Running TIBCO Spotfire Web Player on NUMA Servers
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With a traditional Unified Memory Architecture (UMA), each CPU and its associated processing cores was connected to all the available system RAM using a single bus. Thus each individual processing core could access all available system memory with the same latency. With Non-Uniform Memory Architecture (NUMA), there are multiple buses each comprising of a collection of processing cores and system RAM. Each group of cores and RAM is called a NUMA Node. Each NUMA Node has slightly faster access to the RAM to its own local block of RAM and slightly slower access to the RAM of other Nodes. This architecture introduces problems when an enterprise application, such as TIBCO Spotfire Web Player, needs to utilize large numbers of processing cores and large amounts of RAM across multiple NUMA nodes.

The main obstacles are:
- Increased delay when there is a need to access non-local memory for a NUMA node.
- Thread synchronization between NUMA nodes leading to diminished system utilization
- Spinlock situations in extreme cases ultimately leading to an unresponsive system.

TIBCO Engineering is working on addressing these issues in an upcoming release of TIBCO Spotfire Web Player. However for existing customers who expect to deploy NUMA hardware one of the following approaches are recommended:

1. **Use CPU affinity within Internet Information Services (IIS) to ensure that all processing for TIBCO Spotfire Web Player occurs within a single NUMA Node.**

   Note that currently TIBCO Spotfire Web Player only supports a single installation on a given server, so using this solution means that it may not be possible to utilize all processing cores on servers with multiple NUMA Nodes.

2. **If permitted under your existing license agreement with TIBCO, you may be able to use virtualization technology to create virtual machines that isolate TIBCO Spotfire Web Player from the effects of NUMA hardware. Typically this involves creating virtual machines that run entirely within a single NUMA Node. Please consult your license agreement to confirm the scope of your license.**

   Unless otherwise provided in a valid and signed agreement with TIBCO, Support for virtualized environments will be subject to TIBCO's Maintenance Program Guide which can be found at:

   [http://www.tibco.com/services/support/default.jsp](http://www.tibco.com/services/support/default.jsp)
With either of these configurations, TIBCO Spotfire Web Player can be scaled out to handle the required load using standard HTTP load balancing techniques. For further information see Section 6.12 of the TIBCO Spotfire Web Player Configuration Manual. This note applies to all versions of TIBCO Spotfire Web Player up to 4.5.x