

IBM Intelligent Water  
Version 1.0

*IBM Intelligent Water Information  
Center*

**IBM**

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## Chapter 1. Solution overview

Smarter water management means enabling water utilities to better manage their water, assets, and customers, by using insights from the water network, the environment and from stakeholders. In particular, the success of a water enterprise is dependent on having a fully functioning and productive asset base, reducing operational and maintenance costs, minimizing outages, and ensuring a high quality of service to customers.

The IBM® Intelligent Water Family addresses the following key issues commonly faced by water utilities:

- Manually leveraging massive volumes of data to make informed decisions
- Increasing asset maintenance and work management costs
- Increasing work backlogs
- Inefficiencies in crew utilization and increasing transportation costs
- Inability to optimize revenue through water loss prevention
- Lack of adequate supporting analysis for rate case development and improving pricing models

IBM Work Optimization for Water Utilities is a product of 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 Work Optimization for Water Utilities is designed to deliver advanced analytics capabilities that can help water utilities gain insight into the consumption patterns of its customers.

IBM Work Optimization for Water Utilities uses water industry frameworks and data from enterprise asset management (EAM) systems, water consumption databases, and Geographical Information Systems (GIS), to provide the following benefits:

- Work optimization to create work schedules for field crews that maximize productivity and minimize drive time and fuel costs, based on factors such as work order type, location, priority, and shift hours
- Analytics to help segment customers, understand customer demands, and forecast water usage for long-term planning
- Analysis of water consumption by segment and season to enhance conservation efforts and optimize price schedules
- Analysis of water usage information to help detect abnormalities and patterns in water usage

Tapping into a utility's water consumption database and GIS, IBM Work Optimization for Water Utilities can analyze usage patterns within and across customer segments and identify seasonal trends. With insights on water usage patterns and trends, utilities can better anticipate future demand, including seasonal peaks. Analyzing current, historical, and seasonal consumption can also help utilities target water conservation efforts in times of water stress. Utilities can identify the top residential, commercial, industrial, and agricultural water consumers. Utilities can then use incentive programs to encourage users to monitor and reduce their consumption.

IBM Work Optimization for Water Utilities 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 utilities personnel can visualize information in an intuitive fashion to quickly identify anomalies, trends, and patterns. Personnel can view information on a map that shows critical events and monitor key resources.

IBM Work Optimization for Water Utilities runs on top of the IBM Intelligent Operations Center, which is a software solution designed for effective supervision and coordination of operations. IBM Intelligent Operations Center provides the base platform for IBM Work Optimization for Water Utilities.

IBM Work Optimization for Water Utilities can be deployed in two ways, either on premise or as a cloud-based offering. IBM Work Optimization for Water Utilities can also be integrated with other products in the IBM Smarter Cities Software Solutions portfolio.

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## Intended audience

This information center is intended for people who are using, installing, administering, and maintaining IBM Work Optimization for Water Utilities. It also contains implementation documentation for customizing the solution and integrating the external water management systems that IBM Work Optimization for Water Utilities 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 163 page of the References section.

See also the IBM Intelligent Operations Center Information Center for details about the administration and maintenance of the base platform.

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## Features

IBM Work Optimization for Water Utilities provides work optimization and water usage information and analytics that are designed to help water utilities optimize reliability and reduce operating expenses.

IBM Work Optimization for Water Utilities provides water utilities with real time, map-based information, and spatial-temporal analytics that they can use to analyze water consumption, manage water maintenance, and identify potential problems before they occur.

The following table describes the features of IBM Work Optimization for Water Utilities in more detail.

*Table 1. The features of IBM Work Optimization for Water Utilities.*

Feature	Capabilities
“Work Optimization”	An interactive tool that a water utility can use to optimize and more efficiently manage work associated with water management across a geographically dispersed infrastructure. This feature provides: <ul style="list-style-type: none"><li>• Interactive work order reporting</li><li>• Manual spatial-temporal scheduling</li><li>• Semi-automatic spatial-temporal scheduling</li><li>• Automatic spatial-temporal scheduling</li></ul>
“Usage Analysis” on page 3	An interactive tool that a water utility can use to better analyze water usage in order to forecast future water usage. This feature provides: <ul style="list-style-type: none"><li>• Customer account segmentation</li><li>• Water usage analysis</li></ul>

## Work Optimization

By using IBM Work Optimization for Water Utilities, a water utility can optimize and more efficiently manage work associated with water management across a geographically dispersed infrastructure.

A significant part of a utilities operational expense is allocated to maintaining and upgrading the infrastructure, from responding to emergency situations, to preventive maintenance, and inspections. Each work item involves the dispatch of a crew from a central depot to the location of the work. In addition, in many cases, each work item is composed of a set of dependent subtasks, where each subtask might require a specific skill or equipment.

Water utilities can significantly benefit from analytics, which can assign work to maximize utilization of crews and equipment while minimizing unproductive driving time.

The following table describes the work optimization capabilities of IBM Work Optimization for Water Utilities.

*Table 2. Work optimization features of IBM Work Optimization for Water Utilities.*

Capabilities	What does this do?
Interactive work order reporting	Provides spatial and report-based visualization of work orders by type, season, and problem codes, based on the select asset, the start/end time, analysis frequency (daily/monthly/weekly/yearly).
Manual spatial-temporal scheduling	Is an interactive, spatial-temporal scheduling tool that allows you to manually create a work management schedule based on the selected asset, time interval, crew, and work orders. Allows a water agency scheduler to manually select a task based on a map location and build a schedule which leverages the spatial proximity of resources, tools, and tasks.
Semi-automated spatial-temporal scheduling	Is an interactive, semi-automated, spatial-temporal scheduling tool that creates a work management schedule. The schedule is based on the selected asset, time interval, crew, and work orders and interleaves manual and automated schedule creation. This approach is a valuable transition route to fully automated scheduling and you can adapt your business practices.
Automated spatial-temporal scheduling	Provides fully automated spatial-temporal work management scheduling based on the specification of asset, time interval, work order selection (including polygon selection), and crew. The analytics use a broad range of inputs including location of work, type of work, job plan, skill set, equipment, and priority to compute schedules that optimize utilization and minimize driving.

### Related concepts

“Work Optimization view” on page 95

The Work Optimization view of IBM Work Optimization for Water Utilities provides a visual representation of water operations management in the water authority region. Use this view to optimize and efficiently manage maintenance work associated with water management across a geographically dispersed infrastructure.

### Usage Analysis

A water utility can use the Usage Analysis feature of IBM Work Optimization for Water Utilities to better analyze water usage in order to forecast future water usage.

The following table describes the usage analysis and reporting capabilities of IBM Work Optimization for Water Utilities.

Table 3. Usage Analysis features of IBM Work Optimization for Water Utilities.

Capabilities	What does this do?
Account segmentation	This functionality provides a segmentation of customers based on several criteria including demographics, seasonal water usage patterns, and peak usage patterns. The customer segmentation becomes the basis for other analytics.
Water usage analysis	Usage forecasting is a critical function for utilities. Forecasting water usage has to take into account seasonal usage patterns, peak usage, long-term usage trends, and project usage at an individual and customer segment level. This capability becomes the basis for both revenue and infrastructure planning.

Utilities tend to have mix of commercial and residential customers. IBM Work Optimization for Water Utilities provides a clear understanding of the water revenue mix from the perspective of usage, customer type, seasonality, and location. You can use this solution to attribute the cost of operations across the customer base and use this as a basis to optimize revenue.

**Related concepts**

“Usage Analysis view” on page 81

The Usage Analysis Account Segmentation view of IBM Work Optimization for Water Utilities provides a visual representation of water usage statistics in the water authority region.

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**Users and benefits**

IBM Work Optimization for Water Utilities is designed for water utility personnel to help optimize and more efficiently manage work associated with water management across a geographically dispersed infrastructure. It also helps water utility personnel to view customer account information and perform water usage analysis.

The following table describes the users and associated benefits of using both the Usage Analysis and Work Optimization features of IBM Work Optimization for Water Utilities.

Table 4. Benefits of IBM Work Optimization for Water Utilities to water utility personnel.

If you are a ...	This software can help you ....
Water utility operator or customer analyst	<ul style="list-style-type: none"> <li>• View water usage statistics</li> <li>• Query water usage by customer, customer type, and location</li> <li>• Query water usage by segments or extremes</li> <li>• Find out who the highest water consumers are</li> <li>• Find out where customers are located</li> </ul>
Water utility scheduler	<ul style="list-style-type: none"> <li>• Identify the geographical location of work orders</li> <li>• Efficiently schedule maintenance work</li> <li>• View details about a schedule</li> <li>• View information about work orders and planned schedules</li> <li>• Find unscheduled work orders</li> </ul>



Table 4. Benefits of IBM Work Optimization for Water Utilities to water utility personnel. (continued)

If you are a ...	This software can help you ...
Water utility engineer	<ul style="list-style-type: none"> <li>• Identify water asset failures</li> <li>• Find out where problems are located</li> <li>• Minimize outages</li> <li>• Get information about work orders</li> <li>• Analyze the volume and trends of work orders</li> <li>• Identify abnormal water usage</li> <li>• Associate abnormal water usage with maintenance problems</li> </ul>
Water utility manager or supervisor	<ul style="list-style-type: none"> <li>• Identify and analyze problems and trends in water usage</li> <li>• Forecast water demand</li> <li>• Predict problems associated with water supply</li> <li>• Identify and analyze problems and trends in work management</li> <li>• Define work crews</li> <li>• Identify the location of work crew</li> <li>• Make decisions that will reduce operational costs</li> </ul>

### Related concepts

“User roles and responsibilities” on page 35

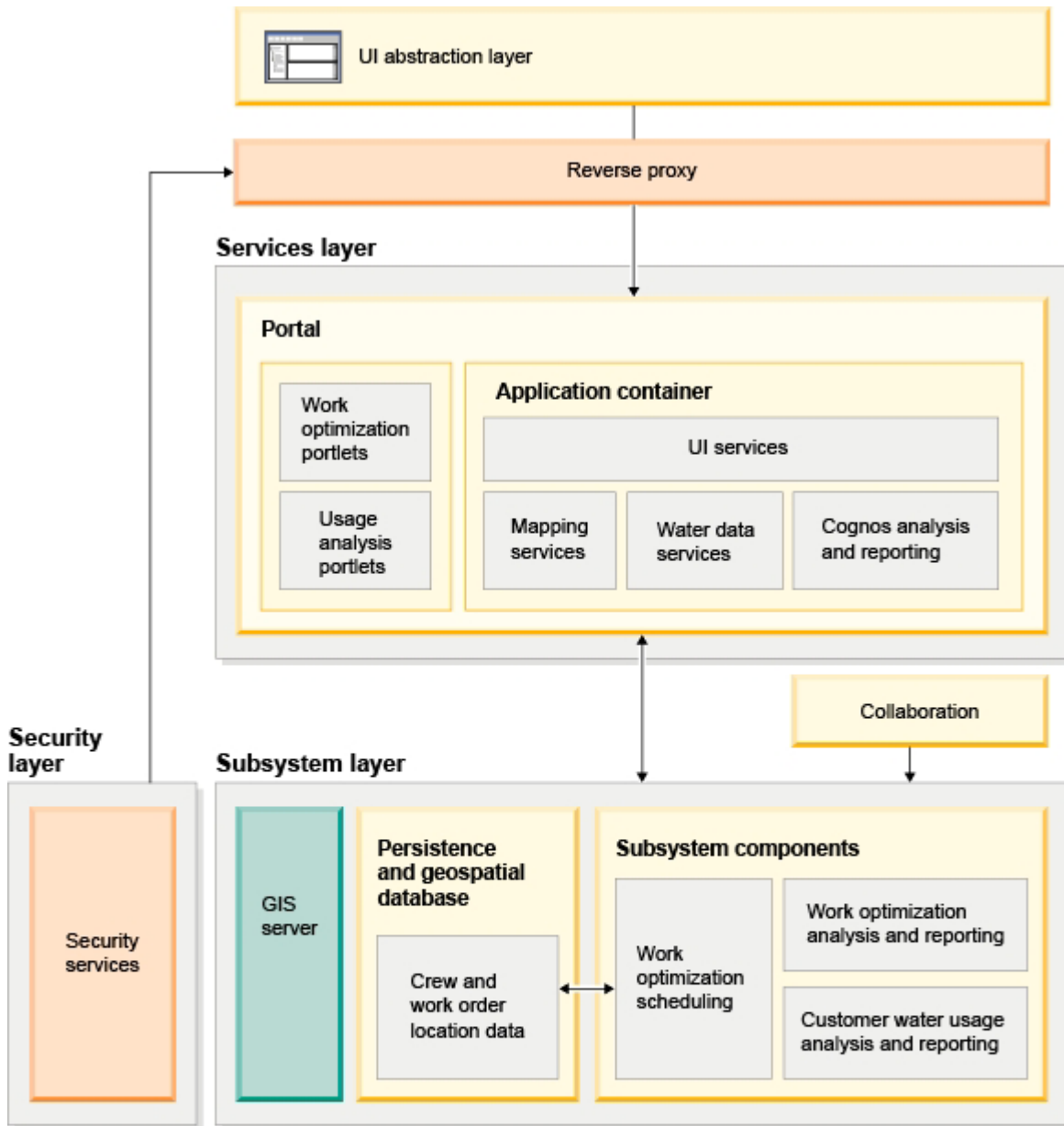
IBM Work Optimization for Water Utilities implements security by limiting access to features and data based on user roles.

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## Components

At a high level, the structure of IBM Work Optimization for Water Utilities can be divided into major components and subsystems.

The deployment of IBM Work Optimization for Water Utilities is dependent on the IBM Intelligent Operations Center. The following diagram shows a high-level view of the main components of IBM Work Optimization for Water Utilities.



**Legend**

- IBM Work Optimization for Water Utilities specific capability or system
- Independent software vendor (ISV)
- Security related services

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## Chapter 2. Installing and configuring

IBM Work Optimization for Water Utilities is a solution that runs on top of the IBM Intelligent Operations Center. IBM Work Optimization for Water Utilities provides a deployment wizard that installs the package into the existing IBM Intelligent Operations Center and underlying environment. After deploying the IBM Work Optimization for Water Utilities package, some additional configuration is required.

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### Preparing for installation

Before deploying IBM Work Optimization for Water Utilities, understand the IBM Work Optimization for Water Utilities system configuration and ensure that the prerequisites are met for the environment.

#### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

“Installing the solution” on page 16

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

### System configuration

The IBM Work Optimization for Water Utilities deployment wizard installs the product on top of the IBM Intelligent Operations Center production environment. IBM Intelligent Operations Center is a prerequisite for IBM Work Optimization for Water Utilities. An additional server is required for IBM Work Optimization for Water Utilities deployment.

IBM Work Optimization for Water Utilities uses the following servers.

#### IBM Intelligent Operations Center access server

The IBM Intelligent Operations Center access server provides security services for the solution.

#### IBM Intelligent Operations Center analytic server

The IBM Intelligent Operations Center analytic server provides data analysis services for the solution.

#### IBM Intelligent Operations Center application and integration server

The IBM Intelligent Operations Center application and integration server provides application and messaging services for the solution.

#### IBM Intelligent Operations Center database server

The IBM Intelligent Operations Center database server provides repository and modeling services for the solution.

#### IBM Intelligent Operations Center event and management server

The IBM Intelligent Operations Center event and management server manages events handled by the solution.

#### IBM Intelligent Operations Center portal server

The IBM Intelligent Operations Center portal server provides user interface services for the solution.

#### IBM Work Optimization for Water Utilities installation management server

The IBM Work Optimization for Water Utilities installation management server is only used during the deployment of IBM Work Optimization for Water Utilities. It is not used in the

production environment. The IBM Work Optimization for Water Utilities installation management server contains the installation and configuration scripts used to deploy IBM Work Optimization for Water Utilities onto the IBM Intelligent Operations Center environment. IBM Work Optimization for Water Utilities communicates directly with the IBM Intelligent Operations Center event and management server.

You can find details about the IBM Intelligent Operations Center server configuration in the IBM Intelligent Operations Center information center.

#### Related tasks

“Installing the solution” on page 16

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

#### Related information

System configuration of the IBM Intelligent Operations Center

Querying the status of the IBM Intelligent Operations Center servers

## Hardware requirements

There are no additional hardware requirements for deploying IBM Work Optimization for Water Utilities, as the product is installed on top of the existing servers in the IBM Intelligent Operations Center cluster. However, a temporary IBM Work Optimization for Water Utilities installation management server meeting the minimum hardware specification is required. This server is only required during the deployment process.

### IBM Intelligent Operations Center hardware requirements

The hardware requirements of the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities is installed on top of are defined in the IBM Intelligent Operations Center Information Center. These are the minimum hardware requirements. The IBM Intelligent Operations Center cluster might require additional resources, depending on any additional IBM Smarter Cities Software Solutions that are deployed in this environment.

### Installation management server hardware requirements

The IBM Work Optimization for Water Utilities installation management server must meet the following requirements:

Server Hardware	Minimum requirements
Number of processors	2
Processor type:	An x86 64-bit processor that must be one of the following types: <ul style="list-style-type: none"> <li>• AMD 64-bit processor</li> <li>• Intel Extended Memory 64 Technology (EM64T) processor</li> </ul>
Memory	8 GB
Hard disk	80 GB

#### Note:

- The /tmp folder on the IBM Work Optimization for Water Utilities installation management server must have at least 2 GB of available space.
- Define the swap space to be twice the amount of the physical memory. For example, if a server has 8 GB memory, define 16 GB of swap space.

## IBM Intelligent Water client hardware requirements

Clients accessing the IBM Work Optimization for Water Utilities portal must meet the following hardware requirements:

Client Hardware	Minimum requirements
Monitor	1280 x 800 resolution
Memory	2 GB
Processor CPU	2 Ghz

### Related tasks

“Installing the solution” on page 16

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

“Preparing the installation management server” on page 13

You must prepare the server that runs the installation of IBM Work Optimization for Water Utilities before you start the deployment wizard. The IBM Work Optimization for Water Utilities installation management server is only required during the deployment process.

### Related information

Hardware requirements of the IBM Intelligent Operations Center

## Software requirements

The servers and clients involved in the deployment of IBM Work Optimization for Water Utilities must meet the minimum software requirements. This includes the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities is installed onto and the installation management server that the IBM Work Optimization for Water Utilities installer runs from.

### Server software requirements

The software requirements of the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities is installed on top of are defined in the IBM Intelligent Operations Center Information Center. These are the minimum software requirements.

The IBM Work Optimization for Water Utilities installer is run on the installation management server. The IBM Work Optimization for Water Utilities installer requires the 64-bit Red Hat Enterprise Linux 5 Update 5 with the Secure Shell (SSH) service installed and open.

### Client software requirements

You can access IBM Work Optimization for Water Utilities with any of the following supported web browsers:

Client browser	Supported versions
Mozilla Firefox	<ul style="list-style-type: none"><li>• 3.0</li><li>• 3.5</li><li>• 3.6</li></ul>
Internet Explorer	<ul style="list-style-type: none"><li>• 8.0 (32 bit)</li><li>• 8.0 (64 bit)</li></ul>

## Related tasks

“Installing the solution” on page 16

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

“Preparing the installation management server” on page 13

You must prepare the server that runs the installation of IBM Work Optimization for Water Utilities before you start the deployment wizard. The IBM Work Optimization for Water Utilities installation management server is only required during the deployment process.

## Related information

Software requirements of the IBM Intelligent Operations Center

## GIS server requirement

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

IBM Work Optimization for Water Utilities requires a GIS server with ESRI ArcGIS Server Standard 10 with the ArcGIS for Server, Network Extension installed.

IBM Work Optimization for Water Utilities does not support other GIS servers.

## Related concepts

“Configuring ESRI ArcGIS” on page 22

Post-installation steps are required for IBM Work Optimization for Water Utilities to work with the ESRI ArcGIS server installed in the environment.

## Related tasks

“Copying the arcobjects.jar file” on page 23

You must copy the arcobjects.jar file provided by ESRI ArcGIS to the IBM Work Optimization for Water Utilities installation.

“Defining the ESRI ArcGIS distance calculation service” on page 23

In addition to map services, IBM Work Optimization for Water Utilities uses the ESRI ArcGIS server for distance calculations.

“Defining the ESRI ArcGIS server to IBM Intelligent Water” on page 24

IBM Work Optimization for Water Utilities requires access to an ESRI ArcGIS server. Information about this server needs to be defined to IBM Work Optimization for Water Utilities.

“Configuring the base map” on page 25

To configure the base map for all the map portlets of IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

## Related information

 <http://www.esri.com/>

## Media packaging

You can order IBM Work Optimization for Water Utilities as a package of DVDs or obtain it through Passport Advantage®.

The IBM Work Optimization for Water Utilities V1.0 product is listed under the IBM Intelligent Water Family. The offering includes the following items:

- IBM Work Optimization for Water Utilities V1.0 English DVD
- IBM Work Optimization for Water Utilities V1.0 Quick Start Guide DVD

You can download IBM Work Optimization for Water Utilities in Passport Advantage as the following:

- IBM Work Optimization for Water Utilities V1.0 English Media Pack

### Related tasks

“Installing the solution” on page 16

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

“Preparing the installation media” on page 14

Before you run the IBM Work Optimization for Water Utilities deployment wizard, you must first obtain and prepare the installation media.

### Related information

 <http://www.ibm.com/software/howtobuy/passportadvantage/>

## Installing the IBM Intelligent Operations Center

Before installing IBM Work Optimization for Water Utilities, you must first install the IBM Intelligent Operations Center.

### About this task

The IBM Intelligent Operations Center is required by IBM Work Optimization for Water Utilities. It is not possible to install IBM Work Optimization for Water Utilities without first deploying and configuring the IBM Intelligent Operations Center. The IBM Intelligent Operations Center must be running during the installation of IBM Work Optimization for Water Utilities.

### Procedure

Install, configure, and verify the IBM Intelligent Operations Center using the steps outlined in the Installing and configuring section of the IBM Intelligent Operations Center Information Center.

### What to do next

Install the required interim fix and prepare the IBM Intelligent Operations Center servers before you start the IBM Work Optimization for Water Utilities installer.

### Related tasks

“Preparing the IBM Intelligent Operations Center servers” on page 12

Before you start the deployment of IBM Work Optimization for Water Utilities, you must first prepare the existing IBM Intelligent Operations Center environment that you are installing on top of.

“Installing IBM Intelligent Operations Center interim fix PO00013”

IBM Work Optimization for Water Utilities requires that IBM Intelligent Operations Center interim fix PO00013 is installed on the IBM Intelligent Operations Center environment running IBM Work Optimization for Water Utilities.

## Installing IBM Intelligent Operations Center interim fix PO00013

IBM Work Optimization for Water Utilities requires that IBM Intelligent Operations Center interim fix PO00013 is installed on the IBM Intelligent Operations Center environment running IBM Work Optimization for Water Utilities.

### About this task

Download the required interim fix from Fix Central and install it using the readme instructions provided with the interim fix.

### Procedure

1. Go to IBM Fix Central.
2. For **Product Group** select Other Software. Click **Continue**.
3. For **Product** select Intelligent Operations Center. Click **Continue**.

4. For **Installed Version** select 1.0.0. Click **Continue**.
5. For **Platform** select Linux. Click **Continue**.
6. Enter P000013 for **APAR or SPR**. Click **Continue**.
7. Select interim fix: IBMIOC-1.0.0-Linux-P000013. Click **Continue**.
8. Select your desired download option and click **Continue**.
9. Install the interim fix using the instructions provided in the interim fix readme file.

#### Related tasks

“Installing the IBM Intelligent Operations Center” on page 11

Before installing IBM Work Optimization for Water Utilities, you must first install the IBM Intelligent Operations Center.

## Preparing the IBM Intelligent Operations Center servers

Before you start the deployment of IBM Work Optimization for Water Utilities, you must first prepare the existing IBM Intelligent Operations Center environment that you are installing on top of.

### About this task

The IBM Intelligent Operations Center must be running during the installation of IBM Work Optimization for Water Utilities. Some of the IBM Intelligent Operations Center services are automatically restarted by the installer. To avoid a disruption in service, it is recommended that users of the IBM Intelligent Operations Center be logged off the system during the IBM Work Optimization for Water Utilities installation period.

### Procedure

1. Make sure that all of the IBM Intelligent Operations Center servers are started.
2. Query the status of all of the IBM Intelligent Operations Center servers to ensure that they are started before the installation begins. If any of the IBM Intelligent Operations Center components are not started, the installation of IBM Work Optimization for Water Utilities does not complete successfully.
3. Verify that you can access the IBM Intelligent Operations Center portal by logging on as the administrator using the following URL:

`http://access_server/wpsv70/wps/myportal`

In the IBM Intelligent Operations Center portal you can see the **Intelligent Operations Center** link on the top navigation bar.

### What to do next

After the IBM Intelligent Operations Center environment is configured and all servers are up and running, you are ready to start preparing the IBM Work Optimization for Water Utilities installation management server.



## Related tasks

“Installing the IBM Intelligent Operations Center” on page 11

Before installing IBM Work Optimization for Water Utilities, you must first install the IBM Intelligent Operations Center.

“Preparing the installation management server”

You must prepare the server that runs the installation of IBM Work Optimization for Water Utilities before you start the deployment wizard. The IBM Work Optimization for Water Utilities installation management server is only required during the deployment process.

## Related information

Starting the IBM Intelligent Operations Center servers

Querying the status of the IBM Intelligent Operations Center servers

## Preparing the installation management server

You must prepare the server that runs the installation of IBM Work Optimization for Water Utilities before you start the deployment wizard. The IBM Work Optimization for Water Utilities installation management server is only required during the deployment process.

## Before you begin

Review the hardware and software requirements of the installation management server.

## Procedure

1. Install and configure a new server running the Linux operating system, according to the minimum software and hardware requirements.
2. Temporarily disable any firewall security that is currently running on the server.
3. Restart the system.
4. Configure the network settings of the server so that it can communicate with all of the existing IBM Intelligent Operations Center server nodes.
5. Test the connectivity of the server to and from all other servers in the environment:
  - a. From the new server, ping each of the IBM Intelligent Operations Center server nodes, by using their host names to ensure that they are reachable.
  - b. From each of the existing IBM Intelligent Operations Center server nodes, ping the impending IBM Work Optimization for Water Utilities installation management server by using the host name to ensure that it is reachable.
  - c. Contact your local network administrator to resolve any connectivity issues.

## What to do next

Prepare the installation media before you start the deployment of IBM Work Optimization for Water Utilities.

## Related concepts

“Hardware requirements” on page 8

There are no additional hardware requirements for deploying IBM Work Optimization for Water Utilities, as the product is installed on top of the existing servers in the IBM Intelligent Operations Center cluster. However, a temporary IBM Work Optimization for Water Utilities installation management server meeting the minimum hardware specification is required. This server is only required during the deployment process.

“Software requirements” on page 9

The servers and clients involved in the deployment of IBM Work Optimization for Water Utilities must meet the minimum software requirements. This includes the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities is installed onto and the installation management server that the IBM Work Optimization for Water Utilities installer runs from.

## Related tasks

“Preparing the IBM Intelligent Operations Center servers” on page 12

Before you start the deployment of IBM Work Optimization for Water Utilities, you must first prepare the existing IBM Intelligent Operations Center environment that you are installing on top of.

“Preparing the installation media”

Before you run the IBM Work Optimization for Water Utilities deployment wizard, you must first obtain and prepare the installation media.

## Preparing the installation media

Before you run the IBM Work Optimization for Water Utilities deployment wizard, you must first obtain and prepare the installation media.

## Before you begin

There are two forms of installation media for deploying IBM Work Optimization for Water Utilities:

- Product installation DVD
- Licensed customers can download the installation package from the IBM® Passport Advantage® website

See the link at the end of this page for more information about the Passport Advantage software package numbers and download links.

## Related concepts

“Media packaging” on page 10

You can order IBM Work Optimization for Water Utilities as a package of DVDs or obtain it through Passport Advantage.

## Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

“Preparing the installation management server” on page 13

You must prepare the server that runs the installation of IBM Work Optimization for Water Utilities before you start the deployment wizard. The IBM Work Optimization for Water Utilities installation management server is only required during the deployment process.

## Related information

 [IBM Intelligent Water Support Portal page](#)

## Preparing the installation DVD

The IBM Work Optimization for Water Utilities installation DVD contains all the files required to start the deployment. You must first mount the DVD on to the IBM Work Optimization for Water Utilities installation management server.

## About this task

This task is not required if you are using the IBM Work Optimization for Water Utilities downloaded installation media to run the installation.

To mount a CD-ROM on Linux operating systems, you must issue the mount command. Depending on your system configuration, you might need root user authority for this procedure.

## Procedure

Insert the DVD into the drive and enter the following command:

```
mount -t iso9660 -o ro /dev/cdrom /cdrom
```

**Note:** /cdrom represents the mount point of the DVD folder. This folder must exist prior to using the mount command.

## Results

Your DVD file system is mounted. View the contents of the installation DVD by placing the disc into the drive and enter the cd /cdrom command where /cdrom is the mount point directory.

## What to do next

The IBM Work Optimization for Water Utilities installation management server is now ready to run the IBM Work Optimization for Water Utilities deployment wizard and deploy the solution.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

## Preparing the downloaded installation package

The IBM Work Optimization for Water Utilities installation package contains all the files required to start the deployment. You must first copy and extract the required installation files and directory structure onto the IBM Work Optimization for Water Utilities installation management server before you begin the deployment.

## About this task

This task is not required if you are using the IBM Work Optimization for Water Utilities product DVD media to run the installation.

## Procedure

1. Log on to the IBM Work Optimization for Water Utilities installation management server as the root user.
2. Create a new directory to contain the temporary installation files and directory structure, for example /images.
3. Copy the IBM Work Optimization for Water Utilities installation package into the new directory that you created in the previous step.
4. From the operating system command line, go to the directory where you just copied the installation package.
5. Extract the installer by using the following command:

```
tar -xvf CI4PQEN.tar
```

## Results

The installation management server is now ready to run the IBM Work Optimization for Water Utilities deployment wizard and deploy the solution. The installation starts from the directory into which you have just extracted the installation package.

## What to do next

The IBM Work Optimization for Water Utilities installation management server is now ready to run the IBM Work Optimization for Water Utilities deployment wizard and deploy the solution.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

---

## Installing the solution

Installing IBM Work Optimization for Water Utilities involves several steps. A deployment wizard is provided to deploy and install IBM Work Optimization for Water Utilities.

## Before you begin

The installation of IBM Work Optimization for Water Utilities requires an installation management server to run the deployment wizard on. The IBM Work Optimization for Water Utilities installation management server must be able to connect to and from the IBM Intelligent Operations Center servers. The IBM Intelligent Operations Center environment provides the middleware required by IBM Work Optimization for Water Utilities.

The IBM Work Optimization for Water Utilities installation management server can be a physical hardware server or a virtual machine running on a VMware Server. It can also be a server in the cloud, if the IBM Intelligent Operations Center environment is also deployed in the cloud. Make sure that the IBM Work Optimization for Water Utilities installation management server meets the minimum hardware and software requirements.

## About this task

The deployment wizard performs several deployment steps:

- Component selection
- Specification of the IBM Intelligent Operations Center event and management server and operating system administrator
- Specification of the existing IBM Intelligent Operations Center administrator account
- Review of deployment progress, status messages and results

When the deployment of IBM Work Optimization for Water Utilities is complete, the IBM Work Optimization for Water Utilities installation management server is no longer required. The installation profile can be optionally saved for later reference, and is useful for future upgrades that are required.

## Related concepts

“Preparing for installation” on page 7

Before deploying IBM Work Optimization for Water Utilities, understand the IBM Work Optimization for Water Utilities system configuration and ensure that the prerequisites are met for the environment.

“System configuration” on page 7

The IBM Work Optimization for Water Utilities deployment wizard installs the product on top of the IBM Intelligent Operations Center production environment. IBM Intelligent Operations Center is a prerequisite for IBM Work Optimization for Water Utilities. An additional server is required for IBM Work Optimization for Water Utilities deployment.

“Hardware requirements” on page 8

There are no additional hardware requirements for deploying IBM Work Optimization for Water Utilities, as the product is installed on top of the existing servers in the IBM Intelligent Operations Center cluster. However, a temporary IBM Work Optimization for Water Utilities installation management server meeting the minimum hardware specification is required. This server is only required during the deployment process.

“Software requirements” on page 9

The servers and clients involved in the deployment of IBM Work Optimization for Water Utilities must meet the minimum software requirements. This includes the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities is installed onto and the installation management server that the IBM Work Optimization for Water Utilities installer runs from.

“Media packaging” on page 10

You can order IBM Work Optimization for Water Utilities as a package of DVDs or obtain it through Passport Advantage.

## Deploying IBM Work Optimization for Water Utilities

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

### Before you begin

Prepare the installation media before you start the deployment wizard. You must also perform the prerequisite tasks that are outlined in this information center. Prerequisites include installing the IBM Intelligent Operations Center and making sure all of the servers are up and running.

### About this task

Run the deployment wizard on the IBM Work Optimization for Water Utilities installation management server that you have prepared the installation media on.

The deployment wizard requires the following information from the existing IBM Intelligent Operations Center environment:

- The host name and operating system administrator ID and password of the IBM Intelligent Operations Center event and management server.
- The user name and password of the IBM Intelligent Operations Center management service provided during the installation of IBM Intelligent Operations Center.

### Procedure

1. Log on to the installation management server as root user.
2. Open the `disk1` directory on the DVD. If you are using the installation download package, then go to the temporary directory where you extracted the IBM Work Optimization for Water Utilities installation file in the previous task, for example `/images/disk1`.

3. Start the IBM Work Optimization for Water Utilities deployment wizard by running the following command as root user:

```
./LinuxSetup
```

The welcome panel of the IBM Work Optimization for Water Utilities deployment wizard is displayed with information about the installation process.

4. To continue to the next panel and start the deployment setup, click **Next**.
5. On the **Select Tasks** panel, click **Next** to continue.
6. On the **Specify Targets** panel:
  - a. Specify the host name, operating system administrator (root user), and password of the IBM Intelligent Operations Center event and management server.
  - b. Optional: To save the information for possible future use, select the **Save this login information** check box.
  - c. Optional: Click **Test Connections** to verify that the IBM Intelligent Operations Center event and management server that you have specified can be reached by the installation management server. If the connection test fails, solve the connection issue before proceeding.
  - d. To continue to the next deployment panel, click **Next**.

**Note:** The **Operating system** field is disabled because only the Linux operating system is currently supported by IBM Work Optimization for Water Utilities.

7. On the **Configure Parameters** panel:
  - a. Select the component or components to install.
    - IBM Work Optimization for Water Utilities
    - IBM Usage Analysis and Reporting for Water Utilities
  - b. Specify the user name and password of the IBM Intelligent Operations Center management service provided during the installation of IBM Intelligent Operations Center.
  - c. Confirm the password again and then click **Next** to continue.
8. The **Summary Panel** displays a summary of all selected tasks and an estimation of the time it takes to complete the deployment. Click **Deploy All** to confirm the deployment selection.
9. To start the installation, click **OK**.
10. Optional: To see more details about the deployment status, click **Deployment messages**.
11. Optional: Click **Master log** to see the full installation log. The logs can also be found on the IBM Intelligent Operations Center event and management server in the `/opt/IBM/iss/intelligentWater/workOptimization/install/logs` directory. A number of logs are included in this directory. The primary log file to check is `install.log`. Other logs are available on the IBM Work Optimization for Water Utilities installation management server in the `/opt/SolutionFiles/logs` directory. Review the `IRU_Deployment_Wizard.log` in this directory.
12. After the installation is complete, when prompted, you can choose to save the current installation profile. This is useful for reinstalling and upgrading the product.
  - Click **Yes** to save the deployment information and configuration before exiting.
  - Click **No** to delete the deployment profile and logs.
  - Click **Cancel** to go back to the previous panel.

## Results

IBM Work Optimization for Water Utilities is installed into the existing IBM Intelligent Operations Center server cluster.

## What to do next

Verify the installation to ensure the solution is correctly deployed and working with the IBM Intelligent Operations Center.

### Related concepts

“Preparing for installation” on page 7

Before deploying IBM Work Optimization for Water Utilities, understand the IBM Work Optimization for Water Utilities system configuration and ensure that the prerequisites are met for the environment.

### Related tasks

“Preparing the installation media” on page 14

Before you run the IBM Work Optimization for Water Utilities deployment wizard, you must first obtain and prepare the installation media.

“Verifying the deployment”

Verify the installation of IBM Work Optimization for Water Utilities to ensure the solution is correctly deployed and working with the IBM Intelligent Operations Center.

“Post-installation configuration” on page 22

After successfully completing the installation of IBM Work Optimization for Water Utilities, additional steps are required to configure the solution.

“Restarting a failed installation”

Restart a failed IBM Work Optimization for Water Utilities installation by following a few steps.

## Verifying the deployment

Verify the installation of IBM Work Optimization for Water Utilities to ensure the solution is correctly deployed and working with the IBM Intelligent Operations Center.

### Procedure

Verify that you can access the IBM Work Optimization for Water Utilities portal by logging on as the administrator at the following URL:

```
http://access_server/wpsv70/wps/myportal
```

Where *access\_server* is the location of your IBM Intelligent Operations Center access server. In the solution portal you can see the **Intelligent Water** link on the top navigation bar.

## What to do next

The system is now ready for post-installation configuration.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

“Post-installation configuration” on page 22

After successfully completing the installation of IBM Work Optimization for Water Utilities, additional steps are required to configure the solution.

---

## Restarting a failed installation

Restart a failed IBM Work Optimization for Water Utilities installation by following a few steps.

### Procedure

1. Determine which installation steps have succeeded and failed by reviewing the logs displayed in the installation wizard and the installation logs located in the `/opt/IBM/iss/intelligentWater/`

workOptimization/install/logs directory on the IBM Intelligent Operations Center event and management server. IBM Work Optimization for Water Utilities is installed in the following order and writes to the specified logs.

Table 5. IBM Work Optimization for Water Utilities installation steps, associated property names, and logs in installation order

Installation Step	install.properties names	Logs
SETUP		installSetup.log
DATABASE	deployDB	db.log
LDAP	deployLDAP	ldap.log
COGNOS	deployCognos	cognos.log
SECURITY	deploySecurity	security.log
PORTAL	deployPortal	portal.log register_out_water_usage_portlets.xml register_out_water_workorder_portlets.xml. water_out_ConfigurationPageOnlyLayout.xml water_out_ConfigurationUsagePageLayout.xml water_out_ConfigurationWorkOrderPageLayout.xml water_out_PageOnlyLayout.xml water_out_UsagePageLayout.xml water_out_WorkOrderPageLayout.xml themeout.xml
CPLEX	deployCPLEX	cplex.log
ETL	deployETL	tdi.log
LICENSES	deployLicenses	install.log
CLEANUP	deployCleanup	install.log

**Note:** There is no property name for the setup step. This step will be run each time.

2. Edit the /opt/IBM/iss/intelligentWater/workOptimization/install/scripts/install.properties file on the IBM Intelligent Operations Center event and management server.
3. Update the install.properties file to indicate steps that completed successfully and the steps that did not run successfully.
  - a. Set the `deployinstallStep` variable to one of the following values.

N	Indicates that the installation step completed successfully. When the installation is restarted, this step will not be retried.
Y	Indicates that the installation step failed. When the installation is restarted, this step will be retried.

Where `installStep` is the name of the installation step. See Table 5 for a list of `install.properties` value names.

- b. Set `installCommon` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities common files are not to be installed.
-------	--



true	Indicates that the IBM Work Optimization for Water Utilities common files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities common files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

c. Set `installUOA` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities Usage Analysis files are not to be installed.
true	Indicates that the IBM Work Optimization for Water Utilities Usage Analysis files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities Usage Analysis files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

d. Set `installWMA` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities Work Optimization files are not to be installed.
true	Indicates that the IBM Work Optimization for Water Utilities Work Optimization files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities Work Optimization files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

e. Set `overridePreviousInstallCheck` to true.

f. Save your changes.

4. Optional: If the file was edited on a system that is not running Linux, run `dos2unix` on the file after copying it to the server.

5. On the IBM Intelligent Operations Center event and management server, run the following command.  
execute ./install.sh *Parm1 Parm2 Parm3 Parm4*

Where:

- *Parm1* is the user name of the IBM Intelligent Operations Center management service provided during the installation of the IBM Intelligent Operations Center.
- *Parm2* is the password of the user name of the IBM Intelligent Operations Center management service provided during the installation of the IBM Intelligent Operations Center.
- *Parm3* is **true** if Work Optimization is to be installed. If Work Optimization is not being installed, specify **false**
- *Parm4* is **true** if Usage Analysis is to be installed. If Usage Analysis is not being installed, specify **false**

## Results

The IBM Work Optimization for Water Utilities installation will restart and will run the installation steps specified.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

---

## Post-installation configuration

After successfully completing the installation of IBM Work Optimization for Water Utilities, additional steps are required to configure the solution.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

“Verifying the deployment” on page 19

Verify the installation of IBM Work Optimization for Water Utilities to ensure the solution is correctly deployed and working with the IBM Intelligent Operations Center.

## Configuring the maps

After the installation of IBM Work Optimization for Water Utilities is complete, log on to the portal and configure the GIS map service used by IBM Work Optimization for Water Utilities.

You can configure the **Map Settings** from any of the map portlets in the Usage Analysis or Work Optimization views, providing you have Water Utility Supervisor or Water Utility IT Administrator access permissions. To configure the map you must switch the map to **Configure** mode.

See the following topics for information about switching the map to **Configure** mode, and configuring the base map and the default starting location. The map that appears in the Usage Analysis and Work Optimization views of IBM Work Optimization for Water Utilities is updated to reflect your configuration changes.

## Configuring ESRI ArcGIS

Post-installation steps are required for IBM Work Optimization for Water Utilities to work with the ESRI ArcGIS server installed in the environment.

These steps include the following:

## Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

## Copying the `arcobjects.jar` file:

You must copy the `arcobjects.jar` file provided by ESRI ArcGIS to the IBM Work Optimization for Water Utilities installation.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as a user with administrative privileges.
2. Copy the `arcobjects.jar` file from the ESRI ArcGIS server `ARCGISHOME/java/web/webcontrols/WEB-INF/lib` directory to the `/opt/IBM/iss/intelligentWater/workOptimization/lib` directory on the IBM Intelligent Operations Center portal server.
3. Change to the `/opt/IBM/iss/intelligentWater/workOptimization/lib` directory on the IBM Intelligent Operations Center portal server and run the following command:

```
chmod 755 arcobjects.jar
```

4. Stop and restart WebSphere® Portal Server on the IBM Intelligent Operations Center portal server using the following commands:

```
/opt/IBM/WebSphere/AppServer/bin/stopServer.sh WebSphere_Portal -username ID -password PW  
/opt/IBM/WebSphere/AppServer/bin/startServer.sh WebSphere_Portal
```

Where:

- *ID* is the WebSphere Portal Server administrator ID.
- *PW* is the password for the WebSphere Portal Server administrator ID.

## Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

## Related information

 <http://www.esri.com/>

## Defining the ESRI ArcGIS distance calculation service:

In addition to map services, IBM Work Optimization for Water Utilities uses the ESRI ArcGIS server for distance calculations.

## About this task

Using the information provided with the ESRI ArcGIS product, define the required service.

## Procedure

1. Create an OD cost matrix on the ESRI ArcGIS server used by IBM Work Optimization for Water Utilities.
2. Publish the resource to the ESRI ArcGIS server. Make note of the service name. The service name needs to be defined to IBM Work Optimization for Water Utilities.

## Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

## Related tasks

“Defining the ESRI ArcGIS server to IBM Intelligent Water”

IBM Work Optimization for Water Utilities requires access to an ESRI ArcGIS server. Information about this server needs to be defined to IBM Work Optimization for Water Utilities.

## Related information

 <http://www.esri.com/>

## Defining the ESRI ArcGIS server to IBM Intelligent Water:

IBM Work Optimization for Water Utilities requires access to an ESRI ArcGIS server. Information about this server needs to be defined to IBM Work Optimization for Water Utilities.

## Procedure

1. Log on to the IBM Intelligent Operations Center database server as a DB2<sup>®</sup> administrator.
2. On the IBM Intelligent Operations Center database server, change to the following directory:  
`/opt/IBM/iss/intelligentWater/workOptimization/scripts/`
3. Run the **esri\_update** script.  
The format of the **esri\_update** script is:  
`esri_update Hostname AdminID Admin_password Service_name`  
Where:
  - *Hostname* is the host name of the ESRI ArcGIS server.
  - *AdminID* is an ESRI ArcGIS user with administrator privileges.
  - *Admin\_password* is the password for *AdminID*.
  - *Service\_name* is the name of the ESRI ArcGIS service defined for distance calculations.
4. Stop and restart WebSphere Portal Server on the IBM Intelligent Operations Center portal server using the following commands:  
`/opt/IBM/WebSphere/AppServer/bin/stopServer.sh WebSphere_Portal -username ID -password PW`  
`/opt/IBM/WebSphere/AppServer/bin/startServer.sh WebSphere_Portal`  
Where:
  - *ID* is the WebSphere Portal Server administrator ID.
  - *PW* is the password for the WebSphere Portal Server administrator ID.

## Results

IBM Work Optimization for Water Utilities is able to communicate with the ESRI ArcGIS server.

## Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

“Work Optimization schedule fails to get created” on page 131

After submitting a new schedule request on the Work Optimization Scheduling page of IBM Work Optimization for Water Utilities, the message ‘Failed Schedules’ appears and the schedule does not get created.

## Related tasks

“Defining the ESRI ArcGIS distance calculation service” on page 23

In addition to map services, IBM Work Optimization for Water Utilities uses the ESRI ArcGIS server for distance calculations.

## Configuring the base map

To configure the base map for all the map portlets of IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

## About this task

You can configure the **Base Maps** from any of the map portlets in the Usage Analysis Account Segmentation or Work Optimization views, provided that you have Water Utility IT Administrator access permissions.

## Procedure

1. Log on to the solution portal as the Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. To switch the map portlet to configuration mode, click **Configure**.
4. Click **Base Maps**.
5. Click **Add Map**.
6. Enter map details for the base map:
  - a. In the **Name** field, enter the name of the new base map.
  - b. In the **Description** field, enter a description for the base map.
  - c. Optional: To make this map the default map, select **Default map?**.
  - d. In the **URL** field, enter the URL of the map server or service.

**Note:** Refer to the system requirements page for information about which map server products and services are supported by IBM Work Optimization for Water Utilities.

- e. To save the base map, click **OK**. The new base map is created.
7. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and click **Back**.

## Results

After the page is refreshed, all of the map portlets of IBM Work Optimization for Water Utilities display the recently configured base map.

## Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

## Related tasks

“Removing a base map” on page 53

To remove a base map from IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

## Setting the center point and zoom level

To set the center point and zoom level of the map, open the map portlet in **Configure** mode and go to the **Map Settings** tab.

## About this task

You can configure the **Map Settings** from any of the map portlets in the Usage Analysis Account Segmentation or Work Optimization views, provided that you have Water Utility IT Administrator access permissions.

## Procedure

1. Log on to the solution portal as the Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. To switch the map portlet to configuration mode, click **Configure**.
4. Click **Map Settings**. The current map with details of the existing center point is displayed.
5. Use the zoom controls on the map to set the zoom level.
6. Use the pan and zoom controls to center the map.
7. Click **Save**.
8. Click **OK** to confirm.
9. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and click **Back**.

## Results

After the page is refreshed, all of the map portlets of IBM Work Optimization for Water Utilities show the center point and zoom level that was recently applied.

## Loading production data

IBM Work Optimization for Water Utilities provides sample data that can be used to test the environment after installation. When testing is complete, values appropriate for your organization need to be loaded into the system prior to moving the system into production.

## About this task

To make IBM Work Optimization for Water Utilities ready for a production environment, do the following.

## Procedure

1. Follow the steps in “Loading organization metadata” on page 27.
2. Follow the steps in “Loading customer account data” on page 28.
3. Follow the steps in Chapter 4, “Integrating the solution,” on page 43.

## Results

The data required by IBM Work Optimization for Water Utilities is loaded and the solution is ready to be used.

### Loading organization metadata

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

### Before you begin

#### CAUTION:

These steps replace the metadata defined in IBM Work Optimization for Water Utilities. Follow these steps to replace the sample data provided with IBM Work Optimization for Water Utilities. Keep a copy of the files you load into IBM Work Optimization for Water Utilities. You will use these files if you need to add data later to IBM Work Optimization for Water Utilities. Replacing existing production data can cause errors in your IBM Work Optimization for Water Utilities environment if you do it incorrectly.

The data specific for your organization is defined in a series of comma-separated value files. See the referenced topic for the format of these files. The files are:

#### **cust\_type.csv**

Defines customer types used to group similar customers.

#### **asset\_type.csv**

Defines types of entities requiring work.

#### **work\_type.csv**

Defines types of work to be done on assets.

#### **cause.csv**

Defines types of problems needing resolution.

#### **failure.csv**

Defines failure categories.

#### **problem.csv**

Defines problem classifications.

#### **remedy.csv**

Defines problem resolution categories.

#### **status.csv**

Defines work order status codes.

### Procedure

1. Copy the CSV files to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory on the IBM Intelligent Operations Center database server.
2. If the file was edited on a system that is not running Linux, run **dos2unix** on the file after copying it to the server.
3. On the IBM Intelligent Operations Center database server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory and run the follow command as the DB2 administrator:  

```
./metaload
```

## Results

The data contained in the CSV files replaces all existing organization data in your IBM Work Optimization for Water Utilities system.

### Related tasks

“Modifying production data” on page 73

IBM Work Optimization for Water Utilities uses metadata and customer account data loaded into the product during processing. Production data is initially loaded after installation. Metadata can be added and customer account data added or changed as needed.

### Related reference

“Customer types” on page 142

Customer types categorize customers. For example, a residential customer or a corporate customer.

“Asset types” on page 143

Asset types are the type of entity requiring work. For example, a valve or sump pump.

“Failure types” on page 144

Failure type describes what has failed. For example, a fire hydrant or sewer inlet.

“Problem codes” on page 146

Problem codes are the formal classification of the reported problem. For example, a seal failure or required repair.

“Problem causes” on page 152

Problem causes describe what caused the problem or failure. For example, a broken pipe or meter.

“Problem remedies” on page 156

Problem remedies describe how a problem was fixed. For example, if a pipe is flushed or replaced.

“Work types” on page 159

Work types describe the type of work that was, or will be, performed. For example, testing or maintenance.

“Status types” on page 162

Status types describe the status of a work order. For example, completed, held, or dispatched.

## Loading customer account data

IBM Work Optimization for Water Utilities requires data on customer accounts. This information includes customer account numbers, the customer type, and location information.

## Before you begin

### CAUTION:

**These steps replace the customer account data defined in IBM Work Optimization for Water Utilities. Follow these steps to replace the sample data provided with IBM Work Optimization for Water Utilities. Keep a copy of the customer.csv file you load into IBM Work Optimization for Water Utilities. You will use this file when adding customer account data later to IBM Work Optimization for Water Utilities. Replacing existing production data can cause errors in your IBM Work Optimization for Water Utilities environment if you do it incorrectly.**

Define the customer account information appropriate for your organization in a file named customer.csv. See the referenced topic for the format of this file.

## Procedure

1. Copy the customer.csv file to the /opt/IBM/iss/intelligentWater/workOptimization/script directory on the IBM Intelligent Operations Center database server.
2. If the file was edited on a system that is not running Linux, run **dos2unix** on the file after copying it to the server.



3. On the IBM Intelligent Operations Center database server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory and run the follow command as the DB2 administrator:  
`./customerload replace`
4. The `/opt/IBM/iss/intelligentWater/workOptimization/script/customer.log` contains information about customerload processing. Review this log to determine whether there were any problems when running the command.

## Results

The data contained in `customer.csv` replaces all existing customer account data in your IBM Work Optimization for Water Utilities system.

### Related tasks

“Modifying production data” on page 73

IBM Work Optimization for Water Utilities uses metadata and customer account data loaded into the product during processing. Production data is initially loaded after installation. Metadata can be added and customer account data added or changed as needed.

### Related reference

“Customer account information” on page 140

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

## Loading and refreshing new report data

The reports of IBM Work Optimization for Water Utilities must be refreshed every time new customer data is loaded into the solution. For optimum performance, the data used to generate the reports is cached locally. When new data is loaded into the database, you must refresh the reports from the IBM Intelligent Operations Center portal server using the IBM Cognos® Connection portal, before the newly loaded data is visible in the solution interface.

## About this task

If you have Portal Administrator access permissions, you can perform the following procedure to load the report data from the database into the reports. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.  
`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`  
Where `portalserver` is the hostname of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:  
`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`  
The IBM Cognos Connection portal is loaded.
2. On the main navigation bar click **Launch**.
3. Click **Report Studio**. A new browser window opens.
4. Click the reports directory titled **Intelligent\_Water**. The IBM Cognos Report Studio client is loaded.
5. Click **Open Existing**.
6. Select the report that you would like to refresh and click **Open**.
7. In the **Insertable Objects** dialog, click the **Refresh** icon to refresh the package tree.
8. Click **Save**.
9. Click **File** and then **Exit**.

## Results

The Reports portlets are updated to contain graph reports that display the most recent data that is loaded into the solution. Users must refresh the browser page to see the new report data.

## Configuring users and groups

Users who want to use the solution must have a portal user account that is assigned to the required groups and roles of IBM Work Optimization for Water Utilities.

User authentication is associated with authorization rights that give the user access to the appropriate features and data. IBM Work Optimization for Water Utilities takes advantage of the user and group management interface that is provided by the IBM Intelligent Operations Center and base architecture. It also integrates with the existing security infrastructure for single sign-on. User access is managed by WebSphere Portal, which hosts both the IBM Intelligent Operations Center and IBM Work Optimization for Water Utilities solutions. The Portal server draws on the Tivoli® Directory Server as the Lightweight Directory Access Protocol (LDAP) database for IBM Work Optimization for Water Utilities and the IBM Intelligent Operations Center.

### Portal administrator

The WebSphere Portal administrator that was created during the initial deployment of IBM Intelligent Operations Center can assign users to the IBM Work Optimization for Water Utilities groups and roles. Portal administrators belong to an Administrator group, *wpsadmins*. You can add additional users to the administrator group as needed.

### Assigning permissions

If your users are existing users of IBM Intelligent Operations Center, they already have a user ID and password and only need to be added to the required groups and roles of IBM Work Optimization for Water Utilities. The groups or roles that a user is assigned to, determine what features in the product they can use.

See the link to the security topic at the end of the page for more information about assigning roles and groups to IBM Work Optimization for Water Utilities users and the permissions they provide.

See the WebSphere Portal Wiki for more information about managing users and groups.

### Importing users and groups

If your IBM Work Optimization for Water Utilities users are not existing IBM Intelligent Operations Center users, you can import your users from an external LDAP directory source into the solution.

## Related concepts

Chapter 3, “Securing the solution,” on page 35

Securing IBM Work Optimization for Water Utilities 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.

“Importing users and groups”

You can import users from an existing external LDAP directory. Use the middleware directory management products that are provided with the IBM Intelligent Operations Center and base architecture.

## Related information

 [Websphere Portal Wiki](#)

## Importing users and groups

You can import users from an existing external LDAP directory. Use the middleware directory management products that are provided with the IBM Intelligent Operations Center and base architecture.

There are several ways to import users and groups into IBM Work Optimization for Water Utilities and the IBM Intelligent Operations Center. Here are two possible methods:

### Using an LDIF file to import users and groups into the Tivoli Directory Server

An LDAP administrator must perform the following procedure on the IBM Intelligent Operations Center event and management server.

1. Import the LDIF file into the Tivoli Directory Server.
2. Import the users and groups into Tivoli Access Manager WebSEAL.
3. Set the following Tivoli Access Manager WebSEAL user account attributes by using the user modify commands:
  - `account-valid {yes}`
  - `password-valid {yes}`

### Using the Portal server admin console GUI





The Portal administrator, for example, `wpsadmin`, must perform the following procedure on the IBM Intelligent Operations Center portal server. The administrator can use either the admin console or run a `WebSphere Portal Server CreateUser.xml` script to import and manage users and groups. The WebSphere Portal Server automatically creates the associated entries in Tivoli Access Manager WebSEAL and in the directory on the Tivoli Directory Server.

## Related concepts

“Configuring users and groups” on page 30

Users who want to use the solution must have a portal user account that is assigned to the required groups and roles of IBM Work Optimization for Water Utilities.

## Related information

-  [Tivoli Directory Server Information Center](#)
-  [Tivoli Access Manager Information Center](#)
-  [User modify : Tivoli Access Manager Information Center](#)
-  [Websphere Portal Information Center](#)

## Deleting sample users

IBM Work Optimization for Water Utilities includes sample users. For security reasons, delete the sample users after IBM Work Optimization for Water Utilities is installed.

## About this task

The WebSphere Portal administrator manages user accounts in the **Administration** portal. Use the following procedure to delete the sample users that are included with IBM Work Optimization for Water Utilities.

### Procedure

1. Log on to the portal as administrator (wpsadmin) using the following URL:  
`http://portalServer:10039/wps/myportal`
2. Click **Administration**.
3. Click **Access > Users and Groups**.
4. Click the delete icon for the following users:
  - gkooper (Gwen Kooper)
  - edrummand (Esther Drummand)
  - jharckness (Jac Harckness)
  - eharper (Eoin Harper)

**Important:** Do not delete the following required users. If you delete them, IBM Work Optimization for Water Utilities and the IBM Intelligent Operations Center will not operate properly.

- wpsadmin
- wasadmin
- wpsbind
- admin
- notesadmin

### Related concepts

Chapter 3, “Securing the solution,” on page 35

Securing IBM Work Optimization for Water Utilities 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.

“Sample users” on page 40

During the deployment of IBM Work Optimization for Water Utilities, sample users are created with corresponding responsibilities and access permissions.

---

## Verifying the installation

After installing IBM Work Optimization for Water Utilities, use the sample users and sample data installed with the product to verify that IBM Work Optimization for Water Utilities is installed correctly.

### Procedure

1. Log on as sample user jharckness with password passw0rd to the WebSphere Portal where IBM Work Optimization for Water Utilities is installed.
2. Click **Intelligent Water**.
3. Click **Usage Analysis**.
4. Verify that the map loads correctly.
5. Request water usage data for account 10810.
  - a. Click **Select Content** on the map portlet.
  - b. Select **Examine a specific account**.
  - c. Enter 10801 as the account number.
  - d. Click **OK**.

The map displays the customer location, the list displays the account, and the water usage for the account is displayed in the reports portal.

6. Request water usage data for all residential accounts.
  - a. Click **Select Content** on the map portlet.
  - b. Select **Look for trends among accounts**.
  - c. Select Residential from the list.
  - d. Click **OK**.

The map displays the residential customer locations, the list displays all residential accounts, and the water usage for the residential accounts is displayed in the reports portal.

7. Click **Configuration > Work Optimization Settings**.
8. Create two new crews.
  - a. Click **Create**.
  - b. Enter a **Crew identifier** and **Description**.
  - c. Select a **Color code** and **Crew starting location**.
  - d. Click **OK**.
  - e. Repeat to create a second new crew.

After clicking **OK** the new crew appears in the crew list.

9. Click **Work Optimization > Scheduling**.
10. Verify that the map loads correctly.
11. Select work orders for Hydrants.
  - a. Click **Select Content** on the map portlet.
  - b. Select Hydrants for **Asset type**.
  - c. Select 3 for **Priority**
  - d. Do not make any selections for **Work type, Status, or Problem**.
  - e. For **Include data from** select **The past year**.
  - f. Click **OK**.

The map and list display unscheduled work orders matching the selection criteria.

12. Select one to three work orders from the list and click **Schedule Work Orders** on the list portlet.
13. Schedule the selected work orders.
  - a. Enter a name for the schedule in **Schedule name**.
  - b. Select the default location for **Start location**.
  - c. Select a crew from the list.
  - d. Select **Selected only**.
  - e. Click **OK**.

The schedule request is submitted. When complete, the selected work orders is displayed in the **Schedule Work Orders** list.

14. Click **Work Optimization > Reporting**.
15. Verify that the map loads correctly.
16. Select work orders for Hydrants.
  - a. Click **Select Content**.
  - b. Select Hydrants for **Asset type**.
  - c. Select 3 for **Priority**
  - d. Do not make any selections for **Work type, Status, or Problem**.
  - e. For **Include data from** select **The past year**.
  - f. Select **Choose for me** for **Summarize by** and **Report type**.

g. Click **OK**.

The map, list, and reports display work orders matching the selection criteria.

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## Chapter 3. Securing the solution

Securing IBM Work Optimization for Water Utilities 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 Work Optimization for Water Utilities 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 Work Optimization for Water Utilities is performed on the IBM Intelligent Operations Center event and management server. Ensure that the method used to connect and transfer the Automatic meter reading (AMR) and enterprise asset management (EAM) 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 Work Optimization for Water Utilities portal.

#### Related concepts

Chapter 4, “Integrating the solution,” on page 43

Data used for usage analysis and work optimization needs to be loaded into IBM Work Optimization for Water Utilities prior to analysis or scheduling. Data is exported from the appropriate systems as comma-separated value (CSV) files and imported into IBM Work Optimization for Water Utilities using the appropriate commands.

#### Related information

Securing the IBM Intelligent Operations Center

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## User roles and responsibilities

IBM Work Optimization for Water Utilities implements security by limiting access to features and data based on user roles.

The security model and user access roles of IBM Work Optimization for Water Utilities are consistent with the IBM Intelligent Operations Center and other IBM Smarter Cities Software Solutions.

To use a specific feature of IBM Work Optimization for Water Utilities, 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 Water Utility IT Administrator.

Table 1 shows the authorized pages, portlets, and responsibilities of the user roles of IBM Work Optimization for Water Utilities.

Table 6. The roles of IBM Work Optimization for Water Utilities.

User role (role group)	Authorized pages or portlets	Authorized responsibilities
Water Utility Customer Analyst (IntelligentWaterAnalyst)	Usage Analysis	Query water usage View water usage summary reports View customer account properties
Water Utility Scheduler (IntelligentWaterScheduler)	Work Optimization Scheduling Work Optimization Reporting	Query work orders View work order summary reports View work order details Create schedules Delete schedules Print schedules, routes, and work orders
Water Utility Supervisor (IntelligentWaterSupervisor)	Usage Analysis Work Optimization Reporting Work Optimization Scheduling Usage Analysis Settings Work Optimization Settings	Responsibilities of the Water Utility Customer Analyst and Water Utility Scheduler roles. Additionally a user of this role can: Configure seasonal usage ratio Configure work crews
Water Utility IT Administrator (IntelligentWaterITAdministrator)	All views and portlets of IBM Work Optimization for Water Utilities and also the following map Configuration views: Map Settings Base Maps	All preceding responsibilities. Additionally a user of this role can: Configure the base map Configure the map starting point



## Related concepts

“Users and benefits” on page 4

IBM Work Optimization for Water Utilities is designed for water utility personnel to help optimize and more efficiently manage work associated with water management across a geographically dispersed infrastructure. It also helps water utility personnel to view customer account information and perform water usage analysis.

## Related tasks

“Adding users and groups”

To use a specific feature of IBM Work Optimization for Water Utilities, a user must be a member of a user role group that provides the required access level to use that feature. Use the **Administration** portal to add users and groups to IBM Work Optimization for Water Utilities.

“Viewing or modifying group membership” on page 38

Use the **Administration** portal to manage users of IBM Work Optimization for Water Utilities and their access permissions. Membership of a role group gives users access to the parts of the solution appropriate to that role. You can change the access level of a user by removing them from one role group and adding them to another group. You can also remove a user from IBM Work Optimization for Water Utilities.

---

## Adding users and groups

To use a specific feature of IBM Work Optimization for Water Utilities, a user must be a member of a user role group that provides the required access level to use that feature. Use the **Administration** portal to add users and groups to IBM Work Optimization for Water Utilities.

## Before you begin

Choose from one of the following IBM Work Optimization for Water Utilities roles that provides the access level that your users or groups require:

- IntelligentWaterAnalyst
- IntelligentWaterScheduler
- IntelligentWaterSupervisor
- IntelligentWaterITAdministrator

See the related links at the end of this topic for more information about the roles of IBM Work Optimization for Water Utilities.

## About this task

You can add new users and groups to IBM Work Optimization for Water Utilities. You can also add users and groups from an existing Lightweight Directory Access Protocol (LDAP) directory source that is configured to work with the underlying IBM Intelligent Operations Center. For more information about how to import LDAP directory users into the solution, see the IBM Intelligent Operations Center Information Center.

## Procedure

1. Log on to the solution portal as a portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.
2. On the main navigation bar at the top of the page, click **Administration**.
3. On the sidebar menu, expand the **Access** submenu, and click **Users and Groups**.
4. Click **All Portal User Groups**. The list of role groups for IBM Work Optimization for Water Utilities, the IBM Intelligent Operations Center, and any other IBM Smarter Cities Software Solutions installed in this environment are displayed.
5. Scroll through the list to find the user group role that you would like to assign to your users.

6. Select the required IBM Work Optimization for Water Utilities role group by clicking it. The IDs of the existing group members are listed.
7. Add the user to the group using one of the following steps:
  - To add a new user, click **New User** and complete the required **Profile Management** fields.
  - To add an existing user or group of users, click **Add Member** and select one or more users or groups from the list.
8. Click **OK**.

## Results

The recently added users or groups appear in the membership list of the user role group. The users are authorized to access the solution portal according to the permissions assigned to the role group selected.

## What to do next

If the users also require access to the IBM Intelligent Operations Center and other IBM Smarter Cities Software Solutions installed in this environment, add them to the relevant user roles for those solutions. For more information, see the security topics in the information center for the IBM Intelligent Operations Center or the other IBM Smarter Cities Software Solutions you have deployed.

### Related concepts

“User roles and responsibilities” on page 35

IBM Work Optimization for Water Utilities implements security by limiting access to features and data based on user roles.

### Related tasks

“Viewing or modifying group membership”

Use the **Administration** portal to manage users of IBM Work Optimization for Water Utilities and their access permissions. Membership of a role group gives users access to the parts of the solution appropriate to that role. You can change the access level of a user by removing them from one role group and adding them to another group. You can also remove a user from IBM Work Optimization for Water Utilities.

### Related information

Importing users and groups into the IBM Intelligent Operations Center

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## Viewing or modifying group membership

Use the **Administration** portal to manage users of IBM Work Optimization for Water Utilities and their access permissions. Membership of a role group gives users access to the parts of the solution appropriate to that role. You can change the access level of a user by removing them from one role group and adding them to another group. You can also remove a user from IBM Work Optimization for Water Utilities.

## About this task

Use the following procedure to add or remove existing users from IBM Work Optimization for Water Utilities user role groups. Users removed from an IBM Work Optimization for Water Utilities user role group can still continue to access the IBM Intelligent Operations Center and any other IBM Smarter Cities Software Solutions. For more information about how to completely delete a user and revoke their access to the entire portal and all solutions running in this environment, see the related links.

## Procedure

1. Log on to the solution portal as a portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.
2. On the main navigation bar at the top of the page, click **Administration**.
3. On the sidebar menu, expand the **Access** submenu, and click **Users and Groups**.

4. Click **All Portal User Groups**. The list of role groups for IBM Work Optimization for Water Utilities, the IBM Intelligent Operations Center, and any other IBM Smarter Cities Software Solutions installed in this environment are displayed.
5. Click one of the following IBM Work Optimization for Water Utilities user role groups that you would like to view or modify. You can scroll to the next page to find the required user role group that you are interested in.
  - **IntelligentWaterAnalyst**
  - **IntelligentWaterScheduler**
  - **IntelligentWaterSupervisor**
  - **IntelligentWaterITAdministrator**
6. A table containing all the users and groups that have been assigned to the user role are displayed. You can perform several actions by clicking the icons at the end of each row for the user you are interested in.
  - To remove a user or group, click the **Delete** icon on the row for that user.
  - To view all other roles that the selected user or group has been assigned, click the **View membership** icon on the row for that user.
  - To add an existing portal user or group to this role, click **Add Member** and select the user or groups to be added.
  - To create a new portal user and add them to the role, click **New User** and complete the required fields.
  - To create a new portal group and add the group to this role, click **New Group** and complete the required fields.
7. To finish and return to IBM Work Optimization for Water Utilities, on the main navigation bar at the top of the portal, click **More...** and then select **Intelligent Water**.

#### Related concepts

“User roles and responsibilities” on page 35

IBM Work Optimization for Water Utilities implements security by limiting access to features and data based on user roles.

#### Related tasks

“Adding users and groups” on page 37

To use a specific feature of IBM Work Optimization for Water Utilities, a user must be a member of a user role group that provides the required access level to use that feature. Use the **Administration** portal to add users and groups to IBM Work Optimization for Water Utilities.

---

## Removing users or groups

If a user or group no longer requires access to the solution, you can remove them from IBM Work Optimization for Water Utilities. You can also remove a user or group from the entire solution including the IBM Intelligent Operations Center and any other IBM Smarter Cities Software Solutions deployed in the environment.

### Procedure

1. To remove a user or group from only the IBM Work Optimization for Water Utilities solution, see Viewing or modifying groups.

**Note:** Removing a user from the IBM Work Optimization for Water Utilities user role groups does not affect any access the user may have to the IBM Intelligent Operations Center and any other IBM Smarter Cities Software Solutions installed in this environment.

2. To completely remove a user or group from the entire system, see the security section of the IBM Intelligent Operations Center Information Center.

## Related tasks

“Viewing or modifying group membership” on page 38

Use the **Administration** portal to manage users of IBM Work Optimization for Water Utilities and their access permissions. Membership of a role group gives users access to the parts of the solution appropriate to that role. You can change the access level of a user by removing them from one role group and adding them to another group. You can also remove a user from IBM Work Optimization for Water Utilities.

## Related information

Deleting a user or group in the IBM Intelligent Operations Center

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## Sample users

During the deployment of IBM Work Optimization for Water Utilities, sample users are created with corresponding responsibilities and access permissions.

IBM Work Optimization for Water Utilities includes the following sample users.

Name	User ID	User role
Gwen Kooper	gkooper	Water Utility Customer Analyst
Esther Drummand	edrummand	Water Utility Scheduler
Jac Harkness	jharckness	Water Utility Supervisor
Eoin Harper	eharper	Water Utility IT Administrator

By default, the sample users only have access to the IBM Work Optimization for Water Utilities 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. For more information, see the IBM Intelligent Operations Center Information Center.

## Related tasks

“Deleting sample users” on page 31

IBM Work Optimization for Water Utilities includes sample users. For security reasons, delete the sample users after IBM Work Optimization for Water Utilities is installed.

---

## Viewing or modifying user profiles

View or edit the profile of a user to set or reset any of the user profile attributes including password, name, email, and language. You cannot change the user ID.

## About this task

The portal administrator can view or edit user profiles by using the **Administration** portal. Select the user from the authenticated portal users list to open the user profile and change profile details.

**Note:** Each user can also change their own profile by clicking **Edit My Profile** on the top navigation bar of the portal.

## Procedure

1. Log on to the solution portal as a portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.
2. On the main navigation bar at the top of the page, click **Administration**.
3. On the sidebar menu, expand the **Access** submenu, and click **Users and Groups**.
4. Click **All Authenticated Portal Users**. A table containing all existing users is displayed.

5. Find the user that you are interested in. Click the edit icon on the row for that user, to display their **Profile Management** page. The attribute fields for the user profile are displayed.
6. To change the password for the user, enter a new password in the **New Password:** and **Confirm Password:** fields.
7. You can add, edit, or delete information in any of the remaining fields.
8. To submit the changes you have made, click **OK**.

## Results

The user profile is updated with the changes you submitted.

---

## Setting the password policy

Tivoli Access Manager installed with the IBM Intelligent Operations Center provides a default for how long a password can be used before it must be changed. Set a different password policy if the default value is not acceptable

### Procedure

1. On the IBM Intelligent Operations Center event and management server, access the Tivoli Access Manager WebSEAL Web Portal Manager at the following URL:  
`http://events_and_mangement_server_hostname:9061/ibm/console`
2. Log on with the IBM Intelligent Operations Center administrator ID and password created when the IBM Intelligent Operations Center was installed.
3. Click **Tivoli Access Manager > Web Portal Manager > Users > Show Global User Policy**.
4. Enter the Tivoli Access Manager administrator ID and password created when the IBM Intelligent Operations Center was installed.
5. Click **Show Global User Policy**.
6. Specify the maximum password age desired for the system.



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## Chapter 4. Integrating the solution

Data used for usage analysis and work optimization needs to be loaded into IBM Work Optimization for Water Utilities prior to analysis or scheduling. Data is exported from the appropriate systems as comma-separated value (CSV) files and imported into IBM Work Optimization for Water Utilities using the appropriate commands.

### Related concepts

Chapter 3, “Securing the solution,” on page 35

Securing IBM Work Optimization for Water Utilities 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.

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## Integrating water meter data

Water meter data can be integrated with IBM Work Optimization for Water Utilities by extracting the data into a comma-separated value (CSV) file and loading the data into IBM Work Optimization for Water Utilities.

As water is consumed, water pressure activates a water meter and the usage is recorded by the meter register. For the usage to be transmitted, the meters must be equipped with absolute encoder registers. These registers interface with AMR systems to transmit the reading digitally.

Each water meter register is a Meter Transmission Unit (MTU) that transmits the reading by a periodic radio signal to a Data Collection Unit (DCU). The DCU data is consolidated into a central database. The central database then transfers the readings to the customer’s MDM system.

MDM data to be used with IBM Work Optimization for Water Utilities must be extracted into a CSV file and imported into IBM Work Optimization for Water Utilities.

**Note:** If an automated system to collect usage data is not available, water meter data can be collected manually and the CSV file created with the manually collected data.

## Loading usage data

A comma-separated value (CSV) file containing usage data is loaded into IBM Work Optimization for Water Utilities with a script.

### About this task

Load water usage data for analysis by IBM Work Optimization for Water Utilities with the following steps.

### Procedure

1. Create a CSV file containing the usage data in the required format.
2. On the IBM Intelligent Operations Center database server, run the `select count(*) from IW_core.usage` command and note the number returned. Use this number to validate that the script ran correctly.
3. Copy the CSV file containing the usage data to be loaded to the IBM Intelligent Operations Center event and management server.
4. On the IBM Intelligent Operations Center event and management server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/al` directory and run the following command:  
`wuse csv_file`

Where *csv\_file* is the fully-qualified name of the CSV file. For example, wuse /data/meter\_20110922.csv

**Important:** The script can run for hours depending on the size of the CSV file. There is no progress indicator. Ignore the JMS exception that is returned.

5. Check the /opt/IBM/iss/intelligentWater/workOptimization/al/logs/ibmdi.log file for any errors.
6. Validate that the usage data was correctly loaded by running the following statement on the IBM Intelligent Operations Center database server.

```
select count(*) from IW_core.usage
```

The number returned should be higher than the number returned in step 2 on page 43. If the script completed without an error, but the number of elements in the usage table has not changed, there is probably a problem with the format of the CSV file.

### Related reference

“CSV file format for usage data” on page 135

Water usage data needs to be imported into IBM Work Optimization for Water Utilities for analysis. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wusage.sh script.

IBM Intelligent Operations Center system configuration

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## Integrating enterprise asset management systems

Enterprise asset management system data can be integrated with IBM Work Optimization for Water Utilities by extracting the data into a comma-separated value (CSV) file and loading the data into IBM Work Optimization for Water Utilities.

A significant part of a utility’s operational expense is allocated to maintaining and upgrading the infrastructure. This includes responding to emergency situations as well as performing preventative maintenance and inspections.

With a geographically dispersed infrastructure, work items can involve dispatching crews from a central location or depot to the location of the work. IBM Work Optimization for Water Utilities provides functions to analyze work requests, crews, and locations to optimize the allocation and scheduling of crews and assigned work.

Work order and related data required for the operation of IBM Work Optimization for Water Utilities must be extracted from the enterprise asset management system into a CSV file and imported into IBM Work Optimization for Water Utilities prior to analysis and scheduling.

### Loading work depot data

A comma-separated value (CSV) file defining the locations of work depots is loaded into IBM Work Optimization for Water Utilities with a script.

### About this task

Load work depot locations into IBM Work Optimization for Water Utilities by the following steps.

### Procedure

1. Create the CSV file containing the location data in the required format.
2. On the IBM Intelligent Operations Center database server, run the `select count(*) from IW_core.gis` command and note the number returned. Use this number to validate that the script ran correctly.
3. Copy the CSV file containing the work depot data to be loaded to the IBM Intelligent Operations Center event and management server.



4. On the IBM Intelligent Operations Center event and management server change to the `/opt/IBM/iss/intelligentWater/workOptimization/al` directory and run the following command:
 

```
gis csv_file
```

 Where *csv\_file* is the fully-qualified name of the CSV file. For example, `gis /data/gis_20110922.csv`  
 Ignore the returned JMS exception.
5. Check the `/opt/IBM/iss/intelligentWater/workOptimization/al/logs/ibmdi.log` file for any errors.
6. Validate that the work depot data was correctly loaded by running the following statement on the IBM Intelligent Operations Center database server.
 

```
select count(*) from IW_core.gis
```

 The number returned should be higher than the number returned in step 2 on page 44. If the script completed without an error, but the number of elements in the usage table has not changed, there is probably a problem with the format of the CSV file.

#### Related reference

“CSV file format for work depot data” on page 136

Data on the location of work depots needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `gis` command.

IBM Intelligent Operations Center system configuration

## Loading crew data

A comma-separated value (CSV) file defining the locations of crews is loaded into IBM Work Optimization for Water Utilities with a script.

### About this task

Load crews into IBM Work Optimization for Water Utilities by the following steps.

#### Procedure

1. Create the CSV file containing the location data in the required format .
2. On the IBM Intelligent Operations Center database server, run the `select count(*) from IW_core.crew` command and note the number returned. Use this number to validate that the script ran correctly.
3. Copy the CSV file with the work depot data to be loaded to the IBM Intelligent Operations Center event and management server.
4. On the IBM Intelligent Operations Center event and management server, run the following command:
 

```
crew csv_file
```

 Where *csv\_file* is the fully-qualified name of the CSV file. For example, `crew /data/crew_20110922.csv`  
 Ignore the returned JMS exception.
5. Check the `/opt/IBM/iss/intelligentWater/workOptimization/al/logs/ibmdi.log` file for any errors.
6. Validate that the crew data was correctly loaded by running the following statement on the IBM Intelligent Operations Center database server.
 

```
select count(*) from IW_core.crew
```

 The number returned should be higher than the number returned in step 2. If the script completed without an error, but the number of elements in the usage table has not changed, there is probably a problem with the format of the CSV file.

## Related reference

“CSV file format for crew data” on page 137

Data related to crews, their location, and how they should be represented on the Map needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the crew command.

IBM Intelligent Operations Center system configuration

## Loading work order data

A comma-separated value (CSV) file defining work orders is loaded into IBM Work Optimization for Water Utilities with a script.

## About this task

Load work orders into IBM Work Optimization for Water Utilities by the following steps.

### Procedure

1. Create the CSV file containing the work order data in the required format.
2. On the IBM Intelligent Operations Center database server, run the `select count(*) from IW_core.wm_wo_details` command and note the number returned. Use this number to validate that the script ran correctly.
3. Copy the CSV file with the work depot data to be loaded to the IBM Intelligent Operations Center event and management server.

4. On the IBM Intelligent Operations Center event and management server change to the `/opt/IBM/iss/intelligentWater/workOptimization/a1` directory and run the following command:

```
wo csv_file
```

Where *csv\_file* is the fully-qualified name of the CSV file. For example, `wo /data/wo_20110922.csv`

Ignore the returned JMS exception.

5. Check the `/opt/IBM/iss/intelligentWater/workOptimization/a1/logs/ibmdi.log` file for any errors.
6. Validate that the work order data was correctly loaded by running the following statement on the IBM Intelligent Operations Center database server.

```
select count(*) from IW_core.wm_wo_details
```

The number returned should be higher than the number returned in step 2. If the script completed without an error, but the number of elements in the usage table has not changed, there is probably a problem with the format of the CSV file.

## Related reference

“CSV file format for work order data” on page 138

Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wo command.

IBM Intelligent Operations Center system configuration

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## Timing data integration

After the initial loading of water meter and maintenance management system data, updated data needs to be loaded periodically into IBM Work Optimization for Water Utilities.

How often data is loaded from water metering and maintenance management systems depends on the needs of the individual installation.

Since maintenance work is normally scheduled daily, work order data, and any changed crew and work depot data, needs to be loaded daily prior to scheduling the day's work.

Water meter data needs to be loaded prior to analyzing the data.



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## Chapter 5. Customizing the solution

You can customize some aspects of the user interface and system settings of IBM Work Optimization for Water Utilities to suit your operational requirements and users.

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### Customizing the user interface

You can customize some elements of the IBM Work Optimization for Water Utilities user interface to suit your operation.

#### List of portlets

IBM Work Optimization for Water Utilities is a portlet-based solution using portal technology.

The following portlets are provided with IBM Work Optimization for Water Utilities out of the box.

#### Portlets on the Usage Analysis view

*Table 7. Usage Analysis Account Segmentation portlets*

Portlet	Description
"Account Map" on page 82	Use the Account Map portlet on the Usage Analysis Account Segmentation view to query customer accounts and see a visual geographical report of where they are located and how much water they are consuming. This information is useful for identifying spatio-temporal patterns in water usage and forecasting future demands.
"Account List" on page 85	Use the Account List portlet on the Usage Analysis Account Segmentation view to see a structured view of customer accounts that are being displayed on the map. This is useful for analyzing specific customer accounts in more detail and determining how much water they have used.
"Reports - Based on Account List" on page 88	Use the Reports - Based on Account List portlet to see a summary of customer water usage based on the query submitted from the Account Map portlet on the Usage Analysis Account Segmentation view.

#### Portlets on the Work Optimization Reporting view

*Table 8. Work Optimization Reporting portlets*

Portlet	Description
"Work Order Map" on page 95	Use the Work Order Map portlet to query work orders and see where the water issues are located geographically. This information can be used for optimizing work order schedules and for planning purposes.

Table 8. Work Optimization Reporting portlets (continued)

Portlet	Description
"Work Order List" on page 100	The Work Order List portlet on the Work Optimization Reporting and Scheduling views, provides an interactive window containing a list of work orders included in the results of the current query. You can use the list to sort the items returned, highlight work orders, and filter the results further. Additionally, from the Work Optimization Scheduling view you can schedule work orders.
"Reports - Based on Work Order List" on page 116	Use the Reports - Based on Work Order List portlet on the Work Optimization Reporting view to see the results of the work optimization query as a graph. This is useful for analyzing trends in work orders.

## Portlets on the Work Optimization Scheduling view

Table 9. Work Optimization Scheduling portlets

Portlet	Description
"Work Order Map" on page 95	Use the Work Order Map portlet to query work orders and see where the water issues are located geographically. This information can be used for optimizing work order schedules and for planning purposes.
Unscheduled Work Order List	The Unscheduled Work Order List portlet on the Work Optimization Scheduling view provides an interactive window containing a list of all unscheduled work orders included in the results of the current query. Use the Unscheduled Work Order List portlet to schedule work orders.
"Scheduled Work Order List" on page 105	The Scheduled Work Order List portlet on the Work Optimization Scheduling view, provides an interactive window displaying a list of work order schedules generated by the solution.

## Portlets on the Configuration view

Table 10. Configuration portlets

Portlet	Description
"Configure Usage Analysis" on page 118	Accessible from the Usage Analysis Settings page on the Configuration view. Allows the Water Utility Supervisor or the Water Utility IT Administrator to define which months are considered <b>Summer months</b> and <b>Winter months</b> , for the purpose of analysis.
"Configure Work Optimization - Scheduling" on page 118	Accessible from the Work Optimization Settings page on the Configuration view. Allows the Water Utility Supervisor or the Water Utility IT Administrator to manage the maintenance crews available for work order scheduling.

## Related concepts

“Guidelines for customizing portlets”

You can reposition and customize the portlets on the Usage Analysis or Work Optimization views.

## Guidelines for customizing portlets

You can reposition and customize the portlets on the Usage Analysis or Work Optimization 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 Water Utility IT Administrator role permissions to reposition the portlets on the page.

1. Log on to the solution portal as a Water Utility IT 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 Work Optimization for Water Utilities 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 Work Optimization for Water Utilities. 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 Work Optimization for Water Utilities and also how to configure the map service.

### Customizing the reports

The graph and table summaries generated in the reports portlets of IBM Work Optimization for Water Utilities are determined by the type of query submitted from the map. You cannot customize the reports in IBM Work Optimization for Water Utilities. 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.

## Related concepts

“List of portlets” on page 49

IBM Work Optimization for Water Utilities is a portlet-based solution using portal technology.

“Configuring the maps”

If you have Water Utility IT Administrator access permissions you can configure the GIS map service used by IBM Work Optimization for Water Utilities.

“Configuring the reports” on page 54

You can change the language and accessibility settings of the graph reports of IBM Work Optimization for Water Utilities. If you load new production data into the solution, you must also refresh the reports.

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

“Resizing a portlet clears the current filter query” on page 130

When you resize a portlet on the **Work Optimization** or **Usage Analysis** views, the current query and results are cleared.

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## Configuring the maps

If you have Water Utility IT Administrator access permissions you can configure the GIS map service used by IBM Work Optimization for Water Utilities.

See the following topics for instructions on how to switch to map **Configure** mode and configure the map that appears in the Usage Analysis and Work Optimization views.

## Configuring the base map

To configure the base map for all the map portlets of IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

### About this task

You can configure the **Base Maps** from any of the map portlets in the Usage Analysis Account Segmentation or Work Optimization views, provided that you have Water Utility IT Administrator access permissions.

### Procedure

1. Log on to the solution portal as the Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. To switch the map portlet to configuration mode, click **Configure**.
4. Click **Base Maps**.
5. Click **Add Map**.
6. Enter map details for the base map:
  - a. In the **Name** field, enter the name of the new base map.
  - b. In the **Description** field, enter a description for the base map.
  - c. Optional: To make this map the default map, select **Default map?**
  - d. In the **URL** field, enter the URL of the map server or service.

**Note:** Refer to the system requirements page for information about which map server products and services are supported by IBM Work Optimization for Water Utilities.

- e. To save the base map, click **OK**. The new base map is created.
7. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and click **Back**.



## Results

After the page is refreshed, all of the map portlets of IBM Work Optimization for Water Utilities display the recently configured base map.

### Related concepts

“GIS server requirement” on page 10

In addition to the servers required for IBM Work Optimization for Water Utilities, the IBM Work Optimization for Water Utilities product requires access to a geographic information system (GIS) server.

### Related tasks

“Removing a base map”

To remove a base map from IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

## Removing a base map

To remove a base map from IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

### About this task

You can configure the **Base Maps** from any of the map portlets in the Usage Analysis Account Segmentation or Work Optimization views, provided that you have Water Utility IT Administrator access permissions.

### Procedure

1. Log on to the solution portal as the Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. To switch the map portlet to configuration mode, click **Configure**.
4. Click **Base Maps**.
5. Select the base map that you would like to delete.
6. Click **Delete**.
7. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and click **Back**.

### What to do next

A default base map is required. If there are no other base maps, click **Add Map** to create a new base map to be used by IBM Work Optimization for Water Utilities. For more information, see the related links at the end of this topic.

### Related tasks

“Configuring the base map” on page 25

To configure the base map for all the map portlets of IBM Work Optimization for Water Utilities, open the map portlet in **Configure** mode and go to the **Base Maps** tab.

## Setting the center point and zoom level

To set the center point and zoom level of the map, open the map portlet in **Configure** mode and go to the **Map Settings** tab.

### About this task

You can configure the **Map Settings** from any of the map portlets in the Usage Analysis Account Segmentation or Work Optimization views, provided that you have Water Utility IT Administrator access permissions.

## Procedure

1. Log on to the solution portal as the Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. To switch the map portlet to configuration mode, click **Configure**.
4. Click **Map Settings**. The current map with details of the existing center point is displayed.
5. Use the zoom controls on the map to set the zoom level.
6. Use the pan and zoom controls to center the map.
7. Click **Save**.
8. Click **OK** to confirm.
9. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and click **Back**.

## Results

After the page is refreshed, all of the map portlets of IBM Work Optimization for Water Utilities show the center point and zoom level that was recently applied.

---

## Configuring the reports

You can change the language and accessibility settings of the graph reports of IBM Work Optimization for Water Utilities. If you load new production data into the solution, you must also refresh the reports.

To configure the reports of IBM Work Optimization for Water Utilities, use the reporting interface and tools that are provided by the IBM Intelligent Operations Center base platform. IBM Cognos Business Intelligence includes the following tools for accessing and configuring the data and reports that are available in IBM Work Optimization for Water Utilities.

- IBM Cognos Connection portal
- IBM Cognos Administration portal
- IBM Cognos Report Studio client

See the following topics for more details.

## Managing accessibility in the reports

The IBM Work Optimization for Water Utilities reporting feature provides accessibility features that can be enabled or disabled depending on your requirements. Accessible reports contain features, such as alternative text, that allow users with disabilities to access report content using assistive technologies, such as screen readers. When you enable accessibility in the reports of IBM Work Optimization for Water Utilities, a table containing a summary of the data in the graph report is displayed. By default, accessibility is enabled for all Work Optimization and Usage Analysis reports.

If you have Portal Administrator access permissions you can configure accessibility from the IBM Intelligent Operations Center portal server. See the following topics for instructions on how to manage accessibility in the reports of IBM Work Optimization for Water Utilities:

### Enabling system-wide accessibility for reports

From the IBM Cognos Administration portal on the IBM Intelligent Operations Center portal server, you can specify system-wide settings for accessible report output that apply to all reports in the solution. Alternatively, you can allow the report creator to decide whether or not accessibility is enabled for individual reports.

## About this task

If you have Portal Administrator access permissions, you can enable system-wide accessibility for the reports. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Administration portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the host name of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. On the main navigation bar click **Launch, IBM Cognos Administration**. The IBM Cognos Administration portal is loaded.
3. On the **Configuration** tab, click **Dispatchers and Services**.
4. From the toolbar in the upper-right corner of the page, click the **Set properties - Configuration** button.
5. Click the **Settings** tab.
6. Under **Category**, click **Administrator Override**.
7. For the **Administrator Override** category, next to **Accessibility support for reports**, in the **Value** column, click **Edit**.
8. In the **Accessibility support for reports** page, select one of the following options:

Option	Description
<b>Disable</b>	Accessible report output is denied.
<b>Make mandatory</b>	Accessible report output is always created.
<b>Allow the user to decide</b>	Accessible report output is specified by the user. If you set this option to <b>Not Selected</b> , then accessible report output is not created automatically. This is the default. For more information about enabling accessibility for individual users, see the related task below.

9. Click **OK**.

## Related tasks

“Enabling accessibility for individual users”

From the IBM Cognos Connection portal on the IBM Intelligent Operations Center portal server, you can choose to enable accessibility for selected users of the solution.

## Enabling accessibility for individual users

From the IBM Cognos Connection portal on the IBM Intelligent Operations Center portal server, you can choose to enable accessibility for selected users of the solution.

## Before you begin

Before you perform this procedure, you must ensure that the system-wide setting **Accessibility support for reports** is set to **Allow the user to decide**. For more information about how to configure the system-wide settings in the IBM Cognos Administration portal, see the related tasks.

## About this task

If you have Portal Administrator access permissions, you can enable accessibility for individual users. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the host name of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. Before you enable accessibility for an individual user, you must first enable accessibility in the user preferences for the current portal administrator.
  - a. Click the **My Area Options** icon.
  - b. Click **My Preferences**.
  - c. On the **General** tab, select **Enable accessibility support for reports I run or schedule**.
  - d. Click **OK**.
3. In the **Name** column of the folder table, click **Intelligent\_Water**. A list of all the users of IBM Work Optimization for Water Utilities is displayed.
4. Choose a report and click the **Set properties** icon in the **Actions** column next to the user or group.
5. On the **Set properties** dialog, click the **Report** tab.
6. Under the **Accessibility** heading, select **Enable accessibility support**.
7. Click **OK**.

## Results

After the selected users refresh their browser, in the Reports portlets of the solution, a table summarizing the report accompanies the report graph. Scroll down to see the table.

## What to do next

Repeat the procedure for any other users of the solution that require accessibility to be enabled.

### Related tasks

“Enabling system-wide accessibility for reports” on page 54

From the IBM Cognos Administration portal on the IBM Intelligent Operations Center portal server, you can specify system-wide settings for accessible report output that apply to all reports in the solution. Alternatively, you can allow the report creator to decide whether or not accessibility is enabled for individual reports.

## Disabling system-wide accessibility for reports

From the IBM Cognos Administration portal on the IBM Intelligent Operations Center portal server, you can disable accessibility for all reports in the solution using a system-wide setting.

## About this task

If you have Portal Administrator access permissions, you can disable system-wide accessibility for the reports. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Administration portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator. For example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the host name of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. On the main navigation bar click **Launch, IBM Cognos Administration**. The IBM Cognos Administration portal is loaded.
3. On the **Configuration** tab, click **Dispatchers and Services**.
4. From the toolbar in the upper-right corner of the page, click the **Set properties - Configuration** button.
5. Click the **Settings** tab.
6. Under **Category**, click **Administrator Override**.
7. For the **Administrator Override** category, next to **Accessibility support for reports**, in the **Value** column, click **Edit**.
8. In the **Accessibility support for reports** page, select **Disable**.
9. Click **OK**.

## Results

After the browser is refreshed, in the Reports portlets of the solution, the report graph is no longer accompanied by a summary table.

### Related tasks

“Disabling accessibility for individual users”

From the IBM Cognos Connection portal on the IBM Intelligent Operations Center portal server, you can choose to disable accessibility for selected users of the solution.

## Disabling accessibility for individual users

From the IBM Cognos Connection portal on the IBM Intelligent Operations Center portal server, you can choose to disable accessibility for selected users of the solution.

## Before you begin

If you disabled accessibility for all reports by setting **Accessibility support for reports** to **Disable**, then you do not need to perform this task.

For more information about how to configure the system-wide settings in the IBM Cognos Administration portal, see the related tasks.

## About this task

If you have Portal Administrator access permissions, you can disable accessibility for selected users. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the host name of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. Before you can disable accessibility for an individual user, you must first disable accessibility in the user preferences for the current portal administrator.
  - a. Click the **My Area Options** icon.
  - b. Click **My Preferences**.
  - c. On the **General** tab, clear the **Enable accessibility support for reports I run or schedule** check box.
  - d. Click **OK**.
3. In the **Name** column of the folder table, click **Intelligent\_Water**. A list of all the users for IBM Work Optimization for Water Utilities is displayed.
4. Choose a report and click the **Set properties** icon in the **Actions** column next to the report.
5. On the **Set properties** dialog, click the **Report** tab.
6. Under the **Accessibility** heading, clear the **Enable accessibility support** check box.
7. Click **OK**.

## Results

After the selected users refresh their browser, in the Reports portlets of the solution, the report graph is no longer accompanied by a summary table.

## What to do next

Repeat the procedure for any other users of the solution that require accessibility to be disabled.

### Related tasks

“Disabling system-wide accessibility for reports” on page 56

From the IBM Cognos Administration portal on the IBM Intelligent Operations Center portal server, you can disable accessibility for all reports in the solution using a system-wide setting.

## Modifying the language of the reports

By default, IBM Work Optimization for Water Utilities detects the language preference of a user from their browser language settings. The default language settings of the reports can also be configured and enforced from the server.

## About this task

To change the language settings of the graph and table reports, use the following procedure. The changes you make will affect the language of only the graph and table text in the reports portlets of IBM Work Optimization for Water Utilities. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Cognos Connection portal as a portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`http://portalserver/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the host name of your portal server.

2. In the **Name** column of the folder table, click . A list of all the reports for IBM Work Optimization for Water Utilities is displayed.

3. Choose a report and click the **Set properties** icon in the **Actions** column next to the report.
4. On the **Set properties** dialog, click the **General** tab.
5. Under the **Language** heading, select the required language for the report.
6. Click **OK**.

## Results

The graph and table text within the Reports portlets are changed to match the language preference.

**Note:** The table report is displayed if accessibility is enabled. See the related topic for more information about enabling accessibility in the reports of the solution.

## What to do next

Repeat the procedure for all of the reports in the folder.

### Related concepts

“Managing accessibility in the reports” on page 54

The IBM Work Optimization for Water Utilities reporting feature provides accessibility features that can be enabled or disabled depending on your requirements. Accessible reports contain features, such as alternative text, that allow users with disabilities to access report content using assistive technologies, such as screen readers. When you enable accessibility in the reports of IBM Work Optimization for Water Utilities, a table containing a summary of the data in the graph report is displayed. By default, accessibility is enabled for all Work Optimization and Usage Analysis reports.

## Loading and refreshing new report data

The reports of IBM Work Optimization for Water Utilities must be refreshed every time new customer data is loaded into the solution. For optimum performance, the data used to generate the reports is cached locally. When new data is loaded into the database, you must refresh the reports from the IBM Intelligent Operations Center portal server using the IBM Cognos Connection portal, before the newly loaded data is visible in the solution interface.

## About this task

If you have Portal Administrator access permissions, you can perform the following procedure to load the report data from the database into the reports. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, *wpsadmin* or another user who is a member of the *wpsadmins* portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the hostname of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. On the main navigation bar click **Launch**.
3. Click **Report Studio**. A new browser window opens.
4. Click the reports directory titled **Intelligent\_Water**. The IBM Cognos Report Studio client is loaded.
5. Click **Open Existing**.
6. Select the report that you would like to refresh and click **Open**.
7. In the **Insertable Objects** dialog, click the **Refresh** icon to refresh the package tree.

8. Click **Save**.
9. Click **File** and then **Exit**.

## Results

The Reports portlets are updated to contain graph reports that display the most recent data that is loaded into the solution. Users must refresh the browser page to see the new report data.

---

## Configuring Usage Analysis

Use the Configure Usage Analysis portlet on the Usage Analysis Settings Configuration view to define the seasonal usage ratios for the Usage Analysis Account Segmentation reports. After defining the seasons in the configuration interface, you must run a script from the command line to update the ratios in the database.

### About this task

You can configure the summer and winter months. The data for the configured months is used by IBM Work Optimization for Water Utilities for seasonal usage analysis. The Water Utility Supervisor or the Water Utility IT Administrator must perform the following procedure:

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Usage Analysis portlet on the Usage Analysis Settings page. The months currently defined for **Summer months** and **Winter months** are displayed.
3. To move months between the **Summer months** and **Winter months** lists, click the month you want to move and click the arrow button between the lists pointing to the list where you want to move the month.
4. When the **Summer months** and **Winter months** lists are complete, click **Apply**.
5. Finally, to recalculate the seasonal ratios in the database, run the `high84` script command. Until the script is run, reports run in the Usage Analysis view are based on the existing ratio stored in the database. For more information about the script, see the related topic *Implementing the seasonal usage ratio* in the IBM Intelligent Water Family: Work Optimization Information Center.

## Results

The configuration change will be effective on the Usage Analysis Account Segmentation view after the user logs off and logs back on to IBM Work Optimization for Water Utilities.

### Related tasks

“Implementing the seasonal usage ratio”

After setting which months are considered summer months and which are considered winter months in the Configuration tab, you must run a script to update the IBM Work Optimization for Water Utilities calculation ratios used for seasonal usage analysis.

## Implementing the seasonal usage ratio

After setting which months are considered summer months and which are considered winter months in the Configuration tab, you must run a script to update the IBM Work Optimization for Water Utilities calculation ratios used for seasonal usage analysis.

### About this task

On the IBM Intelligent Operations Center database server, run the **high84** script to load the configured seasons for seasonal usage analysis.



## Procedure

1. On the IBM Intelligent Operations Center database server, change to the following directory:  
`/opt/IBM/iss/intelligentWater/workOptimization/scripts/`

2. Run the **high84** script.

The format of the **high84** script is:

```
high84 WATERDB User Password Option
```

Where:

- *User* is the DB2 administrator ID for the IBM Intelligent Operations Center database server.
- *Password* is the password for *User*.
- *Option* is one of the following values:
  - **Year** specifies that the seasonal ratio will be applied to the last full year.
  - **12** specifies that the seasonal ratio will be applied to the last twelve months.
  - **Range** *date\_range* specifies a specific range of dates where the seasonal ratio will be applied. *Date\_range* is in the format *beginning\_date ending\_date* where each date is in the format *yyyy-mm-dd*.

## Example

In the following example, a configured ratio is applied to the past full year:

```
./high84 WATERDB db2inst1 passwd year
```

In the following example, a configured ratio is applied to the past twelve months:

```
./high84 WATERDB db2inst1 passwd 12
```

In the following example, a configured ratio is applied from November 1, 2009 through October 31, 2010:

```
./high84 WATERDB db2inst1 passwd range 2009-11-01 2010-10-31
```

## What to do next

Optionally, the `high84` script can be scheduled to run periodically by creating a cronjob. On the IBM Intelligent Operations Center database server enter the following, code, substituting values appropriate to your installation. Save the text into the `high84.cron` file.

```
#!/bin/bash  
# high84.cron
```

```
cd /home/db2inst1  
. ./sqllib/db2profile  
. /opt/IBM/iss/intelligentWater/workOptimization/scripts/high84 WATERDB User Password Option
```

In the crontab file add a line to run the cron job at the desired interval. The following command runs `high84.cron` once a month:

```
0 0 1 * * /home/db2inst1/high84.cron
```

## Related tasks

“Querying seasonal usage ratios” on page 93

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve seasonal usage ratios for one or more customer accounts.

“Configuring Usage Analysis” on page 60

Use the Configure Usage Analysis portlet on the Usage Analysis Settings Configuration view to define the seasonal usage ratios for the Usage Analysis Account Segmentation reports. After defining the seasons in the configuration interface, you must run a script from the command line to update the ratios in the database.

“Configure Usage Analysis” on page 118

Use the Configure Usage Analysis portlet on the Usage Analysis Settings Configuration view to define the seasonal usage ratios for the Usage Analysis Account Segmentation reports. After defining the seasons in the configuration interface, you must run a script from the command line to update the ratios in the database.

---

## Configuring Work Optimization

Use the Work Optimization Settings Configuration view to perform configuration tasks for the Work Optimization feature of IBM Work Optimization for Water Utilities.

### Managing crews

Before you can start scheduling work orders, you must first configure the maintenance crews that are available for scheduling.

The Water Utility Supervisor or the Water Utility IT Administrator can perform the following crew management tasks.

### Creating crews

Use the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings Configuration view to create a work maintenance crew. The scheduling feature of IBM Work Optimization for Water Utilities requires at least one available crew that can be assigned to a work schedule.

### About this task

Either the Water Utility Supervisor or the Water Utility IT Administrator must perform this procedure.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page.
3. Click **Create**. The **Create Crew** dialog is displayed.
4. Enter a **Crew identifier** to identify the crew.
5. Enter a **Nickname** to be displayed in the Scheduled Work Order List portlet.
6. Enter a **Description**.
7. Choose a **Color code** from the color chart. The **Color code** is used to distinguish the crew on the map.
8. Select a **Crew starting location** from the list of available locations.
9. After you have completed all of the required fields, click **OK** to save the crew.

### Results

The new crew is created and appears in the list of available crews for scheduling on the Work Optimization Scheduling view.

## Deleting crews

Use the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings Configuration view to delete a work maintenance crew from the IBM Intelligent Water Work Optimization system.

### About this task

Either the Water Utility Supervisor or the Water Utility IT Administrator must perform this procedure.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page. The portlet displays a list of existing crews currently available for scheduling.
3. Select the crew you would like to delete.
4. Click **Delete**.
5. Click **OK** to confirm the deletion.

### Results

The selected crew is deleted from the list of crews available for scheduling on the Work Optimization Scheduling view. Existing schedules are not updated to reflect changes in crew availability and might need to be revised.

## Updating crews

Use the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings Configuration view to update existing crews that can be used by the IBM Intelligent Water Work Optimization feature.

### About this task

Either the Water Utility Supervisor or the Water Utility IT Administrator must perform this procedure.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page. The portlet displays a list of existing crews currently available for scheduling.
3. Select an existing crew from the list.
4. Click **Update**.
5. On the **Update Crew** dialog, make the required updates to any of the following fields:
  - **Nickname**
  - **Description**
  - **Color code**
  - **Crew starting location**

**Note:** The **Crew identifier** cannot be changed.

6. To save your changes, click **OK**.

### Results

The crew is updated and the changes appear in the list of crews available for scheduling on the Work Optimization Scheduling view. Existing schedules are not updated by crew configuration changes. You

might need to delete and recreate some schedules after a significant crew configuration change, such as a new **Crew starting location**.

---

## Configuring system-wide settings

There are several system-wide settings in IBM Work Optimization for Water Utilities that you can configure according to your implementation requirements.

### Setting the maximum query results for the map and list

You can limit the number of items returned in the query results on the map and list portlets of IBM Work Optimization for Water Utilities. By default, a maximum of 500 items can be displayed on the map or in the list. The limit is stored in the `IW_CORE.PROPS` table of the `WATERDB` database. To change the limit, you need to submit a database command on the IBM Intelligent Operations Center database server to update the required setting.

#### About this task

Limiting the number of items returned in the query results on the map and list portlets can help to improve both client and server performance. The administrator of the IBM Intelligent Operations Center database server must perform the following procedure.

#### Procedure

1. Log on to the IBM Intelligent Operations Center database server as the DB2 database administrator.
2. Connect to the IBM Work Optimization for Water Utilities database by using the following DB2 shell command:  

```
db2 connect to WATERDB
```
3. Update the existing map and list result limit by entering the following DB2 shell command:  

```
db2 "update iw_core.props set prop_val='x' where comp_id='water' and prop_id='max_list_size'"
```

Where *x* is the limit you would like to set. The maximum limit is 500, which is also the default limit. For example, to set the limit to 100 items, use the following DB2 shell command:  

```
db2 "update iw_core.props set prop_val='100' where comp_id='water' and prop_id='max_list_size'"
```
4. To disconnect, enter the following DB2 shell command:  

```
db2 disconnect all
```
5. Restart the IBM Intelligent Operations Center application and integration server.

#### Results

After the IBM Intelligent Operations Center application and integration server is restarted, queries performed from the maps of IBM Work Optimization for Water Utilities returns only the maximum number of items according to the *prop\_val* limit you have set in the `WATERDB` table. If the query results exceed this limit, a warning message is displayed to the user.

**Note:** The Work Optimization Scheduling feature can process a maximum of 300 work order candidates for scheduling. If more items are displayed on the map and in the list in the Work Optimization Scheduling view, a scheduling error occurs, depending on the type of schedule request submitted.

### Defining the displayed water usage unit

The water usage unit displayed in the IBM Work Optimization for Water Utilities Usage Analysis Reports portlet can be configured after installation.

## Procedure

1. Log on to the IBM Intelligent Operations Center database server as the DB2 administrator.
2. Connect to the IBM Work Optimization for Water Utilities database by using the following DB2 shell command:

```
db2 connect to WATERDB
```

3. Update the existing display unit by entering the following DB2 shell command on a single line:

```
db2 "update iw_core.props set prop_val='Your_usage_units'  
where comp_id='water.ocm' and prop_id='waterUsageUnit'"
```

Where *Your\_usage\_units* is the usage units to be displayed in the reports. *Your\_usage\_units* can be set to any value.

For example, to set the display value to "Gallons", use the following DB2 shell command on a single line:

```
db2 "update iw_core.props set prop_val='Gallons'  
where comp_id='water.ocm' and prop_id='waterUsageUnit'"
```

4. To disconnect, enter the following DB2 shell command:

```
db2 disconnect all
```

5. Restart the IBM Intelligent Operations Center application and integration server.

## Results

The configured water usage unit is displayed at the bottom of the Reports - Based on Account List portlet on the Usage Analysis page.



---

## Chapter 6. Managing the solution

The topics in this section describe how to perform administrative tasks for IBM Work Optimization for Water Utilities.

---

### Verifying the version

You can verify the version of IBM Work Optimization for Water Utilities 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 servers

IBM Work Optimization for Water Utilities 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.

For information about how to stop and start the IBM Intelligent Operations Center servers that IBM Work Optimization for Water Utilities runs on, see the security section of the IBM Intelligent Operations Center Information Center.

#### Related information

Controlling the IBM Intelligent Operation Center servers

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### Controlling the services

The services for IBM Work Optimization for Water Utilities are run and managed from the servers of the IBM Intelligent Operations Center.

### Controlling the portal services

You can control and query the portal services of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center portal server.

### Starting the portal services

You can start the portal services of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center portal server.

#### About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center portal server to perform this task.

#### Procedure

1. Navigate to the WebSphere Application Server administrative console at the following URL:  
`https://host:port/ibm/console`

Where *host* is the location of your IBM Intelligent Operations Center portal server and *port* is the SSL port for the console. For example:

`https://server.domain.com:10032/ibm/console`

2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.
4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the following services that are required by the solution.
  - `water_common_services_ear`
  - `water_usage_portlet_ear`
  - `water_usage_services_ear`
  - `water_workorder_portlet_ear`
  - `water_workorder_services_ear`

To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.

7. Select the check box located next to the services you would like to start.
8. On the action panel at the top of the table, click **Start**.

## Results

After a few seconds, a message is displayed at the top of the page providing details on whether the start request was successful.

## What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

### Related concepts

“Controlling the analytic service” on page 70

You can control and query the analytic service required by IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center analytic server.

## Stopping the portal services

You can stop the portal services of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center portal server.

## About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center portal server to perform this task.

## Procedure

1. Navigate to the WebSphere Application Server administrative console at the following URL:

`https://host:port/ibm/console`

Where *host* is the location of your IBM Intelligent Operations Center portal server and *port* is the SSL port for the console. For example:

`https://server.domain.com:10032/ibm/console`

2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.



4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the following services that are required by the solution.
  - **water\_common\_services\_ear**
  - **water\_usage\_portlet\_ear**
  - **water\_usage\_services\_ear**
  - **water\_workorder\_portlet\_ear**
  - **water\_workorder\_services\_ear**

To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.

7. Select the check box located next to the services you would like to stop.
8. On the action panel at the top of the table, click **Stop**.

## Results

After a few seconds, a message is displayed at the top of the page providing details on whether the stop request was successful.

## What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

## Querying the portal services

You can query the status of the portal services of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center portal server.

## About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center portal server to perform this task.

## Procedure

1. Navigate to the WebSphere Application Server administrative console at the following URL:  
`https://host:port/ibm/console`  
Where *host* is the location of your IBM Intelligent Operations Center portal server and *port* is the SSL port for the console. For example:  
`https://server.domain.com:10032/ibm/console`
2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.
4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the following services that are required by the solution.
  - **water\_common\_services\_ear**
  - **water\_usage\_portlet\_ear**
  - **water\_usage\_services\_ear**
  - **water\_workorder\_portlet\_ear**
  - **water\_workorder\_services\_ear**

To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.

7. View the **Status** column in the table for each of the services required by the solution.

## Results

The status column on the row of the service displays a status icon indicating the status. Hover the mouse over the status icon for more information about that status.

- A **green arrow** indicates that the service is running.
- A **red x** indicates that the service has stopped.
- A **question mark** indicates that the service status is unknown.

## What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

## Controlling the analytic service

You can control and query the analytic service required by IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center analytic server.

### Related tasks

“Starting the portal services” on page 67

You can start the portal services of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center portal server.

## Starting the analytic service

You can start the analytic service of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center analytic server.

## About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center analytic server to start the **water\_analytic\_services\_ear** analytic service.

## Procedure

1. Navigate to the WebSphere Application Server administrative console at the following URL:  
`https://host:port/ibm/console`  
Where *host* is the location of the IBM Intelligent Operations Center analytic server and *port* is the SSL port for the console. For example:  
`https://server.domain.com:10032/ibm/console`
2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.
4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the **water\_analytic\_services\_ear** analytic service. To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.
7. Select the check box located next to the **water\_analytic\_services\_ear** service.
8. On the action panel at the top of the table, click **Start**.

## Results

The status column on the row of the **water\_analytic\_services\_ear** service displays a status icon indicating the status. Hover the mouse over the status icon for more information about that status.

- A **green arrow** indicates that the service is running.
- A **red x** indicates that the service has stopped.
- A **question mark** indicates that the service status is unknown.

## What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

## Stopping the analytic service

You can stop the analytic service of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center analytic server.

## About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center analytic server to perform this task.

## Procedure

1. Navigate to the WebSphere Application Server administrative console by using the following URL:

```
https://host:port/ibm/console
```

Where *host* is the location of the IBM Intelligent Operations Center analytic server and *port* is the SSL port for the console. For example:

```
https://server.domain.com:10032/ibm/console
```

2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.
4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the **water\_analytic\_services\_ear** analytic service. To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.
7. Select the check box located next to the **water\_analytic\_services\_ear** service.
8. On the action panel at the top of the table, click **Stop**.

## Results

After a few seconds, a message is displayed at the top of the page providing details on whether the stop request was successful.

## What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

## Querying the analytic service

You can query the status of the analytic service of IBM Work Optimization for Water Utilities from the IBM Intelligent Operations Center analytic server.

## About this task

Use the WebSphere Application Server administrative console running on the IBM Intelligent Operations Center analytic server to perform this task.

### Procedure

1. Navigate to the WebSphere Application Server administrative console at the following URL:  
`https://host:port/ibm/console`  
Where *host* is the location of the IBM Intelligent Operations Center analytic server and *port* is the SSL port for the console. For example:  
`https://server.domain.com:10032/ibm/console`
2. Enter the **User ID** and **Password** of the portal administrator, such as `wpsadmin` or another user who is a member of the `wpsadmins` portal group.
3. Expand the **Applications** menu.
4. Expand the **Application Types** submenu.
5. Select **Business applications**. A table is displayed containing a list of all services.
6. Scroll down the list and locate the `water_analytic_services_ear` analytic service. To sort the list of services by name, in ascending or descending alphabetic order, click the **Name** column heading.
7. Select the check box located next to the `water_analytic_services_ear` service.
8. View the **Status** column for the `water_analytic_services_ear` service.

### Results

The status column on the row of the `water_analytic_services_ear` service displays a status icon indicating the status. Hover the mouse over the status icon for more information about that status.

- A **green arrow** indicates that the service is running.
- A **red x** indicates that the service has stopped.
- A **question mark** indicates that the service status is unknown.

### What to do next

To exit the WebSphere Application Server administrative console, click **Logout**.

---

## Querying the status of the database servers

Use the IBM Intelligent Operations Center **IOControl** script to determine the status of the servers that provide the databases required by IBM Work Optimization for Water Utilities.

### Before you begin

For more information about the **IOControl**, see the IBM Intelligent Operations Center Information Center.

### Procedure

1. On the IBM Intelligent Operations Center event and management server, navigate to the directory where the **IOControl** script is located, as follows:  
`cd /opt/IBM/ISP/mgmt/scripts/`
2. Run the following **IOControl** script command for each database server instance that you would like to query:  
`./IOControl.sh status server_ID password`  
Where *server\_ID* is the name of the server instance.

Where *password* is the password for the IBM Intelligent Operations Center administrator, for example *icpadmin*, that was defined when the IBM Intelligent Operations Center was deployed.

For example:

- To check the status of the DB2 Enterprise server for Runtime server instance, which contains the WATERDB database, run the command:  
`./IOCControl.sh status db24rt password`
- To check the status of the LDAP database server instance, run the command:  
`./IOCControl.sh status db24core password`
- To check the status of the DB2 Enterprise Server Edition for WebSphere Portal Extend server instance, run the command:  
`./IOCControl.sh status db24pe password`
- To check the status of the IBM Integrated Information Core model component server instance, run the command:  
`./IOCControl.sh status db24mih password`
- To check the status of the Tivoli Identity Manager server instance, run the command:  
`./IOCControl.sh status db24tim password`
- To check the status of the Cognos reports database server instance, run the command:  
`./IOCControl.sh status db24cognos password`

## Results

Servers that are started display **[on]**. Servers that are not started display **[off]**.

### Related information

Getting help for the IOCControl command

Querying the status of the IBM Intelligent Operation Center servers

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## Maintaining the solution

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

### Modifying production data

IBM Work Optimization for Water Utilities uses metadata and customer account data loaded into the product during processing. Production data is initially loaded after installation. Metadata can be added and customer account data added or changed as needed.

#### Related concepts

“Customer production data” on page 140

IBM Work Optimization for Water Utilities provides sample data for testing. This data must be replaced with data appropriate to the production environment.

#### Related tasks

“Loading organization metadata” on page 27

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

“Loading customer account data” on page 28

IBM Work Optimization for Water Utilities requires data on customer accounts. This information includes customer account numbers, the customer type, and location information.

### Modifying organization metadata

Over time you might need to modify the organizational metadata used by IBM Work Optimization for Water Utilities.

## Before you begin

### CAUTION:

These steps replace all the metadata defined in IBM Work Optimization for Water Utilities. To avoid errors in your IBM Work Optimization for Water Utilities production environment, always use the latest copy of the files loaded into IBM Work Optimization for Water Utilities to make changes and keep copies of update files to be used when making future changes. Starting with files that are different from the files loaded into IBM Work Optimization for Water Utilities can cause errors in your production environment.

The data specific for your organization is defined in a series of comma-separated value files. See the referenced topic for the format of these files. The files are:

#### **cust\_type.csv**

Defines customer types used to group similar customers.

#### **asset\_type.csv**

Defines types of entities requiring work.

#### **work\_type.csv**

Defines types of work to be done on assets.

#### **cause.csv**

Defines types of problems needing resolution.

#### **failure.csv**

Defines failure categories.

#### **problem.csv**

Defines problem classifications.

#### **remedy.csv**

Defines problem resolution categories.

#### **status.csv**

Defines work order status codes.

Edit the files currently loaded into your system and add any new metadata to the end of the appropriate file. Do not change or sort the other lines or add data in between existing lines. All changes or additions must be made as new lines at the end of the file.

## Procedure

1. Copy the CSV files to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory on the IBM Intelligent Operations Center database server.
2. If the file was edited on a system that is not running Linux, run **dos2unix** on the file after copying it to the server.
3. On the IBM Intelligent Operations Center database server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory and run the follow command as the DB2 administrator:  

```
./metaLoad
```

## Results

The data contained in the CSV files replaces all existing organization data in your IBM Work Optimization for Water Utilities system.

### **Related reference**

“Customer types” on page 142

Customer types categorize customers. For example, a residential customer or a corporate customer.

“Asset types” on page 143

Asset types are the type of entity requiring work. For example, a valve or sump pump.

“Failure types” on page 144

Failure type describes what has failed. For example, a fire hydrant or sewer inlet.

“Problem codes” on page 146

Problem codes are the formal classification of the reported problem. For example, a seal failure or required repair.

“Problem causes” on page 152

Problem causes describe what caused the problem or failure. For example, a broken pipe or meter.

“Problem remedies” on page 156

Problem remedies describe how a problem was fixed. For example, if a pipe is flushed or replaced.

“Work types” on page 159

Work types describe the type of work that was, or will be, performed. For example, testing or maintenance.

“Status types” on page 162

Status types describe the status of a work order. For example, completed, held, or dispatched.

### **Adding customer account data**

Over time you might need to add information about new customers to IBM Work Optimization for Water Utilities.

### **Before you begin**

Define the customer account information to be added in a file named `customer.csv`. See the referenced topic for the format of this file.

### **Procedure**

1. Copy the `customer.csv` file to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory on the IBM Intelligent Operations Center database server.
2. If the file was edited on a system that is not running Linux, run **dos2unix** on the file after copying it to the server.
3. On the IBM Intelligent Operations Center database server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory and run the follow command  
`./customerload`

### **Results**

The data contained in `customer.csv` will be added to the customer account data in your IBM Work Optimization for Water Utilities system.

### **Related reference**

“Customer account information” on page 140

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

### **Replacing customer account data**

Over time you might need to replace the customer information loaded into IBM Work Optimization for Water Utilities.

## Before you begin

Define the customer account information appropriate for your organization in a file named `customer.csv`. See the referenced topic for the format of this file.

## Procedure

1. Copy the `customer.csv` file to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory on the IBM Intelligent Operations Center database server.
2. If the file was edited on a system that is not running Linux, run `dos2unix` on the file after copying it to the server.
3. On the IBM Intelligent Operations Center database server, change to the `/opt/IBM/iss/intelligentWater/workOptimization/script` directory and run the follow command as the DB2 administrator:  
`./customerload replace`
4. The `/opt/IBM/iss/intelligentWater/workOptimization/script/customer.log` contains information about `customerload` processing. Review this log to determine whether there were any problems when running the command.

## Results

The data contained in `customer.csv` replaces all existing customer account data in your IBM Work Optimization for Water Utilities system.

### Related reference

“Customer account information” on page 140

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

## Loading and refreshing new report data

The reports of IBM Work Optimization for Water Utilities must be refreshed every time new customer data is loaded into the solution. For optimum performance, the data used to generate the reports is cached locally. When new data is loaded into the database, you must refresh the reports from the IBM Intelligent Operations Center portal server using the IBM Cognos Connection portal, before the newly loaded data is visible in the solution interface.

## About this task

If you have Portal Administrator access permissions, you can perform the following procedure to load the report data from the database into the reports. For more information about the report settings, click **Help** on the **Set properties** bar at the top of the IBM Cognos Connection portal.

## Procedure

1. Log on to the IBM Intelligent Operations Center portal server as the Portal administrator, for example, `wpsadmin` or another user who is a member of the `wpsadmins` portal group.

`https://portalserver:port/cognos/ServletGateway/servlet/Gateway`

Where `portalserver` is the hostname of the IBM Intelligent Operations Center portal server, and where `port` is the SSL port number for the console, for example:

`https://server.domain.com:9083/cognos/ServletGateway/servlet/Gateway`

The IBM Cognos Connection portal is loaded.

2. On the main navigation bar click **Launch**.
3. Click **Report Studio**. A new browser window opens.
4. Click the reports directory titled **Intelligent\_Water**. The IBM Cognos Report Studio client is loaded.
5. Click **Open Existing**.



6. Select the report that you would like to refresh and click **Open**.
7. In the **Insertable Objects** dialog, click the **Refresh** icon to refresh the package tree.
8. Click **Save**.
9. Click **File** and then **Exit**.

## Results

The Reports portlets are updated to contain graph reports that display the most recent data that is loaded into the solution. Users must refresh the browser page to see the new report data.

## Running the operational metrics script

You can run a script to perform self audits to ensure that you are within the recommended usage limits of IBM Work Optimization for Water Utilities. Running the operational metrics script helps you to determine how your solution is currently being used.

### About this task

On the IBM Intelligent Operations Center database server, run the **water\_metrics** shell script to calculate the operational metrics. The script connects to the database of the solution and calculates the following values:

- Work orders processed into a schedule during a given time period
- Customer accounts in the database when the script is run

### Procedure

1. Log on to the IBM Intelligent Operations Center database server as the database administrator.
2. Change to the following directory:  
`/opt/IBM/iss/intelligentWater/workOptimization/scripts/`
3. Run the **water\_metrics** script.

The format of the **water\_metrics** script is:

```
./water_metrics Start date and time End date and time
```

Where:

- *Start date and time* is in the format `yyyy-mm-dd-hh.mm.ss`
- *End date and time* is in the format `yyyy-mm-dd-hh.mm.ss`

### Results

The number of customer accounts in the database, and the number of work orders scheduled during the time period specified, are output to the console.

### Example

The following is an example command which produces the operational usage metrics for the month of December 2011.

```
./water_metrics 2011-12-01-00.00.00 2011-12-31.23.59.59
```

```
NUMBER OF ACCOUNTS:25,454
```

```
NUMBER OF SCHEDULED WORK ORDERS:55,356
```

The following is an example command which produces the operational usage metrics for the year 2011.

```
./water_metrics 2011-01-01-00.00.00 2011-12-31.23.59.59
```

```
NUMBER OF ACCOUNTS:54,172
```

```
NUMBER OF SCHEDULED WORK ORDERS:620,921
```

## Tuning performance

You can enhance the performance of the product after you have completed the installation.

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

## Backing up data

To prevent the loss of valuable data in IBM Work Optimization for Water Utilities, back up certain files, directories, and databases.

Ensure that the IBM Work Optimization for Water Utilities database used to store production data and information generated by the solution, is backed up on a regular basis.

Database name	Location	Format
WATERDB	IBM Intelligent Operations Center database server	DB2

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 links.

### Related information

Backing up the IBM Intelligent Operations Center

## Maintenance tips

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

The following link launches a customized query of the live Support knowledge base for IBM Work Optimization for Water Utilities:

<http://www.ibm.com/support/search.wss?tc=SSDNSK&q=maintain>

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## Chapter 7. Using the solution interface

IBM Work Optimization for Water Utilities is a product of the IBM Intelligent Water Family that provides work optimization and water usage information and analytics. IBM Work Optimization for Water Utilities is a web-based solution that uses portal technology. You can access the solution with any of the supported web browsers.

For details of which browsers are supported, see the detailed system requirements.

---

### Logging on

Log on to access the IBM Work Optimization for Water Utilities 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 will supply you with the web address (URL) for accessing the solution.

#### About this task

On the main navigation bar at the top of the portal, click **More...** and select **Intelligent Water** to access the solution from the IBM Intelligent Operations Center or other IBM Smarter Cities Software Solutions installed in this environment. Or you can use the following procedure to start a new browser session and access IBM Work Optimization for Water Utilities.

#### Procedure

1. Enter the web address URL into the address field of your web browser.
2. On the server home page, enter your user ID and password.
3. Click **Log In**.
4. Select **Intelligent Water** from the navigation bar at the top of the portal.

#### Results

The home page of IBM Work Optimization for Water Utilities 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 additional access.

#### Related tasks

“Logging off”

Log off to exit the IBM Work Optimization for Water Utilities user interface.

“Viewing or editing your user profile” on page 80

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 IBM Work Optimization for Water Utilities user interface.

## Procedure

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

### Related tasks

“Logging on” on page 79

Log on to access the IBM Work Optimization for Water Utilities user interface.

---

## Using the map controls

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

### The map controls are on the upper left side of the map

The map controls are located on the upper left side of the map. They consist of:

1. Pan arrows (up, down, left, right)
2. Zoom in
3. World view (maximizes out the zoom)
4. Zoom out

### Pan controls for moving around the map

To move around the map you can:

- 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 seeing a more or less detailed view

To zoom in and out of the map you can:

- 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

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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

Refer to 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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## Usage Analysis view

The Usage Analysis Account Segmentation view of IBM Work Optimization for Water Utilities provides a visual representation of water usage statistics in the water authority region.

From the Usage Analysis Account Segmentation view, you can perform several actions including:

- Query water usage statistics
- View customer information and associated water usage statistics on a geographical information system (GIS) map and accompanying table
- Navigate around the GIS map to identify trends and usage patterns
- View graphical reports summarizing the results of the water usage query
- View individual customer account details including water usage information
- Analyze water usage statistics

This information is useful for analyzing customer demands and identifying trends and supply vulnerabilities. It can also be used for forecasting future water usage demands.

The Usage Analysis Account Segmentation view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another.

*Table 11. Usage Analysis Account Segmentation portlets*

Portlet	Description
"Account Map" on page 82	Use the Account Map portlet on the Usage Analysis Account Segmentation view to query customer accounts and see a visual geographical report of where they are located and how much water they are consuming. This information is useful for identifying spatio-temporal patterns in water usage and forecasting future demands.
"Account List" on page 85	Use the Account List portlet on the Usage Analysis Account Segmentation view to see a structured view of customer accounts that are being displayed on the map. This is useful for analyzing specific customer accounts in more detail and determining how much water they have used.
"Reports - Based on Account List" on page 88	Use the Reports - Based on Account List portlet to see a summary of customer water usage based on the query submitted from the Account Map portlet on the Usage Analysis Account Segmentation view.

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**.

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

## Related concepts

“Usage Analysis” on page 3

A water utility can use the Usage Analysis feature of IBM Work Optimization for Water Utilities to better analyze water usage in order to forecast future water usage.

## Account Map

Use the Account Map portlet on the Usage Analysis Account Segmentation view to query customer accounts and see a visual geographical report of where they are located and how much water they are consuming. This information is useful for identifying spatio-temporal patterns in water usage and forecasting future demands.

The Account Map portlet is the starting point for interaction with the Usage Analysis Account Segmentation view. It contains a geographical information system (GIS) map of the water region, providing a visual representation of water usage. From the map, you can query water usage over a specified time by:

- Customer account ID
- Customer type (for example, residential, commercial, or municipal)
- Segment or extremes
- All customers
- Geographical location

The customer accounts are plotted on the map and listed in the Account List portlet. Customer account details can also be viewed from the map. The Account List portlet is updated by the query submitted from the map. The Reports - Based on Account List portlet also updates providing a graphical summary of water usage based on the selected query.

The results of a query can be refined further using the Account Map and Account List portlets to deselect specific customer accounts or a geographical area that you are not interested in. By selecting and deselecting results you can inspect specific items on the map or sort the list to determine what selected items have in common.

## Selecting content on the map and associated reports using filtering

Customer accounts can be selected in the Account Map portlet by specifying filter criteria using the filter form that is superimposed over the map.

### About this task

The map displays the default geographical location configured by your administrator. Contact your administrator if you need to change the default starting location for the Usage Analysis Account Segmentation view of the system.

### Procedure

1. On the Account Map portlet click **Select Content**.
2. Select the type of query you would like to make.
  - To view water usage for one specific customer account, select **Examine a specific account** and enter the customer account ID.
  - To view water usage for all customers, select **Look for trends among accounts**. By default, all customer types are included in the query.
  - To view water usage for all customers by type, select **Look for trends among accounts** and choose one or more types of customer account to view.

**Note:** To select multiple customer types, press Ctrl as you click each item. To clear a customer type from your selection, press Ctrl and click the item again.

3. Select a segment from the **Analyze accounts in the segment** list. For example, you can look at the top 10% of users based on the metric specified in the next step. This selection is not required if querying one specific customer account.
4. In the **Based on the metric** field, choose the water consumption metric for the query. The  $y$  axis of the graph report is computed by using the value selected.
5. In the **When** section, specify the time period of the report by completing either step a or b.
  - a. Select a predefined time period for the usage report in the **Include data from** field.

**Note:** Selecting **The last full month** generates water usage statistics from the start to the end of the previous calendar month. Whereas selecting **The past month** generates water usage statistics from the last 30 days. The same calculation applies to the equivalent options for week, quarter, and year.

- b. Enter a start and end date for the usage report in the **From date** selection field.
6. Select the statistical analysis frequency in the **Summarize by** field. The  $x$  axis of the graph report is computed by using the value selected. Some options are not selectable, depending on the selected time period for the query.
  7. To submit the query, click **OK**.
  8. Click **OK** to confirm the selections and update the map.

## Results

The customer account details meeting the specified criteria are displayed in the Account Map portlet and the Account List portlet. The Reports - Based on Account List portlet also updates to display a graph summary of customer water usage statistics based on the selected criteria.

## Selecting content on the map using a polygon

Customer accounts within a geographical area can be selected on the map by outlining them with a polygon.

### Before you begin

Before you can draw a polygon on the map, you must first click **Select Content** to submit a query.

### Procedure

1. Right-click the Account Map.
2. Click **Draw Polygon**.
3. Click the map at the location where you want the first point of the polygon to be.
4. Continue clicking locations on the Account Map to create additional polygon points.
5. To finalize the polygon, double-click the map.

**Note:** A polygon cannot be modified. If the polygon does not include the required work orders, you can start again and create a new polygon.

## Results

The customer accounts contained within the polygon are selected and included in the Account List. The Reports - Based on Account List portlet remains unchanged. The Reports - Based on Account List portlet only updates after updating or creating a new query by using the filter selection form.

## Viewing customer account details

From the map you can also view the details of a customer account and their water usage statistics.

### Before you begin

First you must submit a water usage query in the Account Map portlet to display content on the map and in the list.

### About this task

You can review the basic details of the specific customer account by hovering on the account's icon on the map. You can also view the full customer account details by viewing its **Properties** on the map or in the list.

### Procedure

1. On the Account Map portlet, click **Select Content**.
2. Use the filter form to specify what customer accounts or water usage statistics you are interested in.
3. Find an individual customer account that you would like to view on the map or the list: Use the map controls to pan or zoom closer to the location of the customer account you are interested in so that the customer account icon is visible.
4. Either:
  - Click the customer account icon on the map and select **Properties**.
  - Click any column on the row in the list, and then right-click and select **Properties**.

### Results

The **Account Properties** dialog is displayed with the customer's information such as the account number, customer name, customer type, physical location, and water usage.

### What to do next

To close the **Account Properties** dialog, click **Done**.

## Using the map controls

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

### The map controls are on the upper left side of the map

The map controls are located on the upper left side of the map. They consist of:

1. Pan arrows (up, down, left, right)
2. Zoom in
3. World view (maximizes out the zoom)
4. Zoom out

### Pan controls for moving around the map

To move around the map you can:

- 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 seeing a more or less detailed view

To zoom in and out of the map you can:

- 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 map

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

### Procedure

1. On the Account 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.

## Configuring the map

### Administrator

If you are a Water Utility IT Administrator you can configure the geographical information system (GIS) map that IBM Work Optimization for Water Utilities uses and displays in the portlet. You can also choose the starting location of the map.

To configure the map:

1. Log on to the solution portal as a Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. Click **Configure**.

**Note:** Only the Water Utility IT Administrator can view and select this option.

4. To configure the base map, select the **Base Maps** tab. Complete the required configuration.
5. To configure the **Center Point and Zoom Level** for the map, select the **Map Settings** tab. Complete the required configuration.
6. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and select **Back**.

For more information about this subject, see the **Customizing the solution** section of the IBM Intelligent Water Family: Work Optimization Information Center

## Account List

Use the Account List portlet on the Usage Analysis Account Segmentation view to see a structured view of customer accounts that are being displayed on the map. This is useful for analyzing specific customer accounts in more detail and determining how much water they have used.

The Account List portlet is an interactive table. The table is populated with customer account information after you select content to view on the map. The customer accounts are plotted on the map and listed in the Account List portlet. Selections made in the Account List portlet updates the map.

The table in the Account List portlet consists of the following columns of customer account information:

- Account
- Usage
- Type
- Postal code
- Customer name
- Address
- Country
- Latitude
- Longitude

From the Account List portlet, you can:

- Select customer accounts
- Deselect customer accounts
- Sort customer accounts
- View customer account details

The Account List portlet is updated when you submit a query from the map.

## Selecting information to display in the Account List

Use the Account Map portlet to choose the customer details to view in the Account List portlet, which provides a more detailed view than the map.

### About this task

The Account List portlet is populated based on your choices in the selection form in the Account Map portlet.

### Procedure

1. On the Account Map portlet click **Select Content**.
2. Use the filter form to specify what customer accounts or water usage statistics you are interested in.
3. Click **OK** to confirm the selections and update the map.

### Results

The Account List portlet displays a list of all customer accounts that match the criteria of the query and are being displayed on the map. Use the scroll bar to view all columns in the table.

**Note:** If you enter an invalid customer account ID, no content is displayed in the list or on the map.

## Sorting the list

Sorting the list is useful for navigating through long lists of customer accounts returned by a query. You can sort the customer accounts in the Account List portlet table clicking the column heading. For example, click the **Usage** column heading to sort the customer accounts by water usage. Or, click the **Type** column heading to view customer accounts by customer type.

The list is sorted in alphabetic or numeric order depending on the information type that is being sorted. Click the column heading again to toggle between ascending and descending sorting.

The list can be sorted by one column value at a time.

## Selecting customer accounts in the list

You can select one or more customer accounts that you are interested in from the list of customer accounts returned by a query. Selecting a customer account from the Account List portlet highlights the account on the map. This is useful for identifying the geographical location of a customer account and its proximity to other customer accounts.

### About this task

To select all accounts, double-click the first column heading of the table in the Account List portlet. Double-click again to clear all selected items in the list. Alternatively, use the following steps to select individual items in the list.

### Procedure

1. On the Account Map portlet click **Select Content**.
2. Use the filter form to specify what customer accounts or water usage statistics you are interested in.
3. From the Account List portlet, find one or more customer accounts that you are interested in. You can sort the list to help navigate to those accounts.
4. Click the check box to select each customer account in the list.

### Results

The selected customer accounts are highlighted in the Account List. The selected customer accounts are also highlighted on the map to distinguish those accounts from the other accounts returned in the query.

**Note:** Your list selection does not update the report portlet. The report portlet is only updated when you submit a new query by clicking **Select Content**.

## Viewing customer account details

Use the Account List portlet to view the **Account Properties** of a customer account.

### Before you begin

First you must submit a water usage query in the Account Map portlet to display content on the map and in the table in the Account List portlet.

### Procedure

1. On the Account Map portlet click **Select Content**.
2. Use the filter form to specify what customer accounts or water usage statistics you are interested in.
3. Find an individual customer account that you would like to view in the Account List portlet.
4. Click any column on the row in the table to select the customer account.
5. Right-click and select **Properties**.

### Results

The **Account Properties** dialog displays information about the customer account such as the account number, customer name, customer type, physical location, and water usage.

## What to do next

To close the **Account Properties** dialog, click **Done**.

## Reports - Based on Account List

Use the Reports - Based on Account List portlet to see a summary of customer water usage based on the query submitted from the Account Map portlet on the Usage Analysis Account Segmentation view.

The Reports - Based on Account List portlet displays a visual water consumption report based on the customer account information currently being viewed on the map. The Reports - Based on Account List portlet is useful for:

- Analyzing water consumption over a given time period
- Identifying seasonal and other trends

The Reports - Based on Account List portlet displays either a graph or table summarizing the water usage statistics for:

- All customers
- A selection of customers based on the query submitted
- A single customer account

After submitting a query from the Account Map portlet, a graph summarizing the water usage statistics is displayed.

## Displaying a graph summary of water usage

To display a water usage summary graph, on the Account Map portlet, click **Select Content** and submit a water usage query based on any of the following metrics:

- Total usage
- Average usage
- Minimum usage
- Peak usage
- Seasonal usage ratio

After submitting a query, the results are displayed on the map and list. A graph that summarizes the water consumption of the customers on the map and list is also computed.

*Table 12. The axis of the graph report*

Axis	Description
<i>x</i>	Computed by using the time period selected in the <b>When</b> section on the filter form. The graph displays statistics available during the period specified in the query. The sampling frequency of the graph is plotted by using the selected <b>Summarize by</b> field of the query. If you would like the system to choose the sampling frequency that best suits the time period of the current query, select <b>Choose for me</b> in the <b>Summarize by</b> field.
<i>y</i>	Computed by using the metric selected in the <b>Based on the metric</b> field on the filter form.

When you hover over a bar on the graph, or a column on the table, the water usage amount is displayed.

**Note:** The results displayed in the Reports - Based on Account List are generated independently from the statistics in the Account List portlet. In some instances the water usage figures displayed in the list and graph report may not be identical. This is because the water usage statistics are summarized differently in the Reports - Based on Account List portlet.

The graph updates when a new query is submitted from the Account Map portlet by clicking **Select Content**. The Reports - Based on Account List portlet does not update when you select or deselect accounts from the query results in the Account Map or Account List portlets.

The graph report data can be seen in a tabular form by scrolling down from the graph. The table is an accessibility feature of the Reports portlet. Your administrator needs to enable accessibility in the reports configuration portal to enable the table to display.

## Displaying a table summary of seasonal usage ratios

You can view a table summarizing the seasonal usage ratio of an individual customer, customer accounts of a specific type, or all customer accounts.

To display a table showing the seasonal usage ratio, go to the Account Map portlet, click **Select Content** and submit a water usage query based on the metric **Seasonal usage ratio**.

Each row in the table corresponds to a single customer. If only one customer is selected, there is only one row of information in the table. The table summary includes the following information about every customer account returned in the query results:

*Table 13. The seasonal usage ratio summary table*

Table column heading	Contains...
Account	Customer account number
Type	Customer account type, such as residential, commercial, or municipal
Location	Address details of the customer account location
Ratio	Seasonal water usage ratio figure for the selected time period

## Querying water usage

To query water usage statistics, use the Usage Analysis Account Segmentation view.

Table 14 shows the different types of water usage query you can make by using the Account Map portlet on the Usage Analysis Account Segmentation view.

*Table 14. Types of water usage query.*

Query by...	Provides
Customer account	Historical water usage information of a specified customer over a time period. The water consumption of the customer and statistical trends over the defined time period are displayed on a graph. The geographical location of the selected customer is plotted on the map. The main customer account details are also displayed when you hover over the customer icon on the map.

Table 14. Types of water usage query. (continued)

Query by...	Provides
Customer account type	Historical water usage information of a specified customer type, such as residential, commercial, or municipal. The water consumption statistics for all customer accounts of this customer type are computed on a graph. These statistics can be filtered further. The geographical locations of all customer accounts of this type are plotted on the map.
All customer accounts	Water usage statistics for all customers within the water authority region over a selected time period. The total water consumption statistics for all customer accounts combined are included in this query.
Segment	Segmented or extreme water usage patterns over a specific time period. For example the top 2 percent of water consumers. Or the top 5 percent of water consumers. There are several segments to select, as defined by the water agency. These segments can be filtered further by customer type. For example you can query the top 5 percent of customers summarized by customer account type.
Geographical location	Historical water usage information of a specific geographical area useful for analyzing spatial-temporal patterns of water consumption. The list updates to reflect the customer accounts within the selected spatial area.

## Querying water usage by customer account

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve historical water usage information for a specific customer account.

### Before you begin

To submit a water usage query for a specific customer account, you will need the customer account ID.

### About this task

You can request a water usage report for a specific account, based on their minimum, average, peak, or total consumption over a defined time period.

### Procedure

1. Open the Usage Analysis Account Segmentation view on the main solution navigation bar.
2. On the Account Map portlet, click **Select Content**.
3. In the **Who** section, select **Examine a specific account**.
4. Enter the account ID of the customer account that you would like to analyze.
5. In the **Based on the metric** field, choose the water consumption metric for the query. The *y* axis of the graph report is computed using the value selected.
6. Specify the time period of the report, in the **When** section, by completing either step a or b.
  - a. Select a predefined time period for the usage report in the **Include data from** field.
  - b. Enter a start and end date for the usage report in the **From date** selection field.
7. Select the statistical analysis frequency in the **Summarize by** field. The *x* axis of the graph report is computed using the value selected.

**Note:** Using **Choose for me** is recommended to avoid incompatible combinations.

8. To submit the query, click **OK**.

## Results

Based on your selections, the map and list are updated with the latest water usage statistics available. The Reports - Based on Account List portlet also displays a graph report showing a water usage summary of the selected customer account, based on the selected metric, analysis frequency, and time period.

## What to do next

You can view further details about the selected customer. See the related links for more information.

### Related tasks

“Viewing customer account details” on page 94

Use the Account Map portlet or the Account List portlet on the Usage Analysis Account Segmentation view to display the **Account Properties** of a customer account.

## Querying water usage by customer account type

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve historical water usage information by customer account type. This is useful for forecasting water usage and analyzing patterns in water usage, such as exploring differences in trends among residential versus commercial customers.

## About this task

You can query water usage statistics by a specific account type, multiple account types, or all account types. The query can be based on the minimum, average, peak, or total water consumption over a defined time period. A percentage of customers, for example, the top 1%, can be selected with the data displayed by account type.

## Procedure

1. Open the Usage Analysis Account Segmentation view on the main solution navigation bar.
2. On the Account Map portlet, click **Select Content**.
3. Select **Look for trends among accounts**.
4. In the **Limit results to** list, select a customer account type. To select multiple customer account types, press Ctrl while you click.
5. Optional: Select a segment from the **Analyze accounts in the segment** list. For example, the top 1% of the selected accounts.
6. In the **Based on the metric** list, choose the water consumption metric for the query. The *y* axis of the graph report is computed by using the value selected.
7. In the **When** section, specify the time period of the report by completing either step a or b.
  - a. Select a predefined time period for the usage report in the **Include data from** field.
  - b. Enter a start and end date for the usage report in the **From date** selection field.
8. Select the statistical analysis frequency in the **Summarize by** field. The *x* axis of the graph report is computed using the value selected.

**Note:** Using **Choose for me** is recommended to avoid incompatible combinations.

9. To submit the query, click **OK**.

## Results

Based on your selections, the map and list are updated with the latest water usage statistics available. The Reports - Based on Account List portlet also displays a graph report showing a visual summary of the water statistics for the selected customer account types. The graph is based on the selected metric, analysis frequency, and time period of the submitted query.

## What to do next

You can refine the results further by:

- Drawing a polygon on the map to filter the accounts by a specific geographical location.
- Using the Account List portlet to clear specific accounts that you do not want to display on the map.

**Note:** The Reports - Based on Account List portlet updates when you **Select Content** to update or submit a new query.

## Querying water usage by all customer accounts

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve historical water usage by all customer accounts. This is useful for analyzing and forecasting total water usage in the water utility region.

### About this task

You can query the average, peak, minimum, or total water usage by all customer accounts over a defined time period. You can also filter the query by selecting segments of the data, such as the top 1% of all customer accounts.

### Procedure

1. Open the Usage Analysis Account Segmentation view on the main solution navigation bar.
2. On the Account Map portlet, click **Select Content**.
3. Select **Look for trends among accounts**.
4. Do not select a customer type in the **Limit results to** list. To clear a customer type that is already selected, press Ctrl and click the item.
5. Optional: Select a segment from the **Analyze accounts in the segment** list. For example, the top 1% of the selected accounts.
6. In the **Based on the metric** field, choose the water consumption metric for the query. The  $y$  axis of the graph report is computed by using the value selected.
7. In the **When** section, specify the time period of the report by completing either step a or b.
  - a. Select a predefined time period for the usage report in the **Include data from** field.
  - b. Enter a start and end date for the usage report in the **From date** selection field.
8. Select the statistical analysis frequency in the **Summarize by** field. The  $x$  axis of the graph report is computed by using the value selected. Some options are not selectable, depending on the selected time period for the query.
9. To submit the query, click **OK**.

### Results

Based on your selections, the map and list are updated with the latest water usage statistics available for all customers. The Reports - Based on Account List portlet also displays a graph report showing a visual summary of the water statistics for all customer accounts. The graph is based on the selected metric, analysis frequency, and time period of the submitted query.

## What to do next

You can distinguish between selected and deselected results by:

- Drawing a polygon on the map to filter the accounts by a specific geographical location.
- Using the Account List portlet to clear specific accounts that you do not want to display on the map.



**Note:** The Reports - Based on Account List portlet updates when you **Select Content** to update or submit a new query.

## Querying water usage by segment

Use the Account Map portlet on the Usage Analysis Account Segmentation view to query water usage by segments and extremes. This is useful for analyzing patterns in water usage and identifying which customer accounts consume the most or least water during a specified time period.

### About this task

You can query water usage statistics by segment to view extreme water consumption across all customer accounts. For example, you can query the top 1% of all water consumers and identify which customers are using the most water during a given time period and metric. You can then determine of those top 1% of water consumers the different account types that are within the top 1%.

### Procedure

1. Open the Usage Analysis Account Segmentation view on the main solution navigation bar.
2. On the Account Map portlet, click **Select Content**.
3. Select **Look for trends among accounts**.
4. Do not select a customer type in the **Limit results to** list. To clear a customer type that is already selected, press Ctrl and click the item.
5. Select a segment from the **Analyze accounts in the segment** list. For example, you can look at the top 10% of users based on the metric specified in the next step.
6. In the **Based on the metric** field, choose the water consumption metric for the query. The *y* axis of the graph report is plotted by using the selected metric.
7. In the **When** section, specify the time period of the report by completing either step a or b.
  - a. Select a predefined time period for the usage report in the **Include data from** field.
  - b. Enter a start and end date for the usage report in the **From date** selection field.
8. Select the statistical analysis frequency in the **Summarize by** field. The *x* axis of the graph report is computed by using the value selected. Some options are not selectable, depending on the selected time period for the query.
9. To submit the query, click **OK**.

### Results

Based on your selections, the map and list are updated with the latest water usage statistics available for the selected segment. The Reports - Based on Account List portlet also displays a graph report showing a visual summary of the water usage statistics for the segment. The graph is based on the selected metric, analysis frequency, and time period of the submitted query.

### What to do next

You can distinguish between selected and deselected results by:

- Drawing a polygon on the map to filter the accounts by a specific geographical location.
- Using the Account List portlet to clear specific accounts that you do not want to display on the map.

**Note:** The Reports - Based on Account List portlet updates when you **Select Content** to update or submit a new query.

## Querying seasonal usage ratios

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve seasonal usage ratios for one or more customer accounts.

## Before you begin

To retrieve seasonal usage ratios for a specific customer account, you will need the customer account ID.

## About this task

A report of the accounts using the most water during the summer months can be requested for one or more accounts. Your Water Utility Supervisor or the Water Utility IT Administrator defines the summer and winter months.

## Procedure

1. Open the Usage Analysis Account Segmentation view on the main solution navigation bar.
2. On the Account Map portlet, click **Select Content**.
3. In the **Who** section, select a specific account or trend among accounts.
  - Select **Examine a specific account** and enter an account number if you want the seasonal usage ratio for the one account.
  - Select **Look for trends among accounts** if seasonal usage ratios are required for more than one account. You can limit results to one or more account type.
4. In the **Based on the metric** field, choose the **Seasonal usage ratio** metric.

**Note:** Values specified for the **When** section and **Reports** section are not used when creating the **Seasonal usage ratio** report.

5. To submit the query, click **OK**.

## Results

IBM Work Optimization for Water Utilities determines the ratio of summer to winter usage by dividing the summer usage by the winter usage. The Reports - Based on Account List portlet displays a table of selected accounts listed from highest to lowest ratio.

### Related tasks

“Implementing the seasonal usage ratio” on page 60

After setting which months are considered summer months and which are considered winter months in the Configuration tab, you must run a script to update the IBM Work Optimization for Water Utilities calculation ratios used for seasonal usage analysis.

“Configure Usage Analysis” on page 118

Use the Configure Usage Analysis portlet on the Usage Analysis Settings Configuration view to define the seasonal usage ratios for the Usage Analysis Account Segmentation reports. After defining the seasons in the configuration interface, you must run a script from the command line to update the ratios in the database.

## Viewing customer account details

Use the Account Map portlet or the Account List portlet on the Usage Analysis Account Segmentation view to display the **Account Properties** of a customer account.

## Before you begin

First you must submit a water usage query in the Account Map portlet to display content on the map and in the list.

## About this task

You can review the basic details of the specific customer account by hovering on the account's icon on the map. You can also view the full customer account details by viewing its **Properties** on the map or in the list.

## Procedure

1. On the Account Map portlet, click **Select Content**.
2. Use the filter form to specify what customer accounts or water usage statistics you are interested in.
3. Find an individual customer account that you would like to view on the map or the list: Use the map controls to pan or zoom closer to the location of the customer account you are interested in so that the customer account icon is visible.
4. Either:
  - Click the customer account icon on the map and select **Properties**.
  - Click any column on the row in the list, and then right-click and select **Properties**.

## Results

The **Account Properties** dialog is displayed with the customer's information such as the account number, customer name, customer type, physical location, and water usage.

## What to do next

To close the **Account Properties** dialog, click **Done**.

### Related tasks

“Querying water usage by customer account” on page 90

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve historical water usage information for a specific customer account.

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## Work Optimization view

The Work Optimization view of IBM Work Optimization for Water Utilities provides a visual representation of water operations management in the water authority region. Use this view to optimize and efficiently manage maintenance work associated with water management across a geographically dispersed infrastructure.

The Work Optimization view contains the following two sub views:

### Related concepts

“Work Optimization” on page 2

By using IBM Work Optimization for Water Utilities, a water utility can optimize and more efficiently manage work associated with water management across a geographically dispersed infrastructure.

## Work Order Map

Use the Work Order Map portlet to query work orders and see where the water issues are located geographically. This information can be used for optimizing work order schedules and for planning purposes.

The Work Order Map portlet is the starting point for interacting with the Work Optimization Scheduling and Reporting views. It contains a geographical information system (GIS) map of the water region, providing a visual representation of work orders. From the map, you can query work orders by:

- Asset type
- Work type

- Problem
- Status
- Priority

The Work Order Map portlet provides different results depending on the Work Optimization view you are in.

Table 15. Differences in the Work Order Map depending on the Work Optimization view.

View	Useful for...	Displays on the map...
Reporting	Analyzing work orders over a given time period	All work orders matching criteria submitted in the query. Query results are also reflected in the Work Order List and Reporting portlets.
Scheduling	Scheduling work orders and viewing: <ul style="list-style-type: none"> <li>• Unscheduled work orders</li> <li>• Scheduled work orders</li> <li>• Work schedules, including their routes, crews, and assigned work orders</li> </ul>	Scheduled and unscheduled work orders. Scheduled work orders assigned to the current schedules are automatically plotted on the map. Unscheduled work orders are displayed after submitting a work order query. You can choose to hide scheduled work orders on the map and only view unscheduled work orders. Unscheduled work order query results are also reflected in the Unscheduled Work Order List portlet.

## Selecting content to display on the map and in the list using the Select Content dialog

Work orders can be selected on the Work Order Map by using the **Select Content** dialog.

### Procedure

1. On the Work Order Map click **Select Content** to expand the content selection dialog.
2. Select criteria to identify the work orders that interest you. You can select multiple items in each of the lists available. Press **Ctrl** as you click each item. To clear an item, press **Ctrl** and click the item again.
3. Select the maximum **Priority** of work orders you are interested in. The default **Priority** values are numerically highest to lowest. For example, **Priority 5** is a higher priority than **Priority 1**. Selecting priority 5 includes all work orders that are priority 5 or less. Selecting priority 2 includes all work orders of that are priority 2 or less.
4. In the **Include data from** field, specify the timeframe of the query. You can select work orders in a specific date range or refer to a time period, for example **The last full month**.

**Note:** Selecting **The last full month** generates work orders from the start to the end of the previous calendar month. Whereas selecting **The past month** generates work orders from the last 30 days. The same calculation applies to the equivalent options for week, quarter, and year.

5. Select how to summarize the data when it is displayed as a chart in the Reporting portlet. **Summarize by** determines how the Reporting portlet bar graphs are grouped, for example, by day, month, quarter, or year. If **Choose for me** is selected, IBM Work Optimization for Water Utilities decides how to group the data. The system groups the data in units one less than the time frame unit specified in the **Include data from** field. For example, if **Include data from** is set to **The past year**, **Choose for me** groups the data in quarterly units.
6. Select the **Report type** for the charted data.

**Report type** specifies what each bar represents within the graph. That is, the **Report type** determines what work order criteria is emphasized in the Reporting portlet. Choices for **Report type** include:

- **By Asset**
- **By Priority**
- **By Problem**
- **By Status**
- **By Work Type**
- **Choose for me**
- **No Report**

If **Choose for me** is selected, the system infers a fitting report type from your selections for **Asset type**, **Work type**, **Problem**, **Status**, and **Priority**.

If **No Report** is selected, the Reporting portlet is not updated. This can be used when reporting is not your focus at the time.

7. Click **OK** to confirm the selections.

## Results

The map and list are updated with the work orders meeting your selection criteria. Additionally, on the Work Optimization Reporting view, the Reports - Based on Work Order List portlet displays a graph report that summarizes the results.

Selected work orders are treated as mandatory or required when manual or semi-automatic scheduling is performed.

If too many results are returned, a message is displayed indicating that the search should be tried again with criteria returning fewer results.

## Selecting content on the map using a polygon

Work orders can also be selected on the map with a polygon. Work orders inside the polygon, or on the polygon borders, are selected. Work orders outside the polygon are not selected.

### About this task

Selecting work orders by using a polygon is typically done before scheduling work orders. Selected work orders are treated as mandatory or required during manual or semi-automatic scheduling. For reporting, a polygon can be used to select specific work orders in the Work Order List which can then be sorted to look for commonalities in the selected work orders.

### Procedure

1. Right-click the Work Order Map.
2. Click **Draw Polygon**.
3. Click the location on the map where you want the first point of the polygon to be located.
4. Continue clicking locations on the Work Order Map to create additional polygon points.
5. To finalize the polygon, double-click the map.

**Note:** A polygon cannot be modified. If the polygon does not include the required work orders, you will need to create a new polygon.

## Results

The work orders contained within, or crossing the borders of, the polygon are selected. The check box for each selected work order will be checked in the Work Order List. Work orders that have not been selected

will be displayed in gray on the map and the check box will not be selected in the Work Order List. Selected work orders are treated as required when scheduling is performed.

The Reporting portlet is not updated when work orders are selected using a polygon. The Reporting portlet is only updated when **Select Content** settings are changed.

## Viewing unscheduled work orders on the map

Viewing unscheduled work orders on the map helps you to prepare for scheduling and to decide which work orders need to be scheduled.

To query and view unscheduled work orders that are candidates for scheduling:

1. Go to the Work Order Map portlet on the Work Optimization Scheduling view.
2. To open the query filter form, click **Select Content**.
3. Complete the required fields on the filter form to specify which work orders you are interested in.
4. Optional: To hide scheduled work orders from the map view, clear the check box next to **Show scheduled work orders on map**.
5. Click **OK** to submit the unscheduled work order query.

The results of the query are displayed on the Work Order Map and Unscheduled Work Order List portlets.

Unscheduled work orders do not have a colored border around the map marker. This distinguishes them from a scheduled work order.

If too many results are returned, a message will be displayed indicating that the search should be tried again with criteria returning fewer results.

## Viewing scheduled work orders on the map

When you open the Work Optimization Scheduling view, by default, all scheduled work orders are displayed on the map. If the scheduled work orders do not appear on the map, click **Select Content** and select **Show scheduled work orders on map**.

Scheduled work orders have a colored border around the map marker which distinguishes them from unscheduled work orders. The map marker border is color coded by route. The route color is determined by the crew that is assigned to the route. As soon as a new schedule is created, the work orders assigned to the schedule are displayed on the map surrounded by the border color that matches the route and crew assignment. This provides a geographical view of a schedule and the proximity of routes and work orders.

Unlike the Work Order Map on the Work Optimization Reporting view, in the Scheduling view you do not need to submit a query to view scheduled work orders.

**Administrator** Your Water Utility Supervisor or Water Utility IT Administrator determines the color assigned to the crews during the crew configuration.

## Highlighting schedules, routes, and assigned work orders

To highlight a scheduled schedule, route, or scheduled work order, click anywhere on the corresponding row in the Scheduled Work Order List portlet. The selected schedule, route, or work order appears highlighted on the map.

## Viewing the details of a work order

You can view the full details of a work order from the map or list.

## Before you begin

First you must submit a water usage query in the Work Order Map portlet to display content on the map and in the list.

## About this task

You can review the summary details of a work order by hovering on the icon of a work order on the map. You can also view the full work order details by viewing its **Properties** on the map or in the list.

## Procedure

1. On the Work Order Map portlet, click **Select Content**.
2. Use the filter form to specify what work orders you are interested in.
3. Find an individual work order that you would like to view on the map or the list: Use the map controls to pan or zoom closer to the location of the work order you are interested in so that the icon for the work order is visible.
4. Either:
  - Click the icon on the map and select **Properties**.
  - Click any column on the work order row in the list, and then right-click and select **Properties**.

## Results

The **Work Order Properties** dialog is displayed with information about the selected work order.

## What to do next

To close the **Work Order Properties** dialog, click **Done**.

## Using the map controls

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

### The map controls are on the upper left side of the map

The map controls are located on the upper left side of the map. They consist of:

1. Pan arrows (up, down, left, right)
2. Zoom in
3. World view (maximizes out the zoom)
4. Zoom out

### Pan controls for moving around the map

To move around the map you can:

- 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 seeing a more or less detailed view

To zoom in and out of the map you can:

- 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 map

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

### Procedure

1. On the Work Order 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.

## Configuring the map

### Administrator

If you are a Water Utility IT Administrator you can configure the geographical information system (GIS) map that IBM Work Optimization for Water Utilities uses and displays in the portlet. You can also choose the starting location of the map.

To configure the map:

1. Log on to the solution portal as a Water Utility IT Administrator.
2. Click the upper right corner of the portlet to view the portlet display menu.
3. Click **Configure**.

**Note:** Only the Water Utility IT Administrator can view and select this option.

4. To configure the base map, select the **Base Maps** tab. Complete the required configuration.
5. To configure the **Center Point and Zoom Level** for the map, select the **Map Settings** tab. Complete the required configuration.
6. To exit the map configuration view, click the upper right corner of the portlet to view the portlet display menu, and select **Back**.

For more information about this subject, see the **Customizing the solution** section of the IBM Intelligent Water Family: Work Optimization Information Center

## Work Order List

The Work Order List portlet on the Work Optimization Reporting and Scheduling views, provides an interactive window containing a list of work orders included in the results of the current query. You can use the list to sort the items returned, highlight work orders, and filter the results further. Additionally, from the Work Optimization Scheduling view you can schedule work orders.



## Portlet overview

The Work Order List portlet displays the following key information about work orders:

- Work order
- Asset type
- Work type
- Problem type
- Priority
- Status
- Location

The Work Order List portlet provides different results and actions depending on what Work Optimization view you are in.

From both the Reporting and Scheduling view you can use this portlet to:

- View a list of work orders
- Sort the list
- Select and highlight a work order
- Filter the results of a query further
- View the details of a work order

Additionally from the Scheduling view, you can also:

- Select work orders to be scheduled
- Schedule work orders

**Note:** Only the unscheduled work orders are returned in the Work Order List, when you submit a query on the Scheduling view.

## Selecting information to display in the list

Use the Work Order Map portlet to choose the work orders to view in the Work Order List portlet, which provides a more detailed view than the map.

### About this task

The Work Order List portlet is populated based on your choices in the selection form in the Work Order Map portlet.

### Procedure

1. On the Work Order Map portlet click **Select Content**.
2. Use the filter form to specify what work orders you are interested in.
3. Click **OK** to confirm the selections and update the map.

### Results

The Work Order List portlet displays a list of all work orders that match the criteria of the query and are being displayed on the map.

## Sorting the list

Sorting the list is useful for navigating through long lists of work orders returned by a query. You can sort the work orders in the Work Order List portlet table by clicking the column heading. For example,

click the **Priority** column heading to sort the work orders by priority. Clicking the column heading once sorts the list by the column values in ascending order. Clicking the column heading again resorts the list in descending order.

The list can be sorted by one column value at a time.

## Selecting work orders in the list

You can select one or more work orders that you are interested in from the list of work orders returned by a query.

### About this task

To select all work orders, double-click the first column heading of the list. Double-click again to clear all selected items in the list. Alternatively, use the following steps to select individual items in the list.

### Procedure

1. Go to the Work Order Map portlet and click **Select Content**.
2. Use the filter form to specify what work orders you are interested in.
3. On the list, find one or more work orders that you are interested in. You can sort the list to help navigate to those work orders.
4. Click the check box to select each work order in the list.

### Results

**Note:** Your list selection does not update the Reports portlet on the Reporting view. The Reports portlet is only updated when you submit a new query by clicking **Select Content**.

## Highlighting the map location of a list item

If you click a selected work order in the list, it highlights the location of the work order on the Work Order Map portlet.

When you click a selected work order, the map icon representing the work order changes its state from selected to highlighted. This is useful for identifying the geographical location of a work order and its proximity to other work orders.

## Viewing work order details

Use the Work Order List portlet to view the **Properties** of a work order.

### Before you begin

First you must submit a query in the Work Order Map portlet to display content on the map and in the table in the List portlet.

### Procedure

1. On the Work Order Map portlet click **Select Content**.
2. Use the filter form to specify what work orders you are interested in.
3. Find an individual work order that you would like to view in the Work Order List portlet.
4. Click any column on the row in the table to select the work order.
5. Right-click and select **Properties**.

## Results

The **Work Order Properties** dialog is displayed with the work order information such as the work order number, description, location, date, and status.

## What to do next

To close the **Work Order Properties** dialog, click **Done**.

## Scheduling work orders

Use the Work Order List portlet on the Work Optimization Scheduling view to schedule work orders.

## Before you begin

Before you create a schedule request, you must first submit a work order query to display a list of unscheduled work orders. Some of the scheduling options also require you to select the work order candidates for scheduling before you open the scheduler.

The scheduler can process up to 300 work order candidates for scheduling. Reduce your work order selection, or filter the work order query further, if your schedule request exceeds this limit.

## Procedure

1. To open the scheduler, go to the Work Order List portlet and click **Schedule Work Orders**.
2. For more detailed information about scheduling work orders and viewing the schedules, click **Help** on the navigation bar at the top of the portal, and see the **Scheduling work orders** topic.

## Viewing the details of a work order

You can view the details of a work order from the Work Order List and Work Order Map portlets.

Information displayed include:

- Work order number
- Description
- Work Type
- Duration
- Equipment number
- Asset type
- Failure
- Cause
- Problem description
- Remedy
- Problem location
- Report date
- Status date
- Work order status
- Work order priority

Work orders are only displayed on the Work Order List and Work Order Map portlets after being selected by using **Select Content** on the Work Order Map. For more information, refer to the related links.

To view the details of a work order:

1. On the Work Order Map portlet, click **Select Content**.
2. Use the filter form to specify which work orders you are interested in.
3. Find an individual work order that you would like to view the details of, on the map or the list.

**Note:** Use the map controls to pan or zoom closer to the location of the work order so that the work order is visible on the map.

4. Either:
  - Click the customer account icon on the map and select **Properties**.
  - Click any column on the row in the list, and then right-click and select **Properties**.

## Scheduling view

The Work Optimization Scheduling view of the solution provides an interactive work order scheduling tool for generating optimized work order schedules. This view also provides interactive spatial visualization of schedules, routes, and work orders. The Scheduling view contains useful work order scheduling features that are designed specifically for water authorities.

From this view, you can perform the following actions:

- Query a subset of unscheduled work orders by selected criteria
- Schedule work orders
- View work order schedules
- View the location of scheduled work orders on a GIS map, color coded by crew
- Print hardcopies of schedules, routes, and scheduled work orders
- Delete work order schedules

The Scheduling view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another.

*Table 16. Work Optimization Scheduling portlets*

Portlet	Description
"Work Order Map" on page 95	Use the Work Order Map portlet to query work orders and see where the water issues are located geographically. This information can be used for optimizing work order schedules and for planning purposes.
Unscheduled Work Order List	The Unscheduled Work Order List portlet on the Work Optimization Scheduling view provides an interactive window containing a list of all unscheduled work orders included in the results of the current query. Use the Unscheduled Work Order List portlet to schedule work orders.
"Scheduled Work Order List" on page 105	The Scheduled Work Order List portlet on the Work Optimization Scheduling view, provides an interactive window displaying a list of work order schedules generated by the solution.

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**.

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

## Scheduled Work Order List

The Scheduled Work Order List portlet on the Work Optimization Scheduling view, provides an interactive window displaying a list of work order schedules generated by the solution.

### Portlet overview

When a work schedule is generated, information about its routes, crews, and assigned work orders are displayed in the Scheduled Work Order List portlet. The newly scheduled work orders are moved from the Unscheduled Work Order List to the Scheduled Work Order List portlet under the schedule they are assigned to.

From the Scheduled Work Order List portlet, you can:

- View all work order schedules, including the routes, crews, and assigned work orders
- View a quick summary of a schedule or route
- Click a schedule, route, or work order that you would like to see highlighted on the map
- Delete a work order schedule
- Print a selected schedule, route, or work order

Expand a schedule in the list to see its routes, crews, and a list of scheduled work orders in the order that they are occurring in the schedule.

The following table shows the information that is displayed in the Scheduled Work Order List portlet:

Schedule information	Description
<b>Schedule</b>	The <b>Schedule name</b> created in the <b>Schedule Work Orders</b> dialog when scheduling work orders. A computed summary of a work schedule is displayed when you hover over the <b>Schedule name</b> in the list. The summary includes: <ul style="list-style-type: none"> <li>• Total number of work orders</li> <li>• Total number of hours required to complete the work orders assigned to the schedule</li> </ul>
<b>Route</b>	A list of the scheduled traveling routes assigned to this work schedule. A crew is assigned to each route in the schedule. The crew name is highlighted in the color code of the crew assigned. A computed summary of a route assigned to a schedule is displayed when you hover over the <b>Route</b> in the list. The summary includes: <ul style="list-style-type: none"> <li>• Total number of hours to complete the scheduled route including work order duration</li> <li>• Total number of hours for the work order duration</li> </ul> The total number of routes for each schedule is also listed in this column.
<b>Stop</b>	The order of the work orders in the route of the schedule
<b>Work order</b>	The work order number

Schedule information	Description
<b>Required</b>	Work orders that were selected for scheduling before being scheduled. The value of this column is computed by the system and contains one of 2 values: <ul style="list-style-type: none"> <li>• Y = Yes, selected for scheduling.</li> <li>• N = No, not selected for scheduling.</li> </ul> You can flag a work order as required for scheduling by selecting the item in the list, or right-clicking the work order on the map, then selecting it.
<b>Priority</b>	The priority assigned to a work order
<b>Start time</b>	The scheduled time for the crew to start working on a work order
<b>End time</b>	The scheduled time for the crew to finish working on a work order
<b>Location</b>	Address details of where a work order is located
<b>Description</b>	The <b>Description</b> defined in the details of the work order

## Viewing a scheduled work order

To view a scheduled work order on the Scheduled Work Order List portlet, you need to know which schedule and route the work order is assigned to. You can view the work order by expanding the schedule and route in the list.

For more detailed information about scheduling a work order and viewing the schedules, click **Help** on the navigation bar at the top of the portal.

## Determining the location of a schedule, route, or work order on the map

From the Scheduled Work Order List portlet, you can select a schedule, route, or work order to highlight on the map and in the list. Highlighting a schedule is useful for obtaining a geographical view of the schedule and the proximity of different routes and scheduled work orders. The highlighted schedule, route, or work order stands out from all other objects on the map.

To highlight a schedule, route or work order on the map and in the list, click anywhere on its row in the Scheduled Work Order List.

## Printing a work order schedule

Use the Scheduled Work Order List portlet to print a hardcopy of a work order schedule, a route, or a scheduled work order.

### Before you begin

IBM Work Optimization for Water Utilities uses the default printer configured for the client you are using to access the system. You must first install and configure a working printer on your client system.

### About this task

You can print a hardcopy of a schedule including the schedule summary, routes, and details of the assigned work orders a schedule. You can also choose to print a selected route or a specific scheduled work order.

### Procedure

1. Go to the Scheduled Work Order List portlet.
2. Find the schedule that you are interested in.
3. Select the object that you would like to print by clicking anywhere on the row for that schedule, route, or work order.

- To print an entire schedule, select a schedule in the list.
  - To print the details of a specific route, including its crew, route summary, and a list of its work orders, expand the schedule and select the route of interest.
  - To print an assigned work order, expand the schedule and route and then select the work order of interest.
4. Click **Print**.
  5. Click **OK** to confirm.

## Results

The hardcopy of the selected schedule, route, or assigned work order is printed by using the default or selected printer configured for the client system.

## Deleting a work order schedule

Use the Scheduled Work Order List portlet to delete a work order schedule and release the assigned work orders.

### About this task

You can delete one schedule at a time by using the following procedure.

### Procedure

1. Go to the Scheduled Work Order List portlet.
2. Find the schedule that you would like to delete in the list.
3. Select the schedule by clicking anywhere on the row for that schedule. The schedule appears highlighted in the list.
4. Click **Delete Schedule**.
5. Click **OK** to confirm the deletion.

## Results

The schedule is deleted and removed from the Scheduled Work Order List portlet. When you delete a schedule, the assigned work orders are removed from the schedule and no longer appear in the Scheduled Work Order List portlet. The status of the work orders assigned to the deleted schedule reverts to unscheduled in the system.

### What to do next

The newly unscheduled work orders appear in the Unscheduled Work Order List portlet after the list is refreshed. To refresh the Unscheduled Work Order List, go back to the map, click **Select Content**, followed by **OK** to resubmit the query.

## Viewing unscheduled work orders

You can view unscheduled work orders that are candidates for scheduling from the Unscheduled Work Order List or Work Order Map portlets on the Work Optimization Scheduling view.

### About this task

When the Work Optimization Scheduling view is opened, by default, scheduled work orders are displayed on the map. The Unscheduled Work Order List is empty. Use the Work Order Map portlet to query unscheduled work orders. The resulting unscheduled work orders are plotted on the map, providing a geographical view useful for planning a schedule for work maintenance and assigning work crews. The Unscheduled Work Order List portlet displays a table of information about the work orders, providing a more detailed view than the map.

## Procedure

1. On the Work Order Map portlet, click **Select Content**.
2. Complete the required fields in the filter form to specify what work orders you are interested in.
3. To hide scheduled work orders from the map view, clear the check box titled **Show scheduled work orders on map**.
4. Click **OK** to submit the unscheduled work order query.

## Results

The map and the list are populated with all unscheduled work orders based on the query submitted using the filter form on the map.

**Note:** If **Show scheduled work orders on map** is selected, scheduled work orders will also appear on the map.

## What to do next

Click **Schedule Work Orders** to schedule a set of work orders. You can schedule a set of selected work orders or you can choose to schedule all unscheduled work orders.

### Related concepts

“Selecting work order candidates for scheduling”

Before you can schedule work orders, you must first submit a query by using the Work Order Map portlet on the Scheduling view. The results of the query are displayed in the Unscheduled Work Order List providing a list of unscheduled work orders that are potential candidates for scheduling.

“Scheduling work orders” on page 109

Use the Work Optimization Scheduling view to produce optimized work maintenance schedules.

“Viewing the details of a work order” on page 103

You can view the details of a work order from the Work Order List and Work Order Map portlets.

## Selecting work order candidates for scheduling

Before you can schedule work orders, you must first submit a query by using the Work Order Map portlet on the Scheduling view. The results of the query are displayed in the Unscheduled Work Order List providing a list of unscheduled work orders that are potential candidates for scheduling.

IBM Work Optimization for Water Utilities allows you to schedule all unscheduled work orders that are listed in the Unscheduled Work Order List portlet, or you can choose to schedule selected work orders.

## Selecting all work orders

To generate an optimized schedule using any of the unscheduled work orders in the list, you do not need to highlight, select, or deselect any items in the list.

The scheduler can process up to 300 work order candidates for scheduling. If there are more than 300 work orders in the Unscheduled Work Order List, reduce the list by narrowing your content selection query.

## Selecting specific work orders to be scheduled

To generate an optimized schedule from a pool of selected work order candidates for scheduling, select the work orders before you create the scheduling request.

The following table describes three alternative methods for selecting specific work orders for scheduling:



Portlet to use	Method
Unscheduled Work Order List	Select work orders in the list by using the check box. By default, all work orders are selected in the list. You can deselect items that you do not want to be scheduled. Double-click the heading of the check box column to deselect all work orders. You can also sort the list by any of the columns to aid your selection.
Work Order Map	Select work orders on the map by right-clicking over the work order icon and selecting <b>Selected</b> .
Work Order Map	Draw a polygon on the map. Work orders inside the polygon are selected. Work orders outside the polygon are deselected. For more information about how to draw a polygon, see “Work Order Map” on page 95.

### Related concepts

“Scheduling work orders”

Use the Work Optimization Scheduling view to produce optimized work maintenance schedules.

### Related tasks

“Viewing unscheduled work orders” on page 107

You can view unscheduled work orders that are candidates for scheduling from the Unscheduled Work Order List or Work Order Map portlets on the Work Optimization Scheduling view.

## Scheduling work orders

Use the Work Optimization Scheduling view to produce optimized work maintenance schedules.

Work orders can be scheduled by using one of the following three methods.

### Related concepts

“Selecting work order candidates for scheduling” on page 108

Before you can schedule work orders, you must first submit a query by using the Work Order Map portlet on the Scheduling view. The results of the query are displayed in the Unscheduled Work Order List providing a list of unscheduled work orders that are potential candidates for scheduling.

### Generating a schedule from all work orders in the list:

Use the Unscheduled Work Order List portlet on the Scheduling view to generate an optimized work schedule from any of the unscheduled work orders in the list. The scheduler creates an optimized schedule choosing from any of the work orders in the list, based on the specified starting location, crew availability, and work order details.

### Before you begin

Before you begin this task, you must first submit an unscheduled work order query by clicking **Select Content** on the map. All work orders returned in the Unscheduled Work Order List portlet are candidates for scheduling regardless of whether they are selected or not.

The scheduler can process up to 300 work order candidates for scheduling. If necessary, revise your query or list selection to reduce the number of work orders that are candidates for scheduling.

For more information about the prerequisite tasks, refer to the related links at the end of this topic.

### About this task

To generate an optimized work maintenance schedule, use the following procedure.

## Procedure

1. Go to the **Unscheduled Work Order List** portlet on the **Work Optimization Scheduling** view.
2. Click **Schedule Work Orders**.
3. On the **Schedule Work Orders** dialog, complete the following fields:
  - a. Enter a name to identify the schedule in the **Schedule name** field.
  - b. Specify the date the work will be completed, by entering the date into the **Schedule date** field. The schedule must be started and finished on the same calendar day.
  - c. Specify the **Start time** and **End time** of the schedule. The time period for the schedule must be between 12:00 AM and 11:59 PM.
  - d. Select the starting and end location of the schedule.
  - e. Select at least one **Crew** from the list of crews available.
  - f. In the **Specify which work orders are candidates for scheduling** section, choose **All work orders**.
  - g. Click **OK** to generate the schedule.

## Results

The **Schedule Work Orders** window is closed and the schedule is generated. Depending on the number of work orders to be scheduled, minutes can elapse before the optimized schedule is displayed in the **Scheduled Work Order List** portlet. After the schedule has been generated, any newly scheduled work orders are immediately moved from the **Unscheduled Work Order List** portlet to the **Scheduled Work Order List** portlet.

## What to do next

Expand the schedules and associated routes to see the list of scheduled work orders.

## Related concepts

“Selecting work order candidates for scheduling” on page 108

Before you can schedule work orders, you must first submit a query by using the **Work Order Map** portlet on the **Scheduling** view. The results of the query are displayed in the **Unscheduled Work Order List** providing a list of unscheduled work orders that are potential candidates for scheduling.

“Viewing scheduled work orders” on page 112

You can view scheduled work orders on the **Work Optimization Scheduling** view. The scheduled work orders are displayed in both the **Scheduled Work Order List** and the **Work Order Map** portlets.

## Generating a schedule from a combination of required and other work orders:

Use the **Unscheduled Work Order List** portlet on the **Scheduling** view to generate an optimized work schedule from a combination of required work orders and other work orders in the list. First, the scheduler schedules the selected work orders based on the specified starting location, crew availability, and work order details. After the selected work orders are scheduled, any further gaps are filled by using the remaining candidates currently displayed in the **Unscheduled Work Order List** portlet.

## Before you begin

Before you begin this task, complete the following prerequisites:

- Query unscheduled work orders by clicking **Select Content** on the map.
- Go to the **Unscheduled Work Order List** and select the work orders that are required to be scheduled.

The scheduler can process up to 300 work order candidates for scheduling. If necessary, revise your query or list selection to reduce the number of work orders that are candidates for scheduling.

For more information about the prerequisite tasks, refer to the related links at the end of this topic.

## About this task

To generate an optimized work order schedule, use the following procedure.

### Procedure

1. Go to the **Unscheduled Work Order List** portlet on the **Work Optimization Scheduling** view.
2. Click **Schedule Work Orders**.
3. On the **Schedule Work Orders** dialog, complete the following fields:
  - a. Enter a name to identify the schedule in the **Schedule name** field.
  - b. Specify the date the work will be completed, by entering the date into the **Schedule date** field. The schedule must be started and finished on the same calendar day.
  - c. Specify the **Start time** and **End time** of the schedule. The time period for the schedule must be between 12:00 AM and 11:59 PM.
  - d. Select the starting and end location of the schedule.
  - e. Select at least one **Crew** from the list of crews available.
  - f. In the **Specify which work orders are candidates for scheduling** section, choose **Selected work orders first, then other work orders**. To choose this option, you must first select the required work orders on the **Unscheduled Work Order List** portlet before you create the schedule.
  - g. Click **OK** to generate the schedule.

### Results

The **Schedule Work Orders** window is closed and the schedule is generated. Depending on the number of work orders to be scheduled, minutes can elapse before the optimized schedule is displayed in the **Scheduled Work Order List** portlet. After the schedule has been generated, the newly scheduled work orders are immediately moved from the **Unscheduled Work Order List** portlet to the **Scheduled Work Order List** portlet.

### What to do next

Expand the schedules and associated routes to see the list of scheduled work orders.

### Related concepts

“Selecting work order candidates for scheduling” on page 108

Before you can schedule work orders, you must first submit a query by using the **Work Order Map** portlet on the **Scheduling** view. The results of the query are displayed in the **Unscheduled Work Order List** providing a list of unscheduled work orders that are potential candidates for scheduling.

“Viewing scheduled work orders” on page 112

You can view scheduled work orders on the **Work Optimization Scheduling** view. The scheduled work orders are displayed in both the **Scheduled Work Order List** and the **Work Order Map** portlets.

### Generating a schedule using only selected work orders:

Use the **Unscheduled Work Order List** portlet on the **Scheduling** view to generate an optimized schedule from selected work orders that are required for scheduling, based on the specified starting location, crew availability, and work order details.

### Before you begin

Before you begin this task, complete the following prerequisites:

- Query unscheduled work orders by clicking **Select Content** on the map.
- Go to the **Unscheduled Work Order List** and select the work orders that are required to be scheduled.

The scheduler can process up to 300 work order candidates for scheduling. If necessary, revise your query or list selection to reduce the number of work orders that are candidates for scheduling.

For more information about the prerequisite tasks, refer to the related links at the end of this topic.

### About this task

To generate an optimized work schedule, use the following procedure.

#### Procedure

1. Go to the **Unscheduled Work Order List** portlet on the **Work Optimization Scheduling** view.
2. Click **Schedule Work Orders**.
3. On the **Schedule Work Orders** dialog, complete the following fields:
  - a. Enter a name to identify the schedule in the **Schedule name** field.
  - b. Specify the date the work will be completed, by entering the date into the **Schedule date** field. The schedule must be started and finished on the same calendar day.
  - c. Specify the **Start time** and **End time** of the schedule. The time period for the schedule must be between 12:00 AM and 11:59 PM.
  - d. Select the starting and end location of the schedule.
  - e. Select at least one **Crew** from the list of crews available.
  - f. In the **Specify which work orders are candidates for scheduling** section, choose **Only the selected work orders**. To choose this option, you must first select at least one work order from the **Unscheduled Work Order List** portlet before you create the schedule.
  - g. Click **OK** to generate the schedule.

#### Results

The **Schedule Work Orders** window is closed and the schedule is generated. Depending on the number of work orders to be scheduled, minutes can elapse before the optimized schedule is displayed in the **Scheduled Work Order List** portlet. After the schedule has been generated, the newly scheduled work orders are immediately moved from the **Unscheduled Work Order List** portlet to the **Scheduled Work Order List** portlet.

#### What to do next

Expand the schedules and associated routes to see the list of scheduled work orders.

#### Related concepts

“Selecting work order candidates for scheduling” on page 108

Before you can schedule work orders, you must first submit a query by using the **Work Order Map** portlet on the **Scheduling** view. The results of the query are displayed in the **Unscheduled Work Order List** providing a list of unscheduled work orders that are potential candidates for scheduling.

“Viewing scheduled work orders”

You can view scheduled work orders on the **Work Optimization Scheduling** view. The scheduled work orders are displayed in both the **Scheduled Work Order List** and the **Work Order Map** portlets.

#### Viewing scheduled work orders

You can view scheduled work orders on the **Work Optimization Scheduling** view. The scheduled work orders are displayed in both the **Scheduled Work Order List** and the **Work Order Map** portlets.

## Viewing scheduled work orders on the list

When a work schedule is generated, information about its routes, crews, and assigned work orders are displayed in the Scheduled Work Order List portlet. The newly scheduled work orders are moved from the Unscheduled Work Order List to the Scheduled Work Order List portlet under the schedule they are assigned to.

Expand a schedule in the list to see its routes, crews, and a list of scheduled work orders in the order that they are occurring in the schedule.

The following table shows the information that is displayed in the Scheduled Work Order List portlet:

Schedule information	Description
<b>Schedule</b>	The <b>Schedule name</b> created in the <b>Schedule Work Orders</b> dialog when scheduling work orders. A computed summary of a work schedule is displayed when you hover over the <b>Schedule name</b> in the list. The summary includes: <ul style="list-style-type: none"> <li>• Total number of work orders</li> <li>• Total number of hours required to complete the work orders assigned to the schedule</li> </ul>
<b>Route</b>	A list of the scheduled traveling routes assigned to this work schedule. A crew is assigned to each route in the schedule. The crew name is highlighted in the color code of the crew assigned. A computed summary of a route assigned to a schedule is displayed when you hover over the <b>Route</b> in the list. The summary includes: <ul style="list-style-type: none"> <li>• Total number of hours to complete the scheduled route including work order duration</li> <li>• Total number of hours for the work order duration</li> </ul> The total number of routes for each schedule is also listed in this column.
<b>Stop</b>	The order of the work orders in the route of the schedule
<b>Work order</b>	The work order number
<b>Required</b>	Work orders that were selected for scheduling before being scheduled. The value of this column is computed by the system and contains one of 2 values: <ul style="list-style-type: none"> <li>• Y = Yes, selected for scheduling.</li> <li>• N = No, not selected for scheduling.</li> </ul> You can flag a work order as required for scheduling by selecting the item in the list, or right-clicking the work order on the map, then selecting it.
<b>Priority</b>	The priority assigned to a work order
<b>Start time</b>	The scheduled time for the crew to start working on a work order
<b>End time</b>	The scheduled time for the crew to finish working on a work order
<b>Location</b>	Address details of where a work order is located
<b>Description</b>	The <b>Description</b> defined in the details of the work order

From the Work Order Map you can view the **Work Order Properties** of a selected scheduled work order.

1. Go to the Scheduled Work Order List portlet.
2. Find and expand the **Schedule** and **Route** that the work order you are interested in is assigned to.
3. Click anywhere on the row in the list for that work order and it will be highlighted on the map.

4. Click the work order icon on the Work Order Map portlet.
5. Select **Properties**.

The **Work Order Properties** dialog is displayed containing the details of the selected work order. Click **Done** to return to the list of schedules, routes, and work orders.

### Viewing scheduled work orders on the map

By default, all scheduled work orders are displayed on the map.

**Note:** The map also might display unscheduled work orders and previously scheduled work orders, depending on the last query that was submitted from the Work Order Map.

Scheduled work orders have a colored border around the map marker which distinguishes them from an unscheduled work order. The map marker border is color coded by route. The route color is determined by the crew that is assigned to the route.

**Administrator** Your Water Utility Supervisor or Water Utility IT Administrator determines the color assigned to the crews during the crew configuration.

As soon as a new schedule is created, the work orders assigned to the schedule are displayed on the map surrounded by a border color that matches the route assignment. This provides a geographical view of a schedule and the proximity of routes and work orders.

Unlike the Work Order Map portlet on the Work Optimization Reporting view, you do not need to submit a query to view scheduled work orders. The **Select Content** filter form is only required to query unscheduled work orders or to hide scheduled work orders from displaying on the map. This is useful if you are only interested in viewing unscheduled work orders.

You can highlight a scheduled work order on the map, by selecting the row for that work order in the Scheduled Work Order List portlet.

You can also highlight a specific route on the map by selecting the row for that route in the Scheduled Work Order List.

### Deleting a work order schedule

Use the Scheduled Work Order List portlet to delete a work order schedule and release the assigned work orders.

#### About this task

You can delete one schedule at a time by using the following procedure.

#### Procedure

1. Go to the Scheduled Work Order List portlet.
2. Find the schedule that you would like to delete in the list.
3. Select the schedule by clicking anywhere on the row for that schedule. The schedule appears highlighted in the list.
4. Click **Delete Schedule**.
5. Click **OK** to confirm the deletion.

## Results

The schedule is deleted and removed from the Scheduled Work Order List portlet. When you delete a schedule, the assigned work orders are removed from the schedule and no longer appear in the Scheduled Work Order List portlet. The status of the work orders assigned to the deleted schedule reverts to unscheduled in the system.

## What to do next

The newly unscheduled work orders appear in the Unscheduled Work Order List portlet after the list is refreshed. To refresh the Unscheduled Work Order List, go back to the map, click **Select Content**, followed by **OK** to resubmit the query.

## Printing schedules, routes and scheduled work orders

Use the Scheduled Work Order List portlet to print a hardcopy of a work order schedule, a route, or a scheduled work order.

## Before you begin

IBM Work Optimization for Water Utilities uses the default printer configured for the client you are using to access the system. You must first install and configure a working printer on your client system.

## About this task

You can print a hardcopy of a schedule including the schedule summary, routes, and details of the assigned work orders a schedule. You can also choose to print a selected route or a specific scheduled work order.

## Procedure

1. Go to the Scheduled Work Order List portlet.
2. Find the schedule that you are interested in.
3. Select the object that you would like to print by clicking anywhere on the row for that schedule, route, or work order.
  - To print an entire schedule, select a schedule in the list.
  - To print the details of a specific route, including its crew, route summary, and a list of its work orders, expand the schedule and select the route of interest.
  - To print an assigned work order, expand the schedule and route and then select the work order of interest.
4. Click **Print**.
5. Click **OK** to confirm.

## Results

The hardcopy of the selected schedule, route, or assigned work order is printed by using the default or selected printer configured for the client system.

## Reporting view

The Work Optimization Reporting view provides interactive spatial and report-based visualization of work orders according to the selected criteria. This view contains useful work order reporting features that are designed specifically for water authorities.

From the Work Optimization Reporting view you can perform the following interactive work order reporting actions:

- View work orders plotted on a geographical information system (GIS) map and accompanying list
- Navigate the GIS map to identify the geographical location of selected work orders
- Select work orders based on specified criteria
- View work order details
- View a reports of work orders based on specified criteria
- View a reports of work orders based on a specific time period

This information is useful in determining current work order load as well as analyzing work order trends and can be used to forecast future work order demands. These reports can be useful when scheduling work orders as well.

The Work Optimization Reporting view contains the following portlets, which you can think of as independent sections of the page that cooperate with one another.

*Table 17. Work Optimization Reporting portlets*

Portlet	Description
“Work Order Map” on page 95	Use the Work Order Map portlet to query work orders and see where the water issues are located geographically. This information can be used for optimizing work order schedules and for planning purposes.
“Work Order List” on page 100	The Work Order List portlet on the Work Optimization Reporting and Scheduling views, provides an interactive window containing a list of work orders included in the results of the current query. You can use the list to sort the items returned, highlight work orders, and filter the results further. Additionally, from the Work Optimization Scheduling view you can schedule work orders.
“Reports - Based on Work Order List”	Use the Reports - Based on Work Order List portlet on the Work Optimization Reporting view to see the results of the work optimization query as a graph. This is useful for analyzing trends in work orders.

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**.

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

### **Reports - Based on Work Order List**

Use the Reports - Based on Work Order List portlet on the Work Optimization Reporting view to see the results of the work optimization query as a graph. This is useful for analyzing trends in work orders.

The Reports - Based on Work Order List portlet contains a graphical report based on the **Select Content** query results submitted from the Work Order Map portlet. The Reports - Based on Work Order List portlet is useful for analyzing:

- Work order volumes over a given time period
- Work order volumes by problem, type, priority, or status



- Work order volumes by assets

## Displaying a work order graph summary

To display a work order summary graph, on the Work Order Map portlet, click **Select Content** and submit a work order query. After submitting a query, the results are displayed on the map and list. A graph summarizing the work orders on the map and list is also displayed in the Reports - Based on Work Order List portlet.

The *y* axis of the graph is computed by using the selected value in the **Report type** field. You can choose from one of the following report types:

- **By Problem**
- **By Priority**
- **By Status**
- **By Work Type**
- **By Asset**

The *x* axis of the graph is computed by using the time period selected in the query. The graph displays statistics available during the period specified in the query. The sampling frequency of the graph is plotted by using the selected **Summarize by** field of the query.

If you would like the system to choose the sampling frequency and statistics that best suit the current query, select **Choose for me** in the **Report type** and **Summarize by** options.

The graph updates when a new query is submitted from the Work Order Map portlet. The Reports - Based on Work Order List portlet does not update when you select or deselect accounts from the query results in the Work Order Map or List portlets.

## Displaying a work order table summary

The report data can be seen in a tabular form by scrolling down from the graph.

---

## Configuration view

The Configuration view is used to change values affecting IBM Work Optimization for Water Utilities functions. The view contains two sections called Usage Analysis Settings and Work Optimization Settings.

The Configuration view contains the following portlets:

*Table 18. Configuration portlets*

Portlet	Description
"Configure Usage Analysis" on page 118	Accessible from the Usage Analysis Settings page on the Configuration view. Allows the Water Utility Supervisor or the Water Utility IT Administrator to define which months are considered <b>Summer months</b> and <b>Winter months</b> , for the purpose of analysis.
"Configure Work Optimization - Scheduling" on page 118	Accessible from the Work Optimization Settings page on the Configuration view. Allows the Water Utility Supervisor or the Water Utility IT Administrator to manage the maintenance crews available for work order scheduling.

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**.

## Configure Usage Analysis

Use the Configure Usage Analysis portlet on the Usage Analysis Settings Configuration view to define the seasonal usage ratios for the Usage Analysis Account Segmentation reports. After defining the seasons in the configuration interface, you must run a script from the command line to update the ratios in the database.

### About this task

You can configure the summer and winter months. The data for the configured months is used by IBM Work Optimization for Water Utilities for seasonal usage analysis. The Water Utility Supervisor or the Water Utility IT Administrator must perform the following procedure:

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Usage Analysis portlet on the Usage Analysis Settings page. The months currently defined for **Summer months** and **Winter months** are displayed.
3. To move months between the **Summer months** and **Winter months** lists, click the month you want to move and click the arrow button between the lists pointing to the list where you want to move the month.
4. When the **Summer months** and **Winter months** lists are complete, click **Apply**.
5. Finally, to recalculate the seasonal ratios in the database, run the `high84` script command. Until the script is run, reports run in the Usage Analysis view are based on the existing ratio stored in the database. For more information about the script, see the related topic *Implementing the seasonal usage ratio* in the IBM Intelligent Water Family: Work Optimization Information Center.

### Results

The configuration change will be effective on the Usage Analysis Account Segmentation view after the user logs off and logs back on to IBM Work Optimization for Water Utilities.

#### Related tasks

“Querying seasonal usage ratios” on page 93

Use the Account Map portlet on the Usage Analysis Account Segmentation view to retrieve seasonal usage ratios for one or more customer accounts.

“Implementing the seasonal usage ratio” on page 60

After setting which months are considered summer months and which are considered winter months in the Configuration tab, you must run a script to update the IBM Work Optimization for Water Utilities calculation ratios used for seasonal usage analysis.

## Configure Work Optimization - Scheduling

Use the Work Optimization Settings Configuration view to configure and manage maintenance crews available for work order scheduling.

The Configure Work Optimization - Scheduling portlet on this view shows the maintenance crews that are available to the Work Optimization Scheduling feature of IBM Work Optimization for Water Utilities. From this portlet you can:

- View a list of crews available for work order scheduling

- Sort the list of available crews
- View the details of a crew
- Create a crew
- Update a crew
- Delete a crew

**Administrator** Only the Water Utility Supervisor or the Water Utility IT Administrator can view this portlet and manage crews.

## Creating a crew

The scheduling feature of IBM Work Optimization for Water Utilities requires at least one available crew to assign to a work schedule. Use the following procedure to create a crew and make it available for scheduling on the Work Optimization Scheduling view.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page.
3. Click **Create**. The **Create Crew** dialog is displayed.
4. Enter a **Crew identifier** to identify the crew.
5. Enter a **Nickname** to be displayed in the Scheduled Work Order List portlet.
6. Enter a **Description**.
7. Choose a **Color code** from the color chart. The **Color code** is used to distinguish the crew on the map.
8. Select a **Crew starting location** from the list of available locations.
9. After you have completed all of the required fields, click **OK** to save the crew.

### Results

The new crew is created and appears in the list of available crews for scheduling on the Work Optimization Scheduling view.

## Updating a crew

Use the following procedure to update an existing crew that is available for scheduling.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page. The portlet displays a list of existing crews currently available for scheduling.
3. Select an existing crew from the list.
4. Click **Update**.
5. On the **Update Crew** dialog, make the required updates to any of the following fields:
  - **Nickname**
  - **Description**
  - **Color code**
  - **Crew starting location**

**Note:** The **Crew identifier** cannot be changed.

6. To save your changes, click **OK**.

## Results

The crew is updated and the changes appear in the list of crews available for scheduling on the Work Optimization Scheduling view. Existing schedules are not updated by crew configuration changes. Some schedules may need to be deleted and recreated following a significant crew configuration change, such as a new **Crew starting location**.

## Deleting a crew

Use the following procedure to delete an existing crew from the list of available crews for scheduling.

### Procedure

1. Open the Configuration view on the main solution navigation bar.
2. Go to the Configure Work Optimization - Scheduling portlet on the Work Optimization Settings page. The portlet displays a list of existing crews currently available for scheduling.
3. Select the crew you would like to delete.
4. Click **Delete**.
5. Click **OK** to confirm the deletion.

## Results

The selected crew is deleted from the list of crews available for scheduling on the Work Optimization Scheduling view. Existing schedules are not updated to reflect changes in crew availability and may need to be deleted and recreated.

## Viewing the crew details

To view the details of a crew, select the crew in the list and click **Update**. From here you can also update the crew information.

Click **Cancel** to close the dialog and return to the crew list.

---

## Chapter 8. Troubleshooting and support for IBM Work Optimization for Water Utilities

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 IBM Work Optimization for Water Utilities 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 Work Optimization for Water Utilities. 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 Work Optimization for Water Utilities by using one of the following additional technical resources:
  - IBM Work Optimization for Water Utilities Support Portal page
  - IBM Work Optimization for Water Utilities system requirements
  - IBM Work Optimization for Water Utilities Library page
  - IBM Work Optimization for Water Utilities technotes and APARs (problem reports)
  - IBM Work Optimization for Water Utilities download document
- 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 121

*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.

---

## 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 Work Optimization for Water Utilities. 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 Work Optimization for Water Utilities 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 Work Optimization for Water Utilities 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 126

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 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 124

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 Work Optimization for Water Utilities, 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 Work Optimization for Water Utilities: IBM Work Optimization for Water Utilities 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 Work Optimization for Water Utilities* RSS feed, use the following substeps:
  - a. Open the link: [IBM Work Optimization for Water Utilities 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 Work Optimization for Water Utilities* 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 124](#)

You can use Fix Central to find the fixes that are recommended by IBM Support for a variety of products, including *IBM Work Optimization for Water Utilities*. 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 Work Optimization for Water Utilities* 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 Work Optimization for Water Utilities* are documented, along with their solutions or workarounds. If you have a problem with *IBM Work Optimization for Water Utilities*, 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.

## Troubleshooting installation problems

Some common problems with installation are documented, along with their solutions or workarounds. If you have a problem deploying the solution, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing.

## Restarting a failed installation

Restart a failed IBM Work Optimization for Water Utilities installation by following a few steps.

### Procedure

1. Determine which installation steps have succeeded and failed by reviewing the logs displayed in the installation wizard and the installation logs located in the `/opt/IBM/iss/intelligentWater/workOptimization/install/logs` directory on the IBM Intelligent Operations Center event and management server. IBM Work Optimization for Water Utilities is installed in the following order and writes to the specified logs.

Table 19. IBM Work Optimization for Water Utilities installation steps, associated property names, and logs in installation order

Installation Step	install.properties names	Logs
SETUP		installSetup.log
DATABASE	deployDB	db.log
LDAP	deployLDAP	ldap.log
COGNOS	deployCognos	cognos.log
SECURITY	deploySecurity	security.log
PORTAL	deployPortal	portal.log register_out_water_usage_portlets.xml register_out_water_workorder_portlets.xml water_out_ConfigurationPageOnlyLayout.xml water_out_ConfigurationUsagePageLayout.xml water_out_ConfigurationWorkOrderPageLayout.xml water_out_PageOnlyLayout.xml water_out_UsagePageLayout.xml water_out_WorkOrderPageLayout.xml themeout.xml
CPLEX	deployCPLEX	cplex.log
ETL	deployETL	tdi.log
LICENSES	deployLicenses	install.log
CLEANUP	deployCleanup	install.log

**Note:** There is no property name for the setup step. This step will be run each time.

2. Edit the `/opt/IBM/iss/intelligentWater/workOptimization/install/scripts/install.properties` file on the IBM Intelligent Operations Center event and management server.
3. Update the `install.properties` file to indicate steps that completed successfully and the steps that did not run successfully.
  - a. Set the `deployinstallStep` variable to one of the following values.

N	Indicates that the installation step completed successfully. When the installation is restarted, this step will not be retried.
Y	Indicates that the installation step failed. When the installation is restarted, this step will be retried.

Where *installStep* is the name of the installation step. See Table 5 on page 20 for a list of `install.properties` value names.

- b. Set `installCommon` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities common files are not to be installed.
true	Indicates that the IBM Work Optimization for Water Utilities common files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities common files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

c. Set `installUOA` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities Usage Analysis files are not to be installed.
true	Indicates that the IBM Work Optimization for Water Utilities Usage Analysis files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities Usage Analysis files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

d. Set `installWMA` to one of the following values.

false	Indicates that the IBM Work Optimization for Water Utilities Work Optimization files are not to be installed.
true	Indicates that the IBM Work Optimization for Water UtilitiesWork Optimization files are to be installed. If this is the first installation attempt, set all options: <code>installCommon</code> , and the components to be installed ( <code>installUOA</code> and <code>installWMA</code> ) to true . If only one component is to be installed, set <code>installCommon</code> and the appropriate component ( <code>installUOA</code> or <code>installWMA</code> ) to true.
xxxx	Indicates that the IBM Work Optimization for Water Utilities installation process should determine if the IBM Work Optimization for Water Utilities Work Optimization files are to be installed. If <code>xxxx</code> is specified, <code>xxxx</code> should be specified for all three options: <code>installCommon</code> , <code>installUOA</code> . and <code>installWMA</code> .

e. Set `overridePreviousInstallCheck` to true.

f. Save your changes.

4. Optional: If the file was edited on a system that is not running Linux, run **dos2unix** on the file after copying it to the server.
5. On the IBM Intelligent Operations Center event and management server, run the following command.  
execute `./install.sh Parm1 Parm2 Parm3 Parm4`

Where:

- *Parm1* is the user name of the IBM Intelligent Operations Center management service provided during the installation of the IBM Intelligent Operations Center.
- *Parm2* is the password of the user name of the IBM Intelligent Operations Center management service provided during the installation of the IBM Intelligent Operations Center.
- *Parm3* is **true** if Work Optimization is to be installed. If Work Optimization is not being installed, specify **false**
- *Parm4* is **true** if Usage Analysis is to be installed. If Usage Analysis is not being installed, specify **false**

## Results

The IBM Work Optimization for Water Utilities installation will restart and will run the installation steps specified.

### Related tasks

“Deploying IBM Work Optimization for Water Utilities” on page 17

IBM Work Optimization for Water Utilities provides a deployment wizard to install IBM Work Optimization for Water Utilities into an existing environment that is running the IBM Intelligent Operations Center.

## Troubleshooting general usability problems

Some common problems with general usability of the product are documented, along with their solutions or workarounds. If you have a problem using the solution, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing.

### Resizing a portlet clears the current filter query

When you resize a portlet on the **Work Optimization** or **Usage Analysis** views, the current query and results are cleared.

### Symptoms

After clicking **Select Content** on the map and submitting a query, if you then resize the portlet by clicking **Minimize**, **Maximize**, or **Restore**, the current query is reset. The **Select Content** filter form and the results in the list are cleared.

### Cause

Resizing the portlets causes the page to be refreshed, resulting in the filter form being cleared and reset.

### Resolving the problem

To prevent your query and results from being cleared, resize the portlet before you submit a query.

## Related concepts

“Guidelines for customizing portlets” on page 51

You can reposition and customize the portlets on the Usage Analysis or Work Optimization views.

## Report graph for the past week displays more data than expected

In some cases, the summary report graph showing statistics for the past week on the **Work Optimization** or **Usage Analysis** views, includes more data than expected. The report shows data from the past week and the previous week.

## Symptoms

When you click **Select Content** to submit a query, if you specify the time period of the report by selecting **Past week** in the **Include data from** field, some reports display data statistics from more than the past week.

The problem arises if the day that you submit the query is within the first six days of the calendar month. For example, if the query is submitted on the 3rd day of December, then the past week includes data from November and December.

## Causes

This issue occurs when the past week includes days that span over two calendar months. This is a limitation of the dimensional hierarchy used in the underlying reports software to generate the reports.

## Resolving the problem

To work around this issue, select the time period for the report by entering the start and end dates of the last week into the **From date** and **To** fields instead.

## Work Optimization schedule fails to get created

After submitting a new schedule request on the Work Optimization Scheduling page of IBM Work Optimization for Water Utilities, the message ‘Failed Schedules’ appears and the schedule does not get created.

## Causes

The Scheduling feature of IBM Work Optimization for Water Utilities requires the following servers to be running:

- The CPLEX® application server instance on the IBM Intelligent Operations Center analytic server
- The ESRI ArcGIS service defined after installation by running the **esri\_update** script on the IBM Intelligent Operations Center database server

This problem can occur if one of these servers are not up and running.

## Resolving the problem

To identify the cause of the scheduling the scheduling issue, check the log files on the IBM Intelligent Operations Center servers.

Check the following log files on the IBM Intelligent Operations Center analytic server:

```
/opt/IBM/WebSphere/AppServer/profiles/cplex/logs/server1/SystemErr.log  
/opt/IBM/WebSphere/AppServer/profiles/cplex/logs/server1/SystemOut.log  
/opt/IBM/WebSphere/AppServer/profiles/cplex/logs/server1/trace.log
```

For example:

CIWSC3020E=CIWSC3020E: Error encountered using Scheduling server <servername>,<reason>

Where<servername> is the name of the CPLEX scheduling server and where <reason> is the detailed error returned.

CIWSC3021E=CIWSC3021E: Error encountered using Distance Matrix server <servername>,<reason>

Where <servername> is the name of the distance matrix server and where <reason> is the detailed error returned.

Check the following log files on the IBM Intelligent Operations Center portal server:

```
/opt/IBM/WebSphere/wp_profile/logs/WebSphere_Portal/SystemErr.log  
/opt/IBM/WebSphere/wp_profile/logs/WebSphere_Portal/SystemOut.log  
/opt/IBM/WebSphere/wp_profile/logs/WebSphere_Portal/trace.log
```

You can also use the **IOControl** script to query the status of the IBM Intelligent Operations Center servers.

For more information about the **IOControl** script, see the IBM Intelligent Operations Center Information Center.

#### **Related tasks**

“Defining the ESRI ArcGIS server to IBM Intelligent Water” on page 24

IBM Work Optimization for Water Utilities requires access to an ESRI ArcGIS server. Information about this server needs to be defined to IBM Work Optimization for Water Utilities.

#### **Related information**

Querying the status of the IBM Intelligent Operation Center servers

IBM Intelligent Operations Center: Portal server log files

## **Troubleshooting accessibility problems**

Some common problems with product accessibility are documented, along with their solutions or workarounds. If you have an accessibility issue, review the problem-solution topics to determine if a solution is available to the problem that you are experiencing.

### **Navigation problems with JAWS virtual cursor**

Some portlet forms and tables cannot be navigated when the JAWS Virtual PC cursor is turned on. You can work around this problem by disabling the JAWS Virtual PC cursor.

#### **Symptoms**

If you use the JAWS screen reader to access the solution, some portlets and tables cannot be navigated to and used. The problem only occurs when the JAWS Virtual PC cursor feature is enabled.

**Note:** The JAWS Virtual PC cursor is on by default.

#### **Resolving the problem**

Disable the JAWS Virtual PC cursor before you access the following portlets of IBM Work Optimization for Water Utilities:

- **Usage Analysis > Account Map**
- **Usage Analysis > Account List**
- **Work Optimization > Scheduling > Work Order Map**
- **Work Optimization > Scheduling > Unscheduled Work Order List**
- **Work Optimization > Scheduling > Scheduled Work Order List**
- **Configuration > Configure Work Optimization - Scheduling**



## Calendar date picker in the map filter is not accessible by keyboard

In the query form of the map portlets of IBM Work Optimization for Water Utilities, the calendar date picker is not accessible by keyboard. You can work around this problem by entering the date manually in the required format.

### Symptoms

In the map portlets of IBM Work Optimization for Water Utilities, when you click **Select Content** to filter your query, the calendar date picker is not accessible by keyboard. In the **When** section of the form, you must either select a time period for the report, or enter a custom start and end date in the **From date** and **To** fields. If you use the keyboard to enter a custom start and end date for your query, you cannot use the calendar date picker to enter the date. The calendar displays but you cannot use the keyboard to select a date. You can select the date using the calendar date picker, only if you use a mouse.

**Note:** The calendar date picker is also commonly known as the date picker widget.

### Resolving the problem

To work around this issue, you can enter the date into the **From date** and **To** fields manually by using the keyboard. However, if an English locale other than US English is set on your client system, then you must enter the date by using the US date format of MM/DD/YYYY.

---

## Log files

To troubleshoot a problem in IBM Work Optimization for Water Utilities, you might need to analyze log files on several systems on the IBM Intelligent Operations Center servers.

See the *Troubleshooting and Support* section of the IBM Intelligent Operations Center Information Center 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 9. References

These topics contain additional reference information to help you.

---

### CSV file format for usage data

Water usage data needs to be imported into IBM Work Optimization for Water Utilities for analysis. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `wusage.sh` script.

The first line in the CSV file must be:

```
ACCOUNTNUN,DT,ENCODER
```

Each data line in the CSV file must have each line in the following format:

```
Account_number,Timestamp,Usage_value
```

Where:

- *Account\_number* is a customer account number up to 20 characters in length. The account number must be an account number defined in the customer account information customer production data CSV file (`customer.csv`).
- *Timestamp* is the time the usage data was read in the format:  
*Year-Month-Day Hour:Minute:Second:Millisecond*

Where:

- *Year* is a four-digit year value.
- *Month* is a two-digit month value.
- *Day* is a two-digit day value.
- *Hour* is a two-digit hour value in 24-hour format.
- *Minute* is a two-digit minute value.
- *Second* is a two-digit second value.
- *Millisecond* is a four-digit millisecond value

The *Year*, *Month*, and *Day* must always be specified. If time is also specified, *Hour*, *Minute*, *Second*, and *Millisecond* must be specified.

- *Usage\_value* is text up to 10 characters in length representing the amount of usage measured by an encoder. The value can include leading zeros. Non-numeric characters will be discarded.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

All values are required for usage analysis.

The following is an example usage data CSV file:

```
ACCOUNTNUN,DT,ENCODER
"C12345",2011-09-01 14:23:15:1234,"00563"
"C45678",2011-09-02 09:01:15:03:0001,"00789"
"B398752",2011-09-15 23:23:01:0786,"10578"
```

## Related tasks

“Loading usage data” on page 43

A comma-separated value (CSV) file containing usage data is loaded into IBM Work Optimization for Water Utilities with a script.

## Related reference

“Customer account information” on page 140

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

---

## CSV file format for work depot data

Data on the location of work depots needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `gis` command.

The first line in the CSV file must be:

```
OP,OBJECT_ID,OBJECT_TYPE,LOCATION,LATITUDE,LONGITUDE
```

Each data line in the CSV file must have each line in the following format:

```
Operation,Object_ID,Object_type,Location,Latitude,Longitude
```

Where:

- *Operation* specifies if the depot is to be added, updated, or deleted. *Operation* is one of the following one character uppercase values:
  - A specifies that the depot is to be added.
  - U specifies that the existing depot is to be updated. If the depot does not exist, it is added.
  - D specifies that the existing depot is to be deleted.
- *Object\_ID* is a unique name for the depot. *Object\_ID* can be up to 100 characters in length.
- *Object\_Type* is the type of depot. *Object\_Type* can be up to 20 characters in length. The value DEPO will define the location as selectable crew locations within IBM Work Optimization for Water Utilities.
- *Location* is a description of the depot location. *Location* can be up to 254 characters in length.
- *Longitude* is the longitude where the depot is located. *Longitude* is a DECIMAL(13,8) value between -180 and +180.
- *Latitude* is the latitude where the depot is located. *Latitude* is a DECIMAL(13,8) value between -90 and +90.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following is an example spatial data CSV file:

```
OP,OBJECT_ID,OBJECT_TYPE,LOCATION,LATITUDE,LONGITUDE
"A","depo_9","DEPO","420 W ST NW",38.91915600,-77.01849600
"U","depo_2","DEPO","(new address) 420 W ST NW",38.91915600,-77.01849600
"D","depo_3","DEPO","(delete me) 420 W ST NW",38.91915600,-77.01849600
```

## Related tasks

“Loading work depot data” on page 44

A comma-separated value (CSV) file defining the locations of work depots is loaded into IBM Work Optimization for Water Utilities with a script.

## Related reference

“CSV file format for crew data”

Data related to crews, their location, and how they should be represented on the Map needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the crew command.

---

## CSV file format for crew data

Data related to crews, their location, and how they should be represented on the Map needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the crew command.

The first line in the CSV file must be:

```
OP,CREW_NAME,NICKNAME,CREW_DESCR,CREW_LOCATION,COLOR
```

Each data line in the CSV file must have each line in the following format:

```
Operation,Crew_name,Nickname,Crew_description,Crew_location,#Color
```

Where:

- *Operation* specifies if the crew is to be added, updated, or deleted. *Operation* is one of the following one character uppercase values:
  - A specifies that the crew is to be added.
  - U specifies that the existing crew is to be updated. If the crew does not exist, it is added.
  - D specifies that the existing crew is to be deleted.
- *Crew\_name* is a unique name for the crew. *Crew\_name* can be up to 80 characters in length.
- *Nickname* is a short, informal name for the crew. *Nickname* can be up to 20 characters in length.
- *Crew\_description* is a description of the crew. *Crew\_description* can be up to 254 characters in length.
- *Crew\_location* is a value matching an *Object\_ID* defining a depot imported into IBM Work Optimization for Water Utilities. Depots are imported as spatial data. If there isn't a matching depot, the crew will not be displayed in the IBM Work Optimization for Water Utilities Scheduling portlet.
- *Color* is the color to be displayed on the Map for this crew. Any valid HTML color code can be used.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following is an example spatial data CSV file:

```
OP,CREW_NAME,NICKNAME,CREW_DESCR,CREW_LOCATION,COLOR
"A","CREW-1","one","Primary Crew","depo_9","#ff0000"
"U","CREW-2","two","Secondary Crew","depo_9","#00ff00"
"D","CREW-3","three","Tertiary Crew","depo_9","#0000ff"
```

## Related tasks

“Loading crew data” on page 45

A comma-separated value (CSV) file defining the locations of crews is loaded into IBM Work Optimization for Water Utilities with a script.

## Related reference

“CSV file format for work depot data” on page 136

Data on the location of work depots needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `gis` command.

---

## CSV file format for work order data

Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `wo` command.

The first line in the CSV file must be:

```
OP,WONUM,ASSETTYPE,FAILURE,PROBLEM,CAUSE,REMEDY,WORKTYPE,EQNUM,STATUS,STATUSDATE,FAILDATE,REPORTDATE,LOCATION,LATITUDE,LONGITUDE,DESCRIPTION,WOPRIORITY,DURATION
```

Each data line in the CSV file must have each line in the following format:

```
Operation,WO_ID,Asset_type,Failure,Problem,
Cause,Remedy,Worktype,Asset_number,Status,
Status_date,Failure_date,Reported_date,Location,Latitude,
Longitude,Description,WOPriority,Duration
```

Where:

- *Operation* specifies if the work order is to be added, updated, or deleted. *Operation* is one of the following one character uppercase values:
  - A specifies that the work order is to be added.
  - U specifies that the existing work order is to be updated. If the work order does not exist, it is added.
  - D specifies that the existing work order is to be deleted.
- *WO\_ID* is an up to 10 character value identifying the work order.
- *Asset\_type* is an up to 20 character value classifying the asset. *Asset\_type* must match an asset type defined in the customer production data.
- *Failure* is an up to 20 character value specifying the type of failure. *Failure* must match a failure type defined in the customer production data.
- *Problem* is an up to 20 character value specifying the problem code for the failure. *Problem* must match a problem code defined in the customer production data.
- *Cause* is an up to 20 character value specifying the cause for the failure. *Cause* must match a problem cause defined in the customer production data.
- *Remedy* is an up to 20 character value specifying how the failure was, or needs to be, fixed. *Remedy* must match a problem remedy defined in the customer production data.
- *Worktype* is an up to 20 character value specifying the type of work to be performed. *Worktype* must match a work type defined in the customer production data.
- *Asset\_number* is a reserved field. Anything specified in the CSV file will be ignored.
- *Status* is an up to 20 character value specifying the status of the work order. *Status* must match a status type defined in the customer production data.
- *Status\_date* is the date of the last work order update in the format:  
*Year-Month-Day Hour:Minute:Second:Millisecond*

Where:

- *Year* is a four-digit year value.
- *Month* is a two-digit month value.
- *Day* is a two-digit day value.
- *Hour* is a two-digit hour value in 24-hour format.
- *Minute* is a two-digit minute value.
- *Second* is a two-digit second value.
- *Millisecond* is a four-digit millisecond value

The *Year*, *Month*, and *Day* must always be specified. If time is also specified, *Hour*, *Minute*, *Second*, and *Millisecond* must be specified.

- *Failure\_date* is the date when the failure occurred in the format:

*Year-Month-Day Hour:Minute:Second:Millisecond*

Where:

- *Year* is a four-digit year value.
- *Month* is a two-digit month value.
- *Day* is a two-digit day value.
- *Hour* is a two-digit hour value in 24-hour format.
- *Minute* is a two-digit minute value.
- *Second* is a two-digit second value.
- *Millisecond* is a four-digit millisecond value

The *Year*, *Month*, and *Day* must always be specified. If time is also specified, *Hour*, *Minute*, *Second*, and *Millisecond* must be specified.

- *Reported\_date* is the date when the failure was reported in the format:

*Year-Month-Day Hour:Minute:Second:Millisecond*

Where:

- *Year* is a four-digit year value.
- *Month* is a two-digit month value.
- *Day* is a two-digit day value.
- *Hour* is a two-digit hour value in 24-hour format.
- *Minute* is a two-digit minute value.
- *Second* is a two-digit second value.
- *Millisecond* is a four-digit millisecond value

The *Year*, *Month*, and *Day* must always be specified. If time is also specified, *Hour*, *Minute*, *Second*, and *Millisecond* must be specified.

- *Location* is an up to 254 character description of the location where the failure occurred. For example, the street address.
- *Longitude* is the longitude where the failure is located. *Longitude* is a DECIMAL(13,8) value between -180 and +180.
- *Latitude* is the latitude where the failure is located. *Latitude* is a DECIMAL(13,8) value between -90 and +90.
- *Description* is an up to 254 character description of the work to be performed.
- *WO\_Priority* is a number describing the priority of the work order where 5 is the highest priority and 1 is the lowest.
- *Duration* is a number describing the planned or actual work time in minutes.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values

cannot include double or single quotation marks. All values must be separated by commas. If a value is not specified, the place for that value must still be held with commas with no data between them.

When *Operation* is add (A) or update (U), the information specified in the CSV file will replace any existing information in IBM Work Optimization for Water Utilities. If a value is not specified in the CSV file, any existing value in IBM Work Optimization for Water Utilities is retained. Only *Operation* and *WO\_ID* are required for the delete (D) operation.

The following is an example spatial data CSV file:

```
OP,WONUM,ASSETTYPE,FAILURE,PROBLEM,CAUSE,REMEDY,WORKTYPE,EQNUM,STATUS,STATUSDATE,FAILDATE,REPORTDATE,LOCATION,LATITUDE,LONGITUDE,DESCRIPTION,WORKPRIORITY,DURATION
"U","0678977","A1","WQ","DISCOLORED",,"EMERG","SeRiA1No","COMP",
2005-11-09-23.50.14.000000,,2005-11-09-15.18.02.000000,"524 Buchanan St NW",
38.946118,-77.020348,"FLUISH FIRE HYDRANT FOR DISCOLORATION IN WATER. WATER IS MILKY.",1,720
```

### Related tasks

“Loading work order data” on page 46

A comma-separated value (CSV) file defining work orders is loaded into IBM Work Optimization for Water Utilities with a script.

### Related reference

“Asset types” on page 143

Asset types are the type of entity requiring work. For example, a valve or sump pump.

“Failure types” on page 144

Failure type describes what has failed. For example, a fire hydrant or sewer inlet.

“Problem codes” on page 146

Problem codes are the formal classification of the reported problem. For example, a seal failure or required repair.

“Problem causes” on page 152

Problem causes describe what caused the problem or failure. For example, a broken pipe or meter.

“Problem remedies” on page 156

Problem remedies describe how a problem was fixed. For example, if a pipe is flushed or replaced.

“Work types” on page 159

Work types describe the type of work that was, or will be, performed. For example, testing or maintenance.

“Status types” on page 162

Status types describe the status of a work order. For example, completed, held, or dispatched.

---

## Customer production data

IBM Work Optimization for Water Utilities provides sample data for testing. This data must be replaced with data appropriate to the production environment.

Customer data includes the following.

### Related tasks

“Modifying production data” on page 73

IBM Work Optimization for Water Utilities uses metadata and customer account data loaded into the product during processing. Production data is initially loaded after installation. Metadata can be added and customer account data added or changed as needed.

## Customer account information

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

The customer account information comma-separated value file defines customer data to be used by IBM Work Optimization for Water Utilities. The file must be named `customer.csv`.



Each line in the CSV file needs to be in the following format:

*Account,Type,Short\_name,Long\_name,Addr\_1,Addr\_2,Addr\_3,Country,Postcode,Longitude,Latitude*

Where:

- *Account* is a customer account number up to 20 characters in length.
- *Type* is a valid customer type defined in the customer type CSV file (cust\_type.csv).
- *Short\_name* is a short form of the customer's name. *Short\_name* can be up to 40 characters in length.
- *Long\_name* is a long form of the customer's name. *Long\_name* can be up to 100 characters in length.
- *Addr\_1*, *Addr\_2*, and *Addr\_3* define up to three lines of customer address information. Each can be up to 40 characters in length.
- *Country* is the country the customer is located in. *Country* can be up to 40 characters in length.
- *Postcode* is the customer's postal code up to 10 characters in length.
- *Longitude* is the longitude where the customer is located. *Longitude* is a DECIMAL(13,8) value between -180 and +180.
- *Latitude* is the latitude where the customer is located. *Latitude* is a DECIMAL(13,8) value between -90 and +90.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following is sample customer account information for IBM Work Optimization for Water Utilities:

```
"14981","FED","Stratford","Mr Leon Stratford","61 Melwood drive","Bensenville","IL","USA",58501,-00077.02633400,+00038.97947600
"14982","RES","King","Miss Daisy King","24 Minster street","Bismarck","ND","USA",,-00077.01698300,+00038.95983400
"14983","RES","Videau","Mr Garrison Videau","205 Caryl street","Newry","MN","USA",,-00077.02021200,+00038.87327200
"14984","WASA","Morobe","Ms Jillian Morobe","185 Green Road","Parkland","FL","USA",,-00076.96460700,+00038.86542400
"14985","EX","Modrier","Mr Orlando Modrier","135 Tennyson","Beaumont","TX","USA",77701,-00077.06178600,+00038.91017700
"14986","FED","Sandre","Mr Lance Sandre","120 Score lane","Curtis station","MS","USA",,-00077.09060200,+00038.87342500
"14987","RES","Husted","Miss Anjali Husted","234 Bowring park avenue","P hill","OH","USA",,-00077.09482800,+00038.87515200
"14988","INTER","Batliwala","Mr Javier Batliwala","38 Wostenholme square","Belle view","VA","USA",,-00077.05338500,+00038.89291900
```

These values can be customized two ways:

- When IBM Work Optimization for Water Utilities is initially installed, all sample values can be replaced with values matching the input that will be used in the production system.
- If additional values are required, these values can be added.

## Related tasks

“Loading customer account data” on page 28

IBM Work Optimization for Water Utilities requires data on customer accounts. This information includes customer account numbers, the customer type, and location information.

“Adding customer account data” on page 75

Over time you might need to add information about new customers to IBM Work Optimization for Water Utilities.

“Replacing customer account data” on page 75

Over time you might need to replace the customer information loaded into IBM Work Optimization for Water Utilities.

## Related reference

“Customer types”

Customer types categorize customers. For example, a residential customer or a corporate customer.

“CSV file format for usage data” on page 135

Water usage data needs to be imported into IBM Work Optimization for Water Utilities for analysis. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the `wusage.sh` script.

## Customer types

Customer types categorize customers. For example, a residential customer or a corporate customer.

The customer types comma-separated value file defines the customer types to be used by IBM Work Optimization for Water Utilities. The file must be named `cust_type.csv`.

Each line in the CSV file needs to be in the following format:

*Customer\_type,Description*

Where:

- *Customer\_type* is a short form for a defined customer type. *Customer\_type* can be up to 20 characters in length.
- *Description* is a description of the defined customer type. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following customer types are defined as samples in IBM Work Optimization for Water Utilities:

Customer type	Description
COM	Commercial
CORP	Corporate
EX	Bulk sale
FED	Public authority
INTER	Interdepartmental
MF	Industrial
MUNI	Municipal
RES	Residential
TMPMPT	Temporary
UNKNOWN	Other or unknown

These values can be customized two ways:

- When IBM Work Optimization for Water Utilities is initially installed, all sample values can be replaced with values matching the input that will be used in the production system.
- If additional values are required, these values can be added.

#### Related tasks

“Loading organization metadata” on page 27

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

“Modifying organization metadata” on page 73

Over time you might need to modify the organizational metadata used by IBM Work Optimization for Water Utilities.

#### Related reference

“Customer account information” on page 140

Customer account information defines individual customers. For example, the customer account number, street address, latitude and longitude.

## Asset types

Asset types are the type of entity requiring work. For example, a valve or sump pump.

The asset types comma-separated value file defines the assets to be used by IBM Work Optimization for Water Utilities. The file must be named `asset.csv`.

Each line in the CSV file needs to be in the following format:

*Asset\_type,Description*

Where:

- *Asset\_type* is a short form for a defined asset type. *Asset\_type* can be up to 20 characters in length.
- *Description* is a description of the defined asset type. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following asset types are defined as samples in IBM Work Optimization for Water Utilities:

Asset type	Description
BFP001	Back flow preventers - Small
BFP002	Back flow preventers - Large
CATCHBASIN	Catch basins
CRANE01	Crane failures
CURBCKS	Curb cocks
CUTOFFS	Cutoffs
EXCEP	Work exception failure codes
FACMGMT001	Facilities management
GEN000	Generic failures
HYDRANTS	Hydrants

Asset type	Description
INLETS	Grated sewer inlets
INSTR01	Instrumentation flow or level loops
JOBSITE	Job sites
LATERALS	Sewer laterals
MAINS	Water mains
MANHOLES	Manholes
METERS	Meters
MOTOR01	Motors - Electric AC induction
MOTOR02	Motors - Electric AC synchronous
MOVACTR	Motor operated valves - Actuators
ODORCTRL01	Odor controllers
OUTLETS	Sewer outlets
PUMP01	Pumps - Centrifugal
SERVICES	Services
SEWERMAINS	Sewer mains
SIOS	Stream outlet and inlet structures
SUMPPUMPS	Sump pumps
VALVEBOXES	Valve boxes
VALVES	Valves
VEHICLES	Vehicles
WQ	Water quality

These values can be customized two ways:

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#### Related reference

“CSV file format for work order data” on page 138

Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wo command.

## Failure types

Failure type describes what has failed. For example, a fire hydrant or sewer inlet.

The failure types comma-separated value file defines the types of failures to be used by IBM Work Optimization for Water Utilities. The file must be named `failure.csv`.

Each line in the CSV file needs to be in the following format:

*Failure\_type,Description*

Where:

- *Failure\_type* is a short form for a defined failure type. *Failure\_type* can be up to 20 characters in length.
- *Description* is a description of the defined failure type. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following failure types are defined as samples in IBM Work Optimization for Water Utilities:

<b>Failure type</b>	<b>Description</b>
BFP001	Back flow preventers - Small
BFP002	Back flow preventers - Large
CATCHBASIN	Catch basins
CRANE01	Crane failures
CURBCKOCKS	Curb cocks
CUTOFFS	Cutoffs
DSS	Other
DWS	Unknown
EXCEP	Work exception failure codes
FACMGMT001	Facilities management
GEN000	Generic failures
HYDRANTS	Hydrants
INLETS	Grated sewer inlets
INSTR01	Instrumentation flow or level loops
JOBSITE	Job sites
LATERALS	Sewer laterals
MAINS	Water mains
MANHOLES	Manholes
METERS	Meters
MOTOR01	Motors - Electric AC induction
MOTOR02	Motors - Electric AC synchronous
MOVACTR	Motor operated valves - Actuators
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OUTLETS	Sewer outlets
PUMP01	Pumps - Centrifugal
SERVICES	Services
SEWERMAINS	Sewer mains
SIOS	Stream outlet and inlet structures
SUMPPUMPS	Sump pumps
VALVEBOXES	Valve boxes
VALVES	Valves

Failure type	Description
VEHICLES	Vehicles
WQ	Water quality

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## Problem codes

Problem codes are the formal classification of the reported problem. For example, a seal failure or required repair.

The problem codes comma-separated value file defines the problem codes to be used by IBM Work Optimization for Water Utilities. The file must be named `problem.csv`.

Each line in the CSV file needs to be in the following format:

*Problem\_code,Description*

Where:

- *Problem\_code* is a short form for a defined problem code. *Problem\_code* can be up to 20 characters in length.
- *Description* is a description of the defined problem code. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following problem codes are defined as samples in IBM Work Optimization for Water Utilities:

Problem code	Description
1PR01OP002	Reduced pumping
1PR01OP024	Chemical leakage
1PR02ME002	Mechanical seal failure
1PR02ME006	Failed inspection

<b>Problem code</b>	<b>Description</b>
1PR02ME007	Inspection - Passed
1PR17XX001	Improper operation
1PR18PC008	Position not fully open
1PRO2ME006	Failed inspection
1PRO2ME007	Inspection - Passed
3RM17XX008	Cleaning
A CPTRY003	General carpentry or construction
A CPTRY004	Structural reinforcement
A ELSYS001	Interior lighting - Installation or replacement
A ELSYS002	Interior lighting - Repair
A ELSYS003	Interior lighting - Replace bulbs
A ELSYS004	Interior lighting - Troubleshooting
A ELSYS005	Exterior lighting - Installation or replacement
A ELSYS006	Exterior lighting - Repair
A ELSYS007	Exterior lighting - Replace bulbs
A ELSYS008	Exterior lighting - Troubleshooting
A ELSYS009	Electrical power - Switch installation or replacement
A ELSYS011	Electrical power - Switch - Troubleshooting
A ELSYS012	Electrical power - Outlet installation or replacement
A ELSYS013	Electrical outlet - RepairA EXENV004"
A ELSYS014	Electrical power - Outlet - Troubleshooting
A ELSYS015	Electrical power - Troubleshooting
A EXENV002	Interior doors and windows - Repair
A EXENV003	Exterior doors or windows - Installation or replacement
A EXENV008	Exterior painting
A FNSHG006	Furniture removal
A FNSHG011	Break room appliances - Troubleshooting
A GRNDS016	Exterior grounds - Repair
A GRNDS017	Exterior grounds cleanup
A HVAC004	HVAC system - Repair
A HVAC005	HVAC system - Troubleshooting
A HVAC007	HVAC system - Repair
A HVAC009	HVAC system - Installation or replacement
A HVAC010	HVAC system - Repair
A INFIN001	Interior door locks - Installation or replacement
A INFIN002	Interior locks - Repair
A INFIN003	Interior locks - Re-keying
A INFIN007	Floor tile - Installation or replacement
A INFIN009	Ceiling components - Installation or replacement
A INFIN011	Window dressing - Installation or replacement
A INFIN018	Bathroom dispensers - Installation or replacement

<b>Problem code</b>	<b>Description</b>
A JNCST002	Interior custodial cleaning
A JNCST004	Exterior debris removal
A JNCST006	Interior debris removal
A PLUMB003	Plumbing - Installation or replacement
A PLUMB004	Plumbing - Repair
A SASEC001	Exterior door locks - Installation or replacement
A SASEC003	Exterior locks - Re-keying
A SASEC010	Fire protection system - Installation or replacement
A SASEC013	Unsafe conditions
A SASEC017	Investigate and report on incident
A SINE001	Interior signage - Installation or replacement
A SINE003	Exterior signage - Installation or replacement
A SP001	Interior renovations
ABANDONED	Abandoned
AIRBUBBLES	Air bubbles
BOXOFFSET	Curb cock - Box offset
BOXTOLOW	Valve box - Too low
BROKEFRAME	Meter - Broken frame and cover
BROKEN	Broken
BROKEPIT	Meter - Broken pit
C03	Rust or corrosion
C07	Improper alignment or tension
C10	Improper installation
C13	Defective - Machine design flaw
C14	Missing parts
C15	Tripped
C18	Normal wear
C20	Obstructed
C21	Operator error
C22	Electrical power - Failure or surge
C24	Unknown
C26	Electrical power - Outtage
C29	Equipment out of service
C30	Redirected labor resources
C34	Conflicting priorities for operations and capital construction
CA	Condition assessment
CAPDAMAGED	Running trap or clean-out cap - Damaged
CAPMISSING	Running trap or clean-out cap - Missing
CBLOOSE	Catch basin - Loose
CBTOLOW	Catch basin - Too low
CLOG	Clog



<b>Problem code</b>	<b>Description</b>
CONTRVALVE	Control valve
COVER1	Meter - Damaged or missing cover
CUTINROAD	Cut in roadway
CW	Water - Cloudy
DEBRIS	Debris
DEFECTIVE	Defective
DISCOLORED	Water - Discolored
DUMPING	Illegal dumping
DW	Water - Dirty
EXERCISE	Exercise
FRCVRTOOLO	Frame and cover - Too low
GENREPR	General repair
HIPRESSURE	High pressure
IMPROPER	Improper installation
INLETDEBRI	Debris at catch basin inlet
INOPERBL	Inoperable
INSPECTION	Inspection
INSTALL	Installed
LEAD	Lead service
LEAK	Leak
LEANING	Leaning
LOOSEPLATE	Plates - Loose
LOPRESSURE	Water - Low pressure
LOSTITEM	Lost item
METERTOOLO	Meter - Too low
MHCD	Manhole - Damaged cover
MHCLOSE	Manhole - loose cover
MHCM	Manhole - Missing cover
MHDAMAGE	Manhole - Damaged
MHL	Manhole - Damaged lining
NEWCONN	New connection
NOACCESS	Inaccessible
NODRAIN	Water - Does not drain
NOFRAMECOV	Meter - Missing frame and cover
NOTFOUND	Not found
NOTUPGRADE	Not capable of upgrade
NOWATER	Water - Unavailable
NOZZLE_NC	Nozzle - Not compliant
OBSTRUCTED	Obstructed
OBSTRUCTN	Obstructed
ODOR	Odor

<b>Problem code</b>	<b>Description</b>
ODORCHLOR	Odor - Chlorine
ODORFOUL	Odor - Foul
OFFSETFRAM	Frame - Offset
P01	No problem - Acceptable
P02	Binding, stuck, or jammed
P03	Cracked, broken, or sheared
P04	Damaged, bent, or dented
P05	Deteriorated or worn
P06	Dirty, oiled, or littered
P07	Electrical power - Grounded, shorting, or arcing
P08	Improper balance or vibration
P09	Incomplete
P10	Inoperable
P12	Leak - Internal
P13	Loose or poorly connected
P15	Missing
P16	Not connected
P19	Out of calibration
P23	Unused
P29	Electrical power - Defective diode
P30	Electrical power - Blown fuses
P32	No work performed
P33	Partial work performed
P34	Equipment removed from preventative maintenance
P35	Inspection - No follow up required
P36	Calibration - No follow up required
P37	Calibration - Follow up required
P38	Lubrication - No follow up required
P39	Lubrication - Follow up required
P40	Corrective maintenance - No follow up
P41	Corrective maintenance - Follow up required
PITTOOHIGH	Meter - Pit too high
PITTOOLOW	Meter - Pit too low
R01	Adjustment, calibration, or setting
R03	Cleaning
R04	Inspection
R05	Inspection
R06	Loosen
R09	Defective - Manufacturing flaw
R11	Rebuild
R12	Repair

Problem code	Description
R13	Replace
R14	Reset
R19	Reschedule work immediately
R27	Rescheduling work upon favorable conditions
RECHARGREQ	Recharge requested
SETTERBROK	Setter - Broken
SETTLEMENT	Settlement
SHUTREQ	Valve - Shut off requested
SINKHOLE	Sinkhole
SKIN_IRRIT	Water - Causes skin irritation
STAGNANT	Water - Stagnant
TAPINSERT	Tap insertion
TASTEFOUL	Water - Foul taste
TASTEMETAL	Water - Metallic taste
TOOHIGH	Improper installation - Too high
TOPLOOSE	Top - Loose
TOPMISSING	Top - Missing
UNSAFECOND	Unsafe conditions
VLVSHUT	Valve - Shut off for system work or test
WHITEPART	Water - Contains white particles
X1P32	No work performed
X1P33	Partial work performed
X1P34	Equipment removed from preventative maintenance
X1P40	Corrective maintenance - No follow up
X2C32	Unsafe conditions
X3R26	Reschedule work upon equipment availability

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## Related tasks

“Loading organization metadata” on page 27

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

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Over time you might need to modify the organizational metadata used by IBM Work Optimization for Water Utilities.

## Related reference

“CSV file format for work order data” on page 138

Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wo command.

## Problem causes

Problem causes describe what caused the problem or failure. For example, a broken pipe or meter.

The problem causes comma-separated value file defines the problem or failure codes to be used by IBM Work Optimization for Water Utilities. The file must be named `cause.csv`.

Each line in the CSV file needs to be in the following format:

*Problem\_cause,Description*

Where:

- *Problem\_cause* is a short form for a defined problem or failure code. *Cause* can be up to 20 characters in length.
- *Description* is a description of the defined problem or failure code. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following problem causes are defined as samples in IBM Work Optimization for Water Utilities:

Problem cause	Description
2CS02ME031	Blocked - Valve
AGE	Aged
AGEDPIPES	Aged - Pipes
BADFAUCET	Defective - Faucet
BADPIPE	Defective - Pipe
BONNET	Caused by bonnet
BOOT	Caused by boot
BROKCC	Broken - Curb cock
BROKCUTOFF	Broken - Cut-off
BROKEN	Broken
BROKENPIPE	Broken - Pipe
BROKNOZZLE	Broken - Nozzle
BROKNUT	Broken - Operating nut

<b>Problem cause</b>	<b>Description</b>
BROKSETTER	Broken - Setter
BROKSHFT	Broken - Shaft
BYOTHERS	Repaired by others
C35	Decommissioned equipment or systems
CAP	Missing or damaged - Cap
CAPCHAIN	Missing or damaged - Cap chain
CAPLEAK	Leaking - Cap
CBBROKE	Broken - Catch basin
CBCONNBROK	Broken - Catch basin connection
CBCONNDEBR	Debris - Catch basin connection
CBCONNROOT	Roots - Catch basin connection
CBDEBRIS	Debris - Catch basin
CBROOTS	Roots - Catch basin
CIRCULAR	Break - Circular
CLOG	Clog
CONNBROKE	Break - Building connection
CONNDEBRIS	Debris - Building connection
CONNECTION	Caused by connection
CONNHARD	Blocked access - Building connection, hard structure
CONNROOTS	Roots - Building connection
CONTRACTOR	Requested by contractor
COTTERPIN	Caused by cotter pin
COVERED	Unknown
CUSTOMER	Requested by customer
DEBRIS	Debris
DEBRISFIXT	Debris - Fixture strainer
DEFECTIVE	Defective
DEFECTMETR	Defective - Meter
DEFECTRISR	Defective - Riser
DEFECTSERV	Defective - Service
DEFER_PM	Deferred to preventative maintenance
DEFGATE	Defective - Gate
DEFTOPSECT	Defective - Top section
DEVELOPER	Requested by developer or contractor
DISTRIBUTN	Requested by distribution branch
DROPPED	Debris
DRYWEATHER	Dry weather
DUPLICATE	Duplicate record
ENVIRONMNT	Environment
EXCAVATION	Excavation
EXISTING	Existing condition

<b>Problem cause</b>	<b>Description</b>
FLANGE	Caused by flange
FLANGEBUR	Buried - Break-away flange
GALVSERVCE	Caused by galvanized service pipes
GASKET	Caused by gasket
GEARS	Caused by gears
GENFAILURE	General failure
GREASE	Caused by grease
HARDOPER	Operating stem hard to operate
HOLE	Break - Hole in main
HOTH2OONLY	Problem only with hot water pipes
HSEVLVSHUT	Shut off - Inside the premises
HYDMAINVLV	Defective - Main valve
IMPROPER	Installation - Improper
INLETDEBRI	Debris - Catch basin inlet
INSPECTED	Inspected
INTERNPROB	Internal problem
JOINT	Leak - Joint
LEAVES	Debris - Leaves
LEFTOPEN	Left open
LOCBLOCKED	Blocked access - Fence or other structure
LOCDESCERR	Location description error
MAGOPNUT	Caused by operating nut
MAINBREAK	Break - Water main
MAINCAPPED	Caused by main - Cut and capped
MAINVLV	Caused by main valve
MAPERROR	Map error
METERWASHR	Caused by meter washer
MISSING	Missing
MNSHUTCONS	Shut off - Main valve due to construction
MNSHUTTEST	Shut off - Main valve due to test
MTRVLVSHUT	Shut off - Meter valve
NEEDREPAIR	Repair needed
NEW	New
NEW_RULE	New rule, regulation, or statute
NEWCUST	Requested by new customer
NEWSURFACE	New surface or grading
NODRAIN	Does not drain
NOLEAK	Leak - No leak found
NONOZZLE	Missing - Nozzle
NONPAYMENT	Non-payment
NONUT	Missing - Operating nut

<b>Problem cause</b>	<b>Description</b>
NOPROBLEM	No problem found
NOREPAIR	Not repaired
NOTCORP	Out of scope
NOTOP	Missing - Top section
NOTUSED	Not used
NOWORK	No work performed
NOZZLEDIR	Caused by nozzle - Facing wrong way
NOZZTHREAD	Damaged - Nozzle threads
OBSOLETE	Obsolete
OBSTRUCTN	Obstruction
OLDPIPESIN	Aged - Iron pipes inside premise
ORING	Caused by O-ring
OTHER	Other cause
PACKING	Caused by valve packing
PRESSBOUND	Pressure boundary
PRIVPROP	Problem on private property
REFER_INV	Referred for further investigation
REMOVEDDEV	Removed during redevelopment
REPAIR	Repair
REPAIRWORK	Repair work
ROOTS	Roots
SADDLE	Caused by saddle
SEAT	Caused by seat
SECTION	Section out
SETTLEMENT	Settlement
SEWAGE	Sewage
SHUTFAIL	Shut off - At valve, unsuccessfully
SHUTOK	Shut off - At valve, successfully
SILTCONTRL	Silt control barrier in place - contractor responsible
SPLIT	Broken - Longitudinal split
STEM	Caused by stem
STRUCK	Struck
SVCE_UPGRA	Service upgrade
TAPWASHER	Caused by tap washer
TOO LOW	Installation - Hydrant too low to ground
TOOHIGH	Installation - Too high
TRASH	Trash
TREE	Tree
TURNEDOFF	Shut off - At meter or curb cock
UNKNOWN	Unknown
UTILITY	Utility

Problem cause	Description
VALVEBROKE	Broken - Valve
VALVECLOSE	Shut off - At valve
VANDAL	Vandalized
VLVBONNET	Caused by valve bonnet
VLVOPEN	Caused by valve opening

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## Problem remedies

Problem remedies describe how a problem was fixed. For example, if a pipe is flushed or replaced.

The problem remedies comma-separated value file defines the problem resolutions to be used by IBM Work Optimization for Water Utilities. The file must be named `remedy.csv`.

Each line in the CSV file needs to be in the following format:

*Problem\_remedy,Description*

Where:

- *Problem\_remedy* is a short form for a defined problem resolution. *Remedy* can be up to 20 characters in length.
- *Description* is a description of the defined problem resolution. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following problem resolutions are defined as samples in IBM Work Optimization for Water Utilities:

Problem remedy	Description
ABANDHYD	Abandoned equipment
ABANDONED	Abandoned equipment



<b>Problem remedy</b>	<b>Description</b>
ADJTOGRADE	Adjusted to grade
BACKFILLED	Backfilled
BLOWN-OUT	Blew out
BUCKET	Cleared bucket machine
CALLPRIVPL	Advised customer to contact plumber
CAULKED	Caulked
CLEANED	Cleaned out
CLEANEDOUT	Cleaned out
CLEARED	Cleared
CLOSED	Closed
CORRGISMAX	Corrected in GIS or work order management system
CUSTDECLIN	Offered services, customer declined
CUTCAP	Cut and capped
CUTCAPLEAD	Cut and capped
CUTCONCRET	Cut concrete in preparation for rotating hydrant
DEFER_PM	Deferred until preventative maintenance due
DEGREASER	Cleared with degreaser
DUGUP	Dug up
EXT KIT	Installed extension kit
FILLED	Filled with soil, gravel, or temporary patch
FLUSH_DIS	Flushed and disinfected
FLUSHED	Flushed
HAND&FLUSH	Cleared manually and flushed
HANDCLEAR	Cleared manually
INSTALL	Installed
INSTFCCL	Installed full circle clamp
INSTJTCL	Installed joint clamp
INSTPSL	Installed split sleeve clamp
ISFP	In-service for fire protection
JETDEGREAS	Cleared with jetvac and degreaser
JETVAC	Cleared with jetvac
LOWERED	Lowered
LUBE	Lubricated
LUBRICATED	Lubricated
MARKED	Marked
NEEDREPAIR	Repair needed
NEWHYDASSY	Installed new hydrant assembly
NOPROBLEM	No problem found
NOPROBPP	Advised customer to contact plumber - no problem found
NOREPAIR	Not repaired
NOTCLEARED	Not cleared

<b>Problem remedy</b>	<b>Description</b>
NOTCORP	Out of scope
NOTFOUND	Not found
NOWORK	No work performed
OOS	Out of service
OPENED	Opened
PATCHED	Patched
PRIVPROP	Problem on private property
R20	Rescheduled
R21	Deferred until preventative maintenance due
R23	No further work required
R24	Coordinated preventative and corrective maintenance
R26	Rescheduled
RAISED	Raised
RAISEREPL	Raised
RECHARGED	Recharged
RECHECKOK	No problem found
REFER_REPL	Referred for replacement
REFER_REPR	Referred for repair
REFERED	Referred to meter department
REFFORREPL	Referred for replacement
REFFORROT	Referred for rotation
RELOCATED	Relocated
REMOVED	Removed
REPACK	Repacked
REPAIRED	Repaired
REPLACED	Replaced
REPLBOLTS	Replaced bolts
REPLGASKET	Replaced gasket or o-ring
REPLHYD	Replaced hydrant
REPLLATCO	Replaced lateral and installed clean-out
REPLLEAD	Replaced lead service
REPLNEW	Replaced with new part
REPLPACK	Replaced packing
REPLPIPE	Replaced pipe section
REPLSTEM	Replaced stem valve
REPLTOP	Replaced top section
REPLVALVE	Replaced valve
REROUTE	Rerouted
RESET	Reset
RESOLVED	Resolved issue
RETHREADED	Rethreaded

Problem remedy	Description
RETRIEVED	Retrieved
ROOTSCUT	Cut roots
ROOT-X	Cleared with Root-X
ROTATED	Rotated
RZMETERPIT	Raised meter and pit to grade
SAFE_REFER	Secured area
SERVEDNOTE	Served notice
SHUTATCC	Shut off service at curb cock
SHUTATMETR	Shut off service at meter
SHUTOFF	Shut off
SNAKE	Cleared with snake
STETCO	Cleared with stetco
STRAIGHT	Straightened
STREETCLNG	Out of scope
THROTTLED	Throttled valve at meter
TIGHTEN	Tightened
TIGHTENED	Tightened
TURNED_ON	Turned on
UPGNOZZL45	Upgraded nozzle
VLVSHUT	Shut valve for system work or test

These values can be customized two ways:

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- If additional values are required, these values can be added.

#### Related tasks

“Loading organization metadata” on page 27

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

“Modifying organization metadata” on page 73

Over time you might need to modify the organizational metadata used by IBM Work Optimization for Water Utilities.

#### Related reference

“CSV file format for work order data” on page 138

Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wo command.

## Work types

Work types describe the type of work that was, or will be, performed. For example, testing or maintenance.

The work types comma-separated value file defines the work types to be used by IBM Work Optimization for Water Utilities. The file must be named `work_type.csv`.

Each line in the CSV file needs to be in the following format:

*Work\_type,Description*

Where:

- *Work\_type* is a short form for a defined work type. *Work\_type* can be up to 20 characters in length.
- *Description* is a description of the defined work type. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following work types are defined as samples in IBM Work Optimization for Water Utilities:

<b>Work type</b>	<b>Description</b>
ABAND	Abandonment
ADM	Administrative support
CC	Capital construction
CCTV	Closed circuit television (CCTV) sewer line
CIP	Capital improvement program (CIP)
CM	Maintenance - Corrective
COMM	Commercial project
DR	Drainage
ELSYS	Building - Electrical system
EM	Maintenance - Emergency
EMERG	Investigation - Emergency
ER	Equipment reliability
EV	EV
EXENV	Building - Exterior envelope
FLDPM	Maintenance - Field-initiated preventative
FLSH1	Flush - Customer complaint - Not urgent
FLSH2	Flush - Total Coliform Rule (TCR) site
FLSH3	Flush - Routine monitoring
FLSH4	Flush - Flushing zone assessment
FLSH5	Flush - Retest based on flush activity
FLSH6	Flush - Customer complaint - Urgent
FLTST	Flow test
FNSHG	Furnishings and accommodations
GRNDS	Exterior grounds
HK	Housekeeping
HKETS	Housekeeping - Engineering
HKFM	Housekeeping - Facilities management
HKMT	Housekeeping - Maintenance
HKPM	Housekeeping - Preventative maintenance
HKWT	Housekeeping - Wastewater treatment
HVAC	Heating, ventilation, air conditioning (HVAC)

<b>Work type</b>	<b>Description</b>
INFIN	Interior finishes
INSP	Inspection
INV	Investigation - Non-emergency
JNCST	Janitorial or custodial support
MESYS	Building - Mechanical systems
MOC	Management of change
OR	Operating resources
PA	Personnel accommodation
PC	Permit compliance
PD	Maintenance - Predictive
PDA	Property disposal
PLUMB	Plumbing - Domestic
PLUMR	Plumbing - Plumber report
PM	Maintenance - Preventative
PRMIT	Permit
PROJ	Project
PSR	Public space restoration
RCNFG	Reconfiguration
RDESN	Redesign
RENOV	Renovation
RESPM	Maintenance - Rescheduled preventative
SA	Safety
SASEC	Safety and security
SCONN	New connection to sewer main
SHCIP	Valve shut - For CIP work test
SHDEV	Valve shut - For developer
SHENG	Valve shut - For environmental testing
SHINV	Valve shut - For investigation
SHMTR	Valve shut - For meter operation
SHSR	Valve shut - For system repair
SINE	Signage
SP	Special projects
TAP	New tap insertion on main
TEST	Test water samples
WCONN	New connection to main
WMSET	Water meter set
WQ	Water quality issue
WSAC	Water and sewer availability certification

These values can be customized two ways:

- When IBM Work Optimization for Water Utilities is initially installed, all sample values can be replaced with values matching the input that will be used in the production system.
- If additional values are required, these values can be added.

### Related tasks

“Loading organization metadata” on page 27

IBM Work Optimization for Water Utilities requires metadata appropriate for the installation. This information includes customer and asset types as well as information on the type of work to be managed and associated work classifications.

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Data related to work orders needs to be imported into IBM Work Optimization for Water Utilities for use in work order scheduling. The data needs to be formatted as a comma-separated value file and imported into IBM Work Optimization for Water Utilities with the wo command.

## Status types

Status types describe the status of a work order. For example, completed, held, or dispatched.

The status types comma-separated value file defines the work order status codes to be used by IBM Work Optimization for Water Utilities. The file must be named `status.csv`.

Each line in the CSV file needs to be in the following format:

*Status\_type,Description*

Where:

- *Status\_type* is a short form for a defined status. *Status\_type* can be up to 20 characters in length.
- *Description* is a description of the defined status type. *Description* can be up to 80 characters in length.

If a value contains non-alphanumeric characters, for example, spaces or symbols, the value must be enclosed in quotation marks. Otherwise, surrounding values with quotation marks is optional. Values cannot include double or single quotation marks. All values must be separated by commas.

The following status types are defined as samples in IBM Work Optimization for Water Utilities:

Status	Description
APPR	Approved
COMP	Completed
DISAPPR	Disapproved
DISPTCHD	In progress
HOLD	On hold
INCOMP	Incomplete
MATLA	Waiting labor or materials
PLAN	Planning
REJECTED	Rejected
RESCHD	Rescheduled
SCHD	Scheduled
TESTING	Testing

Status	Description
WAPPR	Awaiting approval
WOTHERS	Awaiting other conditions
WPROJ	Awaiting scheduling

These values can be customized two ways:

- When IBM Work Optimization for Water Utilities is initially installed, all sample values can be replaced with values matching the input that will be used in the production system.
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#### Related tasks

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## PDF library

This topic provides links to the information center content in PDF format.

The information center content is available in the following PDF for convenient printing:

- IBM Intelligent Water Family: Work Optimization Information Center

## 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>
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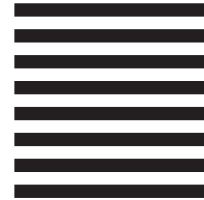
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