



Web-Enabling Solution for
Windows Desktop Applications

White Paper

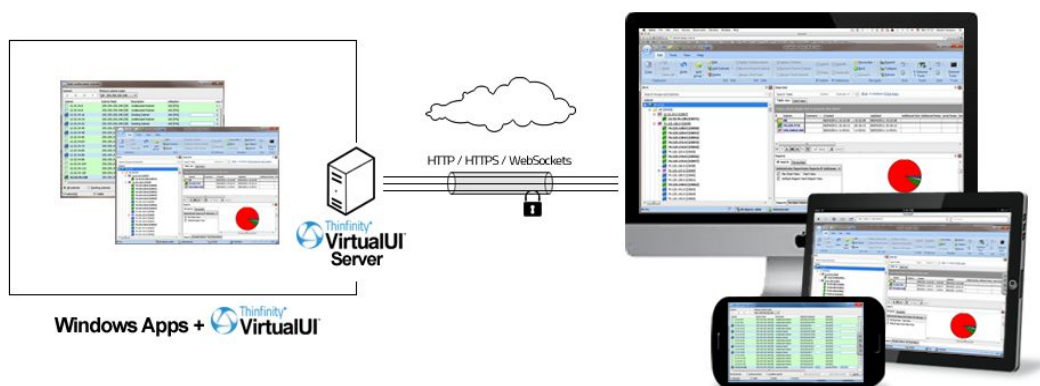
1. Introduction

Thinfinity® VirtualUI™ enables in-house developed Windows applications to be delivered as cross-browser, cross-device web applications while at the same time, providing full web integration capabilities.

Thinfinity VirtualUI offers a user interface remoting solution for in-house developed applications and allows them to be delivered as dual-platform Windows/HTML5, simply by adding one line of code. These Windows applications can keep their standard desktop environment behavior or alternatively, be remotely accessed from any modern web browser in a multi-user, multi-instance fashion, if hosted on a Thinfinty VirtualUI Server environment.

With Thinfinty® VirtualUI™ you can:

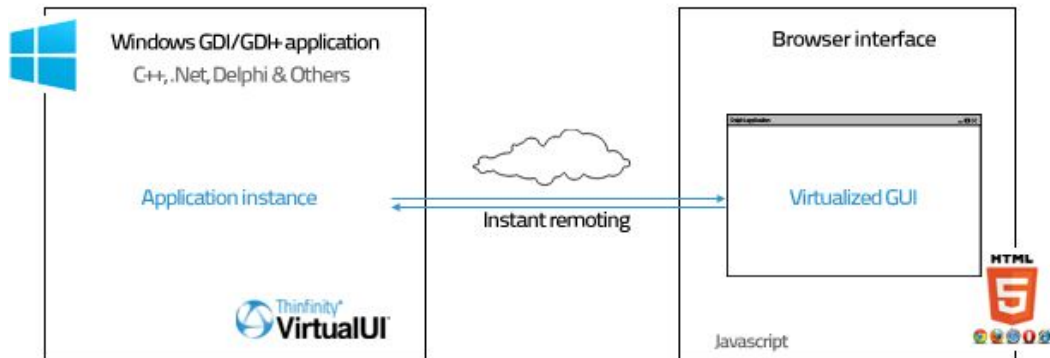
- Instantly transform applications built in .Net, Delphi, Visual C++, Virtual Basic or others into dual-platform Windows/HTML5 Apps.
- Enable full windows-to-web integration, by adding two-way interaction between the Windows application and the web page.
- Easily and instantaneously deliver applications as cross-browser, cross-device web apps.
- Publish whole or part of the Win32/Win64 app front end.
- Immediately upgrade and modernize Windows applications.
- Expand application availability to reach a wider user base.
- Deliver your software to customers as a managed service on the cloud.
- Dramatically reduce the Total cost of ownership (TCO), by slashing IT costs and simplifying administration.



2. Technology

2.1 Instant Web Enabling

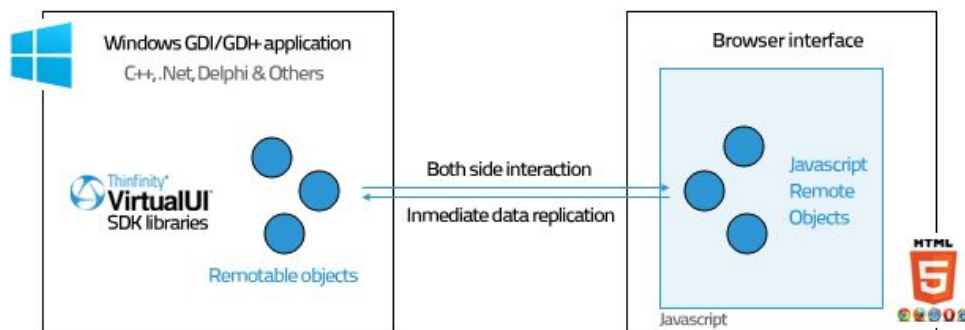
Simply by adding Thinfinty VirtualUI library to the source project and then typing in a single line of code, in-house applications are available for instant remoting from any modern web browser, on any OS and device.



While the instance runs in a Thinfinty VirtualUI Server, the virtualized GUI is shown on the web browser, connected through WebSockets with fallback to AJAX.

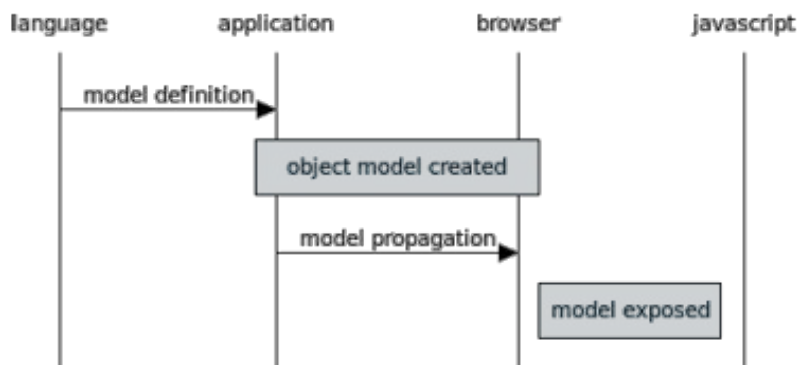
2.2 Windows-to-Web Integration

Thinfinty VirtualUI paves the way to bidirectional integration between the Windows-based application and Internet resources by blending it with the web-side environment. Thinfinty VirtualUI allows your desktop application to be reshaped into a completely tailor-made one, permitting you to expose application data to the browser side and vice-versa, and combining the application with available web and multimedia resources.



The interaction between the application and the web page is achieved by using the new Javascript Remote Objects framework (jsRO), conceived by Cybele Software's Development

Team, that allows for a seamlessly interaction of the desktop app with resources available in the cloud. The jsRO framework allows you to create remotable server objects, with their properties, methods and events mirrored to the web as native javascript objects, enabling both-side interaction and immediate data replication.



2.3. Architecture

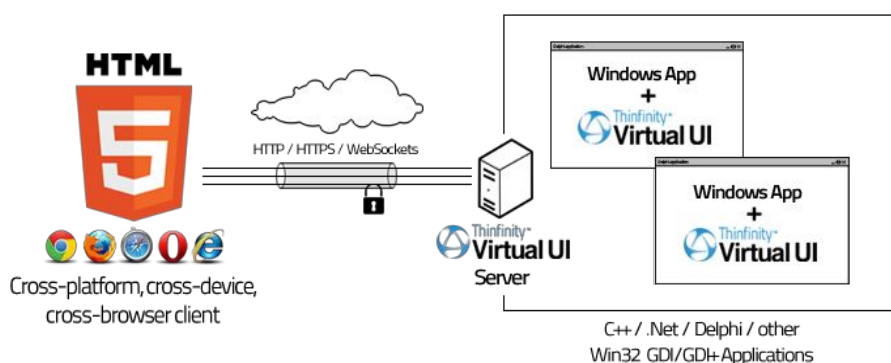
Thinfinity® VirtualUI™ is composed of:

VirtualUI Server

The VirtualUI Server is an http(s)/websockets server that communicates with the Windows app through the VirtualUI SDK libraries, taking the GDI/GDI+/DirectX redirection commands to the web browser.

VirtualUI Client

The VirtualUI Javascript/HTML5 Client is the responsible for the actual drawing on the web-browser canvas and interacting with the end-user mouse and keyboard events.



VirtualUI SDK

The VirtualUI SDK is a set of libraries that plugs into the developer's programming framework to redirect Windows calls and drawing commands to the remote HTML5 canvas. It also provides an object remoting framework (jsRO) devised to ease the integration between the windows application and the web.

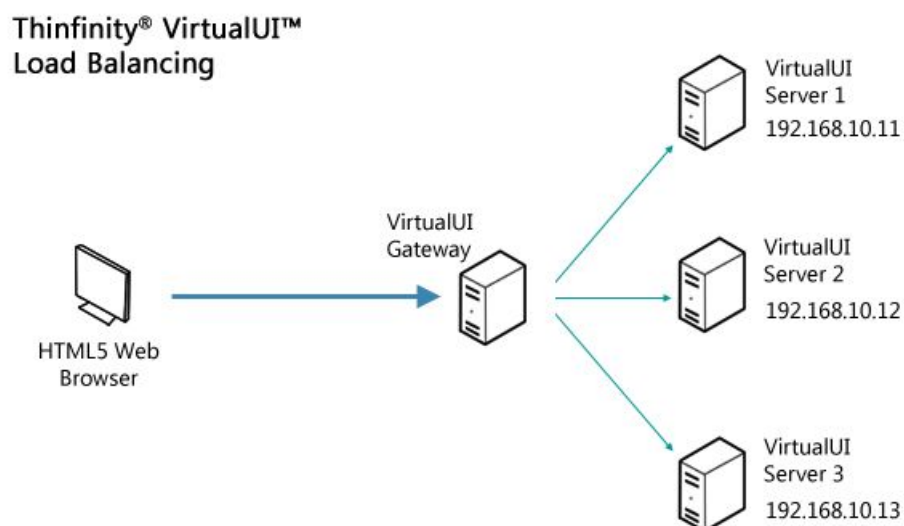


VirtualUI Gateway

The VirtualUI Gateway service makes possible the redirection of http and websockets traffic to VirtualUI Servers.

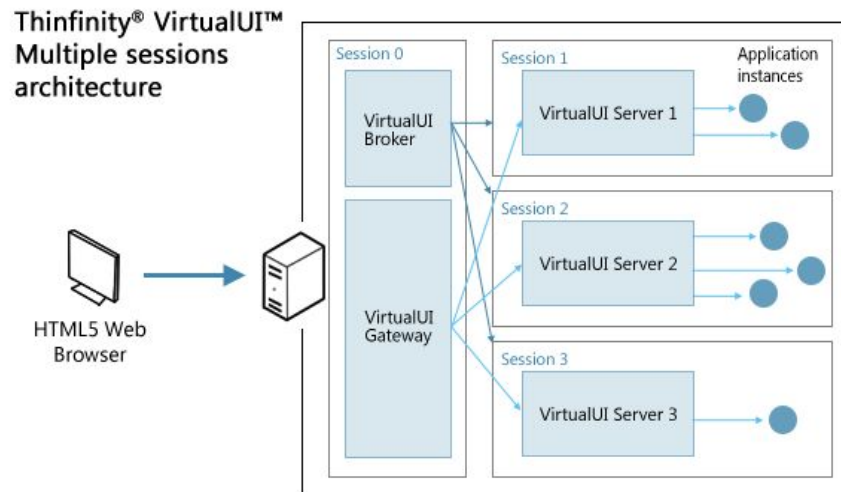
VirtualUI Broker

The VirtualUI Broker service is responsible for opening new Windows sessions when needed. Also, this service will keep a balanced load between all open sessions.



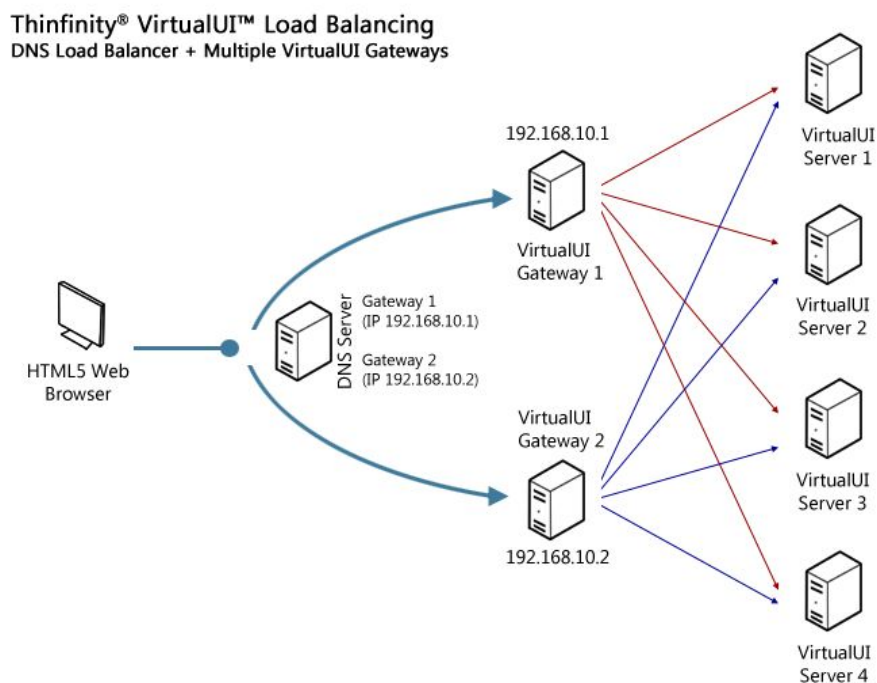
2.4 Scalability

Thinfinity VirtualUI complements its architecture with two components designed to ensure scalability and fault-tolerance in different scenarios, supporting multiple RDS sessions and/or load balancing using multiple servers. The **VirtualUI Gateway Service** makes possible the redirection of http and websockets traffic to **VirtualUI Servers**, and the **VirtualUI Broker Service** keeps the load balanced across servers.



These modules provide access to the VirtualUI applications in three new ways:

- By server instances running in different RDS sessions on the same machine.
- Providing balanced access to different physical servers.
- The previous two can also be combined to make the most out of your environment.



3. Requirements

These are the requirements for each component of the Thinfinity® VirtualUI™ architecture:

- **Development machine**
 - **Operating Systems:**
 - Microsoft Windows 7 32bit / 64bit
 - Microsoft Windows 8 32bit / 64bit
 - Microsoft Windows Server 2012
 - **Development environment**
 - Microsoft Visual Studio
 - Delphi 5 to XE7
 - C++ Builder
 - Microsoft Visual Basic
 - PowerBuilder
 - other
 - **The application can use .NET WPF, GDI, GDI+ and limited DirectX calls.**
- **Server machine**
 - Microsoft Windows 8 32bit / 64bit
 - Microsoft Windows Server 2012
- **Gateway machine**
 - Microsoft Windows 8 32bit / 64bit
 - Microsoft Windows Server 2012
- **End-user machine**
 - Any operating system and/or device with an HTML5-compliant Web Browser.
 - Any modern Web Browser (HTML5-compliant) such as IE10/11, Chrome, Safari, Firefox, Opera, etc.

4. Conclusion

Thinfinity® VirtualUI™ allows developers to:

- Create dual-platform Windows/HTML5 applications effortlessly, by adding only one line of code to their existing projects built in .Net (WinForms), Delphi, Visual C++ and others.
- Fully integrate their Windows application into a web application using the *Javascript Remote Objects (jsRO)* framework included in Thinfinity® VirtualUI™.
- Expose application data to the browser side and vice versa, adding interaction between the application and the web page.
- Expand applications' availability by delivering them normally on a Windows environment, or by installing them on a Thinfinity® VirtualUI™ Server environment to be accessed remotely from any HTML5-compliant Web browser.
- Instantly upgrade and modernize Windows-based applications.
- Reduce dramatically the total cost of ownership (TCO), by slashing IT costs and simplifying administration, avoiding costly virtualization/remoting solutions.

Complete Reference:

Find the complete reference on the **Thinfinity® VirtualUI™** Guide under the links:

Product Page:

<https://www.cybelesoft.com/Thinfinity/VirtualUI/>

Online manual:

<http://www.cybelesoft.com/helps/thinfinity/virtualui>

Live Demos and Tutorials:

<http://www.cybelesoft.com/thinfinity/virtualui/#livedemos>