

Calculating the BOSS Storage Size

Wii U

2014/09/04

Version 4.0

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and should be handled accordingly.**

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1 Introduction

There are six ways to upload and download data with SpotPass.

- NBDL (Nintendo batch download) tasks
- NBDL DataList tasks
- RawDL tasks
- RawUL tasks
- DataStoreDL tasks
- DataStoreUL tasks

In all cases, you must create BOSS (background online services) storage to exchange data. As with save data, you must specify separate sizes for the `\account` directory and the `\common` directory. These sizes (in bytes) are written to the ROM header. The Wii U console creates BOSS storage at the same time as save data, referring to these values.

This document describes how to calculate the necessary sizes for BOSS storage for an application.

A calculator page is provided so that application developers do not need to figure out the BOSS storage sizes on their own. For more information about using calculator page, see Section 2 The BOSS Storage Size Calculator Tool. This calculator page calculates the sizes so that you can use BOSS even if you do not have a handle on the formula and its basis. If you want to know more about the formula, contact Nintendo.

2 The BOSS Storage Size Calculator Tool

2.1 About the Tool

The BOSS storage size calculator is a tool that calculates the size of BOSS storage needed to store your data, based on the actual size of the data you plan to distribute.

This tool was developed in JavaScript, and can be used from your web browser. It supports Internet Explorer 8, Mozilla Firefox 14, Google Chrome 20.0, and later versions of these browsers.

2.2 Cluster Size

To know how much storage space you need for each task, you must know the cluster size of the file system. Although you calculate the size of BOSS storage based on the size of the data you distribute, the amount of space that your data occupies as files on the Wii U file system depends on the cluster size, rather than the actual size of the data you are distributing. The cluster size is determined by the size of the file laid out on disc, as follows.

Table 2-1 Relationship Between File Size and Cluster Size

File Size	Cluster Size
Up to 40 KB	8 KB
Up to 320 KB	64 KB
Larger	512 KB

For example, if the original file is 13 KB, 16 KB is required; if it is 200 KB, 256 KB is required; and if it is 600 KB, 1,024 KB is required. For the rest of this document, data sizes are stated in terms of cluster size unless otherwise noted.

2.3 Using the Tool

Open the `boss_storage_calc.html` file. The following page appears.

Figure 2-1 BOSS Storage Size Calculator Page

BOSS Storage Size Calculator

Introduction

BOSS data will be stored in the BOSS storage. If you calculate the size required and write it in meta.xml in advance, BOSS storage will be made at the size of it when you called SAVEIntSaveDir. This is complex a little because you need to include the size of the area for management that BOSS and the file system requires as well as the file size itself to calculate this size.

Please make use of this calculation sheet to calculate the BOSS storage size required by inputting the file size. Please input the delivery file size per the task into "the task list to register" and push "calculate" button and the required BOSS storage size will appear for account and common separately in "Required BOSS storage size". Please input the displayed value into WiiU-AppConfigTool(available at DEA-SUP) and write it to meta.xml.

Note

- Please activate the JavaScript of the browser to use the calculation sheet. The browsers supported are from IE 8, Firefox14 and Chrome 20.0.
- If you input the size, it will be recognized as the byte. You can use the description of "10KB", "4MB", "1GB" but you can't use the decimals like "210.8KB".
- Regarding NBDL, please input "content size" per task.** Content size is the total summation of cluster size of the delivery file. When the file delivered with BOSS is placed in the filesystem, it consumes more disk space than the actual data with the influence of the block size. This size is called the cluster size. Cluster size can be calculated with the form below.

Calculate cluster size

data size

cluster size = (enter data size and push convert button)

For example, given that you need to ensure the capacity that can deliver 10 files of 10KB and 25 files of 500KB, cluster size is 16KB in case of 10KB file and it is 512KB in case of 500KB so the content size required will be (16KB * 10) + (512KB * 25) = 13271040 byte. Please input 13271040 into content size of NBDL.

- If you use NBDL DataList, please check NBDLDataList.
- Please input the maximum download size for RawDL and the maximum upload size for RawUL.
- Enter a Max Data count(The size that you want to store to the BOSS storage) and Max Data Size for DataStoreDL, max data size for DataStoreUL.

The task list to register

<p>NBDL</p> <ul style="list-style-type: none"> NBDL 1 - total data size <input type="text"/> NBDL 2 - total data size <input type="text"/> NBDL 3 - total data size <input type="text"/> NBDL 4 - total data size <input type="text"/> NBDL 5 - total data size <input type="text"/> NBDL 6 - total data size <input type="text"/> NBDL 7 - total data size <input type="text"/> NBDL 8 - total data size <input type="text"/> 	<p>NBDL DataList</p> <ul style="list-style-type: none"> NBDL DataList - use <input type="checkbox"/> 	<p>RawDL</p> <ul style="list-style-type: none"> RawDL 1 - max data size <input type="text"/> RawDL 2 - max data size <input type="text"/> RawDL 3 - max data size <input type="text"/> RawDL 4 - max data size <input type="text"/> RawDL 5 - max data size <input type="text"/> RawDL 6 - max data size <input type="text"/> RawDL 7 - max data size <input type="text"/> RawDL 8 - max data size <input type="text"/> 	<p>RawUL</p> <ul style="list-style-type: none"> RawUL 1 - max data size <input type="text"/> RawUL 2 - max data size <input type="text"/> RawUL 3 - max data size <input type="text"/> RawUL 4 - max data size <input type="text"/> RawUL 5 - max data size <input type="text"/> RawUL 6 - max data size <input type="text"/> RawUL 7 - max data size <input type="text"/> RawUL 8 - max data size <input type="text"/> 	<p>DataStoreDL</p> <ul style="list-style-type: none"> DataStoreDL 1 <ul style="list-style-type: none"> max data count <input type="text"/> max data size <input type="text"/> DataStoreDL 2 <ul style="list-style-type: none"> max data count <input type="text"/> max data size <input type="text"/> DataStoreDL 3 <ul style="list-style-type: none"> max data count <input type="text"/> max data size <input type="text"/> DataStoreDL 4 <ul style="list-style-type: none"> max data count <input type="text"/> max data size <input type="text"/> DataStoreDL 5 <ul style="list-style-type: none"> max data count <input type="text"/> max data size <input type="text"/> 	<p>DataStoreUL</p> <ul style="list-style-type: none"> DataStoreUL 1 - max data size <input type="text"/> DataStoreUL 2 - max data size <input type="text"/> DataStoreUL 3 - max data size <input type="text"/> DataStoreUL 4 - max data size <input type="text"/> DataStoreUL 5 - max data size <input type="text"/> DataStoreUL 6 - max data size <input type="text"/> DataStoreUL 7 - max data size <input type="text"/> DataStoreUL 8 - max data size <input type="text"/>
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When you enter the required information in each field, the required BOSS storage size appears at the bottom of the page.

If you enter just numbers without unit designators, the tool assumes that the values are in bytes. In other words, if you just enter the value "123," the tool assumes that you have entered 123 bytes. Enter values in units of kilobytes (KB) and megabytes (MB) as follows: 100 KB, 2 MB. 1 KB is 1,024 bytes, and 1 MB is 1,048,576 bytes (1,024 x 1,024). Enter the actual size of the data, rather than the cluster size.

The results of the calculation are displayed in bytes. Notifications are distributed using storage prepared by the system, so the application does not need to allocate space for notifications.

Figure 2-2 Using the BOSS Storage Size Calculator Tool

BOSS Storage Size Calculator

Introduction

BOSS data will be stored in the BOSS storage. If you calculate the size required and write it in meta.xml in advance, BOSS storage will be made at the size of it when you called SAVEInitSaveDir. This is complex a little because you need to include the size of the area for management that BOSS and the file system requires as well as the file size itself to calculate this size.

Please make use of this calculation sheet to calculate the BOSS storage size required by inputting the file size. Please input the delivery file size per the task into "the task list to register" and push "calculate" button and the required BOSS storage size will appear for account and common separately in "Required BOSS storage size". Please input the displayed value into WiiU-AppConfigTool(available at DEA-SUP) and write it to meta.xml.

Note

- Please activate the JavaScript of the browser to use the calculation sheet.
The browsers supported are from IE 8, Firefox14 and Chrome 20.0.
- If you input the size, it will be recognized as the byte. You can use the description of "10KB", "4MB", "1GB" but you can't use the decimals like "210.8KB".

• Regarding NBDL, please input "content size" per task. Content size is the total summation of cluster size of the delivery file. When the file delivered with BOSS is placed in the filesystem, it consumes more disk space than the actual data with the influence of the block size. This size is called the cluster size. Cluster size can be calculated with the form below.

Calculate cluster size

data size

cluster size = (enter data size and push convert button)

For example, given that you need to ensure the capacity that can deliver 10 files of 10KB and 25 files of 500KB, cluster size is 16KB in case of 10KB file and it is 512KB in case of 500KB so the content size required will be (16KB * 10) + (512KB * 25) = 13271040 byte. Please input 13271040 into content size of NBDL.

- If you use NBDL DataList, please check NBDLDataList.
- Please input the maximum download size for RawDL, and the maximum upload size for RawUL.
- Enter a Max Data count(The size that you want to store to the BOSS storage) and Max Data Size for DataStoreDL, max data size for DataStoreUL.

Note: Enter values and select check boxes only for the tasks and features you are using.

This is a supplementary feature for using the BOSS storage size calculator. Enter the data size and click **convert**. This displays the data size allocated in Wii U storage (the CAFE cluster-dependent size). Enter this value in the NBDL field below.

The task list to register

NBDL	NBDL DataList	RawDL	RawUL	DataStoreDL	DataStoreUL
NBDL 1 - total data size <input type="text"/>	<input checked="" type="checkbox"/> NBDL DataList-use	RawDL 1 - max data size <input type="text"/>	RawUL 1 - max data size <input type="text"/>	DataStoreDL 1 - max data count <input type="text"/>	DataStoreUL 1 - max data size <input type="text"/>
NBDL 2 - total data size <input type="text"/>		RawDL 2 - max data size <input type="text"/>	RawUL 2 - max data size <input type="text"/>	DataStoreDL 2 - max data size <input type="text"/>	DataStoreUL 2 - max data size <input type="text"/>
NBDL 3 - total data size <input type="text"/>		RawDL 3 - max data size <input type="text"/>	RawUL 3 - max data size <input type="text"/>	DataStoreDL 3 - max data count <input type="text"/>	DataStoreUL 3 - max data size <input type="text"/>
NBDL 4 - total data size <input type="text"/>		RawDL 4 - max data size <input type="text"/>	RawUL 4 - max data size <input type="text"/>	DataStoreDL 4 - max data size <input type="text"/>	DataStoreUL 4 - max data size <input type="text"/>
NBDL 5 - total data size <input type="text"/>		RawDL 5 - max data size <input type="text"/>	RawUL 5 - max data size <input type="text"/>	DataStoreDL 5 - max data count <input type="text"/>	DataStoreUL 5 - max data size <input type="text"/>
NBDL 6 - total data size <input type="text"/>		RawDL 6 - max data size <input type="text"/>	RawUL 6 - max data size <input type="text"/>	DataStoreDL 6 - max data size <input type="text"/>	DataStoreUL 6 - max data size <input type="text"/>
NBDL 7 - total data size <input type="text"/>		RawDL 7 - max data size <input type="text"/>	RawUL 7 - max data size <input type="text"/>	DataStoreDL 7 - max data count <input type="text"/>	DataStoreUL 7 - max data size <input type="text"/>
NBDL 8 - total data size <input type="text"/>		RawDL 8 - max data size <input type="text"/>	RawUL 8 - max data size <input type="text"/>	DataStoreDL 8 - max data size <input type="text"/>	DataStoreUL 8 - max data size <input type="text"/>

Select the check box.

Enter the maximum size of the data.

Enter the maximum number of data sets.

Enter the maximum size of the data.

Enter the data size of the content to be distributed, using the value obtained above using the **Calculate cluster size** form.

2.3.1 Sample Calculation Using the Tool

This example of using the tool calculates the BOSS storage size for a fictitious application.

Figure 2-3 Sample Calculation Using the Tool

Calculate cluster size

data size: 2M [reset] [cancel]
 cluster size: 2097152 bytes

For example, given that you need to ensure the capacity that can deliver 10 files of 10KB and 25 files of 500KB, cluster size is 16KB in case of 10KB file and it is 512KB in case of 500KB so the content size required will be (16KB * 10) + (512KB * 25) = 13271040 byte. Please input 13271040 into content size of NBDL.

- If you use NBDL DataList, please check NBDLDataList.
- Please input the maximum download size for RawDL and the maximum upload size for RawUL.
- Enter a Max Data count(The size that you want to store to the BOSS storage) and Max Data Size for DataStoreDL, max data size for DataStoreUL.

The task list to register

NBDL (2)

- NBDL 1 - total data size 42914590
- NBDL 2 - total data size
- NBDL 3 - total data size
- NBDL 4 - total data size
- NBDL 5 - total data size
- NBDL 6 - total data size
- NBDL 7 - total data size
- NBDL 8 - total data size

NBDL DataList (3)

- NBDL DataList - use

RawDL (4)

- RawDL 1 - max data size 80KB
- RawDL 2 - max data size
- RawDL 3 - max data size
- RawDL 4 - max data size
- RawDL 5 - max data size
- RawDL 6 - max data size
- RawDL 7 - max data size
- RawDL 8 - max data size

RawUL (5)

- RawUL 1 - max data size 8MB
- RawUL 2 - max data size
- RawUL 3 - max data size
- RawUL 4 - max data size
- RawUL 5 - max data size
- RawUL 6 - max data size
- RawUL 7 - max data size
- RawUL 8 - max data size

DataStoreDL (6)

- DataStoreDL 1
 - max data count 30
 - max data size 5MB
- DataStoreDL 2
- DataStoreDL 3
- DataStoreDL 4
- DataStoreDL 5
- DataStoreDL 6
- DataStoreDL 7
- DataStoreDL 8

DataStoreUL (7)

- DataStoreUL 1 - max data size 5MB
- DataStoreUL 2 - max data size
- DataStoreUL 3 - max data size
- DataStoreUL 4 - max data size
- DataStoreUL 5 - max data size
- DataStoreUL 6 - max data size
- DataStoreUL 7 - max data size
- DataStoreUL 8 - max data size

Reset forms Calculate

Required BOSS Storage Size

account: 219152384
 common: 70778880

Assume that the fictitious application performs the following BOSS distribution actions.

- Distributes additional levels using NBDL.
 - Total number of levels to distribute: 30
 - Data size per level: 2 MB
- Displays a list of levels being distributed using NBDL DataList.
- Gets today's weather using a RawDL task (game weather linked to real-world weather).
 - XML file up to 80 KB in size.
- Sends game screenshots using RawUL tasks.
 - Image binary up to 8 MB in size
- Exchanges daily play logs using DataStore UL/DL.
 - Sends daily play logs using DataStore DL.
 - Maximum logs saved: 30
 - Maximum data size per log: 5MB
 - Gets daily play logs using DataStore UL.
 - Maximum data size per log: 5MB

Take the following steps to calculate the BOSS storage size.

1. Calculate the data size for the additional levels.

An NBDL task will be used to distribute a total of 30 sets of data, each 2 MB in size. In **Calculate cluster size**, enter 2 MB, and then click **convert**. The page displays **cluster size = 2097152 bytes**, which is the data size allocated in Café storage.

2. Set the distribution of the additional levels.

The fictitious application has 30 additional levels. Multiply the value displayed in step 1 by 30 and enter the resulting value for **NBDL 1**.

3. Set the display of the list of levels that are distributed.

This involves the use of NBDL DataList, so select the **NBDL DataList** check box.

4. Set the retrieval of posted data.

The application will get a maximum of 80 KB of data using a RawDL task. In **RawDL 1**, enter 80 KB.

5. Set the sending of screenshots.

The application will send a maximum of 8 MB using a RawUL task. In **RawDL 1**, enter 8 KB.

6. Set the retrieval of daily play logs.

The application will get a maximum of 30 daily play logs using a DataStoreDL task. In **DataStoreDL 1**, in **max data count**, enter 30.

Each set of retrieved data is expected to be no larger than 5 MB, In **DataStoreDL 1**, in **max data size**, enter 5.

7. Set the sending of daily play logs.

The application will send a maximum of 5 MB using a DataStoreUL task. In **DataStoreUL 1**, enter 5 MB.

8. Calculate the BOSS storage size.

After you have made all these entries, click **Calculate** to see the required storage sizes. In the example, the `\account` directory needs 219,152,384 bytes, and the `\common` directory needs 70778880 bytes.

Revision History

Version	Revision Date	Category	Description
4.0	2014/09/04	Added	<ul style="list-style-type: none"> • 1 Introduction • 2.2 Cluster Size • 2.3.1 Sample Calculation Using the Tool
		Changed	<ul style="list-style-type: none"> • 2.3 Using the Tool Changed the screenshot and the overall procedure.
		Deleted	<ul style="list-style-type: none"> • 1 Calculating the BOSS Storage Size
3.0	2012/10/01	Changed	<ul style="list-style-type: none"> • Added consideration for cluster size when calculating content for NBDL tasks. • Revised the screen shots and explanation for the calculation tool in accordance with the update.
2.0	2012/08/06	Added	<ul style="list-style-type: none"> • 2 BOSS Storage Size Calculator Added a chapter describing the storage size calculator.
		Changed	<ul style="list-style-type: none"> • 1.4 Calculating Storage Size for RawDL Tasks and 1.5 Calculating Storage Size for RawUL Tasks Changed the calculation method.
1.0	2012/07/13	—	Initial version.

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