Revolution SDK Extensions (RevoEX)

Network Development Environment Document

Version 1.05

The content of this document is highly confidential and should be handled accordingly.

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Confidential

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Revision History

Version	Revision Date	Description
1.05	2009/01/16	Revised an error code.
1.04	2008/07/15	Revised the error code generation method.
1.03	2008/01/30	Updated the explanation of an ncdconfigtool menu.
1.02	2007/08/08	Added an explanation of ncdconfigtool's error numbers.
1.01	2007/07/26	Revised methods for generating error codes.
1.00	2007/02/16	Initial version.

1 Introduction

1.1 About This Document

This document provides information about the software development environment when developing network-supporting titles for Wii.

To connect from an application to the Internet or use features such as WiiConnect24, a network connection must first be configured. These settings are established via the Wii Menu and are structured so that they can be used from all applications.

In the development system environment, there are cases where parts of the features provided by the Wii Menu (retail system) cannot be used and cases where special configurations must be set up for testing purposes (development system). This document touches upon the differences between the retail systems and development systems, and explains how to use any additional tools required for these different cases.

Processes such as verifying error messages are typical during development. In order to perform these verifications as efficiently as possible, this document also contains information to generate actual errors wherever possible.

This document is written with the assumption that you have obtained Revolution SDK Extensions (RevoEX), the network development environment for Wii. Unless otherwise noted, the libraries, tools, and other software mentioned in this document are contained within the RevoEX package.

1.2 Network Configuration Process on the Wii Console

To use communication features with the Wii, the five-step procedure below must be followed.

1. Configure the network connection settings.
2. Test the network connection.
3. Update the Wii system over the network.
4. Agree to the End User License Agreement (EULA).
5. Configure the WiiConnect24-related settings.

These operations can be carried out by opening up each item from the Wii System Settings screen of the Wii Menu, but normally they progress in order if the network connection is configured first. (Depending on the version of the Wii Menu, the sequence may vary slightly.)

During step 1, you choose the wired/wireless, access point, IP address, and other such network configuration settings. For more information about these configuration items, see Chapter 2 Basic Network Configuration.

During step 2, if the configuration of the network connection was changed, you perform a network connection test to verify whether the change was valid. In this test, an attempt is made to connect to a

connection test server that has been set up by Nintendo. The WiiConnect24 server is also accessed at the same time, and a new account is created if one had not already been created on the server. Succeeding in this connection test allows the connection to be selected as an actual, valid network configuration.

During step 3, if the network connection test succeeds, the update to the Wii system occurs immediately afterward. At this point, the server is queried for Wii Menu updates, firmware updates, or other updates. If updates exist, they are downloaded and applied.

During step 4, you must agree to the EULA. If you hadn't agreed already, restrictions on running each channel application using the network as well as restrictions on using WiiConnect24 will have been applied.

Lastly, during step 5 you are required to configure the WiiConnect24-related settings. Because the option to do so is already selected when you agree to the EULA, this step is required only if you are changing advanced settings. Moreover, in order to use the WiiConnect24 message mechanism to perform communications with other Wii consoles or general e-mail devices, the address book must be opened and the addressee's Wii number or mail address must be registered in the Wii console's friend roster beforehand. This procedure is explained in Chapter 4 Registration in the Wii Console Friend Roster.

1.3 Network Configuration Process on a Development System

By using the Wii Menu (version 2 or later), you can configure the network on development systems with a sequence similar to that of a retail Wii console. The only step that cannot be performed in the procedure detailed in the previous section is step 3, updating the Wii system over the network. Therefore, when using this method, when a dialog box appears stating "The connection test was successful. Would you like to update the Wii console?," make sure to select **No**, and then close the dialog box.

If the Wii Menu is installed, it takes time to launch an application each time, so installation of the Wii Menu may become a hindrance during the development stage. Assuming this to be the case, RevoEX provides the following group of tools for performing the same kind of configuration, and various configurations can be made using these tools without the Wii Menu installed.

- `ncdconfigtool` (basic network configuration tool)
- `nwc24init` (WiiConnect24-related configuration tool)
- `FLViewer` (Demo for editing the Wii console's friend roster)

The following chapters details how to use each of these tools and the demo. To verify error handling, these tools can also be used when intentionally testing abnormal configurations.

2 Basic Network Configuration

2.1 Configuration Procedure Using the Wii Menu

Note: If performing network configuration on a development system using the Wii Menu, be sure to install version 2 or greater of the Wii Menu.

From the Wii Menu, select **Wii Options** > **Wii System Settings** > **Wii System Settings 2** > **Internet** > **Connection settings**, and then select one of the three connection profiles.

2.1.1 Search for an Access Point and Connect

1. Select **Wi-Fi Connection** > **Search for access point** to display a list of available access points.
2. From the SSID list, select the access point to which you want to connect.
3. If a security option is set for the access point, enter a key.
4. Save the configuration, and then continue by performing the connection test.

2.1.2 Connect Using the Nintendo Wi-Fi USB Connector

1. Select **Wi-Fi Connection** > **Nintendo Wi-Fi USB Connector** to begin registration with the PC.
2. Make sure the Wii console nickname is displayed on the registration tool screen on the PC, and then click **Allow connection** on the menu.
3. Make sure that registration has completed on the Wii Menu, and then continue by performing the connection test on the Wii console.

2.1.3 Connect Using AOSS or Easy Wireless Start

1. Select **Wi-Fi Connection** > **AOSS** or **Easy Wireless Start**, and select the access point following the instructions displayed on the screen.
2. Press the “AOSS Button” or the “Easy Wireless Start Button” (SET switch) on the access point, holding the button down until all corresponding LEDs are blinking (or lit).
3. Make sure the configuration has completed in the Wii Menu, and then continue by performing the connection test on the Wii console.

2.1.4 Connect by Configuring Manually

1. Select **Wi-Fi Connection** > **Manual**.
2. Configure the **SSID**, **Security**, **IP Address**, **DNS**, and **Proxy** items.
3. Save the configuration, and then continue by performing the connection test.

2.1.5 Connect Using the Wii LAN Adapter (Ethernet)

1. Select **Wired connection** and start the connection test.
2. If the connection test fails, select **Change settings**, and then configure the **IP Address**, **DNS**, and **Proxy** items.
3. Save the configuration, and then continue by performing the connection test.

2.1.6 Connection Test

When connection settings are either newly created or changed and saved, or when **Connection test** is selected during the connection configuration, a test will be done to determine whether an Internet connection is possible with the given settings. The connection test must succeed in order to enable the connection settings. If the connection test fails, verify the settings and the network status. If the connection test is successful, a five-digit **support code** will be displayed; this is not an error code but rather a numerical conversion of the properties of the communications environment during testing.

2.2 Configuration Procedure Using ncdconfigtool

For development systems where the Wii Menu has not been installed, using the RevoEX `ncdconfigtool` allows you to configure the network connection in the same way as with the Wii Menu, with the exception of the following restrictions.

- "AOSS" is not supported.
- "Easy Wireless Start" is not supported.

The basic operating scheme of ncdconfigtool is as follows:

- **During menu/item selection**

Name	Description
Confirm	A Button
Cancel	B Button
Move to higher-level menu	B Button
Move cursor up	UP on the Control Stick or UP on the +Control Pad
Move cursor down	DOWN on the Control Stick or DOWN on the +Control Pad

- **During text input**

Name	Description
Enter	A Button when the Control Stick has been tilted and a character has been selected.
Backspace	B Button
Delete entire string	A Button + B Button pressed at the same time
Confirm	A Button without tilting the Control Stick
Cancel	B Button when the input string is blank
Next character palette	One clockwise rotation of the Control Stick or DOWN on the +Control Pad.
Previous character palette	One counter-clockwise rotation of the Control Stick or UP on the +Control Pad.

Because `ncdconfigtool` directly configures the elements of the NCDConfig structure of the RevoEX network configuration library (NCD), some aspects of the structure and detail will be different from the Wii Menu. The notable differences are:

- **Validate** in `ncdconfigtool` does not perform the same operation as the **Connection test** of the Wii Menu. In order to use ncdconfigtool to put the system into the same state as when the **Connection test** of the Wii Menu is successful, you must select **Profile** and turn ON the **ValidationPassed** flag in the **Property** menu.
- In order to enable proxy settings, you must select **Profile** and turn ON the **UseProxy** flag in the **Property** menu; you must also turn ON the **Enabled** flags in the **Proxy** > **HTTP** and **SSL** > **Property** menus.

Turning **Easy Mode** OFF makes it possible to perform more detailed configuration than from the Wii Menu, but it is not required to change these items during normal development.

The configuration items of each menu are as follows:

- **TOP Menu**

Name	Description
`READ_CONFIG`	Loads profiles (all three) from Wii system memory.
`WRITE_CONFIG`	Writes the configured profiles (all three) to Wii system memory.
Easy Mode	Switches between displaying and hiding detailed settings. There is no need to use it for normal development.
Select Profile	Selects and enables the profile to be used.
Edit Profile	Edits a profile. Changes to the > Profile Menu.
NWC24 Permission	Configures the sending/receiving of messages in WiiConnect24, and enables/disables the downloading of data.
Link Timeout	Configures the duration of the link timeout with the server.
misc	Performs configuration for enabling/disabling stretching to a widescreen format, and configures the importing/exporting of settings to/from SD Cards.

- **Profile Menu**

Name	Description
Validate	Verifies the connection using the current profile. The connection items verified in Validate: ・(Obtain an IP address using DHCP) ・Ping the Default Gateway ・Ping the Primary DNS Server ・Verify connection to conntest.nintendowifi.net:80 *conntest.nintendowifi.net is the Nintendo Wi-Fi Connection server
Clear Profile	Clears the current profile.
Property	Configures the connection interface, method of obtaining the IP address, and whether to use a proxy.
IP	Performs IP address configuration.
Proxy	Performs proxy configuration. Changes to the > Proxy (HTTP/SSL) Menu.

Name	Description
NetIF	Performs wireless network configuration for wireless connections. This item does not appear for wired connections. Changes to the > NetIF (Wireless) Menu.
ID Adjust	Configures MTU, TCP Timeout, and DHCP Retrans.

- **Property**

Name	Description
IsWired	If selected, the Wii LAN adapter (Ethernet) will be used to make a wired connection.
UseDHCP	If selected, the system's own IP address will be automatically obtained using DHCP.
UseDHCP-DNS	If selected, the IP address of the DNS server will be automatically obtained using DHCP.
UseProxy	If selected, the proxy will be enabled. * "Enabled" must also be set at the same time in ProxyMenu > Property.

- **IP**

Name	Description
IPAddress	Sets the IP address used by the Wii console.
Netmask	Sets the subnet mask.
Gateway	Sets the IP address of the default gateway.
DNS1	Sets the IP address of the primary DNS server.
DNS2	Sets the IP address of the secondary DNS server.

If an error number (-3) is output when `WRITE_CONFIG` or Validate from the Edit Profile is executed, there may be a problem with the Profile settings. Confirm that each setting has been performed properly. For information on other error numbers, see "NCD API Error Values" in the *Revolution SDK Extension Function Reference* manual.

- **Proxy (HTTP/SSL) Menu**

Name	Description
Property	Enables or disables the proxy and basic authentication.
Server	Sets the proxy server's address.
Port	Sets the proxy server's port.
Username	Sets the user name for basic authentication.
Password	Sets the password for basic authentication.
Copy to SSL (HTTP)	Copies settings to SSL (HTTP).

- **Property**

Name	Description
Enabled	If selected, enables proxy settings. * UseProxy must also be set at the same time in ProfileMenu > Property.
BasicAuth	If selected, basic authentication will be used during proxy connections.

- **NetIF (Wireless) Menu**

Name	Description
Scan	Scans for available wireless access points in the area.
Config Method	Selects the wireless configuration method. *Only “Manual” or “USB-AP” can be set.
Config	Enters the required items in the selected configuration method. Changes to > ConfigMenu
Rate Set	Sets the transmission rate that can be used.
Retry Limit	Sets the upper limit for retrying sends.

- **ConfigMenu (during manual configuration)**

Name	Description
SSID	Sets the SSID of the wireless network to connect to.
Privacy Mode	Sets the encryption method of the wireless network to connect to.
Privacy Key	Sets the WEP key or WPA pass phrase of the wireless network to connect to. *Only if Privacy Mode is not set to None.
Privacy Key(HEX)	Sets the WEP key of the wireless network to connect to in hexadecimal format. *Only if Privacy Mode is WEP.
Key Index	Sets the index of the WEP key of the wireless network to connect to. *Only if Privacy Mode is WEP.

  - **Privacy Mode**

None
WEP (RC4 40bit)
WEP (RC4 104bit)
WPA-PSK (TKIP)
WPA-PSK (AES)
WPA2-PSK (AES)

- **ConfigMenu (during USB-AP configuration)**

Name	Description
Start	Starts registering a connection with the USB-AP.
Cancel	Cancels the registration of a connection with the USB-AP.
Nickname	Sets the nickname used for the USB-AP connection. *Only ASCII is supported. The nickname is the last 6 digits of the Wii’s MAC address if a nickname is not entered.
Nickname(HEX)	Sets the nickname used for the USB-AP connection in hexadecimal format. *The character encoding is UTF-16BE.

3 Settings Related to WiiConnect24

3.1 Configuration Procedure Using the Wii Menu

When using the Wii Menu, the WiiConnect24 configuration file is automatically created, so it is not necessary to initialize it. The settings required to operate WiiConnect24 are as follows.

3.1.1 Network Configuration

A valid network configuration must be created in advance using the procedure described in section 1.2.

3.1.2 Agreement to the Terms of Use

From the Wii Menu, select **Wii Options** > **Wii System Settings** > **Wii System Settings 2** > **Internet** > **Terms of Use**, and then agree to the EULA.

3.1.3 Enable WiiConnect24

From the Wii Menu, select **Wii Options** > **Wii System Settings** > **Wii System Settings 2** > **WiiConnect24** > **ON/OFF**, and then select **ON**.

3.1.4 Disable Parental Controls

From the Wii Menu, select **Wii Options** > **Wii System Settings** > **Wii System Settings 2** > **Parental Controls**, and then select the **Do not use Parental Controls** setting.

3.2 Configuration Procedure Using nwc24init

For development systems on which the Wii Menu has not been installed, the RevoEX `nwc24init` tool makes it possible to initialize and edit the WiiConnect24 configuration, as well as to send and receive messages instantaneously for testing purposes.

The basic method for operating `nwc24init` is as follows:

Name	Description
Confirm	A Button
Move cursor	UP/DOWN on the Control Stick or UP/DOWN on the +Control Pad
Switch menu	LEFT/RIGHT on the Control Stick or LEFT/RIGHT on the +Control Pad

The items on the menu are described below.

- **NWC24**
  - **Initialize**
    Initializes the WiiConnect24 configuration file and generates a Wii number. Among the items in the table below , only the selected items are initialized unless the files do not exist or are corrupted, in which case the items are initialized whether checked or not.

Name	Description
Config	Configuration data like the Wii number.
MsgBox	Message box
Flist	Friend roster
DLTask	Download task

- **Register**

  Registers a Wii number with the server. A Wii number must have been generated and the network configured before this occurs.

- **Receive Mails**

  Checks for messages on the server and then immediately downloads any messages (placing them into the inbox).

- **Send Mails**

  Immediately sends from the outbox to the server.

- **SC**

  Performs system configuration relating to WiiConnect24. Originally, this configuration is done from the Wii Menu, but may be changed directly for development and debugging purposes. Table 3-1 describes each item. For normal development that uses WiiConnect24, we recommend that you use the settings shown in the “Normal Configuration” column.

Table 3-1 SC Item Descriptions

Name	Description	Normal Configuration
`WCFlags`	This flag is used to enable/disable WiiConnect24.	ON
`EULA`	This flag indicates whether the user has agreed to the terms of use regarding the network. Normally, the WiiConnect24 service will not be available if the user doesn’t agree to this.	ON
`ParentalControl`	This flag enables/disables the system Parental Controls.	OFF
`NetContentRestrictions`	This flag enables/disables communication limitations for WiiConnect24 messages. It is valid only when Parental Controls are enabled.	OFF
`IdleMode`	This flag specifies whether or not to use WiiConnect24 in standby mode.	Arbitrary
`IdleModeLED`	This is the setting for lighting the Wii console slot illumination with WiiConnect24. Either OFF, DARK, or BRIGHT can be selected.	Arbitrary

- **Flush**

  If this is executed after any setting has been changed, that setting will be written to the Wii console.

Note: By using this SC Configuration Menu, it is possible to perform combinations of settings that cannot exist given the system configuration sequence. Operation is not guaranteed if only `WCFlags` is ON without also turning ON the EULA flag. Moreover, if `ParentalControl` is turned ON in the environment where the Wii Menu has been installed, other restrictions related to Parental Controls will also become enabled at the same time, so the application may not run depending on the situation. Please be fully aware of this.

- **NCD**

  In this menu, permissions for the following items can be set among the network settings related to WiiConnect24. If the Wii Menu has been installed, this configuration is done automatically based on the settings of the SC menu above. If proceeding without installing the Wii Menu, they must all be set to be allowed and then written to the Wii console in advance. If they are not allowed, the WiiConnect24's automatic scheduler cannot run the corresponding processes in Table 3-2.

Table 3-2 Processes Needing WiiConnect24's Automatic Scheduler

Name	Description
SendMail	Send message
ReceiveMail	Receive message
Download	Download

  - **Read Config**
    Reads the network configuration from the Wii console.

  - **Write Config**
    Writes the network configuration to the Wii console.

4 Registration in the Wii Console Friend Roster

4.1 Registration Procedure Using the Wii Menu

From the Wii Menu, run the **Wii Message Board**, and then select **Create Message** > **Address Book** > **Register**. If the various settings are not configured, the following error messages will be displayed.

- If the network settings have not yet been configured:

  “Internet settings must be configured in order to register a friend.”

- If the WiiConnect24 setting is OFF:

  “The WiiConnect24 setting is not currently enabled.”

  “Please check the settings in Wii Options.”

  If these settings have been performed correctly, the friend type (Wii/Other) selection screen will be displayed. From this screen, enter the friend type, the Wii number (or e-mail address), and the nickname, and then perform registration in the Address Book (i.e., the Wii console friend roster).

  When registration has completed, the following message will be displayed:

  “Registration has completed.”

  “In order to exchange messages, you and your friend must register each other, and your internet settings must be configured.”

  As stated above, both parties must perform the aforementioned registration procedure for messages to be exchanged between one Wii and another. However, verification that both parties have registered each other in their address books is done via a mail that is automatically sent during registration. Consequently, between several minutes to several hours may pass between the time that the registration procedure is performed and the time that the friend relationship is established. When “Other” is selected as the friend type for friends, the friend relationship is established by replying to the message that is automatically sent during registration.

  In addition, friends for whom a friend relationship has not yet been established are displayed in the Address Book in light grey; this changes to dark grey once the friend relationship is established .

4.2 Registration Procedure Using FLViewer

By using `FLViewer` from the NWC24 sample demos, it is possible to both verify and edit the content of the current Wii console friend roster and to register new entries to the friend roster.

The Wii Remote is used to operate `FLViewer`. It does not support the Nintendo GameCube™ Controller or any other controllers.

The method of operation is displayed in the lower right-hand corner of the screen, but the basic operations are listed in Table 4-1.

Table 4-1 Basic FLViewer Controls

Control	Function
+Control Pad	Select
A Button	Confirm
B Button	Cancel
+ Button	Register to the Wii console friend roster / Confirm nicknames and e-mail addresses

To register a new friend in the Wii console friend roster, select an unregistered space from the list on the left of the screen (one where the nickname column reads "----------"), and then press the A Button.

Next, enter the information for the friend you wish to register.

The friend information being entered will be displayed at the upper right-hand corner of the screen; select an item with the A Button and enter a value.

Table 4-2 lists the items that can be entered for friend information.

Table 4-2 Friend Information Entry Items

Item	Description
Type	This is the type of friend. Select either "Wii" or "Public (non-Wii)."
Status	This is the status of the establishment of a friend relationship. Either "Pending" or "Established" can be selected, but "Pending" is forcibly set during registration.
FDID	This is a reserved region. There are plans to use this in the future to link with Wii console features; a 16-digit numerical value can be entered.
Name	This is the friend's nickname. LEFT and RIGHT on the +Control Pad select the type of character, UP and DOWN on the +Control Pad select the character to enter, and the A Button enters the selected character. Confirm the nickname by either entering 10 characters or pressing the + Button.
Address	This is the friend's address. For Wii Friends, enter the Wii Number; for "Public" Friends, enter the e-mail address. The method of entering the e-mail address is the same as that for the nickname. Confirm the address by either entering 255 characters or pressing the + Button.

When you have finished entering the friend information, press the + Button to perform registration in the Wii console friend roster. When the registration has completed, the nickname of the registered friend will be displayed on the list on the left side of the screen.

As is the case with the registration method using the Wii Menu, in order to exchange messages with registered friends, both parties must perform the registration procedure for each other and establish a friend relationship.

If "Wii" is selected as the friend type, a message will automatically be sent, and the friendship relationship will be established, as is the case when using the Wii Menu.

However, if “Public” is selected as the friend type, no message will be sent during registration, unlike the case when using the Wii Menu.

In order to establish a friend relationship with a Public Friend, that friend must send an e-mail to the Wii after the Wii-using friend has registered the Public Friend in the Wii console friend roster (the content of this e-mail is inconsequential). The e-mail address for the friend is “w” + “Wii Number” + “@wii.com.” For example, the Wii e-mail address for Wii number 1234567890123456 is w1234567890123456@wii.com.

5 Testing with the WiiConnect24 Operating Environment

5.1 Verifying Operation with Other Application Messages Mixed In

Because the WiiConnect24 message boxes (inbox and outbox) are shared by all applications, there are messages from other applications mixed in. Care must be taken for the applications that use the WiiConnect24 message feature so that mistakenly loading messages intended for other such applications will not result in a malfunction.

The “Wii Message Board” and the “Mii Channel” contained in the Wii Menu both have a feature for sending and receiving WiiConnect24 messages. These features can be used to create the state where the message boxes contain messages intended for applications other than yours when verifying the operation.

6 Verifying Error Messages

6.1 When Using SOStartup

Table 6-1 lists the error values returned by the `SOStartup` function and the resulting error codes after these values have been converted with the `NETGetStartupErrorCode` function.

Table 6-1 SOStartup Error Codes

Wired/ Wireless	SOStartup function	NETGetStartupErrorCode function	Error Code
Both	SO_EFATAL	NET_ECODE_STARTUP_FAILED	50100
Both	SO_ENOENT	NET_ECODE_NO_ENABLED_CONFIG	50299
Both	SO_EINVAL	NET_ECODE_INVALID_CONFIG	50300
Wired	SO_ENXIO	NET_ECODE_DEVICE_NOT_EXISTS	504xx
Wireless	SO_ERR_LINK_UP_TIMEOUT	NET_ECODE_AP_NOT_FOUND	510xx
Wired	SO_ERR_LINK_UP_TIMEOUT	NET_ECODE_WIRED_LINK_UP_FAILED	514xx
Wireless	SO_ERR_LINK_DOWN	NET_ECODE_WIRELESS_LINK_UP_FAILED	513xx
Wired	SO_ERR_LINK_DOWN	NET_ECODE_WIRED_LINK_UP_FAILED	514xx
Wireless	SO_ENOLINK	NET_ECODE_WIRELESS_LINK_UP_FAILED	513xx
Wired	SO_ENOLINK	NET_ECODE_WIRED_LINK_UP_FAILED	514xx
Wireless	SO_ETIMEDOUT	NET_ECODE_WIRELESS_LINK_UP_FAILED	513xx
Wired	SO_ETIMEDOUT	NET_ECODE_WIRED_LINK_UP_FAILED	514xx
Wireless	SO_ENETRESET	NET_ECODE_WIRELESS_LINK_UP_FAILED	513xx
Wired	SO_ENETRESET	NET_ECODE_WIRED_LINK_UP_FAILED	514xx
Both	SO_ERR_DHCP_TIMEOUT	NET_ECODE_DHCP_FAILED	520xx
Both	SO_ERR_DHCP_EXPIRED	NET_ECODE_DHCP_FAILED	520xx
Both	SO_ERR_DHCP_NAK	NET_ECODE_DHCP_FAILED	520xx
Both	SO_ERR_ADDR_COLLISION	NET_ECODE_ADDR_COLLISION	527xx
Both	All other errors	NET_ECODE_STARTUP_FAILED	50100

Table 6-2 describes how to cause the various error codes at will.

Table 6-2 Error Code Causes

Code	Description
50100	This will occur when the hardware or firmware is defective. It is not possible to deliberately cause this error code.
50299	Use either the Wii Menu or `NCDConfigTool` and delete all the connection targets.
50300	This will occur when the network configuration file in Wii system memory is corrupted. It is not possible to deliberately cause this error code.
504xx	This will occur when the firmware is defective. It is not possible to deliberately cause this error code.
510xx	This will occur if a wireless connection target is enabled and power is cut to the AP used in the connection's configuration. This error might not occur if the AP is active even temporarily while the application is running.
513xx	This will occur if a wireless connection target is enabled and the WEP or WPA encryption keys of the AP are changed.
514xx	This will occur if a wired connection target is enabled and either the Wii LAN adapter (Ethernet) or the LAN cable is disconnected.
520xx	This will occur if using a connection target with obtaining IP address automatically enabled and a connection is attempted to a LAN that doesn't have a DHCP server.
527xx	This will occur if using a connection target with obtaining IP address automatically disabled and a connection is attempted after configuring an IP address that is already in use on the LAN.

6.2 When Using WiiConnect24

Table 6-3 lists the error values returned by the `NWC24Check` function, along with the corresponding error codes that can be obtained afterward using the `NWC24GetErrorCode` function.

Table 6-3 NWC24Check Error Values

Result of NWC24Check	Description	Error Code Returned by NWC24GetErrorCode
`NWC24_ERR_DISABLED`	Disabled setting error	109107, 109139
`NWC24_ERR_NETWORK`	Network connection error	5xxxx (same as SOStartup), 10xxxx
`NWC24_ERR_SERVER`	Server error	11xxxx, 10xxxx
`NWC24_ERR_FULL`	Outbox full error	109106
`NWC24_ERR_FATAL`	All other fatal errors	10xxxx

Many types of error codes are defined in WiiConnect24, but most of them occur only rarely or do not normally occur. Because they are difficult to reproduce, it is not necessary to verify them all. Below we have described only those errors which are relatively easy to verify. It is recommended that you verify, at the very least, one error from each error category.

6.2.1 Disabled Settings Errors

The errors in Table 6-4 occur when the WiiConnect24 feature is not in a usable state in the Wii system settings. It is possible to reproduce these errors using the Wii Menu or `nwc24init` by overwriting the relevant parts of the items in Wii system settings.

Table 6-4 Disabled Settings Errors

Code	Description
109107	These errors occur when the sending and receiving of WiiConnect24 messages is restricted by Parental Controls. To reproduce it, either enable Parental Controls in Wii System Settings screen 2 of the Wii Menu and place a restriction on the sending and receiving of WiiConnect24 messages, or set both the ParentalControl and NetContentRestrictions flags to ON under the SC items of nwc24init. (This error code is limited to the applications using the message feature.)
109139	This error code occurs when WiiConnect24 is turned OFF. To reproduce it, either turn WiiConnect24 OFF in Wii System Settings screen 2 of the Wii Menu, or turn WCFlags OFF under the SC items of nwc24init.

6.2.2 Network Connection Errors

The errors in Table 6-5 occur when a problem arises with the WiiConnect24 Internet connection. Some of these are the same as the errors obtained with `SOStartup`.

Table 6-5 Network Connection Errors

Code	Description
05xxxx	The methods for causing these errors are the same those for SOStartup errors.
10x304	These errors occur when the domain could not be resolved during communication. One simple way of reproducing these errors is to set an incorrect address for either the default gateway or the DNS server. (If using the Wii Menu, an error will appear during the connection test phase that prevents configuration from being done, so this configuration should be performed using ncdconfigtool.)
10x305	These errors occur if the server could not be found.
10x313	These errors occur when a connection cannot be made to the proxy server. They can be reproduced by enabling proxy connections and setting an incorrect address, but a 10x305 error may result depending on the conditions of the connection.
109144	This error occurs when registration of the WiiConnect24 account with the server failed for some reason or other, thereby preventing the registration from completing. It can be reproduced by performing a re-initialization of config using nwc24init, and executing the application again after changing the Wii number without performing registration (Register).

Errors related to the network connection cannot be detected until WiiConnect24's automatic sending and receiving processing actually fails to connect. Therefore, these errors cannot be obtained if NWC24Check is called immediately after the application starts up. Due to the mechanism of the scheduler operation, in some cases several minutes may be required until they can be obtained.

6.2.3 Server Errors

The errors in Table 6-6 occur when a problem arises during communications with the server using WiiConnect24. An error emulation server is being prepared for verification purposes, but at present there is no way to deliberately generate these errors.

Table 6-6 Server Errors

Code	Description
1102xx	These errors occur due to errors related to authentication of the server account.
110321	This error occurs when an account has not yet been registered with the server.
1104xx	These errors occur due to internal system errors on the server side.
1105xx	
1106xx	

For the same reasons that applied to the network connection errors, some time is also required until server errors become detectable.

6.2.4 Outbox Full Error

This error occurs when the outbox becomes full. Verification of this error is not necessary for applications that do not send messages.

Table 6-7 Outbox Full Error

Code	Description
109106	This error occurs when no more messages can be created in the outbox. To reproduce it, register 127 messages while the WiiConnect24 scheduler is suspended.

6.3 When Using Nintendo Wi-Fi Connection

Refer to the *Nintendo Wi-Fi Connection Error Simulation Manual*, which has been distributed separately.

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