TROUBLESHOOTING SERVER 2012 R2 CRASHES:

HOW TO FORCE A SYSTEM CRASH FOR ANALYSIS

There are many reasons why **Windows Server 2012 R2** give you a **Blue Screen of Death (BSOD)** or the **stop screen**. As **virtual machines** become more prominent in **enterprise environments**, the same problems that plagued physical servers earlier are now increasingly being observed for **crashes of virtual machines** as well.

Microsoft designs and configures Windows systems to capture information about the state of the operating systems if a total system failure occurs, unlike a failure of an individual application. You can see and analyze the captured information in the **dump files**, the settings of which you can configure using the **System Tool** in the **Control Panel**. By default, BSOD provides **minimal information** about the possible **cause of the system crash** and this may suffice in most circumstances to help in identifying the cause of the crash.

However, some crashes may require a **deeper level of information** than what the stop screen provides – for example, when your server simply hangs and becomes unresponsive. In that case, you may still be able to see the desktop, but moving the mouse or pressing keys on the keyboard produces no response. To resolve the issue, you need a **memory dump**. This is basically a **binary file** that contains a portion of the **server's memory just before it crashed. Windows Server 2012 R2 provides five options for configuring memory dumps**.

TYPES OF MEMORY DUMP FILES POSSIBLE

1. Automatic Memory Dump

Automatic memory dump is the **default memory dump** that Windows Server 2012 R2 starts off with. This is really not a new memory dump type, but is a Kernel memory dump that allows the SMSS process to reduce the page file to be smaller than the size of existing RAM. Therefore, this System Managed page file now reduces the size of page file on disk.

2. Complete Memory Dump

A **complete memory dump** is a record of the complete contents of the physical memory or RAM in the computer at the time of crash. Therefore, this needs a page file that is at least as large as the size of the RAM present plus 1MB. The complete memory dump will usually contain data from the processes that were running when the dump was collected. A subsequent crash will overwrite the previous contents of the dump.

3. Kernel Memory Dump

The **kernel memory dump** records only the read/write pages associated with the kernel-mode in physical memory at the time of crash. The **non-paged memory** saved in the kernel memory dump contains a **list of running processes**, **state of the current thread** and the **list of loaded drivers**. The amount of kernel-mode memory allocated by Windows and the drivers present on the system define the size of the kernel memory dump.

4. Small Memory Dump

A **small memory dump** or a **MiniDump** is a record of the stop code, parameters, list of loaded device drivers, information about the current process and thread, and includes the kernel stack for the thread that caused the crash.

5. No Memory Dump

Sometimes you may not want a memory dump when the server crashes.

CONFIGURING DUMP FILE SETTINGS

Windows Server 2012 R2 allows you to configure an **Automatic memory dump**. To start the configuration, you have to log in as a local administrator and click on **Control Panel** in the Start menu:

From the Control Panel, click on System and Security icon. Next, click on System:

In the System Properties that opens up, click on the Advanced tab as shown below:

In the Advanced System Properties, look for and click on Settings under Startup and Recovery section:

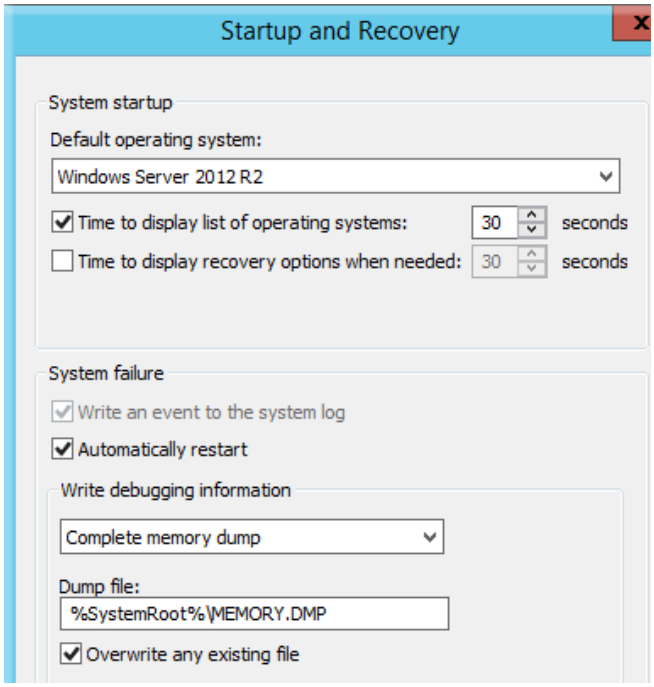


Figure 4. Startup and Recover dialog

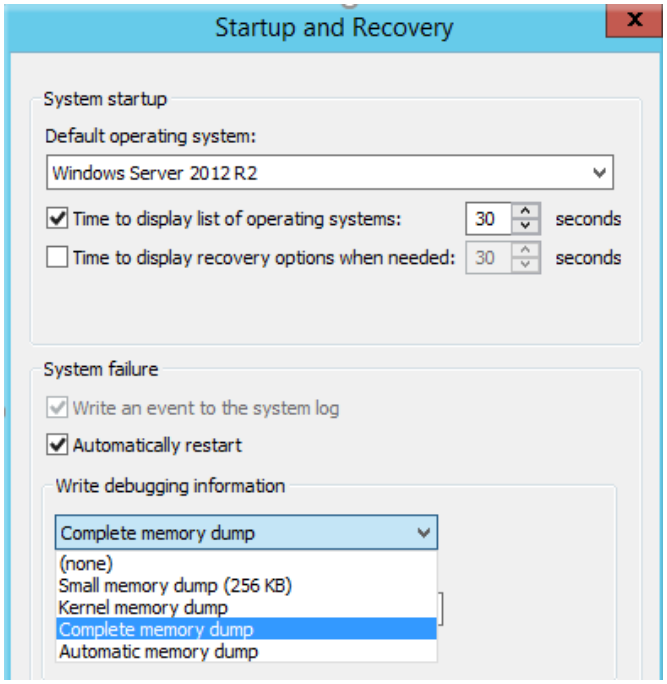


Figure 5. The five types of debugging information (memory dumps) available

Here, you have the choice to let your server **Automatically restart** on **System failure**. Under **Write Debugging information**, you can select between one of the **five types** of memory dumps to be saved in the event of a server crash.

You can also define the **name of the dump file** the server should create and specify its location. The **default location** is in the **System Root** and the **default name** of the file is **MEMORY.DMP**. If you do not want the previous file to be overwritten by the new dump file, **remove the tick mark** from **Overwrite any existing file** (visible in figure 4).

When done, you will need to **restart the server** for the changes to take place.

MANUALLY GENERATING A DUMP FILE

Although the server will create the dump files when it crashes, you do not have to wait indefinitely for the crash to occur. As described in Microsoft's support pages Generating a System Dump via Keyboard and Forcing a System Crash via Keyboard, you can induce the server to crash with a select combination of keys. Of

the several methods described by Microsoft, we will discuss the method via USB keyboards.

FORCING A SYSTEM CRASH FROM THE KEYBOARD

Begin with a command prompt with administrative privileges. For this, begin with the **Start menu** and **click** on **Command Prompt (Admin)**:

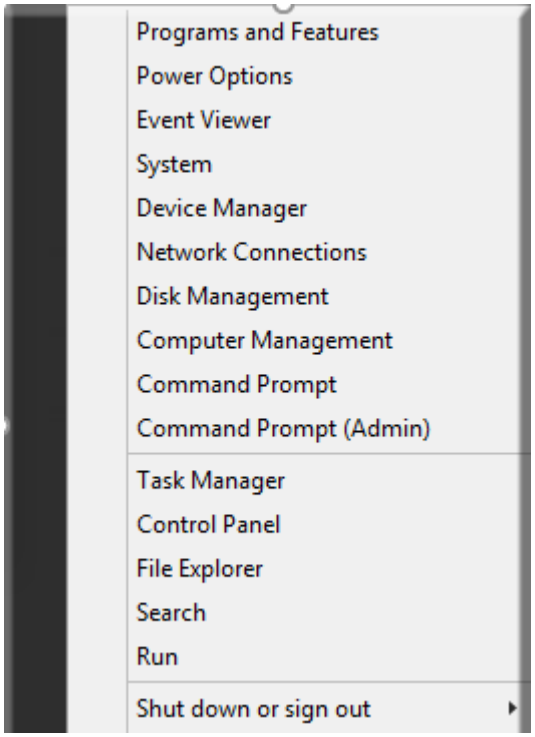


Figure 6. **Invoking the Command Prompt with Elevated Privileges**

In the command prompt window that opens, **type** in "**regedit**" to and **hit Enter**:

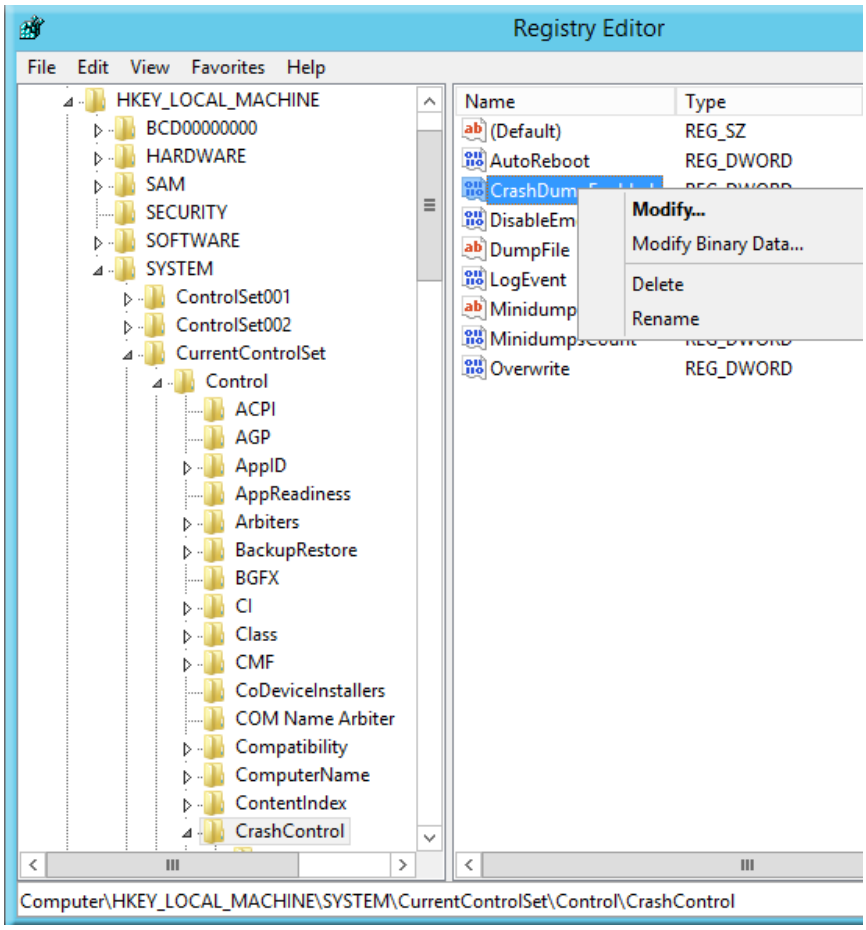
Figure 7. Opening and Editing the Windows Registry

This opens the **Registry Editor** screen. Now expand all the way to the following section:

HKEY_LOCAL_MACHINE\SYSTEM\CurrrentControlSet\Control\CrashControl

Right-click on **CrashControl** and create a new **DWORD** with the name **CrashDumpEnabled** which will appear in the right hand pane. Next, modify its value by **right-clicking** on **CrashDumpEnabled** in the right hand pane and selecting **Modify**:

Figure 8. Editing the Registry. Modifying the new registry DWORD CrashDumpEnabled



In the Edit **DWORD** Value dialog that opens enter Value data as **1** and **click** on **OK**:

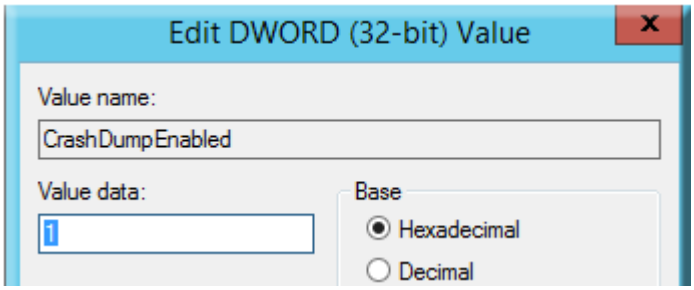


Figure 9. Editing the Value Data of CrashDumpEnabled

Next step is to go to the following registry location:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrrentControlSet\Services\kbdhid\Para
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```
meters
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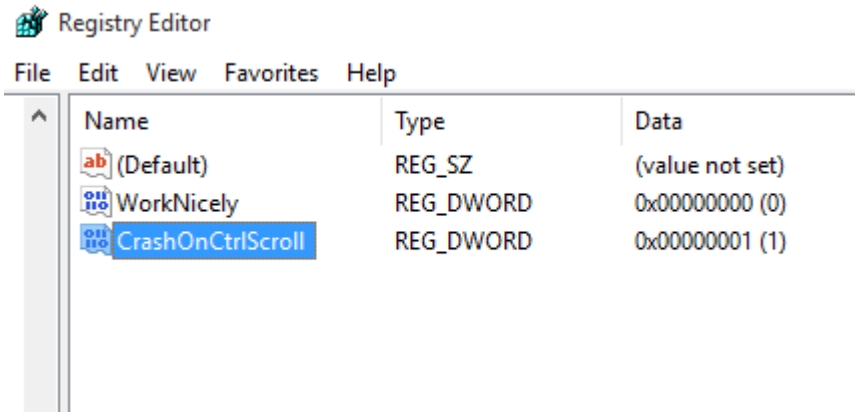
Right-click on Parameters and create a new DWORD with the name CrashOnCtrlScroll, which will appear in the right pane:

Figure 10. Editing the Registry. Creating the new Registry DWORD **CrashOnCtrlScroll**



Now, modify the CrashOnCtrlScroll value by right-clicking on CrashOnCtrlScroll in the right pane and selecting Modify:

Figure 11. Modifying the Registry DWORD entry **CrashOnCtrlScroll**

In the Edit DWORD Value dialog that opens, enter Value data as 1 and click on OK:

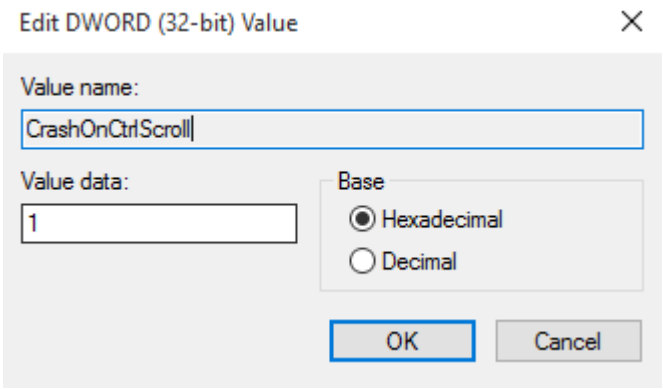


Figure 12. Editing the Value data of CrashOnCtrlScroll

Restart the server for the new values to take effect.

Next, to crash the server, press the combination of keys:

CTRL + SCROLL LOCK + SCROLL LOCK

Note: Press **SCROLL LOCK** key **twice** while holding down the **CTRL** key.

The server will crash and restart and should have created a new dump file

This will work on most system, however it is not guaranteed, you may need to follow another MS article :

https://support.microsoft.com/en-us/help/927069/how-to-generate-a-complete-crash-dump-file-or-a-kernel-crash-dump-file