# Remapping keys for Remote Desktop Mobile

Remote Desktop Mobile (RDM) does not forward all possible keys to a remote session. In example, Function Keys and Page Up and Down are not transmitted by RDM. This is due to RDM either ignoring these keys or that a key is assigned to an internal function at all.

## Function Keys

For example F5 is bound to Refresh the IEMobile screen. F1, F2, F3, F4, F6 and F7 are mapped to OS functions or applications: SoftMenu1, SoftMenu2, Talk, Hangup/End, Volume Up and Volume Down. There are some more as defined in windows mobile 6.5.3 DTK winuserm.h.

Even if function keys are unregister from there assignment (see unregisterFunc1 API), they will still be ignored by RDM.

## Remapping keys

This article describes how to remap keys to 'unsupported' Remote Desktop Mobile keys.

RDM (mstsc40.exe or wpctsc.exe, WEH 6.5.3) supports the use of two keyboard remapping files, tscscan.txt and tscshift.txt.

Remapping is using the keyboard scan codes for a hardware keyboard as defined for PS/2 AT keyboards. A scan code only defines the location of a key on a keyboard. If the Eight key is pressed, RDM sends only the scancode to the host. The scan code for the 8 key is 0x003E. If the shift+8 is pressed, the scancode for shift (left shift is 0x0012) and then the scancode for the 8 is send to the host. Depending on the keyboard layout setup on the host, the host translates this to a '(' for a German keyboard or an '\*' for a US keyboard.

The idea for remapping is to let RDM see a keypress and send the scancode of another key. This can be used to remap unused keys to issue needed keys. For example, let RDM send the scancode for PageDown when the Left Arrow key is pressed. Or let RDM send a F1 key when the semicolon key is pressed.

### tscscan.txt

Here is a part of tscscan.txt:

// Scan Code Expected unshifted char  
0x00 0x00 // 0x00  
0x00 0x00 // 0x01  
...<some line omitted>

0x00 0x00 // 0x1f  
0x39 0x20 // 0x20 - VK\_SPACE  
0x49 0x00 // 0x21 - VK\_PRIOR (PAGE UP)  
0x51 0x00 // 0x22 - VK\_NEXT (PAGE DOWN)  
0x4f 0x00 // 0x23 - VK\_END  
0x47 0x00 // 0x24 - VK\_HOME  
0x4b 0x00 // 0x25 - VK\_LEFT  
0x48 0x00 // 0x26 - VK\_UP  
0x4d 0x00 // 0x27 - VK\_RIGHT  
0x50 0x00 // 0x28 - VK\_DOWN  
0x4C 0x00 // 0x29 - VK\_SELECT  
0x00 0x00 // 0x2a - VK\_PRINT  
0x00 0x00 // 0x2b - VK\_EXECUTE  
0x54 0x00 // 0x2c - VK\_SNAPSHOT (PRINT SCREEN)  
0x52 0x00 // 0x2d - VK\_INSERT  
0x53 0x00 // 0x2e - VK\_DELETE  
0x35 0x2F // 0x2f - VK\_HELP  
0x0b 0x30 // 0x30 - VK\_0  
0x02 0x31 // 0x31 - VK\_1  
0x03 0x32 // 0x32 - VK\_2  
0x04 0x33 // 0x33 - VK\_3  
0x05 0x34 // 0x34 - VK\_4  
0x06 0x35 // 0x35 - VK\_5  
0x07 0x36 // 0x36 - VK\_6  
0x08 0x37 // 0x37 - VK\_7  
0x09 0x38 // 0x38 - VK\_8  
0x0a 0x39 // 0x39 - VK\_9  
0x00 0x00 // 0x3a  
0x00 0x00 // 0x3b  
0x00 0x00 // 0x3c  
0x00 0x00 // 0x3d  
0x00 0x00 // 0x3e  
0x00 0x00 // 0x3f  
0x00 0x00 // 0x40  
0x1e 0x61 // 0x41 - VK\_A  
0x30 0x62 // 0x42 - VK\_B  
0x2e 0x63 // 0x43 - VK\_C  
0x20 0x64 // 0x44 - VK\_D  
0x12 0x65 // 0x45 - VK\_E  
0x21 0x66 // 0x46 - VK\_F  
0x22 0x67 // 0x47 - VK\_G

Each counting line is the entry for a virtual key value (see winuser.h and winuserm.h of WEH DTK). Lines with a comment ('//') are not counted. Line numbering starts with zero.

In example, line 65 will contain the scancode and char to be used by RDM to send to the remote host for the VK\_ value defined for 65 (0x41), which is the A key. As the above tscscan.txt has one comment line at the beginning, the line to be used if you start counting by 1 is line 67: '0x1e 0x61 // 0x41 - VK\_A'.

## Remapping Left and Right Arrow to Page Up and Page Down

The VK\_ values for these keys are:

#define VK\_LEFT 0x25 (37  
#define VK\_RIGHT 0x27 (39)

Search the tscscan.txt for line 37 and 39, this will give:

0x4b 0x00 //line 37, count starts at 0 and //-lines are ignored // VK\_LEFT  
0x4d 0x00 //line 39, count starts at 0 and //-lines are ignored // VK\_RIGHT

Now look for the scan codes used for VK\_PRIOR and VK\_NEXT (PageUp and PageDown) in tscscan.txt:

0x49 0x00 // 0x21 - VK\_PRIOR (PAGE UP)  
0x51 0x00 // 0x22 - VK\_NEXT (PAGE DOWN)

Then change the lines 37 and 39 for VK\_LEFT and VK\_RIGHT to use these scancodes:

0x49 0x00 //changed line 37   
0x51 0x00 //changed line 39

Now, when Remote Desktop Mobile is started the next time it will send the scan codes for VK\_PRIOR and VK\_NEXT instead of the codes for VK\_LEFT and VK\_RIGHT when the Left or Right Arrow key is pressed on the device's keypad. The host will then see the scan codes for Page Up and Page Down instead of Left and Right Arrow.

## List of Supported Virtual Keys for Remapping

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0x09 - Tab  0x0D - Return  0x1B - Escape  0x20 - Space  0x25 - Left  0x26 - Up  0x27 - Right  0x28 - Down  0x2E - Delete | 0x30 - 0  0x31 - 1  0x32 - 2  0x33 - 3  0x34 - 4  0x35 - 5  0x36 - 6  0x37 - 7  0x38 - 8  0x39 - 9 | 0x41 - A  0x42 - B  0x43 - C  0x44 - D  0x45 - E  0x46 - F  0x47 - G  0x48 - H  0x49 - I  0x4A - J  0x4B - K  0x4C - L  0x4D - M | 0x4E - N  0x4F - O  0x50 - P  0x51 - Q  0x52 - R  0x53 - S  0x54 - T  0x55 - U  0x56 - V  0x57 - W  0x58 - X  0x59 - Y  0x5A - Z | 0xBA - Semicolon  0xBB - Equal  0xBC - Comma  0xBD - Hyphen  0xBE - Period  0xBF - Forward Slash  0xC0 - Accent  0xDB - Left Bracket  0xDC - Back Slash  0xDD - Right Bracket  0xDE - Apostrophe |

## List of Scan Codes for Function Keys

|  |  |  |  |
| --- | --- | --- | --- |
| F1 - 0x3B  F2 - 0x3C  F3 - 0x3D  F4 - 0x3E  F5 - 0x3F  F6 - 0x40 | F7 - 0x41  F8 - 0x42  F9 - 0x43  F10 - 0x44  F11 - 0x57  F12 - 0x58 | F13 - 0x64  F14 - 0x65  F15 - 0x66  F16 - 0x67  F17 - 0x68  F18 - 0x69 | F19 - 0x6A  F20 - 0x6B  F21 - 0x6C  F22 - 0x6D  F23 - 0x6E  F24 - 0x76 |

## Ordinary scancodes

Standard Scan codes

00 is normally an error code  
01 (Esc)  
02 (1!),  
03 (2@),  
04 (3#),  
05 (4$),  
06 (5%E),  
07 (6^),  
08 (7&),  
09 (8\*),  
0a (9 (),  
0b (0)),  
0c (-\_),  
0d (=+),  
0e (Backspace)  
0f (Tab),  
10 (Q),  
11 (W),  
12 (E),  
13 (R),  
14 (T),  
15 (Y),  
16 (U),  
17 (I),  
18 (O),  
19 (P),  
1a ([{),  
1b (]})  
1c (Enter)  
1d (LCtrl)  
1e (A),  
1f (S),  
20 (D),  
21 (F),  
22 (G),  
23 (H),  
24 (J),  
25 (K),  
26 (L),  
27 (;:),  
28 ('")  
29 (`~)  
2a (LShift)  
2b (\|) on a 102-key keyboard  
2c (Z),  
2d (X),  
2e (C),  
2f (V),  
30 (B),  
31 (N),  
32 (M),  
33 (,<),  
34 (.>),  
35 (/?),  
36 (RShift)  
37 (Keypad-\*) or (\*/PrtScn) on a 83/84-key keyboard  
38 (LAlt),  
39 (Space bar),  
3a (CapsLock)  
3b (F1),  
3c (F2),  
3d (F3),  
3e (F4),  
3f (F5),  
40 (F6),  
41 (F7),  
42 (F8),  
43 (F9),  
44 (F10)  
45 (NumLock)  
46 (ScrollLock)  
47 (Keypad-7/Home),  
48 (Keypad-8/Up),  
49 (Keypad-9/PgUp)  
4a (Keypad--)  
4b (Keypad-4/Left),  
4c (Keypad-5),  
4d (Keypad-6/Right),  
4e (Keypad-+)  
4f (Keypad-1/End),  
50 (Keypad-2/Down),  
51 (Keypad-3/PgDn)  
52 (Keypad-0/Ins),  
53 (Keypad-./Del)  
54 (Alt-SysRq) on a 84+ key keyboard  
E010 RControl  
E038 RMENU