



## Performing Administrative Tasks

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This chapter is for administrators who configure and manage the WAE Live application.

To configure WAE Live, it is assumed that you already have:

- An admin role—You know that you have admin privileges when you see the admin icon in the upper-right corner of the WAE Live Home page after logging in.
- Installed the Cisco WAE Live server, including the mld data store. For information on installing the WAE Live mld data store, see the *Cisco WAE Server Installation Guide*.
- Collected WAE Live data from plan files, SNMP, or other collection methods, such as a snapshot.
- The appropriate license.

This chapter assumes that you are familiar with the CLI commands to configure the WAE Live server and to troubleshoot operations on your WAE server installation.



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**Note** \$CARIDEN\_ROOT is the directory in which the software is installed. On Linux, the default \$CARIDEN\_ROOT is /opt/cariden. \$CARIDEN\_HOME is the directory in which the WAE Design, and WAE Live executables and binaries are installed. On Linux, the default is /opt/cariden/software/mate/current .

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## About Network Data

WAE Live collects data from WAE Server, which can include the creation and addition of a simulated demand traffic matrix. The data is stored in *plan files* . WAE Live uses two internal mechanisms, a time-series optimized data store and an internal Map archive, to store this data and make it available for use in the application. The

Map component accesses the Map archive and shows the visualization of these plan files in a weathermap layout. The Explore and Analytics components access the data store.

If a newly discovered node cannot be assigned to an existing site, WAE Live creates an ExtraNodes site and places the unassigned node there.

## About Advanced Configuration Settings

Access: **WAE Live > Settings > General** tab

The General tab includes an advanced configuration (Advanced Config) link. Clicking this link displays data configuration details (config.xml) for your WAE Live server. While you can edit this file, be advised that any changes you make could adversely impact your WAE Live setup. We recommend that you consult with your support representative for assistance before changing any properties or parameters in this file.

## Troubleshooting

Relevant log files are located in `$CARIDEN_ROOT/logs/wae-live` and `$CARIDEN_ROOT/logs/wae-web-server`.

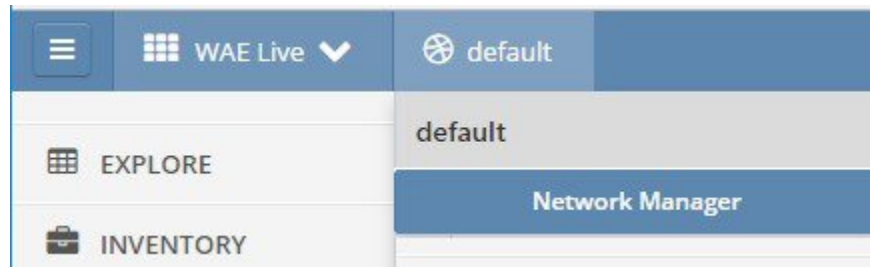
- Data collection is the process of getting the plan files from WAE Server. WAE Live then inserts this data to internal locations for use in the WAE Live application. If the data insertion process is halted, a message appears at the top of each page alerting you to this issue. To troubleshoot the source of the issue, do one of the following:
  - Navigate to **WAE Live > Settings > Data Source** table and click **Check Status** button to check the status.
  - Use the `ml_insert_ctl` tool. For information, see `ml_insert_ctl -help`.
- If you need to contact a support representative, use the `mate_tech_support` tool to create a tar file of support information. The output is stored in the `/tmp/MATE_TS` directory by default. To change the directory in which the results are stored, use the `-tar-path` option.

Example: This creates a tar file of support information and stores the output in the `/troubleshooting` directory:

```
mate_tech_support -tar-path /troubleshooting
```

## Multi-Network Management

Access: **WAE Live > Network icon (default) > Network Manager**



WAE Live supports multiple networks. If only one network exists, the Network menu shows “default” as the name of the default network. If there are multiple networks, the name of the network that is in use shows.

To configure collections for a specific network, you must first create the network. After creating the network, WAE Live automatically creates a map archive. These map archives are stored in `$CARIDEN_ROOT/data/mldata/archives` as `<network_name>-archive`. `$CARIDEN_ROOT` is the installation directory, which is `/opt/cariden` by default.

After you create a network, all users have access to its data through the Explore, Analytics, and Map components.

## Adding a Local Network

If you have not already run collections for a network, any newly added networks have no data to display. For information on running collections, see the *Cisco WAE User Guide*.

When you add a network, it is assumed that you want to add local network, which is your current WAE server.

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- Step 1** As an admin, click the default Network icon at the top of the WAE Live Settings page. Initially, this says “default”; choose the Network Manager.
- On a fresh installation with no networks added, there are empty sections for Active Networks, Inactive Networks, and Remote Network Links. If you have already added networks, this page displays all active, inactive, and network links.
- Step 2** In the upper-right corner of the Network Manager page, click **Add**.
- By default, the Add Network dialog box automatically uses the Local Network option.
- Step 3** Enter a unique network name to identify the network from which you are collecting; for example, `testnetwork1`.
- Step 4** (Optional) Enter a description of the network or other useful notes about the network.
- Step 5** Set the status, and then click **Save**.
- After successfully creating a network, the network name becomes available from the default network drop-down list and appears on the Network Manager page.
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## Adding a Remote Network Link

The network can reside on a separate WAE Live server. A remote network link lets you access another WAE Live server without having to remember its name.

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- Step 1** As an admin, click the default Network icon at the top of the WAE Live Settings page. Initially, this says “default”; choose the Network Manager.
- Step 2** Click **Add**.
- Step 3** Click the **Remote Network Link** radio button.
- Step 4** Enter a hostname.
- Step 5** Enter a network name.
- After adding the remote network link, it appears under the Remote Network Links section on the Network Manager page.
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## Setting Networks to Active/Offline

For local networks only, you can set their state to either Active or Offline.

- **Active**—Data can be collected for this network, and the network is visible to all users.
- **Offline**—Data cannot be collected for this network, and the network is not visible to users.

If you configure collection for an active network, set it to offline, and then later change it back to active, the collection restarts automatically.

## Viewing or Editing Networks

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- Step 1** As an admin, choose **Network Manager** from the list of available networks in the upper-left network link. A list of active and inactive networks opens.
- Step 2** Click the network name that you want to edit.
- Step 3** Enter your changes, and click **Update**.
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## Deleting Networks

If you delete a network and then add it back at a later time, you must reconfigure its collection.

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- Step 1** As an admin, choose **Network Manager** from the list of available networks in the upper-left network link. A list of active and inactive networks opens.
- Step 2** Click the network name that you want to delete.
- Step 3** Click **Delete**, and then click **OK** to confirm the deletion.
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### What to do next

## Data Source Settings

Access: **WAE Live > Settings > Data Source** tab

The Data Source tab lets you configure how often to collect network data, specify the network source for the data, and check the status of the latest data collected.

All WAE Live settings and application data, including the Data Source tab, are applicable on a per-network basis. Before configuring or making changes to any of these pages, choose the appropriate network from the Network menu (top left).

Multi-network collection is only supported in the following cases:

- The Collection Source is the 7.1 Remote Archive.
- The Collection Source is None.

## About Data Collection

Data collection is the process of getting plan files; WAE Live then inserts this data to internal locations for use in the WAE Live application.

The WAE Live > Settings > Data Source tab identifies the source and status of data collection.

By default, WAE Live checks for a plan file every 30 seconds. The Insertplan.Source.Pollfrequency property in the Advanced Config feature sets this default. If none is defined, the default applies.

## Data Collection Sources

Data is collected from WAE 7.1 Remote Archive and the plan is used in WAE Live.

## Collecting Data

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- Step 1** At the top of the WAE Live Settings page, click the default Network icon. Initially, this says “default”; choose the Network Manager.
  - Step 2** Navigate to **WAE Live > Settings > Data Source**.
  - Step 3** For the collection source, click the **7.1 Remote Archive** radio button.
  - Step 4** Enter the hostname.
  - Step 5** Enter the port details.
  - Step 6** Enter a username. This is the administrative username for the server.
  - Step 7** Enter a password. This is the password for the administrative user.
  - Step 8** Click **Save**.
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## Checking the Data Collection Status

**Step 1** Choose **WAE Live > Settings > Data Source**.

**Step 2** At the top of the Data Source tab, click **Check Status**.

The Data Collection Status dialog box shows the last collected filename, the time the plan file was collected, and any source archives for the plan files.

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## Disabling Data Collection

**Step 1** Choose **WAE Live > Settings > Data Source**.

**Step 2** At the bottom of the Data Source tab, click **None** and then **Save**.

This disables data collection and stops the scheduler for the current WAE Live network.

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## Inventory Configurations

This page must be configured to collect the plan files containing topology and statistics for the same network used in the inventory collection process. Inventory collection for use in WAE Live must be configured in WAE Server.

Data is visible on WAE Live when 7.1 Remote Archive which is the remote WAE network specified in the [Collecting Data, on page 5](#) section has the inventory data collected.

## Explore and Analytics Settings

Access: **WAE Live > Settings > Explore and Analytics** tab

WAE Live supports multiple interface types that you can view on the Explore page and are used when creating reports from the Analytics pages. The Settings > Explore and Analytics tab lets you specify the default interface type used. You can override the default for the Explore pages, but not for the Analytics pages.

WAE Live acts on a set of objects (network elements) that are discovered or created prior to WAE Live accessing the plan file. For example, interfaces might be discovered by WAE Collector while demands thereafter can be added to the plan file. Each object has a set of default properties (attributes) that are tracked in and retrieved from the data store. For example, an LSP's Shortest TE Path, a node's CPU, or an interface's Traffic In are all properties that are collected and stored by default. In addition to these default objects, from the Settings > Explore and Analytics tab you can create user-defined properties to fit your specific needs.



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**Note** These settings are configured for all networks; that is, they are not configurable on a per-network basis.

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## Default Interface Types

You can specify the default interface types to show in Explore and use in Analytics (reporting):

- Individual logical interface—An interface with an IP address that is not in a LAG. These names might have a decimal.  
Example: et-0/1/2.0, g2/0/0
- Individual physical interface—An interface that is not in a LAG and does not have an IP address. These interface names do not have a decimal.  
Example: so-0/2/2, g2/0/0
- LAG logical interface—An interface with an IP address that contains member interfaces.  
Examples: ae0.0, Bundle-Ether1, Port-Channel7
- LAG physical interface—The physical representation of an aggregated interface to which a LAG logical interface (such as ae0.0) is assigned.  
Example: ae0 for Juniper interfaces
- LAG member interface—An interface that is in a LAG.  
Example: g2/0/0
- Unknown—None of the preceding interface types.

## User-Defined Properties

You can define your own properties to use when creating reports. User-defined properties derive their values from other properties. For example, rather than tracking incoming traffic (Traffic In) and outgoing traffic (Traffic Out), you might need to track the ratio of incoming to outgoing traffic ([Figure 1: Example of a User-Defined Property Definition Using Simple Arithmetic Expression, on page 8](#)).



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**Note** For two-word properties, use one word in the definition. For example, for the Remote Node property, use “remotenode.” For Traffic In and Traffic Out properties, use “traffin” and “traffout” in the definition.

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Figure 1: Example of a User-Defined Property Definition Using Simple Arithmetic Expression

The figure shows a dialog box for defining a user-defined property. The dialog has three fields: 'Object' set to 'Interfaces', 'Name' set to 'Traff Ratio', and 'Definition' set to 'TraffIn / TraffOut'. Below the dialog is a table with five columns: 'Node', 'Name', 'TraffOut', 'TraffIn', and 'Traff Ratio'. The table contains two rows of data. A red box highlights the 'Definition' field in the dialog, and a red arrow points from it to the 'Traff Ratio' column in the table. A vertical number '381644' is visible on the right side of the table.

Node	Name	TraffOut	TraffIn	Traff Ratio
MIL-BB1	ae2.0	1387.89	12817.79	9.24
BCN-BB1	ae0.0	1735.95	13477.29	7.76

As with default properties, these user-defined properties are available in the Explore and Analytics pages. Each user-defined property consists of an object, a user-specified name, and a user-created definition.

## Adding a User-Defined Property

- Step 1** Choose **WAE Live > Settings > Explore and Analytics**.
- Step 2** Click **Add Property**.
- Step 3** From the Add New Property dialog box, choose the object type to which the newly created property applies (interfaces, interface queues, nodes, and so on).
- Step 4** Enter a property name. Once the property is saved, this name appears as a selectable property for the given object in Explore and Analytics pages.
- Step 5** Enter a definition value.
- Step 6** Click **Preview** to view the results that the object and definition return.
- Step 7** Click **Save**.

## Acceptable Definition Field Values

The definition field accepts alphanumeric characters and regular expressions. Each definition is an expression using one or more default properties. The following rules apply:

- Properties used in the definition must be default properties; that is, you cannot use user-defined properties in defining other user-defined properties.
- Property names in the Definition field are not case-sensitive.
- A user-defined property can be an integer, a double (floating point number), string, or boolean.



- You can use any combination of the following in the definition. You can group any of these with parenthesis, which are executed in the order in which they appear.
  - Arithmetic expressions: +, -, \*, /, and % ([Figure 1: Example of a User-Defined Property Definition Using Simple Arithmetic Expression, on page 8](#))
  - Relational operators: >, <, =, <=, and >=
  - Logical operators: AND, OR, and NOT
  - [Regular Expression Functions, on page 9](#)
  - [CASE Statements, on page 10](#)
  - Edit (pencil icon)—Edit the user-defined property.
  - Delete (trash can icon)—Delete a user-defined property. There is no undo.

## Regular Expression Functions

In the Definition field for your user-defined property, you can use regular expressions to filter results using `regexp_extract` and `regexp` functions.

### `regexp_extract`

#### **regexp\_extract Syntax**

```
regexp_extract(formatted_result, identifier1, pattern1, identifier2, pattern2, ...)
```

This searches a string with a list of regular expressions to produce a formatted string result compiled from back references. Back references are the results of capturing groups from the regular expressions and referencing them in order by \$N, where N is a number that is greater than or equal to 1. This N identifies the captured string returned by a back reference in the order it appears in the matching pattern. At a minimum, only three arguments are needed for `regexp_extract`. You can use any number of pairs of attributes and expressions.

Example: In this example, both captured groups (\$1 and \$2) come from the regular expression for Description. The expression for Node does not have any capturing groups. It is used only as an additional filter. If any of the regular expressions fail to match, the overall `regexp_extract` fails to match.

```
"regexp_extract("$1 ($2)", Description, ";interconnect to ([^\(]* \([^\)]*))", Name, "^(?!.*lo)")"
```

### `regexp`

#### **boolean regexp Syntax**

```
regexp(identifier1, pattern1)
```

This `regexp` syntax returns true, false, or null.

Example: If Node starts with 'palt', then sum the Traffic In and Traffic Out values. If the Node starts with something else, or is null, no value is displayed.

```
case when regexp(node, '.*PALT.*') then traffin + traffout else null end
```

Example: If your node names include site names, this `regexp` syntax is useful for creating site properties for interfaces.

```
regexp_extract('$1', node, '([^-]+)-(.*)')
```

## CASE Statements

The CASE statement allows conditional values based on a set of expressions. All result-expressions must be of the same type. That is, they can all be numeric or all be string, but they cannot be a mixture of both string and numeric.

CASE Statement Syntax
CASE WHEN <boolean-expression> THEN <result-expression>
[WHEN ...]
[ELSE <result-expression>]
END

Example: This example creates a user-defined property if a node name matches a remote node and if neither name is null.

```
case
```

```
when regexp_extract('$1', node, '(...)*\.(...)*') isnull then null
```

```
when regexp_extract('$1', remotenode, '(...)*\.(...)*') isnull then null
```

```
when regexp_extract('$1', node, '(...)*\.(...)*') = regexp_extract('$1', remotenode, '(...)*\.(...)*') then true
else false end
```

## Expression Syntax

Two syntaxes are used for the supported expressions: EBNF (Extended Backus–Naur Form) and a simpler query. Note that you can use one or multiple words for isNull and isNotNull.

- “isNull” can be represented by “is null”
- “isNotNull” can be represented by “is not null”

### Simple Query

The following table shows the syntax for a simple query.

Simple Syntax
expression := value { +, -, *, /, %, IN, is [not] null, case } [ expression ]
when-expression := expression [ {AND, OR, NOT } when-expression ]
case := CASE WHEN when-expression THEN expression [ ELSE expression ] END
value := { object-attribute, number, string, regexp(), regexp_extract() }

### EBNF

The following table shows the grammar in EBNF format.

<b>SELECT Rule</b>	<b>Syntax</b>
expression	case   logical
logical :=	relational {( OR, AND, SEMICOLON, COMMA ) relational }
relational :=	additive {( <, <=, >, >=, =, ==, != ) additive }
additive :=	multiplicative {( +, -,    ) multiplicative }
multiplicative :=	unary {( *, /, % ) unary }
unary :=	( !, not, ~, +, - ) factor   factor isnull   factor
factor :=	NUMERIC   STRING   NULL   TRUE   FALSE   ID   regexp   regexp_extract   in_expr   '( expression )'
regexp :=	REGEXP '( literal COMMA STRING )'
regexp_extract :=	REGEXP_EXTRACT '( STRING COMMA reg_arg_list )' opt-as
reg_arg_list :=	literal COMMA STRING
in_expr :=	IN '( string_list )'
string_list :=	STRING COMMA string_list STRING
case :=	CASE when when_list opt_else END
when_list :=	when when_list
when :=	WHEN expression THEN expression empty

SELECT Rule	Syntax
opt_else :=	ELSE expression   empty
opt_as :=	AS ID
literal :=	ID   STRING

## Map Settings

Access: **WAE Live > Settings > Map** tab

The Settings > Map tab lets you configure the WAE Live Map panels and set a default layout for the weathermap. These configurations apply to all networks and are not configurable for a specific network.

## Map Archives and Templates

WAE Live automatically creates the template (template.pln) file from the most recently collected plan file if no template exists. These templates and plan files are stored in map archives for use in the Map component. If visual elements have not been applied, the plan file is visualized in the default, unprocessed state. To create the visual elements of a template file and save it to a map archive, use the WAE Design GUI.

## About Advanced Configuration Settings

Access: **WAE Live > Settings > Map** tab > **Advanced Config** (in lower-left corner)

As is the case with the WAE server, the Map tab includes an advanced configuration (Advanced Config) link. Clicking this link displays configuration details for the Map component. While you can edit this file, be advised that any changes you make could adversely impact your Map setup. We recommend that you consult with your support representative for **assistance before changing any parameters**.

## Default Map Archive Setting

Assuming that you are using the default map archive path setting and the default installation directory `/opt/cariden`, the property that defines the path to the map file is:

```
"Map.ArchivePath": "/opt/cariden/data/mldata/archives/default-archive"
```

## Overriding the Default Map Archive Setting

You can override the default map archive setting. The `Map.ArchivePath` property controls the location and map archive name. It uses the following format:

```
"Map.ArchivePath": "<map_archive_path>/  
<network_name>  
-archive"
```

**For example, if you want to change the name of the default archive to reflect the “Acme” network’s weathermap, change this property to:**

```
"Map.ArchivePath": "/opt/cariden/data/mldata/archives/acme-archive"
```

Map archives are automatically created when you make a change to the Map.ArchivePath property.

## Configuring the Traffic Panel

The Traffic Widget lets you configure the Peering panel on the Map page. This panel shows the highest traffic utilization per peer and per site. The far left column lists the peers, while each top column lists the associated sites. The icons in the panel represent the traffic flowing between the two.

For this panel to have data, you must configure the collection of BGP.



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### Traffic Widget Fields

- **Enabled**—If checked, the panel shows in the Map page.
- **Title**—The name of the panel to appear on the Map page.
- **Rows**—Configure the ASNs (external peers) used in the panel. Their names appear on the left side of the panel. Each ASN represents a row in the panel.
  - **Top \_\_\_ ASNs by Traffic Utilization**—The ASNs with the highest traffic utilization. Enter a whole number from 1 to 20.
  - **Except**—To exclude specific ASNs that would be captured by the highest utilization, enter one or more ASNs separated by commas.

- **Only These**—To use only a specific set of ASNs, regardless of their traffic utilization, enter one or more ASNs separated by commas.
- **Columns**—Configure the sites used in the panel. Their names appear across the top of the panel. Each site represents a column in the panel.
  - **Top \_\_\_ Sites by Traffic Utilization**—The sites with the highest traffic utilization. Enter a whole number from 1 to 20.
- **Only These**—To use only a specific set of sites, regardless of their traffic utilization, enter one or more site names separated by commas.

## Configuring the Events Panel

The Events Widget lets you configure which events appear on the Map page. This panel tracks a set of current events and the number of changes since the last plan file was received.

Events	Count	Last $\Delta$
Circuits down	600	+0 -0
Nodes down	11	+4/-3

Configuration of this panel is a combination of this UI and the default\_timeplot\_summary\_format.txt file located in the \$CARIDEN\_HOME/etc/matelive directory.

For an event to appear, it must be configured in both locations. Combining the examples in this section would result in two events in the panel: Circuits down and Nodes down.

- **default\_timeplot\_summary\_format.txt file**—Defines the metrics used for the events. Each metric is listed in the “Queries” section. For information on how to configure this file, see the comments at the end of the file.

Example: This is an excerpt from the default file.

```
-----Queries-----
# Circuit Down
CircuitsDown SELECT Old_Name AS Details
CircuitsDown FROM Joined_Circuits
CircuitsDown WHERE ((Old_Name IS NOT NULL) AND (Name IS NULL)) OR ((Old_Active = 'T') AND
(Active = 'F'));
#Node Down
NodesDown SELECT Old_Name AS Details
NodesDown FROM Joined_Nodes
NodesDown WHERE ((Old_Name IS NOT NULL) AND (Name IS NULL)) OR ((Old_Active = 'T') AND
(Active = 'F'));
```

- **Events Widget UI**—Lists the metrics and their display names. Each metric must match an event metric (query) that appears in the default\_timeplot\_summary\_format.txt file. Example:

Metric	Display Name
CircuitsDown	Circuits down
NodesDown	Nodes down

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## Events Widget Fields

- Enabled—If checked, the panel shows in the Map page.
- Title—The name of the panel to appear on the Map page.
- Add Metric—Click to add a new event for display on the Map page.
  - Metric—The name of the event metric that appears in the default\_timeplot\_summary\_format.txt file.
  - Display Name—The event name that appears in the panel on the Map page.
- Edit (pencil icon)—Edit the event metric name or the display name.
- Delete (trash can icon)—Delete a metric from the UI so that it no longer appears in the Events panel. There is no undo.

