

# **Advances in Operating System Design**

## **Assignment 1**

### **Part A: Configuring and Building the Linux Kernel**

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- 1) With DCTCP as the default congestion control and CUBIC TCP as an LKM:
  - a) We observe at the beginning of “menuconfig” that CUBIC TCP is the default TCP congestion control model along with TCP Reno(As a default installation).
  - b) Changing DCTCP to <\*> and Cubic TCP to <M>(indicating loadable kernel module, or just module), we get the options of default congestion control to DCTCP and TCP Reno.
  - c) There, we can select DCTCP as the default congestion control.
- 2) When no TCP congestion control is built, we specify all the modules as < >.
  - a) In this case, the default becomes TCP Reno.
  - b) A point to note is that when we disable modules, TCP Vegas cannot be disabled at first as it has { } type specifier. But after disabling YeAH TCP, the { } becomes <\_>, specifying that YeAH TCP uses TCP Vegas as a submodule.
- 3) When all of the TCP congestion control modules have to be set as callable from user-space without changing the defaults:
  - a) “man 7 tcp” explains that only those user space programs can be called those have been specified in “tcp\_allowed\_congestion\_control” file. For this, all the modules have to be pre-installed into the kernel. Hence, we specify the install configuration of all the TCP congestion control modules to <\*>.
  - b) Specifying this provides us with a multitude of options to set as the default TCP congestion control. Which, we leave TCP CUBIC as the default congestion control.