Tech Note 768
WWHeap Memory Settings: InTouch® Application Considerations and Configuration Recommendations

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Introduction

This *Tech Note* outlines how to modify the WWHeap memory settings in the registry. It also includes the reasons why and what application scenarios these adjustments are recommended for.

Application Versions

- InTouch 10.x

Note: Version 10.1 SP3 P1 and higher will automatically adjust the WWHeap Memory Range to a default maximum of 1.5 GB on a 32-bit system and a default maximum of 2 GB, if the 3GB switch is used on a 32-bit version of Windows (**refer to TN 732 at the end of this *Tech Note***), and to 2 GB on a 64-bit version of Windows.

WWHeap Explained

WWHeap is a range of memory allocated by the InTouch installation which is used to allocated shared memory by WindowMaker and WindowViewer. Certain components of InTouch require memory resources during runtime. The WWHeap allocation is meant to ensure enough memory is available for the application to run properly.

What InTouch Components Use the WWHeap?

The following specific components within an InTouch application consume WWHeap memory resources.

- InTouch Windows utilize WWHeap memory and certain components on a window will use more memory such as large bitmaps, detailed graphic components and wizards. The more windows used in an application, the more WWHeap necessary to handle them.

Note: If **Always Load Windows from Disk** is checked windows are then loaded from disk and use only the required amount of WWHeap memory space while the window is displayed. Once the window is closed, the WWHeap releases the memory that had been allocated for the window.

- The Tagname Database utilizes WWHeap memory. The more tags in an application, the more WWHeap memory is necessary to handle them.

Remote Tag References (RTR) also utilizes WWHeap memory. The more RTRs in an application, the more WWHeap necessary to handle them.

- Other InTouch components that utilize the WWHeap memory are **WindowMaker**, **HD** and **SPC Pro**.

WWHeap Configuration Options

- You can configure the range of the Wonderware Memory Manager (wwHeap) in 1 MB increments up to 1024 MB for versions 9.5 P3 and up, then up to 2047 MB for version 10.1 SP2 P1 or higher. If you set the range to less than 32 MB, a warning is written to the Log Viewer. Any value greater than 2047 MB is set to 2047 MB. The WWHeap has a memory range default of 256 MB. This range is configured by a registry entry. You cannot change the range until wwHeap is completely reset, which means that all programs using wwHeap have been stopped.
- You can choose whether wwHeap should start its search for free memory maps at the zero index or the most recently used index. This allows programs with smaller memory requirements to 'conserve' memory addresses, while those with larger memory requirements can be optimized to find available memory more quickly. The default behavior is to start the search at the zero index each time, as this is the original wwHeap behavior. You configure the setting using the registry. You cannot change the value until wwHeap is completely reset, which means that all programs using wwHeap have been stopped.
- When wwHeap is first started, it can read an optional .INI text file containing a list of reserved memory addresses into which it should never allocate memory. This helps to avoid heap share allocation errors with third-party modules that are not necessarily loaded at system startup. The .INI file's path is read from the registry.

Note: The wwHeap configuration information is always written to the Log Viewer at least once when wwHeap is first accessed by any program. This provides a record of the wwHeap configuration for diagnostic purposes.

WWHEAP WWHEAP Base Address 0x3FFE0000 End Address 0xBFFE0000 and WWHEAP WWHEAP Memory Range 2048 MB (32768 Maps) Conserve Memory 1

Default WWHeap Settings

- **Memory range**: 256 MB
- **Starting address**: 0x21000000
- **Memory Conservation**: Enable - Search for free memory starting at the beginning of the memory range
- **Memory reservation .ini file**: DO NOT MODIFY the process .ini file (we recommend no changes be made to the default setting)

Modifying WWHeap Settings

This section lists the configurable WWHeap settings and modification details.

Memory Range

1. Create a DWORD registry entry with the value **MemoryRange** under the following key:

HKEY_LOCAL_MACHINE\Software\Wonderware\wwHeap

2. Set it to the number of megabytes (MB), from 1 to 2048 (decimal)

Starting Address

1. Create a DWORD registry entry with the value **BaseOffset** under the following key:

   HKEY_LOCAL_MACHINE\Software\Wonderware\wwHeap

2. Set it to the desired memory base offset. The start and end memory addresses are written to the Log Viewer.

Memory Conservation

1. To enable the efficient free-memory search algorithm, create a DWORD registry entry with the value **ConserveMemory** under the following key:

   HKEY_LOCAL_MACHINE\Software\Wonderware\wwHeap

2. Set the value to:

- **0** - efficient free-memory search (to cycle through the list)
- **1** - conserve memory (always start search at beginning of list)

Note: As always, take extra care and create a backup prior to making adjustments to the Windows Registry.

Additional Resources

Tech Note 732 Wonderware Memory Manager Configuration Best Practices

CRs and Versions Affecting WWHeap Memory

- **CR L00052211**: v9.5 P3 WWHeap settings were made adjustable via the registry: MemoryRange to 1024 MB and BaseOffset (Starting address) was increased. Note that as of version 10.1 SP2 P1 the MemoryRange can be increased to 2047 MB Version 9.0 and lower used WwHeap memory for the Alarm Subsystem. However, as of version 9.5 (and higher) the Alarm Subsystem does not use the WWHeap.

A. Rantos

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