Nurse Call & Feature Server Requirements

PDF for Distribution to Customers: The following table lists NaviCare® Nurse Call server system requirements.

Hospitals may choose to virtualize any of the servers involved in the NaviCare Nurse Call system. Hill-Rom generally recommends allocating reserved resources to the virtual servers, or sparsely populating the virtual environment to ensure availability of resources. Nurse Call servers provide many real-time services to the hospital's clinical staff, such as locating and voice communications, so performance issues can impair normal staff operations.

When allocating CPU resources to virtual servers (vCPUs), a similar level of performance to the physical CPU specified is expected. Due to the variable nature of virtual environments, it may be appropriate to, for example, allocate fewer vCPUs if the processors in the hosts have a higher clock speed, or if the virtual environment frequently experiences wait times for multi-processor requests. In all cases, however, it is recommended to allocate a minimum of two vCPUs, in order to allow the applications to take advantage of multi-threading.

Server	CPU	RAM	Storage	Operating System	SQL
Consolidated Enterprise Server (small installations)	Quad-core 2.4 GHz Xeon or equivalent	16 GB	200 GB	Windows Server 2012 R2 or Windows Server 2016	Microsoft SQL Server 2014 or Microsoft SQL Server 2016
NaviCare Platform Services Server	Quad-core 2.4 GHz Xeon or equivalent	16 GB	150 GB	Windows Server 2012 R2 or Windows Server 2016	Not applicable
VOIP Server	Dual-core 2.4 GHz Xeon or equivalent	4 GB	60 GB	Windows Server 2012 R2 or Windows Server 2016	Not Applicable
ADT Server	Dual-core 2.4 GHz Xeon or equivalent	4 GB	60 GB	Windows Server 2012 R2 or Windows Server 2016	Not Applicable
Database Server	Quad-core 2.4 GHz Xeon or equivalent	8 GB	150 GB – Serial Attached SCSI or better	Any operating system compatible with SQL requirements	Microsoft SQL Server 2014 or Microsoft SQL Server 2016
Enhanced Locating Server – RTLS	Quad-core 3.5 GHz Xeon or equivalent	8 GB Note: 12 GB if >100 stars	100 GB	Windows Server 2012 R2 or Windows Server 2016	Not Applicable

Enterprise Reporting Server Requirements (Less than 500 Beds)

This section describes the requirements for facilities with less than 500 beds.

The NaviCare® Report Model is a self-service analytics tool that resides in-memory on a server. The server must be capable of handling a large amount of simultaneous requests, not only from direct users, but also from report subscriptions and execution snapshots. The server must also be able to handle resource-intensive activities such as cube processing.

The hardware requirements listed here are the absolute minimum recommended to achieve one hour or less of data latency when the supported system contains less than 500 beds.

If your Enterprise Reporting server contains only the minimum requirements, we recommend using a machine that can be upgraded as needed. All storage arrays must be on separate spindles for optimal performance.

Component	Server Specification	Considerations
Processor	8 Cores @2.66 GHz	
Memory	64 GB	RAM should be at least 2.5x the model size
OS	Windows Server 2012 R2 <u>or</u> Windows Server 2016	Windows Server 2012 R2 <u>or</u> Windows Server 2016
SQL	SQL Server 2016 Standard **Note:** SQL 2016 Standard has a size restriction of its database to 16G, which equates to 500 beds for one year. The data retention option in the configuration wizard cannot be changed from the one year value.	**Required Components:** • Database Engine Services • SQL Server Replication • Analysis Services (Tabular Only) • Reporting Services - Native • Integration Services • Management Tools - Basic • Management Tools - Complete
Installation Storage	150 GB	
TempDB Storage	100 GB	
Data StoreTransaction Log Storage	5 GB per 100 beds	
Data Store Database Storage	10 GB per 100 beds	
Data Warehouse Transaction Log	5 GB per 100 beds	
Data Warehouse Database Storage	10 GB per 100 beds	
SSAS Data Storage	10 GB per 100 beds	**Important**: Do not leave these directories on the OS drive.
SSAS Log Storage	5 GB per 100 beds	**Important**: Do not leave these directories on the OS drive.

Enterprise Reporting Server Requirements (More than 500 Beds)

This section describes the requirements for facilities with more than 500 beds.

The NaviCare® Report Model is a self-service analytics tool that resides in-memory on a server. The server must be capable of handling a large number of simultaneous requests, not only from direct users, but also from report subscriptions and execution snapshots. The server must also be able to handle resource-intensive activities such as cube processing.

The hardware requirements listed here are the absolute minimum recommended to achieve one hour or less of data latency when the supported system contains less than 500 beds. For facilities with more than 1,800 beds, additional memory and/or processing capabilities are required to maintain one hour of data latency.

If your Enterprise Reporting server contains only the minimum requirements, we recommend using a machine that can be upgraded as needed.

All storage arrays must be on separate spindles for optimal performance.

Store the warehouses and data stores on separate disks with separate controllers. Otherwise, read and write I/O contention (read from the Data Store, and write to the Warehouse) reduces performance of Extract, Transform, Load (ETL) operations and increases data latency.

Component	Data Store / Warehouse Server	Report Model Server	Considerations
Processor	8 Cores @2.66 GHz (per 1000 Beds)	8 Cores @2.66 GHz (The CPU cores impact licensing costs and concurrent user loads. Utilize the comments regarding the Speed, Cores, Sockets, CPU Cache, and CPU Architecture to make the most appropriate decision for your organization. If you choose to start at the lower end of the specification, you should be prepared to increase CPU resources if user experience or data latency deteriorates.)	*Speed:* The faster, the better will help in computing results faster. *Cores:* Generally, the more the better, but too many cores can lead to CPU management overload. So, a balanced approach must be taken when determining the CPU Cores and Speed. For many software packages, licensing cost increases by the CPU. *Sockets:* (Report Model Server) The lower, the better as SSAS Tabular is not NUMA aware. However, this is expected to change in SQL 2016 where some NUMA optimizations have been made. For large tabular models, it might be a challenge to go single socket as the amount of RAM that can be supported on a system will depend on the CPU sockets. *CPU Cache:* The more, the better. Retrieving data from CPU caches are 10-100x faster than retrieving data from RAM. *CPU Architecture:* The newer, the better due to the hardware performance optimizations.
Memory	64 GB	64 GB (for up to 500 Beds) 5 GB for each additional 100 Beds.	*Amount of RAM: Should have at least 2.5x the model size, if the model is going to be processed on the same server. The amount of RAM can be lesser in cases of certain scale out architectures where the model is*

Component	Data Store / Warehouse Server	Report Model Server	Considerations
			processed in a separate server.
			RAM Speed: The faster, the better. This is very important for a memory-bound application like Tabular and should always go for the faster speeds, if budget allows.
			Data Retention: Memory for data storage can be sized according to storage needs, as follows:
			1 Year > 24 GB for up to 500 beds
			2 Years > 48 GB for up to 500 beds
			3 Year > 64 GB for up to 500 beds
			5 GB for each additional 100 beds
OS	Windows Server 2012 R2 Standard <u>or</u> Windows Server 2016	Windows Server 2012 R2 Standard <u>or</u> Windows Server 2016	
SQL	SQL Server 2016 Standard or higher <u>Required Components</u> • Database Engine Services • SQL Server Replication • Integration Services • Management Tools - Basic • Management Tool - Complete	SQL Server 2016 Enterprise <u>Required Components</u> • Analysis Services (Tabular Only) • Reporting Services - Native • Management Tools - Basic • Management Tool - Complete	
Installation Storage	150 GB	150 GB	***Data Store / Warehouse Storage:*** Consider using faster storage (such as SSDs) improves ETL processing and reduces data latency. This applies to TempDB storage, Transaction Log storage, and

Component	Data Store / Warehouse Server	Report Model Server	Considerations
			Database Storage. *Report Model Storage:* Although the storage speed for this component does not have any effect on query performance, using faster storage (such as SSDs) reduces time required for maintenance related activities like backup, storage or getting the tabular model online faster when the service is restarted.
TempDB Storage	200 GB	N/A	**Data Store / Warehouse Storage:**Consider using faster storage (such as SSDs) improves ETL processing and reduces data latency. This applies to TempDB storage, Transaction Log storage, and Database Storage.
Data StoreTran saction Log Storage	4 GB per 100 beds	N/A	
Data Store Database Storage	8 GB per 100 beds	N/A	
Data Warehouse Transaction Log	4 GB per 100 beds	N/A	
Data Warehous e Database Storage	8 GB per 100 beds	N/A	
SSAS Data Storage	N/A	8GB per 100 Beds **Important**: Do not leave these directories on the OS drive.	**Report Model Storage:** Although the storage speed for this component does not have any effect on query performance, using faster storage (such as SSDs) reduces time required for maintenance related activities like backup, storage or getting the tabular model online faster when the service is restarted. Do not leave these directories on OS drive.
SSAS Log Storage	N/A	4 GB per 100 Beds **Important**: Do not leave these directories on the OS drive.	