MP Communication Overview

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What is MP Communication?

- MP = "multi-poll"
- Unique protocol for real-time communication among Nintendo DS systems
- MP API enables MP communication with the Nintendo DS from the Wii
- Reference: NITRO-SDK Wireless
 Communications Library Description





Features of MP Communication

- Real Time Communication
- Extremely low latency
 - Data sent at the beginning of a frame reaches communication partner within the same frame
- Highly reliable
 - Direct connection between devices
 - Low drop rate for normal home environments
- Slightly different from Internet/802.11 ad-hoc



- 1. MP (NITRO-SDK: WM)
- 2. MPDL (NITRO-SDK: MB)
- 3. MPFS (NITRO-SDK: WFS)
- 4. MPDS (NITRO-SDK: WM_StepDataSharing)

All are included in the Revolution SDK Extensions (RevoEX) package





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 WM StepDataSharing)





1. The MP Library

- Enables DS Wireless Play and DS Download Play with Nintendo DS systems
- Allows the Wii to act as a parent DS
- Less flexible than NITRO-SDK WM library, but easier to use





Wii & DS Endianness

- Endianness (byte order) of Wii and DS are different
- DS is Little-Endian, but Wii is Big-Endian
- On the Wii side, convert data before sending and after receiving from the DS





Wii & DS Endianness

- On the Wii side, think of the sent/received data as a simple binary row, and clearly separate the data structures in the game
- Conversion before sending data:
 Use MPHToMP16 or MPHToMP32
 Convert "Host order" to "MP order"
- Conversion after receiving data:
 Use MPMPToH16 or MPMPToH32
 Convert "MP order" to "Host order"





MP Library Restrictions

- Wii can only be the parent
- The number of available channels may be lower depending on the country
 – JP or EU Wiis: Channel 1, 7, 13
 – US or TW Wiis: Channel 1, 7
- V-blank synchronization is not possible





V-Blank Synchronization

- In DS-to-DS MP communication, DS systems can automatically sync to V-Blank
- Wii and DS have different V-blank cycles
 NTSC/PAL is different from DS out of sync
- Therefore, DS communication logic must be independent from Wii's framerate
- However, DS systems connected to Wii can still sync with each other





MP Library Restrictions (Cont.)

- When using sequential communication, limit the number of child devices to 8.
- The MPDS Library gives a representative example of sequential communication.
- The MPDL and MPFS libraries operate using Raw communication, so they are unaffected by this restriction.





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2. The MPDL Library

- A high-level API in the MP library used for download play with the Nintendo DS
- Maximum ROM size of 2.5 Mbytes
- DS download program must be registered within the Wii executable file during development
 - Prevents distribution of unintended programs
 - Allows confirmation of SDK & middleware used



































DS Download Play Flow

- 1. Start the download server (parent)
- 2. Manage player entry status
- 3. Close entry & start download process
 - DS restarts when download completes
- 4. Reconnect as necessary and execute communication





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3. The MPFS Library

- A communication protocol for sending files from Wii to Nintendo DS using MP communication
- Allows your game to access more than the 2.5MB ROM size provided by MPDL library
- Good for DS applications that need to access larger amounts of data





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4. The MPDS Library

- Data Sharing protocol library
- Allows data to be shared synchronously at the game frame level between parent and child devices (30fps/60fps)
- Communication on DS side is managed by WM Library in NITRO-SDK





4. The MPDS Library (Cont)

- Syncs automatically, even if one falls behind due to dropped packets or processing
- No need to implement synchronization or worry about data reliability
- Ideal for applications that require real-time synchronization
- Latency of 2 frames:
 - 1 frame for gathering, 1 frame for broadcast
- Be careful of the V-Blank sync problem!





Thank you!

Questions?

E-mail: <u>support@noa.com</u>
Newsgroups:

rvl.communication
nitro.wireless



