

Omicron Technote
The OSIsoft PI-AF Excluded Property

Recent releases of OSIsoft PI-AF have added new features to the overall AF infrastructure. One very useful feature added to AF 2015 is the Excluded Attribute property. With it, a single “master” element template can be constructed per asset class that covers a wide number of configuration variations. This can be especially useful for operations which wish to reduce administrative overhead and the number of screens that are necessary to monitor the asset class.

Background

Starting with version 2015, OSIsoft added the concept of Attribute Properties and in 2016 R2 extended the list of available properties. Actually, AF attribute properties have been around for a while, but did not have a formal name and were limited to “Indexed” and “Configuration Item”. Before the 2015 release, the “Indexed” and “Configuration Item” properties were check-boxes in the PI system explorer and there was no reference to the name “property” (refer to Figure 1 below).

Group by: Category Template

Name:

Description:

Configuration Item: Indexed:

Categories:

Default UOM: <None>

Value Type:

Default Value:

Data Reference:

Figure 1 - AF Attribute Configuration Screen-shot from AF 2014

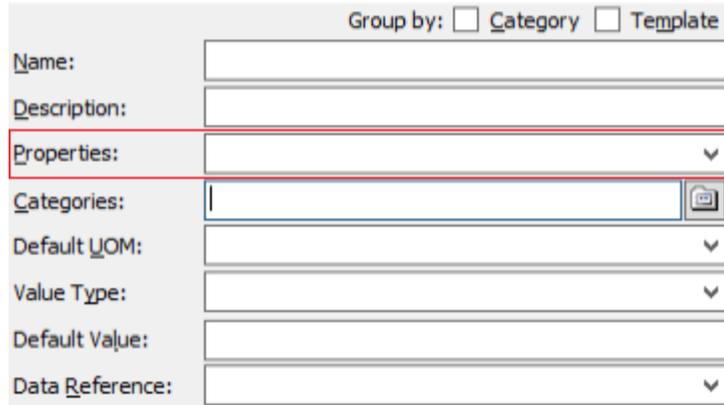
For more than 25 years, Omicron has been at the forefront of creating business applications, visualization tools and operations technology that capitalize on the OSIsoft PI System® to produce outstanding benefits within the process industries. ProcessBook was the first OSIsoft® application that grew from an early Omicron consulting engagement. Decades later, Omicron is still expanding the breadth of applications for which the PI System can be used. Omicron creates Gapware® extensions that enable clients to achieve substantial new benefits from PI data, designs and codes custom interfaces and protocols to support new Industrial IoT devices and creates complex PI configurations. The author, David Soll, has been the CTO and chief innovator throughout Omicron’s journey and has mentored many on OSIsoft’s staff. Omicron is a System Integration Partner of OSIsoft. Visit www.omicron.com for more information or call +1-609-678-0110.

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Beginning with PI-AF 2015, the “Configuration Item” and “Indexed” properties were put into a drop-down that allowed OSIsoft to add more properties without adding more screen real estate (Figure 2).



Group by: Category Template

Name:

Description:

Properties:

Categories: 

Default UOM:

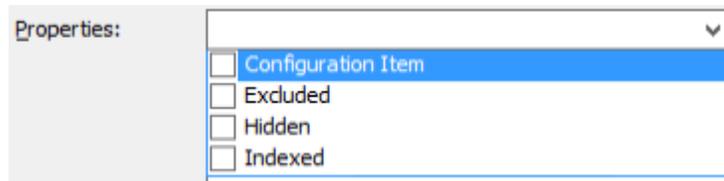
Value Type:

Default Value:

Data Reference:

Figure 2 - AF Attribute Configuration Screen-shot from AF 2015

As can be seen from the screen-shot of the AF 2015 Properties drop-down (Figure 3), “Excluded” and “Hidden” were added to the properties.

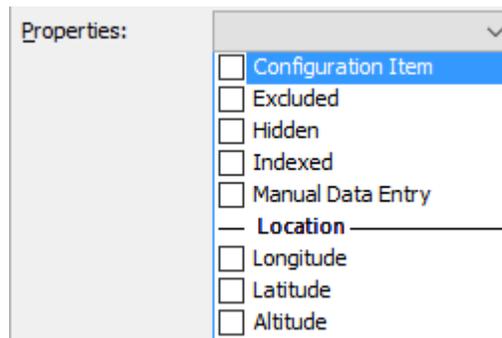


Properties:

- Configuration Item
- Excluded
- Hidden
- Indexed

Figure 3 - AF 2015 Properties Drop-down Screen-shot

Since the AF 2015 release more properties have been added as can be seen in the screen-shot of the AF 2016 R2 Properties drop-down (Figure 4). Now, as of AF 2016 R2, there are 8 properties available for any given AF attribute.



Properties:

- Configuration Item
- Excluded
- Hidden
- Indexed
- Manual Data Entry
- Location —
- Longitude
- Latitude
- Altitude

Figure 4 - AF 2016 R2 Properties Drop-down Screen-shot

Excluded Attribute Property

This article will discuss the usefulness of the “Excluded” property (available in AF 2015 and later). The “Excluded” property makes generating AF templates more generic and flexible. In fact the excluded property only makes sense when an element is based upon a template. If you look at the properties drop-down for an element that is not based on a template, you will not see the excluded property.

Here is the statement in OSIsoft’s release notes for PI-AF 2015 regarding the new properties: “Attributes may now be marked as excluded or hidden. Excluded attributes do not have values, hidden attributes will not show up in search results. The Client must be upgraded to take advantage of these features.”



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So, why would you want to have an attribute excluded? Because it avoids having to create a template for each variation of an asset class. Such variations occur very naturally because of the difference in the role, performance requirements or age of the particular element.

We will look at a data center example, but the example is equally true for dealing with valve, tank or pump variations throughout a plant. Let's say that you are attempting to model a Windows server for monitoring with the PI-PerfMon interface. This interface allows us to collect data such as CPU utilization, memory usage, and disk and network I/O statistics. What we would do is create a template that would describe a typical server, in which case we would define attributes for collecting the various measurements that PI-PerfMon will give us. The problem is: how do we handle minor differences in servers? For example: Server A may have only a C: drive where Server B may have a C: and a D: drive. One server may have a single network adapter whereas another one might have multiple network adapters.

Prior to PI-AF 2015, we would create a template for a server with only one drive and another one with two drives. But a server with one drive may have one network adapter whereas another single drive server may have multiple network adapters. As you can see, the permutation can add up very quickly.

Instead of having many AF templates to handle the variations between servers, we can create a single template that has everything (i.e.: many disk drives), then we mark all of the attributes having to do with the extra drives (such as disk read time, disk write time, etc.) as being excluded. Now when we create an element based on this template, it will create a server with one disk drive and one network adapter ... but we have additional attributes that we can enable by un-checking the Excluded attribute. So a server with two disk drives will have the attributes ready to use.

An alternate technique could also be used where the template does not exclude anything, then when an element is created, the creator would exclude those attributes that do not apply to that particular instance.

The biggest issue in using the excluded attribute is the behavior of the client tools. The PI System Explorer can show or hide excluded attributes as shown in Figure 5, but not all client tools have caught up to the new features in the server.

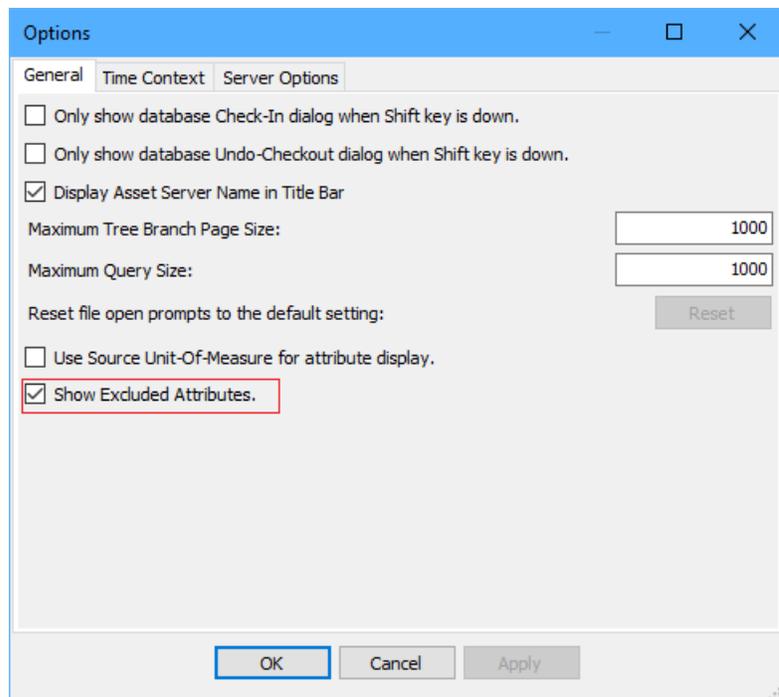


Figure 5 - PI System Explorer 2016 R2 Options Settings



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Figure 6 illustrates a server with a C: drive and a D: drive. It is an element based on an AF Template that defines three drives (C:, D:, & E:). Note that all of the attributes associated with the E: drive are listed as being excluded. By default, all of the attributes associated with the D: drive would also be excluded, but since this particular server has a D: drive, the Excluded property was un-checked manually after creating the element. Of course, in order to do this, the PI System Explorer's options had to have the "Show Excluded Attributes" checked (which is the default setting).

 % Committed Memory In Use	9.78710174560547 %
 % Disk Read Time (C:)	0 %
 % Disk Read Time (D:)	0.0468332432210445 %
 % Disk Read Time (E:)	<i>Excluded</i>
 % Disk Time (C:)	0.405499249696732 %
 % Disk Time (D:)	8.74848365783691 %
 % Disk Time (E:)	<i>Excluded</i>
 % Disk Time Total	3.0513277053833 %
 % Disk Utilization (C:)	0.136184692382813 %
 % Disk Utilization (D:)	6.90767669677734 %
 % Disk Utilization (E:)	<i>Excluded</i>
 % Disk Write Time (C:)	0.405499249696732 %
 % Disk Write Time (D:)	8.73365020751953 %
 % Disk Write Time (E:)	<i>Excluded</i>
 % Free Space (C:)	87.3502044677734 %
 % Free Space (D:)	66.260627746582 %
 % Free Space (E:)	<i>Excluded</i>
 % Idle Time (C:)	99.8638153076172 %
 % Idle Time (D:)	93.0923233032227 %
 % Idle Time (E:)	<i>Excluded</i>
 Available Memory	91396898816
 Available Memory Total MBy...	87162
 Cache Faults/Sec	0
 Committed Byte	11553148928
 Datagrams Received/Sec	4
 Datagrams Sent/Sec	0
 Datagrams/Sec	4

Figure 6 - Server with C: & D: Drive

In order to illustrate how the client tools have not completely caught up to the new AF features, take a look at the two PI ProcessBook displays below. PI ProcessBook version 2015 R2 was used to create the displays in Figure 7 and in Figure 8.



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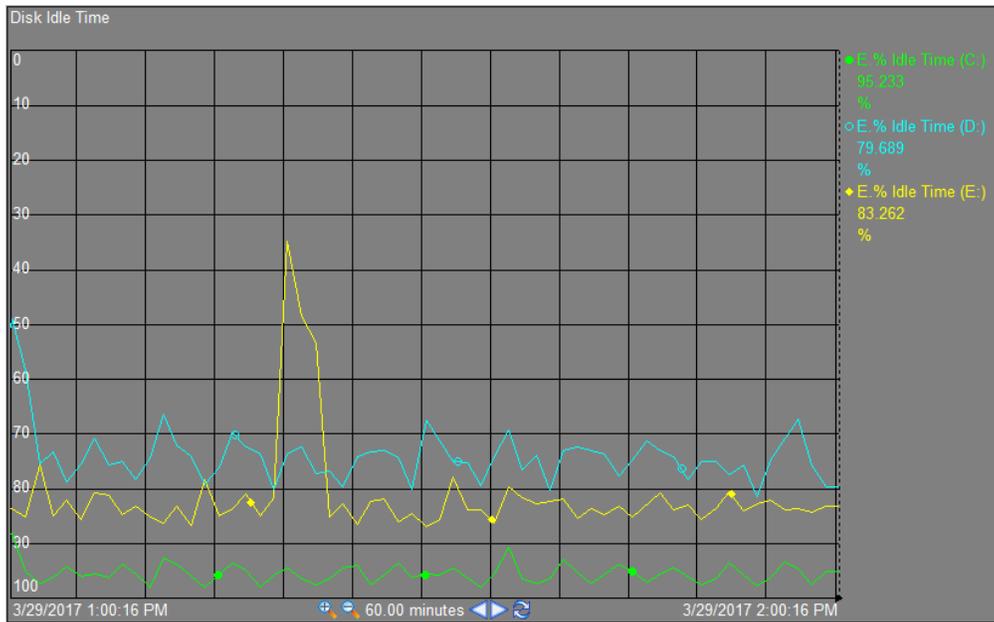


Figure 7 - AF Element Relative Display for a Server with 3 disk drives

Figure 7 above shows an AF Element Relative display when selecting a server that has a C:, D:, and an E: drive. Note that all is displayed as expected.

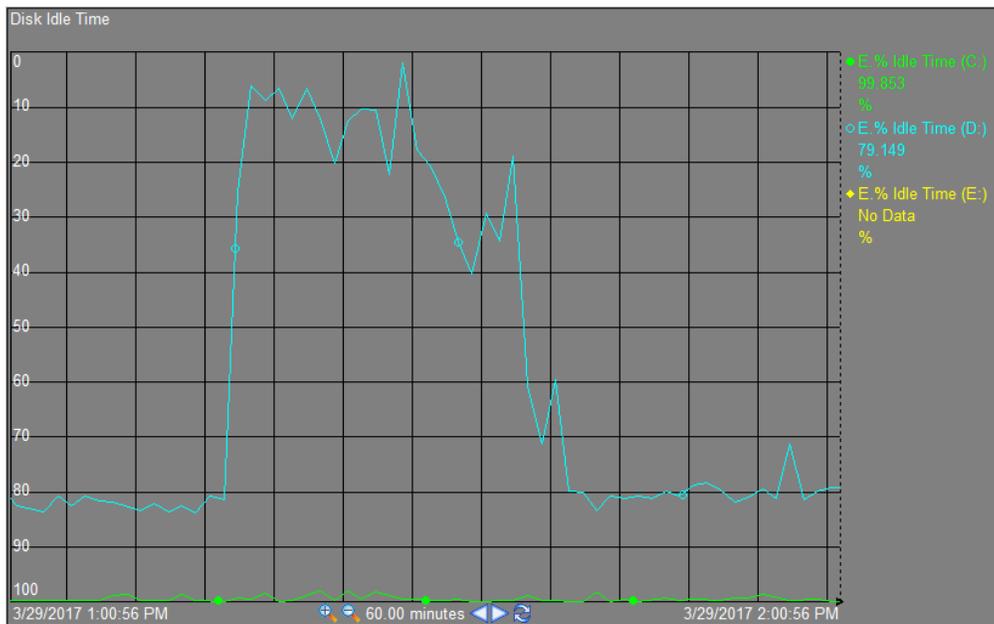


Figure 8 - AF Element Relative Display for a Server with 2 disk drives

Figure 8 above displays an AF Element Relative display when selecting a server that has only a C: and D: drive. It has no E: drive and thus all E: drive related attributes are marked as “Excluded”. Even though the “% Idle Time (E:)” attribute is marked as excluded, it still shows up along the right side along with the current value of “No Data”. Of course, since excluded attributes will always have “No Data”, the trend



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does not show anything for the E: drive, but it would be nice if the “Tag Name” (the label to the right of the trend) would be blank rather than show the excluded attribute.

Conclusions

The new “Excluded” AF attribute property provides additional flexibility to the overall AF template mechanism. It can be used to reduce the number of templates required within a system which in turn reduces the support overhead in maintaining a PI system. Not all OSIsoft visualization applications have yet been fully adapted to capitalize on this new feature and many third party applications may never fully adapt to it. However, its ability to reduce administrative overhead can make use of this feature worthwhile, even before all tools are adapted to support it.

