

AVEVA™ Object Viewer User Guide



AVEVA

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Contents

Chapter 1 Overview	5
Availability	5
Starting Object Viewer.....	5
Navigating In Object Viewer.....	5
Finding Objects.....	6
Closing Object Viewer	7
Chapter 2 Viewing Attributes	9
Viewing an Object's Attribute Data	9
Quality	9
Status.....	9
Has Buffer	10
Understanding Failed Requests	11
Communication Errors	11
Configuration Errors	12
Operational Errors	13
Sorting Data	13
Viewing Attributes in a Watch Window.....	13
Using the Aveva OPC UA Client Service.....	14
Adding a Watch Window	14
Saving a Watch Window	14
Removing Attributes from Watch Windows	15
Chapter 3 Modifying Attribute Values	17
Attribute Properties	17
Category Property	17
Value Property	18
Timestamp Property	18
Modifying an Attribute Value	18
Modifying an Attribute from the Watch Window	18
Viewing Changes Dynamically	19
Setting an ApplicationObject OnScan	19
Setting an ApplicationObject OffScan	19

CHAPTER 1

Overview

Object Viewer provides performance and diagnostic information about ApplicationObjects. You can use Object Viewer to show performance parameters, resource consumption, and reliability measurements of objects you select.

In addition to viewing an object's data value, data quality, and the communication status of the object, you can also modify some of the object's attributes for diagnostic testing. Modifications can include adjusting timing parameters and setting objects in an execution or idle mode.

Object Viewer runs with minimal System Platform and operating system requirements.

Using Object Viewer you can:

- View the data type, data quality, data value, timestamp, and communication status of ApplicationObject attributes.
- Do diagnostic testing on ApplicationObjects.
- Modify selected ApplicationObject attributes.

Availability

Object Viewer is a common component of any Galaxy application and is available from any workstation in the application with a deployed WinPlatform. You do not need to install the utility on each workstation.

Starting Object Viewer

You can use Object Viewer from any workstation that is part of your Galaxy application.

To start Object Viewer

1. Click **Start**, navigate to **AVEVA**, and click **System Management Console**.
2. In the console tree, expand the **Platform Manager** to show the list of Galaxies, and then expand a Galaxy to show a list of platforms.
3. Right-click a platform, and then click **Launch** Object Viewer.

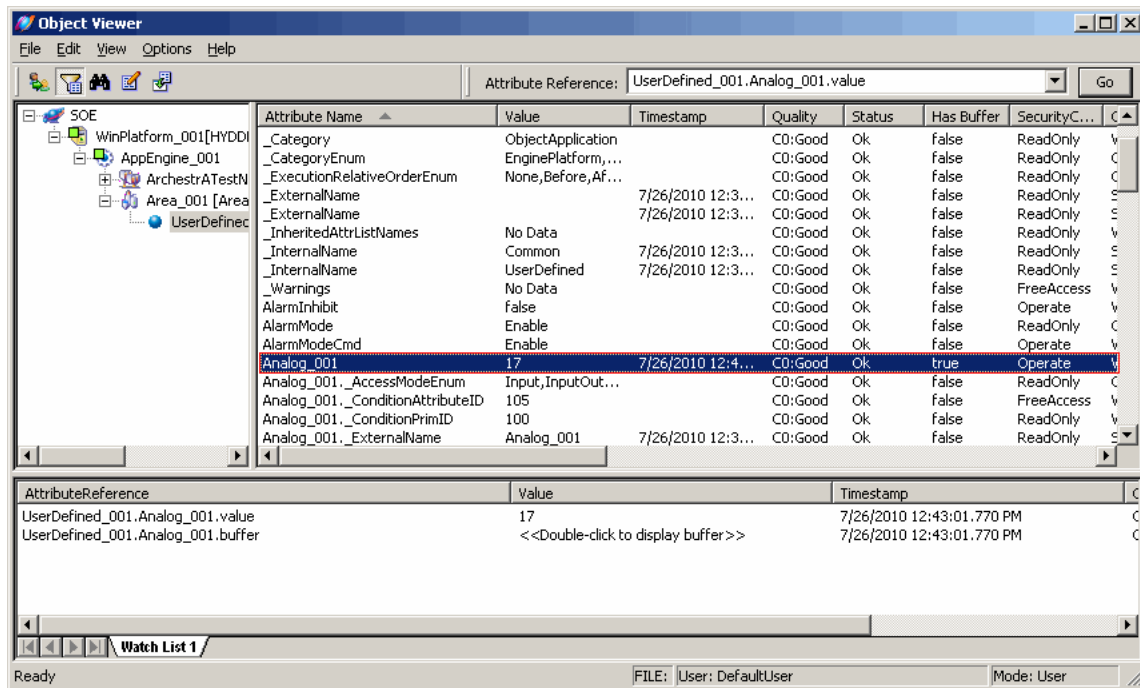
You can also start the Object Viewer from the System Platform IDE by right-clicking a deployed object and then clicking **View in Object Viewer**.

Navigating In Object Viewer

The main window of the Object Viewer is composed of three areas:

- Console tree on the left
- Details pane on the right

- Watch window bottom



The console tree works like Windows Explorer. Use the plus (+) and minus (-) signs to expand or hide the nested list items shown in the pane. When you select an object in the console tree, its associated attributes and their properties are shown in the details pane.

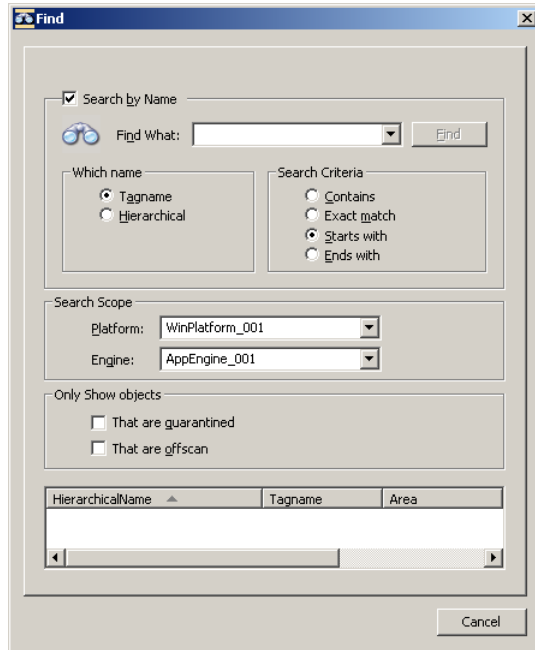
Drag a specific set of attributes of interest to a watch window to monitor their **Quality**, **Status**, **Timestamp**, and **Value** as you manipulate them and other attributes that affect their data values. You can save the contents of a watch window to a file for future reference.

Finding Objects

You can use the **Find** dialog box to search for an object in your Galaxy application.

To find an object by name

1. On the **Edit** menu, click **Find Object**.



2. Select the **Search by Name** check box.
3. In the **Find What** box, type or select a tag name. The **Find** button becomes active.
4. In the **Which Name** area, select either **Tagname** or **Hierarchical**.
5. In the **Search Criteria** area, click a search option.
6. In the **Search Scope** area, select a platform and an engine.
7. In the **Only Show Objects** area, select the **That Are Quarantined** and **That Are OffScan** check boxes to limit the search scope.
8. Click **Find**.

To find an object without using the name

1. On the **Edit** menu, click **Find Object**.
2. Clear the **Search by Name** check box.
3. In the **Search Scope** area, select a platform and an engine.
4. In the **Only Show Objects** area, select the **That Are Quarantined** and **That Are OffScan** check boxes to limit the search scope.
5. Click **Find**.

Closing Object Viewer

By default, when you close the Object Viewer, your settings are not saved, including the attributes you selected for the **Watch** window. You can choose to save the watch windows you create. For more information about saving watch windows, see "Saving a Watch Window" on page 20.

To close the Object Viewer

- On the **File** menu, click **Exit**.

CHAPTER 2

Viewing Attributes

Using Object Viewer, you can view the attributes of all ApplicationObjects in your Galaxy application from any workstation used in the application.

Viewing an Object's Attribute Data

All AutomationObjects consist of attributes and common properties such as data type, initial value, and value range. Each object's set of attributes appears in the details pane when you select the object in the console tree.

To view an object's attribute data

1. Start Object Viewer. Object Viewer's main window appears. The object in focus in the IDE or Platform Manager is put into focus in the console tree of the Object Viewer.
2. To view another object's attributes, select the object in the console tree.

Quality

Every readable attribute is assigned a quality property that matches one of four categories.

Quality	Description
Good	Data is good and can be used.
Uncertain	Data is questionable, but can be used.
Initializing	Data is not yet available, but will be soon.
Bad	Data cannot be used.

Status

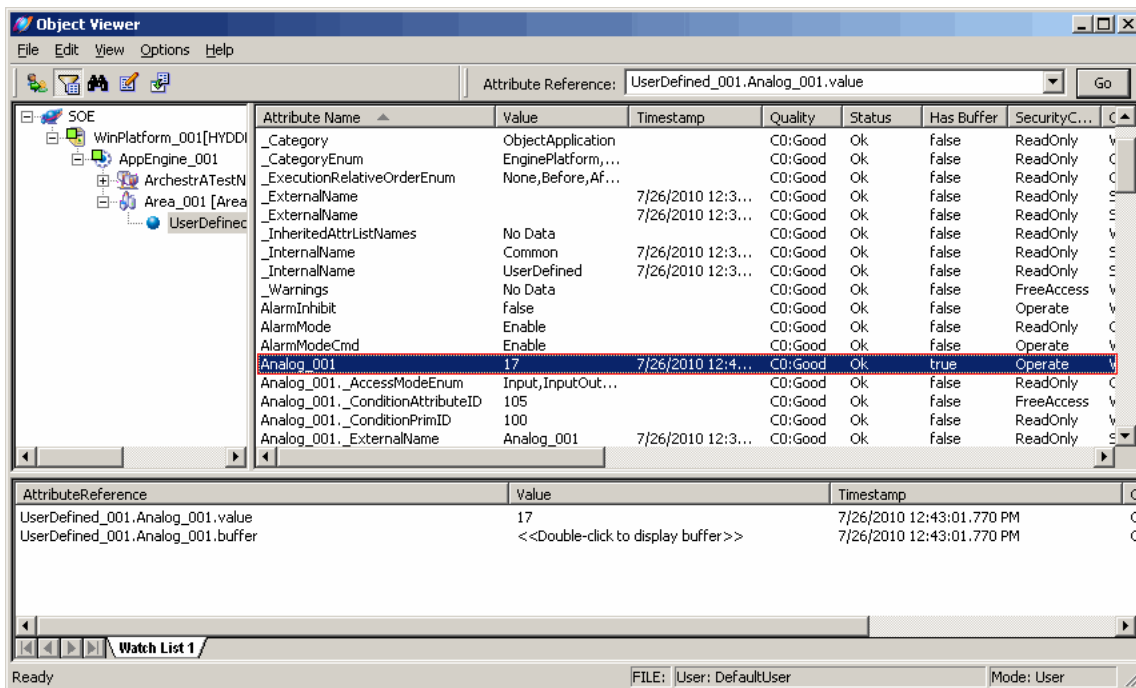
The status of an ApplicationObject's attribute describes whether a particular Read or Write request succeeded or failed. Possible status conditions include:

Status	Description
OK	Operation completed successfully.
Pending	Request is received, but is not yet complete. A transitory status.
Warning	Operation completed successfully, but with some warning condition. Applies only to Write actions.

Status	Description
Communication Error	Request failed due to an error communicating with the target ApplicationObject.
Configuration Error	Request failed due to an error in configuration.
Operational Error	Request failed due to an operator error.
Software Error	Request failed due to an internal software error.
Security Error	Request failed due to insufficient security access rights.
Other Error	All other errors.

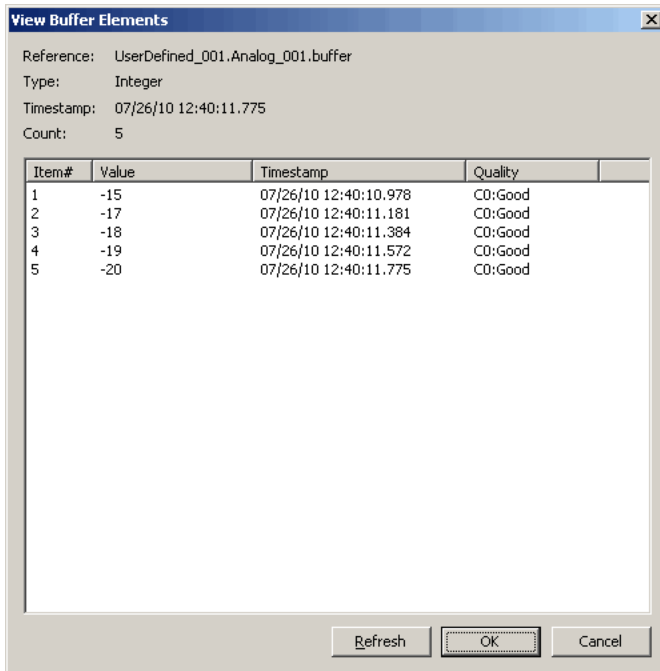
Has Buffer

The Object Viewer **Has Buffer** column indicates if an attribute has a buffer property. The value displayed in the column is True if the attribute has a buffer property or False if the attribute has no buffer property.



To view the value of the Buffer property, add the **<attributename>.buffer** property to the **Attribute Reference** dialog box. You can also use an alternate syntax, **<attributename>.property(Buffer)**, which should be used for subscribing to attributes on a DI Object.

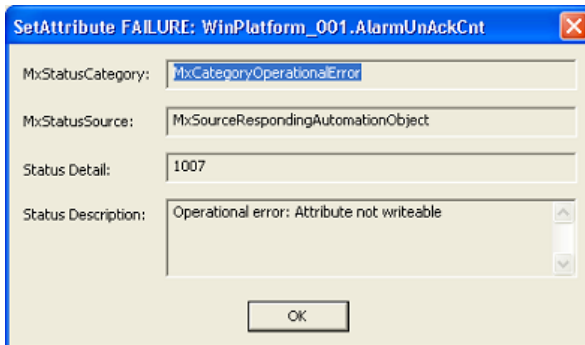
Double-click the attribute. The **View Buffer Elements** dialog box appears.



The **View Buffer Elements** dialog box header displays the Attribute Reference, Type, Timestamp and Count. A details window displays the Value, Timestamp, and Quality (VTQ) columns for each item.

Understanding Failed Requests

When a failure occurs during a request, the details of the error appear in a dialog box, which contains the source of the error and a description of the error.



Communication Errors

Communication errors include the following:

Source	Description	Reason
Requesting NMX	Request Timed Out	A message was not processed in a timely manner.

Source	Description	Reason
Requesting NMX	Communication Error: Platform communication error	Attempt to get or set an attribute from an ApplicationObject on a remote platform with the network down between the two platforms.
Responding NMX	Communication Error: Engine communication error	Attempt to get or set an attribute from an ApplicationObject on a remote engine that is currently not running, but deployed.
Responding NMX	Communication Error: Engine communication error	Attempt to get or set an attribute from an ApplicationObject on a remote engine, but that remote engine is currently undeployed while the remote platform is deployed.
Responding Automation Object	Index out of range	Attempt to get or set an attribute from an ApplicationObject attribute that is an array, but specified an array index that is out of range.

Configuration Errors

Configuration errors include the following:

Source	Description	Reason
Responding LMX	Invalid Object ID	Attempt to get or set an attribute from an ApplicationObject on a remote engine, but that remote ApplicationObject is currently undeployed while the remote engine is deployed.
Requesting NMX	Invalid Platform ID	Attempt to get or set an attribute from an ApplicationObject on a remote platform, but that remote platform is currently undeployed.
Requesting LMX	Invalid reference	Attempt to get or set an attribute from an ApplicationObject that is not yet configured in the system. A bad reference.
Responding NMX	Invalid Engine ID	Attempt to get or set an attribute from an ApplicationObject on a remote engine, but that remote engine is currently undeployed while the remote platform is deployed.

Operational Errors

Operational errors include the following:

Source	Description	Reason
Responding Automation Object	Attribute not writable	Attempt to set an attribute in an ApplicationObject that cannot be written to.
Responding Automation Object	Write access denied.	Attempt to set an attribute in an ApplicationObject that can be written to, but that the user cannot write to. This can be an operational error (the attribute is read only) or a security error (the current user does not have permission to write to the attribute).
Responding Automation Object	Software error: The data to be set was to the wrong data type.	Attempt to set an attribute in an ApplicationObject can be written to, but with a data type that cannot be written to because it cannot be coerced. For example, trying to write a Boolean value of True to an attribute of type QualifiedStruct or QualifiedEnum.

Sorting Data

You can sort the data shown in the details pane in either ascending or descending order by clicking any column heading. You can show hidden attributes in the details pane by selecting the **Include hidden** command from the **Options** menu. For example, click the **Attribute Name** heading to sort the list by attribute name. Attribute names appear in ascending or descending alphabetical order.

Hidden attribute names include leading underscores and appear at the top of an ascending order list. For example, the following figure shows the `_AdviseOnlyActiveEnabled` hidden attribute, which indicates whether Advanced Communication Management is active or not.

Attribute Name ▲	Value	Timestamp	Has Quality/Timestamp
__Attr_Name_List_1	<AttrXML/>	9/4/2008 2:53:36.476...	true
<code>_AdviseOnlyActiveEnabled</code>	true		false
<code>_AlarmModeEnum</code>	Enable,Disable,...		false
<code>_Attributes</code>	No Data		false
<code>_Category</code>	ObjectApplication		false
<code>_CategoryEnum</code>	EnginePlatform,...		false
<code>_ExecutionRelativeOrderEnum</code>	None,Before,Af...		false
<code>_ExternalName</code>		9/4/2008 2:53:36.476...	true
<code>_ExternalName</code>		9/4/2008 2:53:36.476...	true
<code>_InheritedAttrListNames</code>	__Attr_Name_L...		false
<code>_InternalName</code>	Common	9/4/2008 2:53:36.476...	true
<code>_InternalName</code>	UserDefined	9/4/2008 2:53:36.476...	true
<code>_Warnings</code>	No Data		false
<code>AlarmInhibit</code>	false		false
<code>AlarmMode</code>	Enable		false
<code>AlarmModeCmd</code>	Enable		false
<code>Area</code>	Area_001_001		false

Viewing Attributes in a Watch Window

You can use the watch window to view an attribute or a group of attributes apart from the entire list of attributes.

The attributes in the watch window are listed by their **AttributeReference**, which shows which object the attribute belongs to.

For example, the AppEngine_001 object contains AlarmOnCnt and AlarmUnAckCnt attributes. When you add it to a watch list, the object's tag name is appended to the reference string.

AttributeReference	Quality	Status	Value
AppEngine_001.AlarmOnCnt	C0:Good	Ok	0
AppEngine_001.AlarmUnAckCnt	C0:Good	Ok	0

◀◀ ▶▶ Watch List 1 /

To view selected attributes in a watch list

1. Select an ApplicationObject from the console tree. A list of its attributes appears.
2. Add an attribute to the watch list.
 - In the details pane, right-click an attribute to place it on the watch list. Click **Add to Watch**. The attribute in the **AttributeReference** format, along with its data, appears in the watch list.
 - Right-click in the watch window and click **Add Attribute Reference**. In the **Add Attribute Reference** dialog box, type the attribute name in the following format: Object Reference.Attribute Reference. For example, enter SystemArea.ScanState to view the ScanState attribute of the SystemArea object.
3. To add a block of attributes to the watch window, hold down the SHIFT key and click the left mouse key while selecting the first and last attribute of the block.
4. To add a random list of attributes to the watch window, hold down the CTRL key and click the left mouse button while selecting attributes.

Using the Aveva OPC UA Client Service

You can use an instance of the Aveva OPC UA Client Service hosted by your Galaxy to subscribe to attributes hosted by an OPC UA server. Using an instance of the Aveva OPC UA Client Service in Object Viewer requires the use of the specific service instance name as a prefix.

For example, using an instance of the UA Client Service with **Scope Name** of "OPCUAClient_010" would be specified as follows:

```
OPCUAClient_010:AppEngine_001.AlarmOnCnt.value
```

Adding a Watch Window

By default, a single watch window appears in the Object Viewer. You can add more watch windows to view different groups of attributes or view attributes of different ApplicationObjects.

Note: If attributes already appear in the watch window, right-click away from the list of attributes to open the correct shortcut menu.

To add a watch window

1. Right-click in the watch window and click **Add Watch Window**. A new watch window appears with the default tab name, Watch List 2.
2. To rename the new watch window, right-click it and click **Rename Tab**. Type the name of the watch window in the **Rename Tab** dialog box and click **OK**.
3. Add attributes to the watch window or add another watch window.
4. Move from one watch window to another by clicking the tabs.

Saving a Watch Window

You can save a watch window and reuse it each time you start Object Viewer.

To save a watch window

1. Right-click in the **Watch List** and select **Save As** to save the watch list. The **Save As** dialog box appears.
2. Select the folder path to save the watch window, which is an XML file.
3. Click **Save**.

Removing Attributes from Watch Windows

The attributes that you add to watch windows remain until you remove them or until you close Object Viewer. For example, if you are viewing the attributes of an AppEngine and place some of its attributes in a watch window, those attributes remain even when you select another object in the console tree.

Note: This action does not delete the attribute from the object. The attribute is viewable in the details pane.

To remove an attribute from a watch window

- In the watch window, right-click the attribute you want to remove and click **Remove from Watch**. The attribute is removed from the watch window.

CHAPTER 3

Modifying Attribute Values

You can modify an attribute's value for diagnostic testing. You must have the proper security permissions to do this and the attribute's value must also be changeable.

Before making modifications to any attribute, you must be familiar with the attributes and their functions. Also, you must understand the effects that changing attribute values can have on your Galaxy application.

Attribute Properties

Each data point of an attribute is associated with a unique VTQ identifier (Value, Time, and Quality). Only the value can be modified, provided that the attribute is user-writable. When value is modified, a new VTQ is generated.

When you try to modify an attribute value, a dialog box appears that shows the type (datatype) and current value of the attribute. Use this information as a guide for continuing.

Before modifying an attribute value, check its category shown in the **Category** column to determine whether modification is possible.

Category Property

An attribute's Category property determines if the attribute is writable. The only categories that you can write to are:

- Writeable_U
- Writeable_US
- Writeable_UC
- Writeable_USC
- Writeable_UC_Lockable
- Writeable_USC_Lockable

The letters included in the Writable categories mean the following:

Letter	Description
U	UserSets are OK. You can modify these in the Object Viewer.
S	SupervisorySets are OK. You can modify these only with an application function. You cannot modify them in the Object Viewer.
C	Configtime time sets only. You can modify these only when you are configuring the object. You cannot modify them in the Object Viewer.

Value Property

You can modify the value property of an attribute shown in the **Value** column, if the attribute is user-writable (see *Category Property* on page 17). The datatype of the attribute is shown in the **Type** column, and indicates the kind of value that you can assign to the attribute, for example, Boolean, integer, double, etc.

Timestamp Property

The timestamp of an attribute is the Time element of the VTQ packet. It represents the time of the last recorded change to the attribute, and is shown in the **Timestamp** column. The **Timestamp** cannot be modified, or turned on or off. An attribute will have a timestamp if the value in the **Has Quality/Timestamp** column is true.

Modifying an Attribute Value

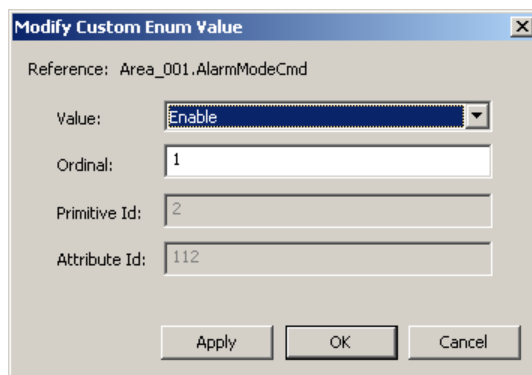
You can only modify attribute values if you have the proper privileges and the attribute is writable. Check the **Category** value in the details pane for the attribute you want to modify. You cannot modify Calculated and SystemWritable attributes.

Some attribute values affected by the changed attribute are updated only after you select the attribute. For example, an object's ScanStateCmd controls the object's scan state, with True being OnScan, False being OffScan. The object also has a ScanState attribute that indicates the current scan state of the object.

Assuming ScanStateCmd and ScanState are False, change ScanStateCmd to True. Notice that the object's ScanState attribute value remains False. Select the ScanState attribute. Its value changes to True.

To modify an attribute value

1. Select the object that contains the attribute you want to change.
2. Right-click the attribute and click **Modify**. A **Modify <data type> Value** dialog boxes appears, related to the data type for the selected attribute.



3. Modify the values as needed.
4. Click **Apply** and click **OK**. The new value appears in the **Value** column of the details pane for that attribute.

Modifying an Attribute from the Watch Window

You can change an attribute's value while in a watch window.

Important: Attributes in the watch window update immediately. Attributes in the details pane update when you click them.

To modify an attribute from the watch window

1. In the watch window, double-click the attribute. A dialog box related to the attribute's data type appears.
2. If the attribute is writable, enter or select the new value for the attribute.
3. Click **Apply** and click **OK**. The new value appears in the **Value** column of the watch window for that attribute.

Viewing Changes Dynamically

Attribute values shown in the details pane are static. You must click on an attribute in the details pane to update the display.

You may have a configuration in which the Galaxy Repository node was upgraded, but other nodes were not upgraded. If you use ObjectViewer on the upgraded node to view information for attributes from a non-upgraded node, the time stamps should not be considered as valid source times. In this case, the time stamps reflect the time of the local node (the one running ObjectViewer) for the attributes running on the non-upgraded node.

Attribute values shown in the watch window are updated immediately when the attribute's value changes.

For example, objects have two common attributes, `ScanStateCmd` and `ScanState`. `ScanStateCmd` controls the scan state of the object (`OnScan` or `OffScan`). `ScanState` shows the last known scan state of the object.

If you place the `ScanState` attribute in a watch window and change the `ScanStateCmd` attribute in the details pane, the `ScanState` attribute is updated immediately. Instead, if you place the `ScanStateCmd` attribute in a watch window, leave the `ScanState` attribute in the details pane, and then change the value of `ScanStateCmd`, the `ScanState` attribute is not updated until you select it in the details pane.

Setting an ApplicationObject OnScan

The `OnScan` state indicates the object's run-time state, which means it is performing its normal processing as part of its execute method.

When setting AppEngines `OnScan`:

- The hosting WinPlatform's status must also be `OnScan`.
- Any object hosted on the AppEngine is automatically set `OnScan`.

To set an ApplicationObject OnScan

1. Select the object in the console tree.
2. In the details pane, right-click the **ScanStateCmd** attribute and click **Modify**. The **Modify Boolean Value** dialog box appears.
3. Assuming the current value is **False** (`OffScan`), click **True**, click **Apply**, and then click **OK**.
Note that the **ScanState** attribute's value in the details pane remains `False` (`OffScan`).
4. To update the display, click the **ScanStateCmd** attribute.

Setting an ApplicationObject OffScan

`OffScan` is the run-time state that indicates that an object is idle and not ready to run.

Because WinPlatforms host AppEngines, you must ensure that all AppEngines hosted by the WinPlatform are OffScan before setting the WinPlatform OffScan. An error message appears if you try to set a WinPlatform OffScan while its hosted AppEngines are still OnScan.

Although AppEngines host other objects, it is not necessary for all the objects to be OffScan before setting the AppEngine OffScan. When you set an AppEngine OffScan, all of its hosted objects are automatically set OffScan.

To set an ApplicationObject OffScan

1. Select the object in the console tree.
2. In the details pane, right-click the **ScanStateCmd** attribute and click **Modify**. The **Modify Boolean Value** dialog box appears.
3. Assuming the current value is **True** (OnScan), click the **False** option button, click **Apply** and then click **OK**.

Note that the **ScanState** attribute's value in the details pane remains True (OnScan).

4. To update the attribute value to False, select it.