

Atos

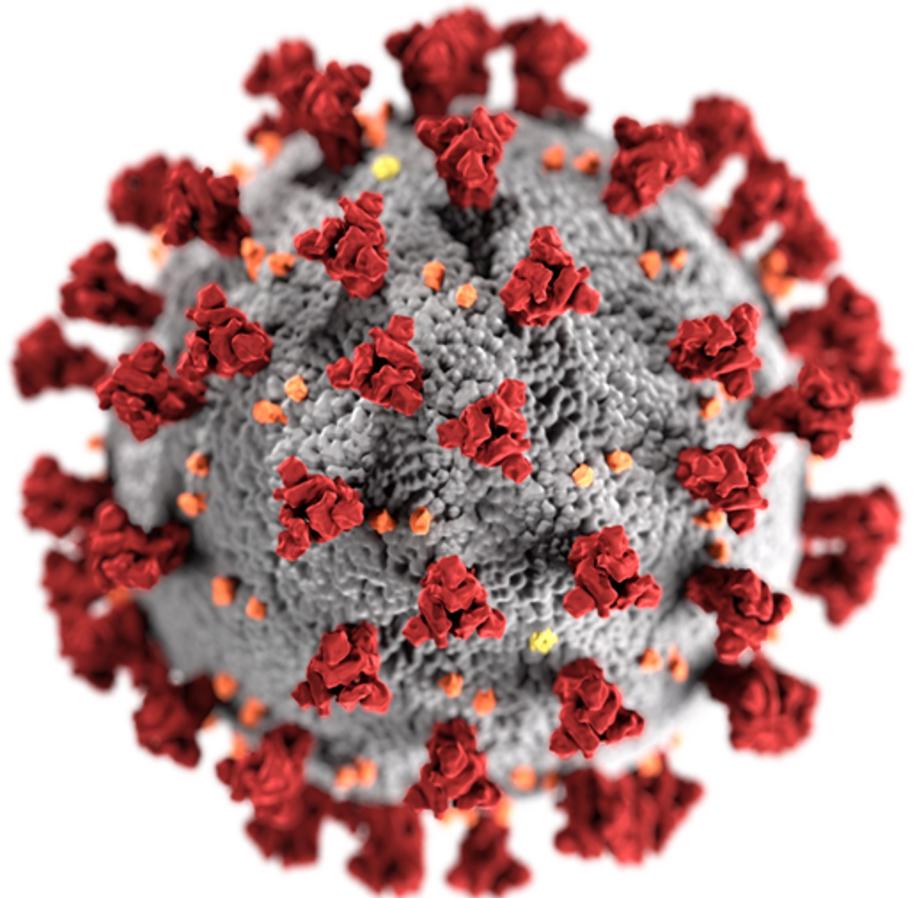
# How Arm platforms can be efficiently used to execute life science workflows

arm



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# Life Science workflows



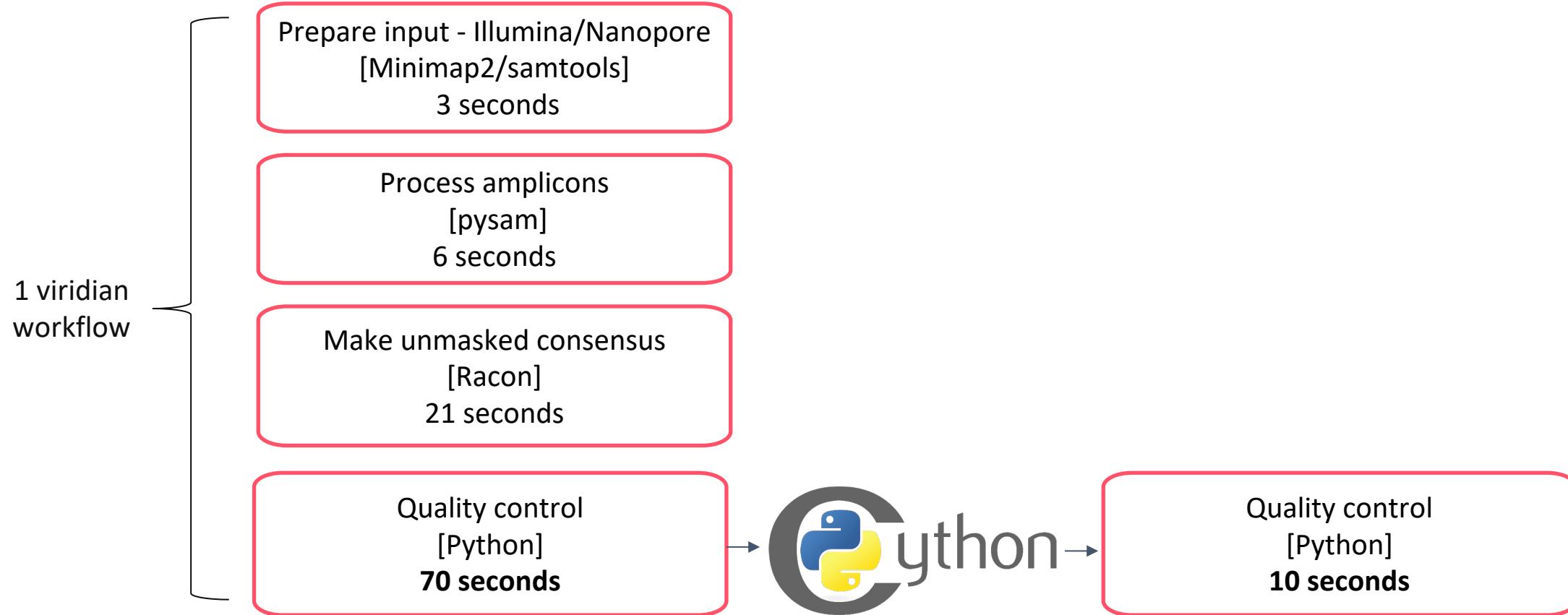
**GROMACS**

High-performance molecular dynamics

**Viridian**

Novel virus assembly tool

# Viridian Workflow



# Objectives

## Life sciences and High-performance computing

1. Traditionally, life science workflows have been run on x86 platforms
2. Growing need for cloud-based platforms in the life sciences

**Are life science workflows efficient on Arm-based platforms?**

# Objectives

Arm Neoverse-based platform - **the Ampere Altra**

How does this platform compare to existing x86 platforms?

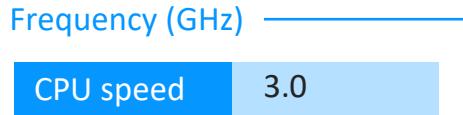
Comparison of Performance at

- Core level
- Socket level
- Node level

# Resource Description

## Ampere Altra

1 socket  
80 cores  
1 thread per core



### Processor Subsystem

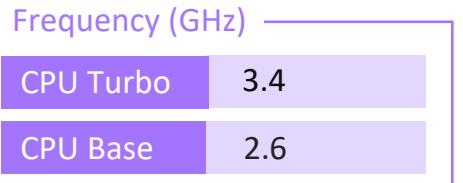
- 80 Arm v8.2+ Cores
- 64 bit CPU
- 64 KB L1 I/D-cache per core
- 1 MB L2 cache per core
- 32 MB system level cache

### Memory

- 8x 72-bit DDR4-3200 channels
- ECC, Symbol-based ECC, and DDR4 RAS features
- Up to 16 DIMMs and 256 GB of memory

## Intel 8358

2 sockets  
32 cores per socket  
2 threads per core



### Processor Subsystem

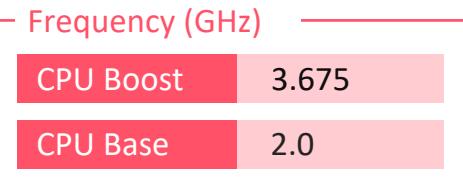
- Cache 48 MB
- 11.2 GT/s Intel® UPI Speed
- 3 UPI Links
- TDP 250 W

### Memory

- 6 TB memory size
- DDR4-3200
- 8 memory channels
- ECC Memory Supported
- Intel® Optane™ Persistent Memory

## AMD 7713

2 sockets  
64 cores per socket  
2 threads per core



### Processor Subsystem

- L3 Cache 256MB
- Default TDP 225W
- AMD Configurable TDP (cTDP) 225-240W
- CPU Socket SP3
- Socket Count 1P/2P

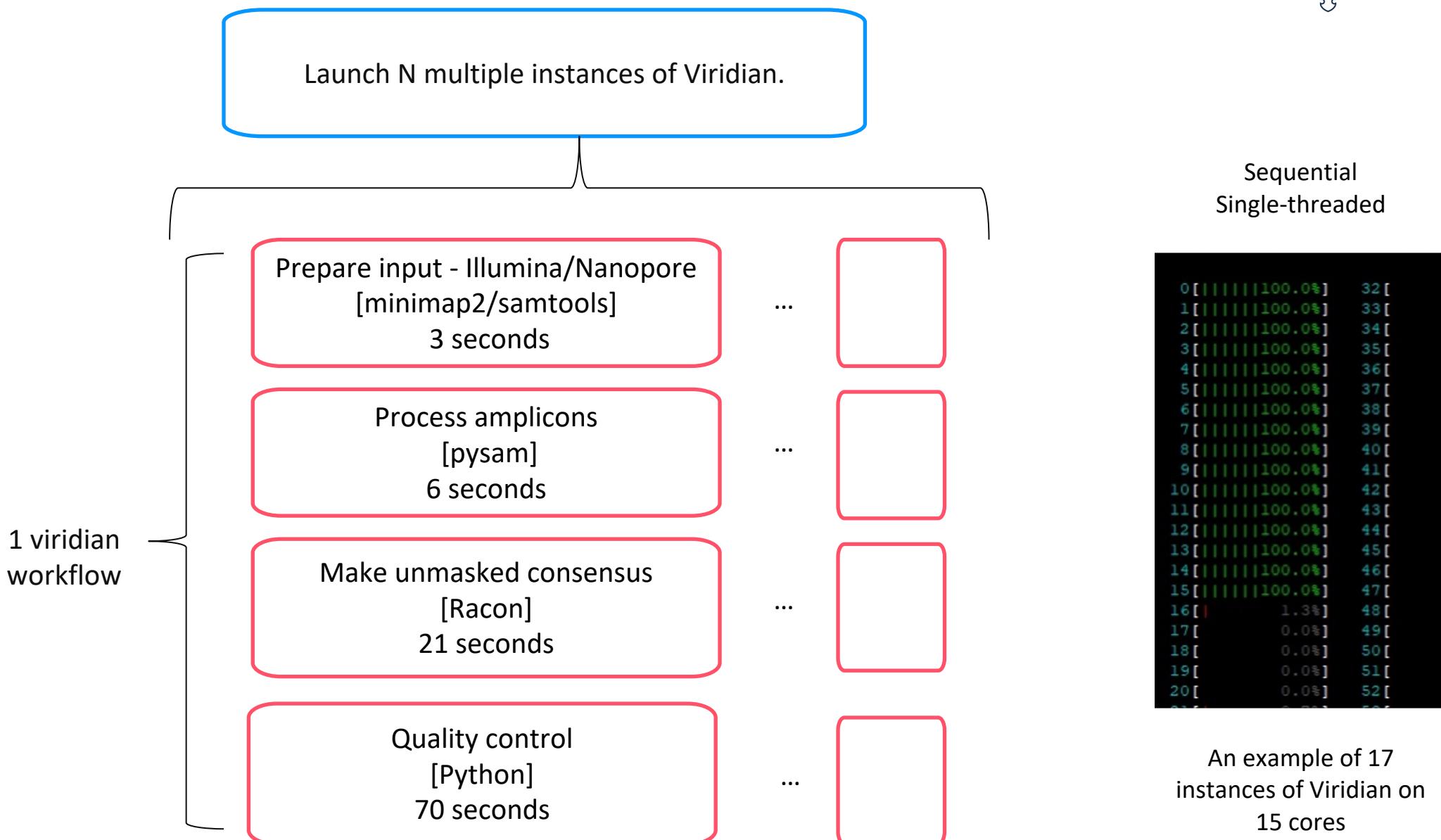
### Memory

- PCI Express® Version PCIe 4.0 x128
- DDR4 3200 MHz
- 8 memory channels
- Per Socket Mem BW 204.8 GB/s

# Viridian Workflow



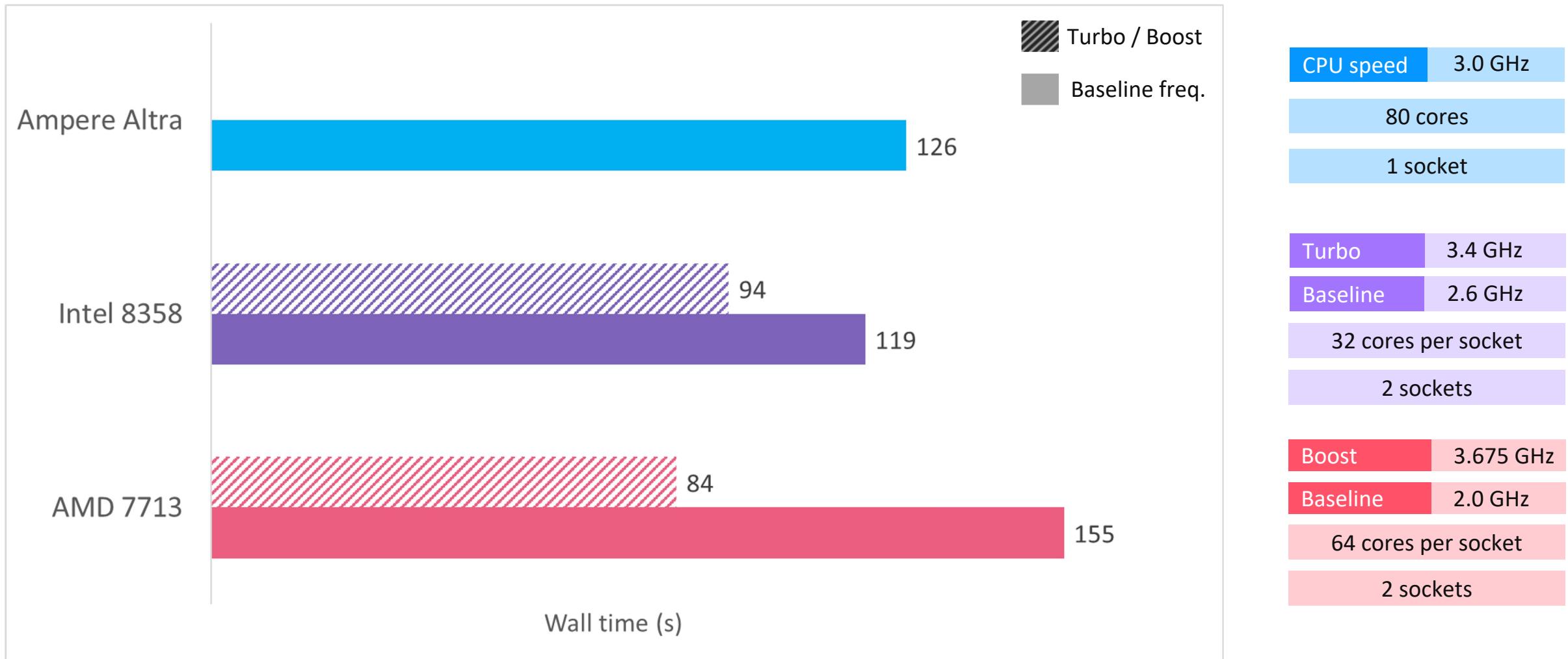
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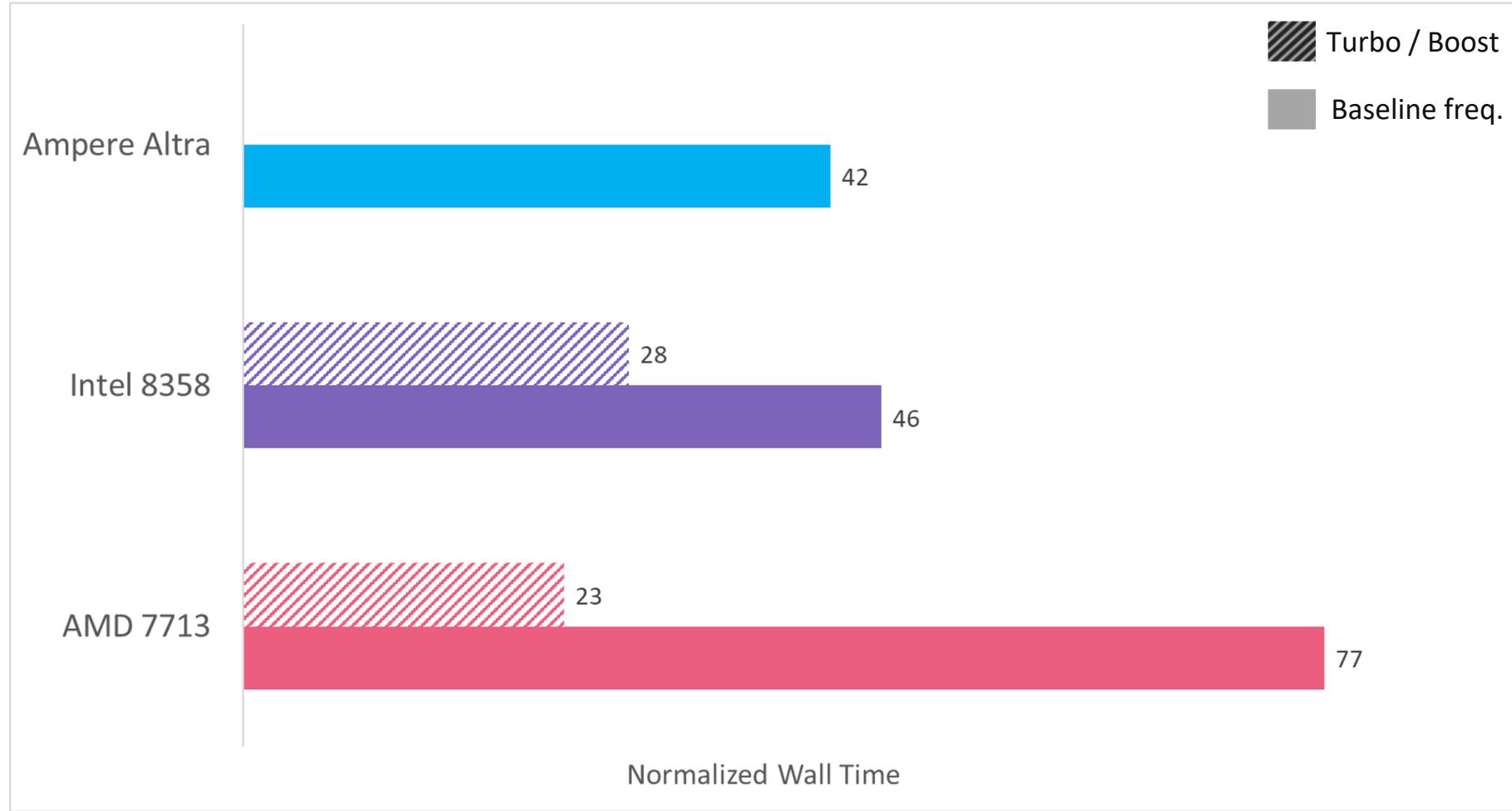
# Comparison of Performance at Core Level

## 1 run on 1 core



# Comparison of Performance at Core Level

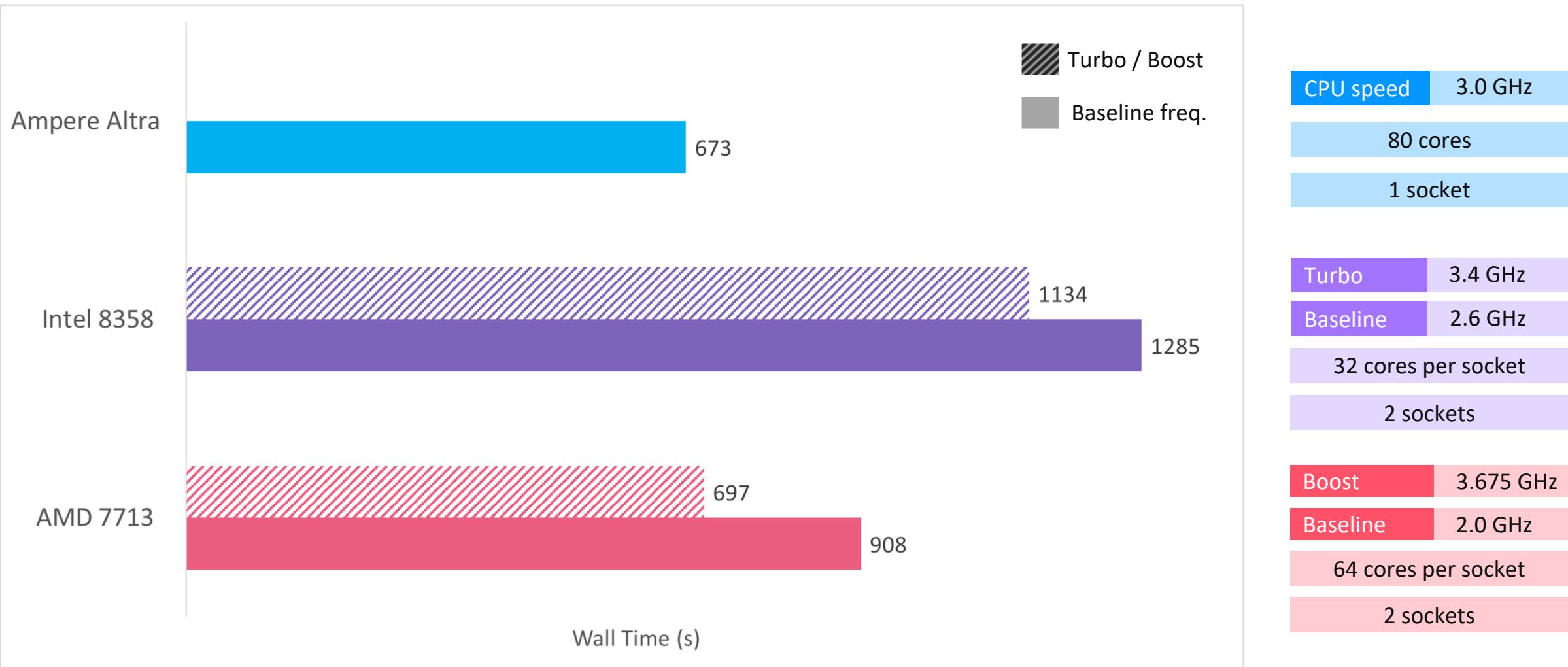
## 1 run on 1 core - Normalized Wall Time



CPU speed	3.0 GHz
80 cores	
1 socket	
Turbo	3.4 GHz
Baseline	2.6 GHz
32 cores per socket	
2 sockets	
Boost	3.675 GHz
Baseline	2.0 GHz
64 cores per socket	
2 sockets	

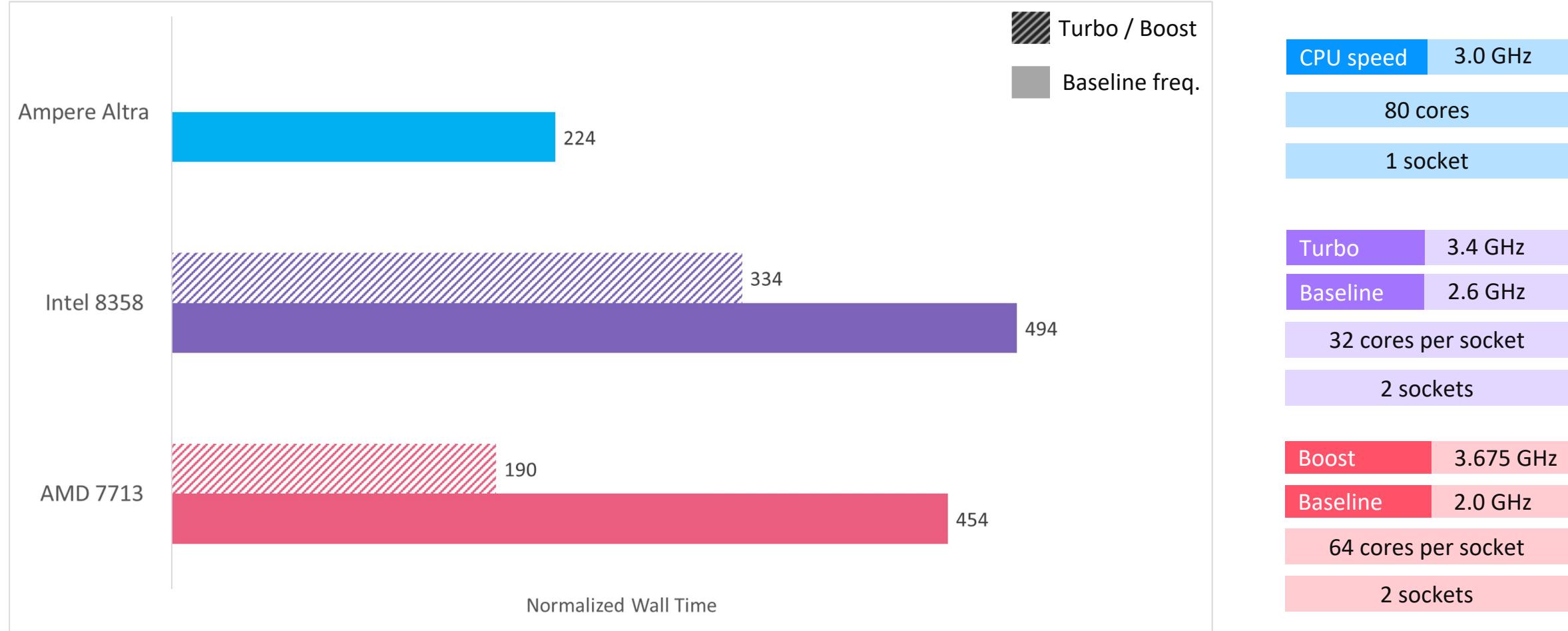
# Comparison of Performance at Socket Level

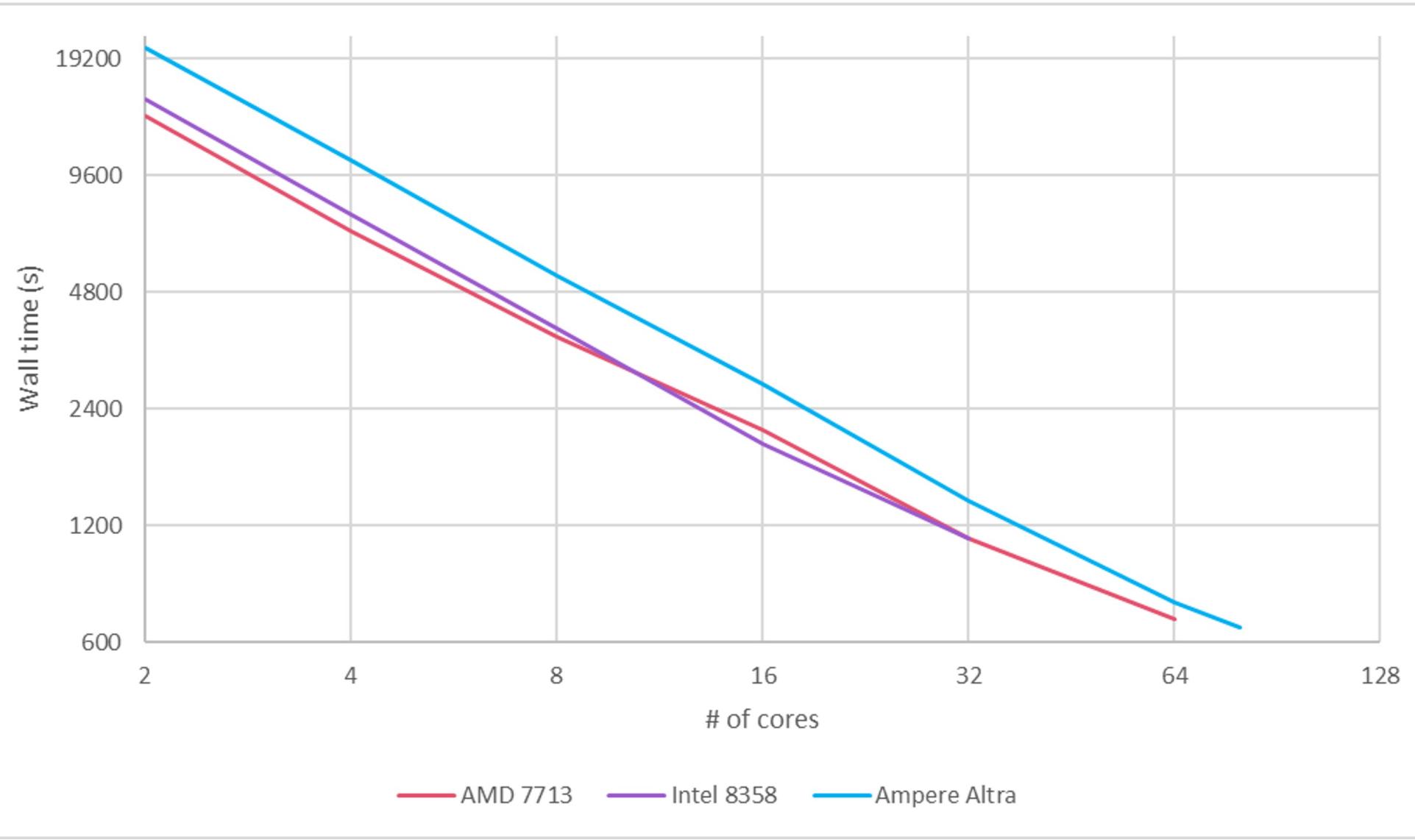
320 runs on 1 socket



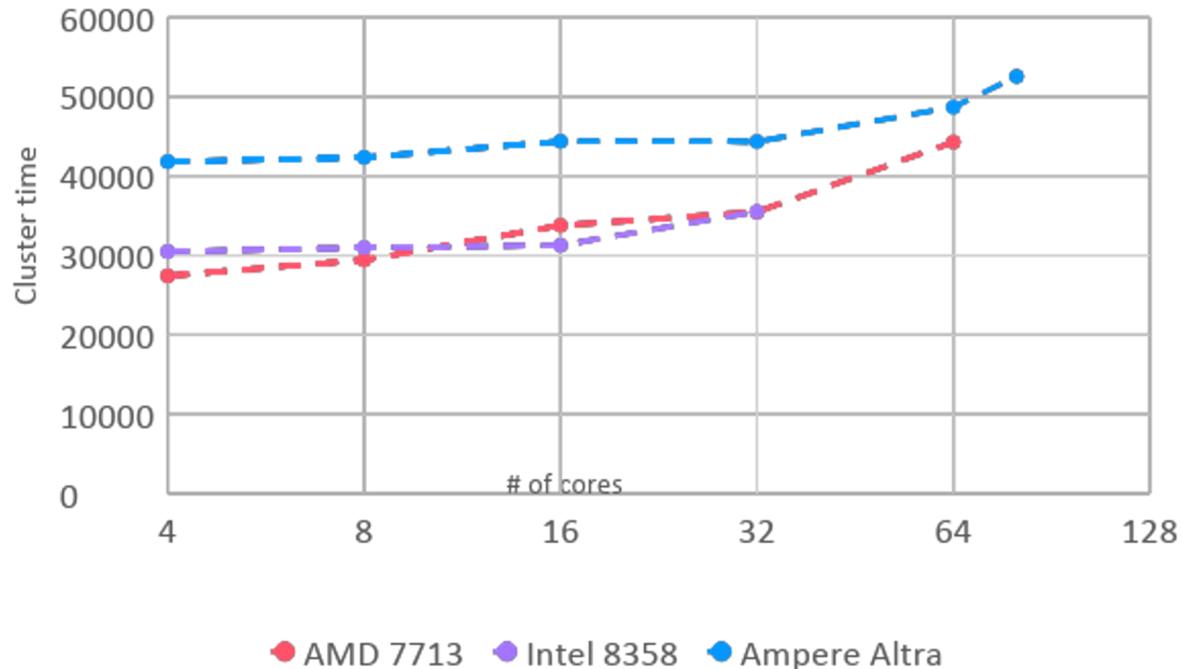
# Comparison of Performance at Socket Level

## 320 runs on 1 socket - Normalized Wall Time

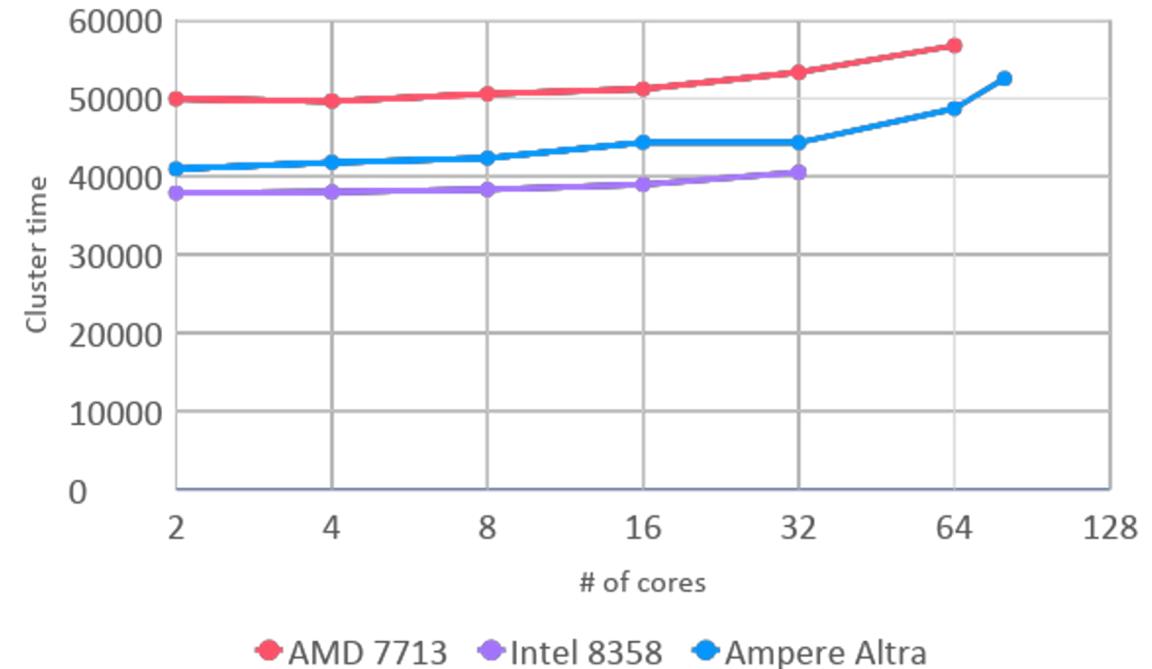




# Comparison of Performance at Socket Level Scalability



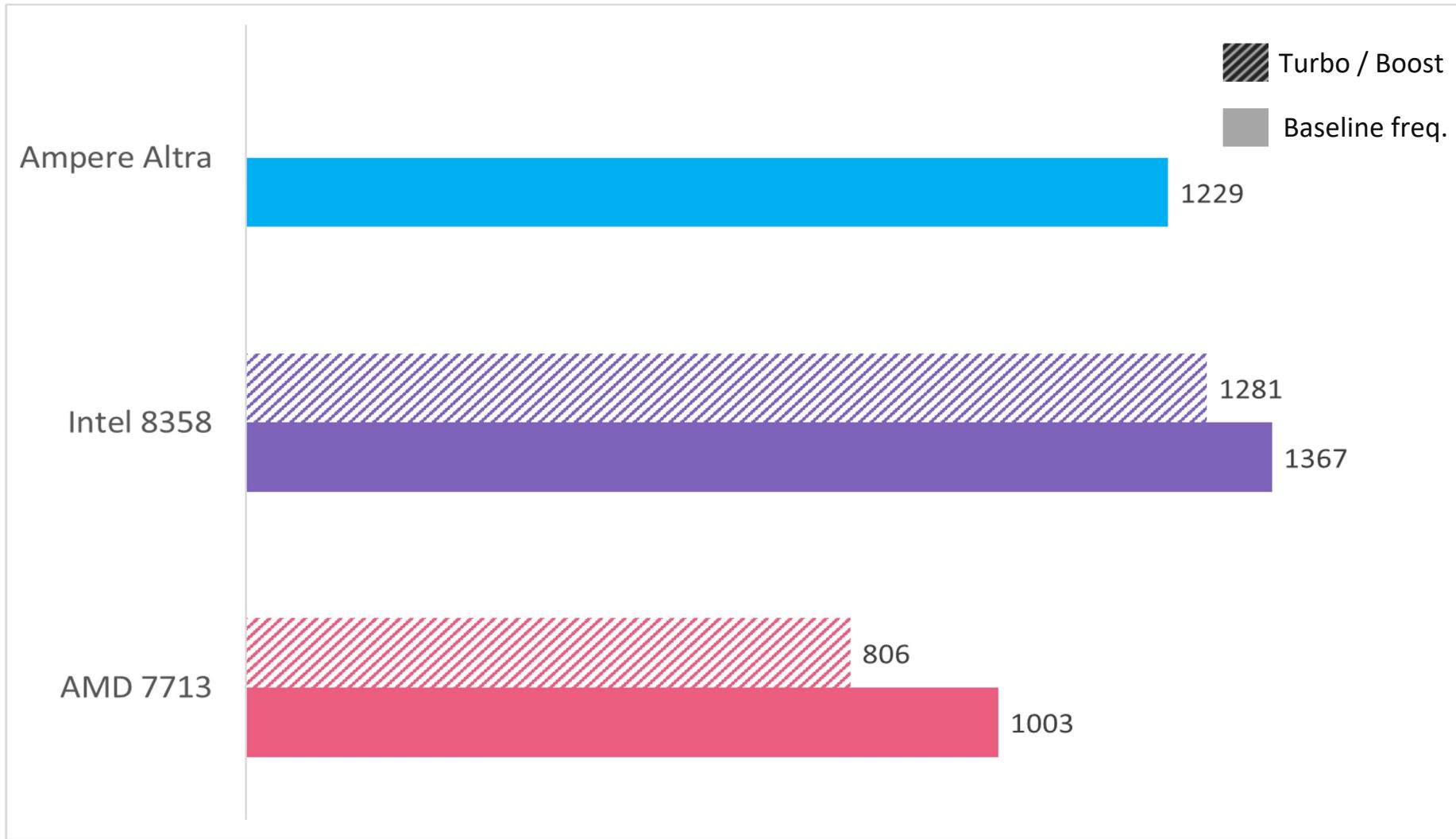
Turbo/Boost enabled



Baseline

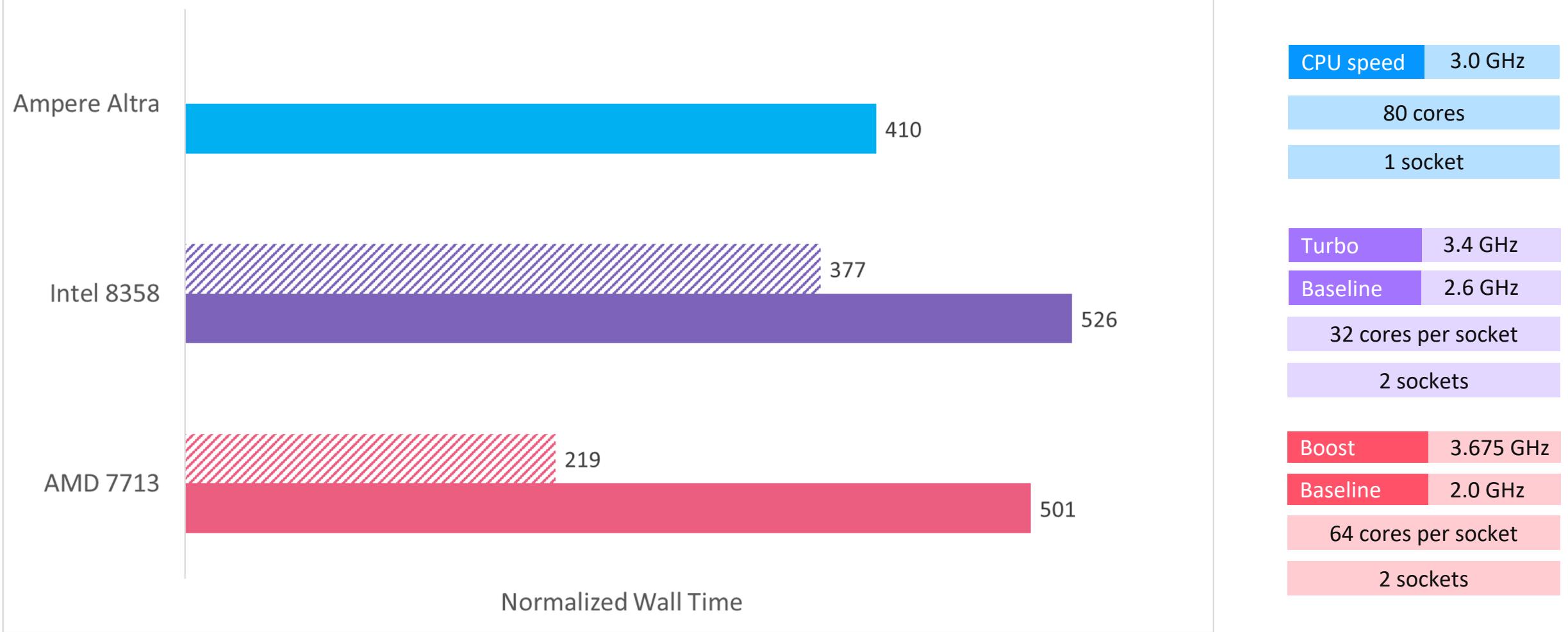
# Comparison of Performance at Node Level

## 640 runs on 1 node



# Comparison of Performance at Node Level

## 640 runs on 1 node - Normalized Wall Time



# Takeaways

Arm-based platforms performed on par with  
x86 platforms

They performed well on socket level

New emerging tool for the life sciences

[Next steps](#)

A big thank you to....



Alex Wade  
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Phil Ridley  
Daniele Piccarozzi



Zamin Iqbal

Xavier Vigouroux  
Okba Hamitou  
Erwan Raffin

David Guibert  
Natalia Jimenez