Fujitsu HPC Solutions to Meet Customers’ Demands

- Supercomputers, both Fujitsu-developed CPUs and x86
- Single system image operation with Fujitsu system software
- High application performance, availability, and reliability

High scalability
with Fujitsu-developed CPU and interconnect

PRIMERGY x86 cluster systems support the latest CPUs and accelerators
Supercomputer “Fugaku”, Formerly Known as Post-K

**Focus**
- Application performance
- Power efficiency
- Usability

**Approach**
- Co-design w/ application developers and Fujitsu-designed CPU core w/ high memory bandwidth utilizing HBM2
- Leading-edge Si-technology, Fujitsu's proven low power & high performance logic design, and power-controlling knobs
- Arm®v8-A ISA with Scalable Vector Extension (“SVE”), and Arm standard Linux

**A64FX chip performance measurements & architectural contributions**

<table>
<thead>
<tr>
<th>Component</th>
<th>Performance Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGEMM</td>
<td>2.5x</td>
</tr>
<tr>
<td>STREAM Triad</td>
<td>6x</td>
</tr>
<tr>
<td>Fluid dynamics</td>
<td>3.0x</td>
</tr>
<tr>
<td>Atomospheres</td>
<td>2.8x</td>
</tr>
<tr>
<td>Seismic</td>
<td>3.4x</td>
</tr>
<tr>
<td>Conv. FP32</td>
<td>2.5x</td>
</tr>
<tr>
<td>Conv. INT8</td>
<td>9.4x</td>
</tr>
</tbody>
</table>

**Notes:**
- 512-bit SIMD
- Memory BW
- Combined gather
- L1$ BW
- L2$ BW
- INT8 partial dot product

Copyright 2019 FUJITSU LIMITED

Toshiyuki Shimizu, Vendor Showdown, ISC19, Frankfurt, June 17th, 2019
“Fugaku” and Fujitsu Commercial Units for an Evolving HPC

- “Fugaku” is designed and runs applications at the highest level performance to be worthy of the name.
- Arm HPC ecosystem and expanding apps portfolio are likened to the broad gradual slopes of Mt. Fuji.
- Fujitsu began production of “Fugaku”, also advances productization of commercial units based on the supercomputer technology.