What Is NVIDIA® Tesla®?

- Designs GPUs (graphic processing units)
- GPU produced by NVIDIA
  - GPGPU computing (general purpose graphics processing unit)
  - Designed for large-scale parallel computer
How Does GPU Acceleration Work?

Reference: [3]
The GPU – CPU Gap (by NVIDIA®)

Conventional CPU computing architecture can no longer support the growing HPC needs.


Reference: [4]
GPU Hardware Roadmap

Reference: [6]
NVIDIA® Tesla® Architecture (1/2)

Reference: [1]
NVIDIA® Tesla® Architecture (2/2)

Reference: [1]
# Specifications: Then vs. Now

## Comparison between G80 (2006) and GP100 (2016).

<table>
<thead>
<tr>
<th></th>
<th>G80</th>
<th>GP100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transistors</td>
<td>681 million</td>
<td>15300 million</td>
</tr>
<tr>
<td>SP</td>
<td>128</td>
<td>3584</td>
</tr>
<tr>
<td>SM</td>
<td>16</td>
<td>56</td>
</tr>
<tr>
<td>TPC</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Base Clock</td>
<td>1350 MHz</td>
<td>1328 MHz</td>
</tr>
<tr>
<td>Process</td>
<td>90-nm CMOS</td>
<td>16-nm FinFET</td>
</tr>
<tr>
<td>TDP</td>
<td>170 Watts</td>
<td>300 Watts</td>
</tr>
<tr>
<td>Processing power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Single-precision FMA)</td>
<td>345.6 GFLOPs</td>
<td>9519-10690 GFLOPs</td>
</tr>
</tbody>
</table>

Reference: [1],[2]
NVIDIA® Tesla® Applications

INTERNET & CLOUD
- Image Classification
- Speech Recognition
- Language Translation
- Language Processing
- Sentiment Analysis
- Analysis Recommendation

MEDICINE & BIOLOGY
- Cancer Cell Detection
- Diabetic Grading
- Drug Discovery

MEDIA & ENTERTAINMENT
- Video Captioning
- Video Search
- Real Time Translation

SECURITY & DEFENSE
- Face Detection
- Video Surveillance
- Satellite Imagery

AUTONOMOUS MACHINES
- Pedestrian Detection
- Lane Tracking
- Recognize Traffic Sign

Reference: [5]
Thank You!

High Performance Computing Solutions

NVIDIA Tesla GPU Computing Solutions for HPC
Infinite Possibilities
References


