

Nintendo Wi-Fi Connection Concepts and Features

Dan Chang

Project Lead, Online Technology Support
Software Development Support Group

Roadmap

- **Nintendo Wi-Fi Connection Concept**
- Nintendo Wi-Fi Connection Pay & Play
- Friends
- New DWC Features
- Nintendo Wi-Fi Connection Usage Notes
- For More Information

Nintendo Wi-Fi Connection: What is it?

- Nintendo's unique network platform
- Goal: For 90% of people who buy a Nintendo Wi-Fi Connection game to connect to the network at least once
- Accomplish this goal by removing and overcoming barriers to connection

Nintendo WFC Concepts

- The Nintendo Wi-Fi Connection logo represents:
 - Comfortable
 - Simple
 - Free



Nintendo WFC Concepts

- Comfortable
 - Protect Users
 - Concept of Friends and Strangers
 - Option to play with only your Friends
 - Profanity filtering



Nintendo WFC Concepts

- Simple
 - Simplify setup
 - Built-in Wi-Fi
 - Simplify account registration
 - No login / password required to play



Nintendo WFC Concepts

- Free
 - Play for free without limitations on play time
 - No cost to publishers
 - No cost to developers



Expanding the Concept

- New, more expansive definition of which titles may receive logo:
 - Titles that use only WiiConnect24
 - Titles that use only Data Storage
 - Titles that use only Ranking Server
- As long as it remains "Comfortable, Simple, and Free"



Roadmap

- Nintendo Wi-Fi Connection Concept
- **Nintendo Wi-Fi Connection Pay & Play**
- Friends
- New DWC Features
- Nintendo Wi-Fi Connection Usage Notes
- For More Information

New Nintendo WFC Pay & Play

- The Nintendo Wi-Fi Connection Pay & Play logo represents:
 - Comfortable
 - Simple
 - Any Paid Content



Which Titles Get the New Logo?

- Any title with paid add-on content, and . . .
 - Offline play + free online play
 - Offline play only
 - Offline play + WiiConnect24 usage
 - Offline play + Data Storage usage
 - Offline play + Ranking Server usage
- Said another way, any title that uses the E-Commerce library



The New Logo & WiiWare



Roadmap

- Nintendo Wi-Fi Connection Concept
- Nintendo Wi-Fi Connection Pay & Play
- **Friends**
- New DWVC Features
- Nintendo Wi-Fi Connection Usage Notes
- For More Information

Friends

- Heart of the Nintendo WFC Concept
- Exchange Friend Registration Keys **outside** of the game to establish friendship
 - Between people who already know each other
- If title supports interactions with others, then friends must be supported:
 - Building friend relationships
 - Choosing friends as communication partners

Global Friends



- New support for global friend roster via the Wii console's friend roster
- A title may choose to import global friend relationships (via WiiConnect24)
- Always ask user before establishing the friendship
- In-game friend relationships do not export to global friend relationships

Friend of a Friend

- Two people with a friend in common
- Treated by Nintendo WFC as friends
- Friendship may be established via exchange of friend registration keys **within** the game
 - If we have a friend in common
- Or friend of a friend may use an invite / accept mechanism to become friends
- A way to expand your network of friends

People Who Are Not Friends

- Strangers – people who have not exchanged friend information
- Rivals – strangers that you'd like to play with again
 - Rival support is optional

Strangers

- Players must explicitly select Strangers as communication partners
 - Game must default to Friends
- Do not include a feature to exchange Friend Registration Keys

Rivals

- Players must explicitly select Rivals as communication partners
 - Game must default to Friends
- Make sure that a Rival is never promoted to a Friend

Permissions

- Keyword communication permitted between anyone
- Free word communication permitted only between friends
- See the *Nintendo Wi-Fi Connection Concept Guidelines for Wii* for details

Roadmap

- Nintendo Wi-Fi Connection Concept
- Nintendo Wi-Fi Connection Pay & Play
- Friends
- **New DWVC Features**
- Nintendo Wi-Fi Connection Usage Notes
- For More Information



DWC Features in 2008

- Faster matchmaking
- 12- player (more or less) matchmaking
- Parent substitution during matchmaking
- Suspend matchmaking
- Group IDs
- Rejoin same group
- Server-side evaluations
- (Expected availability: Q2 2008)

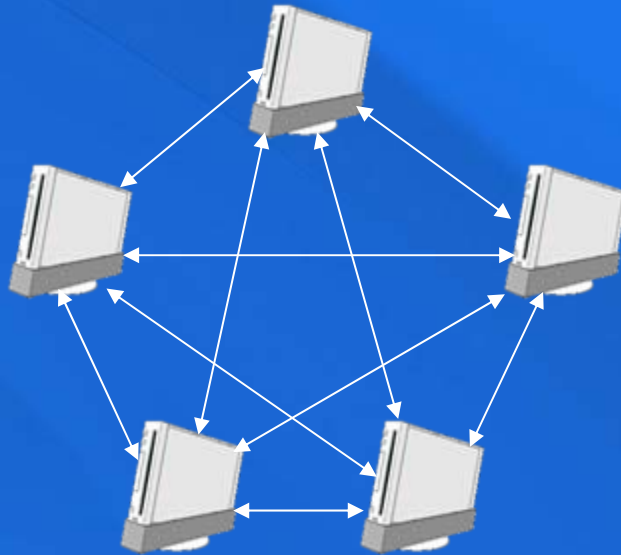
Peer-to-Peer Matchmaking

- Each child must NAT negotiate with every other child
- Many NAT negotiations (5 children: 20x)
- Each NAT negotiation takes time



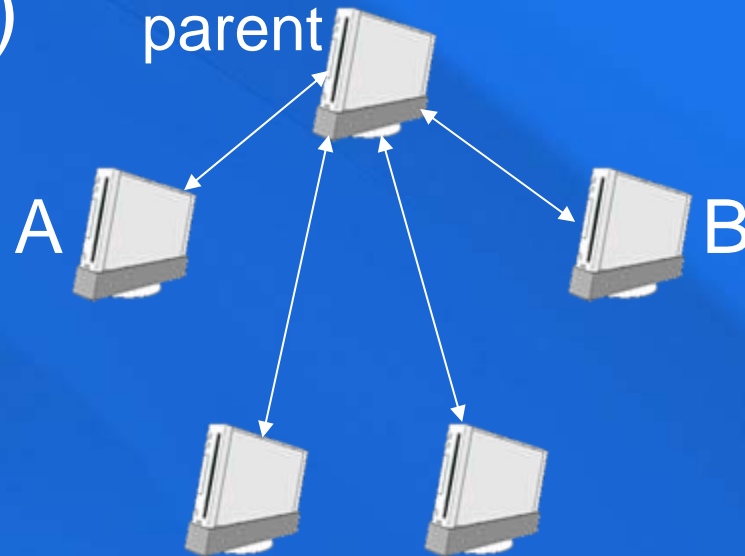
Full Mesh

- All NAT negotiation succeeds
- All communicate directly
- Lowest latency possible



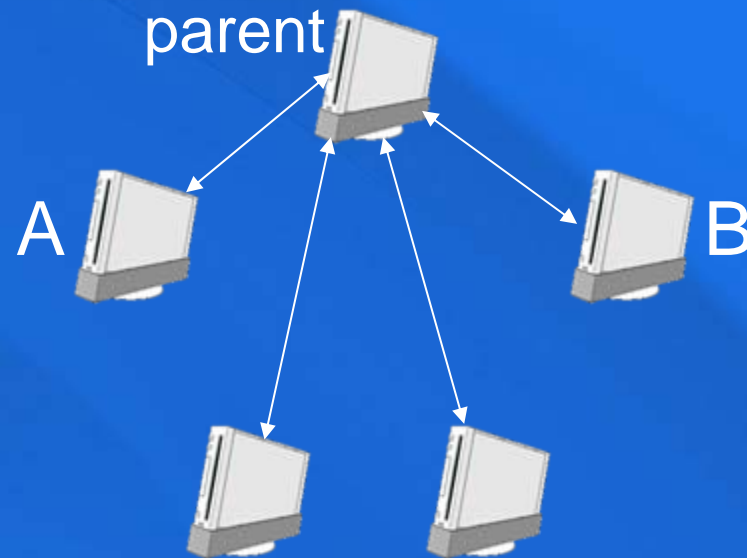
Star-Shaped

- NAT negotiation only with parent (5 children: 8x)
- All communicate through parent
- Higher latency from A to B through parent (vs. direct)



Reliable Communications

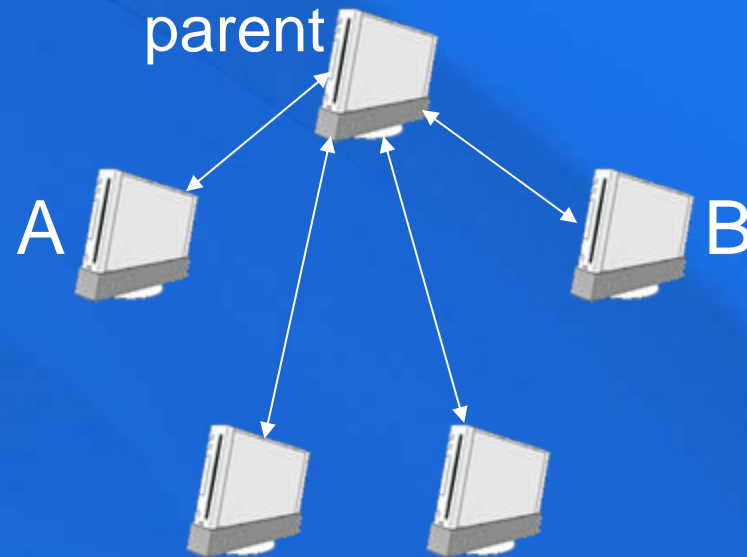
- Not available for messages sent through parent (e.g., A to B)
- Available for direct communications (e.g., A to parent)



Faster Matchmaking

NEW!

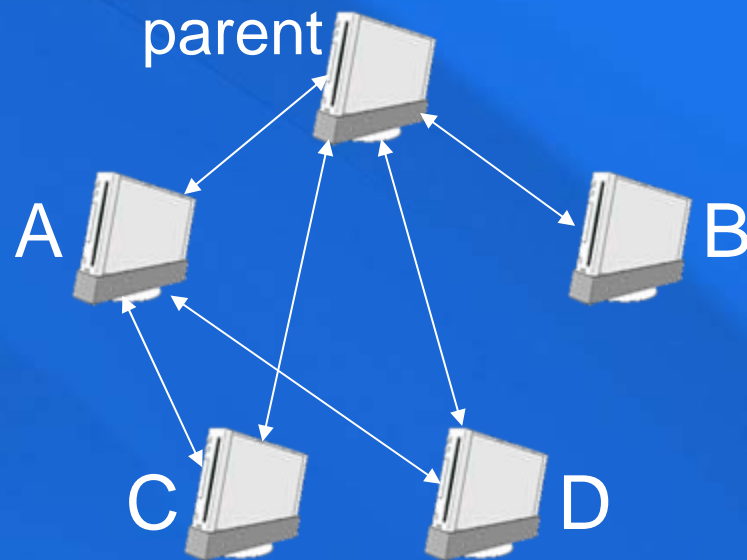
- Matchmaking considered complete once a connection is established with the parent



Faster Matchmaking

NEW!

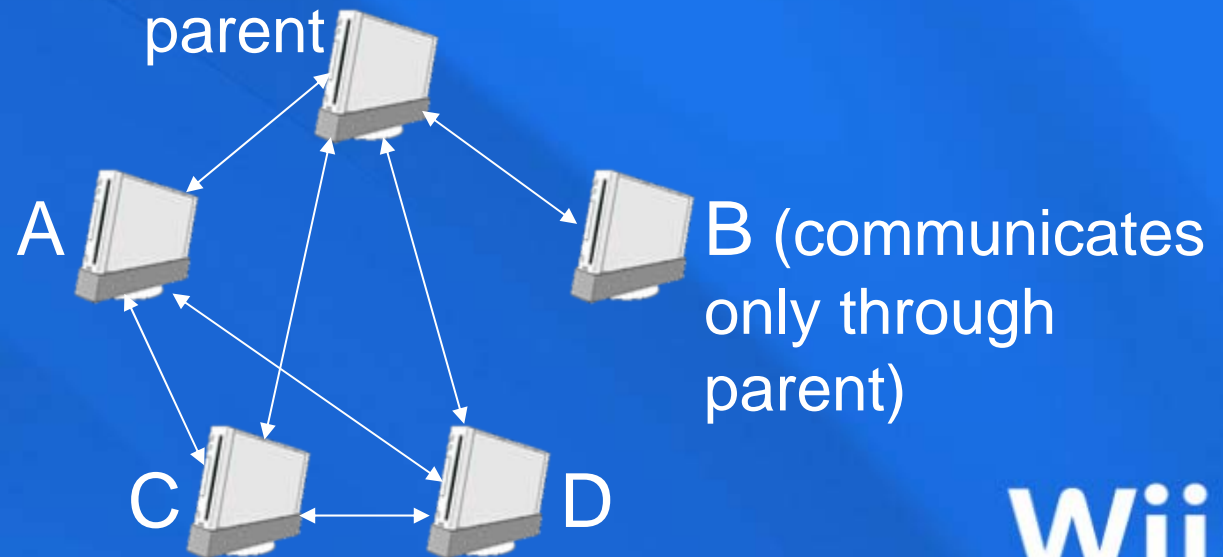
- Matchmaking considered complete once a connection is established with the parent
- Children will then try to form a full mesh network



Hybrid

NEW!

- Some peer-to-peer NAT neg. succeeds
- Some communicate directly (A with C)
- Others through parent (A with B)



DWC_SetMatchingMode()

NEW!

- Star-Shaped

- DWC_MATCH_MODE_STAR_NETWORK

NEW!

Hybrid

- DWC_MATCH_MODE_HYBRID_NETWORK
- Higher latency, but faster matchmaking

- Full Mesh

- DWC_MATCH_MODE_FULLMESH_NETWORK
- Need lowest latency possible

E.g., 12-player matchmaking

- To form full mesh, would require 132 NAT negotiations for 12 players
- Very difficult:
 - Every one must succeed
 - Would take a long time
- Now just 22 NAT negotiations forms a star-shaped mesh
- Can still progress towards Hybrid

Parent Substitution



- Existing library, matchmaking stopped if parent disconnected
- New library, even if parent disconnects, another child is selected to be new parent

Suspend Matchmaking



- Temporarily cut-off matchmaking
 - Play a game with current group of players
 - Resume matchmaking after game

Group IDs



- A group ID is assigned when a match is created
- Group IDs allow you to find the same matchmaking group again



Friend of Friend Matchmaking

- A Friend may join Friend's group right away, if it knows the friend's group ID
- The application must prepare a way to know a Friend's group ID
 - One option: `DWC_SetOwnStatusString()` and `DWC_GetFriendStatus()`

Rejoin Same Group



- If a child is disconnected it can rejoin the same group
- When a child first joins a group, it records the group ID
- Later, to rejoin the same group, call `DWC_ConnectToGameServerFromGroupID()` with the group ID

Client-side Evaluation Functions

- Each client publishes its attributes using one (or more) `DWC_AddMatchKey*()` calls
- The 7th argument to `DWC_ConnectToAnybodyAsync()` specifies the evaluation callback
- Each client decides if it should join this match (or wait for the next candidate)

Server-side Evaluation Functions



- Each client publishes its 4-byte attributes using the 10th argument of `DWC_ConnectToAnybodyAsync()`
- The 9th argument to `DWC_ConnectToAnybodyAsync()` specifies the evaluation callback
- Server decides whether client should be accepted

Client-side or Server-side?

- Client-side Evaluation
 - When client can determine if it should join simply by examining the server
 - Cannot use with server-client
- Server-side Evaluation
 - When server needs to know about all current clients when determining if a new client is allowed to join

Roadmap

- Nintendo Wi-Fi Connection Concept
- Nintendo Wi-Fi Connection Pay & Play
- Friends
- New DWC Features
- **Nintendo WFC Usage Notes**
- For More Information

Nintendo Wi-Fi Connection Usage Notes

- Cross-market Friend Matchmaking
- Cross-market Anybody Matchmaking
- Publishing Data
- Peer-to-Peer Exchange of Data
- Uploading Data to Publisher

Cross-market Friend Matchmaking

- Ask yourself two questions:
- Do you want to permit cross-market?
- Can your game design tolerate latency found in cross-market play?

Prohibit Cross-market Friend Matchmaking

- Use the Game Code assigned for the market
 - From the returned Design Statement A
 - Place the four characters in single quotes (' RVLJ')
- Set as the 3rd argument to `DWC_Init()` for that particular market
 - E.g., ' RVLE' for North America, ' RVLP' for Europe

Allow Cross-market Friend Matchmaking

- Select the Game Code from one market
 - From the returned Design Statement A
 - Place the four characters in single quotes ('RVLE')
- Set as the 3rd argument to `DWC_Init()` in all markets
- See section 4.8, "Specifying the Game Code" of the *Nintendo Wi-Fi Connection Programming Guidelines for Wii*

Cross-market Anybody Matchmaking

- Cross-market anybody matchmaking takes place by default
 - Even if you prohibit cross-market Friend Matchmaking
- Prohibit: use `DWC_AddMatchKeyString()` to pass in the Game Code assigned for the market (e.g., "region_key", "RVLE")
- Specify filter as 2nd argument to `DWC_ConnectToAnybodyAsync()` (e.g., "region_key = 'RVLE' ")

Publishing Data

- Nintendo WFC Download Service
 - Up to 3MB per download
 - Takes place immediately after call is made
- WiiConnect24 Download Task
 - Up to 500 KB in total per 2 download tasks
 - Schedule download
- E-Commerce (pay for add-on content)
 - Up to 16MB per item
 - Takes place immediately after call is made

Peer-to-Peer Exchange of Data (1 of 2)

- `DWC_SetOwnStatusString()`
 - Up to 255 characters
 - One-to-many
 - Takes place immediately
- Data Storage Public Data
 - Up to about 2KB via key & value pairs
 - One-to-many
 - Takes place immediately
 - Submit a Design Statement C

Peer-to-Peer Exchange of Data (2 of 2)

- General-Purpose Ranking Library User-defined Data
 - Up to 764 bytes per category; 2048 bytes total
 - One-to-many – Takes place immediately
 - Submit a Design Statement B
- WiiConnect24 Message
 - Up to 200KB per message
 - One-to-one (up to 8) – Background task

Uploading Data to Publisher

- WiiConnect24 Message
 - Up to 200KB per message
 - Publisher maintains an email address to collect messages
 - Takes place as a background task
 - Please check with us at support@noa.com

Roadmap

- Nintendo Wi-Fi Connection Concept
- Nintendo Wi-Fi Connection Pay & Play
- Friends
- New DWVC Features
- Nintendo Wi-Fi Connection Usage Notes
- **For More Information**

Nintendo Wi-Fi Connection Development Reference

- *Wii Network Game Development and Operation Manual*
 - Step-by-Step guide
 - Flowchart of tasks & deliverables with dates
 - Instructions on how to complete forms

Nintendo Wi-Fi Connection Concept References

- *Nintendo Wi-Fi Connection Concept Guidelines for Wii*
 - Covers Concepts in greater detail
 - Reference during planning stage
- *Nintendo Wi-Fi Connection Terminology*
 - Lists the proper names

Nintendo WFC Programming References

- *Nintendo Wi-Fi Connection Revolution DWC Programming Manual*
 - How to program using the DWC library
- *Wii Nintendo Wi-Fi Connection Message List*
 - Lists text to use for error messages
 - Messages also referenced by Lotcheck

Nintendo WFC Lotcheck References

- *Nintendo Wi-Fi Connection Programming Guidelines for Wii*
 - Contains cautions and requirements
 - Comply with this document to pass Lotcheck
- *Nintendo Wii Lotcheck Instructions (for Nintendo Wi-Fi Connection games)*
 - Describes test method & pass / fail criteria
- *Wii Lotcheck Checklist*
 - Verify compliance with each Lotcheck test

Thank you!

Questions? Feedback?
Contact support@noa.com