



How To Setup OPC Data Caching

APPLICATIONS NOTE

January 2003

Description: *How OPC Data caching works and how to use it*

OS Requirement: *Windows XP/2000/NT, 98/Me*

General Requirement: *Usage of GenBroker communications*

Introduction to Caching:

GenBroker now supports OPC item caching. You can specify a time the cache will keep an item requested. When a client releases an OPC item (e.g. a tag), the item is not actually removed from the server but instead is moved into the item cache. Then, when the client requests the same item again, the item is retrieved from the cache instead of being requested on the OPC server again. You can define how long OPC items should be stored in the cache. Optionally, GenBroker may deactivate the items put in the cache, thereby decreasing the number of updates coming in from the OPC servers (otherwise the items in the cache are also updated).

The cache mechanism is optional and may be switched on or off. It improves the speed of screen switching. Caching takes place for both OPC Direct operation and operation via GenBroker channels.

The OPC Item Cache check box enables/disables the cache. When the cache is enabled, released OPC items are then put into the cache rather than removed from the server. When the items are requested again, they will be taken from the cache. Cache Time defines how long (in seconds) the items should be kept in the cache. When Deactivate Cached Items is checked, the items are deactivated when put into the cache.

How it Works:

Assume that you have two GraphWorX32 displays (Display1 and Display2) on a PC, both getting data via GenBroker. If you switch back and forth between these displays, the following will occur for each scenario involving caching.

Caching OFF

- GWX opens Display1
- GenClient calls AddItems on the server to put the items of Display1 on scan
- Server sends updates for Display1 items
- GWX switches to Display2
- GenClient calls RemoveItems to remove Display1 items from the server
- GenClient calls AddItems to add Display2 items
- Server sends updates for Display2 items
- GWX switches back to Display1
- GenClient calls RemoveItems to remove Display2 items from the server
- GenClient calls AddItems to add Display1 items
- Server sends updates for Display1 items

Caching ON, Deactivate OFF

Assuming Display2 is open shorter time than the Cache timeout. (Differences from #1 are in RED)

- GWX opens Display1
- GenClient calls AddItems on the server to put the items of Display1 on scan
- Server sends updates for Display1 items
- GWX switches to Display2
- GenClient puts Display1 items into cache
- GenClient calls AddItems to add Display2 items
- Server sends updates for Display1+Display2 items
- GWX switches back to Display1
- GenClient puts Display2 items into cache
- GenClient gets Display1 items from cache and reuses them
- Server sends updates for Display1+Display2 items
- After Cache Timeout the Display2 items are removed from cache (so the cache gets empty)
- GenClient call RemoveItems for Display2 item
- Server then sends updates only for Display1 items

Caching ON, Deactivate ON

Assuming Display2 is open shorter time than the Cache timeout. (Differences from #2 are in RED)

- GWX opens Display1
- GenClient calls AddItems on the server to put the items of Display1 on scan
- Server sends updates for Display1 items
- GWX switches to Display2
- GenClient puts Display1 items into cache
- GenClient deactivates Display1 items
- GenClient calls AddItems to add Display2 items
- Server sends updates only for Display2 items (Display1 items are still on the server, but they have been deactivated)
- GWX switches back to Display1
- GenClient puts Display2 items into cache
- GenClient deactivates Display2 items
- GenClient gets Display1 items from cache and reuses them
- GenClient activates Display1 items
- Server sends updates only for Display1 items
- After Cache Timeout the Display2 items are removed from cache (so the cache gets empty)
- GenClient call RemoveItems for Display2 item (note they were on the server, but they were deactivated)



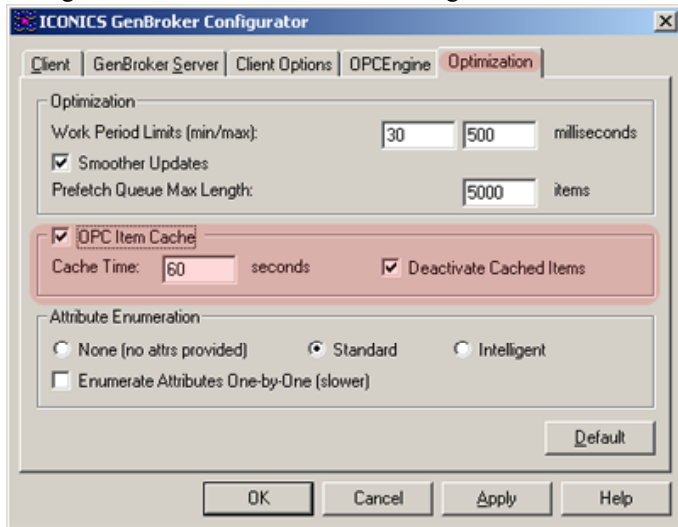
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Where to Turn Caching On

You must go to the “Optimization” tab of the GenBroker Configurator to turn on OPC Item Caching.



Things to Consider:

- Adding and removing items is typically a lengthy operation - but there may be exceptions.
- Activating and deactivating items may be a lengthy operation depending on the OPC server.
- Having items on the server and in GenClient cache needs some memory
- Having lots of items updating quickly consumes CPU, but values *typically* do not change very quickly

In Summary:

Caching OFF

Advantages and Disadvantages

- Minimizes number of items on the server (items are always removed when a display is closed)
- Minimum items gets updated
- Maximum of calls to remove and add items
- Good for cases when many values changes very quickly and when deactivating items takes a long time (same as removing them)

When to Use

1. Any Light Switching
2. Heavy Switching AND Many Tag Updates AND Slow Activation/Deactivation

Caching ON, Deactivate OFF

Advantages and Disadvantages

- Minimizes number of all calls to the server
- Has all items active and therefore taking up CPU
- Good for servers with slowly changing values
- Has quick response when switching displays - the items are taken from cache then

When to Use

1. Heavy Switching AND Few Tag Updates AND Slow Activation/Deactivation

Caching ON, Deactivate ON

Advantages and Disadvantages

- Numerous items on the server and in the client - consumes memory
- Inactive items do not send updates - so they do not load CPU
- If activation and deactivation is quick, then the response is quick as well

When to Use

1. Heavy Switching AND Many Tag Updates AND Fast Activation/Deactivation
2. Heavy Switching AND Many Tag Updates AND Slow Activation/Deactivation