# KST
## KUKA Sunrise Toolbox

## ubuntu

# Tips and tricks

# Tips on improving the performance of network communication for using KST under Ubuntu

## ABOUT

Poor network performance has a huge effect on the performance of the soft real-time functionalities of the KST. Communication delays may lead to jitters and halts during the motion. This document lists countermeasures that helps improve communication performance for achieving a good performance of the soft real-time functions provided by the toolbox.

Those recommendations are applicable to Ubuntu.

## TIPS FOR REDUCING TCP/IP LATENCY

To reduce the TCP/IP latency when using Ubuntu Linux, the user can install one of the following kernels:

### LOW LATENCY KERNEL

The following steps were tested on Ubuntu 16.04 LTS, it was achieved low latency, in-addition good performance of the system was observed. To install low latency Kernel for Ubuntu 16.04 LTS the user shall open the SHELL, then type the instructions:
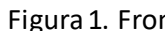
sudo apt-get update

sudo apt-get install linux-low latency linux-headers-low latency

After installing the low latency kernel the user has to reboot the PC. After rebooting, the user shall specify the low latency Kernel as the primary kernel. To do so the user can install the Grub Customizer program. To install the Grub Customizer program, open SHELL then type the instructions:
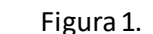
sudo add-apt-repository ppa:danielrichter2007/grub-customizer

sudo apt-get update

sudo apt-get install grub-customizer

Afterwards run the program Grub Customizer, when the program is started, the main window of the program shows up      Figura 1. From the List configuration pane, you have to click on the entry:

Ubuntu, with Linux 4.4.0-122-low latency

Then when it gets highlighted by an orange color, you have to click on the UP arrow from the toolbar of the program, this will take the entry up in the list, place it at the top of the list as shown in      Figura 1.
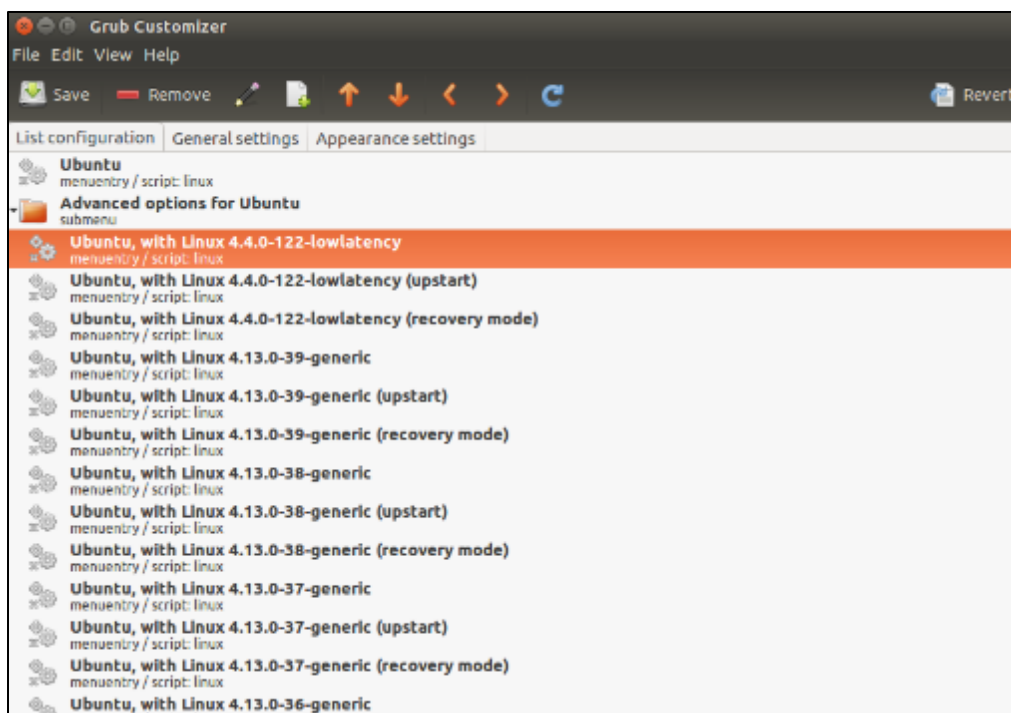
*Figura 1 Grub Customizer window*

For the entries,

Ubuntu, with Linux 4.4.0-122-low latency (upstart)

Ubuntu, with Linux 4.4.0-122-low latency (recovery mode)

Put them below the entry Ubuntu, with Linux 4.4.0-122-low latency as shown in Figura 1.