Tips on improving network performance.

About:

Poor network performance could cause the robot to halt (stop) while performing the realtime motion function, the following documents give instructions for improving the network performance for achieving good performance of the realtime motion functionality of the toolbox.

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Recommendations for reducing TCP/IP latency: (in progress, more tips will be added)

Network architecture:

Try to reduce the traffic between the robot and the PC, it is better to limit the network to only two devices the controlling computer and the robot, use good computer with good Ethernet card and good cables.

Reducing the latency in the communication:

 For windows machine (Win10), open the *cmd* console, then follow the steps:

- Type *regedit* then hit enter.
- Navigate to the path, *HKEY_LOCAL_MACHINES\SYSTEM\CurrentControlSet\services\Tcpip \Prameters\interfaces*
- Check the folders underneath the previous path, choose the folder that has the key *IPAddress* compatible with the IP address of your adapter that is connected to the KUKA controller, see Figure 1.
- In the keys dialog-box, right click with your mouse, then choose *New* then click on *DWORD (32 bit) value*.
- Name the new *DWORD (32 bit) value* by *TCPAckFrequency*.
- Change its value to *Hexadecimal*, then enter *1* in the adjacent textbox.
- Create a new *DWORD (32 bit) value*. Name it *TCPNoDelay*, and change its value to *Hexadecimal*, then enter *1* in the adjacent textbox.
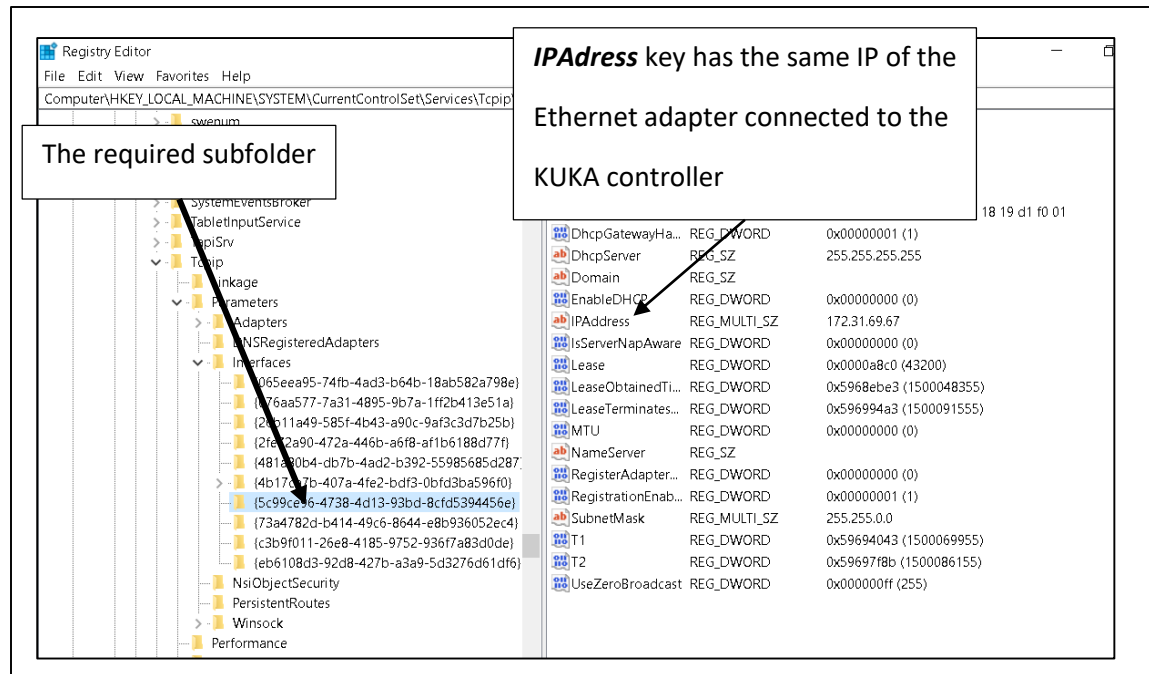
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Figure 1 Optimize network performance of Windows 10

VMware:

When you install Workstation, two virtual **network adapters**, **VMware Network Adapter** VMnet1 and **VMware Network Adapter** VMnet8, are added to the configuration of the host operating system. You might want to disconnect one or both of these virtual **network adapters** to improve performance on the host system.

Set Matlab's priority to real-time:

From **task manager**, go to **Details**, locate **MATLAB.exe**, right click then **Set priority➔Realtime.** During a test the update rate achieved using MATLAB2018b is 270 when the priority is set to **Realtime**, as opposed to 180 when the priority is set to **Normal**.
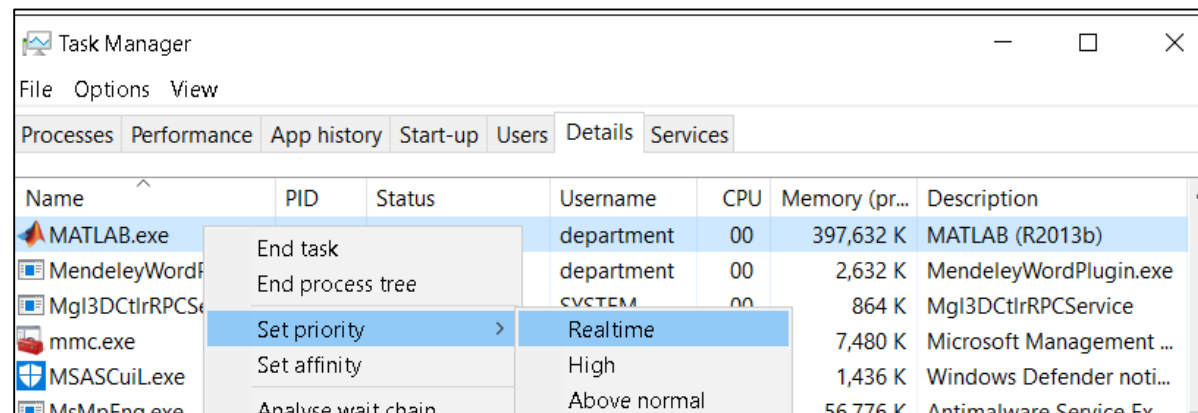

Figure 2 Set MATLAB priority to Realtime

Recommendations for enhancing the performance of windows 10 for use with the KST:

Tips and tricks on how to enhance the performance of windows 10 and configure the PC for realtime control.

Privacy settings

Go to **settings➔Privacy**, there you find several entries like: **messaging**, **radios**, **feedback** …etc. For a computer used for control, you can turn off everything.

Background apps

Turn off the **Background apps**, as the following: go to **settings➔Privacy➔Background apps**, then turn the knop off as shown in Figure 3.
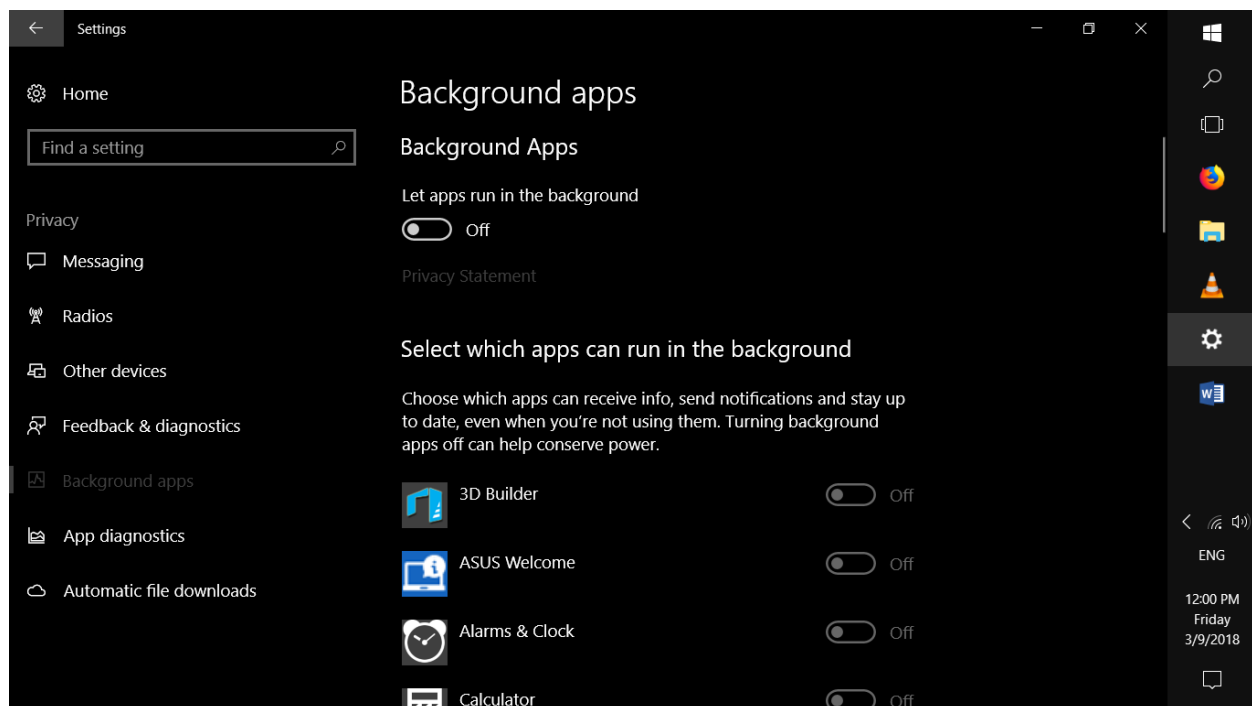

Figure 3 Switch off Background Apps

Adjust the PC for better performance:

First got to **advanced system settings** as shown in Figure 4, click on **advanced** tap then under **performance** click on **settings** button, from the popup window check the **Adjust for best performance**, then click **Ok**.
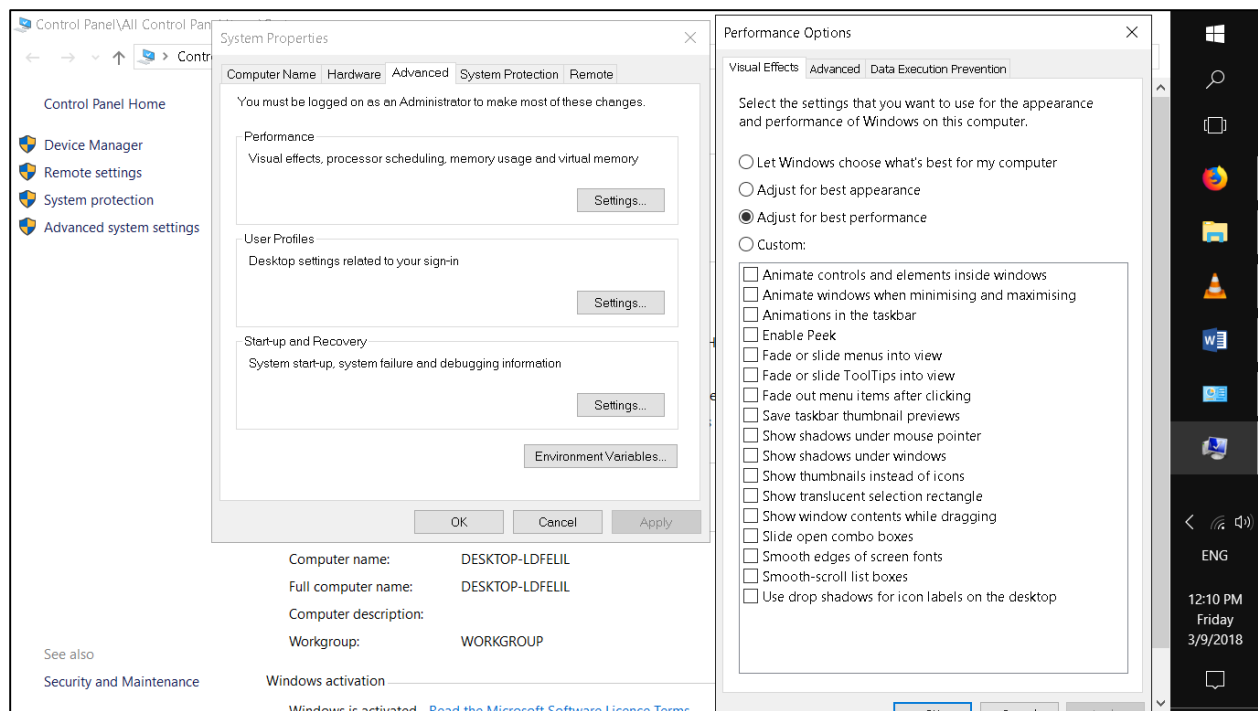
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Figure 4 Adjust for best performance

Turn off services:

Go to search, then type (services)

There you can stop the following services:

1- Print spooler
2- Adobe acrobat update server
3- Xbox related services, turned them off all.

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4- Bluetooth Support (if you don't use Bluetooth)

5- Remote Registry (it's not usually running by default, but you can disable it for safety)

6- Remote Desktop (There are 3 services. If you don't use Remote desktop, disable them)

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1 to 3 had been tested.

4 to 5 hadnot been tested.

You can also go to ((Narrator)) settings and turn it off.