



Who am I?

Cory O'Regan

- Network Engineer at Nintendo® Software Technology (NST)
- Graduated from DigiPen Institute of Technology
- Employed by NST for 4+ years
- Projects
 - 1080° Avalanche
 - Metroid[®] Prime Hunters: First Hunt
 - Ridge Racer DS
 - Metroid® Prime Hunters
 - Mario vs. Donkey Kong 2

About NST

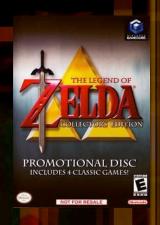
- Founded in 1998
- Located in Redmond, WA next to Nintendo[®] of America and DigiPen Institute of Technology
- Employs 50+ people
- Current employees have worked on games such as:
 - Pikmin
 - Tekken
 - Super Mario 64
 - Metroid® Prime
 - Luigi's Mansion
 - FZero
 - Dungeon Siege
 - Smuggler's Run

About NST

- 2000
 - Bionic Commando[™]: Elite Forces
 - Crystalis
 - Ridge Racer[®] 64
 - Pokemon[®] Puzzle League
- 2001
 - Waverace®: Blue Storm
- 2003
 - Nintendo® Puzzle Collection
 - The Legend of Zelda[®]: Ocarina of Time Master Quest
 - The Legend of Zelda®: Collector's Edition
 - 1080° Avalanche
- 2004
 - Mario vs. Donkey Kong
 - Metroid® Prime Hunters: First Hunt
 - Ridge Racer® DS
- 2006
 - Metroid® Prime Hunters
 - Mario vs. Donkey Kong[™] 2: March of the Minis











Nintendo[®] Wi-Fi Connected Games



- Players upload levels that they created for all their friends to download.
- Download new content from Nintendo[®].
- Players get the chance to have their own level downloaded all across the world.

Nintendo[®] Wi-Fi Connected Games





- Play players across the globe in 7 modes of game play, including Death Match.
- National rankings on nintendowifi.com.
- Follow your friends' and rivals' stats even while they're not logged on.
- Talk to your friends via an on-screen keyboard or by using Voice Chat.



- A look into the design of Metroid® Prime Hunters WFC modes.
- Overview of technical considerations of WFC and tips to help out.
- Tips for testing.

The Unique Design of WFC in Metroid® Prime Hunters

- Find Game (Random Match)
 - Search for other players in your region or across the globe.
 - Match My Rank.
- Friends / Rivals Games
 - Familiar interface for online player searching for games.
 - Browsing for friends' / rivals' games.
 - See all game options and who is in the game before joining it.
 - After joining a game, friends can chat about what they want to play and then the host chooses the game.
 - Chatting between friends can be done with typing via an onscreen keyboard or using Voice Chat.

The Unique Design of WFC in Metroid[®] Prime Hunters

Friends/Rivals

- Friends
 - Players you know personally.
 - You've played them on local network play or you've entered their 12-digit friend code.

The Unique Design of WFC in Metroid® Prime Hunters

Friends/Rivals

- Rivals
 - Everyone who has ever played online always finds an opponent that they want to play again rivals lets player do that.
 - Definition A "Rival"... is basically a stranger that the user has had a previous encounter with via Nintendo[®] Wi-Fi Connection.
 - They are just friends that you can't talk trash to.
 - The SDK does NOT differentiate between a friend and a rival
 it's up to the application.
 - 2-way agreement after a match.
 - Rival Radar Leave your DS in Rival Radar mode and pick up new players (rivals) in the immediate vicinity to play later online.

The Unique Design of WFC in Metroid[®] Prime Hunters

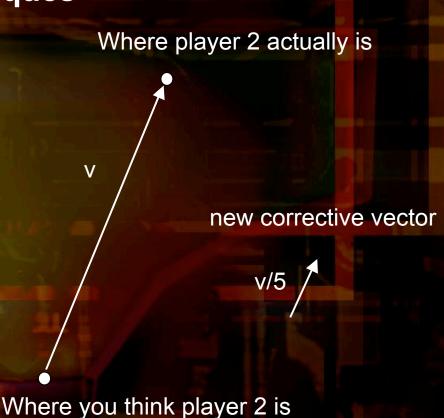
Voice Chat

- Things to keep in mind
 - Packet size
 - In-game or menus only
 - Telephone or transceiver mode
 - Filter packets behind same firewall

Technical Aspects of WFC in Metroid® Prime Hunters

Lag Compensation Techniques

- Interpolative correction
 - Positional update packets every 5 frames
 - Create vector from where you think the other player is to where they actually are
 - Divide that vector by 5
 - Add that new corrective vector to that player's position every frame



Technical Aspects of WFC in Metroid® Prime Hunters

Lag Compensation Techniques

Host-side hindsight

Roundtrip latency = 400ms

200 ms ago

Current player position

Movement direction

Midpoint

Nintendo Confidential

Testing

- WMTestTool
 - MeasureChannel Test
 - Scan(Ex) Test
 - Noise Mode
- Don't always assume a problem you're having is your game
- Have multiple networks to test on
- Use some method of blocking wireless traffic 100%

