

## Hardware requirements for running ModesXML

### Ideal specification

For best possible performance if cost is no object the answer is easy; fire-breathing dragons for both server and clients and a gigabit network.

### Optimum specification

There's no easy answer to this because what is acceptable is subjective. Also the optimum system specification depends to a large extent on the scale of your operation, so there is never going to be a simple response to this 'how long is a piece of string' question.

There are clearly at least three hardware elements to consider:

- server machine specification;
- client machine specification;
- network specification.

To this mix must be added:

- the size of the database;
- number of clients;
- frequency of access;
- other applications running on server.

### ***Server machine specification***

Performance of the server will depend on whether it is dedicated to *ModesXML* or handling other work, how many clients it serves, the amount of data it has to handle and the frequency of access to the database. A powerful and memory-rich server is clearly vital if it is being used for more than *ModesServer*, otherwise processing power for the server probably isn't the biggest issue: good network connections and fast disk access are likely to be more important.

A dedicated machine is best. There is little point in having a fast database engine if it is kept waiting while the machine sends and receives emails, acts as domain controller, file-serves, etc. The number of clients is critical, serving two clients is clearly very different to serving twenty. If some users make only sporadic use of the Modes data there will obviously be less pressure on the server than if all clients are constantly accessing the database (unless the occasional users all need access at the same time).

The general advice from the NexusDB community seems to be to have as much memory as possible, and to give the server permission to use it (although there is currently a 2GB limit in normal use, NexusDB are working on a way of getting round this). A generous amount of RAM will mean that the server will work largely from data held in memory rather than on disk, improving response times. As a rough guide 1Mb of RAM is adequate but 2Mb far better.

A suggested optimum system specification for the server side of a system with 5 users is:

P4 2.8Ghz 1GB RAM (2GB or more would be better) 2 x 40GB SATA hard drives in a mirrored (RAID1) RAID array.<sup>1</sup> 1Gb network card (running at 100Mb due to network switch). *Windows Server 2003 SBS* (*Windows 2000 server/advanced* or *Windows 2003 Standard* or *Enterprise* would work as well).

It is better (if possible) to keep the database files on separate physical drives to anything else to assist with performance.

### ***Client machine specification***

*ModesXML* works the client machine pretty hard, the grid contents are parsed on the fly (each record is just a document and the column contents have to be extracted from this as the grid is painted) and all XSLT processing, XML parsing, etc. happens at client level. Again this machine needs to have enough memory to avoid, in normal use, the need to 'swap out' to disk as this is the point at which response times increase dramatically. A decent P4 processor with at least 512MB of RAM is recommended. As always, additional memory is likely to be beneficial.

### ***Network specification***

Network speeds are also important - there's little point having fast machines at both ends if they communicate over a sluggish network. Because of the design of the *ModesXML* system (based on XML documents) the entire record has to be transferred from server to client every time, unlike a conventional database system where network traffic is minimised by only asking for the fields needed for the current operation.

MUA members are still experimenting with network issues, but it seems pretty clear that a fast (e.g. 100Mbit) network is an important factor in getting decent response times. Running *ModesXML* over a slow wireless network is an exasperating experience although faster wireless connections may give acceptable results.

### ***Minimum specification***

*ModesXML* is running quite happily as both service and client on at least one ageing *Windows XP* portable with 256MB of RAM, a processor speed of 1.2 or 1.6GHz (the system properties dialogue lists both figures - maybe one is nominal and the other actual speed) and "not enough" free disk space (about 1GB). It's just one of several concurrent tasks most of the time.

The *ModesXML* client will run under *Windows 98SE* on a 600 MHz Pentium III computer with 512Mb RAM but at a speed that is really only satisfactory for occasional access.

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<sup>1</sup> SATA drives are very good and cheap for smaller sites up to 50 users but SCSI U320 in a RAID array is recommended for sites with over 50 users. The key thing is to have the right RAID type, RAID 5 can cause performance issues with databases if there are a lot of read/write requests. RAID1-mirrored or RAID 10-a stripe of mirrors, are the best for database servers.