FIU
School of Computing & Information Sciences

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Next Generation Networking for Virtual Reality and Game Player Collaborative and Multi-Player 1.0
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Computing & Information Sciences

VIP Vertically Integrated Projects

Problem

With next-generation video games on the rise, the demand of online gaming content has dramatically increased. The new generation of gamers desire instant gratification of low latency and high throughput force on force multiplayer action, with little to no network delay (lag) or downtime.
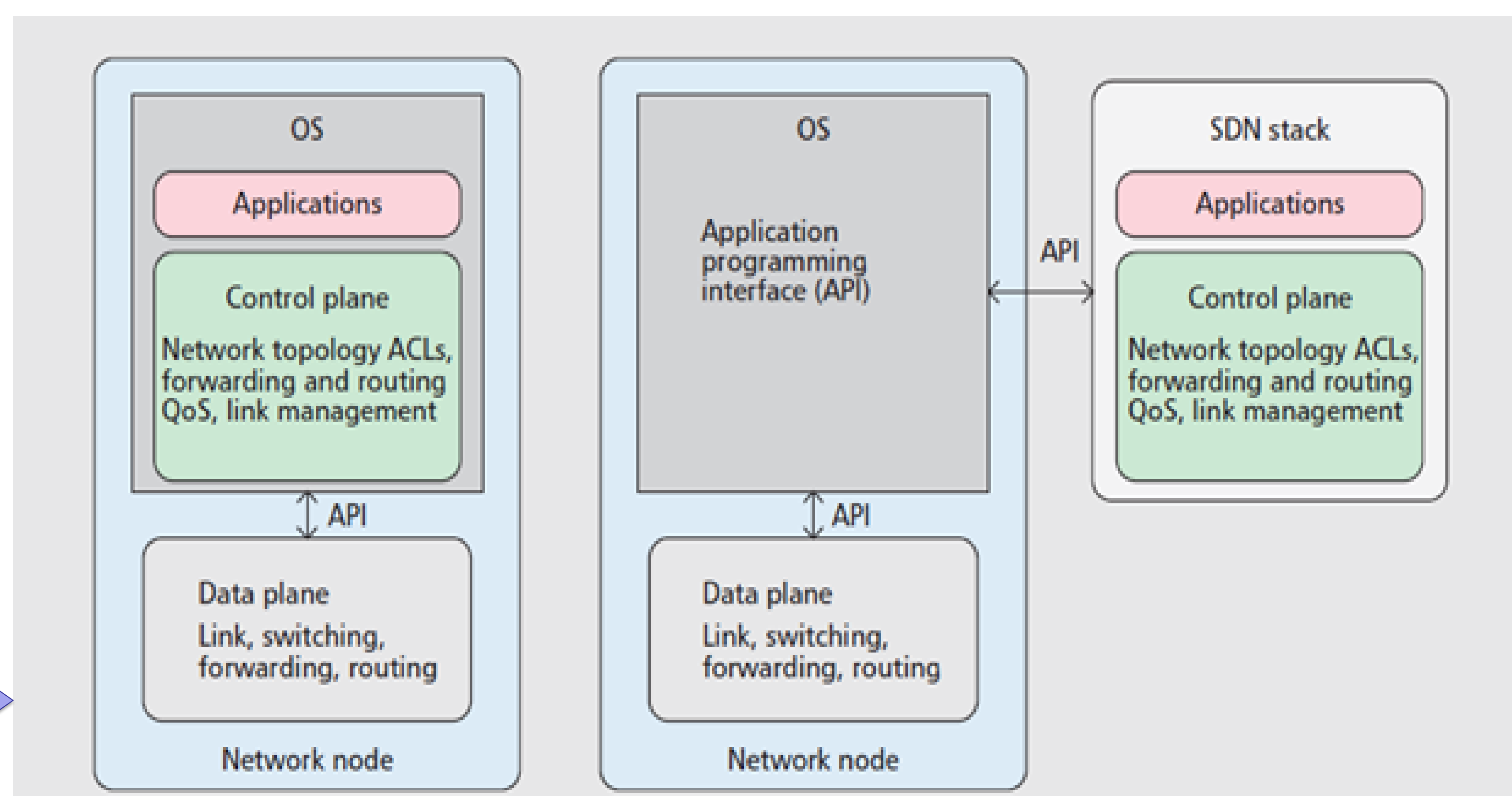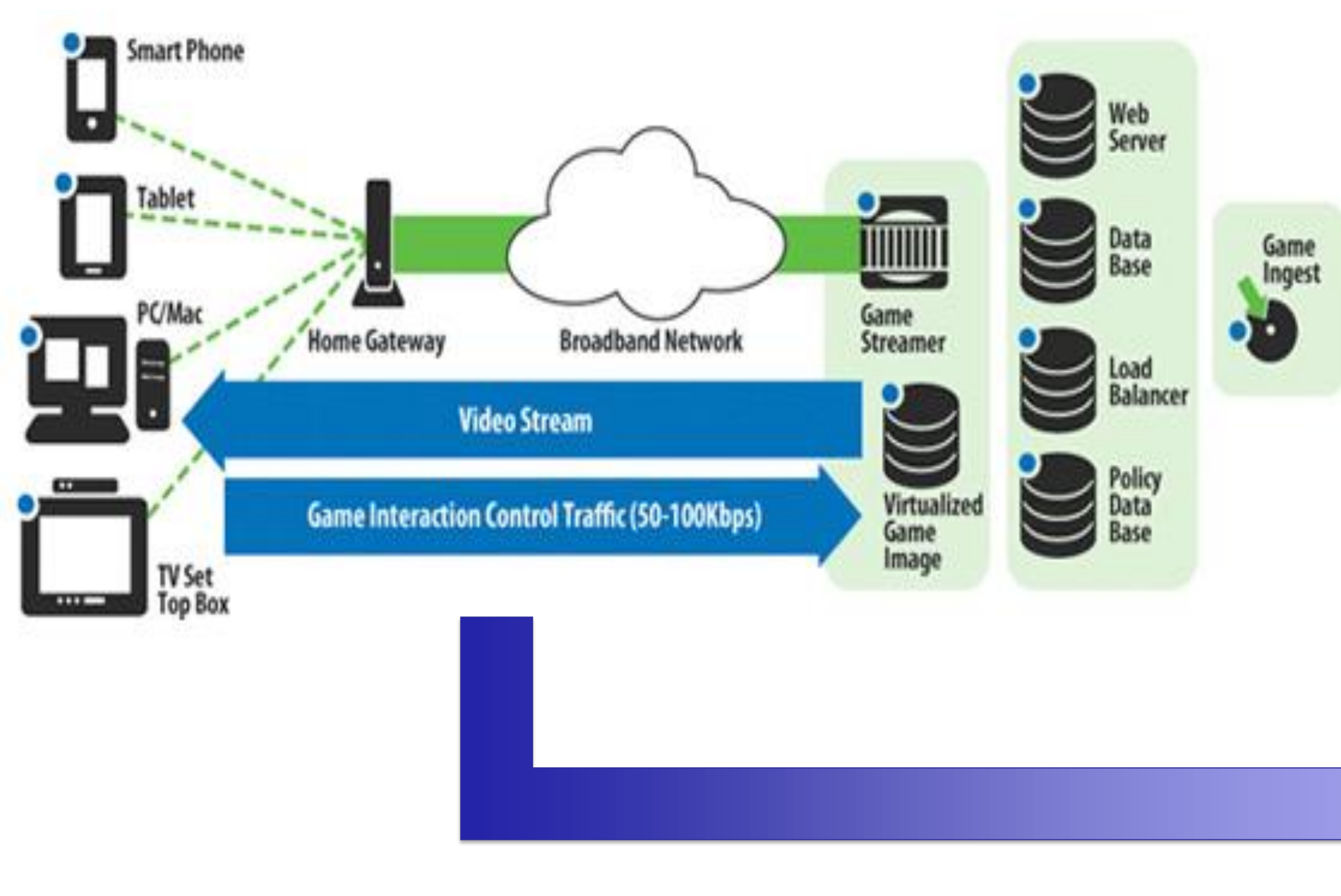
Solution

The implementation of Software-Defined Networking (SDN) within the video game industry provides a great ordeal for game servers to dynamically handle varying amounts of network traffic and bandwidth, to provide a smoother gaming experience, without users worrying about their Internet speed.

Current System
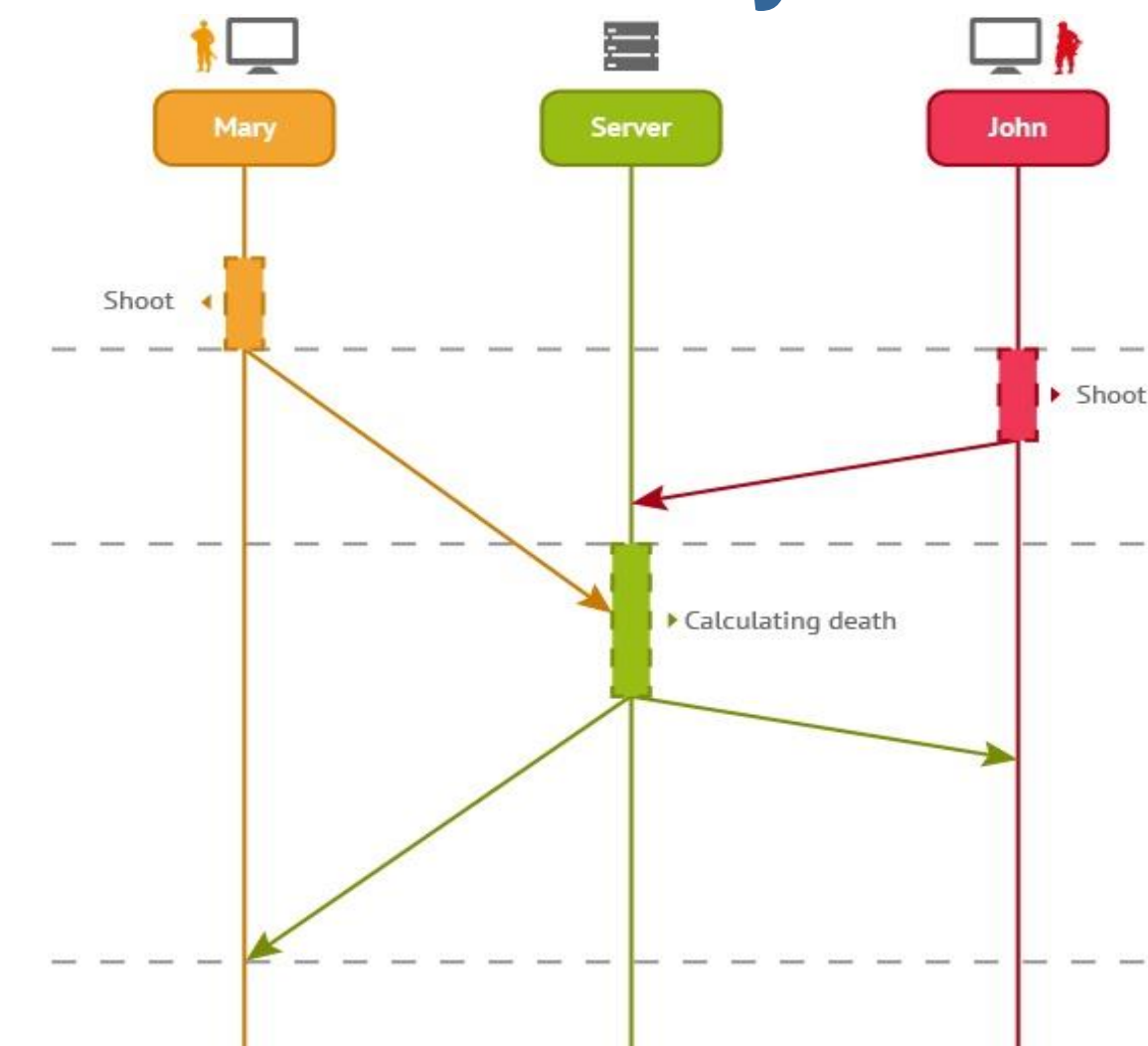
Screenshots

Requirements

The SDN Architecture will require extensive work and research to ensure compatibility with existing network paradigms. SDN must also be supportive to all types of networks, including:

- Wide Area Transport Networks
- Data center networks
- Residential IP services
- Intra-site service
- Transport Services

System Design

A hypernet is an integrated bundle that covers all the knowledge needed to create a SDN network and deploy the software needed to run on the SDN. It can be tailored for a specific game would contain a program to devise the optimal network topology from:
- given set of current players
- the software protocol stacks utilized on the end system
- router methods(priority queues, multicast, routing tables)

Implementation

Incorporate SDN capabilities by reducing amount of hardware specifications, which will require more maintenance services, and allowing more controllable software API and virtualized framework to manage workflow of constant streaming of data packets, to reduce payload of physical servers.

Verification

We want to provide a foundational support for future implementation for multiplayer collaboration. In future projects, we aim to test SDN on higher end gaming platforms to test, and improve network efficiency in an online environment.

Object Design

We convey a "hypernet" as the underlying framework supporting specific set of APIs

User would be able configure/program each switch and allow communication between each API to run on each switch; rather than application pre-configured on switch.

Summary

SDN provides the solution for reduced latency and improve online performance across video game network infrastructure. For future works, we would like to expand about Virtual and Augmented Reality platforms; which will require more extensive hardware and network support.