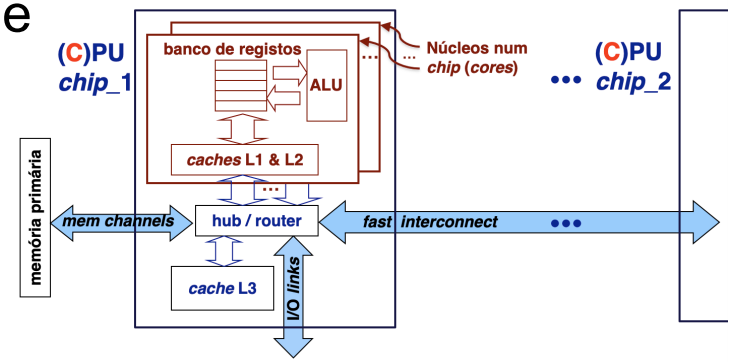
# Homework T1...

Questions/homework T1:

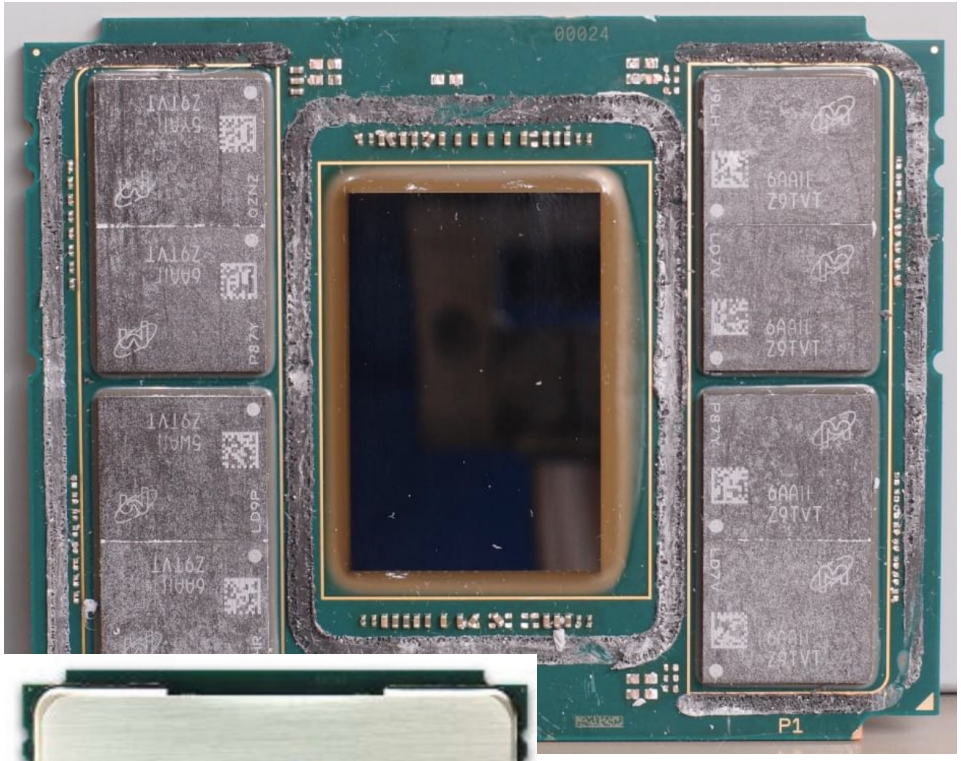
1. Identify the current available devices with the largest #cores; state how many in the device/package & show an image
   a) Designed by Intel
   b) Designed by AMD
   c) Designed by ARM
   d) Designed by a japanese company
   e) Designed by chinese company
   f) Worldwide




2. What are the key chalenges to design a chip with a very large number of cores?

Resolution

# Question: max number of physical cores?



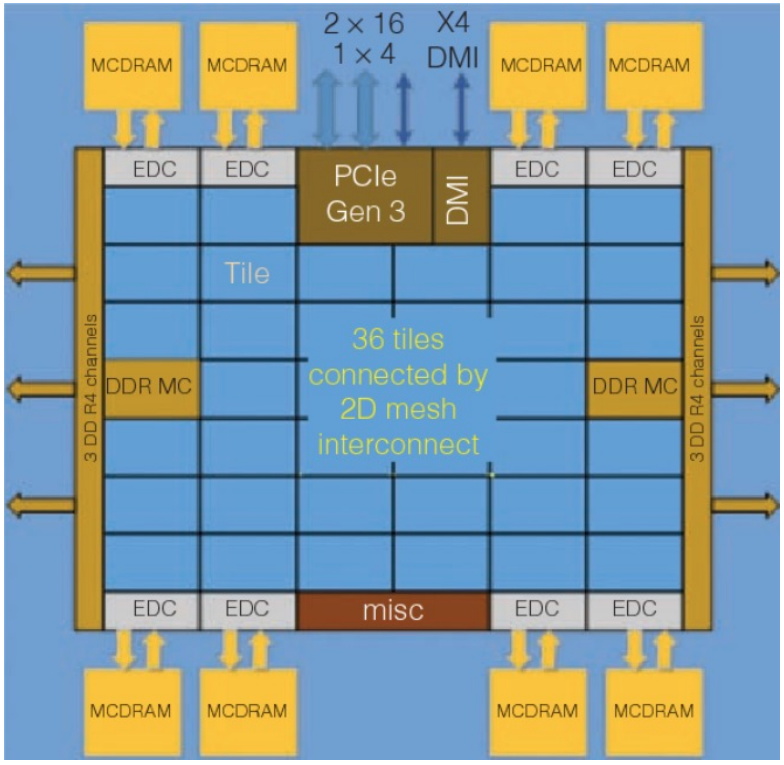


## Intel

**Xeon Phi package:**

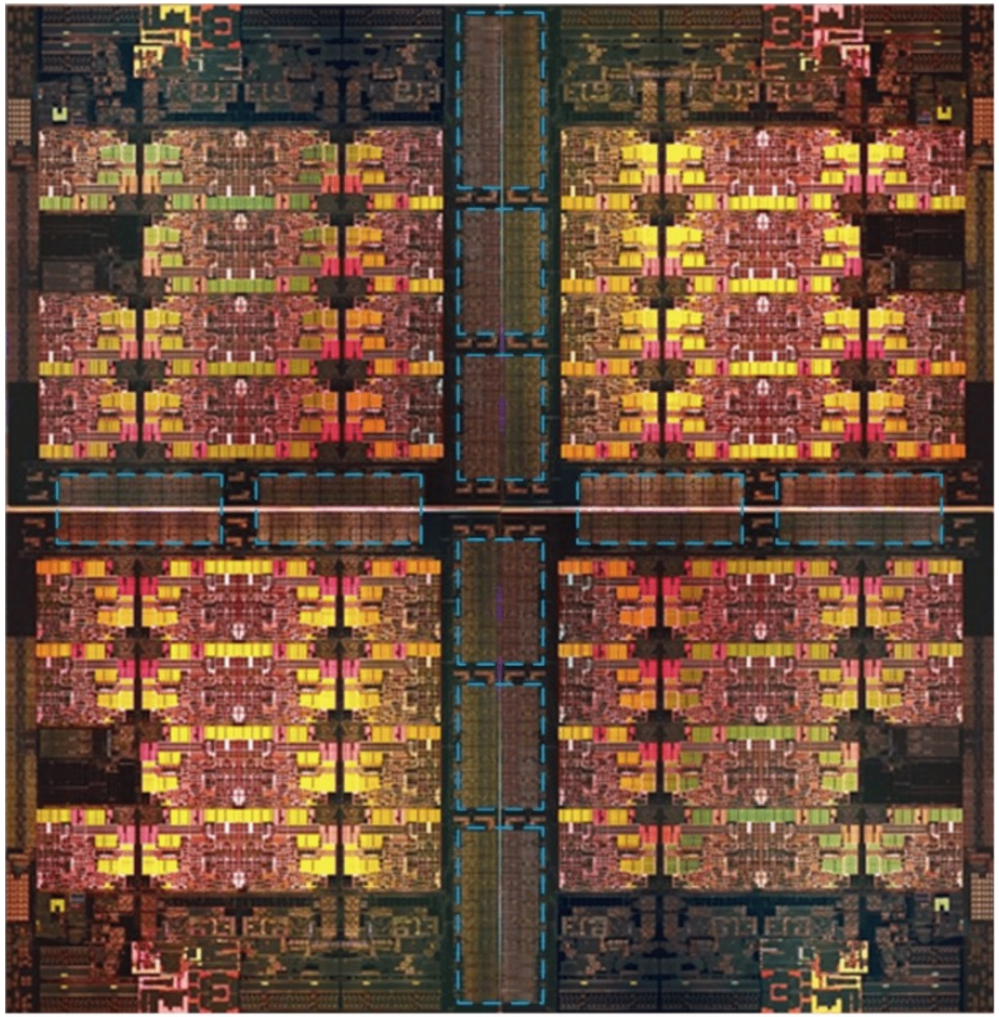
**up to 72 cores**

*(discontinued in 2018)*



Resolution

# Question: max number of physical cores?



## Intel

4th generation

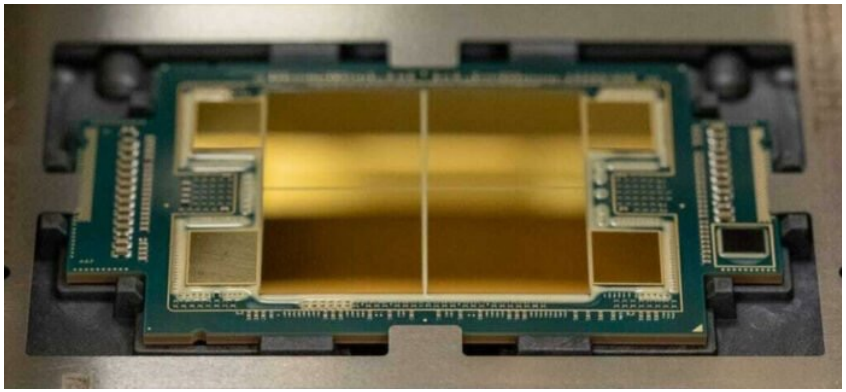
**Xeon Platinum 8480p package:**

**56 cores**

**Sapphire Rapids, 10nm?**

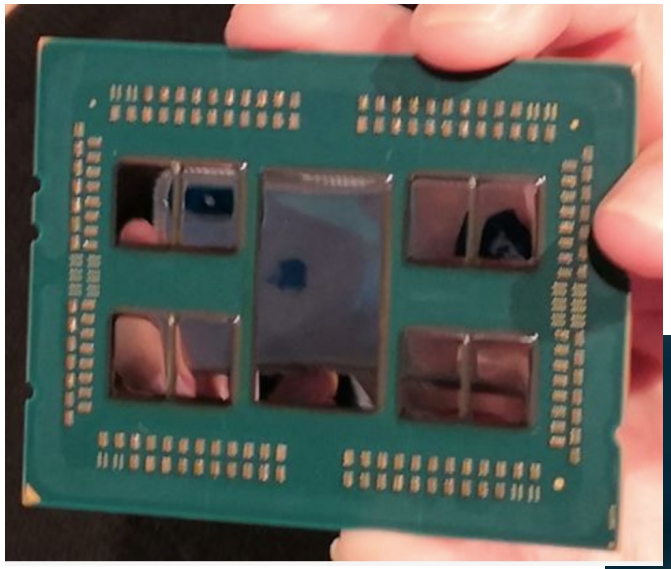
**Note:**

**8490H go up to 60 cores**



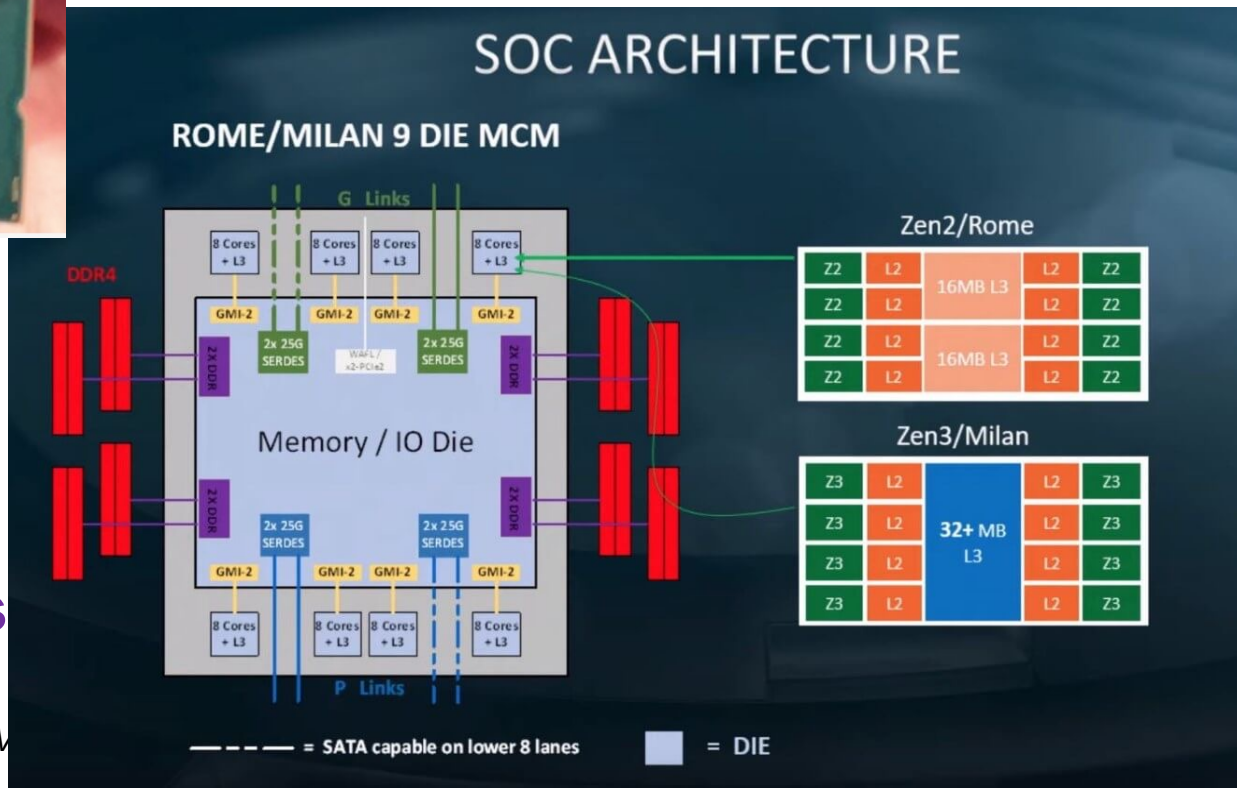
Resolution

# Question: max number of physical cores?



## AMD

Epyc Rome & Milan: **64 cores**



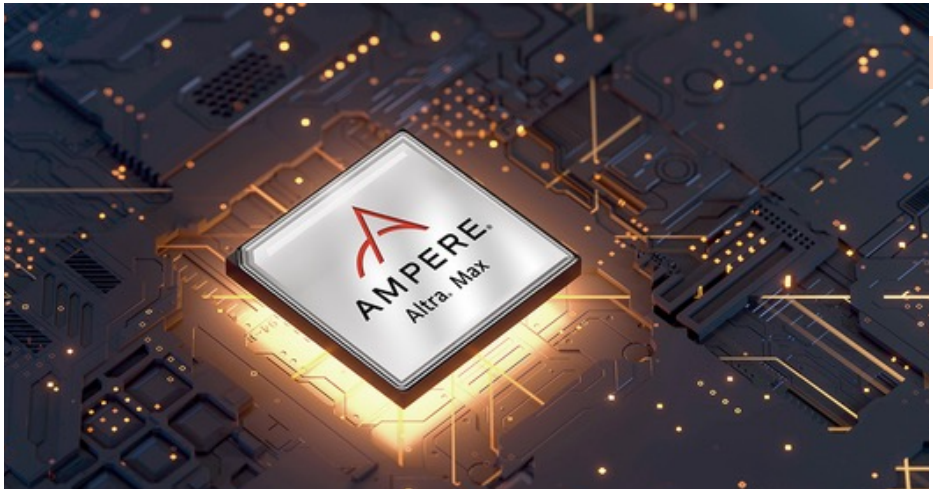

**Note:**

**Soon this year**

**Epyc Bergamo: 96 cores**

Resolution

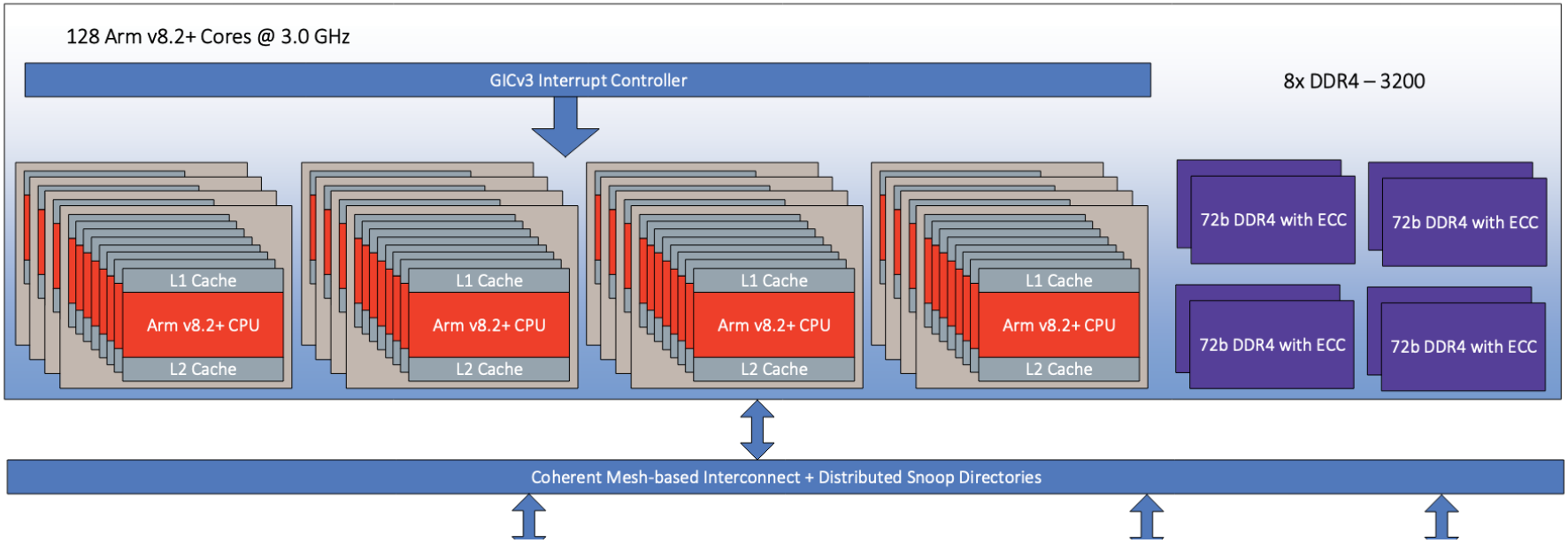
# Question: max number of physical cores?




## ARM

**Ampere Altra Max: 128 cores**

*Altra Max Block Diagram*



Resolution

# Question: max number of physical cores?

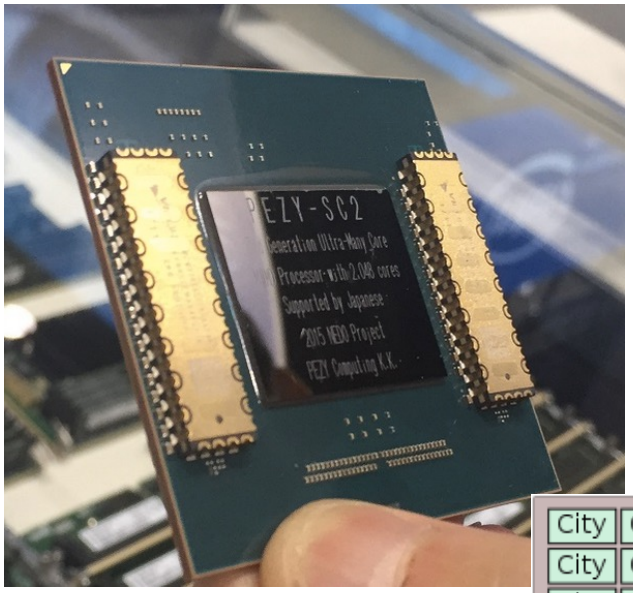
**ARM**


T-Head Yitian 710: **128 cores**

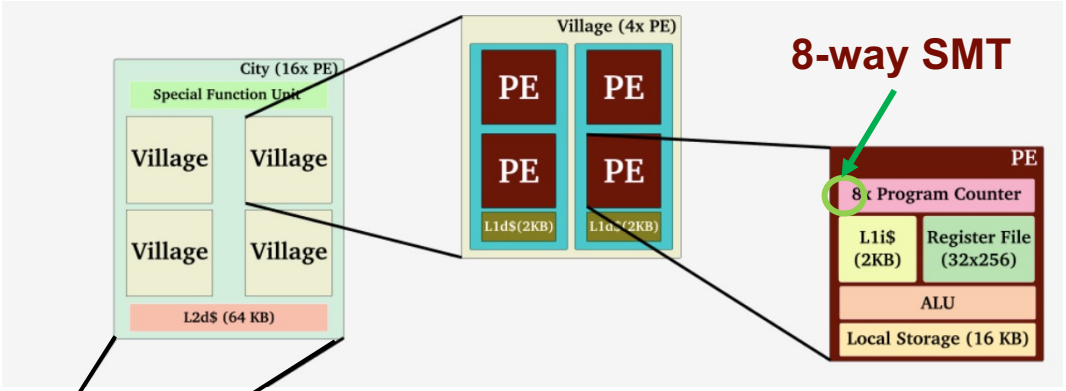
Alibaba

Resolution

# Question: max number of physical cores?



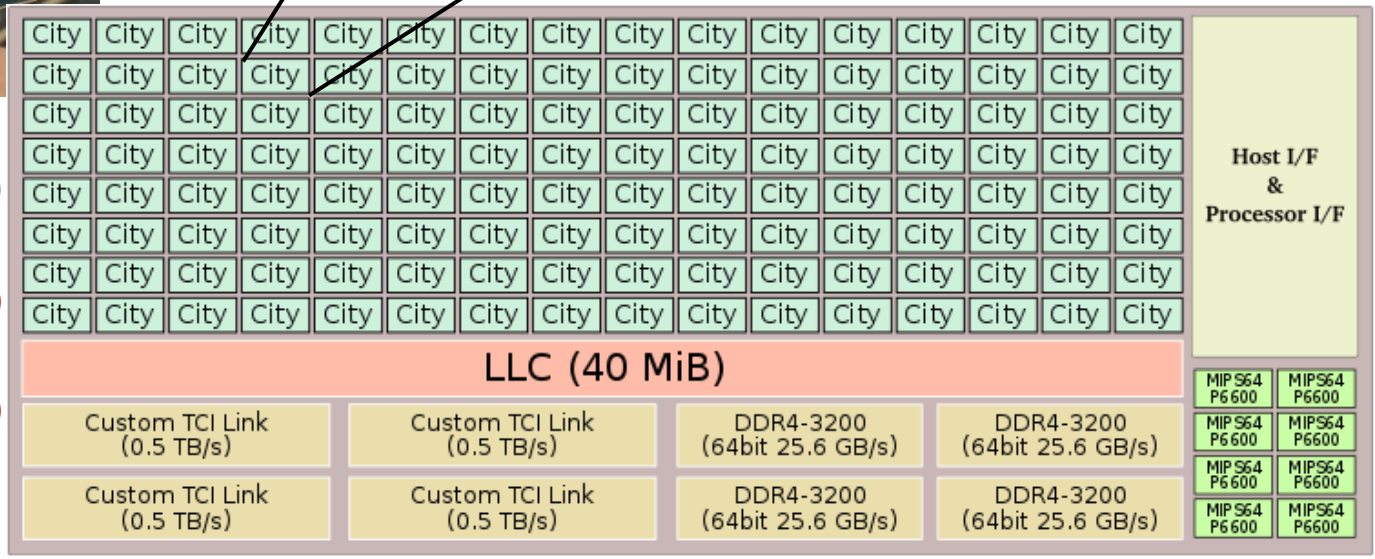

## Japan




**PEZY-SC2**: **2048 cores**
+ 8x MIPS cores *(2017)*

**PEZY-SC3**: 8192 cores
(due in 2019, but…)

**PEZY-SC4**: 16384 cores
(due in 2020, but…)



Resolution

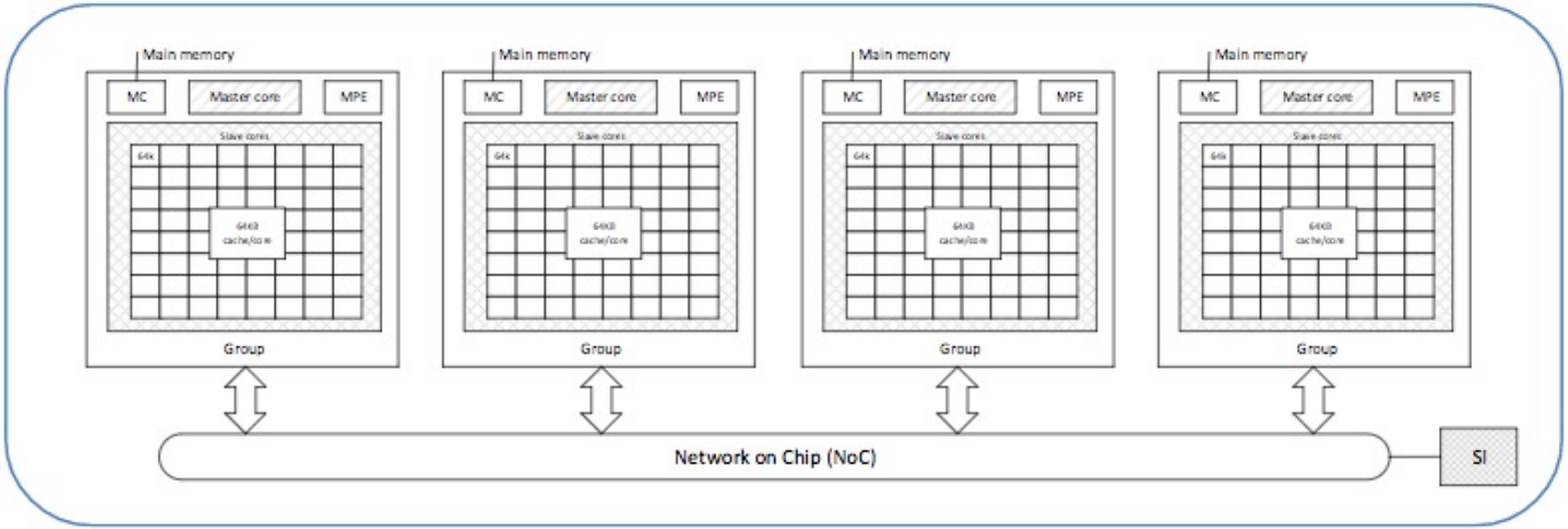
# Question: max number of physical cores?


## China

**Sunway SW 26010**:

**256+4 cores**

*(in #1 TOP500, June 2016)*



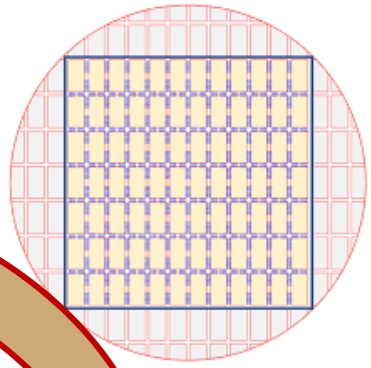
Resolution

# Question: max number of physical cores?

Wafer
Scale
Engine

## Cerebras WSE-2
## The Largest Chip Ever Built

| | |
|---|---|
| 46,225 | $mm^2$ silicon |
| 2.6 | Trillion transistors |
| 850,000 | AI optimized cores |
| 40 | Gigabytes on chip me |
| 20 | Petabyte/s memory bandwidth |
| 220 | Petabit/s fabric bandwidth |
| 1.2 | Terabit/s ingest bandwidth |
| 7nm | Process technology at TSMC |



Worldwide