 19. Water Pipe Failure Prediction Model Management properties

Property	Content
Model ID	The identification number of the model.
Model Type	
Status	The build status of the model, either Building, Ready, Invalid, Verifying, Predicting or Failure.
Creation Date and Time	The date and time that the model was created.
Network Type	
Train From	The start year for the model.
Train To	The end year for the model.
Censor Year	The year from which the maintenance records, or pipe failure results, are chosen to validate the model.
Verified	The verification status of the model, either Yes or No.
ROC Score	The receiver operating characteristics (ROC) score, based on the ROC curve in the portlet. A ROC curve is used for visualizing, organizing and selecting classifiers based on their performance.

Table 19. Water Pipe Failure Prediction Model Management properties (continued)

Property	Content
Gain Score	

## Building a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can build a new pipe failure prediction model. For example, as an analyst, you can build a prediction model from a historical maintenance record, by specifying some data-filtering parameters and some algorithm parameters.

### Procedure

- Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
- To create a model, click **Build** to launch a dialog to input parameters.
- The **Build Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and maintenance records for the build process:
  - Select a model type and network type for the pipes.
  - Enter the historical data range for the pipes by selecting the start and end year. The end year must be greater than the start year.
  - Select the censor year from the list to validate the model with sample data. The sample data is the maintenance record, or pipe failure results, for the chosen year.
  - Click **Run** to launch a background process to build the model on the SPSS server. The **Build Pipe Failure Prediction Model** dialog is closed.
- Click **Refresh** on the portlet to check the model build status. The new model is displayed in the portlet table with a status displayed as 'building'. When the model file is built on the IBM Intelligent Operations Center Application Server, the model status is displayed as 'ready'.

## Verifying a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can verify a new pipe failure prediction model. For example, as an analyst, you can select an existing model and use historical data to verify it, and receive the ROC and Gain performance indicator.

### Procedure

- Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
- To verify a new model, select a model in the portlet table with a status that is displayed as ready.
- Click **Verify** to launch a dialog to input parameters.
- The **Verify Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and maintenance records for the verification process:
  - Select a region from which to use pipe data.
  - Enter the historical data range by selecting the start and end year. The end year must be equal or greater than the start year.
  - Select the censor year from the list to validate the model with sample data. The sample data is the maintenance record, or pipe failure results, for the chosen year.
  - Click **Run** to launch a background process to verify the model on the SPSS server. The **Verify Pipe Failure Prediction Model** dialog is closed.
- Click **Refresh** on the portlet to check the verification status. The model status is displayed as Verifying. When the verification process is complete, the Status is displayed as Ready and the Verify column of the portlet table is displayed as Yes. In addition, the ScoreRoc and ScoreGain columns display numbers other than zero. The Roc Curve and Gain Curve graphs beneath the portlet table display the predicted pipe failure results for your chosen years with failure record for your selected censor year.

## Running a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can run a new pipe failure prediction model. For example, as an analyst, you can select a model and use it to evaluate the risk of pipe failures in specified year.

### Procedure

- Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
- To run a new model prediction, select a model in the portlet table with a status that is displayed as ready.
- Click **Predict** to launch a dialog to input parameters.
- The **Run Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and the year for the prediction process:
  - Select a network type for the pipes and a target year for the prediction.
  - Click **Run** to launch a background process to run the prediction on the SPSS server. The **Run Pipe Failure Prediction Model** dialog is closed.
- Click **Refresh** on the portlet to check prediction status. The model status is displayed as Predicting. When the verification process is complete, the Status is displayed as Ready.

## Deleting a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can delete a new pipe failure prediction model.

### Procedure

- Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
- To delete a model, click **Delete**.
- The **Delete Pipe Failure Prediction Model** dialog is displayed.
  - Select a model to delete.
  - Click **Delete**. The model is removed from the portlet table.

## Viewing the Pipe Failure Prediction Model log file

In the Water Pipe Failure Prediction Model Management portlet, you can view the log file of the pipe failure prediction model process.

### Procedure

- Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
- To view the log file, click **View Log**.

## Planner: Analysis view

Use the Planner: Analysis view to obtain a consolidated view of predicted water asset failures and key details. The Planner: Analysis view enables users with cross-organization responsibility to monitor, manage, and respond to predicted water asset failure status changes.

The Planner: Analysis view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the executive level.

Table 20. Planner: Analysis view portlets

Portlet	Description
“Predicted Asset Failure Map” on page 129	<p>A <b>Geospatial Map</b> of the geographical region that contains predicted water asset failures.</p> <p>A filter form to select the categories of predicted water asset failures to be shown on the map and in the <b>Details</b> portlet.</p> <p>The filter form is used to select:</p> <ul style="list-style-type: none"> <li>• Year to include in the prediction.</li> <li>• Region to include in the prediction.</li> <li>• Network type to include in the prediction.</li> <li>• Display settings on the map, for example percentage or number of assets to display.</li> <li>• Metric upon which the prediction is based.</li> </ul> <p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p>
“Predicted Asset Failure Details” on page 131	<p>The Details portlet is an interactive list portlet. All the predictions that you are authorized to see are visible on the list. Pipeline failure predictions for assets are displayed. Key asset details and predicted risk measurements can be displayed.</p> <p>Work orders that you are authorized to see are visible on the work order list and on any map portlet that is linked to the Details portlet.</p>

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

## Administrator

### Customizing a portlet

As an administrator you can change portlet settings by clicking the upper right corner of the portlet, and selecting an option from the portlet menu.

There are two possible modes of customization, each changing the portlet settings for all users:

- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

## Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

#### Viewing pipeline failure predictions:

Use the information in this topic to monitor the health of the pipe network. Using the Predicted Water Asset Failure map displayed on the Planner: Analysis view, you can monitor pipe network failure predictions for pipelines that are configured in your system.

#### Procedure

1. Log on to IBM Intelligent Water Efficiency Analytics as Planner.
2. Select the Planner: Analysis view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset with associated predicted asset failure icon on the map.
6. Select the asset or equipment item in the map to view a popup of predicted asset failure details associated with the asset.
7. View more asset statuses on the Details portlet.

#### Related tasks:

“Showing the pipe network on the map” on page 133

Use the information in this topic to display the pipe network on the Map portlet.

---

## Pressure optimization content pack

IBM Intelligent Water Efficiency Analytics comes with an optional content pack containing a sample set of data illustrating its use for pressure optimization operations.

Use the Pressure optimization content pack to monitor and manage pressure optimization in real time for your entire water network in IBM Intelligent Water Efficiency Analytics. The system displays data that relates to pressure optimization simulations and provides user controls to create new simulations and apply the results to your water utilities.

### Customizing the pressure optimization content pack

When you install the content pack, you can customize the data and features provided so that they meet your pressure optimization requirements.

#### Related tasks:

“Post-installation configuration” on page 11

After successfully completing the installation of IBM Intelligent Water Efficiency Analytics, additional steps are required to configure the solution.

### Validating the existing EPANET model

Use the information in this topic to validate the existing EPANET model.

## Before you begin

Before you can begin working with pressure optimization in IBM Intelligent Water Efficiency Analytics, you must validate the existing EPANET model. IBM Intelligent Water Efficiency Analytics requires a stable water distribution model. The model must represent the real water distribution network and critical water pressure points should be identified. It is assumed that you have prior knowledge of, and proficiency with, EPANET models and tools in the water domain.

### About this task

IBM Intelligent Water Efficiency Analytics provides a sample model that you can use when validating your existing EPANET model. You can customize the sample to your specific requirements. The sample model is deployed in the `/opt/analytics/cps/master/SAMPLE` folder. Open the sample model, using EPANET tools, and familiarize with the critical water pressure points and valves identified on the sample model network map.

## Preparing the model instances

Use the information in this topic to prepare the model instances.

## Before you begin

Before you can begin working with pressure optimization in IBM Intelligent Water Efficiency Analytics, you must prepare the model instances. To prepare the model instances, you must create a set of IBM Integrated Information Core models for the new model. Sample pressure optimization IBM Integrated Information Core models are provide in the content pack. You can work with or customize the sample IBM Integrated Information Core models provided to meet your specific requirements.

### About this task

In this stage, you may perform two or more tasks relating to model instances. The tasks may include creating the pipeline models, and creating the sensor meter models.

#### Creating pipeline models:

##### About this task

When you define a new pipeline model, you modify the owl ontology and then add the new pipeline model.

#### Procedure

1. Create the owl file with your own namespace to identify the pipeline asset type you will use for pressure optimization.

The following is a sample junction.

```
<rdf:Description rdf:about="http://SunshineWaterGroup#Junction">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
  <rdfs:label xml:lang="en">Junction</rdfs:label>
  <rdfs:subClassOf rdf:resource="http://www.ibm.com/water/wih#WIH_Pipeline_Asset"/>
  <rdfs:comment>Junction</rdfs:comment>
</rdf:Description>
```

The following is a sample valve.

```
<rdf:Description rdf:about="http://SunshineWaterGroup#Valve">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
  <rdfs:label xml:lang="en">Valve</rdfs:label>
  <rdfs:subClassOf rdf:resource="http://www.ibm.com/water/wih#WIH_Pipeline_Asset"/>
  <rdfs:comment>Valve</rdfs:comment>
</rdf:Description>
```

2. Create the RDF file to identify the pipeline asset instance. With the pressure optimization sample, you must create a minimum of three junctions and five valves.

The following is a sample junction.

```
<!-- a Junction segment - START -->
<swg:Junction rdf:ID="J553">
  <cim:RSM_IdentifiedObject.name>J553</cim:RSM_IdentifiedObject.name>
  <cim:RSM_PhysicalEntity.TypeOfPhysicalEntity>WorkEquipment
</cim:RSM_PhysicalEntity.TypeOfPhysicalEntity>
  <cim:RSM_WorkEquipment.TypeOfEquipment>Junction</cim:RSM_WorkEquipment.TypeOfEquipment>
  <cim:RSM_WorkEquipment.EquipmentLevel>1</cim:RSM_WorkEquipment.EquipmentLevel>
</swg:Junction>
<cim:RSM_GeoSpatial rdf:ID="J55310C">
  <cim:RSM_IdentifiedObject.name>J55310C</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>J55310C</cim:RSM_UnnamedObject.description>
  <cim:RSM_Location.TypeOfLocation>ISO6709</cim:RSM_Location.TypeOfLocation>
  <cim:RSM_GeoSpatial.InternalLocation>POINT(-86.21152509909507 41.69066264376857)
</cim:RSM_GeoSpatial.InternalLocation>
  <cim:RSM_Location.providesLocationOf_PhysicalEntity rdf:resource="#J553"/>
</cim:RSM_GeoSpatial>
<!-- a Junction segment - END -->
```

The following is a sample valve.

```
<!-- a Valve segment - START -->
<swg:Valve rdf:ID="V9">
  <cim:RSM_IdentifiedObject.name>V9</cim:RSM_IdentifiedObject.name>
  <cim:RSM_WorkEquipment.EquipmentLevel>1</cim:RSM_WorkEquipment.EquipmentLevel>
  <cim:RSM_WorkEquipment.connects_WorkEquipment rdf:resource="#J542"/>
  <cim:RSM_WorkEquipment.connects_WorkEquipment rdf:resource="#J546"/>
</swg:Valve>
<cim:RSM_GeoSpatial rdf:ID="V9_Location">
  <cim:RSM_IdentifiedObject.name>V910C</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>V910C</cim:RSM_UnnamedObject.description>
  <cim:RSM_Location.TypeOfLocation>ISO6709</cim:RSM_Location.TypeOfLocation>
  <cim:RSM_GeoSpatial.InternalLocation>LINESTRING(-86.21652781796372 41.69814687908287,
-86.21647398582347 41.69451967333195)</cim:RSM_GeoSpatial.InternalLocation>
  <cim:RSM_Location.providesLocationOf_PhysicalEntity rdf:resource="#V9"/>
</cim:RSM_GeoSpatial>
<!-- a Valve segment - END -->
```

**Note:** The IDs for Junctions and Valves must be same as the IDs in EPANET model.

## Creating sensor meter models:

### Procedure

1. Create the owl file with your own namespace to identify the sensor meter asset type you will use for pressure optimization.

The following is a sample water pressure meter.

```
<rdf:Description rdf:about="http://SunshineWaterGroup#WPM">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
  <rdfs:label xml:lang="en">Water Pressure Meter</rdfs:label>
  <rdfs:subClassOf rdf:resource="http://www.ibm.com/water/wih#WIH_SensorMeter_Asset"/>
  <rdfs:comment>Contained by junctions in pipe network, provide junction pressures.
</rdfs:comment>
</rdf:Description>
```

The following is a sample pressure reducing valve.

```
<rdf:Description rdf:about="http://SunshineWaterGroup#PRV">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
  <rdfs:label xml:lang="en">Pressure Reducing Valve</rdfs:label>
  <rdfs:subClassOf rdf:resource="http://www.ibm.com/water/wih#WIH_SensorMeter_Asset"/>
  <rdfs:comment>Contained by valves in pipe network, provide valve settings.</rdfs:comment>
</rdf:Description>
```

2. Create the RDF file to identify the sensor meter asset instance. With the pressure optimization sample, you must create a minimum of three meters and five valves.

The following is a sample water pressure meter.

```
<swg:WPM rdf:ID="PCP553">
  <cim:RSM_IdentifiedObject.name>PCP553</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>PCP553</cim:RSM_UnnamedObject.description>
  <cim:RSM_WorkEquipment.ContainedBy_Equipment rdf:resource="#J553"/>
</swg:WPM>
<cim:RSM_GeoSpatial rdf:ID="PCP553LOC">
  <cim:RSM_IdentifiedObject.name>PCP553_Location</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>PCP553_Location</cim:RSM_UnnamedObject.description>
  <cim:RSM_Location.TypeOfLocation>ISO6709</cim:RSM_Location.TypeOfLocation>
  <cim:RSM_GeoSpatial.InternalLocation>POINT(-86.21152509909507 41.69066264376857)
</cim:RSM_GeoSpatial.InternalLocation>
  <cim:RSM_Location.providesLocationOf_PhysicalEntity rdf:resource="#PCP553"/>
</cim:RSM_GeoSpatial>
<cim:RSM_Measurement rdf:ID="PCP553_M">
  <cim:RSM_IdentifiedObject.name>Pressure of PCP553</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>Pressure of PCP553</cim:RSM_UnnamedObject.description>
  <cim:RSM_Measurement.UOM>PSI</cim:RSM_Measurement.UOM>
  <cim:RSM_Measurement.associatedTo_physicalEntity rdf:resource="#PCP553"/>
  <cim:RSM_Measurement.Is_Primary_Measurement_Of rdf:resource="#PCP553"/>
  <cim:RSM_Measurement.Type>WaterPressure</cim:RSM_Measurement.Type>
</cim:RSM_Measurement>
<cim:RSM_MeasurementValue rdf:ID="Pressure_Value_PCP553_MV">
  <cim:RSM_IdentifiedObject.name>Pressure_Value_PCP553_MV</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.alias>Pressure_Value_PCP553_MV</cim:RSM_UnnamedObject.alias>
  <cim:RSM_MeasurementValue.IsA_Measurement rdf:resource="#PCP553_M"/>
</cim:RSM_MeasurementValue>
```

The following is a sample pressure reducing valve.

```
<swg:PRV rdf:ID="PRV19">
  <cim:RSM_IdentifiedObject.name>PRV19</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>PRV19</cim:RSM_UnnamedObject.description>
  <cim:RSM_WorkEquipment.ContainedBy_Equipment rdf:resource="#V19"/>
</swg:PRV>
<cim:RSM_GeoSpatial rdf:ID="PRV19_Loc">
  <cim:RSM_IdentifiedObject.name>PRV19-Location</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>PRV19-Location</cim:RSM_UnnamedObject.description>
  <cim:RSM_Location.TypeOfLocation>ISO6709</cim:RSM_Location.TypeOfLocation>
  <cim:RSM_GeoSpatial.InternalLocation>POINT(-86.21263432150522 41.69176027662383)
</cim:RSM_GeoSpatial.InternalLocation>
  <cim:RSM_Location.providesLocationOf_PhysicalEntity rdf:resource="#PRV19"/>
</cim:RSM_GeoSpatial>
<cim:RSM_Measurement rdf:ID="PRV19_STM">
  <cim:RSM_IdentifiedObject.name>PRV19_Setting</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.description>PRV19_Setting</cim:RSM_UnnamedObject.description>
  <cim:RSM_Measurement.UOM>PSI</cim:RSM_Measurement.UOM>
  <cim:RSM_Measurement.associatedTo_physicalEntity rdf:resource="#PRV19"/>
  <cim:RSM_Measurement.Is_Primary_Measurement_Of rdf:resource="#PRV19"/>
  <cim:RSM_Measurement.Type>ValveSetting</cim:RSM_Measurement.Type>
</cim:RSM_Measurement>
<cim:RSM_MeasurementValue rdf:ID="PRV19_Setting_Value_MV">
  <cim:RSM_IdentifiedObject.name>PRV19_Setting_Value</cim:RSM_IdentifiedObject.name>
  <cim:RSM_UnnamedObject.alias>PRV19_Setting_Value</cim:RSM_UnnamedObject.alias>
  <cim:RSM_MeasurementValue.IsA_Measurement rdf:resource="#PRV19_STM"/>
</cim:RSM_MeasurementValue>
```

**Note:** The resource ID `cim:RSM_WorkEquipment.ContainedBy_Equipment` for water pressure meters and pressure reducing valves must match with the IDs you define in the pipeline instance model. There is an assumption that an asset can only have one measurement which is `WaterPressure` type, and one measurement must have one and only one `MeasurementValue`.

## Deploying the EPANET model

Use the information in this topic to deploy the EPANET model.



## About this task

Complete the following steps to deploy your EPANET model for the pressure optimization system.

### Procedure

1. Rename your EPANET model file as `demands.inp`.
2. Create a folder named as `SCENARIO1` under `/opt/analytics/cps/master` on your application server.
3. Place the `demands.inp` file into this folder. Run the `chown` command to change the owner to `ibmadmin` user.
4. Create a new entry in the `POSCENARIO` table. Add the values: *"Customization Scenario1"* for `SCENARIO_NAME`, and *"SCENARIO1"* for `SCENARIO_VALUE`. A new scenario is added for specified user in the Pressure Optimization task wizard.

### Related tasks:

*"Defining data requirements"* on page 36

Pipe failure prediction models require data on pipes, maintenance records, regional data and networks. Use the information in this topic to understand and define your data requirements.

## Deploying the model instances

Use the information in this topic to deploy the model instances.

### Procedure

1. Import the updated model instance into the model manager as described in the related topic.
2. Synchronize the model instance changes to the database as described in the related topic.

### Related information:

Importing asset data into the model instance

Updating the database with model changes

Customizing the model

## Using the pressure optimization content pack

You use the Pressure Optimization content pack to manage pressure optimization.

To work with the pressure optimization content pack, you must ensure that the IBM Integrated Information Core model and instances, such as the pressure reducing valve and water pressure meter, have been imported into the IBM Intelligent Water Efficiency Analytics system. They must also be synchronized into the database and data readings for the assets must be imported to the IBM Intelligent Water Efficiency Analytics system.

## Pressure Optimization

Use the Pressure Optimization portlet to monitor and manage pressure optimization in real time for your entire water network. In the Pressure Optimization portlet, you can view, create, update, and delete Pressure Optimization tasks.

## Prerequisite Requirements

Before you use the portlet, ensure that the IBM Integrated Information Core model and instances such as the Pressure Reducing Valve and Water Pressure Meter are imported into the water system. Also, ensure that the instances are synchronized with the database. The IBM Integrated Information Core provides a framework to create water-based applications that are centered on a semantic model of the real world. It supports integration of real time operational data and related enterprise applications.

## Viewing Pressure Optimization Tasks

You can view data for existing tasks in the Pressure Optimization table. The pressure optimization properties are described in the following table.

Table 21. Pressure Optimization Simulation Properties

Property	Description
Status	The status of the pressure optimization simulation, which is either Success or Failed.
ID	The identification number of the pressure optimization simulation.
Name	The name of the pressure optimization simulation.
Scenario	The name of scenario for the pressure optimization simulation.
startTime	The start time and date of the pressure optimization simulation; for example, 2013-04-10 11:56:23.
endTime	The end time and date of the pressure optimization simulation; for example, 2013-04-10 11:58:14.
updateTime	The update time and date of the pressure optimization simulation; for example, 2013-04-10 11:59:45.

You can create, delete, update, and view results for simulation tasks with the portlet user controls. The following table describes each control.

Table 22. Pressure Optimization User Controls

User Control	Description
New	Starts a wizard to help you configure a new pressure optimization simulation.
View Result	Starts a dialog in which you can view the results of a selected simulation and apply the results.
Update	Starts a dialog in which you can update the properties (such as valve settings) of a selected simulation.
Delete	Removes selected simulations from the Pressure Optimization table.

## Create a New Pressure Optimization Task

To create and configure a Pressure Optimization task, you use the Configure and Run Pressure Optimization wizard. The wizard guides you through the data-input and decision-making, and then runs the optimization.

1. Go to **Water > Operator: Operations > Pressure Optimization**. The Pressure Optimization portlet is displayed.
2. Click **New**. The Configure and Run Pressure Optimization wizard is displayed at the Overview screen, which introduces the wizard.
3. Click **Next** in the wizard. The Step 1: Get Ready screen is displayed. Enter the name of the optimization in **Name**, and select an existing scenario on which to base the optimization from the **Existing Scenario** menu.

**Note:** You must select a scenario. Otherwise, you cannot create a simulation.

4. Click **Next** in the wizard. The Step 2: Set Valves screen is displayed. In Adopt Settings, select the settings to use from an existing optimization run.
5. In the **Seek Recommendations** grid, you choose the valves that you want the optimization program to provide recommendations on. To begin, select a valve in the grid and click the **right arrow icon** to move the valve to the **Lock at Current Value** grid. To unlock a valve, select the valve in the **Lock at Current Value** grid and click the **left arrow icon**. The following table describes the valve property values that are displayed in the grids.

Table 23. Valve Properties

Valve Property	Description
Name	The name of the valve.
Current Value	The current recommended/locked value of the valve.
Unit	The unit of measurement; for example, PSI for pressure.

- Click **Next** in the wizard. The Step 3: Set Goals screen is displayed. In the **Set Goals** menu, set your goals for the water pressure meters by selecting current and goal settings from an existing optimization. The Goals properties are described in the following table.

Table 24. Goal Properties

Goal Properties	Description
Pressure Critical Point Name	The name of the critical pressure point.
Goal Settings	The section for the current values of the critical pressure point properties.
Goal Settings/Minimum	The current minimum value. The property is calculated from historical readings in the previous 24 hours.
Goal Settings/Average	The current average value. The property is calculated from historical readings in the previous 24 hours.
Goal Settings/Maximum	The current maximum value. The property is calculated from historical readings in the previous 24 hours.
Goal	The section for the critical pressure point goals. By default, the goals for the optimization run contain recommendation values from the EPANET model.
Goal/Minimum	The goal for the minimum value. You can edit this property to set different goal settings.
Goal/Average	The goal for the average value.
Goal/Maximum	The goal for the maximum value.
Unit	The unit of measurement (for example, PSI for pressure).
Hint	A hint for setting the water pressure. You can select from five hints in the hint property menu. By default, "Increase tank levels" is selected.

**Note:** Ensure that you set the properties according to Tips For Goal Setting, a section of guidelines on the Step 3 screen.

- Click **Next** in the wizard. The Step 4: Set Priorities screen is displayed. You prioritize goals in this screen. For example, if a pressure critical point is at critical status, you can change it as high priority.
- Using the **Apply** menu, you can adopt current goal settings from a previous menu.
- To prioritize a goal, select the goal in the **Normal priority** grid and click the **right arrow icon** to move it to the **High priority** grid. To return the goal to normal priority, select the goal in the **High priority** grid and click the **left arrow icon**. Both grids display the following values for each goal: PressureCriticalPointName and Priority.
- Click **Next** in the wizard. The Step 5: Go! Screen is displayed. Click one of the following user controls:
  - Save and Run Optimization Now**, to store and start the optimization run
  - Save Only**, to save the information for later use
  - Cancel**, to abandon the information that you entered.
- The Configure and Run Pressure Optimization wizard is closed. To confirm that the simulation is running, you can refer to the Pressure Optimization table. On successful completion of a simulation, the Status is displayed as 'Success'.

## Viewing and Applying Task Results

To view results for completed simulation tasks in the Pressure Optimization portlet table, complete the following steps.

1. Select a simulation task in the Pressure Optimization table and click **View Result**.
2. In the resulting View Pressure Optimization Run Results dialog, you can view the Optimal Pressure Critical Point Settings and Prescribed Valve Updates. You can see the recommended values for specific valves and status of their pressure goals. You can use these recommendations to create a work order to change the valve setting. The properties of each are described in the following tables.

Table 25. Optimal Pressure Critical Point Settings

Property	Description
Pressure Critical Point Name	Name of the pressure critical point.
Settings	Heading rows for the current values and recommended values.
Minimum	The current minimum value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Average	The current average value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Maximum	The current maximum value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Unit	The unit of measurement; for example, PSI for pressure.

Table 26. Prescribed Valve Updates

Property	Description
Valve Name	The name of the valve.
Settings	Heading rows for the current values and recommended values.
Value	The current and recommended water pressure values for the valve.
Unit	The unit of measurement (for example, PSI for pressure).

3. Optionally, you can review the original configuration settings for the valves. Click **Review the configuration used in this run**. The properties for the valves and goals are described in the following tables:

Table 27. Valves Input Table

Property	Description
Freeze	Can be true or false.
Name	The valve name.
Current Value	The current value of the valve.
Unit	The unit of measurement; for example, PSI for pressure.

Table 28. Goals Input Table

Property	Description
Name	The name of the goal.
Min	The current minimum value. The property is calculated from historical readings in the previous 24 hours.
Avg	The average value. The property is calculated from historical readings in the previous 24 hours.

Table 28. Goals Input Table (continued)

Property	Description
Max	The current maximum value. The property is calculated from historical readings in the previous 24 hours.
Priority	The current average value. The property is calculated from historical readings in the previous 24 hours.
Hint	A hint to provide guidance to a user of the application.

- Click **Apply Results** to close the dialog and begin an action. For example, you can start a standard operating procedure to change the valve settings. Otherwise, click **Close** to close this dialog.

**Note:** If you chose to close the dialog without applying the results, you can access the results later from the Pressure Optimization list.

## Modifying a Pressure Optimization task

You can change task settings in the Pressure Optimization portlet.

- Select a draft task in the Pressure Optimization table and click **Update**. The task wizard is displayed. Select the relevant Step from the menu for the settings that you want to modify.
- When you finish modifying the settings, click one of the following user controls on the wizard:
  - **Save and Run Optimization Now**, to store and start the optimization run
  - **Save Only**, to save the information for later use
  - **Cancel**, to abandon the information that you entered.

### Customizing the Pressure Optimization portlet: Administrator

As an administrator, you can customize the portlet by clicking the menu on the upper right corner of the portlet and configuring the portlet settings.

When you configure parameters for the Pressure Optimization portlet, you can specify the following properties:

- Column layout, headings, sort order, and priority.
- Extra conditions to filter the events or resources displayed.
- A group name to enables communication with other map and Pressure Optimization portlets.
- Acknowledge or ignore event creation.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

---

## Maximo integration content pack

IBM Intelligent Water Efficiency Analytics comes with an optional sample set of data illustrating its use for enterprise asset management operations.

### Installing the Maximo content pack

When you install IBM Intelligent Water Efficiency Analytics, you can optionally select to install the content pack. Use the content pack to familiarize with the features and end to end data flows in IBM Intelligent Water Efficiency Analytics. Use the information in this topic to perform any post installation setup.

## Related tasks:

“Post-installation configuration” on page 11

After successfully completing the installation of IBM Intelligent Water Efficiency Analytics, additional steps are required to configure the solution.

## Verifying Maximo server port and security settings

Use the information in this task to review and verify server port and security settings.

### Procedure

1. Log in to the WebSphere Application Server administrative console for the event server.
2. Click **Application servers > MXServer > Ports**.
3. Verify the bootstrap address settings. You will need to remember both the host and port settings.
4. Log in to the WebSphere Application Server administrative console for the application server.
5. Click **Security > Global security** and click **Configure** for Federated repositories.
6. Review and verify realm name.

**Note:** Change the realm name if it is set as *defaultWIMFileBasedRealm*. You must restart the Maximo server if the realm name is changed.

## Synchronizing Maximo application security settings

Use the information in this task to synchronize Maximo application security settings.

### Procedure

1. Log in to the WebSphere Application Server administrative console for the event server.
2. In the WebSphere Application Server administrative console, go to **Security > SSL certificate and key management > Key stores and certificates > CellDefaultTrustStore > Signer certificates**.
3. Click **Retrieve from port** and import the Maximo server certificate.
4. Enter the hostname, port and alias of the Maximo server and click **Retrieve signer information**.

**Note:** You can login to the Maximo server to get the secure port. Click **Application servers > MXServer1**. On the **Configuration** tab, you can view the **Ports** table where the **WC\_defaulthost\_secure** port name and number are displayed.

5. When the certificate is imported, note the hostname. Go to **Security > SSL certificate and key management > Key stores and certificates > NodeDefaultTrustStore > Signer certificates** for maximo root. The hostname is noted in the **Issued To** and **Issue by** fields.
6. Log in to the WebSphere Application Server administrative console for the application server.
7. Define a new login configuration in the WebSphere Application Server administrative console. Go to **Security > Global Security > JAAS - application logins**.
8. Click **New** to create a new JAAS login module called **MAXIMO\_WEBSHERE**.
9. Add the module class name: `com.ibm.ws.security.common.auth.module.WSLoginModuleImpl` and click the box to **Use login module proxy**.
10. Add the following custom properties:  
`use_realm_callback=true`  
`delegate= com.ibm.ws.security.common.auth.module.WSLoginModuleImpl`
11. In the WebSphere Application Server administrative console on the application server, go to **Security > Global Security > CSIv2 outbound communications > Trusted authentication realms - outbound**.
12. Add a new item to specify ISMRealm as a trusted authentication realm in the Maximo server.
13. Click **Apply** to save settings.

## Updating the Maximo properties

Use the information in this task to update the Maximo properties file.

### Procedure

Update the settings in the Maximo properties file to add the hostname, bootstrap port, and ISMRealm. The Maximo properties file is located on the application server at: `/opt/IBM/iss/iow/lib/maximo.properties`.

```
MAXIMO_JNDI_PROVIDER_URL=iio://winmax.cn.ibm.com:9810
MAXIMO_CONN_HOST=winmax.cn.ibm.com:13400/MXServer
MAXIMO_HTTP_HOST=http://winmax.cn.ibm.com:9080
```

```
MAXIMO_USERNAME=maxadmin
MAXIMO_REALM=ISMRealm
MAXIMO_PASSWORD=xxxxxx
```

**Note:** *winmax.cn.ibm.com* is the sample hostname of the Maximo server, 9810 is Maximo server bootstrap port, and ISMRealm is the realm name of the Maximo server. Verify the hostname of the certificate is as you have specified.

## Copying the Maximo jar files into the application server

Use the information in this task to copy the Maximo jar files into the application server.

### Procedure

1. Locate the following packages in the Maximo server.

```
businessobjects.jar
mbojava.jar
mboejbclient.jar
```

The packages are typically located at: `/opt/IBM/WebSphere/AppServerV61/profiles/ctgAppSrv01/installedApps/ctgCell01/MAXIMO.ear`

2. Copy the packages `businessobjects.jar` `mbojava.jar` `mboejbclient.jar` to the application node folder: `/opt/IBM/iss/iow/lib`.
3. Delete the package `mbo.jar` from the folder `/opt/IBM/iss/iow/lib` if it is present.
4. Restart the application server and validate the configuration changes.
5. Start the IOCControl services from the management server by running the following commands:

```
su - ibmadmin
/opt/IBM/ISP/mgmt/scripts/IOCContrdubxpcvm144.mul.ie.ibm.com01.sh start all <password>
```

**Note:** The instructions apply to a Maximo server that is running on a Linux operating system.

## Importing the sample data into Maximo

Use the information in this task to import the sample data into Maximo.

### Before you begin

Ensure Maximo has been successfully installed with asset and metre applications. All the steps must have been completed to prepare the Maximo environment.

### Procedure

1. Open the Maximo interface.
2. Create a new site SWG. Select one of the existing organizations or create a new organization, and add the newly created site SWG to the organization.
3. Change one of user's default site to SWG. Go to **security > users**. Use the filter to find *maxadmin*. In the user setting, add the default site as SWG.

4. Create an Asset Type under the user. Click **System configuration > platform configuration > domains**. Use the filter to find the *assettype* domain. Add the following values:

- PRV
- TANKLEVEL
- WPM
- WUM
- Valve
- Pipe
- Tank
- Junction
- Reservoir

5. Use the filter to find *metertype* domain. Create a meter type and add the following values:

- ValveSetting
- TankTurnover
- TankLevel
- WaterPressure
- WaterUsage

6. Create CONNECTS and CONTAINED relationships.

7. Go to the application server and run the load command to import the sample data:

```
cd /opt/IBM/iss/iow/apps
./loadSampleDataToEAM.sh <ASSET_INSTANCE_FILE> <METER_INSTANCE_FILE>
For example: ./loadSampleDataToEAM.sh sunshine_pipeline_instances.rdf
sunshine_meter_instances.rdf
```

## Integrating the message queue

Use the information in this task to configure WebSphere Application Server for the message queue.

### Procedure

1. Copy the script: `/opt/IBM/iss/iow/maximo/sample_maximo_config.sql` from the application server to the Maximo database server. Run the script.  

```
db2 -tvf sample_maximo_config.sql
```
2. Log on to the WebSphere Application Server administrative console on the Maximo server.
3. Select **Resources > JMS > JMS providers > WebSphere MQ messaging provider**.
  - a. For **Scope**, enter `ctgCell01`.
  - b. For **Name**, enter `WebSphere MQ messaging provider`.
  - c. For **Description**, enter `WebSphere MQ messaging provider`.
4. Add J2C authentication. On the WebSphere Application Server administrative console on the Maximo server do the following.
  - a. Select **Security > Global Security > Java Authentication and Authorization Service > J2C authentication data**.
  - b. For **Alias**, enter `mquser`.
  - c. For **User ID**, enter `mqmconn`.
  - d. For **Password**, enter a password.
5. Add JMS Queue Connection Factory. On the WebSphere Application Server administrative console on the Maximo server do the following.
  - a. Select **Resources > JMS > Queue Connection factories**. Click in the Additional Properties section.
  - b. For **Name**, enter `wih.mb.con.factory`.
  - c. For **JNDI name**, enter `jms/wih.mb.con.factory`.
  - d. For **Queue manager**, enter `WIH.MB.QM`.
  - e. For **host**, enter `event server hostname`.
  - f. For **port**, enter `1415`.
  - g. For **transport tpe**, enter `client`.



- h. For **server connection channel**, enter `system.def.svrconn`.
  - i. For **Component-managed authentication alias**, enter `muser`.
6. Add the JMS Queue. On the WebSphere Application Server administrative console on the Maximo server do the following.
    - a. Select **Resources > JMS > Queue**.
    - b. For **JMS resource provider**, enter WebSphere MQ messaging provider.
    - c. For **Name**, enter `water.workorder.in.q`.
    - d. For **JNDI name**, enter `jms/water.workorder.in.q`.
    - e. For **Queue Name**, enter `WIH.Workorder.IN`.
    - f. For **Queue manager**, enter `WIH.MB.QM`.
  7. Log on to Maximo as administrator.
  8. Select **Go To > Integration > Object Structures** and find the MXWO object structure. Add the object **Locations**.
  9. Select **Go To > Integration > Publish Channels** and find the MXWOInterface channel.
    - a. Click **WORKORDER** in the Object Structure Sub-Records panel.
    - b. Click **New Row** to add processing rules.
    - c. Select rule **SKIPNONSWG**. For **Sequence**, enter 2 and for **Action**, enter **SKIP**.
    - d. Click **Add/Modify Conditions** and click **New Row** on the **Add/Modify Conditions** form.
    - e. Select the **XML Field** tab and click **New Row**.
    - f. Add field **SITEID**. For **Evaluation Type**, enter **NOTEQUALS**. For **Evaluate When**, enter **ALWAYS**. Click **Value** and enter **SWG**. Click **OK** and **Save**.
    - g. Select rule **SKIPNONSWG**.
    - h. Click **Add/Modify Conditions** and click **New Row** on the **Add/Modify Conditions** form.
    - i. Select the **XML Field** tab and click **New Row**.
    - j. Add field **WOClass**. For **Evaluation Type**, enter **EQUALS**. Click **Value** and enter **Activity**. Click **OK** and **Save**.

## Integrating the Maximo content pack

IBM Intelligent Operations for Water provides an Application Programming Interface (API) based on Representational State Transfer (REST) principles. You can use the API to build and test your own applications.

### Related concepts:

Chapter 5, “Integrating the solution,” on page 69

Products and services can be integrated with IBM Intelligent Water Efficiency Analytics.

### Assets - GET

The `assets - GET` resource retrieves a list of assets in XML or JSON format.

### Method

GET.

### Resource URI

`/ibm/water/api/eam-service/assets?query=<query>&properties=<properties>`

### Request Body

Not applicable.

## Response

The response is a list of asset objects in XML or JSON format.

## Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: id, name, type, and description.
properties	The properties are returned in the response, separated by a semi-colon (;). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

## Example: List assets

The example model retrieves a list of assets of type 'PIPE' in XML format by using the assets - GET resource. In this example, you can assume that the service uses the following base URL:

<http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/assets>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/assets?query=type=PIPE&properties=id;type;name;description;location>
- Accept: application/xml

In this example, you get the following XML response:

```
<AssetList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <Asset>
    <id>PIPE1</id>
    <type>PIPE</type>
    <name>Pipe1</name>
    <description></description>
    <location>
      <id>PIPE1LOC</id>
      <description>LINESTRING(-86.20972325405445 41.69817547842112,-86.20680681538411
41.69830054220117)</description>
    </location>
  </Asset>
  ...
</AssetList>
```

## Meters - GET

The meters - GET resource retrieves a list of assets in XML or JSON format.

## Method

GET.

## Resource URI

</ibm/water/api/eam-service/meters?query=<query>&properties=<properties>>

## Request Body

Not applicable.

## Response

A list of meter objects in XML or JSON format.

## Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: id, name, type, unit and description.
properties	The properties are returned in the response, separated by a semi-colon (;). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

## Example: List meters

The example model retrieves a list of meters of type 'WATERUSAGE' and unit 'TONS' in XML format by using the meters resource. In this example, you can assume that the service uses the following base URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/meters>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/meters?query=type=WATERUSAGE;unit=TONS&properties=id;type;name;unit;description>
- Accept: application/xml

In this example, you get the following XML response:

```
<MeterList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <Meter>
    <id>WUM1_M</id>
    <name>WUM_1</name>
    <description>WUM_1</description>
    <unit>TONS</unit>
    <type>WATERUSAGE</type>
  </Meter>
  ...
</MeterList>
```

## Workorders - GET

The workorders - GET resource retrieves a list of work orders in XML or JSON format.

## Method

GET.

## Resource URI

</ibm/water/api/eam-service/workorders?query=<query>&properties=<properties>>

## Request Body

Not applicable.

## Response

The response is a list of asset objects in XML or JSON format.

## Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: id, status, priority, and description.
properties	The properties are returned in the response, separated by a semi-colon (;). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

## Example: list work orders

The following examples demonstrate how to return a list of assets by using the assets - GET resource.

The example model retrieves a list of work orders of status 'APPR' in XML format. In this example, you can assume that the service uses the following base URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/workorders>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/workorders?query=status=APPR&properties=id;status;name;priority;description;location>
- Accept: application/xml

In this example, you get the following XML response:

```
<WorkorderList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <Workorder>
    <id>1007-30</id>
    <name>CLEAN MOTOR</name>
    <status>APPR</status>
    <priority>1</priority>
    <location>
      <id>BPM3100</id>
      <description>#1 Liquid Packaging Line</description>
    </location>
    <description>CLEAN MOTOR</description>
  </Workorder>
  ...
</WorkorderList>
```

## Workorders - POST

The workorders - POST resource creates a new work order in Maximo in XML or JSON format.

## Method

POST.

## Resource URI

/ibm/water/api/eam-service/workorders

## Request Body

A work order description object in JSON or XML format.

## Response

Not applicable.

## Resource Parameters

Not applicable.

## Example: List work orders

The example model creates a work order in JSON format by using the `workorders - POST` resource . In this example, you can assume that the service uses the following base URL: `http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/workorders`.

The example uses the following method, URL, and Accept request-header:

- Method: POST
- URL: `http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/workorders`
- Accept: `application/json`

In this example, you get the following JSON response:

```
{"Workorder":[{"id":"Test001","name":"Test WorkOrder","description":"This is a test work order",  
"failureCode":"MECHASSY","problemCode":"MACHPART","workType":"CM","JobPlan":{"id":"APPLREQ"},  
"location":{"id":"Test001LOC","description":"POINT(-86.41054412841 41.678206114523)"}]}
```

## Jobplans - GET

The `jobplans - GET` resource retrieves a list of job plans in XML or JSON format.

## Method

GET.

## Resource URI

`/ibm/water/api/eam-service/jobplans`

## Request Body

Not applicable.

## Response

A list of job plan objects in XML or JSON format.

## Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: id, name, and description.

Property	Description
properties	The properties are returned in the response, separated by a semi-colon (";"). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

### Example: List work orders

The example model retrieves a list of job plans of id '401' in XML format by using the jobplans - GET resource . In this example, you can assume that the service uses the following base URL:  
<http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/jobplans>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/jobplans?query=id=401&properties=id;description>
- Accept: application/xml

In this example, you get the following XML response:

```
<JobPlanList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <JobPlan>
    <id>401</id>
    <description>Spot Patching</description>
  </JobPlan>
</JobPlanList>
```

### Worktypes - GET

The worktypes - GET resource retrieves a list of work types in XML format.

#### Method

GET.

#### Resource URI

</ibm/water/api/eam-service/worktypes>

#### Request Body

Not applicable.

#### Response

A list of work type objects in XML or JSON format.

#### Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: id, name, and description.
properties	The properties are returned in the response, separated by a semi-colon (";"). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

## Example: List work types

The example model retrieves a list of work types in XML format by using the `worktypes` - GET resource. In this example, you can assume that the service uses the following base URL: `http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/worktypes`.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: `http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/worktypes?properties=id;description`
- Accept: `application/xml`

In this example, you get the following XML response:

```
<WorkTypeList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <WorkType>
    <id>CM</id>
    <description>Corrective Maintenance</description>
  </WorkType>
  <WorkType>
    <id>EM</id>
    <description>Emergency Maintenance</description>
  </WorkType>
  <WorkType>
    <id>EV</id>
    <description>Event Report</description>
  </WorkType>
  ...
</WorkTypeList>
```

## Failurecodes - GET

The `failurecodes` - GET resource retrieves a list of failure codes in XML format.

### Method

GET.

### Resource URI

`/ibm/water/api/eam-service/failurecodes?query=<query>&properties=<properties>`

### Request Body

Not applicable.

### Response

A list of failure code objects in XML or JSON format.

### Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: code and description.
properties	The properties are returned in the response, separated by a semi-colon (;). The default value is defined in the file, <code>/opt/IBM/iss/iow/lib/maximo.properties</code> , on the Application server.

## Example: List failure codes

The example model retrieves a list of failure codes in XML format by using the failurecodes - GET resource . In this example, you can assume that the service uses the following base URL:  
http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/failurecodes.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/failurecodes?properties=code;description
- Accept: application/xml

In this example, you get the following XML response:

```
<FailureCodeList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <FailureCode>
    <code>PKG</code>
    <description>Packaging Line Failures</description>
  </FailureCode>
  <FailureCode>
    <code>PUMPS</code>
    <description>Pump Failures</description>
  </FailureCode>
  <FailureCode>
    <code>BLDGS</code>
    <description>Facility Maintenance & HVAC</description>
  </FailureCode>
  <FailureCode>
    <code>BOILERS</code>
    <description>Boiler Failures</description>
  </FailureCode>
  ...
</FailureCodeList>
```

## Problemcodes - GET

The problemcodes - GET resource retrieves a list of problem codes in XML or JSON format.

### Method

GET.

### Resource URI

/ibm/water/api/eam-service/problemcodes?query=<query>&properties=<properties>

### Request Body

Not applicable.

### Response

A list of problem code objects in XML or JSON format.

### Resource Parameters

The resource has the following properties.

Property	Description
query	The query syntax is "key1=value1;key2=value2;...". The supported keys are: code and description.



Property	Description
properties	The properties are returned in the response, separated by a semi-colon (;). The default value is defined in the file, /opt/IBM/iss/iow/lib/maximo.properties, on the Application server.

### Example: List problem codes

The example model retrieves a list of problem codes with a failure code of 'PKG' in XML format by using the failurecodes - GET resource. In this example, you can assume that the service uses the following base URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/problemcodes>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/problemcodes?query=failurecode.code=PKG&properties=code;description>
- Accept: application/xml

In this example, you get the following XML response:

```
<ProblemCodeList xmlns="http://www.ibm.com/iss/iow/services/eam">
  <ProblemCode>
    <code>LIFT</code>
    <description>Packaging Line Failures</description>
  </ProblemCode>
  <ProblemCode>
    <code>LUBE</code>
    <description>Packaging Line Failures</description>
  </ProblemCode>
  <ProblemCode>
    <code>FEED</code>
    <description>Packaging Line Failures</description>
  </ProblemCode>
</ProblemCodeList>
```

### URL/asset - GET

The url/asset - GET resource retrieves a URL string which links to display the asset details in Maximo.

#### Method

GET.

#### Resource URI

/ibm/water/api/eam-service/url/asset?id=<asset id>

#### Request Body

Not applicable.

#### Response

A URL string.

## Resource Parameters

The resource has the following properties.

Property	Description
asset id	The ID of the asset.

### Example: Get maximo URL to view asset details

The example model retrieves a Maximo URL to view the asset details by using the URL/asset - GET resource. In this example, you can assume that the service uses the following base URL:  
<http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/url/asset>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: <http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/url/asset?id=J540>
- Accept: application/xml

In this example, you get the following URL string response:

```
http://maximo-server:port/maximo/ui/?event=loadapp&value=asset&additionalEvent=useqbe&additionalEventvalue=assetnum=J540
```

### URL/workorder - GET

The url/workorder - GET resource retrieves a URL string which links to display work order details in Maximo.

#### Method

GET.

#### Resource URI

</ibm/water/api/eam-service/url/workorder?id=<work order id>>

#### Request Body

Not applicable.

#### Response

A URL string.

## Resource Parameters

The resource has the following properties.

Property	Description
work order id	The ID of the work order.

### Example: Get a Maximo URL to view work order details

The example model retrieves a Maximo URL to view work order details by using the url/workorder - GET resource. In this example, you can assume that the service uses the following base URL:  
<http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/url/workorder>.

The example uses the following method, URL, and Accept request-header:

- Method: GET
- URL: `http://app-ioc.cn.ibm.com/ibm/water/api/eam-service/url/workorder?id=T1071`
- Accept: `application/xml`

In this example, you get the following URL string response:

```
http://maximo-server:port /maximo/ui/?event=loadapp&value=wotrack&additionalEvent
=useqbe&additionalEventValue=wonum=T1071
```

## Configuring the Maximo content pack

Use the information in this topic to synchronize Maximo data with IBM Intelligent Operations for Water.

### Synchronizing Maximo asset data

Use the information in this topic to synchronize Maximo asset data between Maximo and IBM Intelligent Water Efficiency Analytics.

#### About this task

Asset data such as asset number, description, type, long description, and location must be synchronized. Meter data such as meter ID, description, type, measure unit ID, long description and location must also be synchronized.

#### Procedure

Run the following command to synchronize the Maximo asset data.

```
SyncEAMtoModelManager.sh rulefile target asset rdf file
```

The *rulefile* defines the rule for asset synchronization file definition.

#### Example

The following is a sample command:

```
SyncEAMtoModelManager.sh sampleSyncRule.xml target.rdf
```

The following is a sample synchronization rule file in XML. All namespaces used for the target RDF file must be defined in the XML file.

```
<?xml version="1.0" encoding="UTF-8"?>
<config xmlns:rdf=http://www.w3.org/1999/02/22-rdf-syntax-ns#
  xmlns:cim="http://iec.ch/TC57/CIM-generic#" xmlns:dm="http://iec.ch/2002/schema/CIM_difference_model#"
  xmlns:swg="http://SunshineWaterGroup#" xml:base="http://SunshineWaterGroup">
<asset-query>siteid='SWG'</asset-query>

<templates>
<asset-template type="Pipe">
<swg:Pipe rdf:ID="{asset.ID}"
  <cim:RSM_IdentifiedObject.name>("{asset.NAME}")
  </cim:RSM_IdentifiedObject.name>
  <cim:RSM_PhysicalEntity.TypeOfPhysicalEntity>WorkEquipment
  </cim:RSM_PhysicalEntity.TypeOfPhysicalEntity>
  <cim:RSM_WorkEquipment.TypeOfWorkEquipment>Pipe
  </cim:RSM_WorkEquipment.TypeOfWorkEquipment>
  <cim:RSM_WorkEquipment.EquipmentLevel>1
  </cim:RSM_WorkEquipment.EquipmentLevel>
  <cim:RSM_WorkEquipment.connects_WorkEquipment
  rdf:resource="#{asset.connectedby.asset[1].ID}"/>
  <cim:RSM_WorkEquipment.connects_WorkEquipment
  rdf:resource="#{asset.connectedby.asset[2].ID}"/>
</asset-template>
</templates>
```

```

</swg:Pipe>
<cim:RSM_GeoSpatial rdf:ID="({$asset.ID)-Location">
  <cim:RSM_Identifier.name>"({$asset.ID)-Location"
</cim:RSM_Identifier.name>
  <cim:RSM_UnnamedObject.description>"({$asset.ID)-Location"
</cim:RSM_UnnamedObject.description>
  <cim:RSM_Location.TypeOfLocation>ISO6709
</cim:RSM_Location.TypeOfLocation>
  <cim:RSM_GeoSpatial.InternalLocation>{${asset.LOCATION}}
</cim:RSM_GeoSpatial.InternalLocation>
  <cim:RSM_Location.providesLocationOf_PhysicalEntity
    rdf:resource="#{${asset.ID}}"/>
  </cim:RSM_GeoSpatial>
</asset-template>

```

The following is the list of variables supported in the RDF file definition.

Variable	Description
{\${asset.ID}}	Asset ID in Maximo.
{\${asset.NAME}}	Short description of the asset in Maximo.
{\${asset.connectedby.asset[1].ID}}	The asset may be connected by another asset. Represents the first asset that the asset is connected to.
{\${asset.LOCATION}}	Location of the asset specified by longitude and latitude.
{\${asset.containedby.asset.ID}}	Asset may be contained by other asset. Represents the parent asset of the asset.
{\${meter.ID}}	Meter number of the meter.
{\${meter.NAME}}	Description of the meter.
{\${meter.whereused.asset.ID}}	Asset where the meter is used. The meter should be placed on a certain asset.

## Synchronizing Maximo work order data

Use the information in this topic to synchronize work orders in Maximo to the IBM Intelligent Water Efficiency Analytics database.

### About this task

Work order data such as work order number, name, status, priority, location, failure code, problem code, work type, target start date, target end date, work order creation date, work order description and job plan is synchronized by your administrator.

### Procedure

Run the following command to synchronize Maximo work order data.

```
syncWorkorder.sh DB_HOST DB_PORT DB_USERNAME DB_PASSWORD work order query string
```

**Note:** The *DB\_HOST*, *DB\_PORT*, *DB\_USERNAME* and *DB\_PASSWORD* variables are used to construct the database connection URL.

### Example

The following is a sample command:

```
syncWorkorder.sh db.ioc.ibm.com 50000 db2inst1 passw0rd "siteid='SWG'"
```

## Using the Maximo content pack

Familiarize with enterprise asset management integration in the IBM Intelligent Water Efficiency Analytics interface by using the capabilities provided with the Maximo content pack.

### Viewing meter details

Use the information in this topic to view meter details on the Operator: Operations view. Meter information can be viewed on the Map and on the Details portlet. Managing meters requires that you regularly evaluate and monitor equipment and measurements. With the solution, you can display information about the meter device and measurements. You can also drill down to get more information about historic measurements, device installed date, warranty status, and preferred vendor.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the meter. Hover over the meter to view information about the asset (for example, meter readings, historic readings, device installed date, warranty status, and preferred vendor).
7. View the status of the meter on the Details portlet.
8. Right-click the meter and select the **View Details** option to view details.

### Creating work orders

Use the information in this topic to create work orders on the Operator: Operations view.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### About this task

Work orders can be created manually using the solution interface.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Click **Select Content > Work Order**. Use the filtering options on the map to customize your view of the work orders. Use the filtering options on the map to view the asset types.
6. Select the asset or equipment item. Hover over the asset to view critical information about the asset (for example, the location of the device or the last reading/historical reading from the device).
7. View the status of the asset on the Details portlet.
8. Right-click on the Map portlet, or right-click an asset in the Details portlet, and select the **Add Work Order** option.

9. Complete the **Work Order** dialog. Enter details including the work order ID, name, asset, problem description, work type, job plan, description, priority, start and end dates, and work location.

**Note:** You can create a work order against active job plans only.

10. Click **OK** to create the work order. The work order is displayed on the **Work Orders** tab in the Details portlet and also on the map.

## Viewing work order status

Use the information in this topic to view work order status on the Operator: Operations view. Work orders can be viewed on the Map and on the Details portlet.

## Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

## About this task

Managing work orders requires that you regularly evaluate and monitor received work orders. Work orders are generated typically from service requests. For example, you may have a specific piece of water equipment operating at a physical location that requires maintenance work performed. With the solution, you can display information about the equipment or device. You can also drill down to get more information about its maintenance history, installed date, warranty status, and preferred vendor. Managing work orders requires you to be aware of the quantity and nature of work orders. Using IBM Intelligent Water Efficiency Analytics, that information is readily available and key indicators are viewable in charts and tables for selected physical locations and equipment.

## Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the work orders. Click **Select Content > Work Order**.
6. Filter the display based on **Asset Type**, **Work Type**, **Problem**, **Status**, and **Priority**.
7. Open the **Work Orders** tab on the Details portlet, right click a work order in the list, and select the option to view details.
8. The **Work Order** dialog displays work order details including the ID, name, asset, problem description, work type, job plan, description, priority, start and end dates, and work location.

---

## Chapter 5. Integrating the solution

Products and services can be integrated with IBM Intelligent Water Efficiency Analytics.

IBM Intelligent Water Efficiency Analytics uses the same public web service interface that was released in IBM Intelligent Operations for Water. Use the public web service interface when you are writing or testing applications. You can use any HTTP client in any programming language to query metadata about your water infrastructure. You can access the URLs and any HTTP client in any programming language to interact with the API.

For information about solution integration points, refer to the links at the end of the page.

### **Related concepts:**

“Integrating the Maximo content pack” on page 55

IBM Intelligent Operations for Water provides an Application Programming Interface (API) based on Representational State Transfer (REST) principles. You can use the API to build and test your own applications.

### **Related information:**

[Integrating the solution](#)

[Customizing data integration](#)

[Customizing data import and operational storage](#)

[Customizing data processing](#)

[Overview of Integration in Intelligent Operations Center](#)

[Reference information in Intelligent Operations Center](#)



[IBM developerWorks article: Developing KPIs \(Part 1\)](#)



[IBM developerWorks article: Developing KPIs \(Part 2\)](#)





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## Chapter 6. Customizing the solution

You can customize some aspects of the user interface and system settings of IBM Intelligent Water Efficiency Analytics to suit your operational requirements and users. By working with the content packs, you can become familiar with system capabilities when customizing the solution.

### Related information:

Customizing the solution

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## Customizing the user interface

You can customize some elements of the IBM Intelligent Water Efficiency Analytics user interface to suit your operation.

### List of portlets

IBM Intelligent Operations for Water is a portlet-based solution using portal technology.

The following portlets are provided with IBM Intelligent Operations for Water when all content packs are installed out of the box.

*Table 29. List of portlets*

Name	Description	Page
Map	<ul style="list-style-type: none"><li>• Displays the geographical region with events and incidents, resources and assets, and work orders.</li><li>• Provides a filter form to select the categories to be shown.</li></ul>	Operations
Details	<ul style="list-style-type: none"><li>• Linked to the Map portlet.</li><li>• Provides an interactive and detailed list of events, incidents, assets, and work orders that you are authorized to view.</li></ul>	Operations
Status	<ul style="list-style-type: none"><li>• Provided by IBM Intelligent Operations Center displaying an executive-level summary of the status of KPIs across the organizations that you have permission to view.</li><li>• Used to view up-to-date changes in the KPI status so that you can plan and take action if necessary.</li></ul>	Executive
Key Performance Indicator Drill Down	<ul style="list-style-type: none"><li>• Provided by IBM Intelligent Operations Center and offering drill down capabilities on a specific KPI category.</li><li>• Used to inspect the underlying KPIs until you reach details of the KPI that caused the status change.</li></ul>	Executive

Table 29. List of portlets (continued)

Name	Description	Page
Notifications	<ul style="list-style-type: none"> <li>Portlet provided by IBM Intelligent Operations Center displaying a dynamic, interactive list of alerts that result from changing KPIs and correlated events.</li> <li>Highlights changes in KPI or event status and shows key details for each of the alerts.</li> </ul>	Operations and Executive
My Activities	<ul style="list-style-type: none"> <li>Portlet provided by IBM Intelligent Operations Center displaying a list of activities that are owned by the team member logged in.</li> <li>Lists each activity ID and the related incident information.</li> </ul>	Operations and Executive
Sametime	<ul style="list-style-type: none"> <li>Portlet provided by IBM Intelligent Operations Center and provides a customizable contact list organized by group.</li> <li>Used to communicate and collaborate with team members.</li> </ul>	Operations and Executive
Water Conservation: City View	<ul style="list-style-type: none"> <li>Portlet provided by Water Conservation content pack and provides consumption information for a city.</li> </ul>	Water Conservation
Water Conservation: Citizen View	<ul style="list-style-type: none"> <li>Portlet provided by Water Conservation content pack and provides consumption information for a consumer.</li> </ul>	Water Conservation
Pressure Optimization	<ul style="list-style-type: none"> <li>Portlet provided by Pressure Optimization content pack and provides pressure optimization information for operations staff.</li> </ul>	Operations
Pipeline Failure Prediction	<ul style="list-style-type: none"> <li>Portlet provided by Pipeline Failure prediction content pack and provides prediction pipeline failure information for planners.</li> </ul>	Planner

## Guidelines for customizing portlets

You can reposition and customize the portlets on the Operator: Operations or Executive: Status views.

### Repositioning the portlets

Use the following procedure to move a portlet from its default location to a new location on the same portal page. You can move a portlet up, down, left, or right, depending on its current location. You must have administrative role permissions to reposition the portlets on the page.

1. Log on to the solution portal as an administrator.
2. Open the portal page that you would like to customize.
3. Go to the portlet that you would like to move and click the portlet display menu.
4. Select one of the following options:

- **Move Up**
- **Move Down**
- **Move Left**
- **Move Right**

**Note:** Only the options applicable to the current position of the portlet are available.

## Resizing the portlets

All users of IBM Intelligent Water Efficiency Analytics can resize a portlet, which is useful for viewing the map or graph portlets in more detail.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

**Note:** Resizing a portlet clears the current filter query and results from the map and list.

## Customizing the map

You can configure the base geographical information system (GIS) map used by IBM Intelligent Water Efficiency Analytics. You can also configure the default starting point for the map for each component of the solution. See the related links at the end of this topic for more information about the GIS server requirements for IBM Intelligent Water Efficiency Analytics and also how to configure the map service.

## Customizing the reports

The graph and table summaries generated in the reports portlets of IBM Intelligent Water Efficiency Analytics are determined by the type of query submitted from the map. You cannot customize the reports in IBM Intelligent Water Efficiency Analytics. Customized reports are outside the scope of the solution. For more information, contact your IBM Intelligent Water Family representative and arrange a Lab Services engagement.



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## Chapter 7. Managing the solution

The topics in this section describe how to perform administrative tasks for IBM Intelligent Water Efficiency Analytics.

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### Verifying the version

You can verify the version of IBM Intelligent Water Efficiency Analytics that you have deployed by using the Intelligent Operations Center - About portlet in the **Administration** portal. You can also verify the version of the IBM Intelligent Operations Center and other integrated IBM Smarter Cities Software Solutions that you have deployed in this environment.

For more information about the Intelligent Operations Center - About portlet, see the IBM Intelligent Operations Center Information Center.

#### Related information:

Verifying the version of the IBM Intelligent Operations Center and integrated solutions

---

### Controlling the services

IBM Intelligent Water Efficiency Analytics runs on top of the IBM Intelligent Operations Center production environment. The IBM Intelligent Operations Center server cluster provides the middleware and base architecture for the solution. The services for IBM Intelligent Water Efficiency Analytics are run and managed from the servers of the IBM Intelligent Operations Center.

For information about how to stop and start the IBM Intelligent Operations Center servers that IBM Intelligent Operations for Water runs on, see the Related information link in the IBM Intelligent Operations Center Information Center.

#### Related information:

Controlling the IBM Intelligent Operation Center servers

---

### Working with the Administration portlets

Use the Administration portlets to customize some aspects of the user interface and system settings of IBM Intelligent Water Efficiency Analytics to suit your operational requirements and users.

To access the Administration portlets, open the WebSphere Portal Administration interface. Click **Intelligent Operations > Customization Tools**.

Each portlet provides you with services to administer IBM Intelligent Water Efficiency Analytics.

*Table 30. Administration view portlets*

Portlet	Administration
"Customize Asset" on page 120	Use the Customize Asset portlet to set thresholds for sensor readings.
"Customize Namespace" on page 122	Use the Customize Namespace portlet to add, change and delete a namespace.
"Customize Asset Type" on page 123	Use the Customize Asset Type portlet to assign an icon to an asset type.
"Customize Logical Zone" on page 124	Use the Customize Logical Zone portlet to view, monitor, and manage logical zones.

Table 30. Administration view portlets (continued)

Portlet	Administration
"Synchronizing the model database" on page 126	Use the Synchronizing the model database portlet to synchronize model data with the database.

**Related information:**

Customizing the solution

---

## Chapter 8. Maintaining the solution

Perform the tasks described in this section to keep your solution running smoothly.

---

### Tuning performance

You can enhance the performance of the product after you complete the installation.

IBM Intelligent Operations for Water runs on top of the IBM Intelligent Operations Center. For details on tuning performance in IBM Intelligent Operations for Water, see the section of the IBM Intelligent Operations Center Information Center.

Because of its close relationship with the base WebSphere Application Server product, tuning the IBM Intelligent Operations for Water solution entails tuning WebSphere Application Server. Other products that might require tuning: Tivoli Access Manager WebSEAL, Tivoli Netcool/OMNibus, and Tivoli Netcool/Impact.

#### Related information:

Tuning performance in the IBM Intelligent Operations Center

### Tuning the application server

You can work with tuning parameters in WebSphere Application Server and associated settings to improve application server performance. You can update web container properties, log levels, and application server heap size.

#### About this task

Each browser client needs a dedicated web container thread for its lifetime since the client uses this thread for dynamic updates of the browser. The dedicated threads are not available to other web (HTTP) clients. To support dedicated threads, the web container thread pool must, at a minimum, be increased to the recommended settings.

#### Procedure

1. Go to the WebSphere Application Server administrative console.
2. Select the **Servers > Server types > Websphere application servers**.
3. Click the client server link. For example, **insert sample server name**.
4. Scroll to the Additional Properties section at the end of the displayed page, and click **Thread pools**.
5. Click the **WebContainer** link and modify the web container minimum and maximum size as required.
6. Save the changes and restart the client server.

### Setting the log level to avoid excessive logging

#### About this task

At the default setting log level, there might be excessive logging in one component that can cause significant log file creation as well as CPU consumption. By changing the default log setting from *info* to *severe*, you can minimize the impact.

#### Procedure

1. Log on to the WebSphere Application Server administrative console, select **WebSphere Portal** from the list of servers.
2. Click **Troubleshooting > Logs and Trace**.

3. Click the **Runtime**. Change the **Log Detail Level** setting. Check **Save runtime changes to configuration as well** for all components. Replace the string **\*=info** with **\*=severe**.

## Setting heap size for the application server

### About this task

When you set the heap size for an application server, refer to the following guidelines:

- Make sure that the system has enough physical memory for all of the processes to fit into physical memory, plus enough for the operating system. When more memory is allocated than the physical memory in the system, paging occurs, which can result in poor performance.
- After you tune heap sizes, monitor the system to make sure that paging is not occurring. Paging can cause poor performance.
- 32-bit operating systems have an address space limit of 4 GB, regardless of the amount of physical memory in the system. This limits the maximum size of each individual process in the system. In addition, some operating systems restrict the size of processes to be even less than the limit. The following systems restrict the process size:
  - Many versions of Windows limit processes to 2 GB in size.
  - Many 32-bit Linux<sup>®</sup> kernels default to a 2 GB limit for processes.
  - The address space limit further restricts the size of the JVM process. If the process grows larger than the limit imposed by the operating system, it might terminate unexpectedly.

### Procedure

1. Log on to the WebSphere Application Server administrative console, select the name of your server.
2. In the configuration tab, under Server Infrastructure, click **Java and Process Management > Process Definition**.
3. Click **Java Virtual Machine**.
4. In the **Maximum Heap Size** field, enter your recommended value; for example: 1536.
5. In the **Initial Heap Size** field, enter your recommended value; for example: 1024.
6. Click **OK**.
7. Click **Save**.
8. Log out, and then restart the server.

## Tuning the database server

Use the following information to tune performance of the database server.

### About this task

Databases can behave differently for different deployments. When you tune database performance, your approach to maintenance must involve a comprehensive look at the various aspects of the database system. Consideration must be given to memory, the file system of the database host server, and the buffer pools (record caches) of the database setup. Some tuning steps to consider for the IBM DB2 database parameters are provided. Refer to your database information center for specific database tuning guidelines.

### Procedure

1. Update database configuration parameters by running the following command:  
db2 update db config for database alias using db parameter value.  
For example:  
db2 update db config for WIHDB using MAXAPPLS 1000
2. Send logs to separate disks from where the physical database resides to accommodate constant logging. For example, create separate disks for database executable, stored data, transaction logs.



3. Updates the table statistics regularly. Run DB2 utilities to recount records, store table statistics in catalogs, and check for fragmentation. For example:  
db2 reorgchk update statistics on table all
4. Update the statistics about the physical characteristics of a table and the associated indexes. For example:  
db2 runstats on table <table\_name> with distribution and detailed indexes all
5. Physically reorganize your tables. For example:  
db2 reorg table table-name
6. Ensure that the database server has enough disks.
7. Ensure that the parameter **MaxApp1s** is greater than the total number of connections for both the data source and the session manager for each application server clone.
8. Use the SMS table space type for DB2 temporary table spaces for systems with nested queries.

## Tuning Tivoli Netcool/Impact settings

Use the following information to tune performance of Tivoli Netcool/Impact.

### About this task

Under high load you might need to increase the number of connections to support efficient database storage.

### Procedure

1. Change the IOC\_CAP data source maximum SQL connections from 20 to 250. Update the *NCOMS.ObjectServer.MAXSQLCONNECTION* property in the file at: /opt/IBM/netcool/impact/etc/NCI\_IOC\_CAP.ds
2. Change the WIHDB data source maximum SQL connections from 20 to 250. Update the *NCOMS.ObjectServer.MAXSQLCONNECTION* property in the file at: /opt/IBM/netcool/impact/etc/NCI\_WIHDB.ds
3. Change the NCOMS data source maximum SQL connections from 20 to 250. Update the *IOC\_CAP.DB2.MAXSQLCONNECTION* property in the file at: /opt/IBM/netcool/impact/etc/NCI\_NCOMS.ds

## Changing the minimum and maximum event processor thread pool size

### About this task

Under high load you might need to increase the size of the thread pool in the Event Processor to support more concurrency.

### Procedure

1. Change the minimum event processor thread pool size from 5 to 50. Update the *impact.eventprocessor.minnumthreads* property in the file at: /opt/IBM/netcool/impact/etc/NCI\_eventprocessor.props
2. Change the maximum event processor thread pool size from 30 to 100. Update the *impact.eventprocessor.maxnumthreads* property in the file at: /opt/IBM/netcool/impact/etc/NCI\_eventprocessor.props

## Changing the event reader fields size

### About this task

Under high load you might need to increase the event reader fields size to support more concurrency.

## Procedure

Change the event reader fields size from 100 to 1000. Update the *impact.wih\_event\_reader.fields* property in the file at: /opt/IBM/netcool/impact/etc/impact.wih\_event\_reader.props.

## Tuning Tivoli Netcool/OMNIBus settings

Use the following information to tune performance of Tivoli Netcool/OMNIBus.

### About this task

Under high load you might need to increase the number of Tivoli Netcool/OMNIBus NCOMS connections.

## Procedure

Change the Tivoli Netcool/OMNIBus NCOMS maximum connections from 30 to 250. Update the *Connections* property in the file at: /opt/IBM/netcool/omnibus/etc/NCOMS.props.

## Monitoring network performance

Monitor the network closely to ensure that performance is acceptable and consistent.

## Tuning Tivoli Access Manager WebSEAL

Use the following information to tune the performance of Tivoli Access Manager WebSEAL.

### About this task

Under high load you might need to adjust the number of worker threads. You can increase the number of Tivoli Access Manager WebSEAL worker threads to accommodate the amount of concurrent load to be expected on the system.

## Procedure

1. Log in to Tivoli Access Manager WebSEAL node as root.
2. Edit file /opt/pdweb/etc/webseald-default.conf, under THREADS AND CONNECTIONS. Modify the *worker-threads* property to be 1-2 times the number of concurrent users on the system.
3. Restart Tivoli Access Manager WebSEAL by using the **pd\_start stop, pd\_start start** commands.

## Enabling compression of HTTP response content

### About this task

Under high load you might need to enable compression of HTTP response content. Edit the webseald-default.conf file to allow compression of response content to be performed by WebSEAL.

## Procedure

1. Log in to Tivoli Access Manager WebSEAL node as root.
2. Edit file /opt/pdweb/etc/webseald-default.conf.

```
[compress-mime-types]
image/* = -1
text/html = 1000
text/* = 100
application/x-javascript = 100
application/* = 100
*/ = 100
```
3. Restart Tivoli Access Manager WebSEAL by using the **pd\_start stop, pd\_start start** commands.

## Enabling caching of static documents

### About this task

Under high load you might need to enable caching of static documents. Edit the `webseald-default.conf` file to allow caching of static documents to be performed by WebSEAL.

### Procedure

1. Log in to Tivoli Access Manager WebSEAL node as root.
2. Edit file `/opt/pdweb/etc/webseald-default.conf`.

```
[content-cache] !
text/css = memory:5000!
text/html = memory:5000!
application/x-javascript = memory:5000!
image/* = memory:5000!
*/* = memory:10000
```
3. Restart Tivoli Access Manager WebSEAL by using the `pd_start stop`, `pd_start start` commands.

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## Backing up data

To prevent the loss of valuable data, back up certain files, directories, and databases.

Ensure that the database used to store production data and information generated by the solution, is backed up on a regular basis.

Database name	Location	Format
WIHDB	IBM Intelligent Operations Center database server	DB2 <sup>®</sup>

IBM Intelligent Water Efficiency Analytics is integrated with IBM Intelligent Operations Center. When backing up data, ensure that you also backup the IBM Intelligent Operations Center database: IOCDDB.

Some data, for example event data that is used by IBM Intelligent Water Efficiency Analytics, is stored in the IBM Intelligent Operations Center database. There are other files, directories, and databases provided by the IBM Intelligent Operations Center architecture and base platform that must also be backed up regularly. For more information about backing up the IBM Intelligent Operations Center, see the related information.

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## Maintenance tips

More tips for maintaining the solution are documented in the form of individual technotes in the IBM Support Portal.

The following link starts a customized query of the live Support knowledge base for IBM Intelligent Water Efficiency Analytics:

IBM Intelligent Operations for Water technotes and APARs (problem reports)



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## Chapter 9. Using the solution interface

The IBM Intelligent Water Family of web-based solutions use portal technology to enable water companies to manage and monitor water assets and infrastructure.

With the solution, you can monitor operating alerts and key performance indicators to get a summary and detailed view of water assets. The IBM Intelligent Water Family of solutions aggregate data from water monitoring systems and other asset management systems into a centralized, configurable dashboard that provides valuable information to support water management.

You can access the solutions by using the solution portal. You can access the solution with any of the supported web browsers. For details of which browsers are supported, see the detailed system requirements.

### Related information:

IBM Intelligent Operations Center browser requirements

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## Logging on

Log on to access the solution user interface.

### Before you begin

Contact your administrator to obtain a user ID and password. Your administrator is responsible for making sure that you have the required system security access level appropriate to your role in your organization. Your administrator also provides you with the web address (URL) for accessing the solution.

### About this task

On the main navigation bar at the top of the portal, select **Water** to access the solution from the IBM Intelligent Operations Center or other IBM Smarter Cities Software Solutions installed in this environment. Use the following procedure to start a new browser session and access the portal pages.

### Procedure

1. Enter the web address URL into the address field of your web browser. Use the fully qualified domain name in the URL. For example, `http://servername.domainname/wpsv70/wps/myportal`.
2. On the server home page, enter your user ID and password.
3. Click **Sign In**.
4. Select **Water** from the navigation bar at the top of the portal.

### Results

The solution home page is displayed in the web browser. Only the pages, features, and data that you have permission to access are displayed. Contact your administrator if you need more access.

**Related tasks:**

“Logging off”

Log off to exit the user interface and end the server session.

“Viewing or editing your user profile”

Click **Edit My Profile** to access your user profile for the portal server. From your user profile, you can modify some of your personal user settings, including password, name, email, and language preferences.

---

## Logging off

Log off to exit the user interface and end the server session.

### Procedure

To log off from the solution, click **Log Out**. By default, the **Log Out** link is in the upper right corner of the interface.

**Related tasks:**

“Logging on” on page 83

Log on to access the solution user interface.

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## Viewing or editing your user profile

Click **Edit My Profile** to access your user profile for the portal server. From your user profile, you can modify some of your personal user settings, including password, name, email, and language preferences.

### Procedure

See the IBM Intelligent Operations Center help and documentation for more information about viewing or editing your user profile.

**Related information:**

Viewing or editing your user profile in the IBM Intelligent Operations Center

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## Using pages

The interface is a role-based dashboard for consolidating data. Below the navigation bar are pages. Each page consists of portlets that you can interact with to access the information you need. Each page provides a consolidated view of water operations that enable specific roles to monitor, manage, and respond to key areas that impact water organizational performance.

### Operator: Operations view

Use the Operator: Operations view to maintain awareness of the status of water assets, measurement readings, water events, and their location. The Operator: Operations view is intended for operators, managers, or others monitoring and responding to current water infrastructure events.

The Operator: Operations view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the operations level.

Table 31. Operator: Operations view portlets

Portlet	Description
<p>“Map” on page 94</p>	<p>A <b>Geospatial Map</b> of the geographical region that contains event and resource markers, water asset and status, logical zones and layers.</p> <p>A filter form to select the categories of events to be shown on the map and in the <b>Events and Incidents</b> tab on the Details portlet.</p> <p>A filter form to select the asset types to be shown on the map and in the <b>Assets</b> tab on the Details portlet.</p> <p>A filter form to select the logical zones to be shown on the map.</p> <p>A filter form to select the layers to be shown on the map. Use the layers to filter assets to display on the map, for example by virtual group or pipe network.</p> <p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p> <p>A <b>Logical Map</b> of the logical structure that contains a graphical view of the model. The model shows topics, topic associations, and linkages in the model.</p>
<p>“Details” on page 101</p>	<p>The Details portlet is an interactive list portlet. All the events that you are authorized to see are visible on the events list and on any map portlet that is linked to the Details portlet. Events and incidents and asset details are displayed. Resources in the vicinity of an event can be displayed in a resource list and on a map. Key asset measurements, including current and historical values can be displayed.</p> <p>Work orders that you are authorized to see are visible on the work order list and on any map portlet that is linked to the Details portlet.</p>
<p>“Notifications” on page 107</p>	<p>The Notifications portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.</p>
<p>“My Activities” on page 109</p>	<p>The My Activities portlet displays a list of activities that are owned by the person currently logged on to IBM Intelligent Operations for Water. In the My Activities portlet, the activities are grouped by their parent Standard Operating Procedures. Each Standard Operating Procedure corresponds to an individual event.</p>
<p>“Contacts” on page 111</p>	<p>The Sametime portlet provides a contacts list that is organized by group. It can be customized based on the people you communicate with. You can chat with people and modify your online status, contacts, or groups.</p>

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

## Administrator

### Customizing a portlet

As an administrator you can change portlet settings by clicking the upper right corner of the portlet, and selecting an option from the portlet menu.

There are two possible modes of customization, each changing the portlet settings for all users:

- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

## Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

### Executive: Status view

Use the Executive: Status view to obtain a consolidated view of key performance indicators (KPIs) and key events. The Executive view enables users with cross-organization responsibility to monitor, manage, and respond to status changes in key areas of organizational performance.

The Executive: Status view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the executive level.

Table 32. Executive: Status view portlets

Portlet	Description
"Status" on page 105	The Status portlet provides an executive-level summary of the status of KPIs across the organizations that you have permission to view. Use this portlet to view up-to-date changes in the KPI status so that you can plan and act if necessary.



Table 32. Executive: Status view portlets (continued)

Portlet	Description
“Key Performance Indicator Drill Down” on page 107	To focus on a specific KPI category, click the category in the Status portlet. This category is then displayed in the Key Performance Indicator Drill Down portlet. You can use the list to inspect the underlying KPIs until you reach details of the KPI that caused the status change.
“Notifications” on page 107	The Notifications portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.
“My Activities” on page 109	The My Activities portlet displays a list of activities that are owned by the person that is currently logged on. In the My Activities portlet, the activities are grouped by their parent Standard Operating Procedures. Each Standard Operating Procedure corresponds to an individual event.
“Contacts” on page 111	The Sametime portlet provides a contacts list that is organized by group. It can be customized based on the people you communicate with. You can chat with people and modify your online status, contacts, or groups.

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
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- To restore a minimized or maximized portlet to its default view, click **Restore**.

### Administrator

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- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

### Administrator

## Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

### City: Water Conservation

Use the City: Water Conservation view to obtain a consolidated view of resource consumption and use in a city. The City: Water Conservation view enables users with cross-organization responsibility to monitor, manage, and respond to status changes in key areas of organizational performance.

The City: Water Conservation view is an interactive web page. The view contains the following independent sections that cooperate with one another to provide comprehensive information about resource consumption in a city.

Table 33. City: Water Conservation view

Section	Description
Map	<p>A map of the geographical region that contains resource markers (households, parks, assets, zones). Shows your monitored community area.</p> <p>A filter to select the view. You can toggle between the <b>Map</b> or <b>List</b> view.</p> <p>The resources are shown on the map, for example household. Click the resource to determine the associated metrics for that resource. The metrics are displayed and consumption trends are displayed in the <b>Trend</b> section of the view.</p>
List	<p>A table that contains a list of resource markers (households, parks, assets, zones) in the geographic map and their associated properties (name, number of meters, location, contact).</p>
Trend	<p>Compares and charts historic with current usage data for a monitored resource in a monitored community, which is displayed in either a chart or table view.</p>

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

#### Administrator

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- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.

- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

## Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

### Citizen: Water Conservation

Use the Citizen: Water Conservation view to obtain a consolidated view of resource consumption. With the Citizen: Water Conservation view, you can analyze individual consumption and monitor water leakages. The view provides a water report that you can use to plan for changes to behavior, usage patterns, or changes to individual water equipment to actively engage in water conservation.

The Citizen: Water Conservation view is an interactive web page. The view contains the following independent sections of the page that cooperate with one another to provide comprehensive information about resource consumption for a citizen.

Table 34. Water Conservation Portal: Citizen view

Portlet	Description
Profile area	Shows the profile name for the report. The profile name might be a park, a marina, or a household. You can select from the list. Below the profile name is the one or multiple meters in the account. If you have multiple meters, you can select from the list to see the consumption of each meter.
Progress area	Shows your progress, such as your <b>Usage Trend</b> , <b>Monthly Year to Date Variance</b> in dollars and in gallons. Shows your water conservation progress in relation to other participants. The <b>Rank</b> shows your position in relation to other participants in your community. The <b>Green Points</b> shows the number of points earned. Green points are awarded for reductions in water consumption and determined by weekly readings from your water meter.
Daily usage area	Shows water usage each day for the past several months in two usage units: gallons and dollars. Using the slider bar, you can move along a 12 month calendar to see the total water consumption each day. When you move the slider bar, the data and usage unit also change in the two views in the Details area: <b>Hourly Usage</b> and <b>Weekly Usage</b> . Hover over each bar to see the actual amount for Weekly Usage

Table 34. Water Conservation Portal: Citizen view (continued)

Portlet	Description
Details area	Compares hourly and weekly usage in a chart. The following views are available for display: <ul style="list-style-type: none"> <li>• Hourly Usage</li> <li>• Weekly Usage</li> <li>• Compare</li> <li>• This week's game</li> </ul>
Team Chat / Pilot Chat	Used to foster communications and collaboration between teams and communities.

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

#### Administrator

### Customizing a portlet

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- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

#### Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

## Operator: Operations

Use the Operator: Operations view (non-revenue water) to reduce water loss by monitoring the pressure status of your entire water network and by managing pipe pressure optimization. The Operator: Operations view is intended for operators, managers, or others monitoring and managing water pressure optimization.

The Operator: Operations view (non-revenue water) is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the operations level.

Table 35. Operator: Operations view (non-revenue water) portlets

Portlet	Description
<p>“Map” on page 94</p>	<p>A <b>Geospatial Map</b> of the geographical region that contains event and resource markers, water asset and status, logical zones and layers.</p> <p>A filter form to select the categories of events to be shown on the map and in the <b>Events and Incidents</b> tab on the Details portlet.</p> <p>A filter form to select the asset types to be shown on the map and in the <b>Assets</b> tab on the Details portlet.</p> <p>A filter form to select the logical zones to be shown on the map.</p> <p>A filter form to select the layers to be shown on the map. Use the layers to filter assets to display on the map, for example by virtual group or pipe network.</p> <p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p> <p>A <b>Logical Map</b> of the logical structure that contains a graphical view of the model. The model shows topics, topic associations, and linkages in the model.</p>
<p>“Details” on page 101</p>	<p>The <b>Details</b> portlet is an interactive list portlet. All the events that you are authorized to see are visible on the events list and on any map portlet that is linked to the Details portlet. Events and incidents and asset details are displayed. Resources in the vicinity of an event can be displayed in a resource list and on a map. Key asset measurements, including current and historical values can be displayed.</p> <p>Work orders that you are authorized to see are visible on the work order list and on any map portlet that is linked to the Details portlet.</p>
<p>“Notifications” on page 107</p>	<p>The <b>Notifications</b> portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.</p>
<p>“My Activities” on page 109</p>	<p>The <b>My Activities</b> portlet displays a list of activities that are owned by the person logged on. In the My Activities portlet, the activities are grouped by their parent Standard Operating Procedures. Each Standard Operating Procedure corresponds to an individual event.</p>

Table 35. Operator: Operations view (non-revenue water) portlets (continued)

Portlet	Description
"Pressure Optimization" on page 47	The <b>Pressure Optimization</b> portlet provides the results of your pressure optimization simulations. You can manually create a work order to apply pressure optimization results to your system and help manage water pressure.
"Contacts" on page 111	The <b>Sametime</b> portlet provides a contacts list that is organized by group. It can be customized based on the people you communicate with. You can chat with people and modify your online status, contacts, or groups.

## User Scenario

Typically, the operator monitors the status of valves and other assets for water utilities on the map in the Operator: Operations view (non-revenue water). While monitoring, the operator notices the map is indicating that a valve has reached a critical pressure point. The display in Details portlet shows that the valve status has changed from Acceptable to Caution. In addition, the Notifications portlet produces a notification to highlight the changed status of the valve.

The operator decides to optimize the water pressure. Using the Pressure Optimization portlet, the operator starts the Pressure Optimization wizard to simulate pressure optimization. Using the wizard, the operator is helped through the configuration process.

The operator is notified in the Notifications portlet that the simulation is completed. The operator can then create a work order to manually apply the pressure optimization results to the critical valve when the optimization run has completed. For example, the operator clicks the Map, and select the option to **Add Work Order** to start the process of sending a work crew to change the pressure valve settings.

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.
- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

### Administrator

## Customizing a portlet

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There are two possible modes of customization, each changing the portlet settings for all users:

- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

## Administrator

### Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

### Planner: Analysis view

Use the Planner: Analysis view to obtain a consolidated view of predicted water asset failures and key details. The Planner: Analysis view enables users with cross-organization responsibility to monitor, manage, and respond to predicted water asset failure status changes.

The Planner: Analysis view is an interactive web page. The view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another to provide comprehensive information and interaction at the executive level.

Table 36. Planner: Analysis view portlets

Portlet	Description
"Predicted Asset Failure Map" on page 129	<p>A <b>Geospatial Map</b> of the geographical region that contains predicted water asset failures.</p> <p>A filter form to select the categories of predicted water asset failures to be shown on the map and in the <b>Details</b> portlet.</p> <p>The filter form is used to select:</p> <ul style="list-style-type: none"> <li>• Year to include in the prediction.</li> <li>• Region to include in the prediction.</li> <li>• Network type to include in the prediction.</li> <li>• Display settings on the map, for example percentage or number of assets to display.</li> <li>• Metric upon which the prediction is based.</li> </ul> <p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p>
"Predicted Asset Failure Details" on page 131	<p>The Details portlet is an interactive list portlet. All the predictions that you are authorized to see are visible on the list. Pipeline failure predictions for assets are displayed. Key asset details and predicted risk measurements can be displayed.</p> <p>Work orders that you are authorized to see are visible on the work order list and on any map portlet that is linked to the Details portlet.</p>

For help using each portlet, click the upper right corner of the portlet, and select **Help** from the menu displayed.

To resize a portlet, click the upper right corner of the portlet, and select options from the menu that is displayed, as follows:

- To expand the portlet to fill the page, click **Maximize**.

- To hide the portlet contents, other than its title bar, click **Minimize**.
- To restore a minimized or maximized portlet to its default view, click **Restore**.

### Administrator

## Customizing a portlet

As an administrator you can change portlet settings by clicking the upper right corner of the portlet, and selecting an option from the portlet menu.

There are two possible modes of customization, each changing the portlet settings for all users:

- **Edit Shared Settings** changes the portlet only for the instance of the portlet you are in when you change the settings.
- **Configure** changes the portlet's global settings for all instances of the portlet wherever those instances occur.

The modes of customization that are available to you depend on the permissions associated with your user ID. Global settings are superseded by shared settings.

The portlets that are supplied with the IBM Intelligent Operations Center have some settings that are specific to a portlet type, for example, set the default zoom level for a map. In addition, you can set generic portlet parameters that are common across the portlets supplied, for example, the portlet title.

### Administrator

## Customizing a page

As an administrator you can access the WebSphere Portal options for managing pages. Click the right side of the page name tab and select an option from the page menu.

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## Using portlets

A portlet provides access to information that you can view and interact with on a portal page. With the IBM Intelligent Water Family of solutions, you can use portlets to monitor water infrastructure, assets, measurements, and key performance indicators to get a summary and detailed view of water agency performance.

### Map

Use the Map portlet to see events and assets and work orders on a map.

The Map portlet interacts with the Details portlet. The Map portlet provides you with a visual representation of events and assets and work orders on a map. Use the Map portlet together with the Details portlet to identify location patterns, conflicts, issues, and synergies.

The Map portlet can also be used to update the content of the Details portlet. You can select in the Map portlet the categories of events, asset types, work orders, and zones you want to view. Your selection affects what is displayed in both the Map portlet and the corresponding Details portlet on the portal page.

### Map interface

The Map portlet has two views: **Geospatial Map** and **Logical Map**.

The **Geospatial Map** has the interactive interface elements as shown in the following table:



Table 37. Map portlet - Geospatial Map interfaces

Interface element	Description
Map	A map of the geographical region provides event and associated resource locations.
Select Content: Events and Incidents	A filter form to select the categories of the events to be shown on the map and in the <b>Events and Incidents</b> tab on the Details portlet.
Select Content: Resources and Assets	A filter form to select the asset types to be shown on the map and in the <b>Assets</b> tab on the Details portlet.
Select Content: Logical Zone	A filter form to select the zone to be shown on the map and in the <b>Assets</b> tab on the Details portlet.
Select Content: Other Layers	A filter form to select the layers to be shown on the map. Using the layers, you can filter assets to display on the map, for example by virtual group or pipe network.
Select Content: Work Orders	A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.

The **Logical Map** has two interactive interface elements as shown in the following table:

Table 38. Map portlet - Logical Map interfaces

Interface element	Description
Map	A logical map of the model provides topics in the model and associations.
Select Content	A filter form to customize the display in the logical map. Use the options to set the number of items that are displayed, the depth of impact analysis, the type of associations, and the nature of relationships.

Initially, the page opens with the **Geospatial Map** view that shows all the events and asset types and work orders that are relevant to you.

**Note:** To enable the **Logical Map** view, you must select the **Edit Shared Settings** option on the Map portlet, scroll to **Enable the Logical Map** field, and enter True.

The **Geospatial Map** map uses latitude and longitude values that are specified in the event record or asset type to show the location. A point marker or shape outlines the area. You can display more detail on an event headline or asset type by clicking the marker on the map. If there is more than one event or asset clustered at the same location, the number is indicated and when you click the marker. The headline of each event or asset is also displayed.

There is a limit to the number of markers that can be shown on the **Geospatial Map**. If the number of markers in the area in view exceeds the threshold, the markers are not shown. You receive a message with the number of markers available and the number of the threshold. You are given two options to display all available markers:

- Zoom in or pan to an area of the map with the number of markers below the threshold.
- Click **Load all items in view**.

If you choose the second option, you might notice that the markers are displayed on the **Geospatial Map** at a slower rate.

When you select **View Nearby Resources** for an event in the Details portlet, resources are shown on the map, which is based on the radius and capabilities that you selected.

The map keeps you up-to-date by adding new events, subject to any filters you set to limit the categories that are shown.

**Note:** If an event or asset type has no coordinates it is displayed only in the Details portlet list; it is not displayed in the Map portlet.

## Geospatial Map markers

The map represents the location of events or assets with one of the following types of marker:

Table 39. Map markers

Marker Type	Description
Icon	Pinpoints on the map the location of an event or asset by using a unique icon for each.
Polygon	Outlines on the map the area that is associated with a particular event or asset.
Cluster	Indicates more than one event or asset at the same location with a number that represents the number of events or assets at that location
Radius	Outlines on the map the area you select for <b>View Nearby Resources</b> .

The icon that represents an event type is defined in the category field of the event details on the **Events and Incidents** tab in the Details portlet. When an event is escalated to an incident, the icon that is displayed on the map retains its category-specific symbol. A red margin around the icon displays that it is an incident. Clicking an event marker on the map highlights the associated event or events in the Details portlet.

The icon that represents an asset is shown on the **Assets** tab in the Details portlet.

The icon that represents a work order is shown on the **Work Order** tab in the Details portlet.

Table 40. Geospatial Map: Water asset icons












Icon	Represents
 Waste water plant	Waste water plant
 Level indicator	Level indicator
 River gauge	River gauge
 Rain gauge	Rain gauge
 Position indicator	Position indicator
 Asset	Asset
 Lift station	Lift station
 Recorder level	Recorder level

Table 40. Geospatial Map: Water asset icons (continued)

Icon	Represents
 Trunk line monitor	Trunk line monitor
 Combined Sewer Overflow diversion structure	Combined Sewer Overflow diversion structure
 Well head	Well head

## Selecting event categories for the Geospatial Map

Use the Event Categories filter to select by category which events are displayed on the map.

To view the filter form, click **Select Content**. The categories of events that are displayed on the map and in the Details portlet can be changed based on the filter form selection that you make. You can focus on the categories of event you want to analyze by using the filter to hide the event categories you do not need. The map responds to any change on the filter form. When a selection is changed, the map is updated and only the locations of events within the selected categories are plotted on the map. Change the categories of event that is displayed by selecting or clearing check boxes on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to the default, which is all categories selected.

You can focus on individual events you want to analyze by ticking check boxes in the Details portlet. These events are highlighted on the map.

## Selecting asset types for the Geospatial Map

Use the Asset Type filter to select by category the assets to display on the map.

To view the filter form, click **Select Content**. The types of assets that are displayed on the map and in the Details portlet can be changed based on the filter form selection that you make. You can focus on the categories of assets you want to analyze by using the filter to hide the assets you do not need. The map responds to any change on the filter form. When a selection is changed, the map is updated and only the locations of assets within the selected categories are plotted on the map. Change the types of asset that is displayed by selecting or clearing check boxes on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to the default, which is all categories selected.

You can focus on individual assets you want to analyze by ticking check boxes in the Details portlet. These assets are highlighted on the map.

## Selecting logical zones for the Geospatial Map

Use the Logical Zones filter to select by category which zones are displayed on the map.

To view the filter form, click **Select Content**. The categories of zones that are displayed on the map can be changed based on the filter form selection that you make. You can focus on the zones you want to analyze by using the filter to hide the zones you do not need. The map responds to any change on the filter form. When a selection is changed, the map is updated and only the zones that are selected are plotted on the map. Change the zones that are displayed by selecting or clearing check boxes on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to the default, which is all categories selected.

## Selecting layers for the Geospatial Map

Use the Other Layers filter to select by category which layers are displayed on the map.

To view the filter form, click **Select Content**. The categories of layers that are displayed on the map can be changed based on the filter form selection that you make. You can focus on the layers you want to analyze by using the filter to hide the layers you do not need. The map responds to any change on the filter form. When a selection is changed, the map is updated and only the layers that are selected are plotted on the map. Change the layers that are displayed by selecting or clearing check boxes on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to the default, which is all categories selected.

## Selecting resource capabilities for the Geospatial Map

When you select **View Nearby Resources** on the Details portlet, the Event Categories filter is replaced by the Resources filter. Use the Resources filter to select which resources are displayed on the map.

To view the filter form, click **Select Content**. The capabilities of resources that are displayed on the map and in the Details portlet can be changed based on the filter form selection that you make. You can focus on the capability you want to analyze by using the filter to hide the capabilities you do not need. The map responds to any change on the filter form.

When a selection is changed, the map is updated and only the locations of the resources with the selected capabilities are plotted on the map. Change the capability of resources that are displayed by selecting or clearing a check box on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to default, which is all capabilities selected. The capabilities that are selected by default depend on the category of the event and how that category is mapped to capabilities.

## Selecting work orders for the Geospatial Map

Use the Work Orders filter to select by category which work orders are displayed on the map.

To view the filter form, click **Select Content**. The categories of work orders that are displayed on the map can be changed based on the filter form selection that you make. You can focus on the work orders you want to analyze by using the filter to hide the work orders you do not need. The map responds to any change on the filter form. When a selection is changed, the map is updated and only the work orders that are selected are plotted on the map. Change the work orders that are displayed by selecting or clearing check boxes on the filter form. To close the filter form, click **Select Content**. If you leave the portal page and return, the filter is reset to the default, which is all categories selected.

## Adding an event

You can create an event, adding it to the Map portlet map and the Details portlet list at the same time. The map and the list provide two ways of looking at the same content.

### About this task

Use the **Add Event** dialog to specify event properties.

### Procedure

1. Right-click a location on the map and click **Create a new event** to start the **Add Event** dialog. Some of the event properties are completed automatically.
2. Specify the remaining event properties. Properties that are marked with an asterisk are necessary for the successful creation of a new event. Properties not marked with an asterisk are optional.
3. Click **OK** to save the event or **Cancel** to stop adding the event.

## Results

An icon that represents the category of the new event is displayed in the requested location on the map and its details in the Details portlet list.

**Note:** In the Map portlet, you cannot create an event at a location where an icon or polygon is already displayed. To create an event for a location that is already occupied by an event on the map, hide the event category. You hide the event category by using the filter and right-clicking the location. Alternatively, you can use the Details portlet to add an event at that location.

## Adding a work order

You can create a work order by adding it to the Map portlet map and the Details portlet list at the same time. The map and the list provide two ways of looking at the same content.

### About this task

Use the **Add Work Order** dialog to specify event properties.

### Procedure

1. Right-click a location on the map and click **Add Work Order** to start the dialog. Some of the work order properties are completed automatically.
2. Specify the remaining work order properties. Complete all properties marked with an asterisk.
3. Click **OK** to save the work order or **Cancel** to stop adding the work order.

## Results

An icon that represents the category of the new work order is displayed in the requested location on the map and its details in the Details portlet list.

**Note:** In the Map portlet, you cannot create a work order at a location where an icon or polygon is already displayed. To create a work order for a location that is already occupied by a work order on the map, hide the work order category. You hide the work order category by using the filter and right-clicking the location. Alternatively, you can use the Details portlet to add a work order at that location.

## Using the Geospatial Map controls

You can move the cursor around the map by using your mouse or keyboard.

### Controls at the top of the map

The following controls are available at the top of the map:

- Pan arrows (up, down, left, right)
- Zoom in
- World view (zooms out to the maximum extent)
- Zoom out

### Controls for moving around the map

To move around the map, you can use the following controls:

- Click and drag the map by using the mouse
- Press the up pan arrow, or the up arrow key on the keyboard, to pan north
- Press the down pan arrow, or the down arrow key on the keyboard, to pan south

- Press the right pan arrow, or the right arrow key on the keyboard, to pan east
- Press the left pan arrow, or the left arrow key on the keyboard, to pan west

## Zoom controls for magnifying or reducing the scale of the map

To zoom in and out of the map, you can use the following controls:

- Click the + map icon to zoom in, or the - map icon to zoom out of the center of the map
- Double-click the mouse to center the map and zoom in to the selected location
- Click the **World view** icon to maximize the zoom out to show the world view
- Press the + key on the keyboard to zoom in
- Press the - key on the keyboard to zoom out
- Press Shift while you use the mouse to draw a rectangle around the area to zoom in on

## Resetting the Geospatial Map

The Map portlet can be reset to the default view configured for the system.

### Procedure

1. On the Map portlet, click **Reset the Map**.
2. Select one of the following options.
  - **Reset the Map** to zoom and center the map to the default setting.
  - **Reset the Map and Clear Filters** to zoom and center the map to the default setting and reset the values set in **Select Content** to the default values.

## Navigating the Logical Map

Use the Logical Map on the Map portlet to browse topics and associations in the model.

### Before you begin

Before you can view the **Logical Map** view, you must select the **Edit Shared Settings** option on the Map portlet, scroll to **Enable the Logical Map** field, and enter True.

### Procedure

1. On the Map portlet, toggle the **Logical Map** view.
2. To browse the model, select one of the following options.
  - Click a topic in the **Logical Map** view.
  - Expand the topic to view associations.
  - Right-click the topic to select from a list of browse options. For example, you can select to **Expand**, **Focus**, **Hide**, **View Details**, or **Perform Impact Analysis**. Select the **Focus** option to centralize your view of the graph on the selection.

## Customizing the Logical Map

The Map portlet can be customized to limit the number of items that are displayed in the Logical Map.

### Procedure

1. On the Map portlet, select the **Logical Map** view.
2. Click the **Select Content** option and customize your settings by using the following options.
  - Enter a number in **Limit item count to:** to set the maximum number of items to display in the map.
  - Enter a number in **Limit impact analysis depth to:** to set how deep within the layers in the map you want to allow impact analysis to be performed.

- Select from the available options to customize the display of relationships in the model.
  - Type instance** shows relationships of type instance, for example, where Pipe 1 is an instance of Pipe.
  - Connects** shows the connection relationship between assets.
  - Has measurement** shows the relationship between assets and measurements.
  - Contains** shows the contain relationship between two assets.
  - Supertype Subtype** shows the class inherent relationship between two asset types.
- Select from the available options to restrict the scope of relationships that are displayed in the map. The settings are based on the topic map index rule and can be limited to **City Name** or **Reference Semantic Model**.
- Select to focus your analysis on a specific asset.
- Select to search for an alternative asset by entering the asset name or selecting an item from the available list.
- Select the **Reset Map** option on the upper right of the portlet to reset the graph to the initial state and clear any navigation that is displayed.
- Select the **Reset the Map > Change Layout** option on the upper right of the portlet to change the layout of the graph. Select from the **Forced Directed Layout**, **Circular Layout**, **Tree Layout**, or **Hierarchical Layout**, **Long Link Layout**, **Short Link Layout** options.

## Customizing the Map portlet - Geospatial Map

### Administrator

An administrator can change Map portlet settings by clicking the upper right corner of the portlet, and selecting options from the menu that is displayed.

- To change settings for all users and all instances of the Map portlet, click **Configure**.
- To change settings for all users and the instance of the Map portlet on the current portal page, click **Edit Shared Settings**.

Any settings that you change by using the **Edit Shared Settings** option override settings that are changed by using the **Configure** option.

The settings that you can change for the map are as follows:

- Reset the default center point and zoom level for the map.
- Select a new base map.
- Add to the map geographic annotation and visualization layers in Keyhole Markup Language (KML), to represent more data.
- Set a threshold for the markers that can be displayed without a warning message.
- Set the default selection on the map filters to be displayed when you click **Select Content**.

Select to enable the **Logical Map** view and associated settings. To enable the display, select **Edit Shared Settings**. Go to the **Enable the Logical Map** field and enter the value True. Optionally, you can specify a map name in the **Logical Map Name** field, and set a prefix for the model the **Model Prefix** field.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Details

Use the Details portlet to view, monitor, and manage events and assets and work orders.

The Details portlet is an interactive list portlet. All the events and assets and work orders that you are authorized to see are visible on the tabs. You can also see them on any map portlet that is linked to the Details portlet. Assets in the vicinity of an event can be displayed in a resource list and on a map.

## Events and assets

The Details portlet has interactive interface elements as shown in the following table:

Table 41. Details portlet display

Interface element	Description
Events and Incidents	The list contains key details for each event. You can display a more detailed description of an event by hovering over the row in the list.
Assets	The list contains key details for each asset types. You can display a more detailed description of the asset by hovering over the row in the list.
Work Orders	The list contains key details for each work order. You can display a more detailed description of the asset by hovering over the row in the list.

Initially, when you open the portal, the Details portlet shows all the events and assets and work orders that are relevant to you.

In the Map portlet, you select the categories of events and the asset types and work orders to be shown. The categories of events shown on the **Events and Incidents** tab, and the assets shown on the **Assets** tab and the work orders shown on the **Work Orders** tab correspond to events and assets and work orders displayed on the Map portlet.

The lists are refreshed regularly with updates, subject to any filters you set to limit the categories shown.

A counter in the left corner of the action bar at the end of the list indicates the number of items displayed and the total number of items. In the center of the action bar, you can select the number of items to be displayed at one time. If there are more rows than can be displayed at one time, you can page forward or backward by clicking the buttons in the right corner of the action bar.

## Event properties

The following table outlines the properties that describe an event.

Table 42. Event properties

Property	Content
<b>Who</b>	
Sender	Source or user ID
Contact name	Person to contact for extra information
Contact e-mail	Email address of contact person
Contact telephone	Telephone number
<b>What</b>	
Event type*	Event classification below category level
Event status*	Event handling instructions
Event scope*	Intended audience for the message
Restriction	Additional information required when <i>Event scope</i> is 'Restricted'
Headline*	Short description of the event
Category*	High-level event classification



Table 42. Event properties (continued)

Property	Content
Severity*	Intensity of the impact of the event
Certainty*	Confidence in the event prediction
Urgency*	Timeframe for action in response to the event
Message type	Nature of the message
Description	Additional description of the event
Web address	Web address for additional information about the event
<b>When</b>	
Sent date and time	Date and time the message was submitted or sent
Effective date and time	Date and time the message is effective
Onset date and time	Date and time the event is expected to begin
Expiration date and time	Date and time the event is expected to end
<b>Where</b>	
Area description	Description of the affected area
Latitude / Longitude	Coordinates of the event location

**Note:** Properties that are marked with an asterisk in the table are required for the successful creation of a new event. Properties not marked with an asterisk are optional when you create an event.

## Managing events and incidents

In the Details portlet, you can perform various actions on the events in the list on the **Events and Incidents** tab. In the Map portlet, you can add an event that is shown on both the map and the events list of the Details portlet.

### Procedure

On the **Events and Incidents** tab, right-click a row in the events list and select an option from the menu:

- To update the information about an event, click **Update Event**. You can enter your changes in a window with fields that contain information about the event. When an event record is updated the message type property changes to *Update*.
- To change an event status to incident, click **Escalate to Incident** to display a window and enter your contact details. When an event record is escalated there is a change to the properties and to the icon on the map.
- To remove an event from the list and the map, click **Cancel Event** to display a window and enter your contact details.
- To view the standard operating procedure and workflow activities that are associated with an event, click **View Activity Summary and History**. If there are no standard operating procedures associated with an event, this option is not available. If there is an associated standard operating procedure, it is displayed in Maximo Asset Management, in the **SOP Activities** tab. Use the My Activities portlet to manage the workflow activities that are associated with a standard operating procedure.
- To view a list of the resources in the vicinity of an event, click **View Nearby Resources** and select the radius of the area you want to focus on. A list of resources is displayed on the **Resources** tab.
- To view the information about an event, click **Properties** to display a window that contains information about the event.

## Managing assets

In the Details portlet, you can perform various actions on the assets in the list on the **Assets** tab.

### Procedure

On the **Assets** tab, right-click a row in the assets list and select an option from the menu:

- To view current and historical measurement details that are associated with an asset, click **View Details**. Table 3 displays the measurement details that are shown for selected assets.

**Note:** The measurement detail that is provided on the **Assets** tab is for the default measurement that is associated with that particular asset. If you right-click and select to view details, a list of other measurements that are associated with the asset are displayed if available. Selecting any one of the options displays associated properties.

Table 43. Measurement Details

Property	Description
<b>Current Value</b>	
ID	Source of measurement
Name	Name of asset
Type	Asset type
Alias	Asset alias
Description	Asset description
Value	KPI value
Unit	Measurement unit
Threshold	Critical, Warning, Normal, No Reading
Trend	Up, Down, Unchanged
Sent Time	Date and time stamp
<b>Historical Values</b>	
Graphs	Two reports are displayed. Click <b>Recent Historical Values</b> to set the time range and level of granularity for recent historical report display. Click <b>Aggregate Historical Values</b> to view aggregate historical values.

- To view the properties of an asset, click **Properties**. Table 4 describes asset properties.

Table 44. Asset properties

Property	Description
<b>What</b>	
ID	Source or user ID
Name	Asset name
Type	Asset type
Description	Asset description
<b>Where</b>	
Latitude / Longitude	Coordinates of the asset location

Whichever option you choose, the measurement details or properties of the asset are displayed.

## Managing work orders

In the Details portlet, you can perform various actions on the work orders in the list on the **Work Order** tab.

### Procedure

On the **Work Order** tab, right-click a row in the list and select an option from the menu:

- To add a work order, click **Add Work Order** to open the **Work Order** dialog. Enter the work order details for selected assets.

Table 45. Work Order Details

Property	Description
<b>Current Value</b>	
ID	Source of work order.
Name	Name of work order.
Asset	Asset ID or type association.
Problem - Failure Class	Failure classification.
Problem - Problem Code	Problem classification (for example, pipe failure).
Work Type	Work type code (for example, event report).
Description	Description of the work order.
Priority	Priority level for the work order.
Status	Status of the work order.
<b>When</b>	
Start and End Date / Time	Target time and date for work order commencement and completion.
<b>Where</b>	
Latitude / Longitude	Coordinates of the work order location.

- To view the properties of a work order, click **Properties**. Click the link on the end of the **Work Order** dialog to view more information on work order details.

## Customizing the Details portlet

### Administrator

As an administrator, you can customize the portlet by clicking the menu on the upper right corner of the portlet and configuring the portlet settings.

When setting parameters for the Details portlet, you can take the following actions:

- Specify column layout, headings, sort order, and priority.
- Specify the additional conditions to filter the events or resources displayed.
- Specify a group name to enables communication with other map and Details portlets.
- Acknowledge or ignore event creation.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Status

Use the Status portlet to see the status of key performance indicators (KPIs) for a single organization or across organizations.

The Status portlet provides an executive-level summary of the status of KPIs across the organizations that you have permission to view. Use this portlet to view up-to-date changes in the KPI status so that you can plan and take action if necessary.

## KPI color code

Each column contains KPI information about an organization that is named at the top of the column. The KPI categories that are associated with each organization are represented by colored cells. The background color for a KPI category reflects its status. If there are more than six KPIs to be displayed in a column, the size of each individual cell is reduced to accommodate the extra KPIs.

The background color code that is supplied with the solution's sample KPIs is as follows:

- Green indicates that the status is acceptable, based on the parameters for that KPI.
- Yellow indicates that caution or monitoring is required.
- Red indicates that action is recommended.
- Gray indicates that there is insufficient data available to calculate the KPI status.

The color code is defined in the legend at the top of the portlet.

An undetermined status indicates that there is no KPI value available in the time period that is defined for that KPI. This situation occurs when the solution does not receive any messages for the KPI in the specified time period. For example, the water level for a water source is calculated daily. If no water level message for that water source is received on a particular day, then there is no data to determine the KPI value.

To see the KPI name and a definition of the status that is represented by the color of a KPI, hover over the cell with your cursor.

## KPI updates

When an underlying KPI changes, the change is reflected in the Status portlet. For example, one of the sample KPIs that determine the status of the Water Quality KPI changes status from acceptable to caution. The change is reflected in the portlet by a change in the background color of the Water Quality cell from green to yellow. In addition, the Notifications portlet indicates that a KPI changed.

When the solution receives a message that is related to the calculation of a KPI, there is an instant color change. This feature is an advantage when the KPI category is one that is likely to receive changes in real time, for example, airport delays. It is not relevant to those categories that contain historical KPIs, for example, flood control. For those categories of KPI, regular daily measurements are taken and there is unlikely in the interim to be a sudden change that affects status.

For each KPI, you can see all of the underlying KPIs and details in the Key Performance Indicator Drill Down portlet that is linked to the Status portlet.

To focus only on a specific KPI in the Key Performance Indicator Drill Down portlet, click the KPI cell in the table in the Status portlet. You can also click the owning organization title, for example, for example "Water", to see all related KPIs.

### Administrator

## Customizing the Status portlet

If you have administrator access, you can customize this portlet. Click the button in the upper right corner of the portlet to see your portlet menu customization options. Shared settings affect the content of this portlet for all users, but only for this occurrence of the portlet.

By setting parameters for the Status portlet you can:

- Customize KPI colors.
- Enable an additional KPI filter.
- Show or hide the KPI legend.
- Define how the KPIs are sorted.
- Specify a group name to enable communication with a Key Performance Indicator Drill Down portlet.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Customizing KPIs

A set of sample KPIs is provided with the solution. These KPIs are designed to provide guidance for planning and implementing different types of KPIs to suit your organization. Examples are provided in the areas of water, transportation, and public safety.

## Key Performance Indicator Drill Down

Use the Key Performance Indicator Drill Down portlet to see more information about a KPI category, the status of its underlying KPIs.

The Key Performance Indicator Drill Down portlet shows all of the underlying KPIs associated with an organization or KPI category that is shown on the Status portlet. The KPIs are displayed in the form of a nested list that can be expanded or collapsed. The status of each underlying KPI is represented by color, in the same way that color is used for the KPI categories that are displayed in the Status portlet. The values of the underlying KPIs control the color of the parent KPI. To display the status of the KPI, hover over the KPI with your cursor.

To focus on a specific KPI category in the Key Performance Indicator Drill Down portlet, click the category in the Status portlet. This category is then displayed on its own in the Key Performance Indicator Drill Down portlet. You can use the list to inspect the underlying KPIs until you reach details of the KPI that caused the status change.

### Administrator

## Customizing the Key Performance Indicator Drill Down portlet

If you have administrator access, you can customize this portlet. Click the button in the upper right corner of the portlet to see your portlet menu customization options. Shared settings affect the content of this portlet for all users, but only for this occurrence of the portlet.

By setting parameters for the Key Performance Indicator Drill Down portlet you can:

- Specify column layout, headings, sort order, and priority.
- Customize KPI colors.
- Enable an additional KPI filter.
- Show or hide the toolbar at the top of the list.
- Specify a group name to enable communication with a Key Performance Indicator Drill Down portlet.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Notifications

Use the Notifications portlet to view your alert messages and their details.

The Notifications portlet is an interactive window that contains a list of all the current alerts relevant to you. You see those only alerts sent to the user groups you are a member of. Alerts are notifications that received when:

- Multiple events are happening in the same vicinity and at a similar time, thus might be in conflict or require coordination
- A predefined key performance indicator (KPI) value change occurs, where that change is defined as an alert trigger by your administrator

You can also use the portlet to display further details of an alert.

## Notifications list

The Notifications portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. The role of this portlet is to draw attention to changes in KPI or event status. The list contains key details for each of the alerts.

To show a more detailed description of an alert, hover over the row with the cursor. To see all the information that is associated with that alert in a window, right-click the row and select **Properties**.

Initially, when you open the portal page, the portlet displays all of your current alerts. Remove any alert from the portlet by right-clicking the row and selecting **Close alert**. It is possible to close multiple alerts in this way by selecting multiple rows. Close an alert only after you have handled it appropriately because the alert is removed for all recipients when you close it.

Click the button in the upper right corner of the window to cancel it and take you back to the list.

A counter in the left corner of the action bar at the end of the list indicates the number of items displayed and the total number of items. In the center of the action bar, you can select the number of items to be displayed at one time. If there are more rows than can be displayed at one time, you can page forward or backward by clicking the buttons in the right corner of the action bar.

## Alert Properties

The window for alert details displays the following properties:

*Table 46. Alert properties*

Property	Content
Headline	Short description of the alert
Category	High-level classification of event or KPI
Sender	Source of the alert
Sent to Groups	Groups to whom the alert was sent
Sent	Date and time the alert was sent
Description	Additional description of the alert
Refers to Alerts	Event identifier, if the alert is caused by correlated events
Refers to KPIs	Name of the KPI, if the alert is caused by a changing KPI value

### Administrator

## Customizing the Notifications portlet

If you have administrator access, you can customize this portlet. Click the button in the upper right corner of the portlet to see your portlet menu customization options. Shared settings affect the content of this portlet for all users, but only for this occurrence of the portlet.

By setting parameters for the Notifications portlet you can:

- Specify column layout, headings, sort order, and priority.
- Show or hide the toolbar at the top of the list.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## My Activities

The My Activities portlet displays a dynamic list of activities that are owned by the group of which the user, who is logged on to the interface, is a member.

Each time an event triggers a standard operating procedure according to the selection criteria defined in the standard operating procedure selection matrix, the associated activities are assigned to owners.

A user who is logged on can view the activities that are assigned to them in the My Activities portlet. In the My Activities portlet, the activities are grouped by their parent standard operating procedures. Each standard operating procedure corresponds to an individual event.

For each standard operating procedure, the My Activities portlet displays only open activities, and not closed or completed activities. Open activities include those activities that are already started, and those activities that are eligible to be started. For example, if one or more of the activities that are specified in a standard operating procedure are ordered in a sequence, only the current activity in the sequence is displayed. If a particular activity relies on the completion of a predecessor activity, it is not displayed until the predecessor activity is complete or skipped.

The following activity due icons are displayed near the top of the My Activities portlet:

### Past Due

Activities whose completion is past due.

**Today** Activities that are due to be completed today.

**Future** Activities whose completion is due in the future.

When an activity is started, the due date is calculated by adding the start time to the duration of the activity. The activity due dates are used to calculate the number that is displayed in each of the activity due icons.

In the My Activities portlet, standard operating procedures that have past due activities are displayed first, and the remaining standard operating procedures are displayed in alphabetical order.

Next to each standard operating procedure in the list that has past due activities, a red icon indicates the number of activities that are past due. The standard operating procedures with past due activities are sorted according to the number of past due activities they contain. The standard operating procedure that has the most past due activities is displayed at the top of the list.

## Managing activities in the My Activities portlet

Manage your activities in the My Activities portlet:

- To view details about a standard operating procedure, expand the name of the standard operating procedure.
  - The name of the event that triggered the standard operating procedure is displayed. Hover over the event name to view hover help information that includes the event start date and time, and the category, severity, certainty, and urgency of the event.
  - If the Details portlet is displayed on the page, to view the event properties, click the event name. The event Properties window is displayed.

- Steps that are in progress or eligible to be started are displayed. Also, the status and due date of each step is displayed.
- To view further details about a step, including comments and references that users added to the step, expand the name of the step.
- To start, finish, or skip a step, expand the name of the step, and then choose one of the following options:
  - To start a step, from the list, select **Start**. If the step is defined as an automated task in the standard operating procedure, the workflow that is assigned to the task is started automatically, and the step is finished automatically. The user who starts a step becomes the owner of that step, and the name of the user is displayed in the **Owner** field.
  - To skip a step, from the list, select **Skip**.
  - To finish a step, from the list, select **Finish**.
- To add a comment to a step, use the following substeps:
  1. Expand the name of the step.
  2. From the list, select **Add Comment**.
  3. In the Add Comment window, enter a comment in the **Comment** field. **Commentator name** and **Activity name** are read-only fields and contain automatically entered values.
  4. Click **OK**.
  5. Expand the name of the step again. The new comment is displayed at the end of the list of existing comments and references for the step.
- To add a reference to a step, use the following substeps:
  1. Expand the name of the step.
  2. From the list, select **Add Reference**.
  3. In the Add Reference window, enter values for **Reference name** and **Reference URI**. **Activity name** is a read-only field that contains an automatically entered value.
  4. Click **OK**.
  5. Expand the name of the step again. The new reference is displayed as a link at the end of the list of existing comments and references for the step.
- To view the details for a standard operating procedure, click the **i** icon next to the name of the standard operating procedure. In the Standard Operating Procedure Details window, all the activity steps that are included in the standard operating procedure are displayed, including those steps that are in progress, eligible to be started, completed, and closed. The status and due date of each step is also displayed. To view further details about a step, expand the step name.

## Administrator

### Customizing the My Activities portlet

If you have administrator access, you can customize this portlet. Click the button in the upper right corner of the portlet to see your portlet menu customization options. Shared settings affect the content of this portlet for all users, but only for this occurrence of the portlet.

For the My Activities portlet, you can specify a group name to enable communication with other portlets; for example, Details portlets.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.



## Related information:

Standard Operating Procedures

## Enabling the events record

Using administrative tools, you can enable record event management to manage event activity in IBM Intelligent Operations for Water. Use the information in this task to enable event monitoring on the application server.

### Procedure

1. Log on to WebSphere Application Server at the following URL:  
`https://appserver:9043/ibm/console`
2. Select **Applications > Monitor Services > Recorded Events Management > Enable/Disable Events Record**.
3. Select the local host and click **Enable Events Record** to enable event monitoring.

## Contacts

Use the Contacts portlet to send instant messages within the solution.

The Contacts portlet can display a list of your contacts that are organized by category. You can organize contacts in categories that are based on the people you need to communicate with. For example, you can have a category for general work contacts and another category for project work contacts. With the Contacts portlet, you can communicate with people and modify your online status, contacts, or groups.

Click the menus at the top of the portlet:

- **File** to add contacts, modify groups or log out
- **Tools** to set up a chat, meeting, or announcement; or to change your privacy settings
- **Help** to get more detailed information about how to use the portlet

Click your status to modify your status and message. The default status indicates that you are available. You can change your status to indicate that you are away from your computer, in a meeting, or that you do not want to be disturbed.

**Note:** For this portlet to work as expected, you must log on to the solution portal by using the fully qualified domain name of the IBM Intelligent Operations Center application server. If you log on to the portal by using an IP address or a host name alias instead of the registered fully qualified domain name, this portlet does not display correctly.

### Administrator

If you have administrator access, you can customize this portlet. Click the button in the upper right corner of the portlet to see your portlet menu customization options. Shared settings affect the content of this portlet for all users, but only for this occurrence of the portlet.

The settings that you can change for the Contacts portlet are:

- Help file
- Portlet height
- Portlet height when maximized
- Portlet title
- Resource bundle

## City: Water Conservation

Use the City: Water Conservation portal to obtain a consolidated view of resource consumption and use in a city. The City: Water Conservation portal enables users with cross-organization responsibility to monitor, manage, and respond to status changes in key areas of organizational performance.

The City: Water Conservation portal is an interactive web page and provides you with a visual representation of water consumers on a map or list and information about their consumption behavior. Use the City: Water Conservation portal together with the Citizen: Water Conservation portal to identify locations, patterns of consumption, conflicts, issues, and synergies.

You can select in the City: Water Conservation portal the household you want to view from the Map. Your selection affects what is displayed in the other sections of the portal.

### Interface element

The City: Water Conservation portal has interactive interface elements as shown in the following table:

Table 47. City: Water Conservation interfaces

Interface element	Description
Map	<p>A map of the geographical region that contains resource markers (households, parks, assets, zones). Shows your monitored community area.</p> <p>A filter to select the view. You can toggle between the <b>Map</b> or <b>List</b> view.</p> <p>The resources are shown on the map, for example household. Click the resource to view the metrics for that resource. A popup is displayed when the resource is selected. The popup contains the key metrics for the monitored resource that includes number of meters, home owner, location, last weekly usage and trend as a percentage, last daily usage trend as a percentage (use today), average usage, peak time, and number of leaks reported.</p>
List	<p>A table that contains a list of resource markers (households, parks, assets, zones) in the geographic map and their associated properties (name, number of meters, location, contact).</p>
Trend	<p>Compares and charts historic with current usage data for a monitored resource in a monitored community. You can toggle between the <b>Chart View</b> and <b>Table View</b>.</p>

Initially, the page opens with the City: Water Conservation portal that shows all the households that are relevant to you. The map uses latitude and longitude values to show the location. A point marker or shape outlines the household. You can display more detail on a household by clicking the marker on the map. If there is more than one household clustered at the same location, the number is indicated when you click the marker. The headline of each household is also displayed.

You can use the **List view** to see the household information in table format.

**Note:** If a household has no coordinates, it is displayed only in the portlet list; it is not displayed in the Map.

## Map markers

The map represents the location of households with the following type of marker.

Table 48. Map markers

Marker Type	Color	Description
Icon	Red or Green	Pinpoints on the map the location of a household by using a circular icon for each. A red icon indicates that there is an incident associated with the household, for example a water leak. A green margin icon indicates that there are no incidents associated with the household.

## Selecting the households on the map

To review water consumption in a household, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review consumption measures.
4. In the City: Water Conservation, view the Trend area to review the two-year trend charts.

## Detecting leaks

To detect water leaks in a household, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review the number of detected leaks.

## Viewing household consumption data

To view household consumption data, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the key metrics in the popup to review household consumption data.
4. In the City: Water Conservation, view the Trend area to review the two-year trend charts.

## Viewing consumption trends

To view household consumption trends, use the following procedure.

### Procedure

1. Select the City: Water Conservation.
2. In the City: Water Conservation, select the household in the map.
3. In the City: Water Conservation, view the Trend area to review consumption measures.

## Using the map controls

You can move the cursor around the map by using your mouse or keyboard.

## Controls at the top of the map

The following controls are available at the top of the map:

- Pan arrows (up, down, left, right)
- Zoom in
- World view (zooms out to the maximum extent)
- Zoom out

## Controls for moving around the map

To move around the map, you can use the following controls:

- Click and drag the map by using the mouse
- Press the up pan arrow, or the up arrow key on the keyboard, to pan north
- Press the down pan arrow, or the down arrow key on the keyboard, to pan south
- Press the right pan arrow, or the right arrow key on the keyboard, to pan east
- Press the left pan arrow, or the left arrow key on the keyboard, to pan west

## Zoom controls for magnifying or reducing the scale of the map

To zoom in and out of the map, you can use the following controls:

- Click the + map icon to zoom in, or the - map icon to zoom out of the center of the map
- Double-click the mouse to center the map and zoom in to the selected location
- Click the **World view** icon to maximize the zoom out to show the world view
- Press the + key on the keyboard to zoom in
- Press the - key on the keyboard to zoom out
- Press Shift while you use the mouse to draw a rectangle around the area to zoom in on

## Customizing the City: Water Conservation

### Administrator

An administrator can change City: Water Conservation settings by clicking the upper right corner of the portlet, and selecting options from the menu that is displayed.

- To change settings for all users and the instance of the City: Water Conservation portlet on the current portal page, click **Edit Shared Settings**.

The settings that you can change for the portlet are as follows:

- Default help
- Portlet height
- Portlet maximum height
- Portlet title
- Report URL

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Citizen: Water Conservation

Use the Citizen: Water Conservation portal to obtain a consolidated view of resource consumption and use. The Citizen: Water Conservation portal enables users to analyze individual consumption and

monitor water leakages. The view provides a water report. By using the report, you can plan for changes to behavior, usage patterns, or changes to individual water equipment to actively engage in water conservation.

The Citizen: Water Conservation portal is an interactive web page. The view contains the following independent sections of the page that cooperate with one another to provide comprehensive information about resource consumption for a citizen.

## Interface elements

The Citizen: Water Conservation portlet has interactive interface elements as shown in the following table.

*Table 49. Citizen: Water Conservation portal display*

Interface element	Description
Profile area	Shows the profile name for the report. The profile name might be a park, a marina, or a household. You can select from the list. Below the profile name is the one or multiple meters in the account. If you have multiple meters, you can select from the list to see the consumption of each meter.
Progress area	Shows your progress, such as your <b>Usage Trend</b> , <b>Monthly Year to Date Variance</b> in dollars and in gallons. Shows your water conservation progress in relation to other participants. The <b>Rank</b> shows your position in relation to other participants in your community. The <b>Green Points</b> shows the number of points earned. Green points are awarded for reductions in water consumption and determined by weekly readings from your water meter.
Daily usage area	Shows your daily water usage for the past several months in 2 usage units: gallons and dollars. Using the slider bar, you can move along a 12 month calendar to see the total water consumption each day. When you move the slider bar, the data and usage unit also change in the two views in the Details area: <b>Hourly Usage</b> and <b>Weekly Usage</b> . Hover over each bar to see the actual amount for weekly usage
Details area	Compares hourly and weekly usage in a chart. The following views are available for display: <ul style="list-style-type: none"> <li>• Hourly Usage - toggle to display in a graph or table the hourly water usage in a specific day.</li> <li>• Weekly Usage - toggle to display in a graph or table the water usage for a four week period.</li> <li>• Compare Usage - toggle to display in a graph or table a comparison of water usage for each day over weekly intervals.</li> <li>• This weeks game - toggle to display in a graph or table a comparison of your water usage with usage by others in your community.</li> </ul>
Team Chat / Pilot Chat	Communications facility to chat with other users and pilot participants in your community.

Initially, when you open Citizen: Water Conservation, the portal shows your household data. If your household comprises a number of accounts, you can select to display the data for each account.

The lists are refreshed regularly with updates, subject to any filters you set to limit the categories that are shown.

## Comparing usage

In the Citizen: Water Conservation portal, you can monitor and compare resource usage.

## Procedure

- Log on to the Citizen: Water Conservation portal.
- View the water report to review the **Usage trend** and **Monthly Variance** figures.
- Drag the slider to view the water usage by day.
- Toggle to select to view data in gallons or dollars.
- Select the **Hourly Usage** tab to view hourly usage.
- Select the **Weekly Usage** tab to view weekly usage.

## Customizing the Citizen: Water Conservation

### Administrator

As an administrator, you can customize the portlet by clicking the menu on the upper right corner of the portlet and configuring the portlet settings.

Click the **Edit Shared Settings** option to set the following parameters.

- Default help JSP
- Portlet height, titles
- Report URL
- Resource bundle
- Show URL field on page

When you set parameters for the Citizen: Water Conservation portal you can

- Specify the Cognos Report URL.
- Specify column layout, headings, sort order, and priority.
- Specify the additional conditions to filter the events or resources displayed.
- Specify a group name to enables communication with other map and Details portlets.
- Acknowledge or ignore event creation.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Pressure Optimization

Use the Pressure Optimization portlet to monitor and manage pressure optimization in real time for your entire water network. In the Pressure Optimization portlet, you can view, create, update, and delete Pressure Optimization tasks.

### Prerequisite Requirements

Before you use the portlet, ensure that the IBM Integrated Information Core model and instances such as the Pressure Reducing Valve and Water Pressure Meter are imported into the water system. Also, ensure that the instances are synchronized with the database. The IBM Integrated Information Core provides a framework to create water-based applications that are centered on a semantic model of the real world. It supports integration of real time operational data and related enterprise applications.

### Viewing Pressure Optimization Tasks

You can view data for existing tasks in the Pressure Optimization table. The pressure optimization properties are described in the following table.

Table 50. Pressure Optimization Simulation Properties

Property	Description
Status	The status of the pressure optimization simulation, which is either Success or Failed.
ID	The identification number of the pressure optimization simulation.
Name	The name of the pressure optimization simulation.
Scenario	The name of scenario for the pressure optimization simulation.
startTime	The start time and date of the pressure optimization simulation; for example, 2013-04-10 11:56:23.
endTime	The end time and date of the pressure optimization simulation; for example, 2013-04-10 11:58:14.
updateTime	The update time and date of the pressure optimization simulation; for example, 2013-04-10 11:59:45.

You can create, delete, update, and view results for simulation tasks with the portlet user controls. The following table describes each control.

Table 51. Pressure Optimization User Controls

User Control	Description
New	Starts a wizard to help you configure a new pressure optimization simulation.
View Result	Starts a dialog in which you can view the results of a selected simulation and apply the results.
Update	Starts a dialog in which you can update the properties (such as valve settings) of a selected simulation.
Delete	Removes selected simulations from the Pressure Optimization table.

## Create a New Pressure Optimization Task

To create and configure a Pressure Optimization task, you use the Configure and Run Pressure Optimization wizard. The wizard guides you through the data-input and decision-making, and then runs the optimization.

1. Go to **Water > Operator: Operations > Pressure Optimization**. The Pressure Optimization portlet is displayed.
2. Click **New**. The Configure and Run Pressure Optimization wizard is displayed at the Overview screen, which introduces the wizard.
3. Click **Next** in the wizard. The Step 1: Get Ready screen is displayed. Enter the name of the optimization in **Name**, and select an existing scenario on which to base the optimization from the **Existing Scenario** menu.

**Note:** You must select a scenario. Otherwise, you cannot create a simulation.

4. Click **Next** in the wizard. The Step 2: Set Valves screen is displayed. In Adopt Settings, select the settings to use from an existing optimization run.
5. In the **Seek Recommendations** grid, you choose the valves that you want the optimization program to provide recommendations on. To begin, select a valve in the grid and click the **right arrow icon** to move the valve to the **Lock at Current Value** grid. To unlock a valve, select the valve in the **Lock at Current Value** grid and click the **left arrow icon**. The following table describes the valve property values that are displayed in the grids.

Table 52. Valve Properties

Valve Property	Description
Name	The name of the valve.
Current Value	The current recommended/locked value of the valve.

Table 52. Valve Properties (continued)

Valve Property	Description
Unit	The unit of measurement; for example, PSI for pressure.

- Click **Next** in the wizard. The Step 3: Set Goals screen is displayed. In the **Set Goals** menu, set your goals for the water pressure meters by selecting current and goal settings from an existing optimization. The Goals properties are described in the following table.

Table 53. Goal Properties

Goal Properties	Description
Pressure Critical Point Name	The name of the critical pressure point.
Goal Settings	The section for the current values of the critical pressure point properties.
Goal Settings/Minimum	The current minimum value. The property is calculated from historical readings in the previous 24 hours.
Goal Settings/Average	The current average value. The property is calculated from historical readings in the previous 24 hours.
Goal Settings/Maximum	The current maximum value. The property is calculated from historical readings in the previous 24 hours.
Goal	The section for the critical pressure point goals. By default, the goals for the optimization run contain recommendation values from the EPANET model.
Goal/Minimum	The goal for the minimum value. You can edit this property to set different goal settings.
Goal/Average	The goal for the average value.
Goal/Maximum	The goal for the maximum value.
Unit	The unit of measurement (for example, PSI for pressure).
Hint	A hint for setting the water pressure. You can select from five hints in the hint property menu. By default, "Increase tank levels" is selected.

**Note:** Ensure that you set the properties according to Tips For Goal Setting, a section of guidelines on the Step 3 screen.

- Click **Next** in the wizard. The Step 4: Set Priorities screen is displayed. You prioritize goals in this screen. For example, if a pressure critical point is at critical status, you can change it as high priority.
- Using the **Apply** menu, you can adopt current goal settings from a previous menu.
- To prioritize a goal, select the goal in the **Normal priority** grid and click the **right arrow icon** to move it to the **High priority** grid. To return the goal to normal priority, select the goal in the **High priority** grid and click the **left arrow icon**. Both grids display the following values for each goal: PressureCriticalPointName and Priority.
- Click **Next** in the wizard. The Step 5: Go! Screen is displayed. Click one of the following user controls:
  - Save and Run Optimization Now**, to store and start the optimization run
  - Save Only**, to save the information for later use
  - Cancel**, to abandon the information that you entered.
- The Configure and Run Pressure Optimization wizard is closed. To confirm that the simulation is running, you can refer to the Pressure Optimization table. On successful completion of a simulation, the Status is displayed as 'Success'.



## Viewing and Applying Task Results

To view results for completed simulation tasks in the Pressure Optimization portlet table, complete the following steps.

1. Select a simulation task in the Pressure Optimization table and click **View Result**.
2. In the resulting View Pressure Optimization Run Results dialog, you can view the Optimal Pressure Critical Point Settings and Prescribed Valve Updates. You can see the recommended values for specific valves and status of their pressure goals. You can use these recommendations to create a work order to change the valve setting. The properties of each are described in the following tables.

Table 54. Optimal Pressure Critical Point Settings

Property	Description
Pressure Critical Point Name	Name of the pressure critical point.
Settings	Heading rows for the current values and recommended values.
Minimum	The current minimum value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Average	The current average value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Maximum	The current maximum value for the Pressure Critical Point. The property is calculated from historical readings in the previous 24 hours.
Unit	The unit of measurement; for example, PSI for pressure.

Table 55. Prescribed Valve Updates

Property	Description
Valve Name	The name of the valve.
Settings	Heading rows for the current values and recommended values.
Value	The current and recommended water pressure values for the valve.
Unit	The unit of measurement (for example, PSI for pressure).

3. Optionally, you can review the original configuration settings for the valves. Click **Review the configuration used in this run**. The properties for the valves and goals are described in the following tables:

Table 56. Valves Input Table

Property	Description
Freeze	Can be true or false.
Name	The valve name.
Current Value	The current value of the valve.
Unit	The unit of measurement; for example, PSI for pressure.

Table 57. Goals Input Table

Property	Description
Name	The name of the goal.
Min	The current minimum value. The property is calculated from historical readings in the previous 24 hours.
Avg	The average value. The property is calculated from historical readings in the previous 24 hours.

Table 57. Goals Input Table (continued)

Property	Description
Max	The current maximum value. The property is calculated from historical readings in the previous 24 hours.
Priority	The current average value. The property is calculated from historical readings in the previous 24 hours.
Hint	A hint to provide guidance to a user of the application.

- Click **Apply Results** to close the dialog and begin an action. For example, you can start a standard operating procedure to change the valve settings. Otherwise, click **Close** to close this dialog.

**Note:** If you chose to close the dialog without applying the results, you can access the results later from the Pressure Optimization list.

## Modifying a Pressure Optimization task

You can change task settings in the Pressure Optimization portlet.

- Select a draft task in the Pressure Optimization table and click **Update**. The task wizard is displayed. Select the relevant Step from the menu for the settings that you want to modify.
- When you finish modifying the settings, click one of the following user controls on the wizard:
  - Save and Run Optimization Now**, to store and start the optimization run
  - Save Only**, to save the information for later use
  - Cancel**, to abandon the information that you entered.

## Customizing the Pressure Optimization portlet

### Administrator

As an administrator, you can customize the portlet by clicking the menu on the upper right corner of the portlet and configuring the portlet settings.

When you configure parameters for the Pressure Optimization portlet, you can specify the following properties:

- Column layout, headings, sort order, and priority.
- Extra conditions to filter the events or resources displayed.
- A group name to enables communication with other map and Pressure Optimization portlets.
- Acknowledge or ignore event creation.

You can set generic portlet parameters that are common across portlets: help file location, portlet height, portlet title, and resource bundle.

## Customize Asset

Use the Customize Asset portlet to set thresholds for sensor readings.

Measuring the performance of multiple asset instances in the infrastructure is important to determine operational efficiency. By setting the thresholds for multiple asset instances, you can monitor the status of assets and define acceptable and unacceptable boundaries for measurement values. The Customize Asset portlet uses these measurements to indicate when status values are acceptable, warrant caution, or are critical and require immediate attention.

Threshold events help you determine when the measurements obtained from a sensor or other source move outside the normal range. Basic threshold events are comparisons that compare two or more

measures and report a trend. More sophisticated threshold events can compare measures against a threshold that is created by historical information. An example of threshold events is high and low water levels. The IBM Intelligent Operations Center can manage such events in the form of key performance indicators (KPIs).

Using the Customize Asset portlet, role-specific users can perform the following actions:

- Define default or custom key measurements by measurement type.
- View default or custom measurement status by measurement type.
- Create default or custom derived values by measurement type.

The Customize Asset portlet has two tabs as shown in the following table:

*Table 58. Customize Asset portlet interfaces*

Interface element	Description
Default configuration	Used to define or view default configuration measurements by asset type.
Custom configuration	Used to define or view customized configuration measurements by asset instance.

## Defining or modifying key measurements

To define, view or modify the key measurements for an asset type, use the following procedure.

### Procedure

1. Open the Customize Asset portlet, in the WebSphere Portal Administration interface. Click **Intelligent Operations > Customization Tools > Asset Measurements for Water**.
2. Select the **Default configuration** tab to work with default measurements. Select the **Custom configuration** tab to work with customized measurements. The **Key measurement** option is highlighted in the left pane.
3. Click the **Select Asset Type** list to select an asset type.
4. Select a key measurement type for the selected asset type from the available list. For customized measurements, select an asset instance from the list.
5. Click **Save**.

## Viewing measurement status

To define, view or modify the threshold values for a measurement type and set timeout values for a measurement type, use the following procedure.

### Procedure

1. Open the Customize Asset portlet, in the WebSphere Portal Administration interface. Click **Intelligent Operations > Customization Tools > Asset Measurements for Water**.
2. Select the **Default configuration** tab to set default measurements. Select the **Custom configuration** tab to set customized measurements. The **Key measurement** option is highlighted in the left pane.
3. Click the **Measurement status** option in the left pane.
4. Select an asset measurement type from the **Configure by Measurement Type** list. The **Measurement Status** and **Measurement No Reading** sections are displayed.
5. Expand the **Measurement Status** section. The threshold table is displayed.
6. In the table, you can perform the following actions in relation to thresholds:
  - You can view thresholds for a list of measurements. For every asset instance, the threshold table can display the threshold values and its corresponding measurements status, which can be **No Reading**, **Acceptable**, **Caution**, or **Critical**. You can view threshold values across multiple asset instances. If you change the **Measurement Type** in the **Configure by Measurement Type** field, the table resets with the threshold values for the selected measurement type.

- To add a threshold status and data range to the table, click **Add Threshold**. Select a measurement status, and add valid threshold values for the start and end of the data range.
  - To update threshold values for the selected measurement type, click the **Range Starts** and **Range Ends** cells for the threshold and enter valid threshold values. The columns accept numerical values only. Ensure that there is no difference between the Range End value and Range Start value of the subsequent row. If there is a gap between the data values, a warning message displays. In such cases, you must modify the range to remove the difference between the end range and start range on the subsequent row.
  - To remove the threshold setting for a measurement, select the threshold row and click **Remove** in the Actions column or **Remove Selected Thresholds** at the bottom of the table.
  - To revert the table to the last saved version, click **Reset** at the bottom of the table.
  - To save the table for the selected measurement type, click **Save** at the bottom of the table.
7. Expand the **Measurement No Reading** section. Enter a number of milliseconds in the **Timeout** field to specify the timeout interval for all assets with the selected measurement type.

## Defining derived value measurements

To create, view or modify the derived value measurements for an asset type, use the following procedure.

### Procedure

1. Open the Customize Asset portlet, in the WebSphere Portal Administration interface. Click **Intelligent Operations > Customization Tools > Asset Measurements for Water**.
2. Select the **Default configuration** tab to set default derived value measurements. Select the **Custom configuration** tab to set customized derived value measurements. The **Key measurement** option is highlighted in the left pane.
3. Click the **Derived value** option in the left pane.
4. Click the **Select Asset Type** list and select an asset type with which to associate the derived value.
5. You can perform the following actions in relation to derived values:
  - You can view the original measurement, derived measurements, and the formula that is used to calculate the derived measurement in the derived value table.
  - To add a derived value for the selected asset type, click **Add New Derived Value**. The **Edit Derived Value** dialog is displayed. Select an input measurement and output measurement, and enter the formula to calculate the derived value. Click **Save**. The new derived value is added to the table.
  - To update a derived value for the selected asset type, select the derived value row and click **Update** to display the **Edit Derived Value** dialog.
  - To remove a derived value for the selected asset type, select the derived value row and click **Delete**.
  - To save the table for the selected measurement type, click **Save** at the bottom of the table.

## Customize Namespace

Use the Customize Namespace portlet to add, change, and delete a namespace.

The Customize Namespace portlet has interactive interface elements as shown in the following table:

*Table 59. Customize Namespace portlet display*

Interface element	Description
Configure Namespace	Used to add a namespace.

The following table outlines the properties that describe a namespace.

Table 60. Namespace properties

Property	Example
URL	http://cityName#

## Selecting a namespace

In the Customize Namespace portlet, you can select a namespace.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Customization Tools for Water**.
2. In the **Configure Namespace** section, enter the namespace. The namespace must already be present on the model server.

**Note:** An administrator can configure a namespace that is not present on the model server. However, although the administrator can save the namespace value to the model server, the namespace does not have any associated asset types in the model server.

3. Click **Save** to save the namespace.

**Note:** If you change the namespace and click **Save**, an option is displayed to synchronize the model to the database.

## Customize Asset Type

Assets types such as sensors and meters are central to the infrastructure of water management systems. Using the semantic model, you can distinguish between asset types. Changes to the infrastructure require that you update the model instance. Use the Customize Asset Type portlet to assign an icon to an asset type. When you create a new asset type you must assign an icon to that asset type so that the asset can be viewed in the portlets, and be distinguished from other assets in the solution interface.

The Customize Asset Type portlet is an interactive list portlet. All the assets that you are authorized to see are visible on the portlet.

### Icon properties

The Customize Asset Type portlet has interactive interface elements as shown in the following table:

Table 61. Customize Asset Type portlet display

Interface element	Description
Name	Asset type name.
ID	Asset type identifier.
Icons	List of icons for each asset type. (Small, Large, Highlight, Gray).
Actions	Save, Default, Custom.

The lists are refreshed regularly with updates, subject to any filters you set to limit the categories that are shown.

A counter in the left corner of the action bar at the end of the list indicates the number of items displayed and the total number of items. In the center of the action bar, you can select the number of items to be displayed at one time. If there are more rows than can be displayed at one time, you can page forward or backward by clicking the buttons in the right corner of the action bar.

## Assigning an icon to an asset types

In the Customize Asset Type portlet, you can assign an icon to an asset type.

### Procedure

1. On the Customize Asset Type portlet, click a row in the list to select an asset type from the menu.
2. Click **Update**. The **Update Asset Type Icons** dialog is displayed.
3. Select an icon option from the drop-down list. Select from: **Small Icon, Large Icon, Highlight Icon, Grey Icon, Type** and **Instance**.
4. Click **Save**.
5. Click **Default** to select an icon from a default list of icons.
6. Click **Custom** to select a customized icon. Enter the image URL in the field provided. The .PNG file format is supported.

## Configure the Water Pipeline Network

Use the Configure the Water Pipeline Network portlet to generate a pipeline network.

### Pipe network user interface

The Configure the Water Pipeline Network portlet has interactive user interface elements as shown in the following table:

Table 62. Configure the Water Pipeline Network portlet display

Interface element	Description
Generate Pipeline Network	Used to start the process of generating a pipeline network.
Enable/Disable Pipeline Network	Used to enable or disable the pipeline network

## Creating a pipe network

In the Configure the Water Pipeline Network portlet, you can generate a pipeline network to view the pipe network on the Map portlet.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Network for Water**.
2. In the **Generate Pipeline Network** section, click **Generate**. View the status of the task in the display area.

## Enabling or disabling a pipe network

In the Configure the Water Pipeline Network portlet, you can enable or disable the display of the pipeline network on the Map portlet.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Network for Water**.
2. In the **Enable/Disable Pipeline Network** section, click the check box to enable or disable.
3. Click **Save** to save the pipeline network settings.

## Customize Logical Zone

Logical zone settings are displayed on the Map. You can use the settings to configure logical zones to filter assets by geographical location. Use the Customize Logical Zone portlet to view, monitor, and manage logical zones.

The Customize Logical Zone portlet is an interactive list portlet. All the zones that you are authorized to see are visible on the map that is displayed in the portlet. Logical zones in the vicinity are displayed on a map.

## Logical Zones

The Customize Logical Zone portlet has two interactive interface elements as shown in the following table:

*Table 63. Customize Logical Zone portlet display*

Interface element	Description
Map	A map of the geographical region provides zone locations
Zone Edit Properties	A collection of fields that contain the zone name, description, point settings, coordinates.

Initially, when you open the page, the Customize Logical Zone portlet shows all the zones that are relevant to you. In the Customize Logical Zone portlet, you select the zones to be shown.

The lists are refreshed regularly with updates, subject to any filters you set to limit the categories that are shown.

## Zone properties

The following table outlines the properties that describe a zone.

*Table 64. Zone properties*

Property	Content
Name	Zone name
Description	Description of the zone
Points Latitude / Longitude	Coordinates of the zone location

## Editing zones

In the Customize Logical Zone portlet, you can perform various actions on the zones in the list. In the Customize Logical Zone portlet, you can edit an existing zone.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Logical Zones for Water**. The Customize Logical Zone portlet is displayed.
2. To edit a zone, select a logical zone from the list or click the zone in the map.
3. The zone settings are displayed below the map. Modify the zone setting that is displayed to update the zone.
  - Modify the zone name or description by entering a new name or description.
  - Click in the **Points Latitude** or **Longitude** fields to modify an existing coordinate.
  - Click the **insert point** link to add a latitude and longitude point for the zone.
  - Click the **remove point** link to remove a latitude and longitude point for the zone.
  - Click **Update Coordinates** to refresh your latitude and longitude settings and display the information on the map.
4. Click **Save Zone** to save your updates.

## Creating zones

In the Customize Logical Zone portlet, you can perform various actions on the zones in the list and on the map. In the Customize Logical Zone portlet, you can add a zone that is shown on both the map and the list.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Logical Zones for Water**. The Customize Logical Zone portlet is displayed.
2. To create a new zone, click **Add New Zone**.
3. The zone settings are displayed below the map. Create new zone settings.
  - Enter the zone name and description.
  - Enter the points in the zone. Click in the **Points Latitude** or **Longitude** fields to enter new coordinates for the point. You can also click on the map to enter the zone points.
  - Click the **insert point** link to add a latitude and longitude point for the zone and enter your values.
  - Click the **remove point** link to remove a latitude and longitude point for the zone.
  - Click **Update Coordinates** to refresh your latitude and longitude settings and display the information on the map.
4. Click **Save Zone** to save your updates.

## Synchronizing the model database

Use the Synchronizing the model database portlet to synchronize model data with the database.

The Synchronizing the model database portlet has interactive interface elements as shown in the following table:

Table 65. Customize Namespace portlet display

Interface element	Description
Synchronize model data with database	Used to synchronize model data with the database.

## Synchronizing the model data

In the Customize Namespace portlet, you can synchronize the model data with the database by using the portlet.

### Procedure

1. Select **Intelligent Operations > Customization Tools > Customization Tools for Water**.
2. Enter the namespace. The namespace must already be present on the model server.
3. In the **Configure Namespace** section, enter the namespace. The namespace must already be present on the model server.
4. In the **Synchronize model data with database** section, click **Synchronize** to start the process. View the status of the task in the display area.

## Water Pipe Failure Prediction Model Management

Use the Water Pipe Failure Prediction Model Management portlet to build, verify, and monitor pipe failure prediction models.

With prediction models, you can see those sections of pipe network most at risk of failure in report table and GIS view. A model simulates the predicted failure results for pipes that are constructed between a



selected timeframe. To validate the model with sample data, the model uses the maintenance records, or pipe failure results, that occurred in a selected year. After which, you can run the prediction on a future year and visualize the result.

The Water Pipe Failure Prediction Model Management portlet is an interactive list portlet. All the models that you are authorized to see and work with are visible on the portlet.

## Water Pipe Failure Prediction Model Management

The Water Pipe Failure Prediction Model Management portlet has interactive interface elements as shown in the following table:

*Table 66. Pipe Failure Prediction Model Management portlet display*

Interface element	Description
Model List	Lists the models and the prediction results associated with each model in a table.
Model actions	Perform model prediction tasks with the following user controls: <b>Build, Verify, Predict, Delete, View Log, Refresh</b> ). Line graphs display the model prediction outcomes.

A counter in the left corner of the action bar at the end of the list indicates the number of items displayed and the total number of items. In the center of the action bar, you can select the number of items to be displayed at one time. If there are more rows than can be displayed at one time, you can page forward or backward by clicking the buttons in the right corner of the action bar.

## Water Pipe Failure Prediction Model Management properties

The following table outlines the properties that describe Water Pipe Failure Prediction Model Management.

*Table 67. Water Pipe Failure Prediction Model Management properties*

Property	Content
Model ID	The identification number of the model.
Model Type	Two prediction model types are provided: <ul style="list-style-type: none"> <li>• Chi-Square Automatic Interaction Detection (CHAID) model type is a decision tree technique.</li> <li>• Logistic Regression (Logistic) is a regression-based technique.</li> </ul>
Status	The build status of the model, either Building, Ready, Invalid, Verifying, Predicting, or Failure.
Creation Date and Time	The date and time that the model was created.
Network Type	The network type code.
From Year	The start year for the model. Used for filtering pipes. If it is set, only the pipes that are constructed after the specified year are considered in model building.
To Year	The end year for the model. Used for filtering pipes. If it is set, only pipes that are constructed before the specified year are considered in model building.
Validation Year	Used for filtering pipe failure records. Only pipe failure records in the validation year are considered in model building.
Verified	The verification status of the model, either Yes or No.
ROC Score	A value to represent the area beneath the Receiver Operating Characteristics (ROC) curve. Used as an indicator of the model's performance. Value range is between 0.0 to 1.0. A higher value indicates better performance.

Table 67. Water Pipe Failure Prediction Model Management properties (continued)

Property	Content
Gain Score	A value to represent the area beneath the Gain curve. Used as an indicator of the model's performance. Value range is between 0.0 to 1.0. A higher value indicates better performance.

## Building a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can build a new pipe failure prediction model. For example, as an analyst, you can build a prediction model from a historical maintenance record, by specifying some data-filtering parameters and some algorithm parameters.

### Procedure

1. Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
2. To create a model, click **Build** to start a dialog to input parameters.
3. The **Build Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and maintenance records for the build process:
  - Select a model type and network type for the pipes.
  - Enter the historical data range for the pipes by selecting the start and end year. The end year must be greater than the start year.
  - Select the validation year from the list to validate the model with sample data. The sample data is the maintenance record, or pipe failure results, for the chosen year.
  - Click **Run** to start a background process to build the model on the SPSS server. The **Build Pipe Failure Prediction Model** dialog is closed.
4. Click **Refresh** on the portlet to check the model build status. The new model is displayed in the portlet table with a status displayed as 'building'. When the model file is built on the IBM Intelligent Operations Center Application Server, the model status is displayed as 'ready'.

## Verifying a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can verify a new pipe failure prediction model. For example, as an analyst, you can select an existing model and use historical data to verify it, and receive the ROC and Gain performance indicator.

### Procedure

1. Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
2. To verify a new model, select a model in the portlet table with a status that is displayed as ready.
3. Click **Verify** to start a dialog to input parameters.
4. The **Verify Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and maintenance records for the verification process:
  - Select a region from which to use pipe data.
  - Enter the historical data range by selecting the start and end year. The end year must be equal or greater than the start year.
  - Select the validation year from the list to validate the model with sample data. The sample data is the maintenance record, or pipe failure results, for the chosen year.
  - Click **Run** to start a background process to verify the model on the SPSS server. The **Verify Pipe Failure Prediction Model** dialog is closed.
5. Click **Refresh** on the portlet to check the verification status. The model status is displayed as Verifying. When the verification process is complete, the Status is displayed as Ready and the Verify

column of the portlet table is displayed as Yes. In addition, the ScoreRoc and ScoreGain columns display numbers other than zero. The ROC and Gain graphs beneath the portlet table display the predicted pipe failure results for your chosen years with failure record for your selected validation year.

## Running a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can run a new pipe failure prediction model. For example, as an analyst, you can select a model and use it to evaluate the risk of pipe failures in specified year.

### Procedure

1. Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
2. To run a new model prediction, select a model in the portlet table with a status that is displayed as ready.
3. Click **Predict** to start a dialog to input parameters.
4. The **Run Pipe Failure Prediction Model** dialog is displayed. Specify the following parameters to select pipes and the year for the prediction process:
  - Select a network type for the pipes and a target year for the prediction.
  - Click **Run** to start a background process to run the prediction on the SPSS server. The **Run Pipe Failure Prediction Model** dialog is closed.
5. Click **Refresh** on the portlet to check prediction status. The model status is displayed as Predicting. When the verification process is complete, the Status is displayed as Ready.

## Deleting a Pipe Failure Prediction Model

In the Water Pipe Failure Prediction Model Management portlet, you can delete a new pipe failure prediction model.

### Procedure

1. Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
2. To delete a model, click **Delete**.
3. The **Delete Pipe Failure Prediction Model** dialog is displayed.
  - Select a model to delete.
  - Click **Delete**. The model is removed from the portlet table.

## Viewing the Pipe Failure Prediction Model log file

In the Water Pipe Failure Prediction Model Management portlet, you can view the log file of the pipe failure prediction model process.

### Procedure

1. Select **Intelligent Operations > Administration Tools > Pipe Failure Prediction Model**. The Water Pipe Failure Prediction Model Management portlet is displayed.
2. To view the log file, click **View Log**.

## Predicted Asset Failure Map

Use the Map portlet to see predicted water asset failures on a map.

The Map portlet interacts with the Details portlet. The Map portlet provides you with a visual representation of predicted water asset failures on a map. Use the Map portlet together with the Details portlet to identify location patterns, conflicts, issues, and synergies.

The Map portlet can also be used to update the content of the Details portlet. You can select in the Map portlet the categories of predicted water asset failures and to you want to view. Your selection affects what is displayed in both the Map portlet and the corresponding Details portlet on the portal page.

## Map interface

The Map portlet has a single map view with interactive interface elements as shown in the following table .

Table 68. Map portlet - Geospatial Map interfaces

Interface element	Description
Map	A map of the geographical region provides predicted water asset failure resource locations.
Select Content: Pipe Failure Prediction	<p>A filter form to select the categories of the prediction to be shown on the map and in the <b>Predicted Asset Failure Details</b> portlet. The prediction settings are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Show prediction for this year.</b> Select the target year for which you want to know the prediction result.</li> <li>• <b>Region.</b> Select the region to include in the prediction. If no region is selected, the results for all regions are displayed.</li> <li>• <b>Network type</b> to include in the prediction. From the menu, select <b>Fresh</b> (fresh water) or <b>Salt</b> (salt water).</li> <li>• <b>Display.</b> Specify display settings on the map; for example, percentage or number of assets to display.</li> <li>• <b>Metric.</b> Select option on which the prediction is based. For example, select to display <b>Risk</b> or <b>Unit Risk</b>. Metric displayed shows either a probability measurement of failure (risk), or probability measurement of failure by pipe length (unit risk).</li> </ul>
Select Content: Work Orders	<p>A filter form to select the work orders to be shown on the map and in the <b>Work Orders</b> tab on the Details portlet.</p> <ul style="list-style-type: none"> <li>• The <b>What</b> settings are as follows: <ul style="list-style-type: none"> <li>– <b>Problem - Failure Class.</b> Select the failure class.</li> <li>– <b>Problem - Problem Code.</b> Select the problem code.</li> <li>– <b>Work type.</b> Select the work type.</li> <li>– <b>Status.</b> Specify the status of the work order. Only work orders with the specified status are displayed on the map.</li> <li>– <b>Priority.</b> Specify the priority of the work order. Only work orders with the specified priority are displayed on the map.</li> </ul> </li> <li>• The <b>When</b> settings are as follows: <ul style="list-style-type: none"> <li>– <b>Target Start Date.</b> Specify the start date.</li> <li>– <b>Target End Date.</b> Specify the end date.</li> </ul> </li> </ul>

The **Map** map uses latitude and longitude values to show the location. A point marker or shape outlines the area. You can display more detail on a prediction by clicking the marker on the map.

## Map markers

The map represents the location of predictions with one of the following types of marker:

Table 69. Map markers

Marker Type	Description
Icon	Pinpoints on the map the location of a prediction by using a unique icon for each.
Polygon	Outlines on the map the area that is associated with a particular prediction.

The icon that represents a prediction is shown in the Details portlet.

## Using the Map controls

You can move the cursor around the map by using your mouse or keyboard.

### Controls at the top of the map

The following controls are available at the top of the map:

- Pan arrows (up, down, left, right)
- Zoom in
- World view (zooms out to the maximum extent)
- Zoom out

### Controls for moving around the map

To move around the map, you can use the following controls:

- Click and drag the map by using the mouse
- Press the up pan arrow, or the up arrow key on the keyboard, to pan north
- Press the down pan arrow, or the down arrow key on the keyboard, to pan south
- Press the right pan arrow, or the right arrow key on the keyboard, to pan east
- Press the left pan arrow, or the left arrow key on the keyboard, to pan west

### Zoom controls for magnifying or reducing the scale of the map

To zoom in and out of the map, you can use the following controls:

- Click the + map icon to zoom in, or the - map icon to zoom out of the center of the map
- Double-click the mouse to center the map and zoom in to the selected location
- Click the **World view** icon to maximize the zoom out to show the world view
- Press the + key on the keyboard to zoom in
- Press the - key on the keyboard to zoom out
- Press Shift while you use the mouse to draw a rectangle around the area to zoom in on

## Predicted Asset Failure Details

Use the Details portlet to view, monitor, and manage prediction results that are associated with assets.

The Details portlet is an interactive list portlet. All the predicted asset failure details that you are authorized to see are visible on the list and on any map portlet that is linked to the Details portlet.

## Prediction properties

The following table outlines the properties that describe a prediction. The failure records displayed in the Details portlet is determined by the **Select Content** settings in the Map portlet.

Table 70. Prediction properties

Property	Content
Asset ID	Asset identification number.
Region	Geographical area or district. Only pipes in the region are included in a prediction.
Network Type	Network type.
Target Year	Prediction target year.
Risk	Measurement of the probability that the pipe has a leakage problem.
Unit Risk	Measurement of the probability that the pipe has a leakage problem that is divided by the length of the pipe.
Material	The material of the pipe; for example, PVC.
Diameter	Measurement of pipe diameter in meters.
Length	Measurement of pipe length in meters.
Completion Date	Date when the pipe construction was completed.

## Work order properties

The following table outlines the properties that describe a work order. The work order records displayed in the Details portlet are determined by the **Select Content** settings in the Map portlet.

Table 71. Work order properties

Property	Content
ID	The unique identity of the work order.
Asset ID	The unique identity of the asset.
Asset Type	The code number of an asset type.
Work Type	The code number of a work type.
Problem	The code number of a problem.
Priority	The priority number.
Status	The code number of a status type.
Failure	The code name of a failure type.

---

## Operator tasks

Use the information in this topic to perform operator tasks using the solution.

The Operator: Operations view provides a visual representation of water data enabling you to perform the following actions:

- View current water levels, devices, and events, on a geographical information system (GIS) map and accompanying table.
- Navigate around the GIS map, zooming in and out of water infrastructure networks to view pipe infrastructure, asset types and locations within the network.
- View graphical reports summarizing recent water events.

- Monitor specific pipe networks and areas of interest.
- Customize the water data you would like to monitor on the GIS maps.

Use the Operator: Operations view to monitor and analyze current water data available in the solution.

If you have administrator access, you also can perform some configuration and customization actions from this view.

## Displaying the Map portlet

Use the information in this topic to monitor the status and performance of water infrastructure and assets. The map contains geo-spatial and system data collected from subsystems and external data sources. The map provides a single view of infrastructure, assets, devices, and events sourced from SCADA, meter, or sensor systems that are configured in the water network.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges. The subsystems, for example GIS and SCADA subsystems, and all external data feeds must be operational.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the filter options on the Map portlet to refine your view by:
  - a. Event category
  - b. Asset type
  - c. Logical zone
5. Use the pan or zoom options to navigate and refine your view of the map.

## Showing the pipe network on the map

Use the information in this topic to display the pipe network on the Map portlet.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the pipe network to display all assets graphically on the map.

### Related tasks:

“Viewing pipeline failure predictions” on page 43

Use the information in this topic to monitor the health of the pipe network. Using the Predicted Water Asset Failure map displayed on the Planner: Analysis view, you can monitor pipe network failure predictions for pipelines that are configured in your system.

## Viewing water assets and equipment

Use the information in this topic to display water assets and equipment on the Operator: Operations view.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the asset or equipment item in the map.
7. View the status of the asset on the Details portlet.

## Displaying measurement values for assets

Use the information in this topic to display measurement values for water assets and equipment on the Operator: Operations view.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the asset or equipment item. Hover over the asset to view critical information about the asset (for example, the location of the device or the last reading/historical reading from the device).
7. View the status of the asset on the Details portlet.
8. Right-click the asset to display the **Measurement Details** dialog.

**Note:** If the default measurement displayed for the asset in the Details portlet is not what you require, right-click on the asset to select an associated measurement from the list.

9. Use the scroll bar to navigate to the **Value** and **Unit** fields to view the measurement details.



## View historical data records for an asset measurement

Use the information in this topic to display past measurement values for water assets and equipment on the Operator: Operations view. By reading historical measurement values and readings from water network sensors or meters, you can monitor the performance water infrastructure more effectively.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the asset or equipment item in the map.
7. View the status of the asset on the Details portlet.
8. Right-click the asset to display the **Measurement Details** dialog.

**Note:** If the default measurement displayed for the asset in the Details portlet is not what you require, right-click on the asset on the Details portlet to select an associated measurement from the list.

9. Use the scroll bar to navigate to the **Historical Values** section.
10. Click the **Date Time (All)** field on the x-axis to toggle views of historical values.

## Selecting an asset type

Use the information in this topic to display the assets of a specific asset type on the Map portlet.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Navigate to the **Select Content: Asset Types** option, and select an asset type from the available list.
7. View the refined asset type display in the map.
8. View the status of the asset on the Details portlet.
9. Right click the asset to display the **Properties** dialog.

## Displaying assets in a domain or zone

Use the information in this topic to display assets in a domain or zone on the Map portlet. By selecting a zone, you can get a clearer view of the assets and equipment that are displayed on a map.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.

5. Use the filtering options on the map to view the asset types.
6. Navigate to the **Select Content: Logical Zone** option, and select a logical zone from the available list.
7. View the asset or equipment in the logical zone.
8. View the status of the asset on the Details portlet.

## Adding water events

Use the information in this topic to add water events on the Operator: Operations view.

### Before you begin

Use the Zoom and Pan map controls to find the exact location on the map where the new water event has occurred. Otherwise, you need to know the latitude and longitude coordinates of the event location before you begin.

### Procedure

1. Open the **Add Event** window by using one of the following options:
  - Go to the Map portlet, right-click the map, then click **Add Event**.
  - Go to the Details portlet, click **Add Event**.
2. In the **Add Event** window, enter a **Name** to identify the event.
3. Enter the details of the event, by completing the required **Who**, **What**, **Where**, and **When** fields.
4. Click **OK**.

### Water event properties

Water events include properties for identifying the individual event, its type, and its location.

To display a more detailed description of a water event, hover over the location of the event in the Map portlet, or the row in the Details portlet.

The following table outlines the properties of a water event.

*Table 72. Water event properties*

Label	Description
ID	Unique identifier that is used to identify the event in the water system and subsystems. The syntax and format of the ID are specific to the organization requirements.
Name	Meaningful name to identify the event.
Type	Detailed classification of the event, specific to the general classification.
Description	Additional details and information to describe the event.
Latitude / Longitude	Geographical coordinates of the event location.

## Viewing key alerts and notification messages

Use the information in this topic to understand how to view key alerts on the Operator: Operations view. Managing alerts requires that you regularly evaluate and monitor received alerts to identify recurring performance problems.

### About this task

The **Notifications** portlet provides a dynamic, interactive list of alerts that result from changing KPIs and correlated events. For example if multiple events are happening in the same vicinity and at a similar time, there might be a conflict that requires coordination. In a similar way, a predefined key performance

indicator (KPI) value that changes might trigger an alert where such a change is defined for notification by your administrator.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the **Notifications** portlet to view your current alerts.
4. View the properties associated with the alert. Right click the alert and select **Properties**. Hover over the selected alert in the **Notifications** portlet to view more detail on the alert.

## Notifying stakeholders of water network events

Use the information in this topic to understand how to notify stakeholders of water network events.

### About this task

Use the **Sametime** portlet to collaborate with key stakeholders to manage water network events.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. Go to the **Sametime** portlet to view your current contacts.
4. Use the capabilities to notify the relevant parties of water network events by sending a broadcast or instant message.

## Building a list of key contacts

Use the information in this topic to build a list of contact to collaborate with when managing water network events.

### About this task

Use the **Sametime** portlet to build a list of key contacts to collaborate with when managing water network events.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. Go to the **Sametime** portlet to view your current contacts.
4. Use the **People** menu to add contacts to your available list.

## Displaying the logical map

Use the information in this topic to monitor the semantic model in a map. The model is a real world abstraction of the water infrastructure, assets, and measurements represented in a graph. Working with the graph, you can explore the model and analyze integration points and impacts.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges. You must load the model with the required OWL and RDF files. You must also select to enable the **Logical Map** view and associated settings. To enable the display, select **Edit Shared Settings** in the upper right of the portlet. Go to the **Enable the Logical Map** field and enter the value True. Optionally, you can

specify a map name in the **Logical Map Name** field, and set a prefix for the model in the **Model Prefix** field.

## Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. Select the **Logical Map** link.
4. Use the filter options on the Map portlet to refine your view of the map.
  - Enter a number in **Limit item count to:** to set the maximum number of items to display in the map.
  - Enter a number in **Limit impact analysis depth to:** to set how deep within the layers in the map you want to allow impact analysis to be performed.
  - Select from the available options to customize the display of relationships in the model.
    - Type instance** shows relationships of type instance, for example, where Pipe 1 is an instance of Pipe.
    - Connects** shows the connection relationship between assets.
    - Has measurement** shows the relationship between assets and measurements.
    - Contains** shows the contain relationship between two assets.
    - Supertype Subtype** shows the class inherent relationship between two asset types.
  - Select from the available options to limit the scope of relationships displayed in the map. The settings are based on the topic map index rule and can be limited to **City Name** or **Reference Semantic Model**.
  - Select to focus your analysis on a specific asset.
  - Select to search for an alternate asset by entering the asset name or selecting an item from the available list.
  - Select the **Reset the Map > Change Layout** option on the upper right of the portlet to change the layout of the graph. Select from the **Force Directed Layout, Circular Layout, Tree Layout, or Hierarchical Layout, Long Link Layout, Short Link Layout** options.

## Performing impact analysis

Use the information in this topic to perform impact analysis on model artifacts.

### About this task

Use the **Logical Map** to perform impact analysis, for example, on a measurement in the model.

## Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. Select the **Logical Map** option to view the logical map.

**Note:** To enable the **Logical Map** view, you must select the **Edit Shared Settings** option on the Map portlet, scroll to **Enable the Logical Map** field, and enter True.
4. Navigate the **Logical Map** to find the asset that you want to analyze. Right click and select the **Perform Impact Analysis** option.

## Viewing meter details

Use the information in this topic to view meter details on the Operator: Operations view. Meter information can be viewed on the Map and on the Details portlet. Managing meters requires that you regularly evaluate and monitor equipment and measurements. With the solution, you can display

information about the meter device and measurements. You can also drill down to get more information about historic measurements, device installed date, warranty status, and preferred vendor.

## Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

## Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset types.
6. Select the meter. Hover over the meter to view information about the asset (for example, meter readings, historic readings, device installed date, warranty status, and preferred vendor).
7. View the status of the meter on the Details portlet.
8. Right-click the meter and select the **View Details** option to view details.

## Creating work orders

Use the information in this topic to create work orders on the Operator: Operations view.

## Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

## About this task

Work orders can be created manually using the solution interface.

## Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Click **Select Content > Work Order**. Use the filtering options on the map to customize your view of the work orders. Use the filtering options on the map to view the asset types.
6. Select the asset or equipment item. Hover over the asset to view critical information about the asset (for example, the location of the device or the last reading/historical reading from the device).
7. View the status of the asset on the Details portlet.
8. Right-click on the Map portlet, or right-click an asset in the Details portlet, and select the **Add Work Order** option.
9. Complete the **Work Order** dialog. Enter details including the work order ID, name, asset, problem description, work type, job plan, description, priority, start and end dates, and work location.  
  
**Note:** You can create a work order against active job plans only.
10. Click **OK** to create the work order. The work order is displayed on the **Work Orders** tab in the Details portlet and also on the map.

## Viewing work order status

Use the information in this topic to view work order status on the Operator: Operations view. Work orders can be viewed on the Map and on the Details portlet.

### Before you begin

Before you can perform this task, you must be authenticated with the appropriate role and privileges, and validated as a water operator.

### About this task

Managing work orders requires that you regularly evaluate and monitor received work orders. Work orders are generated typically from service requests. For example, you may have a specific piece of water equipment operating at a physical location that requires maintenance work performed. With the solution, you can display information about the equipment or device. You can also drill down to get more information about its maintenance history, installed date, warranty status, and preferred vendor. Managing work orders requires you to be aware of the quantity and nature of work orders. Using IBM Intelligent Water Efficiency Analytics, that information is readily available and key indicators are viewable in charts and tables for selected physical locations and equipment.

### Procedure

1. Log on as operator.
2. Select the Operator: Operations view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the work orders. Click **Select Content > Work Order**.
6. Filter the display based on **Asset Type, Work Type, Problem, Status, and Priority**.
7. Open the **Work Orders** tab on the Details portlet, right click a work order in the list, and select the option to view details.
8. The **Work Order** dialog displays work order details including the ID, name, asset, problem description, work type, job plan, description, priority, start and end dates, and work location.

---

## Executive tasks

Use the information in this topic to perform executive tasks with the solution.

Use the Executive: Status view to obtain a consolidated view of key performance indicators (KPIs) and key events. The Executive: Status view provides a visual representation of water infrastructure and organizational efficiency.

If you have administrator access, you can perform configuration and customization actions.

## Displaying Key Performance Indicators

Use the information in this topic to monitor the overall health of the water network. Using the heat map displayed on the Status portlet on the Executive: Status view, you can monitor system health for performance categories that are configured in your system.

### Procedure

1. Log on as executive.
2. Select the Executive: Status view.
3. View the Status portlet to display key performance indicator categories. The background color options and legends indicate the performance status.

4. Hover over the key performance indicator to display more information. Click the key performance indicator to display more information in the Key Performance Indicator Drill Down portlet.

**Related information:**

Key Performance Indicators

## Viewing Key Performance Indicator details

Use the information in this topic to get a detailed view of the health of the water network. By drilling down on performance indicators in the heat map displayed on the Status portlet on the Executive: Status view, you can get a detailed view of system health. You can expand nested Key Performance Indicators that monitor system health for additional diagnosis.

### Procedure

1. Log on as Executive.
2. Select the Executive: Status view.
3. View the Status portlet to display Key Performance Indicator categories. The background color options and legends indicate the performance status.
4. Double-click the key performance indicator to drill down for more information. The detail is displayed in the Key Performance Indicator Drill Down portlet.

### What to do next

Switch to the Operator: Operations view to locate the key performance indicator abnormality geo-spatially and display it on the map. Alerts are also posted on the Notifications portlet.

**Note:** All key performance indicators that are beyond the normal range are displayed on the Map Details portlet and reported to the Executive: Status dashboard.

**Related information:**

Key Performance Indicators

## Monitoring changes to Key Performance Indicators

The Notifications portlet provides a dynamic interactive list of alerts that result from changing KPIs and correlated events.

### Procedure

1. Log on as executive.
2. Select the Executive: Status view.
3. View the Notifications portlet to view your current alerts.
4. View the properties associated with the alert by right clicking the alert and selecting **Properties**.  
Hover over the selected alert in the Notifications portlet to view more detail on the alert.

**Related information:**

Key Performance Indicators

## Working with Standard Operating Procedures

The My Activities portlet provides a dynamic table of open activities that are owned by the person who logged on to the solution. Standard Operating Procedures are provided to respond to changing KPIs and correlated events.

### Procedure

1. Log on to IBM Intelligent Operations for Water as Executive.

2. Navigate to the My Activities portlet to view the procedural response to your current alerts. Counters are displayed for past, present, and future activities.
3. Expand the procedure to view the steps. Click **Start** to begin the procedure. Click the information icon for more information about the procedure.

**Related information:**

Standard Operating Procedures

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## Administrator tasks

If you have administrator access, you can perform administration tasks and related configuration and customization actions. Use the information referenced this topic to perform administrator tasks.

To perform administration tasks, log on to the solution as administrator, and select the **Administration** view. Open the Customize Asset portlet, and click **Intelligent Operations > Customization Tools** to view the available administration options. Refer to the topics below to used the administration consoles and customization capabilities.

**Related information:**

Working with the Administration portlets

Use the Administration portlets to customize some aspects of the user interface and system settings of IBM Intelligent Water Efficiency Analytics to suit your operational requirements and users.

Customizing the solution

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## Planner tasks

Use the information in this topic to perform planner tasks with the solution.

Use the Planner: Analysis view to obtain a consolidated view of pipeline health and related key details. The Planner: Analysis view provides a visual representation of the predicted health of the pipeline infrastructure and efficiency in a Map and Details table.

If you have administrator access, you can perform configuration and customization actions.

## Viewing pipeline failure predictions

Use the information in this topic to monitor the health of the pipe network. Using the Predicted Water Asset Failure map displayed on the Planner: Analysis view, you can monitor pipe network failure predictions for pipelines that are configured in your system.

### Procedure

1. Log on to IBM Intelligent Water Efficiency Analytics as Planner.
2. Select the Planner: Analysis view.
3. View the Map portlet.
4. Use the pan or zoom options to refine your view of the map.
5. Use the filtering options on the map to view the asset with associated predicted asset failure icon on the map.
6. Select the asset or equipment item in the map to view a popup of predicted asset failure details associated with the asset.
7. View more asset statuses on the Details portlet.



### Related tasks:

“Showing the pipe network on the map” on page 133

Use the information in this topic to display the pipe network on the Map portlet.

## Displaying work orders

In the Planner: Analysis view, you can display a work order item.

### Procedure

1. Log on to IBM Intelligent Water Efficiency Analytics as Planner.
2. Select the Planner: Analysis view.
3. Select **Select content > Work Order**.
4. In the **Work Order** section, configure the settings if required. The following is an example setting:
  - a. Work Type: Major
5. In the Predicted Water Assets Details portlet, you can view the work order data.

## Exporting work orders

In the Planner: Analysis view, you can export Work Order items to Maximo.

### Procedure

1. Log on to IBM Intelligent Water Efficiency Analytics as Planner.
2. Select the Planner: Analysis view.
3. Select **Select content > Pipe Failure Prediction**.
4. In the **Pipe Failure Prediction** section, enter filtering criteria. You can enter data for some or all of the criteria, including target year, region, network type, top number of assets, and base metric. The following is example criteria:
  - a. Show Prediction for this Year: 2013
  - b. Network Type: Salt
  - c. Display: Top 15 assets
5. Wait until the system processes the data and displays the pipe data in the Predicted Water Asset Details portlet. Click **Export Work Orders**
6. Enter parameters in the dialog box, and click **OK**
7. Wait until the progress bar disappears, after which the data is exported.



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## Chapter 10. Troubleshooting and support

To isolate and resolve problems with your IBM products, you can use the troubleshooting and support information. This information contains instructions for using the problem-determination resources that are provided with your IBM products, including the products from the IBM Intelligent Water Family of solutions.

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### Techniques for troubleshooting problems

*Troubleshooting* is a systematic approach to solving a problem. The goal of troubleshooting is to determine why something does not work as expected and how to resolve the problem. Certain common techniques can help with the task of troubleshooting.

The first step in the troubleshooting process is to describe the problem completely. Problem descriptions help you and the IBM technical-support representative know where to start to find the cause of the problem. This step includes asking yourself basic questions:

- What are the symptoms of the problem?
- Where does the problem occur?
- When does the problem occur?
- Under which conditions does the problem occur?
- Can the problem be reproduced?

The answers to these questions typically lead to a good description of the problem, which can then lead you to a problem resolution.

#### What are the symptoms of the problem?

When starting to describe a problem, the most obvious question is “What is the problem?” This question might seem straightforward; however, you can break it down into several more-focused questions that create a more descriptive picture of the problem. These questions can include:

- Who, or what, is reporting the problem?
- What are the error codes and messages?
- How does the system fail? For example, is it a loop, hang, crash, performance degradation, or incorrect result?

#### Where does the problem occur?

Determining where the problem originates is not always easy, but it is one of the most important steps in resolving a problem. Many layers of technology can exist between the reporting and failing components. Networks, disks, and drivers are only a few of the components to consider when you are investigating problems.

The following questions help you to focus on where the problem occurs to isolate the problem layer:

- Is the problem specific to one platform or operating system, or is it common across multiple platforms or operating systems?
- Is the current environment and configuration supported?
- Do all users have the problem?
- (For multi-site installations.) Do all sites have the problem?

If one layer reports the problem, the problem does not necessarily originate in that layer. Part of identifying where a problem originates is understanding the environment in which it exists. Take some time to completely describe the problem environment, including the operating system and version, all corresponding software and versions, and hardware information. Confirm that you are running within an environment that is a supported configuration; many problems can be traced back to incompatible levels of software that are not intended to run together or have not been fully tested together.

## **When does the problem occur?**

Develop a detailed timeline of events leading up to a failure, especially for those cases that are one-time occurrences. You can most easily develop a timeline by working backward: Start at the time an error was reported (as precisely as possible, even down to the millisecond), and work backward through the available logs and information. Typically, you need to look only as far as the first suspicious event that you find in a diagnostic log.

To develop a detailed timeline of events, answer these questions:

- Does the problem happen only at a certain time of day or night?
- How often does the problem happen?
- What sequence of events leads up to the time that the problem is reported?
- Does the problem happen after an environment change, such as upgrading or installing software or hardware?

Responding to these types of questions can give you a frame of reference in which to investigate the problem.

## **Under which conditions does the problem occur?**

Knowing which systems and applications are running at the time that a problem occurs is an important part of troubleshooting. These questions about your environment can help you to identify the root cause of the problem:

- Does the problem always occur when the same task is being performed?
- Does a certain sequence of events need to happen for the problem to occur?
- Do any other applications fail at the same time?

Answering these types of questions can help you explain the environment in which the problem occurs and correlate any dependencies. Remember that just because multiple problems might have occurred around the same time, the problems are not necessarily related.

## **Can the problem be reproduced?**

From a troubleshooting standpoint, the ideal problem is one that can be reproduced. Typically, when a problem can be reproduced you have a larger set of tools or procedures at your disposal to help you investigate. Consequently, problems that you can reproduce are often easier to debug and solve.

However, problems that you can reproduce can have a disadvantage: If the problem is of significant business impact, you do not want it to recur. If possible, re-create the problem in a test or development environment, which typically offers you more flexibility and control during your investigation.

- Can the problem be re-created on a test system?
- Are multiple users or applications encountering the same type of problem?
- Can the problem be re-created by running a single command, a set of commands, or a particular application?

**Related tasks:**

“Searching knowledge bases”

You can often find solutions to problems by searching IBM knowledge bases. You can optimize your results by using available resources, support tools, and search methods.

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## Searching knowledge bases

You can often find solutions to problems by searching IBM knowledge bases. You can optimize your results by using available resources, support tools, and search methods.

### About this task

You can find useful information by searching the information center for IBM Intelligent Operations for Water. However, sometimes you need to look beyond the information center to answer your questions or resolve problems.

### Procedure

To search knowledge bases for information that you need, use one or more of the following approaches:

- Find the content that you need by using the IBM Support Portal.

The IBM Support Portal is a unified, centralized view of all technical support tools and information for all IBM systems, software, and services. The IBM Support Portal lets you access the IBM electronic support portfolio from one place. You can tailor the pages to focus on the information and resources that you need for problem prevention and faster problem resolution. Familiarize yourself with the IBM Support Portal by viewing the demo videos ([https://www.ibm.com/blogs/SPNA/entry/the\\_ibm\\_support\\_portal\\_videos](https://www.ibm.com/blogs/SPNA/entry/the_ibm_support_portal_videos)) about this tool. These videos introduce you to the IBM Support Portal, explore troubleshooting and other resources, and demonstrate how you can tailor the page by moving, adding, and deleting portlets.

- Search for content about IBM Intelligent Operations for Water by using one of the following additional technical resources:
  - IBM Intelligent Water Support Portal page
  - IBM Intelligent Water system requirements
- Search for content by using the IBM masthead search. You can use the IBM masthead search by typing your search string into the Search field at the top of any [ibm.com](https://www.ibm.com)® page.
- Search for content by using any external search engine, such as Google, Yahoo, or Bing. If you use an external search engine, your results are more likely to include information that is outside the [ibm.com](https://www.ibm.com) domain. However, sometimes you can find useful problem-solving information about IBM products in newsgroups, forums, and blogs that are not on [ibm.com](https://www.ibm.com).

**Tip:** Include “IBM” and the name of the product in your search if you are looking for information about an IBM product.

**Related concepts:**

“Techniques for troubleshooting problems” on page 145

*Troubleshooting* is a systematic approach to solving a problem. The goal of troubleshooting is to determine why something does not work as expected and how to resolve the problem. Certain common techniques can help with the task of troubleshooting.

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## Getting fixes from Fix Central

You can use Fix Central to find the fixes that are recommended by IBM Support for a variety of products, including IBM Intelligent Operations for Water. With Fix Central, you can search, select, order, and download fixes for your system with a choice of delivery options. A product fix for IBM Intelligent Operations for Water might be available to resolve your problem.

## Procedure

To find and install fixes:

1. Obtain the tools that are required to get the fix. If it is not installed, obtain your product update installer. You can download the installer from Fix Central. This site provides download, installation, and configuration instructions for the update installer.
2. Select IBM Intelligent Operations for Water as the product, and select one or more check boxes that are relevant to the problem that you want to resolve.
3. Identify and select the fix that is required.
4. Download the fix.
  - a. Open the download document and follow the link in the "Download Package" section.
  - b. When downloading the file, ensure that the name of the maintenance file is not changed. This change might be intentional, or it might be an inadvertent change that is caused by certain web browsers or download utilities.
5. To apply the fix, follow the instructions in the "Installation Instructions" section of the download document.
6. Optional: Subscribe to receive weekly email notifications about fixes and other IBM Support updates.

### Related tasks:

"Subscribing to Support updates" on page 150

To stay informed of important information about the IBM products that you use, you can subscribe to updates.

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## Contacting IBM Support

IBM Support provides assistance with product defects, answers to FAQs, and helps users resolve problems with the product.

### Before you begin

After trying to find your answer or solution by using other self-help options such as technotes, you can contact IBM Support. Before contacting IBM Support, your company or organization must have an active IBM software subscription and support contract, and you must be authorized to submit problems to IBM. For information about the types of available support, see the Support portfolio topic in the *Software Support Handbook*.

## Procedure

To contact IBM Support about a problem:

1. Define the problem, gather background information, and determine the severity of the problem. For more information, see the Getting IBM support topic in the *Software Support Handbook*.
2. Gather diagnostic information.
3. Submit the problem to IBM Support in one of the following ways:
  - Online through the IBM Support Portal: You can open, update, and view all of your service requests from the Service Request portlet on the Service Request page.
  - By phone: For the phone number to call in your region, see the Directory of worldwide contacts web page.

## Results

If the problem that you submit is for a software defect or for missing or inaccurate documentation, IBM Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Support provides a workaround that you can implement until the APAR

is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM Support website daily, so that other users who experience the same problem can benefit from the same resolution.

**Related concepts:**

“Known problems and solutions” on page 151

Some common problems with IBM Intelligent Operations for Water are documented, along with their solutions or workarounds. If you have a problem with IBM Intelligent Operations for Water, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing. The problem-solution topics are categorized according to the type of issue.

**Related tasks:**

“Exchanging information with IBM”

To diagnose or identify a problem, you might need to provide IBM Support with data and information from your system. In other cases, IBM Support might provide you with tools or utilities to use for problem determination.

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## Exchanging information with IBM

To diagnose or identify a problem, you might need to provide IBM Support with data and information from your system. In other cases, IBM Support might provide you with tools or utilities to use for problem determination.

**Related tasks:**

“Contacting IBM Support” on page 148

IBM Support provides assistance with product defects, answers to FAQs, and helps users resolve problems with the product.

## Sending information to IBM Support

To reduce the time that is required to resolve your problem, you can send trace and diagnostic information to IBM Support.

### Procedure

To submit diagnostic information to IBM Support:

1. Open a problem management record (PMR).
2. Collect the diagnostic data that you need. Diagnostic data helps reduce the time that it takes to resolve your PMR. You can collect the diagnostic data manually or automatically:
  - Collect the data manually.
  - Collect the data automatically.
3. Compress the files by using the .zip or .tar file format.
4. Transfer the files to IBM. You can use one of the following methods to transfer the files to IBM:
  - The Service Request tool
  - Standard data upload methods: FTP, HTTP
  - Secure data upload methods: FTPS, SFTP, HTTPS
  - Email

All of these data exchange methods are explained on the IBM Support website.

## Receiving information from IBM Support

Occasionally an IBM technical-support representative might ask you to download diagnostic tools or other files. You can use FTP to download these files.

## Before you begin

Ensure that your IBM technical-support representative provided you with the preferred server to use for downloading the files and the exact directory and file names to access.

## Procedure

To download files from IBM Support:

1. Use FTP to connect to the site that your IBM technical-support representative provided and log on as anonymous. Use your email address as the password.
2. Change to the appropriate directory:
  - a. Change to the /fromibm directory.  
`cd fromibm`
  - b. Change to the directory that your IBM technical-support representative provided.  
`cd nameofdirectory`
3. Enable binary mode for your session.  
`binary`
4. Use the **get** command to download the file that your IBM technical-support representative specified.  
`get filename.extension`
5. End your FTP session.  
`quit`

---

## Subscribing to Support updates

To stay informed of important information about the IBM products that you use, you can subscribe to updates.

### About this task

By subscribing to receive updates about IBM Intelligent Operations for Water, you can receive important technical information and updates for specific IBM Support tools and resources. You can subscribe to updates by using one of two approaches:

#### RSS feeds and social media subscriptions

The following RSS feed is available for IBM Intelligent Operations for Water: IBM Intelligent Water RSS feed

For general information about RSS, including steps for getting started and a list of RSS-enabled IBM web pages, visit the IBM Software Support RSS feeds site.

#### My Notifications

With My Notifications, you can subscribe to Support updates for any IBM product. (My Notifications replaces My Support, which is a similar tool that you might have used in the past.) With My Notifications, you can specify that you want to receive daily or weekly email announcements. You can specify what type of information you want to receive (such as publications, hints and tips, product flashes (also known as alerts), downloads, and drivers). My Notifications enables you to customize and categorize the products about which you want to be informed and the delivery methods that best suit your needs.

## Procedure

To subscribe to Support updates:

1. To subscribe to the IBM Intelligent Operations for Water RSS feed, use the following substeps:
  - a. Open the link: IBM Intelligent Water RSS feed.



- b. In the **Subscribe with Live Bookmark** window, select a folder in which to save the RSS feed bookmark and click **Subscribe**.

For more information on subscribing to RSS feeds, see the IBM Software Support RSS feeds link in the Related information section at the end of the topic.

2. Subscribe to My Notifications by going to the IBM Support Portal and click **My Notifications** in the **Notifications** portlet.
3. Sign in using your IBM ID and password, and click **Submit**.
4. Identify what and how you want to receive updates.
  - a. Click the **Subscribe** tab.
  - b. Select IBM Intelligent Water RSS feed and click **Continue**.
  - c. Select your preferences for how to receive updates, whether by email, online in a designated folder, or as an RSS or Atom feed.
  - d. Select the types of documentation updates that you want to receive, for example, new information about product downloads and discussion group comments.
  - e. Click **Submit**.

## Results





Until you modify your RSS feeds and My Notifications preferences, you receive notifications of updates that you have requested. You can modify your preferences when needed (for example, if you stop using one product and begin using another product).

### Related tasks:

“Getting fixes from Fix Central” on page 147

You can use Fix Central to find the fixes that are recommended by IBM Support for a variety of products, including IBM Intelligent Operations for Water. With Fix Central, you can search, select, order, and download fixes for your system with a choice of delivery options. A product fix for IBM Intelligent Operations for Water might be available to resolve your problem.

### Related information

-  [IBM Software Support RSS feeds](#)
-  [Subscribe to My Notifications support content updates](#)
-  [My Notifications for IBM technical support](#)
-  [My Notifications for IBM technical support overview](#)

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## Known problems and solutions

Some common problems with IBM Intelligent Operations for Water are documented, along with their solutions or workarounds. If you have a problem with IBM Intelligent Operations for Water, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing. The problem-solution topics are categorized according to the type of issue.

### Cannot reinstall custom KPI model on the application server

If you cannot reinstall a custom key performance indicator (KPI) model on the application server, uninstall the monitor models and data and then reinstall the models. For information about uninstalling a single version of a monitor model, see the related task.

## **No message is displayed when using the command line to install IBM Intelligent Operations for Water 1.5 on top of an existing IBM Intelligent Operations for Water deployment**

Because IBM Intelligent Operations for Water is already installed, the status of all components in the topology files is ready. Therefore, no messages from the new installation are displayed. This behavior differs from the graphical user interface (GUI) installation, which allows separate checking to determine if the solution is already installed.

## **After an IBM Installation Manager installation failed, the reinstallation attempt also fails**

If, after an IBM Installation Manager installation of IBM Intelligent Operations for Water fails and you manually fix a problem and want to continue the installation, run the command-line installer. See the related task for more information.

If the IBM Installation Manager installation failed because you manually canceled the IBM Installation Manager, use the command line to continue the installation.

## **After a command-line installation failed, the reinstallation attempt also fails**

Check the log file for a message similar to the following:

```
Command failed: The following error occurred while executing this line:
/opt/IBM/IOC/BA/ioc/spec/SOLUTION/portal_content/build.xml:16:
Command failed with code 1
```

If you want more detailed operation messages, please check  
`/opt/IBM/IOC/BA/ioc/log/installSolution_water_wih...log`

Review the problem details and attempt to manually fix the problem. Then use the command line to continue the installation.

If problems persist, you can take one of the following actions:

- Recover the system to the IBM Intelligent Operations Center status and then reinstall IBM Intelligent Operations for Water.
- Contact IBM Support for help. See the related task.

## **The launchpad shows an authentication rejected error**

This issue is environmental and not launchpad-specific. No method is currently available to suppress the error message, but the functionality or display of the launchpad is not affected. This issue is being addressed.

**After clicking Sign in at <http://app-ioc.cn.ibm.com>, the following message appears: Access Manager WebSEAL could not complete your request due to an unexpected error.**

Ensure that the amount of free disk space on the servers is sufficient.

## **Nothing happens when I select Add Event from the map in the IBM Intelligent Operations for Water portal**

This issue is being addressed. Until it is resolved, go to **Citywide > Operator** to create the event.

**After setting up the new IBM Intelligent Operations for Water 1.5 and trying to log on through Tivoli Access Manager WebSEAL, the following message appears: Third-party server not responding.**

The portal server and the Tivoli Service Request Manager® server did not start properly. The Tivoli Service Request Manager port conflict issue is resolved.

**When I send a .csv file to the simulator in the app-ioc host, two messages with the same title and time are displayed in My Activities portlet**

Another simulator process is running on either a PuTTY or VNC client. Stop that process.

**An activity does not appear in My Activities portlet, as specified in the standard operating procedure policy, even though the Tivoli Service Request Manager service displays as ON in the IOControl.sh script for services status**

Log on to `https://event_server:9044/ibm/console/` and restart the MXServer, or start the MXServer if it is not running. Select **Servers > Application servers > MXServer**. To verify that the Tivoli Service Request Manager cluster is running, select **Servers > Clusters > TSRMCluster**. If the cluster is running, you see a green icon.

**Related tasks:**

“Contacting IBM Support” on page 148

IBM Support provides assistance with product defects, answers to FAQs, and helps users resolve problems with the product.

“Deploying from the command line” on page 11

Use the command line utility to deploy the IBM Intelligent Water Efficiency Analytics solution.

**Related information:**

 Uninstalling a single version of a monitor model

**Problem starting the simulator when the property file is updated with a new JMS Queue**

When you create a new JMS Queue in the Portal Server, you must update the **target.queue** parameter in the `simulator.properties` file with a new JMS Queue. An error may be displayed in the `simulator.log` file when you attempt to start the simulator. You must restart the Portal Server before you start the simulator.

**Procedure**

1. Log on to WebSphere Application Server at the following URL:  
`https://appserver:9043/ibm/console`
2. Select **Servers > Clusters > WebSphere Application Server clusters**.
3. Select the **PortalCluster**.
4. Click **Stop** and wait until the red icon is displayed.
5. Click **Start** and wait until the green icon is displayed.
6. Log off WebSphere Application Server and run the command to start the simulator.  
`#nohup ./run_simulator.sh > simulator.log &`

**Cannot select IBM Intelligent Operations for Water assets from the Categories menu**

If you cannot select IBM Intelligent Operations for Water assets from the Categories menu, check the status of the DB2 server.

## Procedure

1. Log on to the management server as `ibmadmin`.
2. Type the following command:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status db24po topology_password
```

If the portal is running, you see a message similar to the following:

```
Executing query command.....completed.
IBM DB2 Enterprise server for WebSphere Portal Extend [ on ]
Command completed successfully.
```

3. If the DB2 server is not running, type `./iopmgmt.sh start db24pe topology_password`

**Note:** To check the status of all DB2 instances, type `./iopmgmt.sh status all topology_password`.

## Authentication mechanism not available

If you receive the HPDIA0119W Authentication mechanism is not available error message after you log on to the WebSphere Portal, check the status of the Tivoli Directory Server and the Tivoli Directory Server Proxy for the application server.

## Procedure

1. Log on to the management server as `ibmadmin` and type the following commands:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status tds topology_password
```

If the server is running, a message similar to the following example is displayed:

```
Executing query command.....completed.
IBM Tivoli Directory Server [ on ]
Command completed successfully.
```

2. If the server is not running, type `./iopmgmt.sh start tds topology_password`
3. If the server is not running after you complete Steps 1 and 2, log on to the management server as `ibmadmin` and type the following commands:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status tdspxyapp topology_password
```

If the server is running, a message similar to the following example is displayed:

```
Executing query command.....completed.
IBM Tivoli Directory Server [ on ]
Command completed successfully.
```

4. If the server is not running, type `./iopmgmt.sh start tdspxyapptopology_password`

## Third-party server not responding

If you receive the Third-party server not responding error message after you log on to the WebSphere Portal portal, check the status of the WebSphere Portal.

## Procedure

1. Log on to the management server as `ibmadmin` and type the following command:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status wpe topology_password
```

If the portal is running, a message similar to the following is displayed:

```
Executing query command.....completed.
IBM WebSphere Portal Extend [ on ]
Command completed successfully.
```

2. If the portal is not running, type `./iopmgmt.sh start wpe topology_password`.

## Problem installing the model manager component

If an error is displayed stating the installation of the model manager on the host has failed (CIYBA0241E), complete the steps in this topic.

### Procedure

1. Check the error description in the log file at `/opt/IBM/IOC/BA/ioc/log`.
2. If the following message is displayed, you must restart the IBM Integrated Information Core model server and resume installation:

```
<Operation failed:CDIMS0164E A failure occurred while parsing the RDF file. Content is not
allowed in prolog.
Fail to import rdf file: content/model/sensorMeter.rdf
[ERROR][line 31] Install Model Manager Content Failed.>
```

- a. Go to the management server and open a terminal session. Restart the model server.

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts/
./iopmgmt.sh stop smsclt passwd
./iopmgmt.sh stop smsdaq passwd
./iopmgmt.sh stop smsmdl passwd
./iopmgmt.sh stop smsgmt passwd
./iopmgmt.sh stop smsrtc passwd
./iopmgmt.sh start smsclt passwd
./iopmgmt.sh start smsdaq passwd
./iopmgmt.sh start smsmdl passwd
./iopmgmt.sh start smsgmt passwd
./iopmgmt.sh start smsrtc passwd
```

- b. Go to the terminal where you ran the install command on the installation server. Run the install command again.

```
cd /opt/IBM/IOC/BA/ioc/bin ./ba.sh intallSolution -s water_wih -p passwd
```

## Cannot access portal

If you cannot access the portal at `http://portal_URL/wpsv70/wps/myportal`, check the status of the Tivoli Access Manager WebSEAL.

### Procedure

1. Log on to the application server as `root` and type `pd_start status`. The status of the Tivoli Access Manager WebSEAL is displayed. If the Tivoli Access Manager WebSEAL is not running, type `pd_start start` to start the Tivoli Access Manager WebSEAL server.
2. You can also check the Tivoli Access Manager WebSEAL status by logging on to the management server as `ibmadmin` and typing the following command:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status tamweb topology_password
```

If the server is running, you see a message similar to the following:

```
Executing query command.....completed.
IBM Tivoli Access Manager WebSEAL [ on ]
Command completed successfully.
```

If the status is `[ off ]`, type `./iopmgmt.sh start tamweb topology_password`.

## Authentication failed

If you receive an error `403: authenticationFailed` message after you log on to the portal, check the status of the Tivoli authorization server and the Tivoli Access Manager policy server.

## Procedure

1. Log on to the management server as root and type **pd\_start status**. You see results similar to the following. Ensure that the status of each component is yes.

```
Tivoli Access Manager servers
Server Enabled Running
```

```
-----
pdmgrd yes yes
pdacld yes yes
pdmgrproxyd no no
```

**Note:** pdmgrd refers to the Tivoli authorization server, and pdacld refers to the Tivoli Access Manager policy server.

If the Tivoli authorization server and the Tivoli Access Manager policy server are not running, type **pd\_start start**.

2. You can also check the status of the Tivoli authorization server and the Tivoli Access Manager policy server by typing the following commands on the management server:

```
./iopmgmt.sh status tamas topology_password
```

If the Tivoli authorization server is running, you see a message similar to the following:

```
Executing query command...completed.
IBM Tivoli Access Manager Authorization Server [ on ]
Command completed successfully.
```

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status tamps topology_password
```

If the Tivoli Access Manager policy server is running, you see a message similar to the following:

```
Executing query command...completed.
IBM Tivoli Access Manager Policy Server [ on ]
Command completed successfully.
```

If the Tivoli authorization server is not running, type `./iopmgmt.sh start tamas topology_password`.

If the Tivoli Access Manager policy server is not running, type `./iopmgmt.sh start tamps topology_password`.

## Cannot access IBM Cognos Business Intelligence reports, and receive error message

If you cannot access IBM Cognos Business Intelligence reports and you receive An error occurred while retrieving content error message, check the status of IBM Cognos Business Intelligence.

## Procedure

1. Log on to the management server as ibmadmin and type the following command:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status cognos topology_password
```

If IBM Cognos Business Intelligence is running, you see a message similar to the following:

```
Executing query command...completed.
IBM COGNOS Business Intelligence [ on ]
Command completed successfully.
```

2. If IBM Cognos Business Intelligence is not running, type `./iopmgmt.sh start cognos topology_password`.

## KPIs are not triggered

If Key Performance Indicators (KPIs) are not triggered, check the status of the WebSphere Message Broker.

## Procedure

1. Log on to the management server as `ibmadmin` and type the following command:

```
su - ibmadmin
cd /opt/IBM/ISP/mgmt/scripts
./iopmgmt.sh status wmb topology_password
```

If WebSphere Message Broker is running, you see a message similar to the following:

```
Executing query command...completed.
IBM WebSphere Message Broker [ on ]
Command completed successfully.
```

2. If WebSphere Message Broker is not running, type `./iopmgmt.sh start wmb topology_password`.

## Measurements in the user interface are not changing

If you know the queue manager and broker are started, are running the simulator, and are trying to simulate measurements, but you do not see the measurements changing in the user interface, check the status of the IBM Intelligent Operations Center XML probe and the IBM Intelligent Operations for Water XML probe.

## Procedure

1. Log on to the event server as `root` and check the status of the `water_wih` Tivoli Netcool/OMNIBus probe and the `ioc_xml` Tivoli Netcool/OMNIBus probe. Type the following commands:

```
ps auxww |grep water_wih
ps auxww |grep ioc_xml
```

**Note:** If you cannot log on to the event server as `root`, log on as an administrator and use the `sudo` command to issue the required commands.

2. If no processes are running, you must manually start the probes.
  - a. To start the `ioc_xml` probe, type the following command:

```
/opt/IBM/netcool/omnibus/probes/nco_p_xml -name ioc_xml -propfile
/opt/IBM/netcool/omnibus/probes/linux2x86/ioc_xml.props &
```

- b. To start the `water_wih` probe, type the following command:

```
/opt/IBM/iss/iow/omnibus/startXmlProbe.sh
```

## Measurements are changing but KPIs and standard operating procedures are not triggered

If measurements in the user interface are changing but Key Performance Indicators (KPIs) and standard operating procedures do not seem to be triggering, check your Tivoli Service Request Manager password.

## Procedure

1. Log on to the Tivoli Netcool/Impact administrative console at `http://event_host:9080/nci/main` where `event_host` is the host name of the event server. Log on as the `admin` user with the `netcool` password.
2. Click **IOC Project**.
3. In the Policies section, double-click the policy **IOC\_Sample\_Password\_Encoder**. The policy is opened in the Policy Editor window.
4. In the **Enter Password Here** field, enter the password for **Maxadmin**.
5. To save the policy, click **Save**.
6. Click the **Trigger Policy** icon.
7. Click **Execute**.
8. In the Service Status section, scroll to **PolicyLogger**, click **View log for PolicyLogger** (icon with the down arrow).
9. In the policy logger window, locate the statement that is similar to the following statement:

10. Copy the encrypted **Maxadmin** password from the statement, for example:  
`{aes}FF877B74ADF4DF1C2002F94ACB38FAFF`
11. In the Tivoli Netcool/Impact administrative console, in the Policies section, double-click the policy **UTILS\_LIBRARY\_IOC\_TSRM**. The policy is opened in the Policy Editor window.
12. Replace the value of *MAXAdminPassword* with the encrypted value that you copied in Step 10:  
`MAXAdminPassword = "{aes}FF877B74ADF4DF1C2002F94ACB38FAFF";`
13. Click **Save**.
14. Return to the policy **IOC\_Sample\_Password\_Encoder** that you accessed in Step 3 on page 157 and remove your unencoded password.  
You can leave the field blank or you can type a text string.

**Important:** Ensure that the string does not contain any spaces. Check for spaces at the beginning and end of the string.

## KPIs are displayed incorrectly in the Supervisor:Status and Executive:Status views

If Key Performance Indicators (KPIs) are not displayed correctly in the Supervisor: Status and Executive: Status views, ensure that the **Intelligent Operations Center** APARs are installed on the environment.

### Procedure

1. If Key Performance Indicators (KPIs) are displayed incorrectly in the Supervisor: Status and Executive: Status views, ensure that all **Intelligent Operations Center** APARs are installed on the environment, including APAR PO00087 and APAR PO00211. If not installed, deploy all APARs and restart the environment.
2. If the KPIs remain incorrectly displayed after you perform step 1, take the following steps:
  - a. Go to **Enterprise Applications - iss\_curi\_ear - Startup behaviour**.
  - b. In the Configuration tab, change the startup order of `iss_curi_ear` to 20.
  - c. Select **Create MBeans for resources** and click **Apply**.
3. Restart the WebSphere Portal portal and ensure that the KPIs are displayed correctly.

## Water Administrator cannot access the Citizen: Water Conservation view

Users that have been solely assigned the Water Administrator role cannot access the Citizen View portlet on the **Citizen: Water Conservation** view. To create access for the users, you must assign the System Administrator role to them by creating a user record in the WCP.ACCOUNT table of the Water Conservation Portal database.

### Procedure

1. Log on to the server as root and type the following command: `cd /opt/IBM/iss/iow/wcp`
2. Open the `account.csv` file and append the user information for the user(s) assigned the Water Administration role. Ensure that the user information corresponds to the following columns in the account table: ACCOUNT\_ID (NOT NULL), ADDRESS, CITY, STATE, ZIPCODE, TYPE, EMAIL, ROLE (NOT NULL), CLASSIFICATION. Example user information is as follows: "eharper", "unknown", " ", "FL", "33111", "na", "eharper@cityname.com", "uadmin", "unknown".

**Note:** The ACCOUNT\_ID is unique and that ROLE for an account is "uadmin" and "PM". The "uadmin" role is system administrator for WCP. With this role, the user can interact with the content of the Citizen View portlet on the **Citizen: Water Conservation** view, including all households and meters content.



3. Run `import_users.sh` to import the users. The importing tool performs validation on the new data and will import the validated user information.

## Cannot load asset details in Maximo

A connection timeout or similar issue can occur when you try to load asset details from Maximo in IBM Intelligent Operations for Water. To resolve the issue, first ensure that you have access to the HTTP port of the Maximo server. Second, ensure that the Maximo server host name / IP address is defined in the operating system on which you run your browser.

### About this task

The error can occur in the Operator: Operations view, when you right-click an asset in the Details grid and click the **View [Key Measurement] Details** option.

### Procedure

1. Ensure that you have access to the HTTP port (default 80) of the external Maximo Server.
2. Add the line `[maximo_ip] [maximo_hostname]` to the hosts file in the operating system where the browser is running. The hosts file names are as follows:
  - a. Linux system: `/etc/hosts`
  - b. Windows system: `C:\WINDOWS\system32\drivers\etc\hosts`

---

## Log files

To troubleshoot a problem in IBM Intelligent Operations for Water, you might need to analyze log files on several systems on the IBM Intelligent Operations Center servers.

See the related link for a list of the log files that are available for each of the IBM Intelligent Operations Center servers.

### Related information:

IBM Intelligent Operations Center server log files



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## Chapter 11. Reference

These topics contain additional reference information to help you.

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### PDF library

The product documentation is available in the PDF for convenient printing.

- IBM Intelligent Water Family: IBM Intelligent Operations for Water documentation library

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### Additional information

The following additional resources are available online.

#### WebSphere Portal

- WebSphere Portal product support page: [http://www.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere\\_Portal](http://www.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere_Portal)
- WebSphere Portal information library: <http://www.ibm.com/software/genservers/portal/library/>
- WebSphere Portal wiki: <http://www.lotus.com/ldd/portalwiki.nsf>

#### WebSphere Application Server

- WebSphere Application Server product support page: <http://www.ibm.com/software/webservers/appserv/was/support/>
- WebSphere Application Server information library: <http://www.ibm.com/software/webservers/appserv/was/library/index.html>
- WebSphere Application Server 7.0.x Information Center: <http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp>

#### Redbooks®

- Smarter Cities Series Redguide: <http://www.redbooks.ibm.com/abstracts/redp4736.html>
- Redbooks Domain: <http://publib-b.boulder.ibm.com/Redbooks.nsf>

#### Tivoli software

- Tivoli training and certification: <http://www.ibm.com/software/tivoli/education/>

#### Cognos software

- IBM Cognos Business Intelligence: <http://www-01.ibm.com/software/analytics/cognos/business-intelligence/>
- IBM Cognos Business Intelligence Information Center: <http://publib.boulder.ibm.com/infocenter/c8bi/v8r4m0/index.jsp>

#### Web resources

- JAWS Screen Reading Software: <http://www.freedomscientific.com/products/fs/jaws-product-page.asp>

#### Information centers

- IBM Smarter Cities Software Solutions Information Center: <http://publib.boulder.ibm.com/infocenter/cities/v1r0m0/index.jsp>
- WebSphere Application Server 7.0.x Information Center: <http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp>

- IBM WebSphere Business Monitor Information Center: <http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.btools.help.monitor.doc/home/home.html>
- Rational® Application Developer Information Center: [http://publib.boulder.ibm.com/infocenter/radhelp/v7r5/index.jsp?topic=/com.ibm.rad.legal.doc/helpindex\\_rad.html](http://publib.boulder.ibm.com/infocenter/radhelp/v7r5/index.jsp?topic=/com.ibm.rad.legal.doc/helpindex_rad.html)

**Related information:**

IBM Intelligent Operations Center reference information

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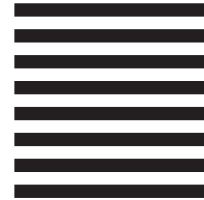
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