

In [1]:

```
1 ! unzip deploy2-on-pynq.zip -d finn-cybsec-mlp-demo2
```

Archive: deploy2-on-pynq.zip

```
creating: finn-cybsec-mlp-demo2/bitfile/
creating: finn-cybsec-mlp-demo2/driver/
creating: finn-cybsec-mlp-demo2/driver/finn/
creating: finn-cybsec-mlp-demo2/driver/runtime_weights/
inflating: finn-cybsec-mlp-demo2/driver/validate.py
inflating: finn-cybsec-mlp-demo2/driver/unsw_nb15_binarized.npz
inflating: finn-cybsec-mlp-demo2/driver/driver.py
inflating: finn-cybsec-mlp-demo2/driver/validate-unsw-nb15.py
inflating: finn-cybsec-mlp-demo2/driver/driver_base.py
creating: finn-cybsec-mlp-demo2/driver/finn/core/
creating: finn-cybsec-mlp-demo2/driver/finn/util/
inflating: finn-cybsec-mlp-demo2/driver/finn/core/onnx_exec.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/rtlsim_exec.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/execute_custom_node.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/datatype.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/modelwrapper.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/throughput_test.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/data_layout.py
inflating: finn-cybsec-mlp-demo2/driver/finn/core/remote_exec.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/fpgadataflow.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/onnx.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/config.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/inference_cost.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/hls.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/basic.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/pyverilator.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/platforms.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/data_packing.py
inflating: finn-cybsec-mlp-demo2/driver/finn/util/vivado.py
inflating: finn-cybsec-mlp-demo2/bitfile/finn-accel.bit
inflating: finn-cybsec-mlp-demo2/bitfile/finn-accel.hwh
```

In [2]:

```
1 cd finn-cybsec-mlp-demo2/driver
```

```
/home/xilinx/jupyter_notebooks/finn-cybsec-mlp-demo2/driver
```

In [12]:

```
! python3 validate-unsw-nb15.py --batchsize 1000
```

```
Loading dataset...
Initializing driver, flashing bitfile...
Starting...
batch 1 / 82 : total OK 863 NOK 137
batch 2 / 82 : total OK 1697 NOK 303
batch 3 / 82 : total OK 2600 NOK 400
batch 4 / 82 : total OK 3480 NOK 520
batch 5 / 82 : total OK 4428 NOK 572
batch 6 / 82 : total OK 5371 NOK 629
batch 7 / 82 : total OK 6285 NOK 715
batch 8 / 82 : total OK 7259 NOK 741
batch 9 / 82 : total OK 8169 NOK 831
batch 10 / 82 : total OK 9114 NOK 886
batch 11 / 82 : total OK 10031 NOK 969
batch 12 / 82 : total OK 10976 NOK 1024
batch 13 / 82 : total OK 11967 NOK 1033
batch 14 / 82 : total OK 12962 NOK 1038
batch 15 / 82 : total OK 13960 NOK 1040
batch 16 / 82 : total OK 14959 NOK 1041
batch 17 / 82 : total OK 15958 NOK 1042
batch 18 / 82 : total OK 16958 NOK 1042
batch 19 / 82 : total OK 17958 NOK 1042
batch 20 / 82 : total OK 18957 NOK 1043
batch 21 / 82 : total OK 19957 NOK 1043
batch 22 / 82 : total OK 20956 NOK 1044
batch 23 / 82 : total OK 21953 NOK 1047
batch 24 / 82 : total OK 22951 NOK 1049
batch 25 / 82 : total OK 23949 NOK 1051
batch 26 / 82 : total OK 24949 NOK 1051
batch 27 / 82 : total OK 25949 NOK 1051
batch 28 / 82 : total OK 26949 NOK 1051
batch 29 / 82 : total OK 27949 NOK 1051
batch 30 / 82 : total OK 28949 NOK 1051
batch 31 / 82 : total OK 29949 NOK 1051
batch 32 / 82 : total OK 30949 NOK 1051
batch 33 / 82 : total OK 31949 NOK 1051
batch 34 / 82 : total OK 32949 NOK 1051
batch 35 / 82 : total OK 33949 NOK 1051
batch 36 / 82 : total OK 34949 NOK 1051
batch 37 / 82 : total OK 35949 NOK 1051
batch 38 / 82 : total OK 36949 NOK 1051
batch 39 / 82 : total OK 37948 NOK 1052
batch 40 / 82 : total OK 38948 NOK 1052
batch 41 / 82 : total OK 39886 NOK 1114
batch 42 / 82 : total OK 40848 NOK 1152
batch 43 / 82 : total OK 41804 NOK 1196
batch 44 / 82 : total OK 42639 NOK 1361
batch 45 / 82 : total OK 43255 NOK 1745
batch 46 / 82 : total OK 43920 NOK 2080
batch 47 / 82 : total OK 44608 NOK 2392
batch 48 / 82 : total OK 45362 NOK 2638
batch 49 / 82 : total OK 46116 NOK 2884
batch 50 / 82 : total OK 46907 NOK 3093
batch 51 / 82 : total OK 47708 NOK 3292
batch 52 / 82 : total OK 48513 NOK 3487
batch 53 / 82 : total OK 49358 NOK 3642
batch 54 / 82 : total OK 50177 NOK 3823
batch 55 / 82 : total OK 51107 NOK 3893
batch 56 / 82 : total OK 51992 NOK 4008
batch 57 / 82 : total OK 52931 NOK 4069
batch 58 / 82 : total OK 53807 NOK 4193
batch 59 / 82 : total OK 54707 NOK 4293
batch 60 / 82 : total OK 55557 NOK 4443
batch 61 / 82 : total OK 56402 NOK 4598
batch 62 / 82 : total OK 57219 NOK 4781
batch 63 / 82 : total OK 58019 NOK 4981
batch 64 / 82 : total OK 58793 NOK 5207
batch 65 / 82 : total OK 59573 NOK 5427
batch 66 / 82 : total OK 60346 NOK 5654
batch 67 / 82 : total OK 61322 NOK 5678
batch 68 / 82 : total OK 62238 NOK 5762
batch 69 / 82 : total OK 63155 NOK 5845
batch 70 / 82 : total OK 64103 NOK 5897
batch 71 / 82 : total OK 65064 NOK 5936
batch 72 / 82 : total OK 66021 NOK 5979
batch 73 / 82 : total OK 66986 NOK 6014
batch 74 / 82 : total OK 67838 NOK 6162
batch 75 / 82 : total OK 68696 NOK 6304
batch 76 / 82 : total OK 69611 NOK 6389
batch 77 / 82 : total OK 70585 NOK 6415
batch 78 / 82 : total OK 71561 NOK 6439
batch 79 / 82 : total OK 72524 NOK 6476
batch 80 / 82 : total OK 73433 NOK 6567
batch 81 / 82 : total OK 74390 NOK 6610
batch 82 / 82 : total OK 75332 NOK 6668
Final accuracy: 91.868293
```

In [14]:

```
! python3 driver.py --exec_mode throughput_test --bitfile ../bitfile/finn-accel.bit --batchsize 1000
```

Results written to nw_metrics.txt

In [15]:

```
cat nw_metrics.txt
```

```
{'runtime[ms]': 0.9021759033203125, 'throughput[images/s]': 1108431.289640592, 'DRAM_in_bandwidth[Mb/s]': 83.13234672304439, 'DRAM_out_bandwidth[Mb/s]': 1.108431289640592, 'fclk[mhz]': 99.999, 'batch_size': 1000, 'fold_input[ms]': 0.06222724914550781, 'pack_input[ms]': 23.38242530822754, 'copy_input_data_to_device[ms]': 1.1906623840332031, 'copy_output_data_from_device[ms]': 0.11038780212402344, 'unpack_output[ms]': 164.57462310791016, 'unfold_output[ms]': 0.033855438232421875}
```

In []: