FreeRDP User Manual

Marc-André Moreau

Awake Coding Consulting Inc.

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Introduction

1.1 Help

FreeRDP - A Free Remote Desktop Protocol Implementation

See www.freerdp.com for more information

```
Usage: ./client/X11/xfreerdp [file] [options] [/v:<server>[:port]]
```

Syntax:

```
/flag (enables flag)
/option:<value> (specifies option with value)
+toggle -toggle (enables or disables toggle, where '/' is a synonym of '+')

/v:<server>[:port]        Server hostname
/port:<number>            Server port
/w:<width>                Width
/h:<height>               Height
/size:<width>x<height>    Screen size
/f                        Fullscreen mode
/bpp:<depth>              Session bpp (color depth)
/kbd:0x<layout id> or <layout name> Keyboard layout
/kbd-list                 List keyboard layouts
/kbd-type:<type id>       Keyboard type
/kbd-subtype:<subtype id>   Keyboard subtype
/kbd-fn-key:<function key count>    Keyboard function key count
/admin                    Admin (or console) session
/multimon                 Multi-monitor
```

```
/workarea              Work area
/t:<title>             Window title
+decorations (default:off)  Window decorations
/a                     Addin
/vc                    Static virtual channel
/dvc                   Dynamic virtual channel
/u:[<domain>\\]<user> or <user>[@<domain>]  Username
/p:<password>          Password
/d:<domain>            Domain
/g:<gateway>[:port]    Gateway Hostname
/gu:[<domain>\\]<user> or <user>[@<domain>] Gateway username
/gp:<password>         Gateway password
/gd:<domain>           Gateway domain
/app:||<alias> or <executable path> Remote application program
/app-name:<app name>   Remote application name for user interface
/app-icon:<icon path>  Remote application icon for user interface
/app-cmd:<parameters>  Remote application command-line parameters
/app-file:<file name>  File to open with remote application
/app-guid:<app guid>   Remote application GUID
+compression (default:off)  Compression
/shell                 Alternate shell
/shell-dir             Shell working directory
/audio-mode            Audio output mode
/mic                   Audio input (microphone)
/network               Network connection type
+clipboard (default:off)   Redirect clipboard
+fonts (default:off)   Smooth fonts (cleartype)
+aero (default:off)    Desktop composition
+window-drag (default:off)  Full window drag
+menu-anims (default:off)   Menu animations
-themes (default:on)   Themes
-wallpaper (default:on) Wallpaper
/gdi:<sw|hw>           GDI rendering
/rfx                   RemoteFX
/rfx-mode:<image|video> RemoteFX mode
/frame-ack:<number>    Frame acknowledgement
/nsc                   NSCodec
/jpeg                  JPEG codec
/jpeg-quality:<percentage>  JPEG quality
-nego (default:on)     protocol security negotiation
/sec:<rdp|tls|nla|ext>  force specific protocol security
-sec-rdp (default:on)  rdp protocol security
-sec-tls (default:on)  tls protocol security
-sec-nla (default:on)  nla protocol security
+sec-ext (default:off) nla extended protocol security
/cert-name:<name>       certificate name
```

```
/cert-ignore          ignore certificate
/pcb:<blob>           Preconnection Blob
/pcid:<id>            Preconnection Id
/vmconnect:<vmid>     Hyper-V console (use port 2179, disable negotiation)
-authentication (default:on)    authentication (hack!)
-encryption (default:on)    encryption (hack!)
-grab-keyboard (default:on) grab keyboard
-mouse-motion (default:on)  mouse-motion
/parent-window:<window id>  Parent window id
-bitmap-cache (default:on)  bitmap cache
-offscreen-cache (default:on)   offscreen bitmap cache
-glyph-cache (default:on)   glyph cache
/codec-cache:<rfx|nsc|jpeg> bitmap codec cache
-fast-path (default:on) fast-path input/output
+async-input (default:off)  asynchronous input
+async-update (default:off) asynchronous update
/version              print version
/help                 print help
```

Examples:

```
xfreerdp connection.rdp /p:Pwd123! /f
xfreerdp /u:CONTOSO\\JohnDoe /p:Pwd123! /v:rdp.contoso.com
xfreerdp /u:JohnDoe /p:Pwd123! /w:1366 /h:768 /v:192.168.1.100:4489
xfreerdp /u:JohnDoe /p:Pwd123! /vmconnect:C824F53E-95D2-46C6-9A18-23A5BB403532 /v:192.168.1.
```

```
Clipboard Redirection: +clipboard
```

```
Drive Redirection: /a:drive,home,/home
Smartcard Redirection: /a:smartcard,<device>
Printer Redirection: /a:printer,<device>,<driver>
Serial Port Redirection: /a:serial,<device>
Parallel Port Redirection: /a:parallel,<device>
Printer Redirection: /a:printer,<device>,<driver>
```

```
Audio Input Redirection: /dvc:audin,sys:alsa
Audio Output Redirection: /vc:rdpsnd,sys:alsa
```

```
Multimedia Redirection: /dvc:tsmf,sys:alsa
USB Device Redirection: /dvc:urbdrc,id,dev:054c:0268
```

1.2   Authentication

Sample Values:

- User: JohnDoe

- Domain: CONTOSO

- Password: Password123!

- Server: rdp.contoso.com

There simplest, unambiguous way of passing credentials at the command-line is with /u, /d and /p. The domain name is only needed if you connect using domain credentials:

```
xfreerdp /u:JohnDoe /d:CONTOSO /p:Password123! /v:rdp.contoso.com
```

The domain name can also be passed in the username using the same notation accepted by mstsc:

```
xfreerdp /u:CONTOSO\JohnDoe /p:Password123! /v:rdp.contoso.com
```

While the above notation is shorter, it has an unpractical side effect: the backslash is often, but not always, interpreted as an escape character. To avoid the problem, make sure the shell does not interpret the backslash as an escape character:

```
xfreerdp /u:CONTOSO\\JohnDoe /p:Password123! /v:rdp.contoso.com
xfreerdp "/u:CONTOSO\JohnDoe" /p:Password123! /v:rdp.contoso.com
```

From experience, most Linux shells will require such handling of the backslash character. However, there are certain cases like the Eclipse launcher which do not require it.

Alternatively, the User Principal Name (UPN) notation can be used:

```
xfreerdp /u:JohnDoe@CONTOSO /p:Password123! /v:rdp.contoso.com
```

This notation does not have the drawbacks of the backslash character, but introduces a potential conflict with usernames containing the '@' symbol and no domain name. This is frequently the case with the new Windows 8 Microsoft Accounts (a.k.a. Windows Live Accounts) which correspond to an email address. To work work around the ambiguity, precede the user name "john.doe@live.com" with a backslash:

```
xfreerdp /u:\john.doe@live.com /p:Password123! /v:rdp.contoso.com
```

Be careful to properly handle the backslash character as previously instructed.

Passwords entered as command-line arguments could potentially be seen by other users on the same system, so they are automatically hidden:

```
awake@workstation:~$ ps aux | grep freerdp
awake            22506   0.0  0.1  2502620  10236 s002  S+   11:10pm   0:01.00 xfreerdp /u:Jo
```

1.2.1 Credentials Prompt

If you omit entering credentials at the command-line, FreeRDP may prompt you for credentials depending on the negotiated protocol security level.

Protocol Security

RDP protocol security is confusing for many users because it strongly affects the way credentials can be prompted. There are three main security levels that can be negotiated:

- RDP Security (old encryption, old authentication)

- TLS Security (TLS encryption, old authentication)

- NLA Security (TLS encryption, NLA authentication)

Old Authentication The old RDP authentication mechanism is very simple: the server presents the client with the Winlogon GUI, and the user can either automatically or manually enter the credentials. If you enter credentials prior to connecting to a server with the old authentication, they will be automatically on connection, saving you the trouble of typing them manually.

Old RDP authentication may be practical in the sense that you can get a remote Winlogon GUI without being authenticated on the server. This is however a design flaw which makes the RDP server vulnerable to a DDOS attack: since significant resources need to be allocated for the Winlogon GUI without being authenticated, a distributed denial of service attack could be performed by simply launching multiple unauthenticated connections. This is exactly why it is no longer possible to obtain such a GUI prior to authentication with newer security levels.

Network Level Authentication (NLA) Network Level Authentication (NLA) is required by default with servers starting with Windows Vista. With NLA, authentication is the very first thing that occurs over the wire, such that the server will only allocate resources and present a graphical interface to

authenticated clients. It is also much more secure and provides strong defense mechanisms against Man-in-the-Middle (MITM) attacks.

When NLA is negotiated, the complete credentials are needed at connection time, which is why FreeRDP will prompt for the missing information:

```
xfreerdp /u:JohnDoe /d:CONTOSO /v:rdp.contoso.com
connected to rdp.contoso.com
Password:
```

1.3   Performance Flags

The RDP performance flags are used by the client to tweak certain remote graphical operations affecting the user experience. A good example is the wallpaper: drawing it requires sending a lot of data as opposed to filling it with black. Using the wallpaper is fast enough on the LAN, but it may negatively affect performance over a slower connection such as over a cellular network. The same principle applies for themes, fonts, menu animations, window dragging, etc.

1.3.1   Smooth Fonts

Disabled by default, enable with +fonts. Regular RDP fonts are drawn and encoded separately from images sent over the wire, but they have the drawback of not being very crisp and clear. Enabling smooth fonts means you get easier to read and clearer characters (ClearType), but they are sent as images, which may be slower.

1.3.2   Desktop Composition

Disabled by default, enable with +aero. This should not be confused with the desktop composition extension that redirects compositing calls for local rendering, a feature not supported by FreeRDP. This flag will only work in the few cases where compositing can be rendered over RemoteFX. As for now, this is only possible with Windows 7 SP1 on Hyper-V on Windows Server 2008 R2 SP1 with RemoteFX 3D.

1.3.3   Full Window Dragging

Disabled by default, enable with +window-drag. Dragging a window around is particularly intensive as it causes a lot of graphical updates (each time you move the window by one pixel, there is a large area of the screen that needs to

be updated). To work around this problem, the server can draw the outline of the window as you drag it, and only draw the full window once you are done dragging it.

1.3.4   Menu Animations

Disabled by default, enable with +menu-anims. Just like window dragging, menu animations may cause a lot of successive graphical updates. Disabling it is a good idea.

1.3.5   Themes

Enabled by default, disable with -themes. Rich themes usually require operations with bitmaps, while a classic theme can often be drawn with simple and efficient operations using plain colors. Disabling themes is worth it if you can stand the look & feel.

1.3.6   Wallpaper

Enabled by default, disable with -wallpaper. The wallpaper may look pretty but it is a large image that compresses less efficiently than a plain color background. Disabling it reduce rendering time for the background, which is particularly noticeable at connection time and when minimizing windows.

1.4   Drive Redirection

To redirect all drives, use /drives:

```
xfreerdp /v:rdp.contoso.com /drives
```

On Windows, each drive has a letter and is redirected individually. On Linux, the root directory (/) is redirected, which is equivalent to redirecting all drives.

To redirect the user home directory as a drive, use /home-drive:

```
xfreerdp /v:rdp.contoso.com /home-drive
```

This is convenient if the user "JohnDoe" wants to redirect only "/home/JohnDoe" instead of the root directory ("/").

1.5   Serial Redirection

To redirect a serial device, you must first identify the corresponding device file. If you are using a USB to serial adapter, the device usually shows up as /dev/ttyUSB0.

In most cases, the device representing the serial device will not be usable with user permissions. You can either chown or chmod the device or do it cleanly with udev rules.

```
xfreerdp /serial:COM3,/dev/ttyUSB0 /v:rdp.contoso.com
```

It might be confusing at first, but the redirected serial ports will not appear in the device manager. Instead, open a command prompt and type:

```
>change port /query
AUX = \DosDevices\COM1
COM1 = \Device\Serial0
COM2 = \Device\Serial1
COM3 = \Device\RdpDrPort\;COM3:2\tsclient\COM3
GLOBALROOT =
```

In this above listing, /dev/ttyUSB0 is redirected as COM3.

You need to manually map the remote COM port to a local COM port:

```
net use COMx: \\tsclient\COMy
```

Where x is a COM port available on the server and y is a COM port available on the client.

1.6   Parallel Redirection

To be expanded.

1.7   Smartcard Redirection

To be expanded.

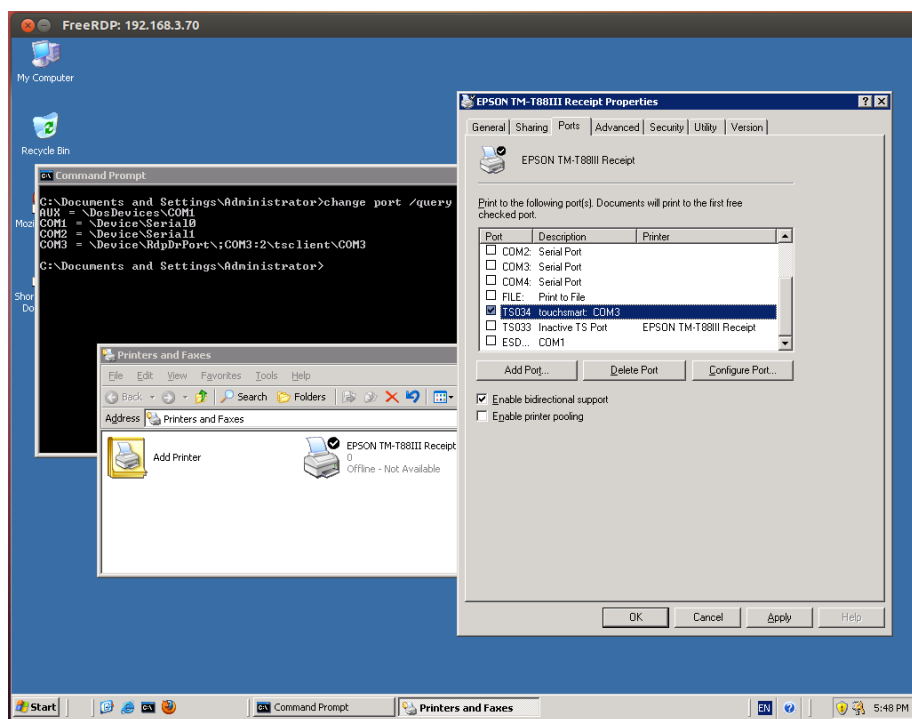## 1.8   Printer Redirection

To be expanded.

Figure 1.1: FreeRDP Serial Redirection

1.9 Clipboard redirection

To enable clipboard redirection, use /clipboard:

```
xfreerdp /v:rdp.contoso.com /clipboard
```

While clipboard redirection is supported in remote desktop mode, it is not yet supported with RemoteApp due to certain technical challenges.

1.10 Audio Playback

To enable sound redirection, use /sound:

```
xfreerdp /v:rdp.contoso.com /sound
```

1.11 Audio Recording

To enable audio input (recording), use /microphone:

```
xfreerdp /v:rdp.contoso.com /microphone
```