

# Wii U Background Stress Mode

2013/10/17

Version 4.5

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# 1 Background Stress Mode

The Wii U console performs several tasks in the background of an application that is running, such as updating the system and downloading data. Currently, the background processing may impact application processing, although there are plans to fix this in the future. Until that time, Nintendo has provided an environment called Background Stress Mode, in which background processing is performed at all times. Use this mode to test and adjust the impact of background processing on your application.

**Note:** Background Stress Mode triggers communication with an external server. The communication processes only perform downloads and access dedicated data that Nintendo has prepared at the URLs below. This process does not pose any security risks. The application will never upload data from development hardware to an external server.

**Table 1-1 Access to Background Stress Mode**

Item	Access
Protocol	http
Port	80
URL (Stress Modes 1, 3)	<a href="http://npns-dev.c.app.nintendowifi.net/bst.dat">http://npns-dev.c.app.nintendowifi.net/bst.dat</a>
URL (Stress Modes 2, 4)	<a href="http://npns-dev.c.app.nintendowifi.net/bst2.dat">http://npns-dev.c.app.nintendowifi.net/bst2.dat</a>
IP Address	Because these URLs use CDN (content delivery network), the IP address is not fixed.

## 2 Impact of Background Stress Mode

If Background Stress Mode is used, contention sometimes occurs between the FS (file system) processes for the foreground application and the FS processes for Background Stress Mode, which can cause processing slowdowns. Check to make sure that the application does not freeze and that the processing does not become extremely slow.

## 3 Using Background Stress Mode

You must have an Internet connection to use Background Stress Mode. Set up your environment and connect your development hardware to the Internet before using this application.

### 3.1 Starting Background Stress Mode

You can switch between stress modes with **Test Setting > Background Stress Mode** in the System Config Tool. Modes 1 and 3 just download a file and then write it. Modes 2 and 4, on the other hand, flush the file after writing it. These modes reduce the size of the downloaded data and flush frequently so that you can see the effect of the flushing process. Stress Modes 1 and 2 use the internal system NAND memory; Stress Modes 3 and 4 use the USB storage. Use these stress modes to make sure that downloading and writing data in the background and the flushing process will not adversely impact your application.

The `runBgStressMode.sh` shell script for starting Background Stress Mode was added in Cafe-SDK 2.09.10. Using this script makes it possible to make Background Stress Mode settings and start the system all at once. The steps for using this script are as follows.

1. Run `runBgStressMode.sh` with the number of the Background Stress Mode you want to start as an argument.

Usage: `runBgStressMode.sh <BG stress mode number>`

(When the shell finishes, the **Test Menu** screen of System Config Tool is shown.)

2. Check the program state values to confirm that Background Stress Mode is working properly.
3. Start the target application from the **Title Launcher** in the top screen.

Note that in step 2, it takes a few seconds for Background Stress Mode to start working correctly. Normally the state value will momentarily change to ERROR (00360000) before transitioning to a value that shows it is running correctly (such as RUNNING).

#### Notes

- Starting with SDK 2.07.01, Background Stress Mode is set to Stress Mode 2 by default.
- When running Background Stress Mode, enable the Background Daemon in the **Test Menu** of System Config Tool.
- When using Stress Modes 3 and 4, set Find USB to True in the **Test Menu** of System Config Tool.
- In Stress Modes 3 and 4, the regions Background Stress Mode will use within USB storage are allocated. The region allocation is executed when the mode is selected, so if connecting to USB storage after the mode is selected, the mode will need to be selected again for Background Stress Mode to run correctly.
- To run Background Stress Mode with updated changes to the stress mode, it is necessary to reboot the development hardware.

Following are the use options from the System Config Tool for Background Stress Mode.

**Table 3-1 System Config Tool Options for Background Stress Mode**

Name	Description	Flush Frequency
Disable	Turns Background Stress Mode off. The BOSS storage used by Background Stress Mode will be deleted.	No flush processing
Mode 1 (FS-Write)	Continuously downloads and writes data for about 20 minutes, after which the flush process is run and the data is saved to a file. The operation is then repeated. This is primarily used to verify what impact downloading and writing a file in the background has on the application.	About once every 20 minutes
Mode 2 (FS-Flush)	Continuously downloads and writes data for about 1 minute, after which the flush process is run and the data is saved to a file. The operation is then repeated. . This is primarily used to verify what impact of performing a flush process in the background has on the application.	About once every minute
Mode 3 (FS-Write to USB)	Performs the same process as Stress Mode 1, but downloads the file to the USB storage.	About once every 20 minutes
Mode 4 (FS-Flush to USB)	Performs the same process as Stress Mode 2, but downloads the file to the USB storage.	About once every minute

## 3.2 Checking the Status of Background Stress Mode

You can check the status of the task operating in Background Stress Mode using the System Config Tool. The task status is shown in **Status**.

Following is each status and description.

**Table 3-2 Background Stress Mode Task Status in System Config Tool**

Display	Description	Comments
–	The stress mode is turned off.	
WAITING TIME	Task awaiting the time to start.	Waiting for execution.
WAITING RUN	Task awaiting its turn to execute.	Waiting for execution.
WAITING RESUME	Task awaiting its turn to resume execution.	Waiting for execution.
RUNNING	Task is running.	Operating normally.
ERROR	Task execution resulted in an error.	Shown along with the error code.
FINISHED	All task executions are finished.	This normally does not occur.
UNKNOWN	Task status unknown.	Could not start Background Stress Mode.
STOPPED	Task has stopped.	This normally does not occur.
STOP BY POLICYLIST	Service is temporarily stopped.	This normally does not occur.

When running normally, the task status alternates between two states: WAITING TIME and RUNNING. In Stress Modes 1 and 3, the change interval is long (more than ten minutes). In Stress Modes 2 and 4, the change interval is short (around a few seconds).

If the task is in a waiting-for-execution status, after waiting for several seconds it will transition to the RUNNING status.

If the status is UNKNOWN, Background Stress Mode cannot be started for some reason. This status occurs in cases such as when the Background Stress Mode tries to write data to BOSS storage that does not exist.

If the status is ERROR and the error code is 00360000, Background Stress Mode is not operating because communication could not be performed in the background. This could also happen if the preparations for communication have not been completed right after the tool is started. In such cases, operation will start if you wait for about 10 seconds. If you wait and the same error is shown repeatedly, check the following.

- The network settings have been made, and you can connect to the Internet.
- The Background Daemon is enabled (this can be checked from the same **Test Setting** menu as the Background Stress Mode settings).

**Note:** If these settings are changed, they will not be reflected until the tool is rebooted.

If any ERROR status other than the one above occurs, Background Stress Mode is not operating for unknown reasons. Contact Nintendo support at [support@noa.com](mailto:support@noa.com) for more information. Be sure to include the error code when you contact Nintendo.



### 3.3 Notes on Network Environment

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If you have built a special DNS environment for developing network features, and the DNS server is configured to not perform recursive queries, then you will not see the intended behavior of Background Stress Mode because it will be unable to retrieve its file. No special considerations are needed to use Background Stress Mode if you do not have environment configurations like these.

### 3.4 Notes on Errors

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(-503) errors occur when the USB storage device does not exist. Check the connection to the USB storage device.

### 3.5 Use of BOSS Features

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Background Stress Mode uses BOSS (background online services) features to download data. If your application uses BOSS, running Background Stress Mode will not block your application's use of these features. Requests from your application will be handled appropriately. However, the BOSS features may become active at different times from when Background Stress Mode is turned on. If you want to avoid this, you should disable Background Stress Mode while testing BOSS features.

### 3.6 Output of Background Stress Mode Startup Result to Log

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Starting in SDK 2.08.04, statuses of whether Background Stress Mode was started and the reason it was not started, if it was not, are output to the console log upon system boot.

If Background Stress Mode was started, the following message is output to the console log.

```
[BOSS] BG stress mode (mode number) started. (Unless the
system can connect to the Internet with the current network
settings, there will be no effect.)
```

Background Stress Mode has no effect on the system if the system is not configured for communication with the Internet. Note that you will not be able to determine from the log itself whether Internet communication is possible.

If Background Stress Mode is disabled, the following message is output to the console log.

```
[BOSS] BG stress mode is disabled.
```

If Background Stress Mode is enabled but could not be started, the following message is output to the log.

```
[BOSS] BG stress mode failed to start. (Reason.)
```

If Background Stress Mode could not be started and the message continues to be output to the log, contact Nintendo support at [support@noa.com](mailto:support@noa.com) for assistance. Be sure to include the console log CFA file when you contact Nintendo.

## Notes

- The region used for downloading data in Background Stress Mode is allocated by Background Stress Mode. For this reason, you do not need to manually allocate memory.
- If the development hardware is initialized, the save data used by Background Stress Mode is deleted. For this reason, it is necessary to set the mode using System Config Tool to use Background Stress Mode after initialization.

## 4 Application Development Precautions

Whether background processing will have a significant effect on an application depends entirely on the application's own implementation. You can limit the impact of background processing on your application by keeping the following in mind during development.

### 4.1 Background Feature APIs that Increase Processing Load

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Avoid calling background feature APIs, such as `ac`, `act`, `boss`, or `fp`, ahead of other APIs with higher priority, as this can have negative effect on the responsiveness of the system when the processing load is high.

To prevent exacerbating slowdowns if system responsiveness drops, do not call any of these APIs in the main loop of your application. Calling these APIs increases the load on the system, therefore if you must use them, at least minimize the frequency (once per frame, for example). For instance, when using functions that check the status of clients by ongoing polling, such as `nn::ac::IsApplicationConnected` and `nn::fp::IsOnline`, instead, call the functions approximately every 100 ms in a separate thread, store the result, and then check that result every frame.

## Revision History

Version	Revision Date	Category	Description
4.5	2013/10/17	Changed	<ul style="list-style-type: none"> <li>Modified the content of the table in Section 3.1 Starting Background Stress Mode and added a "Flush Frequency" column.</li> </ul>
4.4	2013/07/08	Deleted	<ul style="list-style-type: none"> <li>Deleted descriptions relevant to the known issue using USB storage with Stress Modes 3 and 4 because it was corrected.</li> </ul>
4.3	2013/04/19	Added	<ul style="list-style-type: none"> <li>Added the following chapters: 2 Impact of Background Stress Mode 1 Background Stress Mode</li> <li>Added a description of the shell script for starting Background Stress Mode.</li> <li>Added notes about starting Background Stress Mode.</li> </ul>
		Deleted	<ul style="list-style-type: none"> <li>Deleted information about Dev Menu now that System Config Tool has become the default.</li> <li>Deleted the installation instructions now that Background Stress Mode has become part of the system.</li> <li>Deleted information about the (-502) and (-504) errors.</li> </ul>
4.2	2012/11/28	Added	<ul style="list-style-type: none"> <li>Added information indicating that Find USB needs to be set to True when using Stress Modes 3 and 4.</li> <li>Added an explanation of the need to reboot the development hardware to update stress mode changes.</li> <li>Added a description of the behavior when Background Stress Mode is running normally.</li> <li>Added instructions on how to install applications to realize Background Stress Mode in CAT-DEV.</li> </ul>
4.1	2012/10/26	Added	<ul style="list-style-type: none"> <li>2.6 Background Stress Mode Application</li> <li>2.7 Using Background Stress Mode on a CAT-R Unit</li> <li>2.8 Output of Background Stress Mode Startup Result to Log</li> <li>3 Application Development Precautions</li> </ul>
4.0	2012/10/13	Added	<ul style="list-style-type: none"> <li>Added descriptions of Stress Modes 3 and 4, which were added for testing background stress with USB storage devices.</li> <li>Added descriptions of when errors occur.</li> </ul>
3.0	2012/08/06	Added	<ul style="list-style-type: none"> <li>2.4 Notes on Errors</li> <li>Added that starting in SDK 2.07.01, the default Background Stress Mode is Stress Mode 2.</li> </ul>
2.0	2012/06/08	Added	<ul style="list-style-type: none"> <li>2.2 Checking the Status of Background Stress Mode</li> <li>Added a description of Stress Mode 2, which was added as a feature.</li> </ul>
	2012/05/24	—	Initial version.

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