

VRVD White Paper

# Virtual Remote Video Driver 5.0

## Make IT Easy with RSUPPORT

RSUPPORT is proud of releasing 2009 New line of Products meeting growing needs of Remote Support market..

**RemoteHelp** – is a virtual help desk over the Internet and is able to have general representatives and professional representatives separately to increase the efficiency for large call centers and is a tool that contains automated distribution and queue system as a Advanced Remote Support **RemoteCall 5.0** – is a remote support tool that anyone from regular users to professionals can communicate each other easily via their browser.

**RemoteSales** – is a online-sales tool that enables sales professionals to make online presentation to customers anytime anywhere with reducing travel time and cost.

<http://www.rsupport.com>

Please visit RSUPPORT homepage for more information.

## Optimal engine for remote support

### Introduction

RSUPPORT's remote support products use VRVD (Virtual Remote Video Driver) which is proprietary engine developed by RSUPPORT. The Products include RemoteCall 4.0, RemoteCall 5.0, RemoteHelp, RemoteSales, RemoteView. VRVD Engine provides maximum, optimum remote support as a Kernel Level Mirror Driver.

Most commonly used remote control products are like below.

: Windows Terminal Service, Windows Remote Desktop Connection(Windows XP, Windows Vista), MSN Messenger Remote Assistance, RealVNC, UltraVNC, TightVNC, MAC Desktop etc.

Remote control provides control function remotely showing remote desktop. It detects the change of remote computer desktop and compress/transfer the changed data(screen, keyboard, mouse control) to representative's computer and displays it on representative's Viewer.

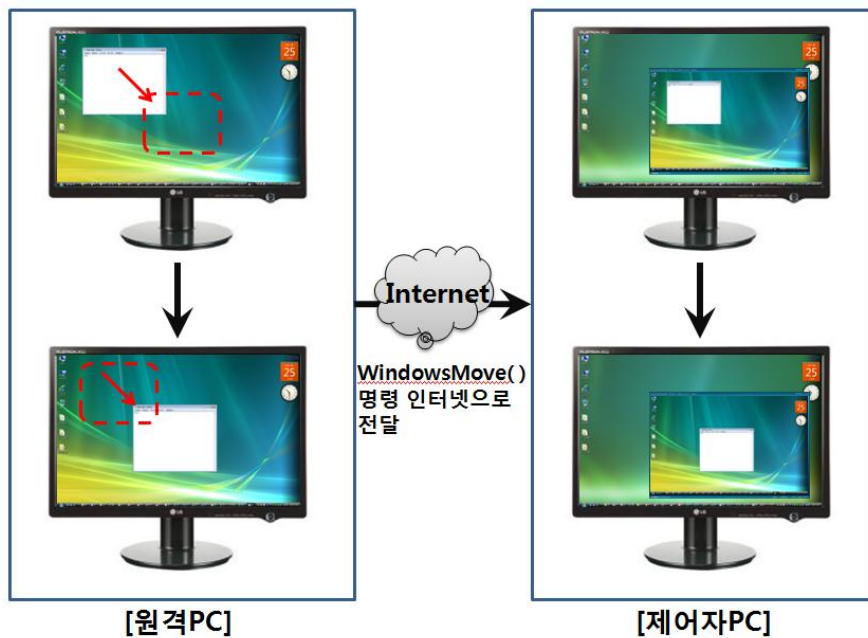


Image 1 Concept for remote control

Remote control processes changed screen, keyboard/mouse control, text chat, file transfer in Application level and send it to the other computer(representative's computer) to display it in the Viewer.

## Remote control technology

### Traditional remote control technology(Hooking, Polling)

Two method are used to detect the screen changes traditionally. Those are Hooking and Polling. Hooking intercepts Window message in screen change instead of detecting screen changes all the time and Polling is sampling the whole screen which consumes lots of CPU Resources and Memory according to the screen refresh rate.

Cons :

- Consumes lots of CPU Resources – uses complex algorithm consumes a lot of CPU resources to detect the screen changes.
- Consumes a lot of Memory.
- A lot of Packet transfer because of Non-compression transfer.
- Remote support performance drops in proportion to low specification system or slow network.
- Most commonly used software is VNC which is freeware.

### Mirror Driver remote control technology

Mirror Driver is directly linked to Video Driver in Kernel Level(Device Layer) whereas traditional way detects the screen changes in Application Layer of Windows operating system.

This is very stable and efficient way to detect the screen changes.

Mirror Driver accesses directly to Framebuffer memory of Video Driver.

It drops CPU usage for screen Blitting directly because it uses Framebuffer. Mirror Driver brings a merit of big enhancement of speed and very low CPU Resources.

However, It is only for Windows 2000, Windows XP or later version of Windows Operating system.

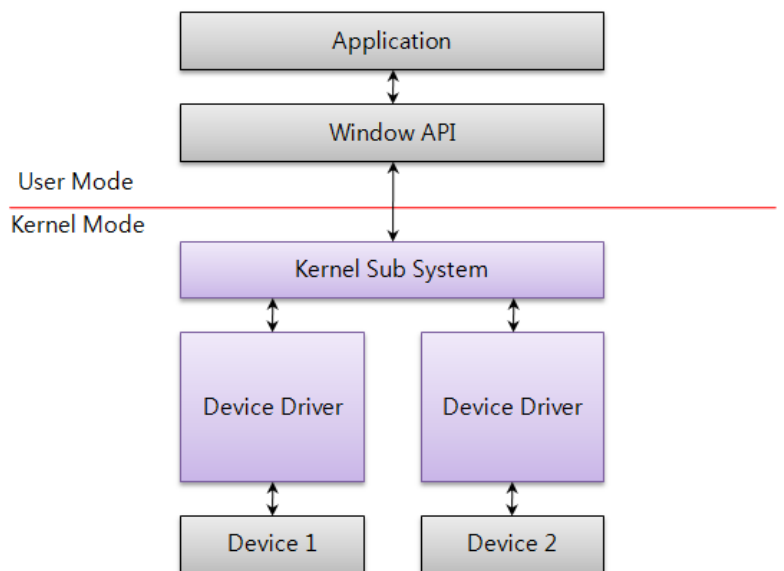


Image 2 Windows OS core architecture

Driver method detects the screen changes of Framebuffer of Video Card by DDI in Kernel Mode of Windows Operating System. Whereas, Traditional method (Hooking, Polling) detects them in a limited condition on User Mode. Screen changes are sent to Video Driver from OS, then Display device shows it first and Application notices them afterwards. They can be accessed by hooking WindowsMove() command that is a Window Message produced in screen changes, because restricted accesses are permitted for system resources on User mode. Therefore, Driver method provides much faster remote control performance than Hooking method does.

## VRVD(Virtual Remote Video Driver) 5

VRVD 5 is one of the Mirror Driver method that is directly linked to Framebuffer of Video Driver in Kernel Mode. VRVD 5.0 that is loaded on new Products has been much enhanced from previous VRVD 4 engine. It supports GDI (Graphic Device Interface) and DDI(Device Driver Interface) at the same time and also provides DGI(Driver, Graphics device Interface) in addition to them. This enhanced engine gives multimedia users to feel much faster remote control speed instantly and provides much smoother screen display for Text, CAD, CATIA and Graphic tools with enhanced high speed JPEC compression.

*RSUPPORT products used to apply VRVD 4.0 engine for RemoteCall 4.0 and currently apply new VRVD 5.0 engine for New products(RemoteCall 5, RemoteHelp, RemoteSales, RemoteView 5.0)*

**Display Adapter Name : Rsupport VRVD5**

**Path = %System32%\DRIVERS\VRVD5.sys**

**Version Information : 5.2.0.0**

**OS support :**

*Microsoft Windows® Vista*

*Microsoft Windows Server™ 2003*

*Microsoft Windows XP*

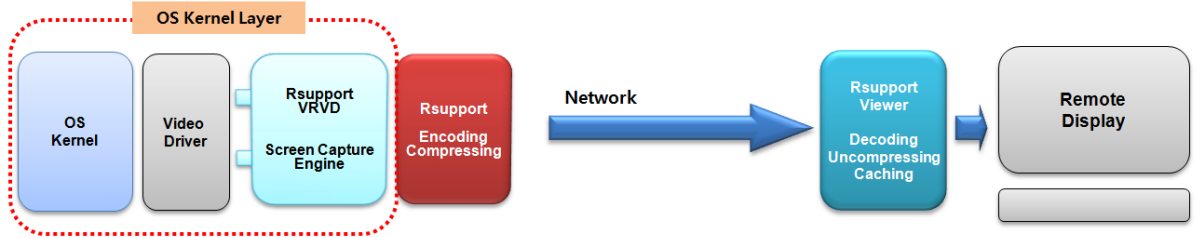
*Microsoft Windows 2000*

*Pros :*

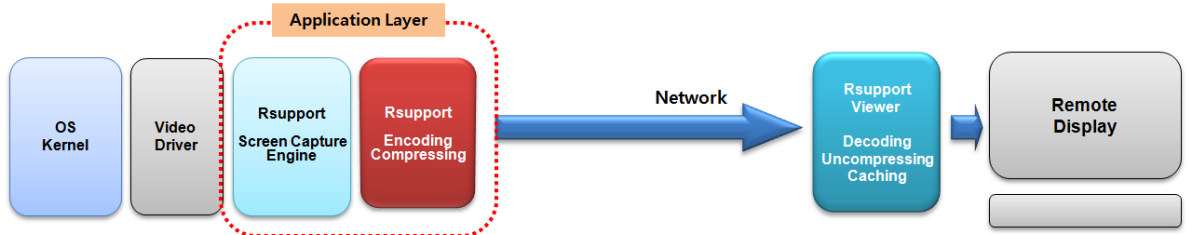
- *Supports all video drivers because it is a virtual remote driver working in Kernel Mode.*
- *Provides best screen display in Multimedia, Games, DirectX, High resolution Graphic tools(CAD, CATIA) because it supports DGI (Driver, Graphics Device Interface)*
- *Provides smoother screen display with supporting high speed JPEG compression.*
- *Small data transfer packet size within 20 Bytes.*
- *Best performance in the world.*

Control Flow for GDI, DDI, DGI

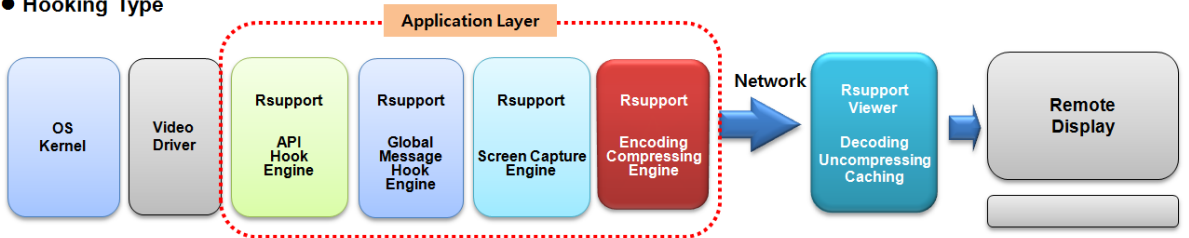
• Mirror Video Driver Type



• Advanced Polling Screen Type



• Hooking Type



Comparison for GDI, DDI, DGI

Type	Minimum CPU Spec	CPU Usage	Data Packet Size	Extract Data Process	DirectX 3D	Program ming	Control Speed
Mirror Driver	Low	Low	Low	Short	None	High Skill	High Performance
Polling Screen	Medium	Low & Medium	Medium	Short	Yes	Very Simple	Medium Performance
Hooking	High	Medium	High	Long	Yes	High Skill	Medium Performance

RSUPPORT provides all 3 remote support methods stated above, much faster performance than other products such as Citrix or Microsoft Terminal Service.

RSUPPORT has developed a algorithm that consumes low CPU Resources and has best performance even in low-specification computers through Enhanced Polling Screen method. Above 3 methods RSUPPORT supports have a small amount of packet transfer because they use the optimized compression comparing to non-compression method for traditional hooking and polling.

## Conclusion

VRVD 5 is the core of RSUPPORT technology. It uses the most enhanced method in the field and is excellent than any other remote control engine in terms of speed and stability.

Specially, its value stands out in multimedia filed such as graphic works that cannot be supported by traditional remote control/access. Also small amount of packet transfer that doesn't cause any load on the network possibly shows RSUPPORT's technology.

## Appendix

### DDI(Driver, Graphics device Interface)

New term that calls Interface supports both previous GDI and DDI. RSUPPORT has applied this to VRVD 5.

### DDI(Device Driver Interface)

Routines that Driver calls to work with Kernel Service. DDI is a Driver API that System provides.

### Kernel mode

Mode that core system of Windows OS and Drivers are working on.

### GDI(Graphics Device Interface)

GDI draws graphic objects including scroll bar, line etc in Microsoft Windows. GDI is managed by a program as gdi.exe and loaded automatically when Windows starts.

Running Application sends variables for images needs to be displayed to GDI. GDI creates images by sending this command to Monitor, Printer or other devices. New version of Windows even has new interface like "DirectDraw" to display 3D objects, Games or Movies much faster.

Contact Information

RSUPPORT: [www.rsupport.com](http://www.rsupport.com)

Technical Support: [support@rsupport.com](mailto:support@rsupport.com)

Sales: [sales@rsupport.com](mailto:sales@rsupport.com)

Info: [info@rsupport.com](mailto:info@rsupport.com)

Headquarters:

Nano Bldg., 149-11,  
Bangi-dong, Songpa-gu,  
Seoul, Korea  
Phone: +82-70-7011-0590  
Fax: +82-2-479-4429

USA Office:

116 West 23rd Street, Suite 500,  
New York, NY 10011,  
USA  
Phone : +1-888-348-6330  
Fax : +1-888-348-6340

China Office:

Rm1903 block4No.5  
Changchunqiao Road,  
Haidian District, Beijing 100089, China  
Phone : +86-10-8256-1810  
Fax : +86-10-8256-2978

Japan Office:

Shinkasumigaseki Bldg., 18F, 3-3-2,  
Kasumigaseki, Chiyoda-ku,  
Tokyo 100-0013, Japan  
Phone : +81-3-3539-5761  
Fax: +81-3-3539-5762