Network Games

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Better QoE for Cloud-based Game Streaming

Traditional

Cloud-based

Thin Client

Cloud Servers

Client

Player input

Game frames

Response time

Message: User Input

Game World

Process Input

Server

Server

User Input

Display World

Time

Game frames

Server

Server

Player input

Cloud Servers

Network Games

Lag can kill!
(your fun)

Need latency compensation!
Need buffering for smoothing jitter!

Methodology

• Build latency compensation & buffering
• Evaluate with user study experiments
  ✓ Measure and model benefits
• Provide API for game developers
• Build game to demonstrate
• Deploy to Cloud/Testbed
First-Person Science - Exploring FPS Games and Latency

Lag can kill!
(your fun)

Need latency compensation!

Methodology

- Build network game
- Add latency compensation
- Evaluate with user study
- Analyze

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TCP/QUIC Performance

Suffers when high round-trip time → Satellite Internet!

Methodology

1. Read and discuss research papers on networking
2. Design and run experiments (programs sending network traffic)
3. Analyze the data (stats and drawing graphs)
4. Improve congestion control algorithms
5. Repeat 2-4, as needed → publish!

Satellite Testbed

Internet’s Classic and New broadband Facility

Satellite Testbed

Satellite Internet!

Methodology

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Congestion Control Research Group