

# AWS EC2 Simulation Guide

# Hardware Development Kit (HDK)

---

The HDK directory contains documentation, examples, simulation, build and AFI creation scripts to start building Amazon FPGA Images (AFI).

## AWS Shells

With Amazon EC2 FPGA instances, each FPGA is divided into two partitions:

- **Shell (SH)** – AWS platform logic implementing the FPGA external peripherals, PCIe, DRAM, and Interrupts.
- **Custom Logic (CL)** – Custom acceleration logic created by an FPGA Developer.

# Prerequisite

**Vivado v2019.1.op (64-bit)**

**Vivado v2019.1 (64-bit)**

**Vivado v2019.1\_AR73068 (64-bit)**

**Vivado v2019.1\_AR73068\_op (64-bit)**

**Vivado v2019.1\_AR72668 (64-bit)**

**Vivado v2019.2 (64-bit)**

**Vivado v2019.2\_AR73068\_op (64-bit)**

**Vivado v2019.2\_AR73068 (64-bit)**

**Vivado v2020.1 (64-bit)**

**Vivado v2020.2 (64-bit)**

**Vivado v2021.1 (64-bit)**

**Vivado v2021.2 (64-bit)**

---

# Procedure/Steps

# Step 1 : Creating the hardware development environment.

```
source hdk_setup.sh
```

**Setup environment  
variables**

**Check Vivado**

**Check HDK shell**

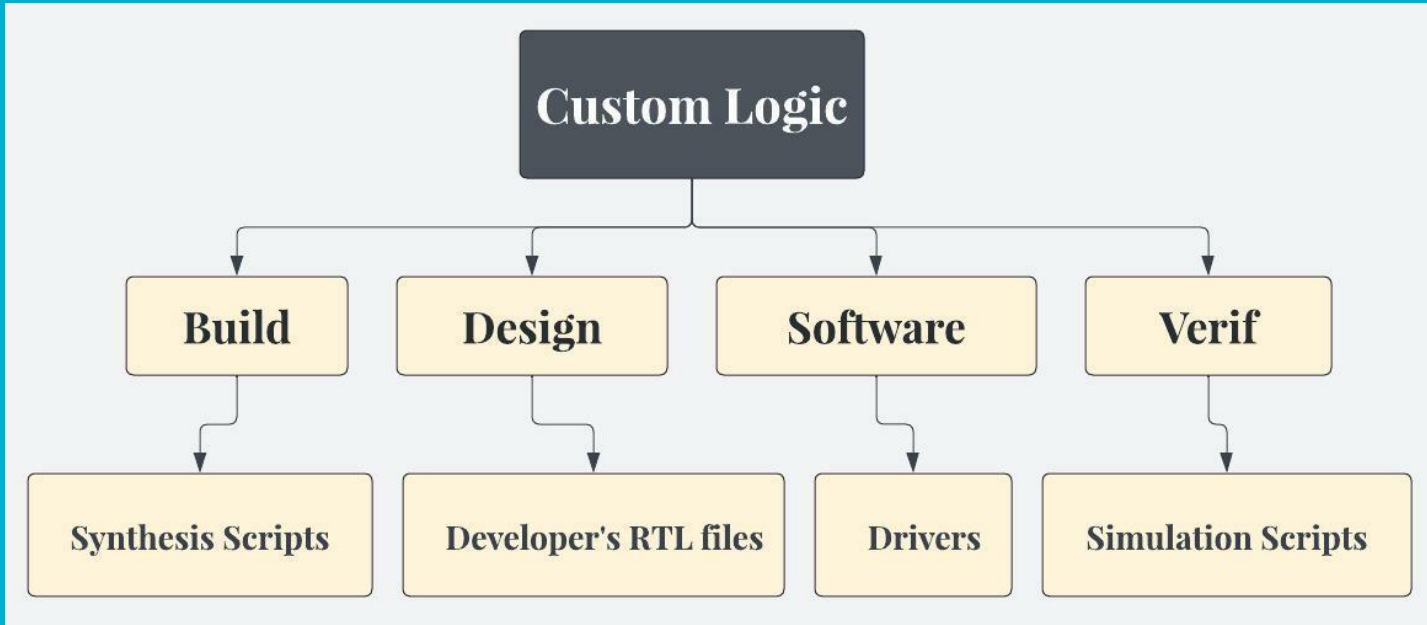
**Setup pass**

## Step 2: Creating the custom logic environment.

- `mkdir <Your_New_CL_Directory>`
- `cd <Your_New_CL_Directory>`
- `export CL_DIR=$(pwd)`
- `source $HDK_DIR/cl/developer_designs/prepare_new_cl.sh`

By running this script you will have an environment containing all the necessary scripts to build, simulate, synthesize, generate AFI and at last emulate your custom logic on aws-fpga.

# Directory structure of Custom Logic environment.



## Step 3 :

Add all the custom logic file i.e ( `.v` , `.sv` ) and `.vhd` files in `top.vivado.f` and `top_vhdl.vivado.f` file simultaneously.

These both files are present in the scripts of the custom logic and they already contains the shell's RTL files to make our CL compatible to AWS-fpga.



## Step 4 :

---

Run the simulation script present in `aws-fpga/hdk/cl/developer_design/custom_logic_design/verif/scripts` by `make TEST=test_name`.

This script performs following series of operations to build a given test's simulation environment file.



# Step 5:

---

Now you have a vivado simulation environment file in **sim/vivado/test\_name**.

**xsim -gui tb** command will open the simulation file and you can see the simulation of your Custom logic design + Shell.

THANK YOU