

# Choose the Right Hardware

## Proposal Template

### Scenario 1: Manufacturing

#### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
<i>FPGA</i>

Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Durability : The client would ideally like it to last for at least 5-10 years.	<i>FPGAs have a high durability and availability as they can be used 24/7/360.</i>
Flexibility: The clients requires the system would also need to be flexible so that it can be reprogrammed and optimized to quickly detect flaws in different chip designs.	FPGA is typically a reprogrammable hardware
Economic constraints : The client other chips in the last year have earned them two million dollars alone.	With such good revenue, it can easily afford this FPGAs.
Risk: a significant percentage of the semiconductor chips being packaged for shipping have flaws.	<i>Risks reduced drastically by using reliable FPGAs</i>

#### Queue Monitoring Requirements

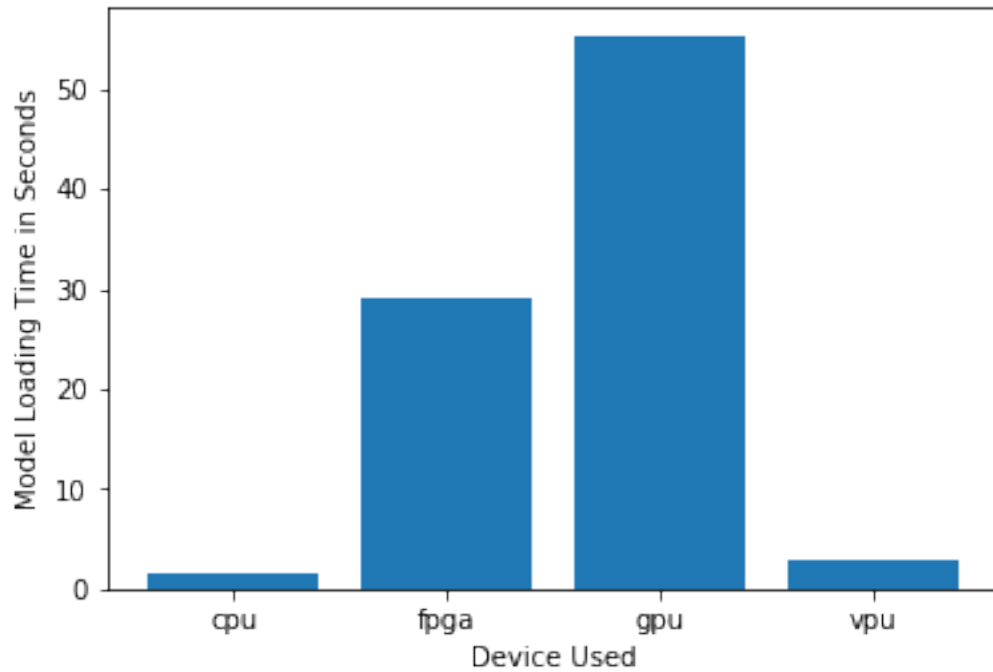
Maximum number of people in the queue	2
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Model precision chosen (FP32, FP16, or Int8)

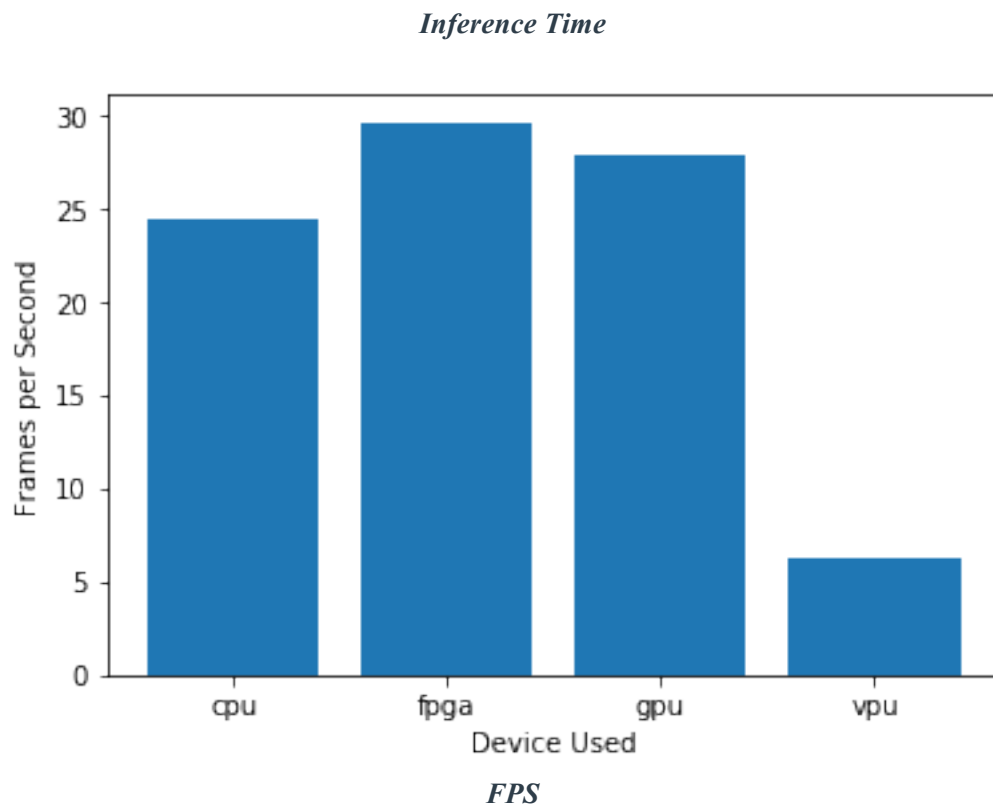
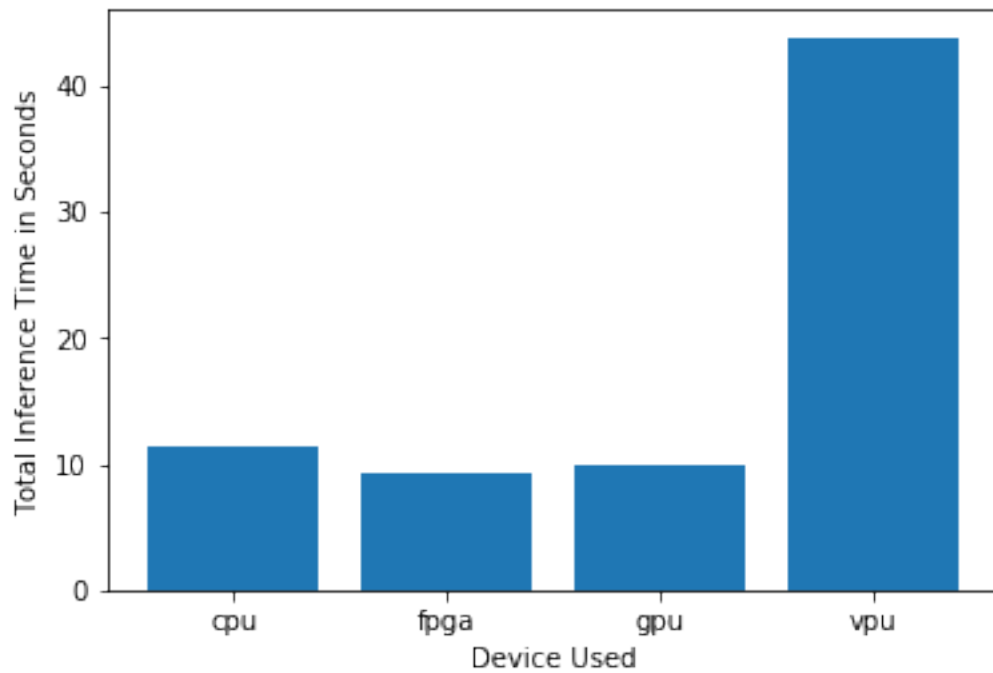
FP16

## Test Results

After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



*Model Load Time*



## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

## Write-up: Final Hardware Recommendation

Considering the most crucial requirements of the client such as flexibility, durability and flaws avoidance, FPGA is the best choice for this use case. On top of that by just observing the graphs above; FPGA is obviously showing very good results with the highest FPS and lowest inference time.

## Scenario 2: Retail

### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario?  
(CPU / IGPU / VPU / FPGA)

CPU/IGPU

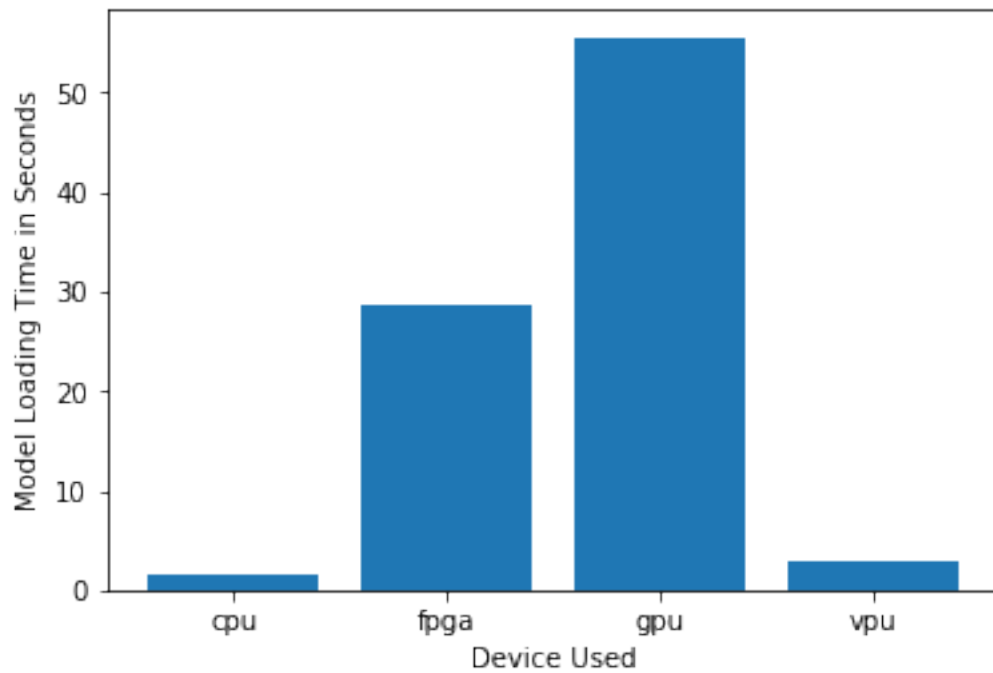
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Economic constraints : The client does not have much money to invest in additional hardware,	The client can't afford extra hardware and can only use the existing hardware which fills up the requirements for CPU inference or IGPU which is embedded already in the i7 CPUs.
Energy/Power constraints : The client would like to save as much as possible on his electric bill.	In accordance with low energy/power consumption, pre-installed CPUs/IGPUs are the best solution here
[TODO: Type your answer here]	[TODO: Type your answer here]
[TODO: Type your answer here]	[TODO: Type your answer here]

### Queue Monitoring Requirements

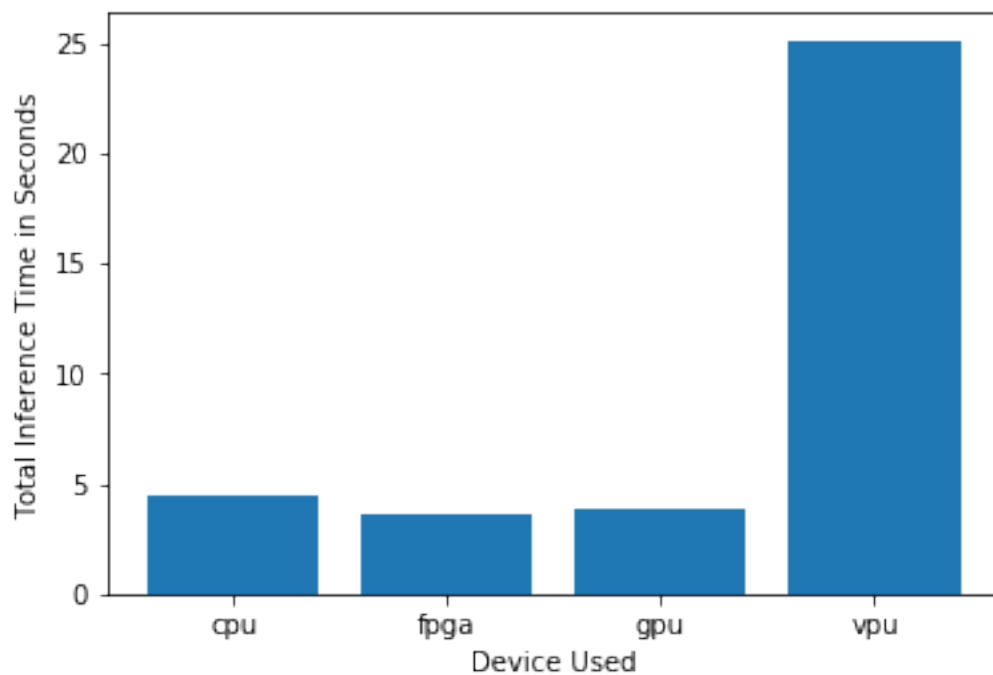
Maximum number of people in the queue	5
Model precision chosen (FP32, FP16, or Int8)	FP16

## Test Results

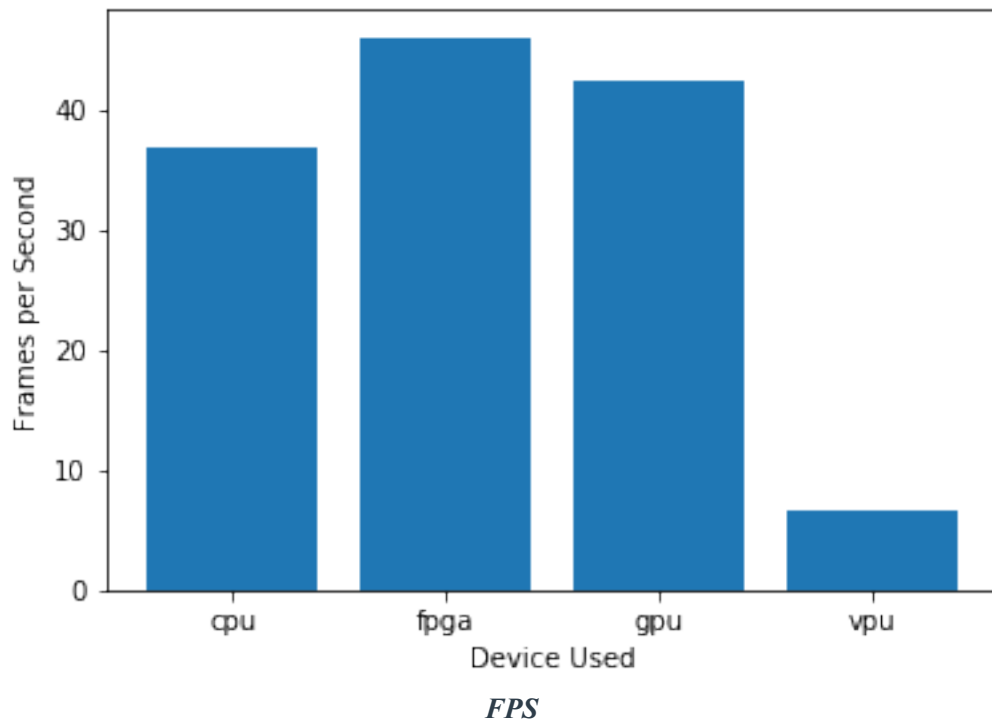
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



*Model Load Time*



*Inference Time*



## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

### Write-up: Final Hardware Recommendation

*Considering the most crucial requirements of the client such as cost, energy constraints, using existing CPUs/IGPUs hardware is the best choice for this use case. On top of that by just observing the graphs above; GPU is obviously showing very good results with one of the highest FPS and lowest inference time even though the model load time is very high it is not in itself a big issue.*

## Scenario 3: Transportation

### Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario?  
(CPU / IGPU / VPU / FPGA)

VPU

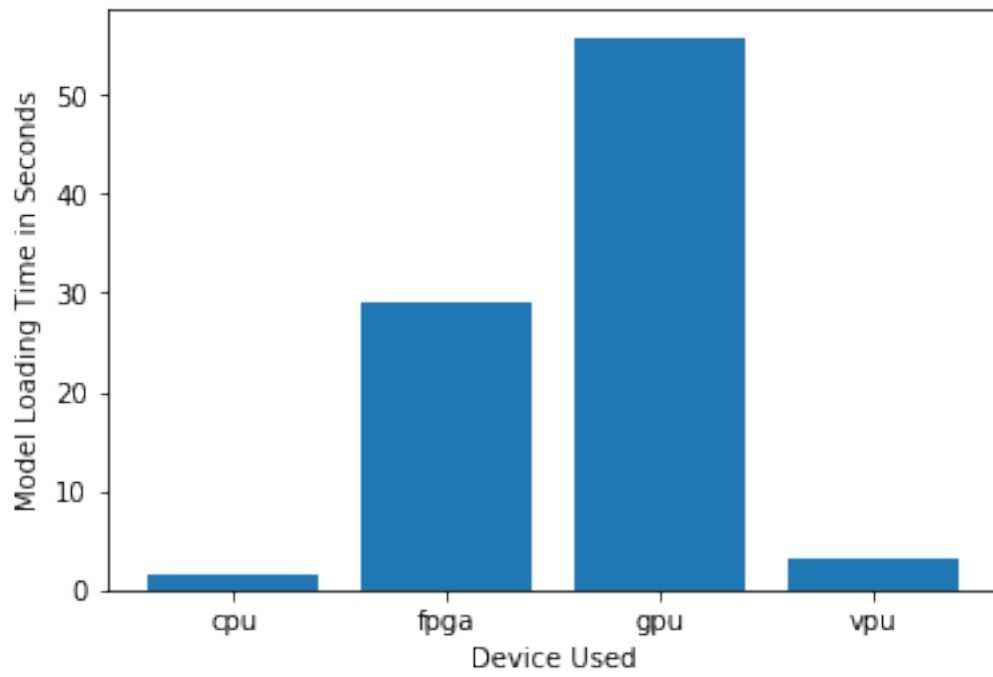
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Economic constraints:</i> The client has only about \$300 for each machine.	VPU would fit in the price range.
<i>Power constraints:</i> The client has no significant additional processing power available to run inference.	VPU are the best choice here as the client is already using the CPU for the CCTV camera handling.
<i>Performance:</i> The client monitors the entire situation with 7 CCTV cameras on the platform. These are connected to closed All-In-One PCs that are located in a nearby security booth.	<i>As an example the Myriad X VPU can easily handle the inference on this videos.</i>
<i>[TODO: Type your answer here]</i>	<i>[TODO: Type your answer here]</i>

## Queue Monitoring Requirements

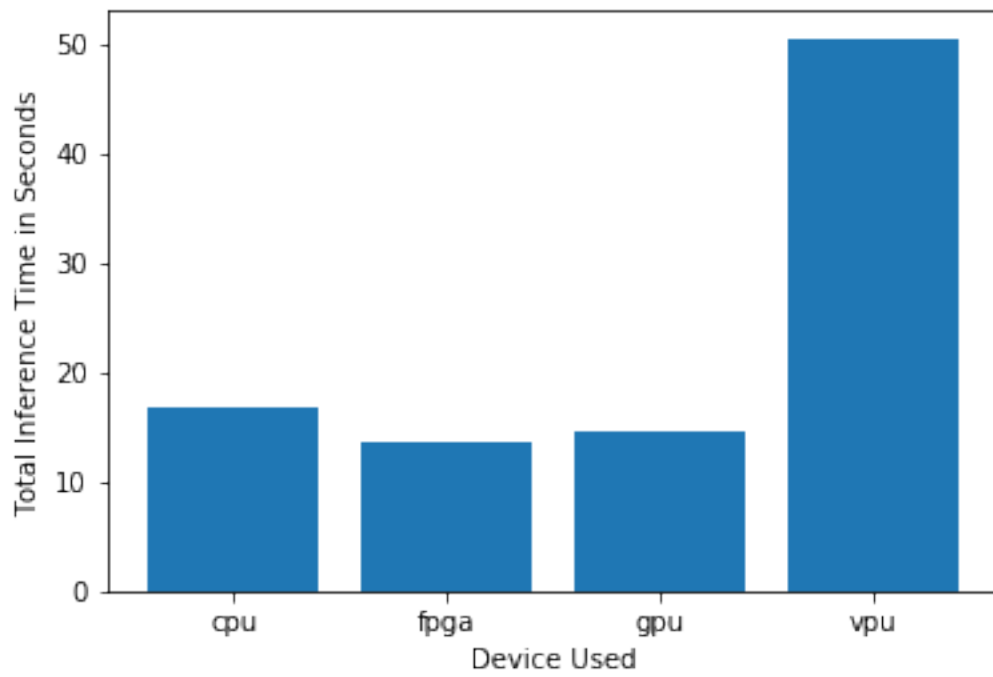
Maximum number of people in the queue	15
Model precision chosen (FP32, FP16, or Int8)	FP16

## Test Results

After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).

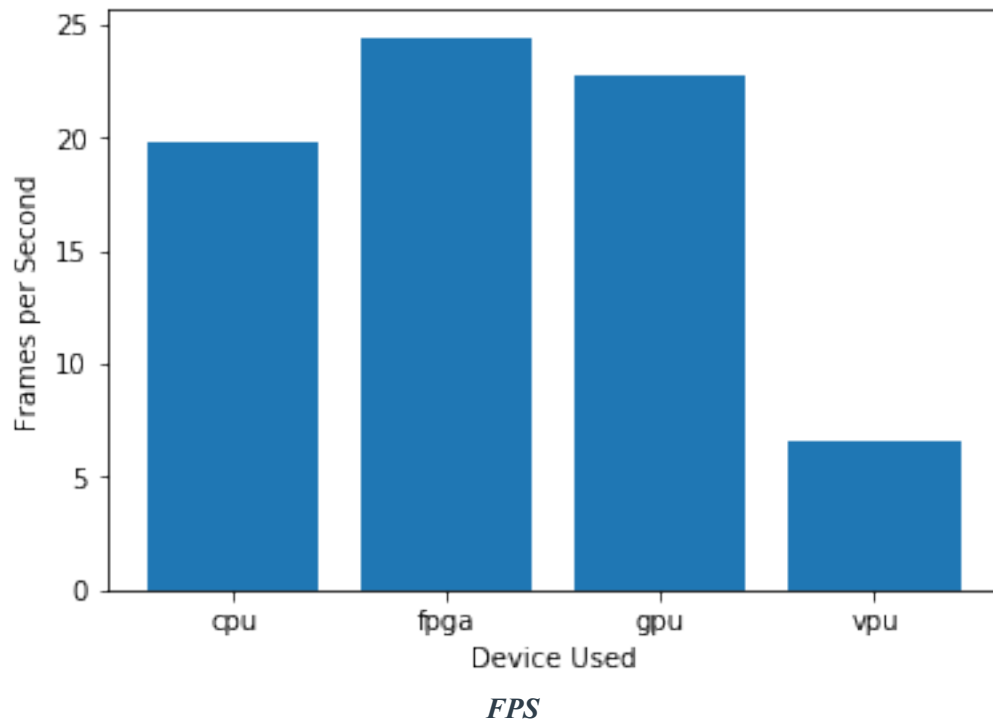


*Model Load Time*



*Inference Time*





## Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

### Write-up: Final Hardware Recommendation

*Considering the most crucial requirements of the client such as cost , very limited budget and processing resource constraints, using existing VPUs hardwares is the best choice for this use case even tough I think for this use case the client should increase the budget to invest on more powerfull hardwares . On top of that by just observing the graphs above; VPU is obviously not showing very good results with the lowest FPS and lowest inference time even tough the model load time is good and acceptable.*