Nintendo Wi-Fi Connection

Programming Guide

Version 1.3.2

> **The contents in this document are highly**
> **confidential and should be handled accordingly.**

Confidential

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Revision History

Version	Revision Date	Description
1.3.2	1/25/2007	• Revised the text for section "4.2 Creating and Saving User Data." • Revised the text for section "4.3.1 Implementing the Friend Information Exchange Feature." • Revised section 4.3.2, "Prohibiting Friendships via Chance Encounter Communications" to "4.3.2 Prohibiting Unidirectional Friendships." • Revised the text for section "4.4.1 Implementing the Feature for Exchange via Friend Registration Keys." • Added section "5.3 Prohibition of Processing Unique to a Game." • Revised the text for section "6.5.3 Checking Invalid Names." • Added an exception to section "10.5 Control Flow When Disconnecting."
1.3.1	12/11/2006	• Revised section "4.3.1 Implementing the Friend Information Exchange Feature" • Added section "5.2 Libraries Used in 'Nintendo Wi-Fi Connection Configuration'." • Revised section "6.2.2 Display When Errors Occur." • Added image data location information to section "6.3.2 Confirmation via Wi-Fi Connection Icon." • Added image data location information to section "6.4.1 Displaying the Wi-Fi Reception Strength Icons." • Revised section "6.5.3 Checking Invalid Names." • Changed the section "7.4.1 Transitioning After a Fixed Amount of Time When Waiting for Input" to [Recommended]. • Changed the section "7.4.2 Input Wait Display" to [Recommended]. • Added section "7.10 Consideration for Data Send/Receive Delays." • Added section "8.4.2 Access Frequency Limitation." • Revised "Figure 10.4 Control Flow When Checking the Validity of Names."
1.3.0	07/14/2006	• Added section "1.4 The Package Exclusively for the Download Feature" • Changed section "2.1 Strict Observance of Library Usage (Required)" • Added section "6.2.5 The Process for Disassociating a DS console and a DS Game Card" • Changed section "6.2.8 Disconnecting Wi-Fi Communications when There is No Input (Required)" to Recommended. • Changed section "6.3.3 Do Not Alter the Wi-Fi Connection Icon" • Changed section "7.4 Behavior when Waiting for Input from Another Player" • Changed section "7.5 Process During Communications (Required)" • Changed section "8.3.2 Using Data for Purposes Other than Ranking" to information • Added section "8.3.4 Acquiring Friend Rankings" • Revised section "8.3.5 Total Size of User-Defined Data

Version	Revision Date	Description
		(Required)" • Changed section "8.3.7 Limitations for Communications with the Ranking Server (Required)" • Added section "8.4 Data Storage" • Changed section "9.1 Reporting the Game Specifications of Nintendo Wi-Fi Connection Compatible Game Software (Required)" to "9.1 Using Exclusive Codes" • Added section "10.3 Connection Flowchart (NITRO-DWC-DL) (Required)" • Made other changes such as integration of terminology, etc.
1.2.0	06/09/2006	• 4.3.1 Changed section related to the implementation of the friend information exchange feature. • 4.3.2 Changed section related to the prohibition of establishing friendships when using chance encounter communications. • 4.4.1 Changed section related to the implementation of the friend code entry feature. • 4.4.2 Changed section related to displaying friend codes. • 4.5 Changed section related to implementation of the feature for ending friendships. • 6.2.2 Changed content regarding display during errors. • 6.2.3 Changed content of a note concerning the display of error codes. • 6.2.5 Added a section related to displaying information for restoring game-specific friendships • 6.5 Changed content regarding names used under Wi-Fi connection. • 7.1 Added section related to changing the connection point to the authentication server • 8.2 Added section regarding Wi-Fi download service. • 8.3 Added section regarding the general-purpose ranking library. • 9.3 Added section related to restricting the publication of information gotten inside games such as that for WEB sites • Made other stylistic revisions and standardized terminology.
1.1.1	03/10/2006	Complete revision Added Section 10, Flow Charts
1.1.0	01/16/2006	• The following notation revision was made: Changed how the Japanese version of "Nintendo Wi-Fi USB Connector" is written • Added the new section "2.2 Initializing the NITRO-DWC Library." • Changed the section name of "3.2 Connecting with Access Points and Routers." • Added the new section "4.2 Creating and Saving Friend Information." • Changed the section name of "4.3 Exchanging Friend Information via DS Wireless Communications." • Changed the section name of "4.4 Exchanging Friend Information via Friend Registration Keys." - Added the new section "4.4.1 Converting to Friend Information" - Made changes to the section name for "4.4.2 Key Issuance Interface."

Version	Revision Date	Description
		- Made changes to the section name for "4.4.3 Key Entry Interface."
		- Made changes to the section name for "4.4.4 List Display."
		• Added the new section "4.5 Establishing Rival Relationships."
		• Made changes to the section name of "4.6 Designating Initial Codes."
		• Made changes to the section name of "6 Connecting to and Disconnecting from the Wi-Fi Connection."
		• Added a description of the recommended flow reference for section "6.2 Initializing User Data."
		- Added a passage about multiple icons existing in the same game to "6.5.1 Displaying the Wi-Fi Reception Strength Icon."
		• Made changes to the section name of "6.6 Handling a Loss of Communications."
		- Changed the section name of "6.6.1 Screen Display." Also added a description of the recommended flow reference.
		- Made changes to the section name of "6.6.2 Handling Communication Errors."
		- Added the new section "6.6.3 Disconnecting from the Server DS During Server-Client Matchmaking."
		- Added a description about the recommended flow reference section "6.8.2 Message Display."
		- Added the new section "6.9.2 Displaying Error Codes."
		• Added the new section "7 Processes During Wi-Fi Communications."
		- The sections below were moved from section "6 Connecting to and Disconnecting from the Wi-Fi Connection."
		"7.1 Disabling Soft Reset While Communicating"
		"7.2 Prohibiting Soft Reset While Communicating"
		"7.3 Prohibiting Transition to Sleep Mode While Communicating"
		"7.4 Behavior When Waiting for Input from Another Player"
		- Added the new section "7.5 Processes While Communicating."
		- Added the new section "7.6 Prohibiting the Sending and Receiving of Data by Using SOC Functions."
		- Added the new section "7.7 Candidates for Connect to Friends Peer Matchmaking."
		• Added the new section "8 Special Features."
		• Changed section "9.1.1 Reporting the Game Specifications" from [Required] to [Information].
		• Added the new section "9.2 Displaying the North American ESRB Rating."
1.0.0	11/02/2005	Initial release.

1   About This Document

1.1   Contents

This programming guide covers precautions to be taken when creating game software for Nintendo DS (DS) that is compatible with Nintendo Wi-Fi Connection. This guide also covers information required for development.

1.2   Level of Importance

Required items are designated "Required." Items that are recommended to improve the quality or performance of your game are designated "Recommended." Additional information items for game developers are designated "Information".

1.3   Purpose

The purpose of this document is to eliminate problems in the market. However, there is no guarantee that all such problems can be avoided.

See Nintendo Wi-Fi Connection Guidelines for Planning Purposes for information about planning Nintendo Wi-Fi Connection–compatible game software.

1.4   Using the Package Exclusively for the Download Feature

When using the package exclusively for the NITRO-DWC library download feature, (NITRO-DWC-DL), the following sections are not applicable:

- 4 User Management

- 6.5 Names Used with Nintendo Wi-Fi Connection

- 7.4 Behavior when Waiting for Input from Another Game Player

- 10.2 Control Flow When Connecting (Required)
  (10.3 Connection Flowchart (NITRO-DWC-DL) (Required) is applied instead of 10.2)

- 10.4 Control Flow When Checking the Validity of Names (Required)

Released: March 22, 2007

2   Development Environment

2.1   Strict Observance of Library Usage (Required)

When creating game software compatible with Nintendo Wi-Fi Connection, you must use the
following libraries, which are provided by Nintendo. Always use the most recent version of these
libraries.

- NITRO-SDK

- NITRO-SYSTEM

- NITRO-WiFi Socket Library for Nintendo DS

- NITRO-DWC Development Library for Games Compatible with Nintendo Wi-Fi Connection
  Or
  NITRO-DWC-DL (the package exclusively for downloading data from the server)

Note: Do not use functions that are not included in the Function Reference. When using only the
download feature, use NITRO-DWC-DL.

3   Connection Environment

3.1   Connection via Broadband Line (Information)

Game software that is compatible with Nintendo Wi-Fi Connection must be able to connect to the Internet via a broadband line (ADSL, FTTH, or cable television).

Non-broadband modem connections are not necessary.

3.2   Connecting via Access Points and Routers (Required)

Confirm that at least one of the devices listed on the "List of Wireless LAN Access Point Devices" can connect. This list shows the devices that have been confirmed to work with the Nintendo Wi-Fi Connection Web site. This list can be found at http://www.nintendowifi.com/customersupport/supportedRouters.do (or for the Japanese market: http://wifi.nintendo.co.jp/information/router/index.html.)

It is not necessary to confirm a DS connection via access points or wireless routers that use a Nintendo Wi-Fi USB Connector, a Nintendo Wi-Fi Station, or a free hotspot.

4   User Management

4.1   User Data Save Area (Information)

Allocate an area in the DS Card backup area to save user data.

Information for one person requires 64 bytes.

4.2   Creating and Saving User Data (Required)

After starting Wi-Fi Connection–compatible software, use the `DWC_CreateUserData` function to create user data, if none exists or if it has been corrupted. Then, save that user data to the backup region of the DS Card.

To create friendships with DS wireless communications using DWC, you must create your own friend information from the user data even if you have not connected to Nintendo Wi-Fi Connection.

4.3   Exchanging Friend Information with DS Wireless Communications

4.3.1   Implementing the Friend Information Exchange Feature (Required)

When including specifications that utilize friendships with a Nintendo Wi-Fi Connection, be sure to provide a mechanism that allows players who want to establish friendships with each other to exchange friend information via DS wireless communications (even for users who have never connected to Nintendo Wi-Fi Connection before).

However, if not implementing DS Wireless Play (communications play which is done in local game mode using as many Game Cards as there are players), it is not necessary to prepare such a mechanism.

4.3.2   Prohibiting Unidirectional Friendships (Required)

If exchanging friend information using DS Wireless Communications, make it possible for the partners to recognize each other (nicknames should be displayed), and exchange the data only after getting consent. Furthermore, it is not possible to recognize mutual consent with chance encounter communications, so friendships cannot be built in this way.

4.3.3   If the User ID for a DS Console and a DS Card do not Match (Information)

If, during DS wireless communications, the user ID saved in the DS console does not match the user ID saved in the DS card, you can use the user data information in the DS card to exchange friend information (as if the user IDs matched). Even if no friend information is exchanged, this does not cause any problems.

4.4   Exchanging Friend Information with Friend Registration Keys

4.4.1   Implementing the Exchange via Friend Registration Keys (Required)

If your game software utilizes friendships over a Nintendo Wi-Fi Connection, be sure to implement a feature for establishing friendships through the exchange of friend registration keys. Until a connection to the Wi-Fi Connection is made and the friendship is established include the ability to check the friend registration key entered and correct it if necessary.

4.4.2   Displaying Friend Registration Keys (Required)

If your game software utilizes friendships over a Nintendo Wi-Fi Connection, be sure to implement a feature that displays the game player's own friend registration key so it may be exchanged easily.

4.5   Implementing a Method for Ending Friendships (Required)

If your game software utilizes friendships over a Nintendo Wi-Fi Connection, be sure to implement some means of ending an established friendship.

4.6   Displaying the Friend Roster (Information)

When displaying a roster of friends with whom friendships have been established, it is all right to display friend registration keys, rather than nicknames.

4.7   Establishing Rival Relationships

4.7.1   Definition of a Rival (Information)

A rival is a partner that can be specified for Nintendo Wi-Fi Connection battle and other game play. However, unlike friends, there are restrictions on communication between rivals. (For details, see the Nintendo Wi-Fi Connection Guidelines for Planning Purposes.)

4.7.2   Distinguishing Between Rivals and Friends (Required)

No distinction is made between rivals and friends within the NITRO-DWC library. Be sure to distinguish between rivals and friends at the game level, and let game players know what the difference is.

4.7.3   Establishing Rivals through Chance Encounter Communications (Required)

When establishing a rival relationship with an unknown person through a chance encounter, always get the approval of the local game player before beginning communication. You can do this by first displaying a prompt to register the other game player as a rival.

4.7.4   Establishing a Rival for Wi-Fi Competitive Play (Required)

When establishing a rival relationship with an unknown person for Wi-Fi competitive play, always get approval first by confirming the intentions of both game players.

4.7.5   Implementing a Method for Ending Rival Relationships (Required)

Be sure to implement a way of ending an established rival relationship.

4.7.6   Prohibiting Promotions to Friends (Required)

Do not promote to rivals to friends without going through the normal procedure required to establish a friendship.

4.8   Designating Game Codes (Required)

Be sure to designate the Game Codes assigned by Nintendo to each game in the gamecode argument of the `DWC_CreateUserData()` function.

When conducting matchmaking in different regions, be sure the game players share one or the other of the regional Game Codes.

Note: Contact the Nintendo help desk when you want to allow matchmaking between different game titles.

5 Configuring the Nintendo Wi-Fi Connection

5.1 Implementing the Nintendo Wi-Fi Connection Configuration (Required)

The Wi-Fi Connection Configuration must be implemented for games compatible with Nintendo Wi-Fi Connection.

5.2 Libraries Used in Wi-Fi Connection Configuration (Information)

The `DWC_StartUtility`/`DWC_StartUtilityEx` functions, which start the Nintendo Wi-Fi Connection Configuration, call the NITRO-SDK, NITRO-SYSTEM, and NITRO-WiFi libraries apart from NITRO-DWC. Other libraries associated with these must be loaded in memory prior to running the Nintendo Wi-Fi Connection Configuration. Make note of this when overlaying libraries in the following list.

- NITRO-SDK

  Operating System (OS), Graphics (GX/G2), Memory Interface (MI), Fixed-point (FX), Mathematical Operation (MATH), ARM7 Processor Peripherals (TP/PM), Real-time Clock (RTC), ROM File System (FS), CARD Module (CARD), Wireless Manager (WM), Multi-boot Library (MB)

- NITRO-SYSTEM

  Foundation Library (Fnd), Graphics 2D Library (G2d), NITRO Composer (Snd)

- NITRO-WiFi

  Socket Library (SOC), TCP/IP Protocol Stack (CPS), Wireless Connection Management Library (WCM)

5.3 Prohibiting Processing Unique to a Game (Required)

Processing unique to a game, such as playing background music, should not be made during execution of the Wi-Fi Connection Configuration.

5.4 Language Settings

5.4.1 Using the Game-Side Language Settings (Required)

Use the language setting on the game software side as the language to be used in Wi-Fi Connection Configuration. Do not use the IPL language setting on DS.

5.4.2   English Notation (Required)

Wi-Fi Connection Configuration provides two types of English: North American and European. Use the language that is appropriate for the location of the users of your game. In addition, if a shared ROM is used for both North American and European versions, be sure to set the English specification to North American English.

5.5   Displays Corresponding to Wi-Fi Communications in the Wi-Fi Connection Configuration (Required)

When Wi-Fi Connection Configuration is started, Wi-Fi Communications are turned on. The behavior of Wi-Fi Connection Configuration should be consistent with the instructions in section 6.3, The Wi-Fi Communications Confirmation Display.

5.6   Wi-Fi Connection Configuration Sequence (Required)

Be sure to save any game data before performing Wi-Fi Connection Configuration because DS powers down without returning to game software processing when user information is deleted or moved.

6 Connecting to and Disconnecting from Nintendo Wi-Fi Connection

6.1 The Wi-Fi Communications ON and OFF State

6.1.1 The Wi-Fi Communications ON State (Information)

When Wi-Fi Communications is on, this indicates that wireless signal transmission and reception is possible or is currently occurring.

When Wi-Fi Communications is on, the DS system power indicator LED flashes irregularly.

6.1.2 Wi-Fi Communications OFF State (Information)

When Wi-Fi Communications is off, this indicates that wireless signals cannot be sent or received.

If Wi-Fi Communications is off, the DS system's power indicator LED is either always lit (active mode/LCD is off) or flashes slowly (sleep mode).

6.2 Process During Wi-Fi Connection and Disconnection (Required)

6.2.1 Compliance With Flow (Required)

Be sure to comply with the control flow shown in Chapter 10, Flow Charts, when connecting to and disconnecting from Nintendo Wi-Fi Connection.

6.2.2 Display When Errors Occur (Required)

If an error occurs during Nintendo Wi-Fi Connection, display the error code and accompanying message on the screen. However, if recovering and performing an automatic retry, an error does not need to be displayed each time. In addition, if the operation successfully ends without any issues, there is no need to display the error.

Always use the latest version of the Prescribed Message List for the error messages to be displayed. You can obtain the latest version of this list from the Nintendo support Web site.

6.2.3 Displaying Error Codes (Required)

Since all error codes are either zero or a negative number, reverse the sign of the number to make it positive before displaying it on the screen.

6.2.4 Displaying Animation (Required)

Animate some part of the screen while DS is connecting to Wi-Fi so that the user does not mistakenly think that DS has frozen.

6.2.5   Disassociating a DS and a DS Game Card (Required)

Even if the association between a DS system and a DS Game Card is deleted and if the friend information remains on the DS Game Card, use the `DWC_ClearBuddyFlagFriendData` function to clear all the friend-establishment flags.

6.2.6   Displaying Friendship Restore Information for a Game (Required)

Even if the association between a DS console and a DS game card has been deleted, it is still possible to restore a friendship, as long as friend information remains on the DS game card. This is accomplished by having the other party register a new friend code for the first player. Be sure to clearly explain the procedure for restoring a friendship in the operation manual or at some point during game play.

Note: See section10.2, Control Flow When Connecting (Required), for more information on where to display restore information.

6.2.7   Original Game Software Errors (Required)

If you display errors unique to your game during a Nintendo Wi-Fi Connection session, design your application so that those errors can be distinguished from the Prescribed Message List errors.

6.2.8   Disconnecting Wi-Fi Communications When There Is No Input (Recommended)

If there is a specification for your game is designed to disconnect from Wi-Fi if there is no input from the game player for a specified period of time, display a prompt regarding disconnection from Wi-Fi.

6.2.9   Disconnecting the Server DS During Server-Client Matchmaking (Information)

If the server DS is disconnected during server-client matchmaking, no more clients can be added after the server has disconnected.

6.3   The Wi-Fi Communications Confirmation Display

If the game has a mode that uses Wi-Fi Communications, the game player's consent must be obtained first. Display a message or an icon for Nintendo Wi-Fi Connection before turning on Wi-Fi Communications.

6.3.1   Confirmation via Message (Required)

Confirm the user's consent to the establishment of Wi-Fi Communications by displaying a message such as "Do you want to use Wi-Fi Communications?" Turn on Wi-Fi Communications only after obtaining confirmation from the game player.

6.3.2   Confirmation via Wi-Fi Connection Icon (Required)

To use the Wi-Fi Connection icon to confirm the user's consent to the establishment of a Wi-Fi connection, display the icon and turn Wi-Fi Communications on once the game player selects "This Icon is Being Displayed". By selecting this option, the game player consents that "After this selection, Wi-Fi Communications will be turned ON".

The Wi-Fi connection icon tells the game player that Wi-Fi Communications are on for the relevant game mode. Since this icon is common to all games, use the character data provided by Nintendo.

Note: The Wi-Fi Connection icon is different from the DS Wireless Icon. Image data can be found in
`$(NITRODWC_ROOT)/data/Wi-Fi icons` in the NITRO-DWC package.

Figure 6-1 Wi-Fi Connection Icon

Figure 6-2 shows an example of how to display the Wi-Fi Connection icon.
In this example, Wi-Fi Communications is turned on if either "Nintendo WFC Play" or "Nintendo WFC Setting" is selected.

Figure 6-2 Displaying the Wi-Fi Connection Icon
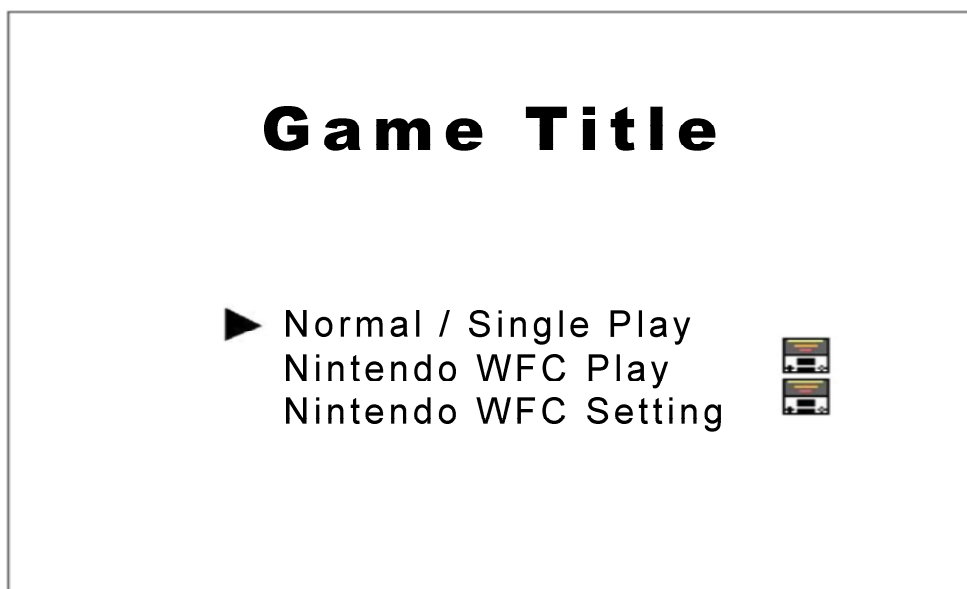
6.3.3   Do Not Alter the Wi-Fi Connection Icon (Required)

Do not modify the Wi-Fi Connection icon in any way, including icon size, dot pattern, or color. However, if the associated menu option is not selected and the game player can adequately see that the icon is present, effects may be added to it as long as they are not confusing to the user.

6.4   Displaying the Wi-Fi Reception Strength Icons

6.4.1   Displaying the Wi-Fi Reception Strength Icons (Required)

Once Wi-Fi Communications is turned on and the game player has given consent, display the following Wi-Fi Reception Strength icons, which indicate the incoming signal strength. (No specific method for displaying the icon is provided, nor is the display location specified.)

Note: The Wi-Fi Reception Strength icon is different from the Reception Strength icon used in DS Wireless Communication. Image data can be found in `$(NITRODWC_ROOT)/data/Wi-Fi icons` in the NITRO-DWC package.

Wi-Fi Reception Strength	Icons with Black Background	Icons with White Background
Level 3		
Level 2		
Level 1		
Level 0		

Select either the black or the white background, according to game requirements.

Do not use both styles of icon in the same game. However, using an icon that is different from that used in Wi-Fi Connection Configuration does not cause any problems.

In some cases, it is permissible to hide the Wi-Fi Reception Strength icons. For example, you may not want the game player to know about changes in reception strength. Contact the Nintendo help desk before implementing anything along these lines.

6.4.2   Modifying the Wi-Fi Reception Strength Icons (Required)

Nintendo prohibits any modification of these icons, including icon size, dot pattern, or color. However, you may slightly modify the red, yellow, and green colors as long as the three levels are easily distinguishable.

6.5   Names Used with Nintendo Wi-Fi Connection

6.5.1   Checking Improper Names and Disconnecting from Nintendo Wi-Fi Connection (Required)

If you are displaying names or other information (such as nicknames) to identify game players over a Nintendo Wi-Fi Connection, verify with the authentication server that they are appropriate names.

If the result obtained with the `DWC_GetIngamesnCheckResult` function is deemed inappropriate, display the prescribed message and disconnect. However, if the communication partner is a friend, there is no need to display a prescribed message or disconnect from Nintendo Wi-Fi Connection.

6.5.2   Implementing a Function for Changing Names (Required)

It is important to implement a function that allows names to be changed when a name is determined to be inappropriate. This item does not apply to cases where names are based on DS owner information or when changing to a suitable default name.

Contact support@noa.com if changing names is difficult because of game specifications.

6.5.3   Checking Invalid Names (Information)

Operation under an invalid name can be checked by setting "badword" (no case or half-/full-width distinction) for name.

If the specifications of the game prevent "badword" from being set, contact support@noa.com.

7   Processes During Wi-Fi Communications

7.1   Changing the Authentication Server Connection Point (Required)

Two authentication servers have been prepared: one for developers and one for final products. You can switch between them by using the `DWC_SetAuthServer` function. Use the authentication server for developers during development and debugging, and then switch to the authentication server when creating final ROMs for products.

Note: This setting also simultaneously switches the Wi-Fi download server and general-purpose ranking server from servers intended for developers to those for final products.

7.2   Disabling Soft Reset During Communications (Required)

If soft reset has been implemented, be sure to disable it during Wi-Fi Communications.

7.3   Prohibiting Transition to Sleep Mode During Communications (Required)

Do not make any transitions to sleep mode during Wi-Fi Communications.

7.4   Behavior when Waiting for Input from Another Game Player

7.4.1   Transitioning After a Fixed Amount of Time When Waiting for Input (Recommended)

When the progress of a game is impeded because it is waiting for input from another game player during Wi-Fi Communications, set up a timeout for the input. Once this timeout is exceeded, proceed to the next step in the game.

7.4.2   Input Wait Display (Recommended)

During Wi-Fi Communications, if the game cannot proceed because it is waiting for input from another game player, be sure to display some sort of message onscreen that indicates that the game has not frozen and that the console is waiting for input.

7.5   Processes During Communications (Required)

The `DWC_ProcessFriendsMatch` function controls all communication processes for matchmaking and friend-related features. Call the `DWC_ProcessFriendMatch` function once per game frame so that these processes can proceed.

In addition, when not using matchmaking or friend-related features (ranking, download, and so on), `DWC_UpdateConnection` function should be called instead to check the Internet connection state.

7.6   Prohibiting the Sending and Receiving of Data Using NITRO-WiFi (Required)

The direct use of any NITRO-WiFi SOC functions to send and receive data is prohibited.

However, if the game design includes the use of SOC functions to perform communications other than those with the matchmaking partner, contact support@noa.com.

7.7   Prohibiting the Sending and Receiving of Data Using the GameSpy Functions (Required)

The direct use of any GameSpy functions to send and receive data is prohibited.

However, if the game design includes the use of GameSpy functions, contact support@noa.com.

7.8   Filtering Candidates for Peer Matchmaking without a Friend Specification (Required)

To limit matchmaking candidates when performing peer matchmaking without a friend specification (when restricting to a nation, level, etc.), we recommend that you use the filter function passed as an argument to the `DWC_ConnectToAnybodyAsync()` function.

In addition, we also recommend that matchmaking candidates not be filtered within the game player evaluation callback function, but that connection candidates only be weighted.

Note: If matchmaking candidates are filtered inside the game player evaluation callback function, it is possible that all matchmaking candidates retrieved will be invalidated, causing loss of time when retrieving the list a second time. Be sure that the candidate list to be retrieved is made up of connectable candidates by using the filter function to filter out unconnected candidates, as much as possible. Be sure to use only a moderate filter because aggressive filtering can result in no eligible candidates.

7.9   Candidates for Connect to Friends Peer Matchmaking (Recommended)

If matchmaking with friends of friends is not allowed when performing peer matchmaking with a friend specification, the success rate for matchmaking drops sharply. Therefore, friends of friends should be considered as matchmaking candidates, if at all possible.

7.10   Consideration for Data Send/Receive Delays [Recommended]

Depending on the network environment, there may be delays in sending/receiving data. Therefore, we recommend that the application not have any operational issues under delays of 300 ms round trip.

Note: Delays can be simulated using the `NITRO-DWC DWC_SetRecvDelay` function.

8   Special Features

8.1   The HTTP Communication Features

8.1.1   Limiting Communication Targets (Required)

When connecting a Nintendo Wi-Fi Connection–compatible game to any server other than the one provided by Nintendo, make sure that access (including links) is limited only to those servers that can be managed (servers for which action can be taken if a problem arises).

8.1.2   Types of Communications Data (Required)

Be sure that the communications data is of a type that can be incorporated into the existing application on the DS Card (image data). If you plan to allow programs and scripts to be downloaded and run, contact support@noa.com.

8.1.3   Checking Communications Data (Required)

Make sure that any data that is editable and directly viewable by a large number of unspecified game players can be checked on the server side. There are no particular restrictions on the timing or method of this check.

8.2   Nintendo Wi-Fi Connection Download Service

8.2.1   Types of Data that Can be Downloaded (Required)

Be sure to conform to specifications described in section 8.1.2 Types of Communications Data (Required).

8.3   General-Purpose Ranking Library

8.3.1   Reproducing Ranking Data on Websites (Required)

Be sure to conform to specifications described in section 9.3 Limitations on Reproducing on Websites Information Obtained Inside Games (Required).

8.3.2   Using Data for Purposes Other Than Ranking (Required)

When performing ranking using the general-purpose ranking library, you can use data communications for purposes associated with ranking (such as exchanging emblems).

Note: Contact support@noa.com if you want to use the general-purpose ranking library for the purpose of data communications only.

8.3.3   Observing Relationships with Other Parties (Required)

Even when performing data communications using features of the general-purpose ranking library, be sure to observe friend, rival, and stranger relationships as defined in the Nintendo Wi-Fi Connection Concept Guide.

For example, the feature that allows attaching a comment to a ranking corresponds to the exchange of free-form messages. Such comments are not displayed in the case of rankings that display strangers, since this is allowed only between friends. However, there is no problem using this feature when using rankings among friends or when using a keyword method for creating comments.

8.3.4   Acquiring Friend Rankings (Required)

In the General-Purpose Ranking Library when acquiring friend rankings, friends are designated with a GS profile ID. Check whether a friend relationship has been established because the GS profile ID can be acquired from friend rankings, from using user-defined data in a free word exchange, or from friend information (that has a friend registration key data type) of partners for whom friend relationship information has not been established.

8.3.5   Total Size of User-Defined Data (Required)

Up to 768 bytes of binary data can be specified for each category of user-defined data. When using user-defined data in multiple categories, be sure to limit the total size of the user-defined data to at most 2048 bytes.

8.3.6   Checking Names Included in User-Defined Data (Required)

Be sure to conform to specifications described in section 6.5, Names Used with Nintendo Wi-Fi Connection, when displaying user-defined data that includes information that can be used to identify the player, such as the player's name. Be sure to check for this even when performing ranking among friends. There is a possibility that rankings can be seen by an unspecified large number of people.

8.3.7   Limitations for Communications with the Ranking Server (Required)

To help reduce the load on the ranking server, wait at least one minute between accesses. A single access allows up to one upload and one download of ranking information. Furthermore, do not provide an interface that allows the user to freely retrieve ranking information at any time.

Similarly, keep the frequency of access low, even when getting ranking data that uses general-purpose ranking management tools and/or Web services.

8.4   Data Storage

8.4.1   Referencing Others' Data Regions (Required]

Designate an index for the friend roster when referencing another player's data region with the `DWC_LoadOthersDataAsync` function. Since partners (those whose data type in the friend information included in the friends list are friend registration keys) for which no friend relationships are included in the friend roster, entering the friend code allows players to reference the data regions of other players. When using others' data regions to communicate only with friends (free word exchange for example), check whether a friend relationship has been established.

8.4.2   Access Frequency Limitation [Required]

Frequent access to the data storage may be seen by the GameSpy server as an attack, and result in disconnection. Limit access to less than 10 times per second.

9   Other

9.1   Using Proprietary Codes (Required)

Use the proprietary codes (game name, secret key, product ID) assigned to each game software title that is compatible with Nintendo Wi-Fi Connection.

The proprietary codes are assigned after Nintendo receives the required Design Statement Checklist (Nintendo Wi-Fi Connection).

In addition, when using the download feature, submit the Nintendo Wi-Fi Connection Download Service Application Form, and acquire a proprietary code (a game code for connection or game password) used for downloading.

9.2   Using DS Console Data (Information)

The owner information for DS consoles recorded on each DS console can be used for the user information for software that is compatible with Nintendo Wi-Fi Connection.

9.3   Limitations on Reproducing on Websites Information Obtained Inside Games (Required)

If you want to reproduce information obtained by Nintendo Wi-Fi Connection–compatible software somewhere where it might be seen by an unspecified large number of people (such as a typical Web site), inform the user before doing so. Do not implement specifications that needlessly allow people other than game software users to view such information. Furthermore, treat information to be reproduced as if communicating with strangers. Do not allow the display of free-word communications or other such information.

Note: Clearly describe all information to be posted so that the user is aware of it.

9.4   Displaying the North American ESRB Rating (Required)

The message below must be displayed on-screen before any Wi-Fi connection is made for all games sold in North America that are compatible with Nintendo Wi-Fi Connection. This display should not be located inside an option menu or a similar location where the game player might not see it. It must be clearly visible to the game player before the Wi-Fi connection is established.

ESRB Notice: Game Experience May Change During Online Play

For updated information, log in to the ESRB Web site (https://www.esrb.org/publishers/index_notloggedin.jsf) and look at the Advertising & Marketing Guidelines (ARC Manual).

This applies to features such as *Mario Cart DS* emblems and nicknames, the *Animal Crossing* chat function, and bottle mail found in Nintendo Wi-Fi Connection–compatible game software from

Nintendo. However, if it is clear that this display does not need to be shown or if it is recognized as unnecessary by the ESRB, contact support@noa.com so that this item can be set aside as inapplicable to your game.

9.5   Standardization of Terms and Names (Required)

Use the correct terms and names related to Nintendo Wi-Fi Connection, following the conventions in *Nintendo Wi-Fi Connection Communication Terminology*.
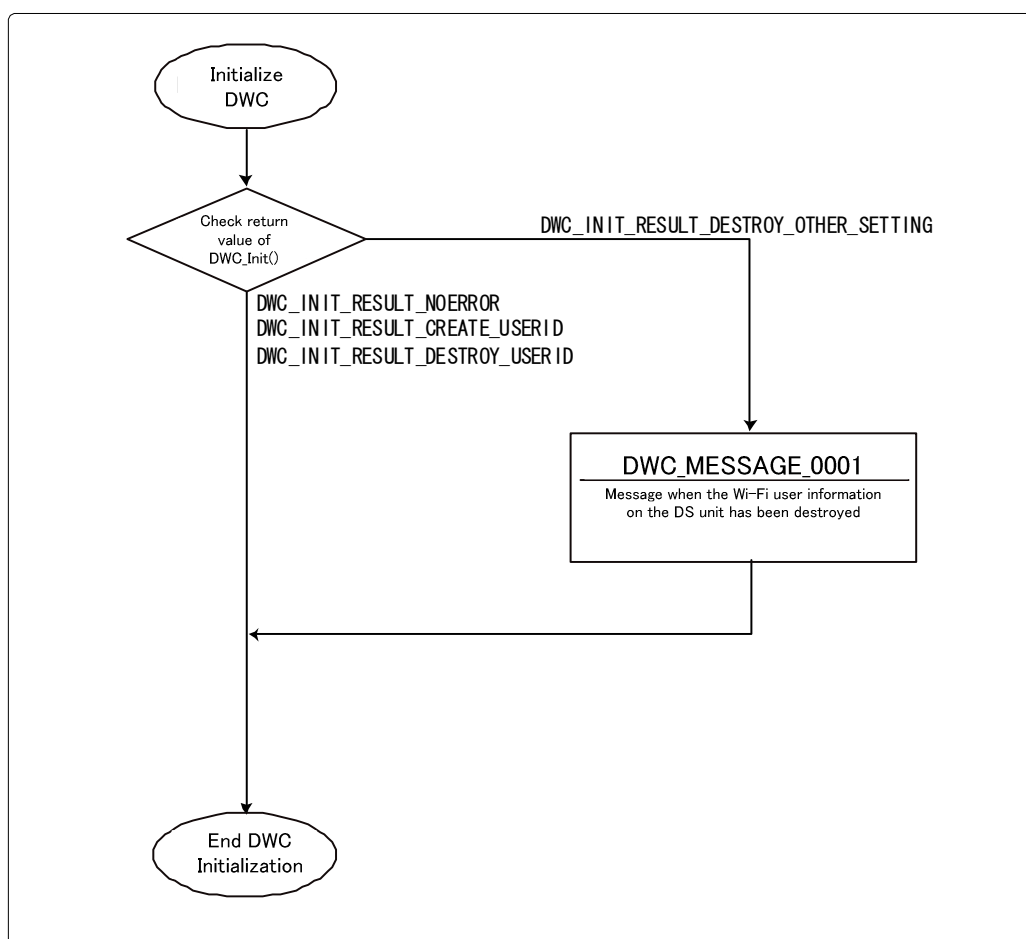
10 Flow Charts

At every sequence, be sure to comply with the control flow given in the flow charts that follow.

Try to always use the latest version of the Prescribed Message List for the messages in the flow charts that appear as `DWC_MESSAGE_XXXX`

You can obtain the latest version of the Prescribed Message List from the Nintendo support page.
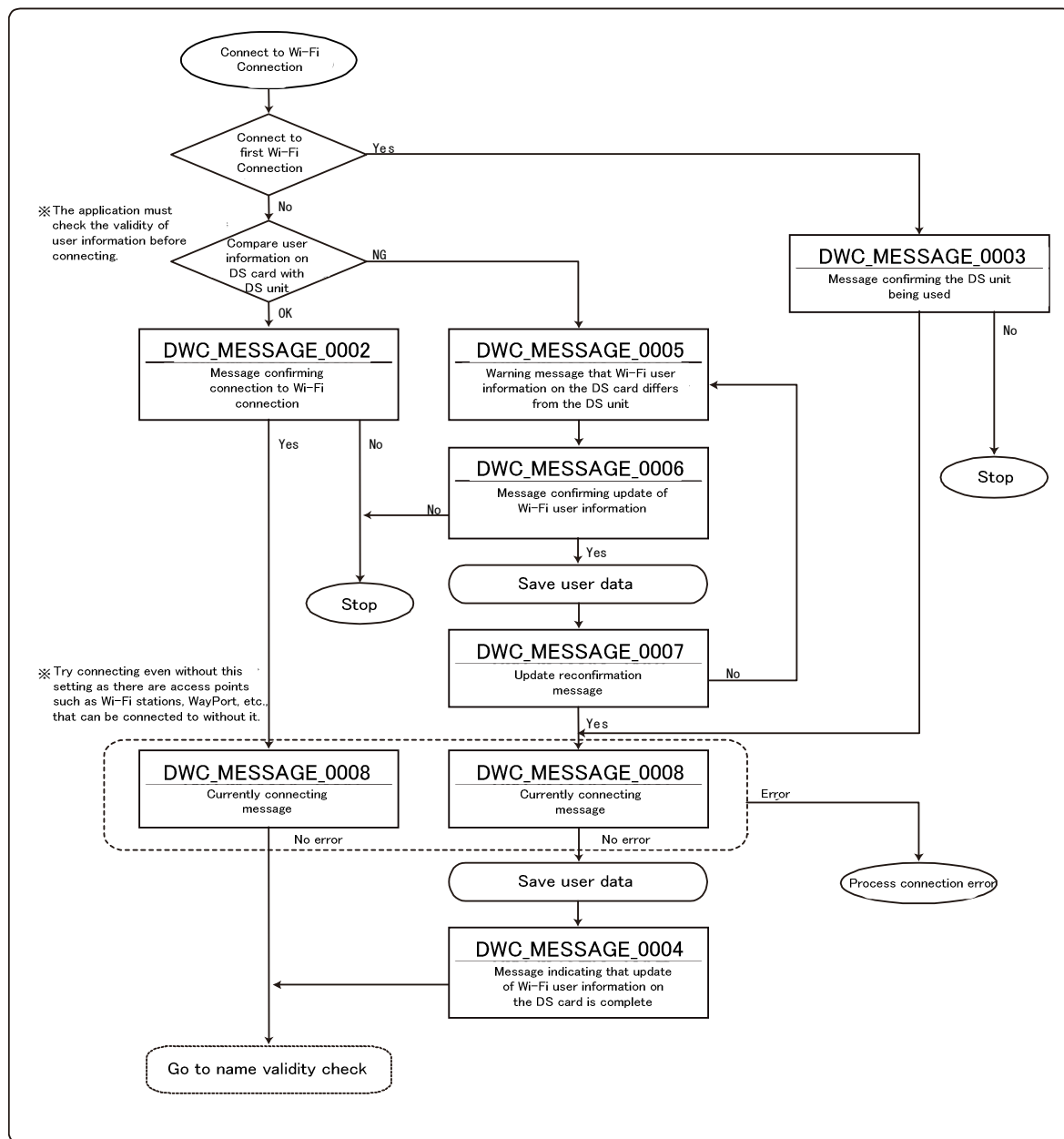
10.1   Control Flow During Initialization (Required)

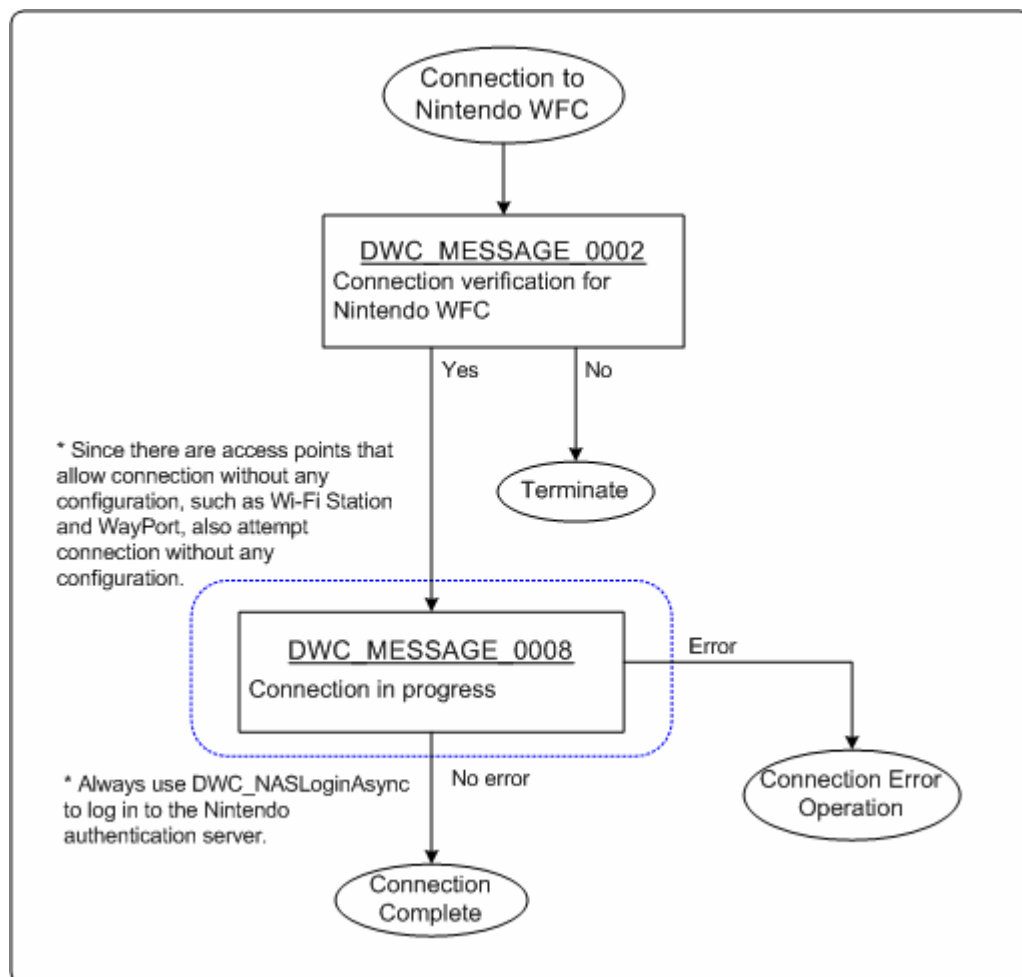**Figure 10-1 Control Flow During Initialization**

10.2   Control Flow When Connecting (Required)

Figure 10-2 Control Flow When Connecting

10.3   Connection Flowchart (NITRO-DWC-DL) (Required)

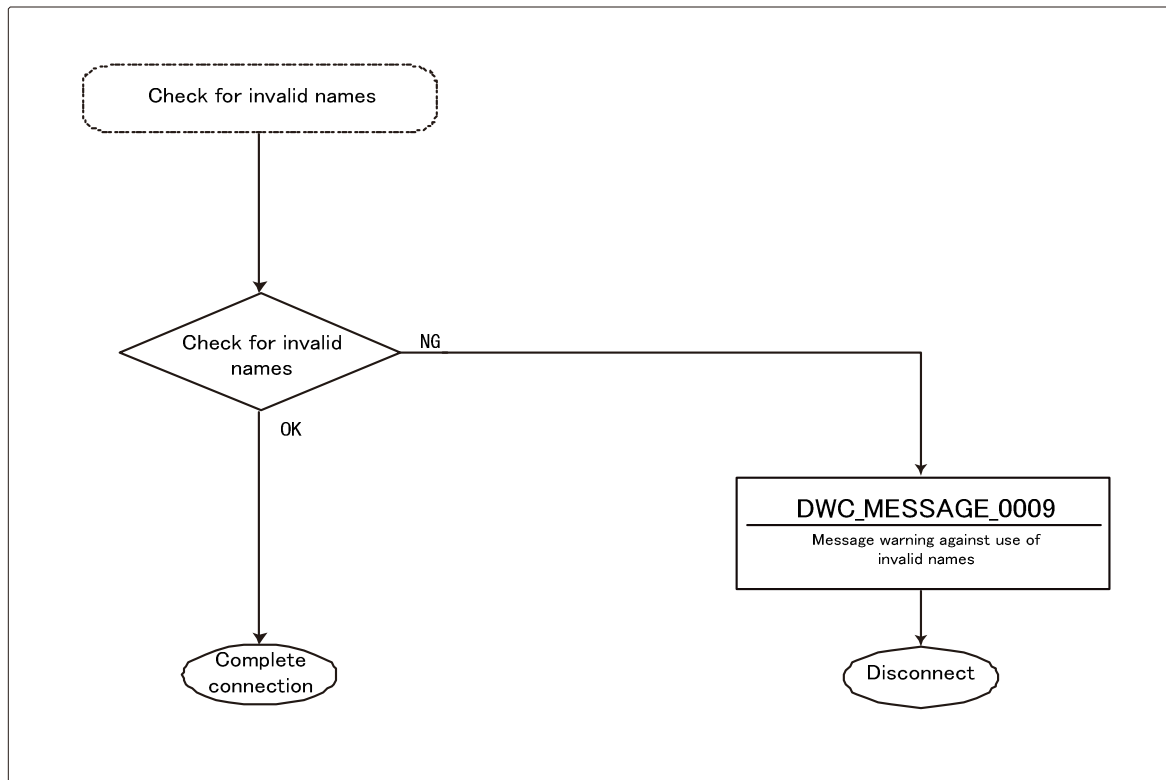**Figure 10-3 Connection Flowchart (NITRO-DWC-DL)**

Note: This section is not applicable when NITRO-DWC-DL is not used.

10.4   Control Flow When Checking the Validity of Names (Required)
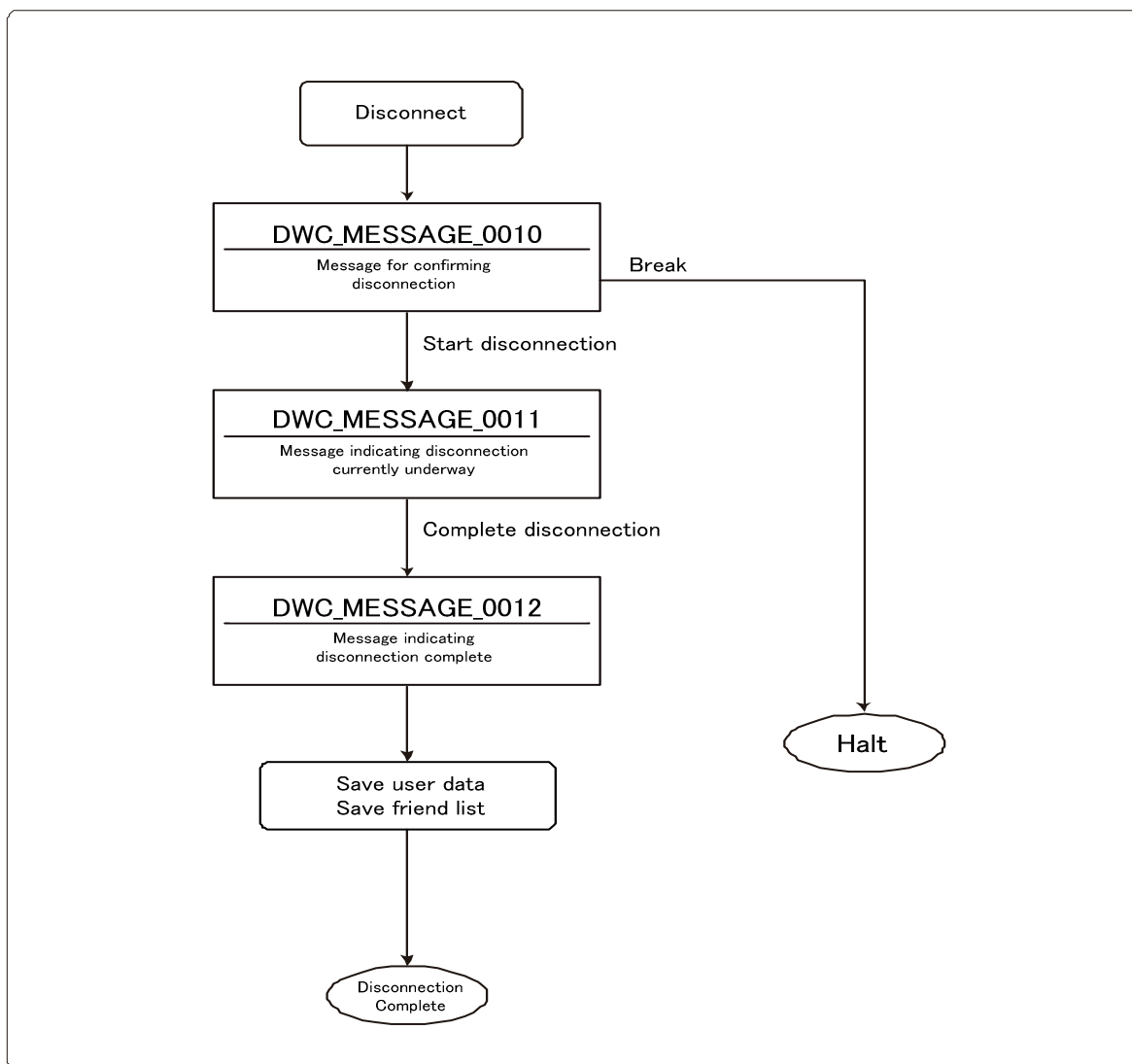
Figure 10-4 Control Flow When Checking the Validity of Names

Note: If the communications partner is a friend, there is no need to display a required message or disconnect from Nintendo Wi-Fi Connection.

10.5   Control Flow When Disconnecting (Required)

Figure 10-5 Control Flow When Disconnecting

Note: If it is no longer necessary to be connected, there is no problem with proceeding to the disconnect (message indicating disconnection currently underway) without confirming the user's consent for the disconnection (message for confirming disconnection).