



Maestro System Requirements

Server/Client/Hosted

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Overview

This document serves to outline Maestro's minimum specifications for hardware and operating platforms for the various deployment options available with Maestro, all of which are addressed in this document.

The platform options are:

1. On premise installation using Maestro Windows (Client/Server Install)
2. On premise installation using Maestro Web (Browser Based Install)
3. On premise hybrid installation using both Maestro Windows and Maestro Web
4. Self-hosted solution using Maestro Windows and/or Maestro Web
5. Cloud hosted solution using Maestro's Cloud Services (Browser Access)

Considerations

These specifications may change from time to time to accommodate releases and advances in technology.

It should be expected that, over time, Client's data volume and end-user performance requirements will change thereby resulting in the need for possible hardware, operating system and/or connectivity changes.

Northwind recognizes that less powerful components may, in some circumstances, provide adequate performance.

Components designated as 'dedicated' devices in this document shall only be used to operate software applications approved by Northwind and are specified for meeting acceptable performance under this proviso.

Client shall be responsible for performance of all Client Supplied Products installation and configuration tasks. Client may elect to perform such activities using fully qualified internal staff members or by contracting such services from a qualified third-party vendor.

Client shall be responsible for all ongoing administration, maintenance, virus protection, data backup and accessibility/security for all hardware, operating systems and network connectivity. Client may elect to perform such activities using fully qualified internal staff members or by contracting such services from a qualified third-party vendor.

Client shall ensure adequate performance of all Client supplied products including all troubleshooting and error correction necessary to ensure such performance.

Please ensure that the hardware system is installed professionally; specifically, the Windows Operating System and SQL Server software should be installed by a Microsoft Certified Professional.

Northwind sets guidelines for the use of its software only. Due to the nearly limitless number of variables within any Server, Personal Computer or Network Configuration, Northwind is not liable for any perceived speed or performance issues which may arise on any given system. Due to differences in network environments, Northwind makes no guarantee regarding any specific configuration.



Maestro Server Configuration

The sections below describe different methods on how to estimate the required components for the Maestro Server. This should be perceived as a guideline due to the almost endless number of variations available on the market.

General Guidelines

Maestro Server configuration should be determined based on the following main criteria:

1. What configuration environment will be used (see previous section)
2. How many concurrent user connections the server will handle
 - a. 1 user may have multiple sessions
3. How many interfaces will be running at the same time
 - a. 1 interface uses 1 session
4. Whether or not Maestro Analytics is installed on the same machine
 - a. Each active Maestro Analytics user needs an additional 4GB of memory
5. How large is the database and how fast it will grow? This depends of the following additional factors:
 - a. How many days statistics is collected for
 - b. How many rooms the property has
 - c. What is a forecasted average occupancy

The larger the database, the more RAM SQL Server will use. For example, if the database is 10GB, it means that SQL Server will use very close to 10GB of RAM alone.

A good way to estimate a number of concurrent connections is to take a number of Maestro licenses purchased and multiple that number by 1.5 (to accommodate the fact that most of the users will be running multiple Maestro sessions). 1 user license for 1 user can be used for multiple sessions started by the same user.

Sessions represent a running Windows process. For example, if there are 10 users, and 2 interfaces, and each user has two tabs open in Maestro Web that would be $((10 \times 2) + 2)$ or 22 sessions. If there is a separate server for interfaces then they don't need to be considered for the memory/ CPU requirements of the main server.

Whichever environment is used the following must always apply

- Disks are 15k rpm, or SSD (preferred), in a redundant configuration (RAID-5 or RAID-1 or RAID 1+0)
- RAID controller must have a battery backed cache or flash memory backed cache (a non-cache memory controller will have write speed problems)
 - A good example of fast RAID controller is [Dell PowerEdge RAID Controller H740P](#)
 - For best performance, consider controllers with 3GB non-volatile memory cache
- Server should have Windows Server 2019 Standard Edition (max 4TB memory and 64 cores) or any higher version
- Server should have SQL Server 2019 Standard Edition (max 128GB memory and 16 cores) or any higher version
- Can be setup as a virtual server



Configure by Formula

You can estimate the required server configuration using the criteria below. Hardware requirements directly depend on the type of environment Maestro is deployed in. Below are the minimum estimates. The property should always scale to its anticipated future needs and configure the servers in a way to last at least 5-7 years without having to reconfigure/replace it.

Environment 1 - all sessions RDP (users connect to the SQL or Terminal Server):

RAM memory

- for SQL Server: 128MB x number of sessions
- for Maestro programs: 128MB x number of sessions
- for Maestro Analytics: 4GB per Maestro Analytics user
- for operating system: 4GB

CPU

- 1 core for every 10 sessions
- 1 core for every 2 GDS interfaces if GDS is on the main server (if more than 4 GDS interfaces are running it is suggested to run them on a separate server)

Disk

- for SQL and Maestro: 250MB per user
- for OS: 75GB

Network

- estimated at 256Kbps per user

Environment 2 - all sessions Maestro Web (users use Maestro via the Web Browser. Offers best performance)

RAM memory

- for SQL Server: 128MB x number of sessions
- for Maestro programs: 128MB x number of sessions
- for Operating System: 4GB

CPU

- 1 core for every 10 sessions
- 1 core for every 2 GDS interfaces if GDS is on the main server (if more than 4 GDS interfaces are running it is suggested to run them on a separate server)

Disk

- for SQL and Maestro: 250MB per user
- for OS: 75GB

Network

- estimated at 256Kbps per user



Environment 3 - all sessions Windows Client/Server (this assumes a separate interface server)

RAM memory

- for SQL Server: 128MB x number of sessions
- for Maestro Analytics: 4GB per Maestro Analytics user
- for operating system: 4GB

CPU

- 1 core for every 20 sessions

Disk

- for SQL and Maestro: 250MB per user
- for OS: 75GB

Network

- 1Gbps or 10Gbps LAN

Estimating the size of the database files (.mdf and .ldf)

The potential size of the hotel database and how fast it will grow depends on many factors. We have studied a number of existing client databases and how fast they increased in size over the years to offer 2 methods of approximate estimation. Please note, these methods might not fit your exact situation.

- By number of rooms (seems slightly more accurate than by users)
 - Bytes consumed per day is the number of rooms times 19,000
- By number of users
 - Bytes consumed per day is the number of user's times 120,000

Use 1,325 days (5 years) to allow for 5 years without reconfiguring the disks

Disk space requirements to store database files, transaction log and backup files can be calculated as follows:

- Database file and transaction log files
 - mdf and ldf size: 3 x database size
 - it is suggested to store the files on 2 different drives
- Backups
 - 3 bak files (backups) size is 3 x database size
 - Store backups separately
 - 6 trn files (transaction log backups) size is 1 x database size
- Backup transfer files size is 0.5 x database size (applies to Maestro-hosted solution only)

Total minimum space required is 7.5 x database size



Configuration Examples

Below is an outline of a few possible real configuration examples for different Maestro environments. Please note, these are general guidelines and may not fit your exact scenario.

Maestro SQL Server

up to 120 sessions

A single server, all sessions RDP to this server or access the server via Maestro Web (Maestro Web offers the best performance):

- 96GB RAM memory
- 16 core 2.4Ghz or greater
- 750GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory
- a 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

OR

A single server with all workstations using classic client server:

- 64GB RAM memory
- 8 core 2.4Ghz or greater
- 500GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory
- A 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

up to 60 sessions

A single server, all sessions RDP to this server or access the server via Maestro Web (Maestro Web offers the best performance):

- 48GB memory
- 8 core 2.4Ghz or greater
- 400GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory
- a 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

OR

A single server with all workstations using classic client server:

- 32GB memory
- 4 core 2.4Ghz or greater
- 400GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory



- a 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

up to 30 sessions

A single server, all sessions RDP to this server or access the server via Maestro Web (Maestro Web offers the best performance):

- 16GB RAM memory
- 2 core 2.4Ghz or greater
- 250GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory
- A 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

OR

A single server with all workstations using classic client server:

- 14 GB memory
- 2 core 2.4Ghz or greater
- 150GB total usable disk
- Disks are 15k rpm, or SSD, in a redundant configuration
- High-end RAID controller with 3GB non-volatile cache memory
- A 1 GigE (Gigabit Ethernet) with a 1 GigE connection all the way to the workstations

Dedicated Interface Server (excluding GDS)

All interfaces run on the interface Server

- RAM: 256 MB per interface + 4GB for OS
- CPU: 2 cores 2.4Ghz or greater
- Disk: 500GB total usable disk (to accommodate interface log files)
- Disks are 14k rpm, or SSD, in a redundant configuration
- Good RAID controller with at least 512 MB non-volatile cache memory
- A 1 GigE (Gigabit Ethernet) with a 1 GigE connection to SQL server
- OS: Windows Server 2019 or higher advised

Dedicated GDS Server

If running more than 4 instances of GDS interfaces, it is suggested to run them on a separate dedicated server. GDS interfaces are CPU intensive processes.

- RAM: 256 MB per 1 GDS instance + 4GB for OS
- CPU: 1 core 2.4Ghz or greater per 2 GDS instances
- Disk: 500GB total usable disk (to accommodate interface log files)
- Disks are 15k rpm, or SSD, in a redundant configuration
- Good RAID controller with at least 512 MB non-volatile cache memory
- A 1 GigE (Gigabit Ethernet) with a 1 GigE connection to SQL server
- OS: Windows Server 2019 or higher advised
- Internet speed: at least 30Mbps upload speed

Client Workstation

All modern workstations that run a supported Windows OS are capable of running Maestro. In case Maestro Web only, Maestro supports most modern browsers. Best performance is achieved using Google Chrome.

- RAM: 8GB
- CPU: 1 core 2.4Ghz
- DISK: 250GBtotal usable disk
- A 1 GigE (Gigabit Ethernet) to Maestro SQL Server
- OS: Windows 10 or any Microsoft Supported higher versions



Miscellaneous

Antivirus

Industry standard virus scanner using scheduled daily scans of local hard disks during low-utilization periods. 'Auto-Monitoring' real-time virus scanning services may be used on PC workstations to scan local workstation drives but must not be allowed to scan mapped network drive connections.

Antivirus should be configured to exclude any Maestro folders and specially to exclude GDS and Revenue Management Interface executables and the log folders from scanning.

Hardware Maintenance

The client is responsible for arranging hardware maintenance coverage with their hardware manufacturer, vendor, or system integrator. Maestro recommends clients arrange for 7x24 4 hour response on-site coverage for the server.

Services Required from Hardware Vendor/System Integrator

Assembly and Testing of Hardware

Configuration of Network

Installation and Configuration of Windows Server and Database for Server and client PCs.

Installation and Configuration of Printers for the network environment for print sharing.

Installation of Hardware in training room.

Installation of Hardware in final location.

Hardware Supplier

Your chosen hardware vendor should provide hardware with all peripherals assembled and operating system loaded to ensure hardware compatibility. Your hardware vendor should also provide your cable contractor with specifications and standards for wiring and networking the other workstations. Maestro's role is to provide the loading, training, and the support of our application software.

Please ensure that the hardware system is installed professionally; specifically, the Windows Operating System must be installed by a Microsoft Certified Professional. Maestro's support department will be dialing into your network (to be setup in a training room that simulates the live environment) at least one week prior to the scheduled training date in order to verify that the configuration requirements have been met.

If specifications are required for alternative implementation options, please contact your Maestro Solutions Consultant or email support@maestropms.com