**Integrate NS3-DCE with MPTCP and mmWave DOCUMENTATION**

**Ubuntu version : 14.04 LTS / DCE version : 1.10  
gcc, g++ complier version: 5.5**

**1. Install bake program**

**cd $HOME**

**hg clone http://code.nsnam.org/bake bake**

**export BAKE\_HOME=`pwd`/bake**

**export PATH=$PATH:$BAKE\_HOME**

**export PYTHONPATH=$PYTHONPATH:$BAKE\_HOME**

**2. Create DCE folder**

**mkdir dce**

**cd dce**

**3. Configure version of DCE and download DCE**

**bake.py configure -e dce-ns3-1.10**

**bake.py download**

**4. Replace ns-3.28 folder to mmwave module**

**cd $HOME/dce/source**

**sudo rm -r ns-3.28**

**git clone https://github.com/nyuwireless-unipd/ns3-mmwave.git**

**5. Apply patch files**

**cd $HOME/dce/source/ns-3-dce/model**

**cp ../../ns-3.28/utils/mmWave-dce18-patch.diff ./patch.diff**

**patch < patch.diff**

**6. Modify some files and build with bake**

**cd $HOME/dce/source/ns-3-dce**

**rm wscript**

**wget https://raw.githubusercontent.com/parksjin01/2018\_USA/master/Modification/wscript**

**cd model**

**rm unix-datagram-socket-fd.cc**

**wget https://github.com/parksjin01/2018\_USA/blob/master/Modification/unix-datagram-socket-fd.cc**

**cd ../test/addons**

**rm dce-linux-ip6-test.cc**

**wget https://raw.githubusercontent.com/parksjin01/2018\_USA/master/Modification/dce-linux-ip6-test.cc**

**cd $HOME/dce/source/ns-3.28/src/mmwave/model**

**rm mmwave-beamforming.cc**

**wget https://github.com/parksjin01/2018\_USA/blob/master/Modification/mmwave-beamforming.cc**

**cd $HOME/dce**

**bake.py build**

**7. Replace net-next-nuse-4.4.0 folder**

**sudo rm -r net-next-nuse-4.4.0**

**git clone -b mptcp\_trunk\_libos https://github.com/libos-nuse/net-next-nuse.git**

**mv net-next-nuse net-next-nuse-4.4.0**

**8. Configure new net-next-nuse-4.4.0 folder and compile**

**cd $HOME/dce/source/net-next-nuse-4.4.0**

**cat >> arch/lib/defconfig <<END**

**CONFIG\_MPTCP=y**

**CONFIG\_MPTCP\_PM\_ADVANCED=y**

**CONFIG\_MPTCP\_FULLMESH=y**

**CONFIG\_MPTCP\_NDIFFPORTS=y**

**CONFIG\_DEFAULT\_FULLMESH=y**

**CONFIG\_DEFAULT\_MPTCP\_PM="fullmesh"**

**CONFIG\_MPTCP\_SCHED\_ADVANCED=y**

**CONFIG\_MPTCP\_ROUNDROBIN=y**

**CONFIG\_DEFAULT\_MPTCP\_SCHED="default"**

**END**

**make defconfig ARCH=lib**

**make library ARCH=lib**

**mv liblinux.so liblinux0.so**

**ln -s $HOME/dce/source/net-next-nuse-4.4.0/arch/lib/tools/libsim-linux.so $HOME/dce/source/net-next-nuse-4.4.0/liblinux.so**

**9. Install and patch new iproute2 program**

**wget http://ftp.osuosl.org/pub/clfs/conglomeration/iproute2/iproute2-2.6.38.tar.bz2**

**tar jxf iproute2-2.6.38.tar.bz2**

**cd iproute2-2.6.38**

**cp $HOME/dce/source/ns-3-dce/utils/iproute-2.6.38-fix-01.patch ./**

**patch -p1 -i iproute-2.6.38-fix-01.patch**

**rm Makefile**

**wget https://raw.githubusercontent.com/parksjin01/2018\_USA/master/Modification/Makefile**

**make clean**

**LDFLAGS=-pie make CCOPTS='-fpic -D\_GNU\_SOURCE -O0 -U\_FORTIFY\_SOURCE'**

**10. Reconfigure DCE**

**export DCE\_PATH=$HOME/dce/source/net-next-nuse-4.4.0:$HOME/dce/source/iproute2-2.6.38/ip**

**cd $HOME/dce/source/ns-3-dce**

**./waf configure --with-ns3=$HOME/dce/build --enable-kernel-stack=$HOME/dce/source/net-next-nuse-4.4.0/arch --prefix=$HOME/dce/build**

**./waf build**