

Massively Multiplayer Online Games

Networking

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Agenda

- Introduction
- Networking in MMOs
- Current approach in MMOs
- Possible new approaches
- How efficient?
- Goals for network
- Implementation highlights
- Time plans

Introduction

- Group project (3 students)
- First Person Shooter (Capture the flag)
- Common parts
 - Rendering
 - Server architecture
 - Database

MMO Components

- Typical MMO Game has:
 - Rendering, Networking, Physics, Database, Artificial Intelligence, Reliability and Scripting, etc.
- Group chose:
 - Physics
 - Artificial Intelligence
 - Networking

Goals for project

- Research and develop chosen topics
- Benchmark the techniques implemented
- Propose new ideas (wherever possible)
- Aim for tech demo

Project Development

- Common parts:
 - Developed at start of project. Things like Server architecture, rendering and interfaces.
- Specific parts:
 - Developed after common parts.
 - Research and implementation.
 - Continuous code integration and testing.

Networking in MMOs

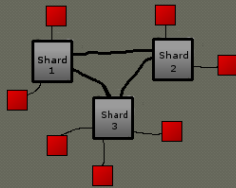
- How important is it?
- Responsible for game experience.
 - If network is slow, unpredictable events can happen in AI or Physics.
- Limitations in current MMOs.
 - Players from different regions not allowed to interact in some MMOs.
- Depends on each system architecture and number of concurrent players.

Current approach in MMOs

- Client-server architecture.
- Normally 1 server shard per map / game region.
- Limited users per region.

Possible new approaches

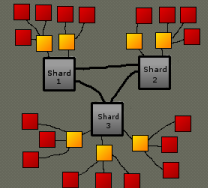
- Several shards interconnected to form a server farm for entire MMO.



- Now players on different regions can interact together.

Possible new approaches

- Each region is on a shard where it connects to broadcasting servers.



- Users connect to Broadcasting servers .
Increases concurrent users count.

How efficient?

- Efficiency will be measured by:
 - One client (or more) application executing lots of user connections to servers.
 - One client application per user connection.
 - Place router in middle to simulate real network problems (lags, lost packets and other common issues.).

Goals for network

- A more reliable network with less congestion.
- Connect a great number of users concurrently.
- Sending and receiving large volume of data at any time reliable and fast.

Implementation highlights

- Focus on UDP protocol instead of TCP protocol.
- Overlapped I/O for server and / or broadcasting servers.
- Consider 3rd party network libraries such as RakNet.
- The most efficient way to send and receive data (most probably that will be large packets with compressed data).

Time plan

- The plan is to complete the MMO in 12 weeks.
- Initial 2 weeks for common parts.
- Thereafter 10 weeks for R&D and milestones are interleaved until MMO is finished.



References

- <http://en.wikipedia.org/wiki/MMORPG>
- <http://www.ibm.com/developerworks/library/ar-powerup1/>
- <http://www.jenkinssoftware.com/>
- Snader, J., 2000, Effective TCP/IP Programming, Addison Wesley.

THANK YOU.