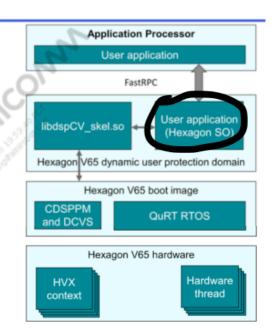
## hexagon nnlib

nn\_lib available at <a href="https://source.codeaurora.org/quic/hexagon\_nn/nnlib">https://source.codeaurora.org/quic/hexagon\_nn/nnlib</a>
 libhexagon\_nn\_skel.so//hexagon/fastrpc.mak-→运行在 CDSP 上的 hexagon SO
 Qcom 维护(Code aurora 是高通的开源社区网站)

130|sdm845:/ # ls vendor/lib/rfsa/adsp/libhexagon\_nn\_skel.so vendor/lib/rfsa/adsp/libhexagon\_nn\_skel.so

## **cDSP Software Architecture**

- Basic compute software architecture is maintained from previous non-HVX to HVX targets
- · Minor changes to programming model:
  - Assembly code can contain HVX instructions
  - C code can contain HVX intrinsics
  - HVX context is automatically locked to software thread when that thread issues HVX instructions
    - HVX register set is saved and restored by QuRT™ Software during context switch
  - libdspCV\_skel.so provides only multi-threading support that can be directly invoked from DSP side
  - DCVS v2 APIs is provided for clock and power management



@Interface/Hexagon\_nn.idl//IDL 编译器编译,与实现方式无关的@@通用接口描述文件,定义格式,cpu 这边的 user thread(如下面的 libhexagon\_controller.so 中)调用方法:hexagon\_nn\_prepare(...)

Interface <a href="hexagon\_nn">hexagon\_nn</a>{

...

Long prepare(..)

Long execute(..)

Long treardown(..)

•••

}

真正 C 接口的定义在 hexagon/include/nn\_graph\_if.h 中(接口名称必须与 IDL 中的一致);接口的实现在 hexagon/src/interface.c 中

• Tensor flow integration at

https://github.com/tensorflow/tensorflow/tree/master/tensorflow/contrib/hvx libhexagon\_controller.so//tensorflow/contrib/hvx/hexagon\_controller/target/make/android.min

----google/tensorflow 的人维护

hvx hal for android NNAPI

https://android.googlesource.com/platform/hardware/qcom/neuralnetworks/hvxservice google 的人维护,已经支持到 androidP NNapi v1.2 v1.1 v1.0

```
vendor.qti.neuralnetworks@1.0-service-hvx
130|sdm845:/ # s vendor/bin/hw/vendor.qti.neuralnetworks@1.0-service-hvx
```

```
hbtp_daemon hdcp1prov hdcp2p2prov hvdcp_opti hw/
MacBook-Pro-3:prebuilt_HY11 sunhuchang$ cd target/product/sdm845/vendor/bin/hw/
android.hardware.gatekeeper@1.0-service-qti
android.hardware.keymaster@3.0-service-qti
vendor.display.color@1.0-service
vendor.qti.hardware.qdutils_disp@1.0-service-qti
vendor.qti.hardware.qteeconnector@1.0-service
vendor.qti.hardware.tui_comm@1.0-service-qti
vendor.qti.neuralnetworks@1.0-service-hvx
```

<u>framework/ml/nn</u>
 编译出 libneuralnetwork.so

```
/<sub>{</sub> llb/ llb64/
5<sub>1</sub> 130|sdm845:/ # cd system/lib/libne
libnetd_client.so libnetlink.so libnetutils.so libneuralnetworks.so
/<sub>{</sub> 130|sdm845:/ # []
```

- tensorflow/core/kernels/hexagon/
- anroidP/external/tensorflow, androidO 下面没有,libtensorflow\_jni.so 打包在 apk 中:

```
sdm845:/ # find . -name *tensor*
./data/app/org.benchmark.demo-G5RL2eXUz82o5rs5hDL3cQ==/lib/arm64/libtensorflowlite_jni.so
```

