



Technical Briefing

Introduction

With gaming now a predominantly online activity the ability of the gaming application to deal gracefully with a wide range of different network conditions and Internet service provider networks is absolutely key to the gamers' experience and therefore the game's success. A poor gaming experience as a consequence of Internet issues can have serious consequences.



Gamers are very keen to share their positive and negative experiences quickly proving the adage "its hard to build a reputation and very easy to lose it".

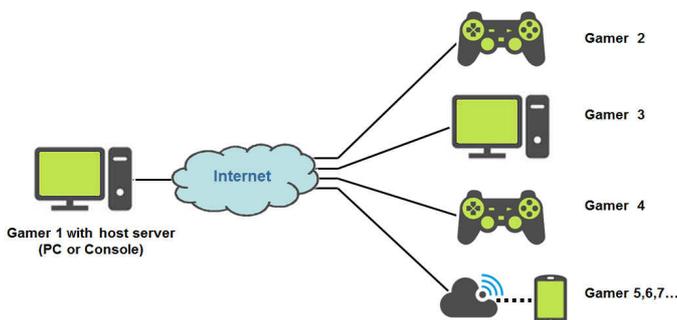
For online bookmakers and gambling in no other industry are the consequences more immediate, damaging and costly.

Overview

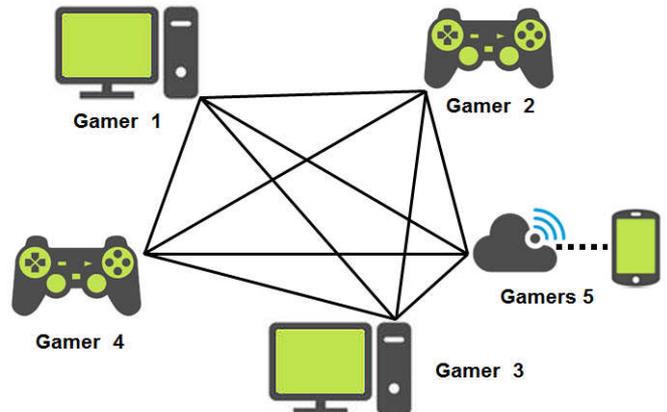
Online games typically operate in one of two ways:

- **Client to Server:** Where the server is hosted by either the game provider or for some game play it is located with a game player and the gamers then connect to this server in order to play.
- **Peer to Peer:** Where the game is a multiplayer (networking) scenario and the game consoles/PCs are basically synchronized: A player issues a command and this is executed in exactly the same way, at the same time, on the other gamers machines.

Client to Server - Gamer Hosted Server Example



Peer to Peer



A Peer to Peer fully meshed network scenario where all the PC/Game consoles communicate. Since the simulations must always have the exact same input, the game can really only run as fast as the slowest machine can process the communications, render the turn, and send out new commands.

Internet Issues

Regardless of the topology the two prominent Internet related gaming issues are data latency and data loss.

Two significant factors that make the gameplay feel "laggy" are:

- If one machine's frame rate drops (or is lower than the rest) the other machines will process their commands, render all of the allocated time, and end up waiting for the next turn.
- Communications lag which is entirely due to Internet latency and lost data packets would also stop the game as the players waited around for enough data to complete the turn.

Another issue that will affect the playability of the game is the amount of data transmitted over the Internet (the data rate). A number of things affect the data rate including the location of other players, the layout of the landscape, any combat situations, the current state of objects in the game, etc. The higher the data rate the more likely that the gamer will experience data latency or data loss.

In a Client to Server Gamer Hosted scenario the gamer's Internet link could be anything from a poor xDSL line to an excellent fiber link.

The more players connected the greater the data rates. When the data rate becomes constrained by the link capacity the gamers will begin to see problems.

Testing with Real Networks

Clearly the game developer must include testing games 'in the network' as a critical part of the testing process in order to ensure the Internet aspects of the game's operability. However, it really isn't practical or viable to test in a real network because:

- ⇒ Real networks are not manageable - It isn't feasible to provide multiple network types and topologies and regardless, you can't easily induce appropriate transmission issues.
- ⇒ You can't determine the network characteristics and transmission issues being experienced; you really are flying blind.
- ⇒ The network scenarios are not controllable and repeatable. How would you replicate the exact test case scenarios.

Network Virtualization (Emulation)

If it isn't viable to develop and test in a real network how does a game company solve this quandary?

The answer is **Network Virtualization** technology that allows gaming companies to create **Virtual Test Networks** that can replicate all the real-world network scenarios and associated transmission issues likely to be encountered in real online gaming environments.



A Virtual Test Network is more useful than the real network because you can replicate, on demand, any network scenario, all the transmission issues and do this in a completely controlled and repeatable manner.

Another invaluable feature of a Virtual Test Network is that you can see what's really happening with powerful inbuilt statistics, reports and graphs providing total visibility in terms of the communication traffic, performance and errors.

Creating the Ideal Test Environment

With a Virtual Test Network we can bring all the gamers into one place; a controlled test environment where we know that the game is safe and secure.

You can create different topologies where many or all of the test gamers have different Internet links and even on similar links the test gamers can have differing Internet experiences in terms of the quality and stability of those links.

The test scenarios are not only controllable and repeatable but with a Virtual Test Network you can push the 'real-world' scenarios to the point of game failure and therefore truly understand the scope of your customers acceptable gaming environment and the gaming response requirements in all situations.

Agile Testing

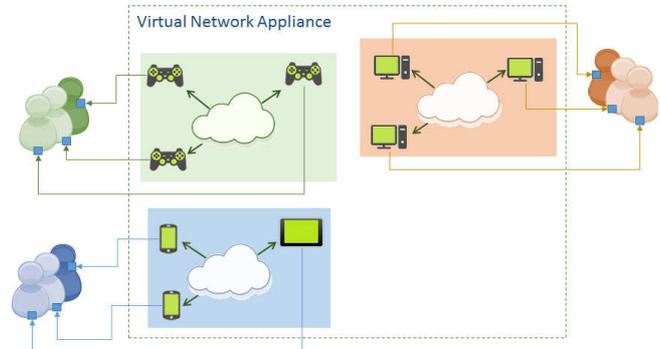
Network Virtualization also enhances Agile test methodologies. Virtual Test Networks supporting a menu of automated pre-set test scenarios can be provided to development groups with more sophisticated Virtual Test Network environments for the QA and Test Deployment teams.



All groups operate with the reassurance that test environments are appropriate and complementary to the overall QA goals.

iTrinegy – The World Leader in Network Virtualization

iTrinegy, the recognized leader in network virtualization, uniquely supports the most demanding requirements of game developers needing to test applications in the most complex real world fully meshed peer to peer network scenarios.



Compelling features include the ability to scale the test environment as required with full multi-tenancy capability (multiple users running multiple emulations with all the appropriate user level security and access controls). An elegant and intuitive pictorial GUIs with a full picture overlay facility so that testers can fully visualize the network gaming topologies.

iTrinegy is the only Network Virtualization vendor with the technology that can create fully meshed peer to peer network scenarios required in the gaming industry. iTrinegy's Network Virtualization technology represents the defining way to deliver the insight, proof and confidence that your games will perform in real game play environments.

iTrinegy is trusted and valued by the biggest names in game development.