

Thank you for using **hh2 Cloud Services!** We are excited to have you as a customer. If you are about to install our synchronization client and are looking at the tech specs and wondering why we do things, then you've come to the right place.

hh2 Cloud Services has carefully considered the technical specifications required for smooth running of our synchronization client on the accounting server. We have developed these specifications over the course of many years as we have encountered situations where the IT infrastructure interfered with the stability of the accounting server itself, and disrupted the use of our software.

You can find the current Tech Specs at <http://www.hh2.com/techspecs>.

Please review the information below to understand a bit more about why we require the specifications that we do.

Hard Drive Space

Currently, hard drives come in two basic types: Spindle-Based and Solid State. Spindle Based drives have platters that spin around like a record, and have a head and actuator arm that floats over the platter that reads and writes data. Solid state drives have no moving parts and are based on NAND Flash like the high speed memory card in your camera.

Most servers, especially aging servers, use spindle-based hard drives based on SATA, SCSI, or SAS technology. When these drives begin to fill up, it becomes harder to find empty space to write files, so the hard drive has to break them up into pieces. This "Fragmentation" makes it take longer to read and write data and reduces the drive's overall performance.

The computer's operating system needs hard disk space for a variety of reasons. First it has to store a copy of the OS. Second, it needs space for virtual memory (also known as a scratch disk, swap file or paging file) for temporary files that don't fit in memory. There are also many windows services that need space like the print spooler, Internet cache files, windows update...etc.

Years ago, when hard drive capacity was much smaller and more expensive, it became a common practice to partition your hard drive. This would divide it into two or more smaller hard drives. Some people did it to organize their files. Others did it to prevent user and program data from maxing out the system partition and

crashing the server. In all cases, partitioning the hard drive required you to guess ahead of time the amount of space you will EVER need for the operating system partition.

Over the years, many IT departments have stumbled by creating very tight system partitions. They want to preserve space for their data so they create very small system partitions that they later regret. Something as simple as a printer running out of paper can crash a server when the print spooler temporary files grow too large. Windows Update is constantly downloading OS updates and security fixes, these updates consume space and make the size of your OS steadily grow.

Microsoft recommends that you allocate much more disk space than the minimum spec they list. A best practice is to start with the minimum spec, then add the maximum amount of memory your system can take to account for virtual memory. Then double it to account for future needs you don't anticipate. Then double it again to keep enough free space to keep the hard drive from becoming overly fragmented and to optimize performance. This is a conservative approach that minimizes future issues.

For Example, if I were running Windows 2012 Server (40GB Minimum Spec) with 32GB of memory (but it could accept 64GB), I would want a system partition of at least 416GB (((40+64) x2) x2). In this example, I would recommend just jumping up to 500GB. You could install Windows 2012 Server with less but if you did, you will take the risk that eventually you will either run out of space or experience reduced performance. Since you can currently pick up a 3TB hard drive for a little over \$100, carving out 500GB for a system partition is really not that much of a burden.

Best Practice

The best practice today is actually not to partition your hard drives at all and to get hard drives that are multiple times what you anticipate. Most experts agree that there are little to no benefits, and the disadvantages just make it a bad idea.

Instead, the most cost effective way to keep a server stable for the long term is to buy relatively low cost servers with 1 or 2 processors, with 1 to 4 hard drives, make one large partition and dedicate the server for a single purpose, such as an accounting server, or Exchange server. With the size of hard drives being what they are today, you are not likely to run out of space for a single purpose server (Unless of course it's a file server, then you should be considering a SAN, Storage Area Network, anyway).

hh² Synchronization Client

We use Mongo DB to cache hash codes of your data on your server. We install this on your C: partition. This database starts small, but as we begin synchronizing it can grow to server GB's. We require 40GB of free space, but we rarely see our Mongo DB consume more than 4 or 5 GB. The size is completely dependent on the amount of data in your accounting system.

Operating System

Windows 2003 Server is old...and it was already put down by Microsoft (July 2015). We recommend that all companies using Windows 2003 Server to upgrade as soon as possible. After an operating system is no longer supported by its manufacturer, it will be vulnerable to various forms of attack.

Although Windows 2008 server comes in 32 bit and 64 bit variants, most servers that came with Windows 2008 are 64 bit. The 32-bit version was mostly used to upgrade older servers with 32 bit processors. 64-bit servers can access more than 4GB of memory natively and run certain types of operations many times faster than their 32-bit counterparts.

Best Practice

The best practice is to take efforts to be on the latest operating system available. If you are still running Windows 2008, you should consider upgrading to 2012. If you are already on 2012, make sure you are fully patched by going to Windows Update in the control panel. You should consider installing updates automatically on a weekly basis. Statistics show that most people will never remember to patch if they try to do it manually.

hh² Synchronization Client

Our synchronization client requires a 64-bit system for optimal running. Mongo DB is limited to a 2GB database in a 32-bit system, and this isn't always big enough to cache everything we need, which could result in an interruption of service.

Hardware Age

A computer's performance is heavily impacted by its weakest link. Processors are rarely worth upgrading in place, but memory and storage are quite simple and cost effective to upgrade. You can extend the life of your machines by upgrading some of these components 2 to 3 years after purchasing.

Operating Systems and the core software that runs on them are constantly being enhanced and upgraded. As they do, they consume more storage, more memory, and tax the CPU. After 5-6 years, a server that once did its job admirably can be struggling to keep up.

Best Practice

Once your server hits about 3 years old, consider maxing out the memory if you haven't already. For accounting servers, the storage system is rarely a bottleneck on performance unless you are running low on free space. For thick clients like Timberline, the client machine can benefit greatly from Solid State drives, but it usually won't make much of a difference on the accounting server. It will boot up faster, but it won't end up affecting the performance of your accounting users.

hh² Synchronization Client

We recommend replacing your server hardware every 5-6 years to maximize performance and keep from obstructing your users, costing you valuable time and productivity.

Internet Speeds

Bandwidth is getting cheaper all the time. Unfortunately, we are coming up with more creative ways to use the bandwidth. As cloud services proliferate and backups are done online, Internet access is no longer a luxury, but a required utility. And rarely will you hear someone say their Internet is too fast. You can always use more speed.

Best Practice

Don't be stingy on your bandwidth. Get as much as you need, you'll make up the cost in productivity.

Cloud Services such as hh2 need bandwidth to synchronize data to and from the cloud. If your speed is slow, or your connection has a ton of latency, it can cause synchronization to be painfully slow. Fast connections ensure everything runs smoothly and nothing gets backed up.

hh² Synchronization Client

We recommend most businesses run at least 10Mbps in Internet speeds. Anything over 2Mbps will typically run fairly well, as long as you don't have many users or other services that consume all the data. Most Cable, DSL, Fiber, and wireless options for business run speeds that can vastly exceed 10Mbps. You can also bond several T1's together to reach speeds that high for a reasonable price. In environments where bandwidth is limited, consider policies that limit bandwidth use to prevent unrelated YouTube videos from chewing up your available bandwidth.

Security Software

From an Internet security perspective, it's the wild west out there. Anti-Virus software and firewalls are a must to protect your systems and data from corruption or theft. But in your efforts to secure your network, it's easy to get carried away.

We have encountered some IT departments that disable internet access to their accounting server and require their users to use USB thumb drives to add and remove data. This is incredibly short-sighted. Without Internet access, they won't be able to patch, then they will be vulnerable to all the viruses that run rampant on USB storage sticks (don't plug them in, you don't know where they've been and what viruses they have contracted along the way).

Proxy Servers and Real Time Protection services can also heavily interfere with or disrupt Cloud Services entirely. These services can be useful, but in general, training your staff properly makes them moot.

Best Practices

We recommend that you use security software on all your machines in the network, and have a firewall appliance on the perimeter of your network. But choose your security software vendor carefully. Most free solutions delete corrupted files automatically instead of cleaning them, and have other flaws that result in lost data.

Don't be a security Nazi! Adopt reasonable policies. Extreme security precautions are usually poorly thought out and implemented. And they cause more damage than they prevent.

hh² Synchronization Client

If you have security software on your accounting server, you will want to make sure to exempt *.hh2.com from your real time protection. Do not use a proxy server.

Our synchronization client only requires outbound ports 80 and 443 to be open on your firewall. Most software firewalls do not perform outbound port filtering, but your firewall appliance most likely will. If you don't have these ports open, you won't be able to browse the web securely so these ports are usually open by default.

Conclusion

Customers that adhere to the tech specs should rarely if ever experience IT difficulties with the hh2 Synchronization Client. Customers that push against these requirements are the ones who end up wasting their own valuable time working with our support to solve the same problems over and over again.

But if you've reached the end of this document, we know what kind of person you are. You care enough to do the research, which means you are the kind of customer that likes to take the easy road...the road that's been paved by the mistakes of others. I can tell already...we are going to be great friends. And you are going to love what hh2 Cloud Services can do for you.



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