Aurora Fact Sheet

System Feature	The Aurora Details	Comparison to Mira
Peak System Performance (FLOP/s)	180 - 450 PetaFLOP/s	10 PetaFLOP/s
Processor	Future Generation Intel® Xeon Phi™ Processor (Code name: Knights Hill)	PowerPC A2 1600 MHz processor
Number of Nodes	>50,000	49,152
Compute Platform	Intel system based on Cray Shasta next generation supercomputing platform	IBM Blue Gene/Q
Aggregate High Bandwidth On-Package Memory, local Memory and Persistent Memory	>7,000 Terabytes	768 Terabytes
Aggregate High Bandwidth On-Package Memory Bandwidth	>30 Petabytes/s	2.5 Petabytes/s
System Interconnect	2nd Generation Intel® Omni-Path Architecture with silicon photonics	IBM 5D torus interconnect with VCSEL photonics
Interconnect Aggregate Node Link Bandwidth	>2.5 Petabytes/s	2 Petabytes/s
Interconnect Bisection Bandwidth	>500 Terabytes/s	24 Terabytes/s
Interconnect Interface	Integrated	Integrated
Burst Buffer Storage	Intel® SSDs, using both 1st and 2nd Generation Intel® Omni-Path Architecture	None
File System	Intel® Lustre File System	IBM GPFS File System
File System Capacity	>150 Petabytes	26 Petabytes
File System Throughput	>1 Terabyte/s	300 Gigabyte/s
Intel Architecture (Intel® 64) Compatibility	Yes	No
Peak Power Consumption	13 Megawatts	4.8 Megawatts
FLOP/s Per Watt	>13 GigaFLOP/s per watt	>2 GigaFLOP/s per watt
Delivery Timeline	2018	2012
Facility Area for Compute Clusters	~3,000 sq. ft.	~1,536 sq. ft.

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For further information on Aurora, visit: intel.com/Aurora

Aurora Fact Sheet

Aurora's High Performance Software Stack
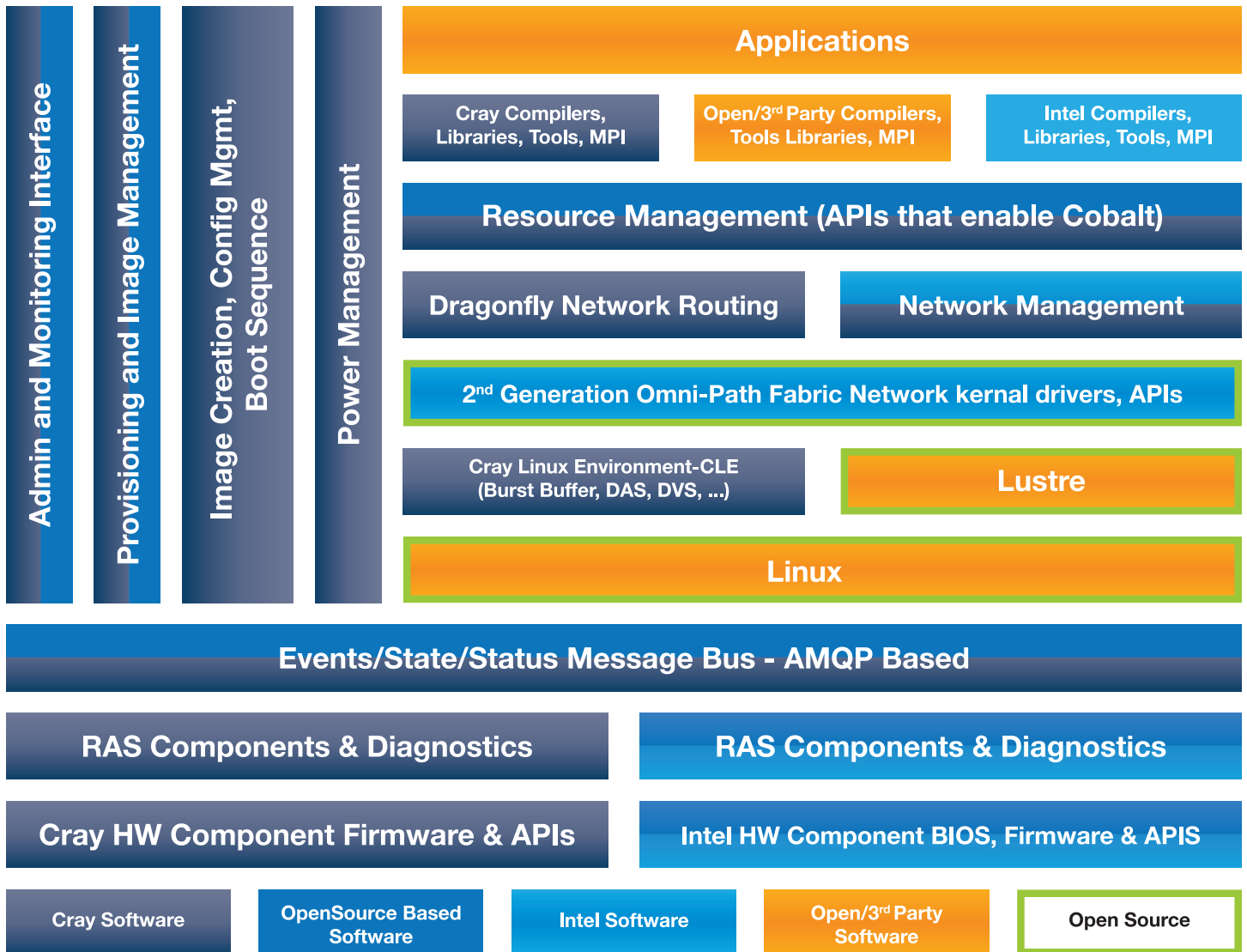
Admin and Monitoring Interface

Provisioning and Image Management

Image Creation, Config Mgmt, Boot Sequence

Power Management

Applications

Cray Compilers, Libraries, Tools, MPI	Open/3rd Party Compilers, Tools Libraries, MPI	Intel Compilers, Libraries, Tools, MPI

Resource Management (APIs that enable Cobalt)

Dragonfly Network Routing	Network Management

2nd Generation Omni-Path Fabric Network kernal drivers, APIs

Cray Linux Environment-CLE (Burst Buffer, DAS, DVS, ...)	Lustre

Linux

Events/State/Status Message Bus - AMQP Based

RAS Components & Diagnostics	RAS Components & Diagnostics
Cray HW Component Firmware & APIs	Intel HW Component BIOS, Firmware & APIS

Cray Software	OpenSource Based Software	Intel Software	Open/3rd Party Software	Open Source

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Theta
Fact Sheet

System Feature	The Theta Details
Peak System Performance (FLOPs)	>8.5 PetaFLOP/s
Compute Node CPU	Next Generation Intel® Xeon Phi™ Processors (Code name: Knights Landing) https://software.intel.com/en-us/articles/what-disclosures-has-intel-made-about-knights-landing
Compute Node Count	>2,500
Compute Platform	Intel system based on Cray XC supercomputing platform
Compute Node Peak Performance	>3 TeraFLOP/s per compute node
Cores Per Node	>60 cores with four hardware threads per core
High Bandwidth On-Package Memory	Up to 16 Gigabytes per compute node
High Bandwidth On-Package Memory Bandwidth	Projected to be 5X the bandwidth of DDR4 DRAM memory, >400 Gigabytes/sec
DDR4 Memory	192 Gigabytes using 6 channels per compute node
Lustre File System	10 Petabytes
Lustre File System throughput	210 Gigabytes/s
System Interconnect	Cray Aries high speed Dragonfly topology interconnect
Peak Power Consumption	1.7 Megawatts
Delivery Timeline	Mid-2016
Programming Environments	Intel, Cray, and GNU
Programming Models	MPI + OpenMP
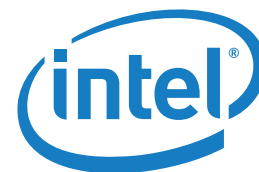
To access further information, visit the following sites:
Argonne - www.anl.gov | Cray - www.cray.com | Intel - www.intel.com/hpc