SOCOM: Bringing a Console Game Online

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Why should we listen to you?

- SOCOM has sold "thru" over 1 million units in North America alone since its release on August 28th, 2002.
- There are over 300,000 active SOCOM players that have played online in the last 30 days.
- 50,000 to 60,000 people play SOCOM everyday.
- On the weekends, players log over 170,000 hours of game time for a very high average of 3 hours per person.

No really, why should we listen to you?

- In the last 7 days, consumers have logged 1,038,134 hours on SOCOM.
- During peak hours (3-7pm PST), there are 11,000 to 12,000 simultaneous people playing SOCOM.
- On an average day, SOCOM has more simultaneous players than all but one of the competing online "PC Games"; including Battlefield 1942, UT2003, Medal of Honor, America's Army or Quake3.
- The only reason why we are here is because we want to see many more successful, online console games.

Design Goals for SOCOM Online

1. **Create 2 separate, full games**
   - **A full online game and a full single player game**
     - **This equals double the work/resources**

2. **Provide the player with a "full" online game experience**
   - **16 players**
     - **Required client/server, which is $$$**
   - **Voice Chat**
   - **Built in community support**
     - **Clans and ladder rankings**

Design Goals for SOCOM Online (continued)

3. Make it easy for console players
   - UI Screens need to be very well designed
     - Quick and easy to navigate
     - Use familiar interface conventions
     - Persistent appearance
     - Psychological grouping

4. Focus the online gameplay
   - Don't try to do everything; try to do one thing really, really well and build upon that
     - You have to ship before the console hardware changes

5. Enable the community to police itself
   - Password protected games
   - Easy to vote out players

Major Production Hurdles

- **Everything was brand new, everything…**
  - **A dependency nightmare**
- **Testing, testing, testing…**
  - **Be sure to perform a "real" Public Beta test**
- **NAT and Firewall Devices**
  - **AKA – A peer to peer nightmare**
- **Post game release server deployment**
  - **You mean we're not done?**
- **Localization**
  - **Japanese and Korean text input… ☹**
    - **We need to display 5,000+ Kanji and 2350 Hangul???**

Advice for Creating an Online Console Game

- Look at online PC games for guidance
- Don’t look at online PC games for guidance
- Enable player to player communication
  - No communication = no community
- Add community features
  - Ladders, clans, stat tracking, etc…
- Bring console production values to online gaming

Advice for Creating an Online Console Game (continued)

- Try to anticipate the worst
  - Because the reality will be much worse than what you can anticipate
    - Cheating
    - Exploits
    - Rude behavior
    - Spamming

SCE-RT Networking SDK - Architecture

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SCE-RT SDK/Infrastructure

- SCE-RT PS2 Online Titles
- SCE-RT Medius SDK
- SCE-RT DME SDK
- SCE-RT Client Simulations
- SCE-RT Server Monitoring tools

SCE-RT PS2 Online Titles

- Currently integrated into 28 1st party titles world wide
- Growing by 2-3 per month
- Good PS2 Title sells millions
  - Expect > 20,000 simultaneous online
- Easily > 200,000 simultaneous World Wide soon
- Over 500,000 Network Adapter units sold in U.S (Projected for 3/2003)
  - Network Adapter sales give accurate online user base
  - XBox Live kits similar information
  - Unlike PC
- Internet Game Soon Required for competitive edge

SCE-RT Medius SDK

- **The SCE-RT Medius SDK is the player matching service for the online experience.**
- **Infrastructure**
  - **Medius Universe Manager**
  - **Medius Lobby Server**
  - **Medius Authentication Server**
  - **Medius Proxy Server**
  - **Medius Database Caching Server**
  - **Medius Universe Information Server**
- **Client Side Coding Requirement**
  - **Medius Client**
  - **Medius Game Communication Library (MGCL)**

SCE-RT Medius SDK (Continued)

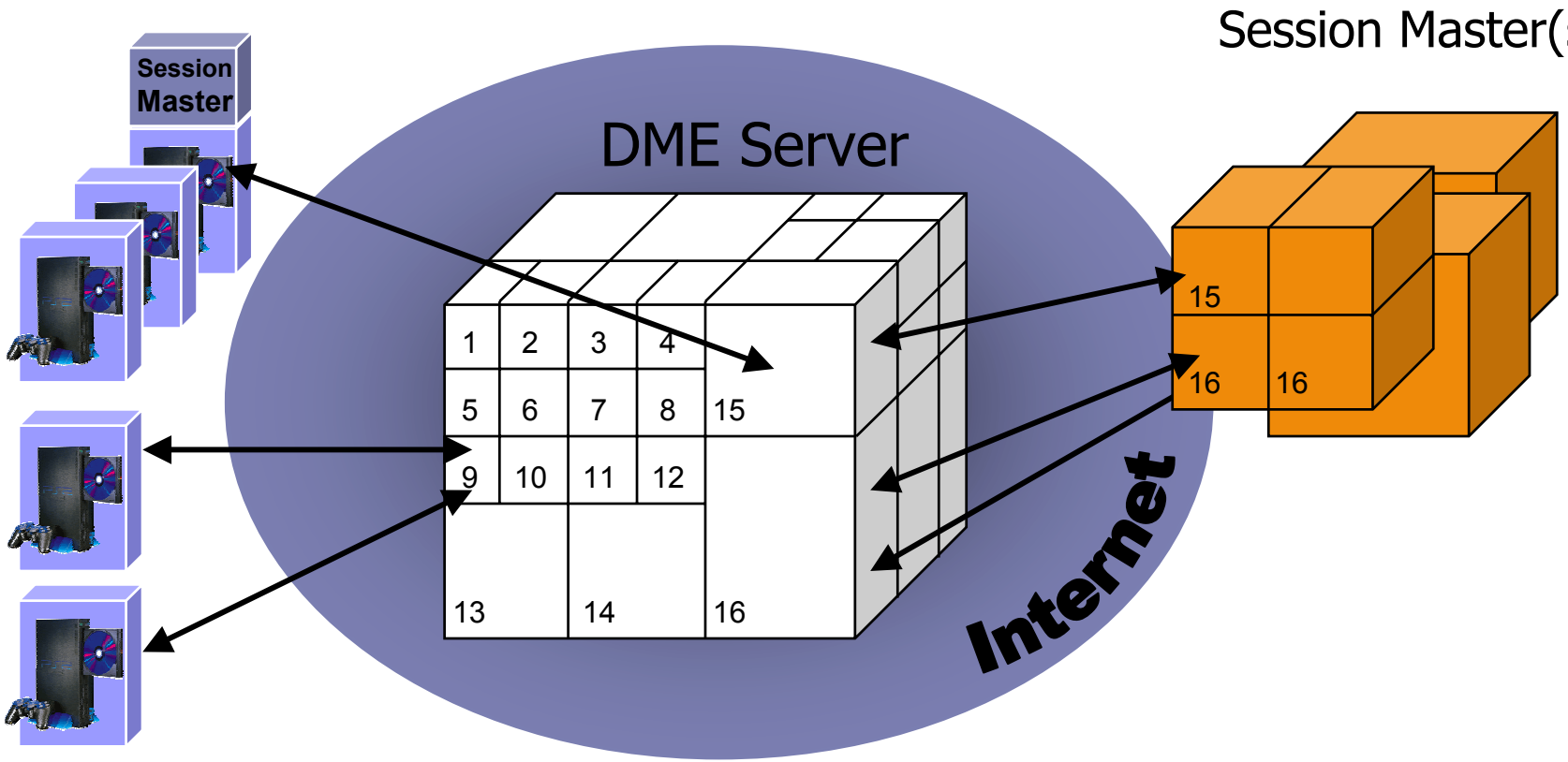
- **Client/Server architecture**
  - **Composes all backend services for online gaming**
  - **User authentication and security engine**
  - **Player matching and game list management**
  - **Create a game, join a game, play the game**
  - **Persistent player statistic tracking**
  - **Lobby and in-game chat**
  - **Buddy Lists and Instant Messaging**
  - **Clan and Ladder support**
  - **Client platform: PlayStation 2, Linux, Windows**
  - **Server platforms: PlayStation 2, Linux, Windows**

SCE-RT DME SDK

- **The RTIME Distributed Memory Engine (DME) SDK is a central part of the game application. The DME SDK is packaged into 3 components, DME client, DME Session Master and DME Server**

- **Native object interface**
- **Broadcast scheduling**
- **Client-side & server-side filtering**
- **Global timebase**
- **Reliable & latency critical communications**
- **Security**
- **Peer to peer client connections**
- **Integrated Server**
- **Client platform: PlayStation 2, Linux, Windows**
- **Server platforms: PlayStation 2, Linux, Windows**

DME Client/Session Master/Server



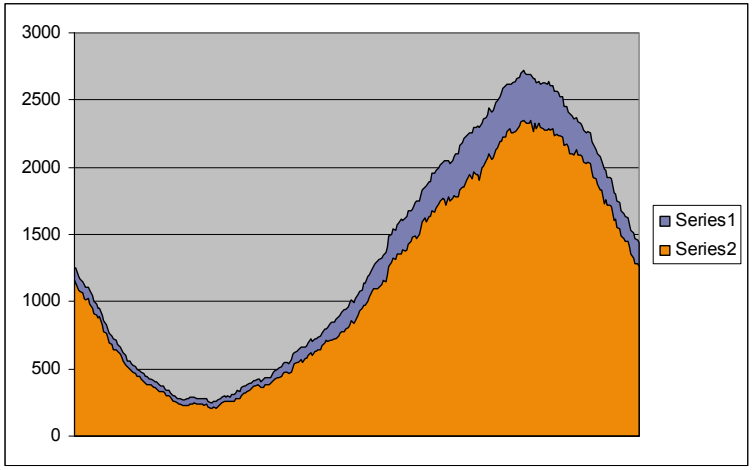
Client Simulations

- Linux Based
- Runs on Production or Development machines
- 1000 clients on production, 500 client on development
- Represents identical Medius capability
- Mimics Game Traffic rates
- Loosely based on User behavior
  - 85-92 percent in game
    - Creating games
    - Joining games
    - Playing games
  - 4% in lobby
  - 5% in lobby/game transition
  - 1-6%% chatting

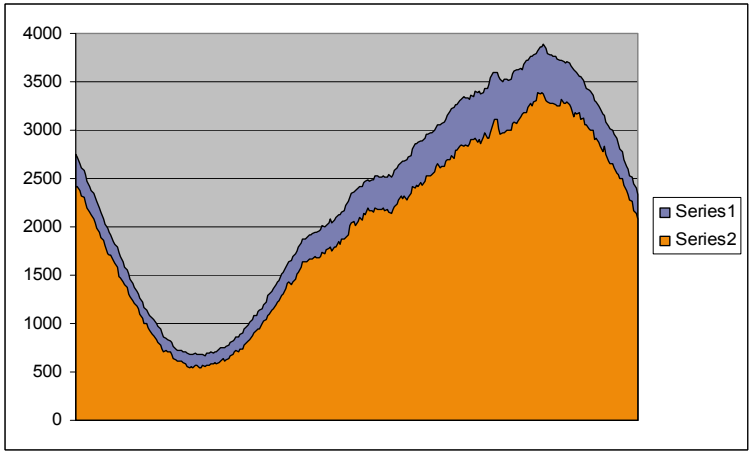
Server Monitoring tools

- Backend Monitoring (Server Executables)
  - System Health Monitoring
  - CPU, Memory, IO, Frame times, Connections
  - User Monitoring
    - Application Counts
    - Chat
    - User IP addresses
    - Hours played
    - Logins
- User data very valuable
  - What features/games users like most
  - Where users are coming from and what times
  - Sine wave usage graphs

Server Monitoring tools (Continued)



- **2 weeks after Launch**



- **10 weeks after Launch**

SOCOM In-Game Multiplayer

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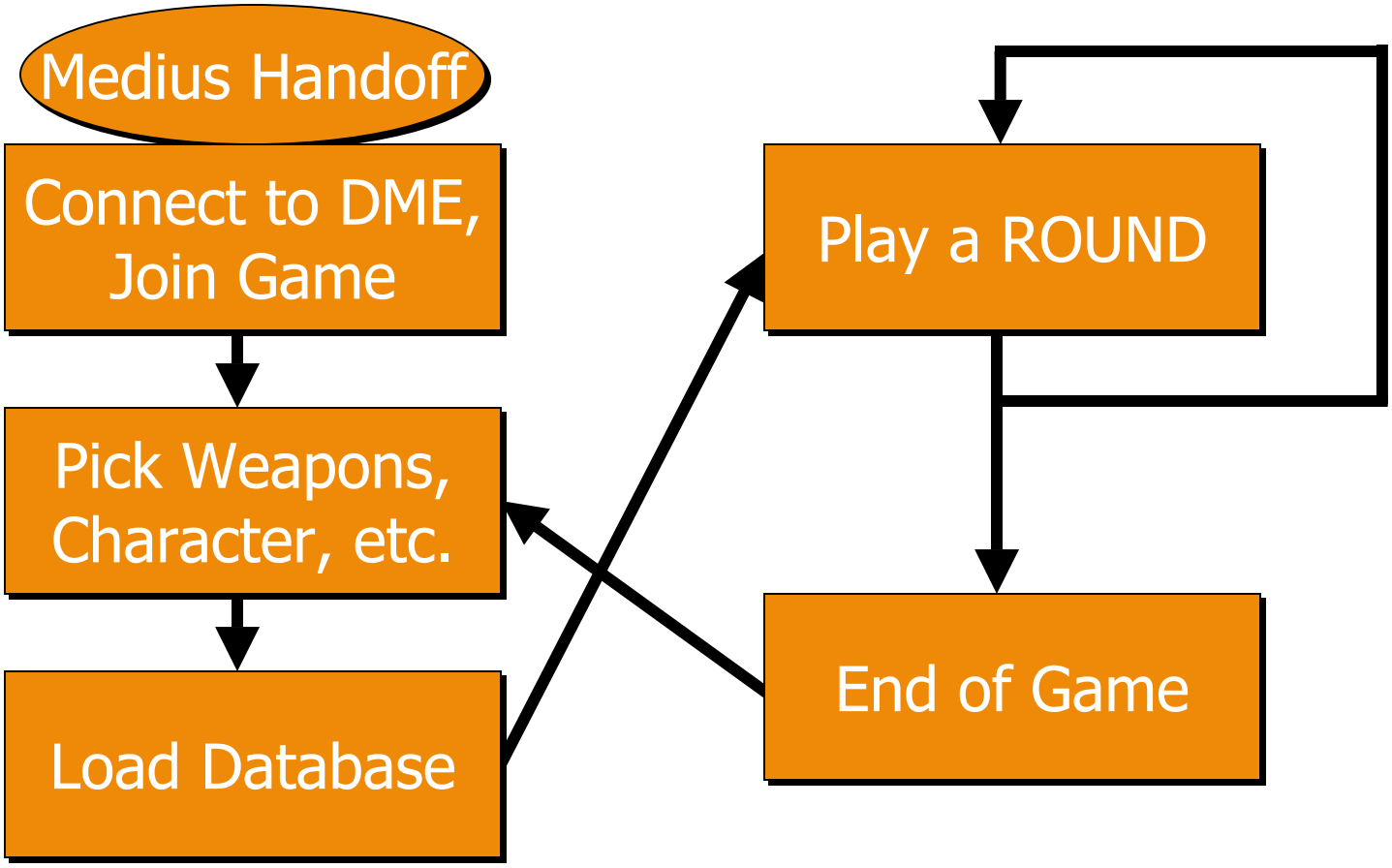
Game Based on SCE-RT DME Architecture

- Client-Server network
- Two modes of data transmission
  - Objects – Sent on a "schedule"
  - Messages – Sent on demand
- DME takes care of network interface
- One player is the "Session Master"
- Voice chat not based on SCE-RT code

SOCOM Online Game Flow



DME Network Objects

- Basically a C-struct
- Each field is registered with the DME
  - Data type (size)
  - Associate with a schedule
- Define callbacks
  - Create – When a new object is born
  - Update – When any field is updated
  - Destroy – When the object is removed

SOCOM Network Objects

- Persona – Created as you join
- Game – Created by the SM
- SEAL – Created at end of DB load
- Grenade – Created on demand
- FootBomb – Created at end of DB load for demolition games

SEAL Object Example

- Contains avatar information (position, velocity, health, and so on)
- Position data (floats) @ 2.0 units, 100 ms
- Velocity data (8 bits) @ 0.0 units, 100 ms
- Horizontal velocity applied to position between updates
- Smooth position changes when update comes in

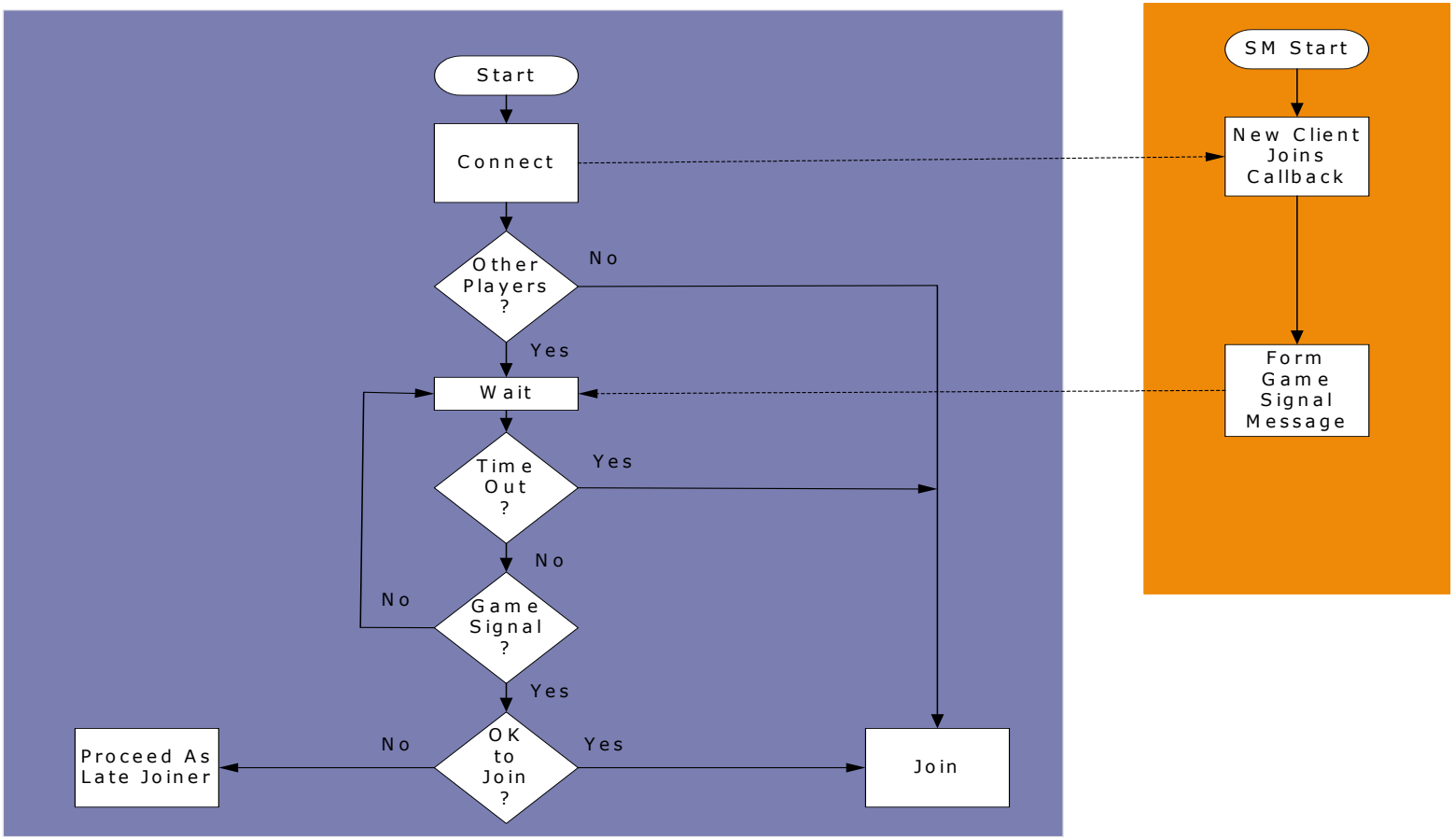
DME Network Messages

- For relatively rare updates
- Also C-struct based
- Register message & callback (handler)
- Register each field
- Can be variable length

Housekeeping Messages

- New client connects
- Client disconnects
- Client joins
- Client leaves – possibly a new SM assigned

SOCOM Join Logic



Voice Chat Overview

- Developed by Secret Level Inc.
- Public domain G.723 CODEC (3KB/sec)
- UDP protocol (point-to-point)
- Walkie-talkie type with one talker per channel at a time (256 channels)
- Channel arbitration required
- UDP/NAT problem

How to Stay Out of MP Trouble

- Get out of single player mindset (player actions)
- Limit animations that move (important) stuff
- Establish interfaces with other code segments
- Understand what causes data transmissions
- Test as many ways as possible (“Squiggle”, etc.)

What Went Wrong

- SCE-RT Issues
  - Developing code as we were
  - Changing the API as we go
  - Documentation
  - Server scalability
- Too Much Logic in UI Scripts
- Test Tools - ?
- Voice chat integration

What Went Right

- SCE-RT Issues
  - Very responsive to reported bugs
  - DME Code finally stabilized
- Reasonably Good I/F With Other Code
- Good I/F Between BEI-Medius and Zipper

Thank you!

Q&A Time