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Server and session parameters

- Parameter server
server parameter determines terminal server that terminal connects to. Server address, used protocol and server port can be specified. Specify terminal server IP address or DNS-name if DNS server works in the network:

```
server=192.168.1.1  
server=ts1.local  
server=ts3.local:4000
```

Possible protocol values are: rdp;; rdweb: for [loading connections from RDWEB](#); password: for [changing password via RDWEB](#); vnc: for connection to VNC server (terminal color depth should be equal to server color depth). Default protocol is rdp. Examples:

```
server=vnc:192.168.1.5  
server=vnc:tsx3.local:5000  
server=rdweb:192.168.1.1,pt-br  
server=password:rdweblocal
```

By default first connection to RDP server is performed without NLA so that you could enter login and password in Windows interface. Terminal will automatically relogin with NLA, if server is configured not to accept connections without NLA. You may tell terminal to connect with NLA at start (login and password in this case will always be entered in VEEMClient interface):

```
server=192.168.1.1,NLA
```

List of servers can be specified. Then terminal will try to connect to each server from the list. If fails terminal connects to the next one. And only when it fails to connect to all listed servers, terminal returns an error. It's the easiest way to increase fault tolerance. Protocol is specified only once. Examples:

```
server=192.168.1.6;192.168.1.7;  
server=tsx2.local,192.168.1.11:5000
```

User can enter server address manually. Specify:

```
server=--new--
```

Next line means: connect to 192.168.1.1 server, and if won't respond (out of order) - ask user to enter address:

```
server=192.168.1.1,--new--
```

Application

- Parameter application

By default RDP or VNC terminal server client runs. To run Chromium on terminal without connection to terminal server specify in configuration file:

```
application = chrome
```

Chromium requires 1024MB RAM. Video driver should be from (U) package. Here's [the manual about local Chromium](#).

Also on terminal may be started [local VLC mediaplayer](#):

```
application = vlc
```

Here's [the manual about local VLC](#).

Keyword for creating special menu item to turn off terminal:

```
application = shutdown
```

Keyword for creating special menu item to reboot terminal:

```
application = reboot
```

Example of menu with two items, one to connect to RDP server, second to turn off terminal:

```
connection
server=192.168.1.1
displayName=RDP Connection
connection
application=shutdown
displayName=Turn off the computer
```

- Parameter displayName

Name to display in terminal menu.

- Parameter autostart_delay

```
autostart_delay = 60
```

Automatically starts connection in 60 seconds (value specified in autostart_delay= option), if user won't press any keys and won't move mouse.

Session parameters

- Parameter user

By default terminal user should specify login, password and domain (if terminal server is included into domain) in "Windows login" window when terminal connects to terminal server. Set these values in configuration file to simplify user life. There are two possible ways to specify these values:

1. Definite values. The values you won't set user will have to specify in login window. Parameters user and domain are used:

```
user = vasyapupkin
domain = MYDOMAIN
```

Also you can specify password:

```
user = petja:password
```

2. Selection from menu. User can select login parameters from menu. Possible values for login parameters:

```
DOMAIN\user[display_name]:password
DOMAIN\user:password
user[display_name]:password
user:password
DOMAIN\user[display_name]
DOMAIN\user
user
```

display_name - is the to display in menu. When display_name is not specified user name is displayed in menu. These blocks are separated by semicolons. For example, this line creates menu with 5 items (users vasja and peter from DOMAIN2, basil's password is 'joke', john's password is '1'):

```
user = DOMAIN2\asil[Basil Washington]:joke;DOMAIN2\peter;john:1;july;Guest;--new--
```

Keyword `--new--` tells terminal to leave username empty. You can create as many items as can be placed on the screen. Terminal automatically shows them in columns.

If server doesn't accept password - check off checkbox "Always prompt for password" in Control Panel - Administrative Tools - Terminal Services Configuration - RDP-Tcp - Logon Settings.

You may tell terminal to allow connection only to the users, listed in parameter `user=`. If terminal manually enters another login and correct password, terminal stops session. To turn on this mode specify `--only-listed--`:

```
user = vasya; peter; john; --only-listed--
```

- Parameter `domain`

If specified `domain` will be set in login window when terminal connects to terminal server.

- Parameter `shell`

Usually terminal server starts explorer as soon as user connects to terminal server. So user sees common Windows desktop. If you need to run any other program instead of desktop, use `shell` parameter. Of course `shell` parameter won't prevent advanced user from entering Ctrl-Shift-Esc, running "Windows Task manager" and starting any other program. Use Windows group policy or special software for such restrictions. Examples of `shell` usage, starts command prompt console:

```
shell = c:\windows\system32\cmd.exe
```

Run Microsoft Word and open document (it should be one line in configuration file).

```
shell = C:\Program Files\Microsoft Office\Office10\winword.exe "c:\temp\document 1.doc"
```

By default Windows Server restricts running arbitrary programs. To make `shell` work you should add this program into RemoteApp Manager (`remoteprograms.msc`) list.

Another way: in `gpedit` you may allow to run arbitrary program. Run `gpedit.msc`, Computer Configuration, Administrative Templates, Windows Components, Remote Desktop Services, Remote Desktop Session Host, Connections, Allow remote start of unlisted programs.

To make sure that server is configured to run needed program, create on Windows computer `test.rdp` file containing one line:

```
alternate shell:s:c:\windows\system32\calc.exe
```

Start this file in Windows. `mstsc.exe` will start and try to execute specified program. If instead of calculator you'll receive error, configure Windows Server as mentioned above.

To run published application (RemoteApp) specify:

```
shell = ||RMySuperRemoteApp
```

- Parameter `directory`

When using `shell` parameter you may need to set current working directory. Then use `directory` parameter. For example, if `shell` parameter starts command prompt console, then this line opens command prompt and sets current directory to `c:\windows\temp` instead of user home directory:

```
directory = c:\windows\temp
```

- Parameter `keyboard`

`keyboard` parameter determines default keyboard language in "Windows login" window and keyboard layout in RDP session. *This parameter works only inside RDP session in Windows interface.* Keyboard for login and password dialogs in VEEMClient interface and for local Chromium is determined by [language](#) parameter. Keyboard for VNC client is determined by [vncclient_keyboard](#) parameter.

Default value is english layout ("en-us"), also you can set german:

```
keyboard = de
```

Or any other from listed below:

```
af (Afrikaans), sq (Albanian), ar (Arabic), ar-sa (Arabic (Saudi Arabia)), ar-iq (Arabic (Iraq)), ar-eg (Arabic (Egypt)), ar-ly (Arabic (Libya)), ar-dz (Arabic (Algeria)), ar-ma (Arabic (Morocco)), ar-tn (Arabic (Tunisia)), ar-om (Arabic (Oman)), ar-ye (Arabic (Yemen)), ar-sy (Arabic (Syria)), ar-jo (Arabic (Jordan)), ar-lb (Arabic (Lebanon)), ar-kw (Arabic (Kuwait)), ar-ae (Arabic (U.A.E.)), ar-bh (Arabic (Bahrain)), ar-qa (Arabic (Qatar)), eu (Basque), bg (Bulgarian), be (Belarusian), ca (Catalan), zh (Chinese), zh-tw (Chinese (Taiwan)), zh-cn (Chinese (China)), zh-hk (Chinese (Hong Kong SAR)), zh-sg (Chinese (Singapore)), hr (Croatian), cs (Czech), da (Danish), nl (Dutch (Netherlands)), nl-be (Dutch (Belgium)), en (English), en-us (English (United States)), en-gb (English (United Kingdom)), en-au (English (Australia)), en-ca (English (Canada)), en-nz (English (New Zealand)), en-ie (English (Ireland)), en-za (English (South Africa)), en-jm (English (Jamaica)), en-bz (English (Belize)), en-tt (English (Trinidad)), et (Estonian), fo (Faeroese), fa (Farsi), fi (Finnish), fr (French (France)), fr-be (French (Belgium)), fr-ca (French (Canada)), fr-ch (French (Switzerland)), fr-lu (French (Luxembourg)), gd (Gaelic), de (German (Germany)), de-ch (German (Switzerland)), de-at (German (Austria)), de-lu (German (Luxembourg)), de-li (German (Liechtenstein)), el (Greek), he (Hebrew), hi (Hindi), hu (Hungarian), is (Icelandic), in (Indonesian), it (Italian (Italy)), it-ch (Italian (Switzerland)), ja
```

(Japanese), ko (Korean), lv (Latvian), lv-qwerty (Latvian QWERTY), lt (Lithuanian), mk (FYRO Macedonian), ms (Malay (Malaysia)), mt (Maltese), no (Norwegian (Bokmal)), no (Norwegian (Nynorsk)), pl (Polish), pt-br (Portuguese (Brazil)), pt (Portuguese (Portugal)), rm (Rhaeto-Romanic), ro (Romanian), ro-mo (Romanian (Moldova)), ru (Russian), ru-mo (Russian (Moldova)), sr-cyrillic (Serbian (Cyrillic)), sr-latin (Serbian (Latin)), sk (Slovak), sl (Slovenian), sb (Sorbian), es (Spanish (Traditional Sort)), es-mx (Spanish (Mexico)), es (Spanish (International Sort)), es-gt (Spanish (Guatemala)), es-cr (Spanish (Costa Rica)), es-pa (Spanish (Panama)), es-do (Spanish (Dominican Republic)), es-ve (Spanish (Venezuela)), es-co (Spanish (Colombia)), es-pe (Spanish (Peru)), es-ar (Spanish (Argentina)), es-ec (Spanish (Ecuador)), es-cl (Spanish (Chile)), es-uy (Spanish (Uruguay)), es-py (Spanish (Paraguay)), es-bo (Spanish (Bolivia)), es-sv (Spanish (El Salvador)), es-hn (Spanish (Honduras)), es-ni (Spanish (Nicaragua)), es-pr (Spanish (Puerto Rico)), sx (Sutu), sv (Swedish), sv-fi (Swedish (Finland)), th (Thai), ts (Tsonga), tn (Tswana), tr (Turkish), tr-f (Turkish F), uk (Ukrainian), ur (Urdu), vi (Vietnamese), xh (Xhosa), ji (Yiddish), zu (Zulu)

Also US International keyboard layout may be specified, it grave in a different way:

```
keyboard = en-us-int
```

```
keyboard = pt-br-int
```

To turn on Japan IME layout set in configuration file:

```
keyboard = ja-ime
```

Also if you need to use keyboard, not listed in the layouts list, you may specify keyboard layout code:

```
keyboard = 0xb0060409
```

All keyboard layouts codes, installed on your server, are listed in the registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Keyboard Layouts
```

- Parameter numlock

By default NumLock indicator is on when terminal connects to terminal server. To turn off NumLock set in configuration file:

```
numlock = off
```

- Parameter graphic

By default additional graphic options turned off to increase operating speed and lower network load. To turn them on use graphic parameter. Parameter value is a line containing one or more of these symbols: a - Desktop background

b - Show window contents while dragging

c - Menu and window animation, scroll documents in MS Office

d - Themes

e - Display cursor shadow

f - Font smoothing

g - Desktop composition

Set parameter value as a sequence of symbols corresponding to the options you want to turn on. For example, to turn on all options specify:

```
graphic = abcdefg
```

To show only desktop wallpaper:

```
graphic = a
```

Windows 2003 Server shows desktop wallpaper only if you set to "Disabled": Start > Run > gpedit.msc > Computer configuration > Administrative templates > Windows components > Terminal services > Enforce removal of remote desktop wallpaper.

В Windows 2016 появились новые кодеки графики и поддержка сжатия h264. [How to turn on h264 on server](#). Codecs are good, but complicated. To turn off new graphics (and to paint as 2012 server) specify:

```
graphic = disable-gfx
```

To use new graphics codec, but to turn off h264 in full-screen video mode and in video window:

```
graphic = disable-h264-fullscreen
```

```
graphic = disable-h264-window
```

To disable h264 hardware decoder:

```
graphic = disable-h264-hardware
```

Separate Different values by commas:

```
graphic = a, disable-h264-fullscreen, disable-h264-window
```

- Parameter `rd_gateway`

Remote Desktop Gateway. Will be done in the next version.

- Parameter `vmconnect`

You may connect to Hyper-V, RDP virtual machine console by VMBus. 2179 port is used. In Hyper-V server options should be enabled *Enhanced Session Mode*.

Virtual machine VM ID you may see from command line on Hyper-V server, run this command:

```
Get-VM | select Name,Id
```

Copy VM ID into VEEMClient configuration file:

```
vmconnect = c4355813-ac42-4f09-bb6e-eadf9c792cbe
```

Without domain connection to Hyper-V console won't work. User, that connects to Hyper-V console, must be in Hyper-V Administrators group.

Terminal resolution must be exactly the same as virtual machine resolution. VEEMClient without license is not able to connect to Hyper-V console because of banner, that reduces screen width. You may contact VEEMClient licensing service and ask for license to test connection to Hyper-V console.

You may test connection to Hyper-V console using `mstsc.exe`. Create text file with these three lines:

```
full address:s:192.168.1.1
pcb:s:c4355813-ac42-4f09-bb6e-eadf9c792cbe
server port:i:2179
```

Specify correct server IP and VM ID. Save with extension `.rdp` and run. `mstsc.exe` should run. If `mstsc.exe` won't connect you should configure Hyper-V server correctly.

- Parameter `loadbalanceinfo`

To connect to load-balanced RD Session Host server farm or to VDI pool via Remote Desktop Connection Broker use `loadbalanceinfo=` parameter. In Windows `.rdp` file, that is used for connecting, is specified:

```
loadbalanceinfo:s:tsv://MS Terminal Services Plugin.1.NameSC
```

Instead of `NameSC` is the name of your Session Collection. In VEEMClient configuration file you should specify:

```
loadbalanceinfo = tsv://MS Terminal Services Plugin.1.NameSC
```

- Parameter `rdpcompression`

`rdpcompression` parameter enables RDP packets compression:

```
rdpcompression = on
```

Use this option only for lower-bit-rate channels. Compression decreases terminal performance in local networks. Disabled by default.

- Parameter `scale_factor`

```
scale_factor = 125
```

The scale factor (as a percentage) applied to Windows Desktop Applications. Possible values: 100 (default), 125, 150.

VNC session parameters

- Parameter `vncclient_keyboard`

In order to set VNC client keyboard layout specify `vncclient_keyboard`. RDP client keyboard layout is set by [keyboard](#) option. Keyboard layout for VEEMClient login dialogue and for local Chromium is set by [language](#) option.

By default VEEMClient sends keys scan-codes. It works for VNC server, embedded into VMware Player and VMware Workstation. For VNC servers, that you install on Windows (UltraVNC, TightVNC), symbols, not scan-codes, should be sent. Num Lock should work with this setting:

```
vncclient_keyboard = en
```

Google Chrome parameters

- Parameter `chrome_url`

When Chrome starts show specified URL. Read VEEMClient docs:

```
chrome_url=http://VEEMClient.com/doc.html http://VEEMClient.com/logs.html
```

- Parameter `chrome_mode`

Windows frames are used to show sites that create new windows:

```
chrome_mode = window
```

Kiosk mode without address line is used for users that don't view other sites:

```
chrome_mode = kiosk
```

Without mouse pointer:

```
chrome_mode = kiosk-nopointer
```

- Parameter `chrome_language`

Language of embedded Google Chrome interface. Messages and menu items in Chrome will be written in this language:

```
chrome_language = nl
```

If user needs to enter text in some language other than english, specify parameter `language=`

- Parameter `chrome_profile`

All Chromium settings are stored in profile. By default profile with uBlock is loaded, which adds several megabytes during terminal boot. You can use empty profile:

```
chrome_profile=empty
```

If you need to add plug-in, save user password or specify another Chromium setting, not added to VEEMClient config, you are to create your own profile and use it instead of default profile.

If terminal boots from local disk, SD card or USB flash, Chromium profile may be stored on local disk. Open terminal web-interface, press "Save custom Chromium profile on disk" and follow the instructions. Here's [video-tutorial](#).

If terminal downloads configuration from TFTP or HTTP server, Chromium profile may be loaded from the same server. In terminal web-interface press "Download custom Chromium profile" and follow the instructions.

- Parameter `chrome_pac`

[Proxy auto-config](#):

```
chrome_pac=http://192.168.1.1/proxy.pac
```

- Parameter `chrome_proxy`

Proxy server address:

```
chrome_proxy=192.168.1.1:3128
```

```
chrome_proxy="https=proxy1:80;http=socks4://baz:1080"
```

- Parameter `chrome_share`

You may use shared folder from Windows-server to store files, downloaded from Internet, or attach files from network share to e-mails. You should specify server IP-address, server names are not supported now. To connect Windows directory, shared for full access without password, specify:

```
chrome_share=\\10.1.2.3\sharename
```

With username and password:

```
chrome_share=\\10.1.2.3\sharename, user vasja, password 123
```

To connect folder read-only, so that user could not store file from Internet:

```
chrome_share=\\10.1.2.3\sharename, ro
```

Complicated magic for working with old Windows:

```
chrome_share=\\10.1.2.3\sharename, vers 1.0
```

- Parameter `chrome_camera`

Load Web camera drivers:

```
chrome_camera=on
```

VLC parameters

- Parameter `vlc_cmdline`

VLC command line. The easiest way to start video playback from active stream:

```
vlc_cmdline=-I dummy rtsp://10.1.1.32:8556/6
```

For more details about VLC usage see [manual](#).

- Parameter `vlc_files`

During boot terminal may download one or several files from VLC directory on TFTP or HTTP server and save them to `/vlc_files` directory on disk or to terminal RAM. It may be background images, videofiles or vlm configuration script:

```
vlc_files=background.jpg, vlm.txt
```

For more details about VLC usage see [manual](#).

- Parameter `vlc_restart`

When VLC works for 24x7 it may work slowly. This parameter specifies number of hours till next automatic VLC restart.

```
vlc_restart=4
```

By default VLC will restart each 12 hours, value `=off` turns off automatic restart.

- Parameter `vlc_timeout`

Timeout determines for how long VLC player will work in background when user switches to another virtual screen. Default timeout value is 0, possible values from 0 to 300. This line tells terminal not to turn off VLC working in background:

```
vlc_timeout=off
```

Using terminal periphery

- Parameter `disk`

You can access terminal USB-disks and CDROM. To enable device redirection set corresponding parameter `disk` or `shared_disk` value. The difference between using these parameters is in disk redirection way.

While using `disk` parameter RDP protocol is used for redirection. We recommend to use this value. In current terminal session disk is available at:

```
\\tsclient\{cdrom|usb\}. Sometimes (not always, reasons not revealed) disk automatically appears in "My computer".
```

If you've set proper parameter in configuration file, but can't see any disk icon - please, make sure that terminal server settings allow client disk redirection.

Try to access Windows-computer disks using standart Microsoft terminal services client (Start > Programs > Accessories > Communications > Remote desktop connection).

One of terminal server settings: in group policy (Start -> Run -> gpedit.msc) goto Computer Configuration -> Administrative Templates -> Windows Components -> Remote Desktop Services -> Remote Desktop Session Host -> Device and Resource Redirection and specify policy "Do not allow drive redirection" to "Disabled".

While using terminal floppies and CD-s user should connect and disconnect disks manually. After inserting CD user should place mouse to bottom right screen corner. Then window with buttons appears. Press "connect" button to make terminal read disk contents. It's necessary to press "disconnect" **BEFORE** disk ejecting, otherwise disk data can be damaged. As our practice shows this is the only safe way of working with terminal disks.

USB flash-disks connect automatically without pressing any buttons. Before ejecting USB flash wait till light stops blinking and eject disk in several minutes.

By default all disk redirections are disabled. Don't allow users to access terminal disks without extreme necessity. It threatens your computer infrastructure security. Having the opportunity to read/write information to disks, user can bring virus or steal important information.

To access terminal CDROM specify:

```
disk = cdrom
```

To access terminal USB_flash disks specify:

```
disk = usb
```

USB-disks can be protected from writing, just specify:

```
disk = usb(r/o)
```

For example this line:

```
disk = cdrom;usb(r/o)
```

means that user can access terminal CD-ROM and USB-disks, and USB-disks will be redirected read-only.

- Parameter `shared_disk`

You can access terminal USB-disks and CDROM. To enable device redirection set corresponding parameter `disk` or `shared_disk` value. The difference between using these parameters is in disk redirection way.

While using `shared_disk` parameter terminal is told to run "Microsoft networks" support service. It means, that any user is able to access disk from any computer in network. Disk is available at: `\\terminal_IP_address\{cdrom|usbN}`. By default all disk redirections are disabled. Don't allow users to access terminal disks without extreme necessity. Firstly, it threatens your computer infrastructure security. Having the opportunity to read/write information to disks, user can bring virus or steal important information. Secondly, redirection uses terminal resources, most of all memory, that could be used for cache. To access terminal CDROM specify:

```
shared_disk = cdrom
```

To access terminal USB_flash disks specify:

```
shared_disk = usb
```

USB-disks can be protected from writing, just specify:

```
shared_disk = usb(r/o)
```

For example this line:

```
shared_disk = cdrom;usb(r/o)
```

means that user can access terminal CD-ROM and USB-disks, and USB-disks will be redirected read-only.

- Parameter `printer`

There are four ways of using printer that is connected to terminal. They are managed by `printer=`, `rdp_printer=`, `vhub=` and `usb=` parameters. Select the most suitable for you and use it. For more details read [article about printers](#).

If `printer` parameter is specified correctly, printer can be attached to terminal, and all computers in the network, including terminal server, can use it.

Possible parameter values:

```
printer = lpt1
```

one-way data communication with printer (only from server to printer), lpt parallel port driver configured to work with 378 port, irq 7.

```
printer = usb
```

one-way data communication with printer, USB printer.

```
printer = usb(1234:abcd), usb(5678:cdef)
```

binds printer USB ID to port number. The first printer will be available on 9100 port, the second printer - 9101 port. USB ID tells terminal, which of physical printers it should determine as the first and which as the second.

```
printer = usb(delay 300)
```

specifies delay. It is used only for USB-LPT adapters.

```
printer = com1
```

one-way data communication with connected to com1 port printer, 9600 bps speed, 8 bit capacity, no parity check, one stop-bit (9600-8-N-1, common com-port hardware configuration). Expanded parameter syntax:

```
printer = com1(38400)
```

specifies 38400 bps speed.

Terminal with attached printer should have fixed IP address. For more details about how to make Microsoft DHCP to give fixed terminals addresses see [this article](#). About printer drivers installation on the server read at [this article](#).

How to print from DOS on terminal read [here](#)

VEEMClient terminal emulates HP JetDirect hardware print-server (hardware print-server is a small box, that connects computer network and printer). With VEEMClient terminal:

- work all printers able to work with hardware print-server HP JetDirect (as well as with any other print-server, all hardware print-servers are HP JetDirect copies),
- work all printers which drivers are included into Window distributive,
- work all printers able to print from DOS without additional drivers,
- don't work so called Win-printers. Some of win-printers: HP 700c, 820c, 1000c, 3300c, 3400c, DJ 820cxi, LJ 3100; Canon LBP-250/810/1110/1120/1210/2410; Epson LP1300,EPL 5800/2050+/6200L, C900; Lexmark X5150;Dell A920/940/960, J740; Minolta 1350W/1250W/2300W.

Up to 4 printers can work on the terminal. Blocks containing each printer data are separated by semicolons. 2nd printer uses port 9101, 3rd printer uses port 9102 and 4th printer uses port 9103. If you connect more than one printers of the same type (lpt1 and lpt2, or usb and usb), then check experimentally physical naming order by printing test pages.

```
printer = lpt1;lpt2;usb;com1(38400)
```

To turn on printer debug information logging specify in configuration file:

```
printer = usb, debug
```

Send full terminal log to support@VEEMClient.com. In this mode a lot of debug messages will be saved into terminal log. Turn on only when needed.

- Parameter `rdp_printer`

There are four ways of using printer that is connected to terminal. They are managed by **printer**, **rdp_printer**, **vusb=** and **usb=** parameters. Select the most suitable for you and use it. For more details read [article about printers](#).

`rdp_printer` parameter redirects connected to terminal printer using RDP. The same as `mstsc.exe` does. Parameter value is **correct** printer name without any other symbols. In [this article](#) is described where to find this name. For example:

```
rdp_printer=HP LaserJet 1020
```

Terminal name length (specified by `clienthostname=` or DHCP 012 option) **must be no more than 14 symbols**. If you don't see redirected printer in printers folder, try to specify in terminal configuration file:

```
clienthostname=w*MAC
```

You can specify which printer to use. Connect to working terminal by http to determine printer USB ID. For example:

```
rdp_printer=HP LaserJet 1020:usb 03f0:2b17
```

If you have many similar printers, write their USB ID and names to the file "Everyone\printers-local.wtc". Then specify in configuration file:

```
rdp_printer=auto
```

Supported printers connected via RS232 to COM-port:

```
rdp_printer=TSC TDP-225:com1
```

You can print to network printer. That is especially important for remote offices without VPN:

```
rdp_printer=HP LaserJet 400 MFP M425dn:tcp 192.168.1.50:9100
```

In addition you may specify name, that user will see:

```
rdp_printer=HP LaserJet 400 MFP M425dn [Printer at reception]:tcp 192.168.1.50:9100
```

You can redirect several (not more than four) printers. For each printer specify how it connected to terminal. In one line:

- Parameter vhusb

USB devices redirection using [VirtualHere](#). For more details read [forum](#).

- Parameter vhusb_license

VirtualHere License:

```
vhusb_license=1234050617ea4984,0,CMICDwCbZ6kF1QLfgUwRe/EGQQIPAKnVhp2ED1dcd8CCKXV1
```

- Parameter vhclient

Terminal may accept redirected USB token from [VirtualHere](#) server and use it in RDP session. For more details read [forum](#).

- Parameter usb

USB redirection for Windows Server. Not all devices work. For more details see [forum](#).

To turn on debug information logging specify in configuration file:

```
usb=0403:6001, debug
```

Send full terminal log to support@VEEMClient.com. In this mode a lot of debug messages will be saved into terminal log. Turn on only when needed.

- Parameter usbip

USB redirection for Linux. Terminal makes `usbip bind` for specified device. `usbip attach` on terminal server side you should make manually. You may specify USB ID device identifier:

```
usbip=0403:6001
```

Or bus id, USB port address, then will be redirected any device, connected to this port:

```
usbip=1-1.3
```

USB ID and bus id you may find in USB section of terminal web-interface.

Turn on debug mode in configuration file:

```
usb=0403:6001, 0403:6002, debug
```

Then full terminal log send to support@VEEMClient.com. In this mode terminal will send to log many messages, turn on only when needed.

- Parameter sound

It's possible to redirect sound from server to terminal sound card. In order to redirect sound to terminal specify in configuration file:

```
sound = on
```

You can specify sound device:

```
sound = on, hw:1:0
```

Specify `sound=on` and reboot terminal. On terminal web-interface you'll see the list of all sound devices, that terminal has drivers for, and buttons for testing sound.

Next line leaves sound on server, i.e. sound will be played by server sound card:

```
sound = remote
```

By default redirected one channel of compressed ADPCM sound. To turn on second channel and play stereo sound specify:

```
sound = on, stereo
```

To turn off compression and redirect two channels of uncompressed sound (then traffic will be about 170 KB/s) specify:

```
sound = on, raw
```

Manual about sound configuration: VEEMClient.com/docs5/sound.html

- Parameter `sound_level`

Terminal sound level:

```
sound_level = 50
```

Possible values - from 0 (sound muted) to 100 (maximum level). You may show volume control in popup window:

```
sound_level = 75, infobox
```

- Parameter `microphone`

Microphone redirection. Supported only by Windows 7 Ultimate, Windows Server 2008r2 and newer:

```
microphone = on
```

USB microphone (only microphone without headphones):

```
microphone = on, hw:1:0
```

- Parameter `microphone_level`

Terminal microphone sound level:

```
microphone_level = 50
```

Possible values - from 0 (microphone muted) to 100 (maximum level). You may show volume control in popup window:

```
microphone_level = 100, infobox
```

- Parameter `camera`

Web camera RDP redirection works on Windows Server 2019 and newer. Turn on:

```
camera = on
```

By default h264 and Motion JPEG compressed formats are redirected. Uncompressed formats are not redirected, because your network won't stand too much traffic. If your camera is unable to compress or you are sure you need uncompressed format:

```
camera = on, raw
```

On terminal web-interface there's list of all formats supported by your camera.

- Parameter `serial`

In order to redirect serial port COM1 to terminal specify in configuration file:

```
serial = com1
```

To redirect COM2 and COM2:

```
serial = com1;com2
```

USB bar code scanners, check printers and other devices with COM and USB interfaces also should be connected using `serial=` parameter. Then on the terminal server such device is available as COM-port device. Such devices have USB to Serial converter, and terminal makes reconversion. Like Windows-driver terminal creates virtual COM-port. To redirect such device with USB interface specify in configuration file:

```
serial = com1(usb)
```

If you need to redirect two or more devices with USB to Serial converter, you should specify USB ID (unique USB device model ID, it's common for similar USB to Serial adapters) or bus ID (physical USB connector address on computer) for each of these devices. Terminal needs to determine corresponding port for each device. Connect all needed devices to terminal. Boot terminal. On another windows-computer in network open web-browser and enter terminal IP in address line. In "USB Bus" section you'll see list of all devices, USB ID (marked green) and bus ID (marked orange) of each device. Syntax of `serial=` parameter in such case is:

```
serial = com2(usb 0403:6001), com3(usb 0c2e:0720), com6(usb 11ca:0207)
```

Or for bus ID (Do not mix! Specify either USB IDs of all devices or bus IDs of all devices):

```
serial = com1(usb 2-1.1), com3(usb 1-1)
```

Some USB devices represent two COM ports. It is configured so:

```
serial = com1(usb), com2(usb second)
```

Some advanced programs require COM-ports' names for different terminals to be unique. To work with these programs specify in configuration file:

```
serial = com25(com1),eklmn10(com2),com45(usb)
```

This line redirects com1 port from terminal, it will be named com25 on server. com2 terminal port on server will be named eklmn10 (yes, it's possible). Connected to USB device with com-usb interface (barcode scanner, receipt printer, scales etc.) on server will be named com45.

Not to cause confusion with physical server ports we recommend to rename physical ports. It's not obligatory, but otherwise there will be two COM1 ports in terminal session. If applications have to deal with these two variants, it can cause errors. To configure ports: rightclick on "My Computer" > Manage > Device manager > Ports (COM & LPT) > Communications port (COM1) > Properties > Port settings > Advanced > COM-port number. For example, set COM11. Just the same rename COM2 to COM12. **Reboot server.**

Redirected by RDP COM ports are not displayed in Device Manager! To make sure, that everything is right: connect to terminal server, start command line prompt and execute change port command. Correct result is (redirected COM1 port):

```
COM1 = \Device\RdpDrPort\;COM1:1\tsclient\COM1
COM11 = \Device\Serial0
COM12 = \Device\Serial1
```

It means, that there are three serial ports available in session. COM11 and COM12 ports are physical server ports. COM1 is physical terminal COM1 port. In this session any application, that works with COM1 device, in fact works with terminal COM1 port.

To turn on debug information logging specify in configuration file:

```
serial = com1, debug
```

Send full terminal log to support@VEEMClient.com. In this mode a lot of debug messages

In this mode a lot of debug messages will be saved into terminal log. Turn on only when needed.

- Parameter ser2net

COM-ports can be redirected through [ser2net](#) utility. TCP/IP ports start from 2001. For Windows client side you can use [Tibbo](#) or [com0com](#). Examples:

```
ser2net = com1 115200
ser2net = usb 9600
ser2net = usb 0c2e:0720 9600 NONE 1STOPBIT 8DATABITS XONXOFF LOCAL -RTSCTS
```

```
ser2net = com1 115200, usb 0c2e:0722 57600
ser2net = usb 1-1 57600, usb 1-2 57600ser2net = usb serial:00247857 57600, usb serial:"S/N G19I76903" 57600
```

USB ID, BUS ID and serial number of the USB device (if there is one, not every USB device manufacturer identifies devices by serial number) can be found on terminal web interface.

Use only one way of access to port. If you specify both serial=com1 and ser2net=com1, none of them will work.

- Parameter scanner

USB-scanners are redirected with the help of [SANE project](#). All devices from [this list](#) are supported. You should setup and configure on terminal server [SaneTwain](#). To redirect scanner specify in configuration file:

```
scanner = on
```

To turn on debug information logging specify in configuration file:

```
scanner = on, debug
```

Send full terminal log to support@VEEMClient.com. In this mode a lot of debug messages

In this mode a lot of debug messages will be saved into terminal log. Turn on only when needed.

- Parameter smartcard

To redirect smartcards to terminal in configuration file specify:

```
smartcard = etoken
```

Terminal can understand 2 or three (not more than three) card types:

smartcard = etoken, rutoken, omnikey

Next devices are supported:

- auto - Autodetect connected reader
- etoken - eToken 72K Java (0529:0620)
- jacarta - JaCarta, JaCarta LT (24dc:0101, 24dc:0102)
- jacarta_0402 - JaCarta LT new (24dc:0402)
- rutoken - Rutoken S, ECP, lite, iBank2 A (0a89:0020, 0a89:0060, 0a89:0030, 0a89:0025)
- rutoken_scr - Rutoken SCR 3001 (0a89:0069)
- acr122 - ACR122 (072f:2200)
- acs - ASC CCID USB (072f:90cc)
- acr128u - ACR1281U (072f:2224)
- acr3901u - ACR3901U (072f:b000)
- acr39u - ACR39U, some devices are not supported (072f:b100)
- acr38u - ACR38U (072f:9000)
- ezzccid - EZCCID, EZ100PU (0ca6:00a0)
- gempctwin - Gemplus (08e6:3437)
- gempckey - Gemplus (08e6:3438)
- ibank2_blue - iBank2Key blue token (23a0:0002, 23a0:0004)
- omni1021 - OMNIKEY CardMan 1021 (076b:1021)
- omnikey - OMNIKEY (076b:5321)
- omni3021 - OMNIKEY (076b:3021, 076b:3022)
- omni3x21 - OMNIKEY (076b:3031)
- asedrive - ASEDrive (0dc3:1004)
- multisoft - MultiSoft SCR2 (2a0c:0001)
- trustscreen - BIFIT Trustscreen (23a0:0005)
- watchdata - Watchdata (163c:0407, 163c:0417)
- cryptomate64 - ACS CryptoMate64 (072f:90db)
- esmart - ESMART Token (2ce4:7479)
- safetouch - SafeTouch (24a2:0102)
- identive_5710 - Identive CLOUD 2700 F (04e6:5710)
- identive_5810 - Identive CLOUD 2700 R (04e6:5810)
- angara - BIFIT ANGARA (23a0:0008)
- starsign - G&D StarSign (1059:0017, 1059:0019)
- vdtoken - vdToken (2bb1:0f10)
- avtor - Avtor (15cf:0019)
- ezio - Gemalto Ezio Shield (08e6:34c0, 08e6:34c1)
- dell - Dell Keyboard (413c:2101)
- kobil - Kobil Smart Token (0d46:3014)
- minilector - Bit4id miniLector EVO (25dd:3111)
- DigitalDNA - Bit4id Digital-DNA (25dd:2351)
- avbign - AVEST AvBign (28a1:0601)
- scr3311 - SCM SCR3311 (04e6:5116, 04e6:511d)
- au9540 - Alcor AU9540 (058f:9540)
- ePass2003 - Feitian ePass2003 (096e:0807)
- ePass2003Auto - Feitian ePass2003Auto (096e:080a)
- scr301 - Feitian SCR301 (096e:0503)
- acr1252 - ACR1252 (072f:223b)
- almaz1c - IIT Almaz-1C (03eb:9324)
- JCR721 - Aladdin JCR721 reader (24dc:0428)
- yubikey_ofc - YubiKey OTP+FIDO+CCID (1050:0407)
- tokenMe_CC_v2 - Bit4id tokenMe CC v2 (25dd:1101)
- iToken - BIFIT iToken (23a0:0003)

Terminal may autodetect smartcard reader, if it's from the list of supported readers and is connected before terminal turned on:

smartcard = auto

Only one smartcard can be redirected, two cards at once can't be redirected.

To turn on debug information logging specify in configuration file:

smartcard = etoken, debug

Send full terminal log to support@VEEMClient.com. In this mode a lot of debug messages will be saved into terminal log. Turn on only when needed.

Others

- Parameter `clienthostname`

Terminal name, that is shown in "Terminal Services Manager" and is used for licensing access to Microsoft terminal services, is determined by `clienthostname` parameter:

```
clienthostname = terminal1
```

Terminal can generate name using template:

```
clienthostname = ca*MAC
```

This value tells terminal with MAC-address 01:02:03:ab:cd to generate the name `ca010203ABCD`. Also it may use one, two or three numbers from IP-address:

```
clienthostname = wt*IP1
```

Terminal with IP-address 192.168.1.123 will have the name `wt-123`. And this value:

```
clienthostname = wt*IP3
```

will name the terminal with the same IP-address 192.168.1.123 as `wt-168-1-123`.

Name length must be not more than 15 symbols!

It's better to use different names for different terminals. Also terminal name can be received from DHCP-server (in this case it can be used as a name for configuration file, for more details see [this article](#)). But `clienthostname` parameter value **underlies** received from DHCP-server name. `clienthostname` default value is `wtwXXXXXXXXXX`, where `XXXXXXXXXX` - terminal MAC-address.

- Parameter `rdweb_password`

1. Настроить смену пароля через RDWEB: [инструкция](#).
2. Указать в конфигурационном файле терминала адрес сервера RDWEB:

```
rdweb_password = 192.168.1.1
```

Если RDP сервер потребует сменить пароль (истек срок действия пароля или первый логин), терминал с такой настройкой предложит интерфейс смены пароля.

Можно указать язык сообщений, если соответствующий языковой пакет установлен на сервере RDWEB:

```
server=password:192.168.1.1, pt-BR
```

- Parameter `turnoffmenu`

After disconnecting from terminal server terminal automatically connects to server again. Sometimes users don't understand: when are they to shut down computer if there's always Windows on the screen? When you set parameter value to:

```
turnoffmenu = on
```

then if parameters `server` and `user` create start menu, terminal adds new menu item **"Turn off computer"**. Otherwise after disconnect on the screen appears screen saver with the text **"Turn off computer or press Enter to continue."**

If parameter value is always:

```
turnoffmenu = always
```

then after disconnect terminal shows screen saver with the text **"Turn off computer or press Enter to continue."** AND adds item **"Turn off computer"** to server and user selection menus, if they are created by `server` and `user` parameters.

Press Esc, Sleep, Power when you see screen saver "Turn off computer..." to turn off terminal.

To change text message specify:

```
turnoffmenu = on,msg:Turn it off NOW!
```

To make terminal turn off automatically after log off specify:

```
turnoffmenu = poweroff
```

- Parameter `autosshutdown`

This parameter is used to make terminal shut down when it is **not connected to server** during specified time. Timeout is specified in minutes:

```
autosshutdown = 5
```

- Parameter `sleep`

This parameter is used to put the monitor to sleep when it is not used during specified time. Energy saving mode can be Poweroff, Stand-by, Suspend. Wikipedia knows the [difference between these modes](#). Timeout is specified in minutes. Default mode is Poweroff.

```
sleep = 10  
sleep = 20,standby
```

By default Raspberry Pi doesn't turn off display. To turn off display backlight add this line in `config.txt` file on boot SD card:

```
hdmi_blanking=1
```

- Parameter `infobox`

When moving mouse to right-bottom screen corner - VEEMClient window appears. It contains technical information: VEEMClient version, terminal server IP, terminal MAC-address. Also when `disk=cdr0m` parameter are specified in configuration file connect or disconnect button for disk are placed in this window. When this window makes you nervous, terminal can show it only if you press one of the control buttons and move mouse to right-bottom corner. Specify **one** these lines:

```
infobox = lctrl  
infobox = rctrl  
infobox = lalt  
infobox = ralt  
infobox = lshift  
infobox = rshift  
infobox = never
```

`lctrl` means "left Ctrl button", `rshift` means "right Shift button".

You may remove VEEMClient logo and version number from this window. Specify `skin` parameter and create `popup.png` with your company logo.

VEEMClient may show connection name. Specify name in connection `displayName` parameter.

You may turn off showing terminal MAC address in this window:

```
infobox = nomac
```

Or do not show MAC, IP and terminal hostname just not to scare users:

```
infobox = noinfo
```

By combining both of these flags, this window appears only when right Alt button is pressed and no addresses are shown:

```
infobox = ralt,noinfo
```

If you need terminal power off button in popup window specify:

```
infobox = shutdown
```

If you need reboot terminal button in popup window specify:

```
infobox = reboot
```

- Parameter `screenswitch`

You may switch between virtual screens using buttons in popup windows or using keyboard. By default Win-1..Win-4 key sequences are used. To set another key sequence specify in configuration file:

```
screenswitch = Win-Ctrl-N
```

```
screenswitch = Win-Alt-N
```

Or you may disable switching from keyboard:

```
screenswitch = none
```

- Parameter `win_l`

Pressing Win-L locks terminal, if there's at least one working RDP session with NLA and it's password was entered in VEEMClient interface. You may tell terminal not to process Win-L locally, but to pass it to server:

win_1 = remote

In this case only one RDP session will be locked. We recommend not to specify this option and not to change default behaviour. Microsoft Windows always locks locally, so the described [hereproblem](#) will not be reproduced in Windows and will never be fixed by Microsoft.

- Parameter onerror

If terminal session fails with error, terminal shows error info window and waits until user presses the button "OK". You may tell terminal to wait no longer than the specified number of seconds (possible values from 5 to 300), after that automatically remove error window and continue to work:

```
onerror = 60
```

Or event not to scare user with error messages (errors will be stored only in terminal log):

```
onerror = quiet
```

- Parameter redraw_delay

redraw_delay parameter determines maximal screen refresh interval. It is specified in milliseconds. Possible values - from 50 to 3000, default value is 300.

```
redraw_delay = 50
```

When server sends data to screen too fast and terminal can't cope with such data amount - terminal stops screen refreshing and draws image only to frame buffer, in RAM. To see this effect run some console application, for example, execute command 'type longtextfile' from command prompt. For there's no output to slow video memory terminal can calculate each frame faster and thus cope with redraw amount faster. But people don't like when image freezes and screen stops refreshing. Small parameter values make image more alive. High values cause refresh delays but help to increase the speed of large data amounts redraw.

- Parameter connect_timeout

connect_timeout parameter specifies the period in seconds, during which terminal attempts to connect to server:

```
connect_timeout = 5..60
```

This line means that terminal will be trying to connect to server for at least 5 seconds and no more than 60 seconds.

- Parameter keepalive

TCP keepalive timer configuration, it determines when to drop connection if network link broke:

```
keepalive = 10,3,5
```

Better not to change this parameter. Numbers - TCP_KEEPIIDLE, TCP_KEEPINTVL, TCP_KEEPCNT - are described in TCP/IP documentation. By default =on, is the same as =10,3,5. With these settings terminal will show that link is broken in $10 + 3 * 5 = 25$ seconds. To turn off this timer specify:

```
keepalive = off
```

- Parameter firmware

Firmware for drivers.

- Parameter extra

Load and launch external files.

- Parameter CLID

Concurrent licenses identifier. To determine it go to VEEMClient license generator. For more details see [this manual](#).

- **Parameter language**

Parameter `language` sets the language for login and password input in VEEMClient interface. Also this parameter sets the language for Google Chrome and VNC client. English is default language, any other language or keyboard layout (QWERTZ, AZERTY etc.) should be added by such line:

```
language = de, default
```

- **Parameter keyswitch**

Parameter `keyswitch` sets key sequence to change keyboard layout. This parameter is used for domain, login, password input in VEEMClient interface and only when `language` parameter specified. Also it works for Google Chrome. Default key sequence is Ctrl-Shift. To change it specify:

```
keyswitch = alt-shift
```

- **Parameter clipboard**

You can use clipboard to transfer data between several simultaneously working sessions. Specify on configuration file:

```
clipboard = on
```

If common clipboard is needed not in all sessions specify `clipboard` parameter only in needed connections of needed.

For example, no need to specify `clipboard` parameter if there's only one screen on terminal.

- **Parameter ask_password**

Session Broker in Windows Server doesn't pass password to terminal when tells it to connect to another server. Therefore user has to enter password or PIN second time. In order to avoid password reentering specify in configuration file:

```
ask_password = on
```

Then user will input password in VEEMClient dialog and this password will be automatically used in Session Broker session redirection.

You may tell terminal not to ask for smartcard PIN, if smartcard is not used for login:

```
ask_password = nopin
```

To change captions in login and password fields specify:

```
ask_password = username:Nom d'utilisateur, password:Mot de passe
```

- **Parameter animation_speed**

Animation speed during switching screens:

```
animation_speed = 3
```

0 - no animation, 1 - slow, 9 - fast.

- **Parameter timezone**

By default in all Windows servers timezone redirection is turned off. It means that all users work in server timezone and `timezone` parameter won't change anything.

To connect terminal from another timezone set to "Enabled" policy "Allow time zone redirection" in Administrative Templates - Windows components - Remote Desktop Services - Remote Desktop Session Host - Devices and Resources Redirection. Then on all terminals should be specified timezone.

To specify terminal timezone use parameter:

```
timezone = hawaii
```

In this line `hawaii` - it's several first letters from Hawaiian Standard Time, name of timezone (GMT-10:00) Hawaii. Full list of timezones and names:

Timezone	In configuration file
(UTC-12:00) International Date Line West	<code>timezone = Dateline Standard Time</code>
(UTC-11:00) Coordinated Universal Time-11	<code>timezone = UTC-11</code>
(UTC-10:00) Aleutian Islands	<code>timezone = Aleutian Standard Time</code>
(UTC-10:00) Hawaii	<code>timezone = Hawaiian Standard Time</code>
(UTC-09:30) Marquesas Islands	<code>timezone = Marquesas Standard Time</code>

(UTC-09:00) Alaska	timezone = Alaskan Standard Time
(UTC-09:00) Coordinated Universal Time-09	timezone = UTC-09
(UTC-08:00) Baja California	timezone = Pacific Standard Time (Mexico)
(UTC-08:00) Coordinated Universal Time-08	timezone = UTC-08
(UTC-08:00) Pacific Time (US & Canada)	timezone = Pacific Standard Time
(UTC-07:00) Arizona	timezone = US Mountain Standard Time
(UTC-07:00) Chihuahua, La Paz, Mazatlan	timezone = Mountain Standard Time (Mexico)
(UTC-07:00) Mountain Time (US & Canada)	timezone = Mountain Standard Time
(UTC-06:00) Central America	timezone = Central America Standard Time
(UTC-06:00) Central Time (US & Canada)	timezone = Central Standard Time
(UTC-06:00) Easter Island	timezone = Easter Island Standard Time
(UTC-06:00) Guadalajara, Mexico City, Monterrey	timezone = Central Standard Time (Mexico)
(UTC-06:00) Saskatchewan	timezone = Canada Central Standard Time
(UTC-05:00) Bogota, Lima, Quito, Rio Branco	timezone = SA Pacific Standard Time
(UTC-05:00) Chetumal	timezone = Eastern Standard Time (Mexico)
(UTC-05:00) Eastern Time (US & Canada)	timezone = Eastern Standard Time
(UTC-05:00) Haiti	timezone = Haiti Standard Time
(UTC-05:00) Havana	timezone = Cuba Standard Time
(UTC-05:00) Indiana (East)	timezone = US Eastern Standard Time
(UTC-04:00) Asuncion	timezone = Paraguay Standard Time
(UTC-04:00) Atlantic Time (Canada)	timezone = Atlantic Standard Time
(UTC-04:00) Caracas	timezone = Venezuela Standard Time
(UTC-04:00) Cuiaba	timezone = Central Brazilian Standard Time
(UTC-04:00) Georgetown, La Paz, Manaus, San Juan	timezone = SA Western Standard Time
(UTC-04:00) Santiago	timezone = Pacific SA Standard Time
(UTC-04:00) Turks and Caicos	timezone = Turks And Caicos Standard Time
(UTC-03:30) Newfoundland	timezone = Newfoundland Standard Time
(UTC-03:00) Araguaina	timezone = Tocantins Standard Time
(UTC-03:00) Brasilia	timezone = E. South America Standard Time
(UTC-03:00) Cayenne, Fortaleza	timezone = SA Eastern Standard Time
(UTC-03:00) City of Buenos Aires	timezone = Argentina Standard Time
(UTC-03:00) Greenland	timezone = Greenland Standard Time
(UTC-03:00) Montevideo	timezone = Montevideo Standard Time
(UTC-03:00) Punta Arenas	timezone = Magallanes Standard Time
(UTC-03:00) Saint Pierre and Miquelon	timezone = Saint Pierre Standard Time
(UTC-03:00) Salvador	timezone = Bahia Standard Time
(UTC-02:00) Coordinated Universal Time-02	timezone = UTC-02
(UTC-02:00) Mid-Atlantic - Old	timezone = Mid-Atlantic Standard Time
(UTC-01:00) Azores	timezone = Azores Standard Time
(UTC-01:00) Cabo Verde Is.	timezone = Cape Verde Standard Time
(UTC) Coordinated Universal Time	timezone = UTC
(UTC+00:00) Casablanca	timezone = Morocco Standard Time
(UTC+00:00) Dublin, Edinburgh, Lisbon, London	timezone = GMT Standard Time
(UTC+00:00) Monrovia, Reykjavik	timezone = Greenwich Standard Time
(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna	timezone = W. Europe Standard Time
(UTC+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague	timezone = Central Europe Standard Time
(UTC+01:00) Brussels, Copenhagen, Madrid, Paris	timezone = Romance Standard Time
(UTC+01:00) Sarajevo, Skopje, Warsaw, Zagreb	timezone = Central European Standard Time
(UTC+01:00) West Central Africa	timezone = W. Central Africa Standard Time
(UTC+01:00) Windhoek	timezone = Namibia Standard Time
(UTC+02:00) Amman	timezone = Jordan Standard Time
(UTC+02:00) Athens, Bucharest	timezone = GTB Standard Time
(UTC+02:00) Beirut	timezone = Middle East Standard Time
(UTC+02:00) Cairo	timezone = Egypt Standard Time
(UTC+02:00) Chisinau	timezone = E. Europe Standard Time
(UTC+02:00) Damascus	timezone = Syria Standard Time
(UTC+02:00) Gaza, Hebron	timezone = West Bank Standard Time
(UTC+02:00) Harare, Pretoria	timezone = South Africa Standard Time
(UTC+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius	timezone = FLE Standard Time
(UTC+02:00) Jerusalem	timezone = Israel Standard Time
(UTC+02:00) Kaliningrad	timezone = Kaliningrad Standard Time

(UTC+02:00) Tripoli	timezone = Libya Standard Time
(UTC+03:00) Baghdad	timezone = Arabic Standard Time
(UTC+03:00) Istanbul	timezone = Turkey Standard Time
(UTC+03:00) Kuwait, Riyadh	timezone = Arab Standard Time
(UTC+03:00) Minsk	timezone = Belarus Standard Time
(UTC+03:00) Moscow, St. Petersburg, Volgograd	timezone = Russian Standard Time
(UTC+03:00) Nairobi	timezone = E. Africa Standard Time
(UTC+03:30) Tehran	timezone = Iran Standard Time
(UTC+04:00) Abu Dhabi, Muscat	timezone = Arabian Standard Time
(UTC+04:00) Astrakhan, Ulyanovsk	timezone = Astrakhan Standard Time
(UTC+04:00) Baku	timezone = Azerbaijan Standard Time
(UTC+04:00) Izhevsk, Samara	timezone = Russia Time Zone 3
(UTC+04:00) Port Louis	timezone = Mauritius Standard Time
(UTC+04:00) Saratov	timezone = Saratov Standard Time
(UTC+04:00) Tbilisi	timezone = Georgian Standard Time
(UTC+04:00) Yerevan	timezone = Caucasus Standard Time
(UTC+04:30) Kabul	timezone = Afghanistan Standard Time
(UTC+05:00) Ashgabat, Tashkent	timezone = West Asia Standard Time
(UTC+05:00) Ekaterinburg	timezone = Ekaterinburg Standard Time
(UTC+05:00) Islamabad, Karachi	timezone = Pakistan Standard Time
(UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi	timezone = India Standard Time
(UTC+05:30) Sri Jayawardenepura	timezone = Sri Lanka Standard Time
(UTC+05:45) Kathmandu	timezone = Nepal Standard Time
(UTC+06:00) Astana	timezone = Central Asia Standard Time
(UTC+06:00) Dhaka	timezone = Bangladesh Standard Time
(UTC+06:00) Omsk	timezone = Omsk Standard Time
(UTC+06:30) Yangon (Rangoon)	timezone = Myanmar Standard Time
(UTC+07:00) Bangkok, Hanoi, Jakarta	timezone = SE Asia Standard Time
(UTC+07:00) Barnaul, Gorno-Altaysk	timezone = Altai Standard Time
(UTC+07:00) Hovd	timezone = W. Mongolia Standard Time
(UTC+07:00) Krasnoyarsk	timezone = North Asia Standard Time
(UTC+07:00) Novosibirsk	timezone = N. Central Asia Standard Time
(UTC+07:00) Tomsk	timezone = Tomsk Standard Time
(UTC+08:00) Beijing, Chongqing, Hong Kong, Urumqi	timezone = China Standard Time
(UTC+08:00) Irkutsk	timezone = North Asia East Standard Time
(UTC+08:00) Kuala Lumpur, Singapore	timezone = Singapore Standard Time
(UTC+08:00) Perth	timezone = W. Australia Standard Time
(UTC+08:00) Taipei	timezone = Taipei Standard Time
(UTC+08:00) Ulaanbaatar	timezone = Ulaanbaatar Standard Time
(UTC+08:30) Pyongyang	timezone = North Korea Standard Time
(UTC+08:45) Eucla	timezone = Aus Central W. Standard Time
(UTC+09:00) Chita	timezone = Transbaikal Standard Time
(UTC+09:00) Osaka, Sapporo, Tokyo	timezone = Tokyo Standard Time
(UTC+09:00) Seoul	timezone = Korea Standard Time
(UTC+09:00) Yakutsk	timezone = Yakutsk Standard Time
(UTC+09:30) Adelaide	timezone = Cen. Australia Standard Time
(UTC+09:30) Darwin	timezone = AUS Central Standard Time
(UTC+10:00) Brisbane	timezone = E. Australia Standard Time
(UTC+10:00) Canberra, Melbourne, Sydney	timezone = AUS Eastern Standard Time
(UTC+10:00) Guam, Port Moresby	timezone = West Pacific Standard Time
(UTC+10:00) Hobart	timezone = Tasmania Standard Time
(UTC+10:00) Vladivostok	timezone = Vladivostok Standard Time
(UTC+10:30) Lord Howe Island	timezone = Lord Howe Standard Time
(UTC+11:00) Bougainville Island	timezone = Bougainville Standard Time
(UTC+11:00) Chokurdakh	timezone = Russia Time Zone 10
(UTC+11:00) Magadan	timezone = Magadan Standard Time
(UTC+11:00) Norfolk Island	timezone = Norfolk Standard Time
(UTC+11:00) Sakhalin	timezone = Sakhalin Standard Time
(UTC+11:00) Solomon Is., New Caledonia	timezone = Central Pacific Standard Time
(UTC+12:00) Anadyr, Petropavlovsk-Kamchatsky	timezone = Russia Time Zone 11
(UTC+12:00) Auckland, Wellington	timezone = New Zealand Standard Time

(UTC+12:00) Coordinated Universal Time+12	timezone = UTC+12
(UTC+12:00) Fiji	timezone = Fiji Standard Time
(UTC+12:00) Petropavlovsk-Kamchatsky - Old	timezone = Kamchatka Standard Time
(UTC+12:45) Chatham Islands	timezone = Chatham Islands Standard Time
(UTC+13:00) Coordinated Universal Time+13	timezone = UTC+13
(UTC+13:00) Nuku'alofa	timezone = Tonga Standard Time
(UTC+13:00) Samoa	timezone = Samoa Standard Time

For local, running on terminal Google Chrome you may set local timezone. Correct POSIX timezone naming you may find [in wikipedia](#), see TZ column in this table. In configuration file specify:

```
timezone = local:America/Sao_Paulo
```

Time in computer BIOS should be set as UTC, not local time!

If you need timezones both for Windows session and for local Google Chrome specify:

```
timezone = hawaii, local:Pacific/Honolulu
```

- Parameter ntp

Terminal may request correct time from [NTP](#) server. Default value is =dhcp. Means, that terminal requests time only if NTP server address is specified in 042 DHCP parameter. Also NTP server may be specified manually:

```
ntp = pool.ntp.org
```

To disable NTP even if there's 042 DHCP parameter, specify in configuration file:

```
ntp = disable
```

- Parameter viterminal_licensing

ViTerminal licensing server address. Used only for work with ViTerminal servers.

- Parameter SIP

Settings for connection to SIP server. Username, password and server address:

```
SIP = user:password@sip.linphone.org
```

For work with SIP we use [linphone](#). For testing and tuning there's linphonec command line. It's available from terminal web-interface, i.e. http-access to terminal by IP from another computer browser. You can specify sound devices for ringing and talking:

```
SIP = user:password@sip.linphone.org, ring:1:0, talk:3:0
```

For more details about sound devices read this manual: [VEEMClient.com/docs5/sound.html](#)

When terminal receives incoming call it shows popup window and blocks mouse, until user accepts or rejects the call. Terminal will show only call icon and won't block mouse when it receives call, if you specify:

```
SIP = user:password@sip.linphone.org, noLock
```

To enable auto answering for incoming calls on terminal specify:

```
SIP = user:password@sip.linphone.org, auto-answer
```

If SIP server port differs from default 5060 for UDP and 5061 for TLS:

```
SIP = user:password@sip.linphone.org, port:55555
```

You may turn on TLS encryption (that SIP server supports). With turned on TLS encryption you may turn off server certificates check:

```
SIP = user:password@sip.linphone.org, tls
SIP = user:password@sip.linphone.org, tls, nocert
```

Turn on SRTP encryption:

```
SIP = user:password@sip.linphone.org, tls, srtp
```

You may use your own configuration file for linphone instead of our's. do not use it if you're unsure. Last section in configuration file must be [sound]. At the end of file will be automatically added lines ringer_dev_id, playback_dev_id and capture_dev_id. Terminal searches for configuration file in Everyone directory:

```
SIP = user:password@sip.linphone.org, config:my_enterprise_sip.wtc
```

Turn on linphone logging into log. Possible values - from 1 to 6:

```
SIP = user:password@sip.linphone.org, debug:2
```

Contact list terminal reads from Everyone/contacts.txt file. You may add more contacts for some terminals. File with additional contacts should have the same structure as contacts.txt and should also be in Everyone directory:

```
SIP = user:password@sip.linphone.org, contacts:morecontactsforreception.txt
```

To change ring sound (WAV file should be stored in Everyone folder) specify:

```
SIP = user:password@sip.linphone.org, wav:local.wav
```

- Parameter SIP_usb_sound_level

If SIP phone uses the only one connected to terminal sound card (no matter USB, PCI or onboard sound card, the main thing is that it's the only one), then volume is configured by sound_level parameter. If on terminal is also connected USB headset, then headset sound volume is configured by SIP_usb_sound_level parameter.

```
SIP_usb_sound_level = 75
```

Volume of all microphone is configured only by microphone_level parameter. You may show volume control in popup window:

```
SIP_usb_sound_level = 75, infobox
```

Terminal console parameters

Terminal configuration wizard helps to determine and check parameters from this group. It's easier to use wizard than to select values manually.

- Parameter display

Display description. Includes several parameters separated by commas. To configure video it's better to use video configuration wizard. For more details read: [videocard configuration](#).

You should specify real screen resolution, the same as specified in monitor documentation:

```
display = 1920x1080
```

Video output is required for some drivers. Possible values: VGA, DVI, HDMI, LVDS, DP, DSI, VGA2, DVI2, HDMI2, LVDS2, DP2. Some drivers ignore specified video output and determine monitor on their own. Sometimes drivers mix HDMI and DVI, when connectors are specified incorrectly in videocard BIOS. In terminal web-interface you will find the list of video outputs, determined by driver on terminal. Terminal web-interface is available even when videocard driver failed to work and there's only black image on terminal screen. Example of specifying video output:

```
display = 1920x1080, hdmi
```

For some displays you may correct display brightness. Specify brightness as a percentage of the maximum value:

```
display = 1920x1080, 42%
```

Some drivers allow to rotate display:

```
display = 1920x1080,portrait  
display = 1920x1080,landscape flipped  
display = 1920x1080,portrait flipped
```

On Raspberry Pi rotation should be specified in config.txt file on boot SD card in [display_hdmi_rotate](#) option.

Rotated screen always works slower than normal, not rotated.

Magic word noddc forbids driver to ask monitor about preferred mode. Use it when image fails to center:

```
display = 1920x1080, hdmi, noddc
```

You can specify display refresh rate. Almost always there's no need to specify it for LCD monitors:

```
display = 1920x1080, hdmi, noddc, 75Hz
```

Instead of refresh you can specify full line of timings. It can be useful in very difficult cases, for monitors connected via 15-contact VGA D-SUB:

```
display = 1680x1050, "146.3 1680 1960 2136 2240 1050 1053 1059 1089"
```

- Parameter M2_display

Description of second monitor. Syntax is the same as in display parameter. Use this parameter **only** when second monitor is connected to terminal.

- Parameter `mouse_accel_mult`

`mouse_accel_mult` parameter changes mouse pointer speed. Possible values - from 0.01 to 16. To make a very low mouse speed set:

```
mouse_accel_mult = 0.05
```

Set touchpad sensitivity:

```
mouse_accel_mult = touch:12
```

Different settings for mouse and touchpad:

```
mouse_accel_mult = 3, touch:12
```

- Parameter `doubleclick`

Only for ViTerminal client. Double-click interval in milliseconds. Possible values - from 100 to 1000.

- Parameter `touchscreen`

Touchscreen calibration. See the [touchscreen configuration](#) manual.

- Parameter `bluetooth`

Bluetooth devices. On Raspberry only. See the [bluetooth configuration](#) manual.

- Parameter `video`

`video` parameter determines video card driver. All possible values are listed below. We insist on using terminal configuration wizard to select video card driver.

- `video = auto` Autodetect
- Linux kernel Framebuffer drivers, suffix (F)
 - `video = VESA(F)` VESA, no widescreen modes!
 - `video = efi(F)` EFI (default resolution)
 - `video = amd(F)` AMD GPU
 - `video = vmwgfx(F)` VMware virtual
 - `video = nouveau(F)` nVidia new
 - `video = i915(F)` Intel i915..newest
 - `video = radeon(F)` ATI new
 - `video = gma(F)` Intel GMA500/600/3600/3650
 - `video = aty128fb(F)` ATI Rage128
 - `video = gxfb(F)` Geode GX
 - `video = gx1fb(F)` Geode GX1
 - `video = i810fb(F)` Intel i810, i815
 - `video = lxfb(F)` Geode LX
 - `video = hyperv_fb(F)` Microsoft Hyper-V
 - `video = nvidiafb(F)` nVidia
 - `video = matroxfb_base(F)` Matrox
 - `video = radeonfb(F)` ATI Radeon
 - `video = rivafb(F)` nVidia RIVA 128/TNT/TNT2
 - `video = sisfb(F)` SIS/XGI
 - `video = viafb(F)` VIA, S3 Unichrome
 - `video = vt8623fb(F)` VIA VT8623 [CLE266]
- The newest X.org graphic library drivers, suffix (U)
 - `video = efi(U)` EFI (default resolution)
 - `video = ati(U)` ATI
 - `video = intel(U)` Intel
 - `video = modesetting(U)` Kernel modesetting
 - `video = nouveau(U)` Nvidia
 - `video = openchrome(U)` Openchrome for VIA
 - `video = sis(U)` SIS
 - `video = vesa(U)` VESA, no widescreen modes!
- X.org 1.5.3 graphic library drivers, suffix (X)
 - `video = apm(X)` APM, Alliance Technology
 - `video = ark(X)` ARK Logic
 - `video = chips(X)` Chips & Technologies
 - `video = cirrus(X)` Cirrus Logic
 - `video = geode(X)` Geode
 - `video = glint(X)` GLINT/Permedia
 - `video = i810(X)` Intel i8xx/i9xx

o video = mga(X)	Matrox
o video = nsc(X)	NSC
o video = rdc(X)	RDC
o video = rdcM12(X)	RDC M2012
o video = rendition(X)	Rendition/Micron
o video = s3(X)	S3
o video = s3virge(X)	S3 Virge
o video = savage(X)	S3 Savage
o video = sis(X)	SIS
o video = tdfx(X)	3Dfx
o video = trident(X)	Trident
o video = tseng(X)	Tseng Labs
o video = unichrome(X)	Unichrome for VIA
o video = xgi(X)	XGI
o video = vesa(X)	VESA Universal driver

- Parameter `bpp`

`bpp` parameter determines color depth for all terminal sessions.

```
bpp = 16
```

```
bpp = 32
```

На Raspberry глубина цвета задается в файле `config.txt` на загрузочной SD.

По умолчанию используется 32 бита. При работе с 2012R2 и новее с кодеками по умолчанию снижение до 16 бит *не* уменьшит сетевой трафик.

- Parameter `kbdrate`

This parameter specifies keyboard character repeat settings - repeat delay and repeat rate. This line sets common settings (30 repeats per second, 250 milliseconds repeat delay):

```
kbdrate = 30,250
```

And this line makes slow keyboard (2 repeats per second, 1000 milliseconds repeat delay):

```
kbdrate = 2,1000
```

Possible values: from 2 to 100 repeats per second, repeat delay from 100 to 1000 milliseconds. If parameter `kbdrate` is not specified BIOS settings are used.

Remote terminal management

- Parameter `managed`

You can turn off or restart terminals remotely. It can be useful, for example, when you changed configuration files and need to apply these changes immediately. Such line in configuration file allows to manage terminal from any other computer:

```
managed = on
```

And this line allows to manage terminal only from computers with addresses 192.168.10.15, 192.168.10.16 and subnet 192.168.1.0/24:

```
managed = 192.168.10.15, 192.168.10.16, 192.168.1.0/24
```

Terminals are managed by command line tool `rsh.exe` included into Windows Server distribution. To restart terminal 192.168.10.50 immediately run:

```
rsh.exe 192.168.10.50 reboot
```

If you changed configuration file and want terminal to re-read it, terminal should be restarted. You can tell terminal to restart as soon as possible, i.e. when user will exit current session:

```
rsh.exe 192.168.10.50 update
```

To turn off terminal run:

```
rsh.exe 192.168.10.50 shutdown
```

Instead of `rsh` in Linux and other *nix you can use `echo` and `nc`:

```
echo -en "\0\0\0reboot\0" | nc 192.168.1.50 514
```


- Parameter `httpd`

For diagnostics and management on every terminal is working micro-web-server. If you know terminal IP, you can connect to it by browser and see settings, configuration file, log and other terminal information. By default access to it is granted to all. You can allow access only from selected IPs:

```
httpd = 192.168.1.1, 192.168.1.2, 192.168.2.0/24
```

Or turn off terminal http server:

```
httpd = off
```

At boot start http-server always runs available for all. If error won't allow terminal to read it's configuration, boot will fail with error. But http-server will work to help diagnose the problem remotely.

- Parameter `wtrc`

Terminal remote control. Works by VEEMClient protocol. It can do all the that embedded VNC server can do. And additionally:

- Shows local Chromium.
- Shows popup window in top bottom corner.
- Shows two terminal displays.
- Works correctly with keyboard.
- Connection is SSL encrypted.
- Shows image faster.

To start remote control on Windows run VEEMClient configurator, right-click on needed terminal in the list.

This line in configuration file allows to run terminal remote control from any computer:

```
wtrc = on
```

This line allows to run remote control only from specified IP-addresses:

```
wtrc = 192.168.10.15, 192.168.10.16, 192.168.1.0/24
```

By default user has no information about connection from remote control. With such line terminal will ask user to allow terminal remote control:

```
wtrc = allow after timeout
```

If in 30 seconds user won't allow connection, remote control will automatically start.

Another line:

```
wtrc = reject after timeout
```

will show the same request, bu if you ignores it, remote control will be rejected.

By default remote control password is the same as password for Setup menu, that appears at terminal boot start, or as password for HTTPS management. You may specify another password in [wtrc_password](#) option.

Zoom (possible values 50%, 75%, by default 100%):

```
wtrc = on, 75%
```

- Parameter `wtrc_password`

Terminal remote control is turned on by [wtrc](#) option. By default remote control password is the same as password for Setup menu, that appears at terminal boot start, or as password for HTTPS management. You may specify another password:

```
wtrc_password = 12345
```

We recommend to specify password in configurator, for it will encrypt password to store it on disk safely.

You may allow remote control without password:

```
wtrc_password = mode:none
```

Password for view, without terminal mouse or keyboard control:

```
wtrc_password = view 123
```

Passwords for view (123) and control (the same as Setup password) must be **different**:

```
vnc_password = view 123, control mode:setup
```

- Parameter `vnc`

You can connect to terminal by VNC protocol to view terminal screen and to help user with his problem. It became more important when Microsoft removed Remote Desktop Connection from Windows 2012 Server.

Next configuration file line allows connection to terminal by VNC from any computer:

```
vnc = on
```

Next line allows connection only from computers with IP 192.168.10.15, 192.168.10.16 and subnet 192.168.1.0/24:

```
vnc = 192.168.10.15, 192.168.10.16, 192.168.1.0/24
```

Popup window in right bottom corner is not shown by VNC. Local Google Chrome is not shown by VNC.

If terminal uses two monitors, then to view second monitor by VNC connection specify while connecting 5901 port.

If terminal is over slow channel, specify in configuration file:

```
vnc=4to1
```

This setting will reduce terminal screen by four times. Due to such image decrease show speed will noticeably increase.

By default user knows nothing about VNC-connection. You may ask user for permission. With such line:

```
vnc=allow after timeout
```

terminal will show window with request for VNC connection. If in 30 seconds user won't react, VNC connection will be established.

Another line:

```
vnc=reject after timeout
```

will show the same request, but if user won't react, in this case connection will be rejected.

- Parameter `vnc_password`

Password for connection to VEEMClient VNC server:

```
vnc_password = 12345
```

Password length is from 1 to 8 symbols. Allowed latin letters and digits. Specified in configuration file password is available to everyone - from TFTP configuration file or terminal log. It's more secure to store in configuration file password hash. It won't protect from serious hack, but at least it'll force to spend some time. To generate password hash use VEEMClient graphic configurator. For example:

```
vnc_password=hex:a0987527920893f174515708320c7fe3
```

Password for view, without terminal mouse or keyboard control:

```
vnc_password = view 123
```

Passwords for view and control must be **different**:

```
vnc_password = view 123, control 12345
```

- Parameter `syslog`

Terminal can send all log events to syslog server by UDP to port 514:

```
syslog = 192.168.1.1
```

Or another port:

```
syslog = 192.168.1.1:9099
```

- Parameter `discover`

By default during boot terminals send broadcast requests, that contain VEEMClient version, IP, MAC, hostname and IP address of the DHCP server, that has

just told download addresses. If VEEMClient configurator works in the same network, it receives broadcast messages and saves or updates terminal information.

If VEEMClient configurator works over the router and is unable to receive broadcast packet, you may tell terminal to send additional message to IP of the computer with working configurator:

```
discover = 192.168.1.1
```

- Parameter keyboard_log

Send every key you press on terminal to log. *DO NOT USE this option unless you prepare log for VEEMClient technical support.* Default value is =off

```
keyboard_log = on
```

If you have any comments or remarks to this article, please, [let us know!](#)

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