

## SBS 2000 SP1 (/SP4) system hang

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I added Smart Array 431 RAID controller to a client's Proliant ML370 G1 SBS 2000 server.

Windows 2000 SP4

Exchange 2000 SP3

ISA 2000 SP1

Before the addition the client had the following configuration.

C:\ and D:\ drives were located across a two 9 GB disk using the O/S software mirroring.

C:\ was the system disk.

D:\ contained several directories of which the only significant one directory was the D:\Program Files\ which contained the SQL, Exchange and Office directories.

E:\ was a 36 GB hard disk that contains all the company data as well as a E:\Program Files\ directory containing a Exchange directory and an SQL directory which used to be the location the SQL databases.

Upon adding the Smart Array card we configured four hard disks in a RAID 5 configuration. Each hard disk was an 72 GB Ultra 3 hard disk and the result was a 205 GB drive. I copied all company data to the new disks. I then attempted to migrate ISA's system cache to temporarily to D:\ drive but while I believe I knew the location to move the cache configuration /drives I could not determine how to move the cache so I just reset it to zero as they do not use ISA server anyway, (after the completion of the migration I did attempted to recreate the cache to its original size on the new E:\ but was unable to do so.)

After stopping all non essential services I copied the E:\Program Files\ and all its contents to the new drive and re labelled the new drive to E:\ this went off with out a hitch and when the system was rebooted it came up

cleanly with no issues at all.

Once we were satisfied that the system was running ok we removed the old E:\ drive. We then uninstalled SQL as they had previously migrated there GoldMine and Heat applications to a separate server but had not removed the SQL installation on the SBS server.

Having only just taken over the network I had a few weeks ago added a Windows 2003 Server using terminal services to replace the SBS server. This allowed me to remove Office from the domain controller.

At this time I also moved the exchange databases from D:\ to E:\.

This work was completed over two nights and according to the logs and the fact that all services started we felt the process had been successful.

It is difficult to pinpoint when the system began to hang as the users only direct access with it now is file access as they use GoldMine as there mail client and internet access comes through there WatchGuard firewall.

I have just sampled the system hang a total of ten time and the system hang occurs between every 5 minutes and 35 seconds to 5 minutes and 40 seconds, (00:05;35 and 00:05;40). The hang lasts for between 1 minute and 27 seconds and 1 minute and 32 seconds, (00:01;27 and 00:01;33).

After reviewing the logs there were no errors that we could directly attribute to the hang, with the exception of 'Information' logs from Exchange which seem to be related to an Exchange service failing to get access to the database (which is now located on the E:\ drive.)

In attempt to isolate the issue we rebooted into Safe Mode where the issue was not replicated and so we concluded that it was not a hardware issue, but many of the services are not that rely on the E:\ drive like Exchange are not started in Safe Mode.

We rebooted the server and begun to stop services to see if the hang was related to a particular service. After stopping all but what we considered the core services the problem was still occurring. We then stopped all services but the services which the system does not allow you to stop.

When we did this the hanging stopped.

We then restarted the core services again and the server still did not hang.

These core services included; Alerter, Com+, System Event Notify, Computer Browser, Local Disk Manger, Net Logon, Network Connections, RPC Locator, SNMP Service, TCP/IP NetBIOS Helper, Windows Management Instrumentation, Windows Management Instrumentation Driver Extension, Workstation, IIS Admin Service, Protected Storage, Remote Access Connection Manger, Telephony, Plug and Play. I may have missed one or two of the services that can not be stopped but this is a quite a comprehensive list.

We guessed that the reason that one of the core service which is a dependent service for a non core service may have impacted the behaviour of a core service and that it was not until the core service was stopped and restarted manually with out the non-core service then starting that it did not hang the system.

At this point we begun to restart services after restarting about two thirds of the way through when we restarted the 'Microsoft Scheduled Cache Content Download' service and in the middle of starting the service the system hung. When the system hang was over the serviced finished starting. We waited to see if the system would hang again which it did. We then stopped the 'Microsoft Scheduled Cache Content Download' service in the hope that this was our offending service. When the hanging still kept occurring we stopped related ISA services, but the hanging remained.

We then stopped all services so as to stop the hanging and begun restarting services again. Around a third of the way through the restarting the system again hung this service (which I did not note down, stupidly) was not related to ISA, and from what I recall seemed to be quite an unremarkable service, (if you can ever say that about a service.)

We noted also that at the time of the hang the RAID disks E:\ drive which contains the page file and exchange the lights on the disks would go solid and when the system came back from the hang the lights would go back to flashing in unison. For this reason we downloaded the latest firmware for the RAID card and installed it, this had no effect.

Throughout the investigation I have been monitoring a few performance monitor counters where a pattern is developing before the system hangs, (unfortunately during the hang no data is collected.) (Please note this data is collected over the weekend so not much other activity by other users is expected on the system.) These patterns are as follows.

Between 20 and 22 seconds before the system hangs the counter % Processor Time moves from a resting % of about 8% to an average of about 55% to 60%. Not surprisingly the counter Processor Queue Length goes from average of 0% to average around 20% and the counter Page/sec increases from occasional activity spiking from 0% to 30% to frequent activity around 20% to 30%. The counter % Time increases from an average of around 6% to about 20%. All this activity occurs about 20 to 22 seconds before the hang.

Upon returning from the hang the counters Processor Queue Length, Context Switches/sec, Page/sec starts returns at around 100%.

I am sorry for the verbosity of the posting but as the issue does not offer any obvious error message I have tried to give as complete a summary of the issue.

Thank you for your time.

Regards,

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