

Why you'll love uLink over Unity Network





INTRODUCTION

At UnityPark we believe that Unity is an amazing game engine and that its only apparent flaw is its built-in networking. Because of this, we have from day one set out to address every weakness in the built-in network when designing our own uLink. By now, there are tons and tons of new features and crucial changes that make uLink complete, flexible and reliable to the core, while remaining familiar to Unity Network developers. And just like Unity Network, uLink is used together with the Unity game engine on both the client and server-side.

- ♥ uLink handles way more players, is production ready and has commercial quality while Unity Network does not.
- ♥ uLink has a more than four times larger API than Unity Network.
- ♥ uLink means you write less code and can utilize ready-to-use building blocks for complicated details of networking.





COMPARISON

>> AUTHORITATIVE SERVER

Unity Network

Doesn't at all support authoritative servers. This is an unacceptable security flaw which is ridiculously easy to exploit, even by novice hackers who want to cheat or ruin the game for other players. This is even more serious if the game is commercial in any sense, such as having subscription fees or micro-payments.

uLink

Has been designed from the ground up with authoritative server support. By enabling authoritative server mode any attempts from players to hack or cheat in the game is simply blocked and logged. Non-authoritative server mode is also fully supported across the entire API, which makes it easy to first test the game logic without anti-cheat.

>> OBJECT MANAGEMENT

Unity Network

Has very limited object management functionality. Game objects can't for instance, have an initial state such as a given name, color, etc. Game object logic and resources can't be clearly separated between server-side and client-side. All this greatly complicates development of for ex. avatars and NPCs, which increases development time and bugs, not to mention maintenance work.

uLink

Has an amazingly powerful and just-straightforward API for object management. Including user-defined and arbitrarily-long initial states for game objects upon instantiation. Even more importantly, a separation of logic and resources between server-side and client-side that is truly elegant. This separation is done by introducing a clever paradigm which has three types of roles: Creator (usually the server), Owner (the player who owns a specific avatar) and Proxy (all the other players who do not own that avatar). Combined, this means less and cleaner code so you can focus on making your game great.



>> RPC COMMUNICATION

unity Network

Has very limited RPC functionality. Doesn't support any reliability types other than reliable in-order. Can't handle array arguments, or variable-length arguments. Has limited broadcasting options. Inflexible receiver control and many other restrictions. This not only prohibits optimizations but also cripples network communication overall.

uLink

Has incredibly flexible and powerful RPC functionality compared to Unity Network. Supports not only array arguments or serialization of user-defined classes, but also variable length arguments. Supports multiple reliability types such as reliable (in-order), unreliable etc. Rich broadcasting options and an impressively large number of RPC receivers to choose from. Arguments are type safe in debug mode so they can't be read incorrectly on the other end. RPCs can also be optimized to the bone by for example removing timestamps and other header data.

>> DATA SERIALIZATION

unity Network

Has an unbelievably limited range of data that can be transferred (int, float, string, NetworkPlayer, NetworkViewID, Vector3 and Quaternion). More importantly these can't be arrays or variable length which effectively prevents useful network communication.

uLink

Automatically serializes all types, including entire user-defined objects, arrays and even nullable types. uLink also allows you to customize the serialization process for each type, including user-defined types, so that you can optimize and control the bandwidth further. These features makes uLink exceptionally easy and powerful for any multiplayer or online game.



>> LOGIN & PERSISTENCE

Unity Network

Has no way to reject or approve incoming connections from players based on login information such as user name and password. Neither can you reserve a player ID based on login information so that it is persistent, which is extremely valuable for persistent games such as MMOs.

uLink

Not only can you approve or reject incoming connections from players, based on user-defined login data, but you can also respond back, with more user-defined data to, for example, inform the player ahead of time which level to load. In addition, you can either automatically assign unique player IDs or manually based on login information. If you want to make a persistent game such as an MMO then this is a must have.

>> SECURITY & AUTHENTICATION

Unity Network

Has very basic all-or-nothing security. This wastes huge amounts of resources in both bandwidth and CPU usage for both client and server which instead could have been used to improve the game experience or reduce the cost of the maintaining the game servers. In addition Unity does not offer any form of authentication of game servers which is a highly critical security hole.

uLink

Has a very smart and intuitive security system which offers encryption on demand. Encryption can be per event, per player, or per message and it will always notify you when it is initialized or not. In addition uLink prevents man-in-the-middle attacks by supporting authentication of servers. This is vital for commercial games so that players can trust the server with sensitive information. Generating authentication keys can directly be done in the uLink window in the Unity Editor, with instructions on how to use them.



>> RELEASE CYCLE

unity Network

The Unity engine has a long and complicated release process compared to uLink. To patch network bugs, add new features or any other type of change, a full Unity release has to be shipped. Not only to all developers but also all players. This makes it slow and costly to propagate network fixes and updates.

uLink

uLink is completely written in C# and is entirely layered above the Unity game engine. This means that new releases does neither require the developer to install a new version of Unity or force the player to install a new Unity web player. The end result is that players have lower threshold to play your game and in addition you don't have to wait ages for fixes and updates.

>> LOBBY

unity Network

Has only basic server listing called the Unity Master Server, which can't be queried by anything other than your game's title. The host information also lacks a lot of game-critical data such as ping, level etc. Neither does Unity Network support automatic LAN discovery or retrieving up-to-date information from favorite game servers. In addition it is also non-trivial to deploy Unity's Master Server since the source code and dependencies need to be built by you on each platform.

uLink

Features a SQL-like server listing called the uLink Master Server which can be queried by custom requirements such as non-empty game, dedicated server, ping etc. The host information is packed with important data such as level, timestamp etc. The Master Server is completely written in C#, thus can run in .NET on Windows or Mono on Mac OS X, Linux and similar with just one click. uLink can also automatically discover all servers in a LAN and retrieve real-time information about favorite game servers before connecting. In addition uLink can be extended with uLobby which is a complete all-in-one lobby system with chat, web-interface, instancing servers, Facebook integration etc.



>> ZONED MMO

unity Network

Has no support for any form of zoned MMO, or even handing over avatars between server instances. Basically you can't have more than one server for your game which is unfeasible for a MMO or similar.

uLink

Supports zoned MMO and also handing over avatars between server instances. uLink also offers pure P2P communication (outside of the regular connected client/server network) which has endless uses such as for communicating with a central server and lobby server made with uLink. If you want to release an MMO then uLink is a no-brainer.

>> SEAMLESS MMO

unity Network

Has no support for any form of a multiple-server MMO, never mind seamless.

uLink

Is designed from the ground up to transparently work together with Pikko Server for unprecedented, 100% dynamic load balancing and perfectly seamless MMOs.



>> PROXY SERVER

unity Network

When hosting a game server from a web player on the player's machine there is no guarantee that anyone can connect to it because of NAT and firewalls. To circumvent this issue a proxy server is used but unfortunately Unity Network's proxy server is not ready for production and is unreliable. In addition the proxy server is non-trivial to deploy because the source code and dependencies need to be built by you on each platform.

uLink

Has a built-in proxy server in the uLink Master Server, to circumvent NAT and firewalls on player hosted games. The Master Server can automatically determine whether to use the proxy server or not upon registration of the player's game. The Master Server is completely written in C#, thus can run in .NET on Windows or Mono on Mac OS X, Linux and similar with just one click.

>> PROGRAMMING API

unity Network

Has an incomplete API. Some of the design goals are good but the implementation is unacceptable. Users generally state that it is disappointing and unreliable for professional use.

uLink

Has a truly elegant and rich API which is over four times larger than Unity Network. uLink's API radically reduces the number of code lines needed, compared to doing the same thing in Unity Network. Also, uLink customers generally state what an absolute joy it is to use and how much easier it is to get things right the first time than with Unity Network. Although uLink's API may look like Unity Network at first-glance, it is far more powerful, flexible and, most importantly, polished.



>> DOCUMENTATION & EXAMPLES

Unity Network

The documentation is brief and leaves a lot of gaps. Forcing you to guess and spend a lot of time trying to figure out how things work. Examples are also few, incomplete and teaches practices that won't scale.

uLink

Has a comprehensive manual which covers a wide range of subjects such as useful network concepts, optimization guidelines, server maintenance etc. The API documentation is easy to navigate and browse online. Examples are many and specially tailored for beginners as well as experts. There are also examples of advanced complete network games. In addition there is an active Stack-Overflow-like community where all questions are quickly and thoughtfully answered.

>> LOAD TESTING

Unity Network

Has no load testing tool or ability to simulate large numbers of players. This is a crucial step before releasing commercial games and applications. Otherwise, undetected server bugs will destroy the game for online players after it is launched.

uLink

Can simulate massive amounts of individual players with uTsung, uLink's free distributed load testing tool. This means that measuring and improving the game before release is unbelievably easy compared to all other solutions.



>> NETWORK EMULATION

Unity Network

Can only emulate four predefined network scenarios, all of which only limit bandwidth. Furthermore, emulation can only be done in the Unity Editor. This severely hinders emulation of players' network connections when testing, and thus can render the game experience unplayable for a big part of the audience.

uLink

Can emulate seven predefined network scenarios which affects everything from packet loss and duplication, restricted bandwidth, latency and more. Custom emulation scenarios can be defined and tweaked. All emulation parameters can be enabled outside of the Unity Editor as well.

>> LOGGING

Unity Network

Has basically all-or-nothing logging, with only three log levels without any categories. In addition, logging output can't be redirected for performance and ease of server maintenance. These makes debugging very time-consuming and difficult, but also makes server administration more costly and unorganized.

uLink

Has comprehensive and fully customizable logging with five different log levels in over 20 categories. Furthermore, logging can be redirected for performance and server maintenance to custom storage such as databases, daily-organized log-files, etc. This truly goes way further to help and decrease time spent on debugging and solving inevitable issues and bugs that exist in all games.



>> READY-TO-USE COMPONENTS

unity Network

Doesn't provide any utility or help scripts for common and complicated networking tasks. This means that you have to understand all this and correctly implement it yourself instead of focusing on making your game.

uLink

Has a vast range of out-of-the-box components that will get you far ahead and keep you away from common and tedious networking tasks. You can even make a full network game by just dragging & dropping uLink components, without writing a single line of code. Complete source code is available for all these components so that you can easily and quickly tweak them further to fit your needs perfectly.

>> EDITOR INTEGRATION

unity Network

Although Unity Network is built into the game engine, the editor integration is almost non existing. Only two of the many settings can be changed in the Unity Editor and the statistics window is very modest. This means that game designers and non-programmers can't tweak network parameters and instead have to ask programmers to do it for them, thus wasting development time.

uLink

All of uLink's features are fully integrated in the Unity Editor. All settings are easily and immediately editable and either saved as project settings or applied directly in play mode. Extensive network statistics are easily accessible at any time. uLink has truly taken the step to be a part of the Unity Editor and the result is a wonderful development experience like none other.



FURTHER INFORMATION

>> THANK YOU FOR READING!

If you are interested in learning more or if you have any questions - please, visit our homepage!

www.unitypark3d.com

Christian Lönnholm, CEO
+46 733 99 38 44
christian@unitypark3d.com

