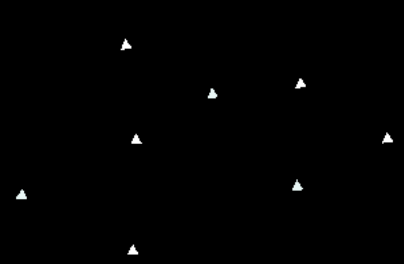
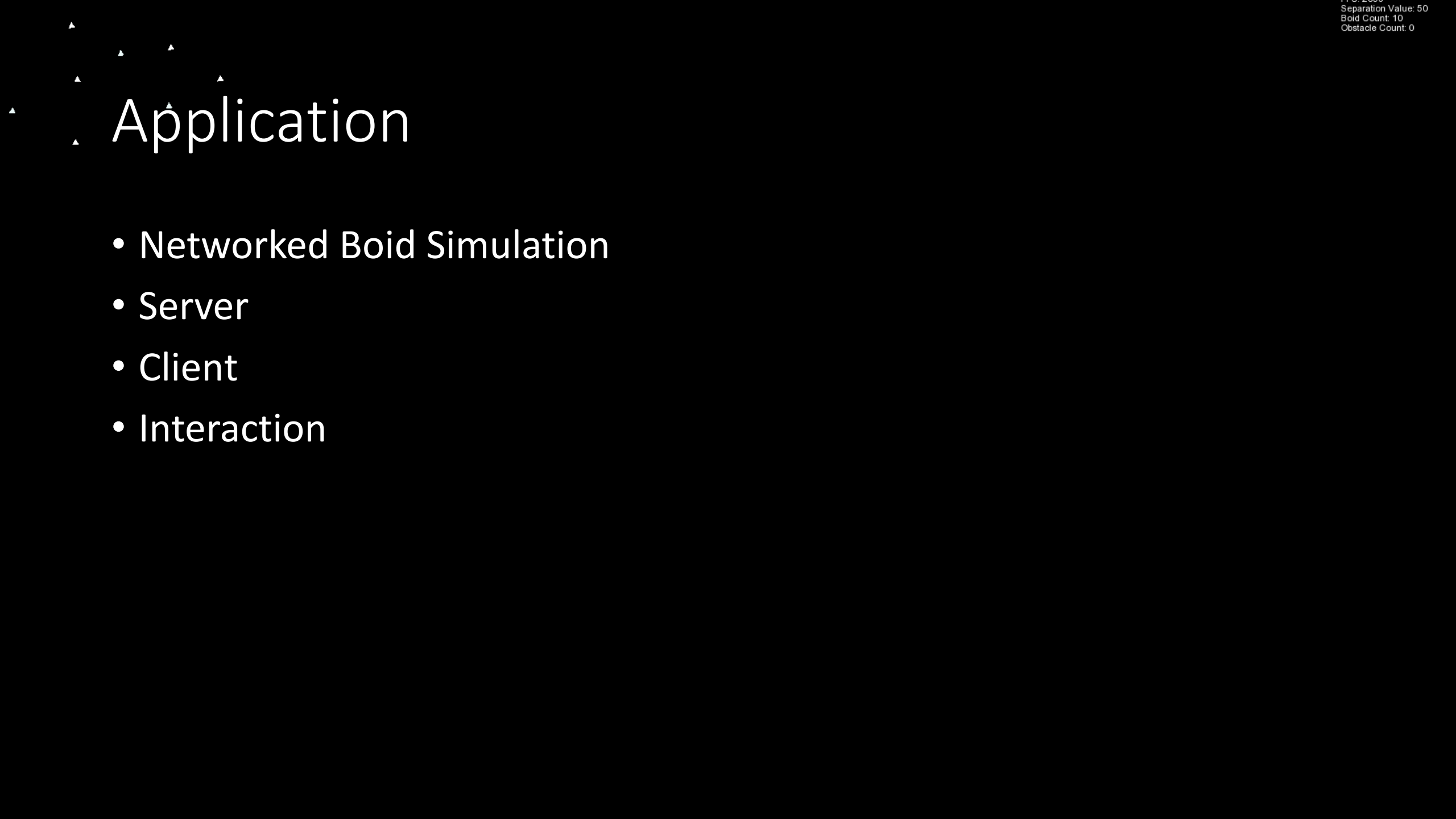


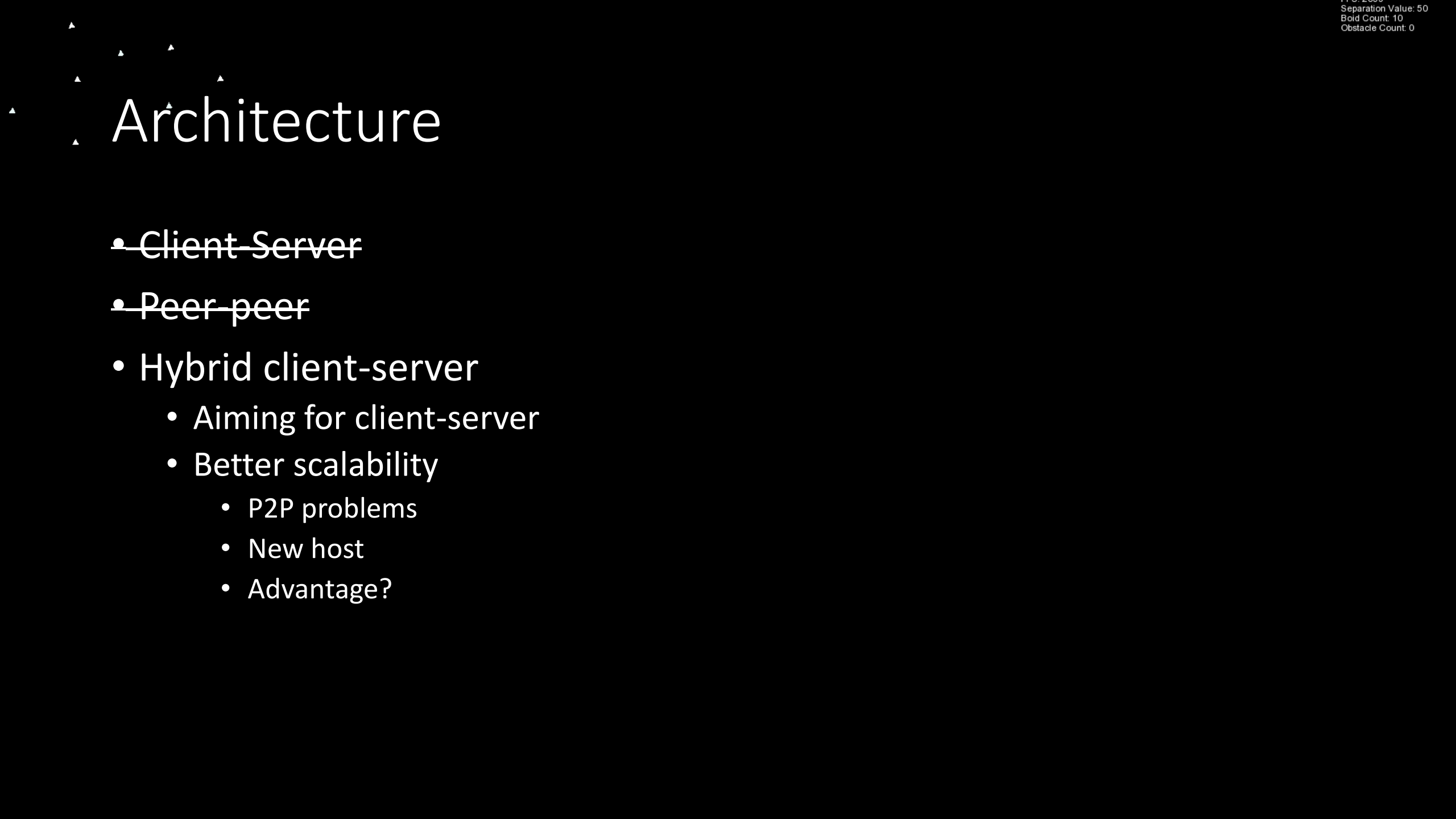
CMP303 Networking

Fraser Barker(1600196)



Application

- Networked Boid Simulation
- Server
- Client
- Interaction



Architecture

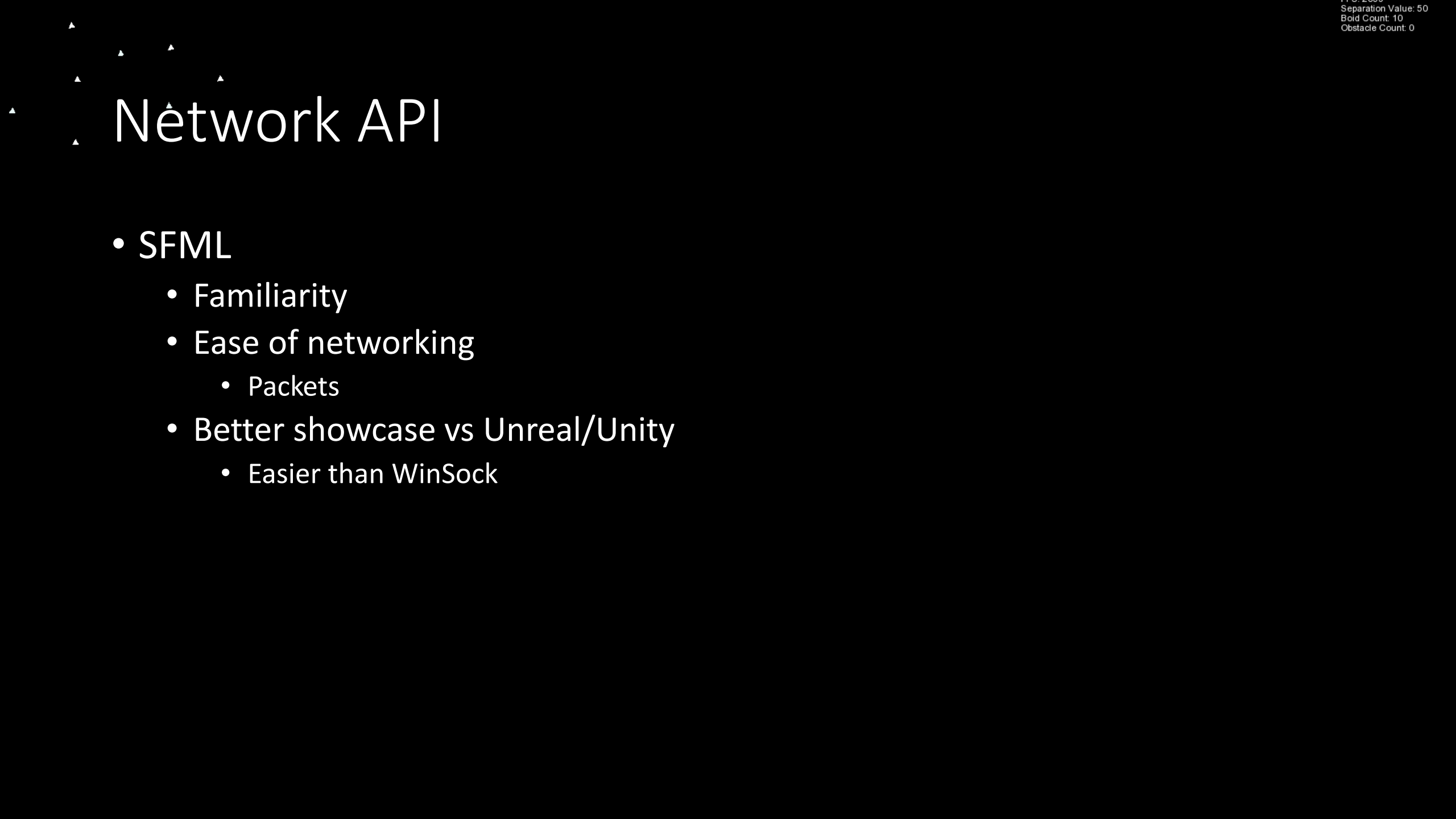
- ~~Client-Server~~
- ~~Peer-peer~~
- Hybrid client-server
  - Aiming for client-server
  - Better scalability
    - P2P problems
    - New host
    - Advantage?

Separation Value: 50
Boid Count: 10
Obstacle Count: 0

Protocols

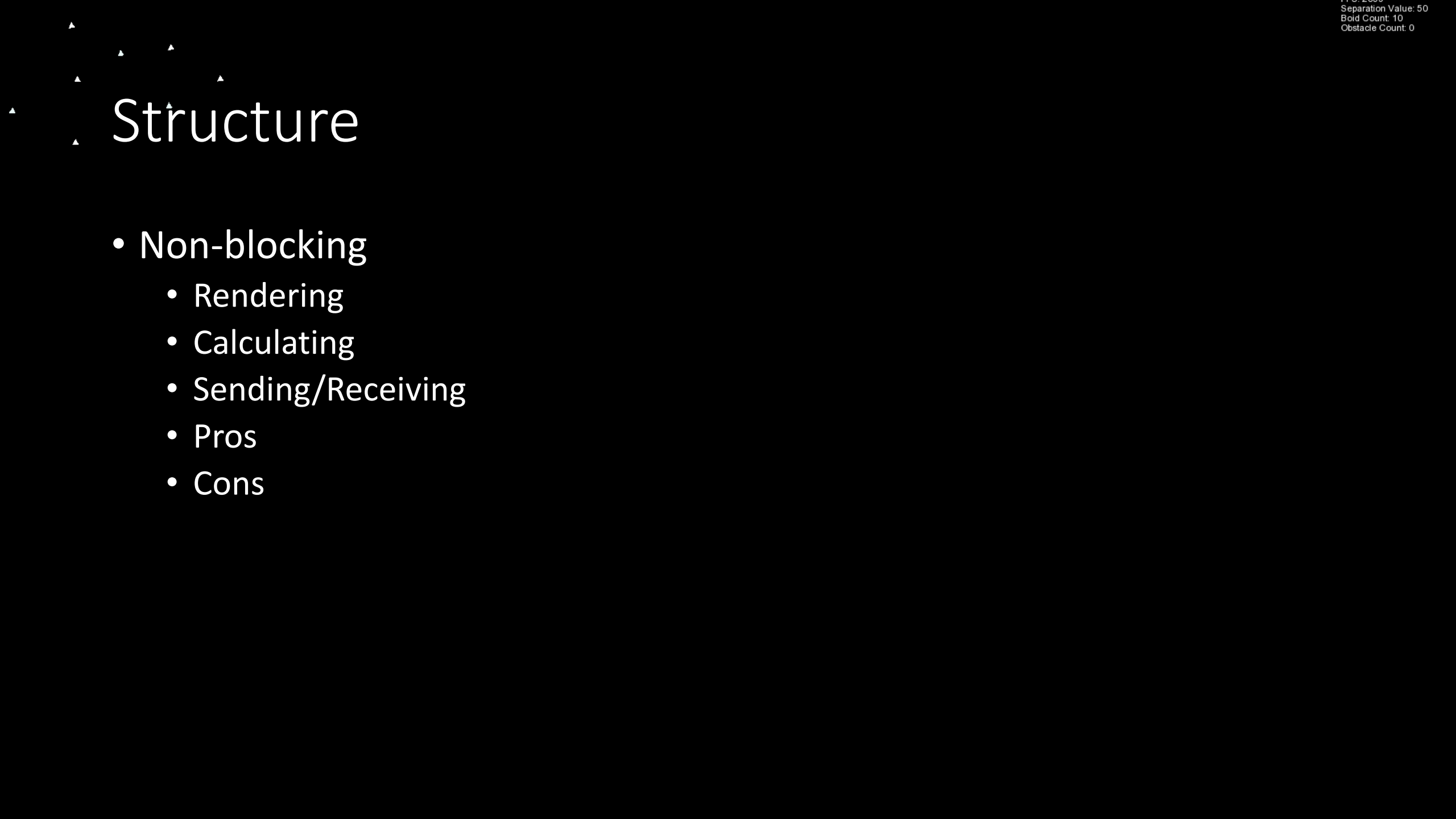
- Application layer protocols designed
  - Messages
    - Enums
    - Boids
    - Obstacles
- Transport layer protocols chosen
  - UDP
    - Speed
    - Connectionless
    - One socket to talk to multiple
    - Less overheard

```
enum Messages : int
{
    Connect,
    BoidCount,
    ObstacleCount,
    Disconnect
};

struct BaseMessage
{
    int messageType;

    BaseMessage() :
        messageType(0)
    {
    }
};

struct NewConnection : BaseMessage
{
    float time;
    float totalTime;
    int playerID;

    NewConnection()
    {
    }

    NewConnection(float time_, float totalTime_, int ID) :
        time(time_),
        totalTime(totalTime_),
        playerID(ID)
    {
        messageType = Messages::Connect;
    }
};
```



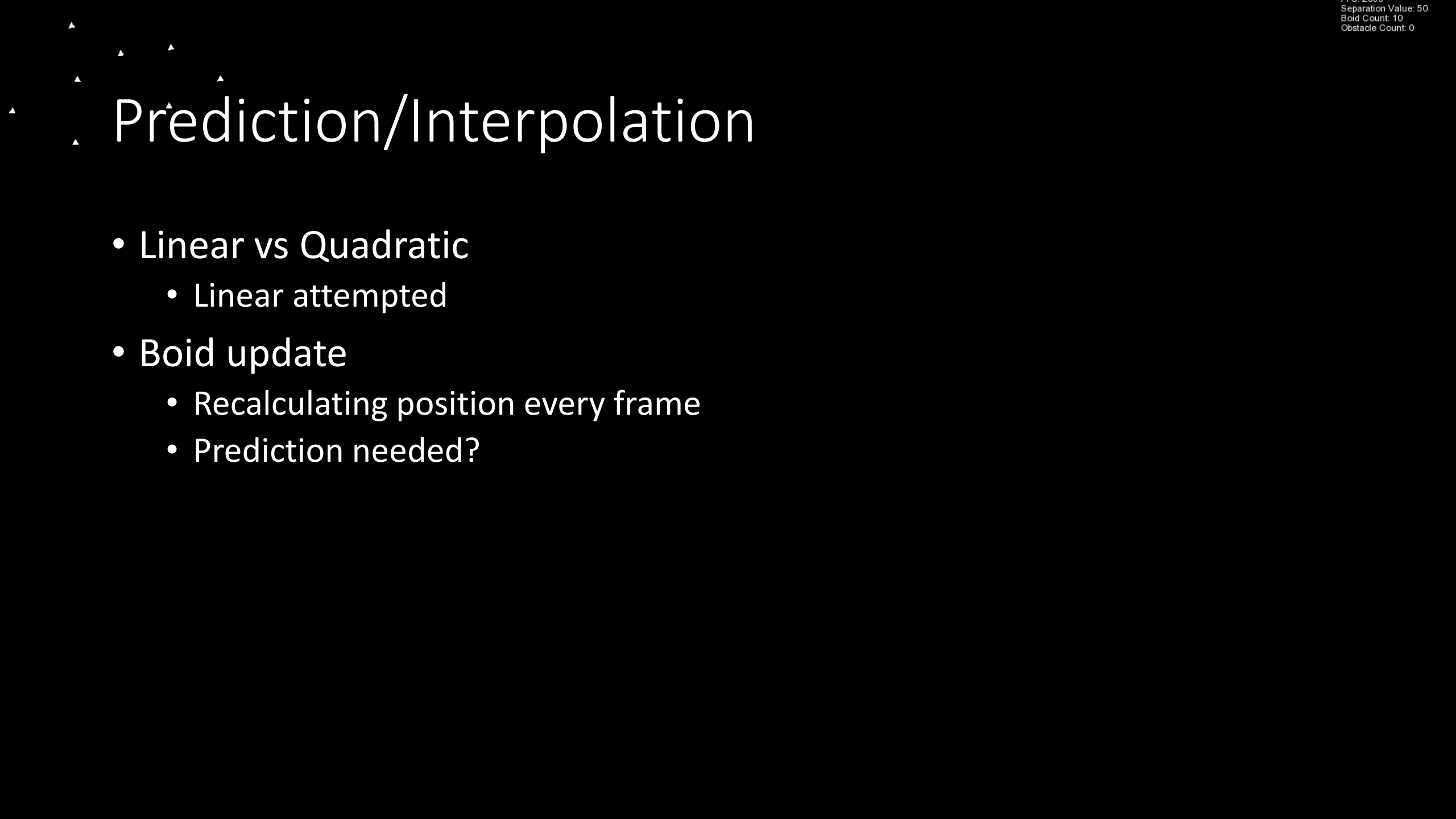
Network API

- SFML
  - Familiarity
  - Ease of networking
    - Packets
  - Better showcase vs Unreal/Unity
    - Easier than WinSock



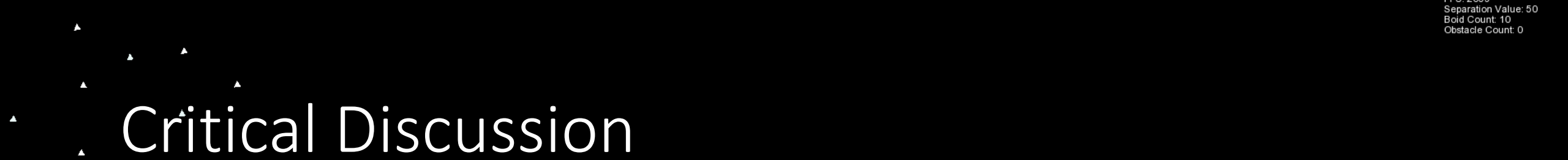
Structure

- Non-blocking
  - Rendering
  - Calculating
  - Sending/Receiving
  - Pros
  - Cons



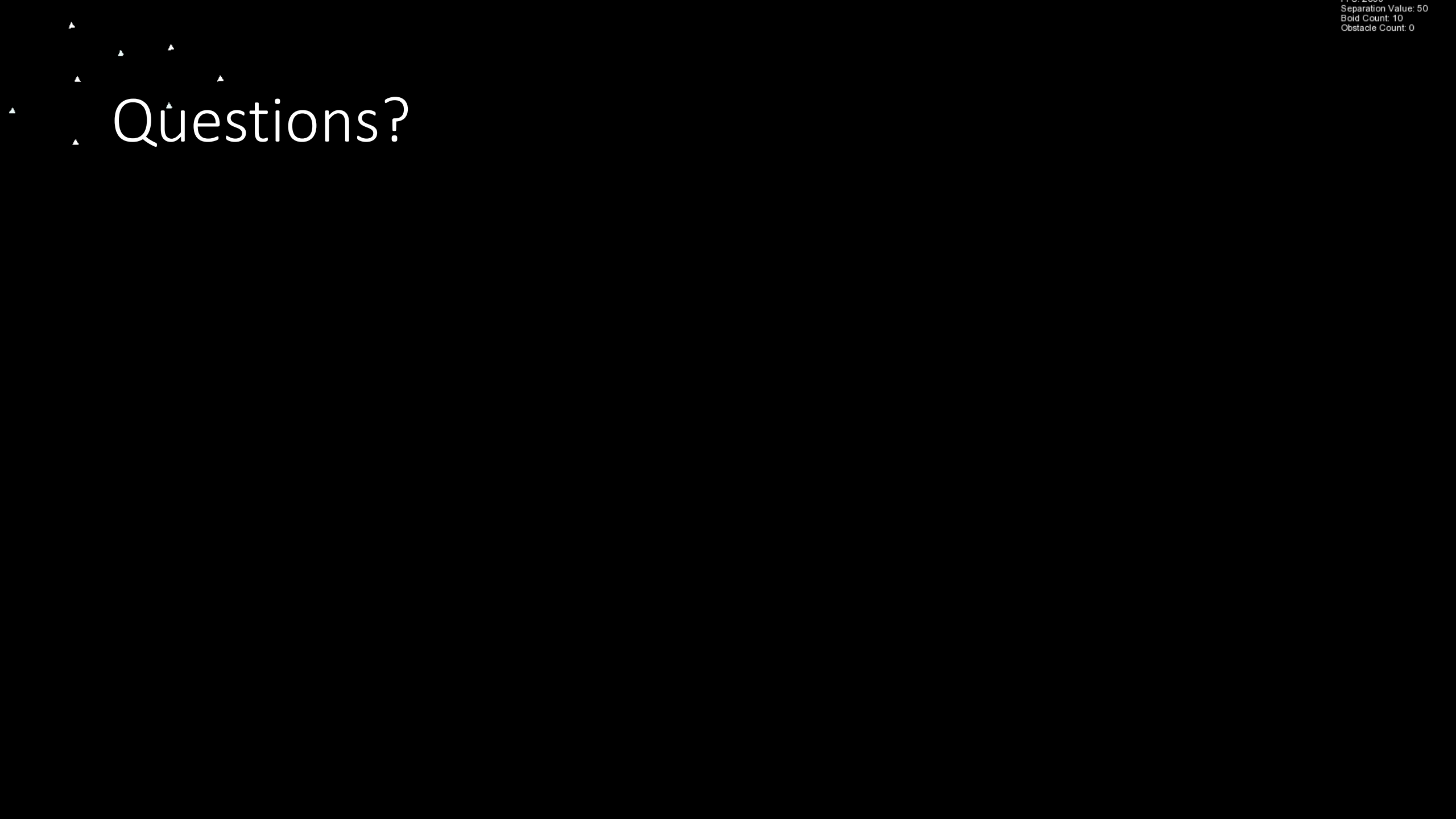
Prediction/Interpolation

- Linear vs Quadratic
  - Linear attempted
- Boid update
  - Recalculating position every frame
  - Prediction needed?



Critical Discussion

- Use TCP for connection/disconnection
- Connection class
- Improve/add prediction
- More interaction
- Sf::Int
- Clumsy Testing
  - Max players 3 – Boid information.
  - Max latency 50ms -250ms, 250ms – 500ms
  - Packet loss – 25%, 50%+, 75%?
  - Throttling – 50%, 75%+ delay
  - Duplicates – 50%, 75%+ Double boids
  - Out Of Order – 50%, 75%+ seems fine too?
  - Tamper – 50% - Server issues.
  - All?



Questions?