

oneAPI  
DevSummit  
ISC 2022

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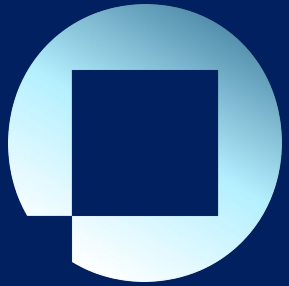
# The evolving open ecosystem for accelerated computing



Joe Curley

VP & GM Software  
Products & Ecosystem  
Intel Software and  
Technology Group

# We are committed to a Vibrant Open Ecosystem for Developers



Open.



Choice.



Trust.

Focus on making our ecosystem successful:

- 1 Enable developer productivity on high performance open platforms
- 2 Foster choice and interoperability of software platforms and ecosystems for our industry
- 3 Built on a confidential computing platform you can trust

20

Years of Investment  
Across hundreds  
of independent projects

#1

Linux Kernel  
Corporate Contributor  
since 2007<sup>1</sup>

22

Centers of Excellence  
With top universities worldwide<sup>2</sup>Award for Best HPC Programming Tool or Technology<sup>3</sup>

#1

Winner HPCwire Readers Choice

700+

GitHub Projects

CHROME OS

Leading Contributor

1- Source: [https://www.linuxfoundation.org/wp-content/uploads/2020\\_kernel\\_history\\_report\\_082720.pdf](https://www.linuxfoundation.org/wp-content/uploads/2020_kernel_history_report_082720.pdf)

2- <https://www.intel.com/content/www/us/en/developer/tools/oneapi/training/academic-program.html>

3- <https://www.hpcwire.com/off-the-wire/hpcwire-reveals-winners-of-the-2021-readers-and-editors-choice-awards-during-sc21/>

Additional Resources: [Intel.com/SoftwareFirst](https://www.intel.com/SoftwareFirst)



# Cambrian Explosion of Computer Architecture

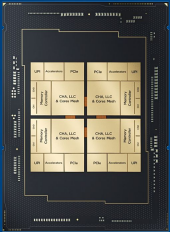
High-level, domain-specific languages and architectures, freeing architects from the chains of proprietary instruction sets, along with demand from the public for improved security, will usher in a new golden age for computer architecture.

Diverse and evolving workloads enable hardware innovation

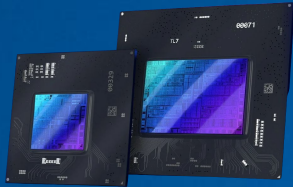


# A New Golden Age for Computer Architecture

## Products



Novel On-Die Accelerators



GPU/Data Parallel



Spatial/  
Dataflow  
w



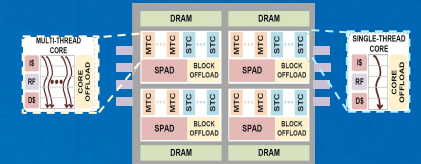
Deep Learning  
Optimized



Blockchain



Neuromorphic

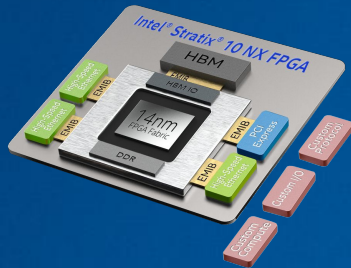


Graph Analytics

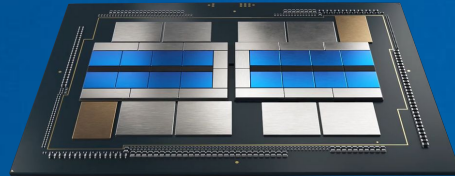
“Strong growth in demand for data center services continues to be mostly offset by ongoing efficiency improvements...”

# Time to Market and Scale through Integration

Chiplet interconnects accelerated by standards

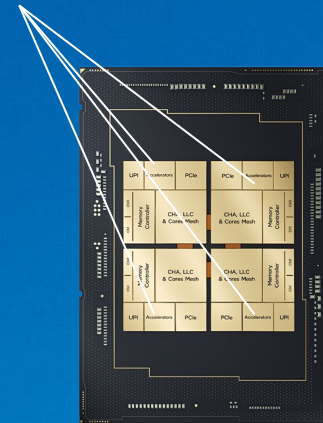


UCIe  
Universal Chiplet  
Interconnect Express



CXL  
Compute  
Express Link

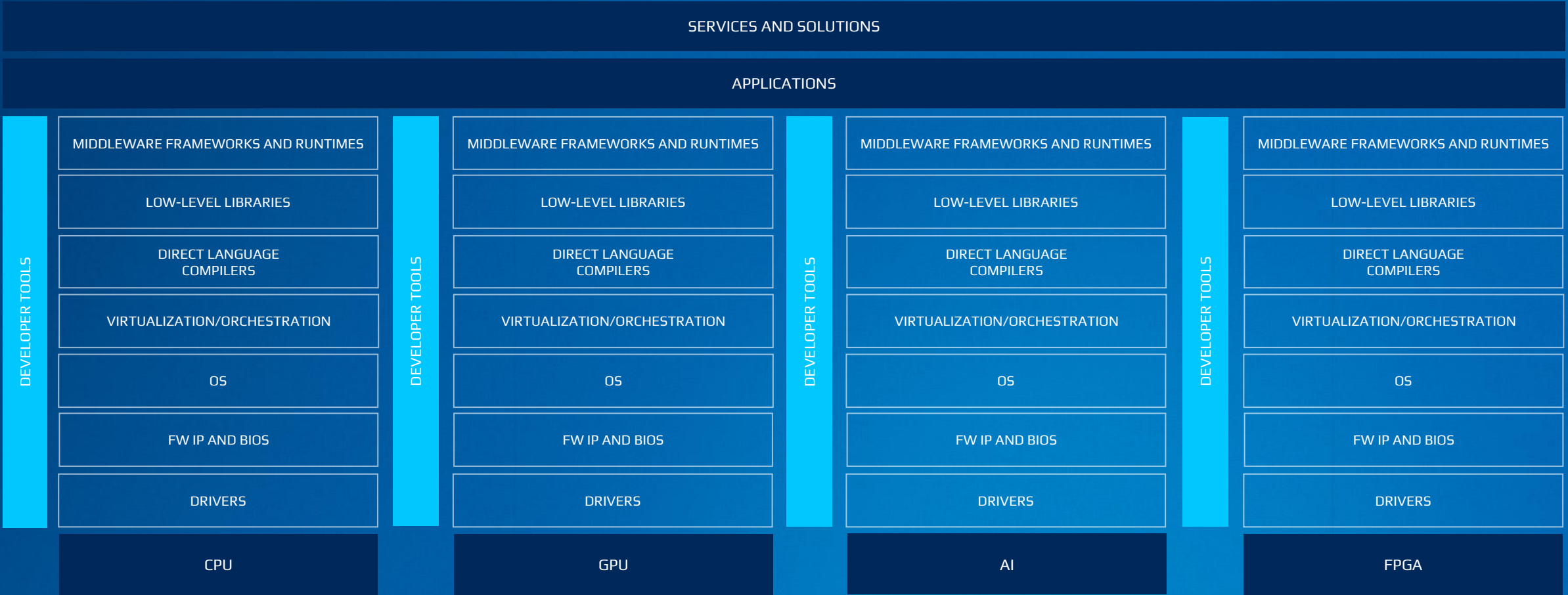
On-die/on-package accelerators



“It may prove to be more economical to build large systems out of smaller functions, which are separately packaged and interconnected.”\*

\*Source: “Cramming More Components onto Integrated Circuits,” Electronics, Volume 38, Number 8, April 19, 1965

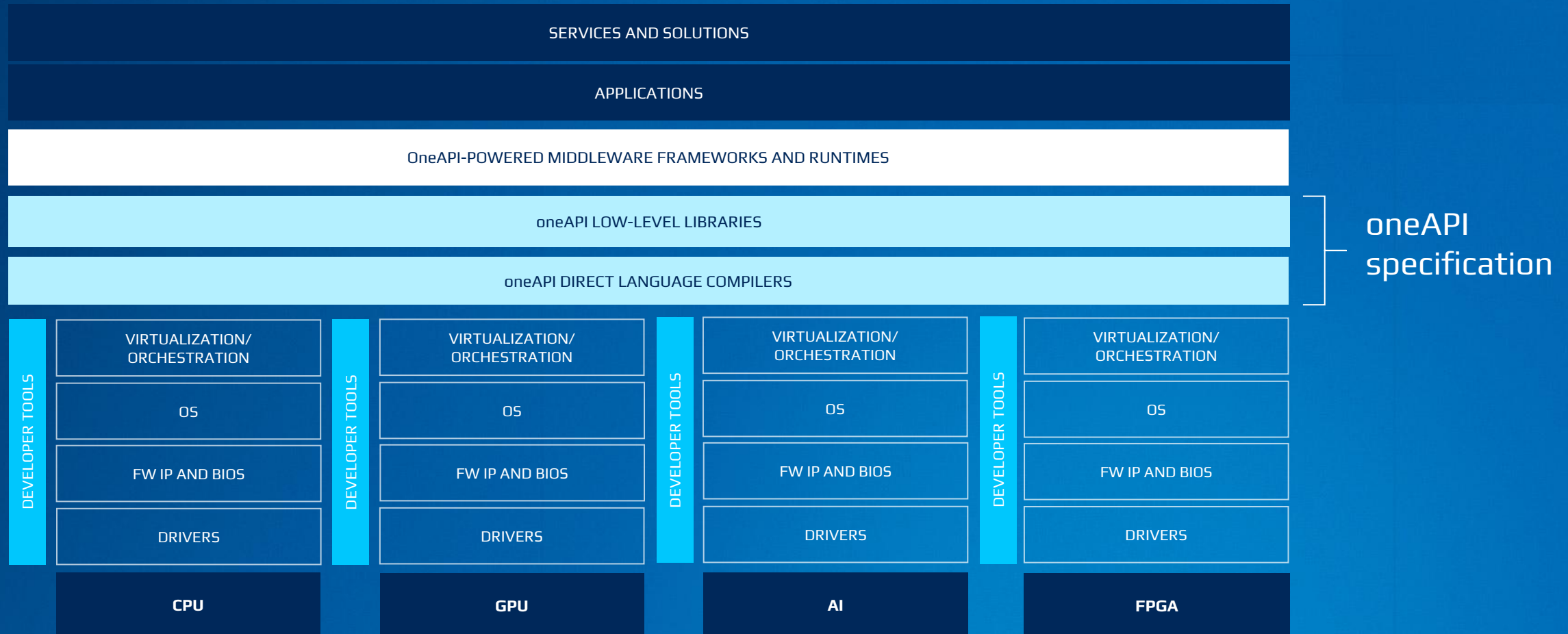
# How Do You Get to Market?



IHV and SW developers incur cost, time to market, and complexity impact of per device developer stacks.

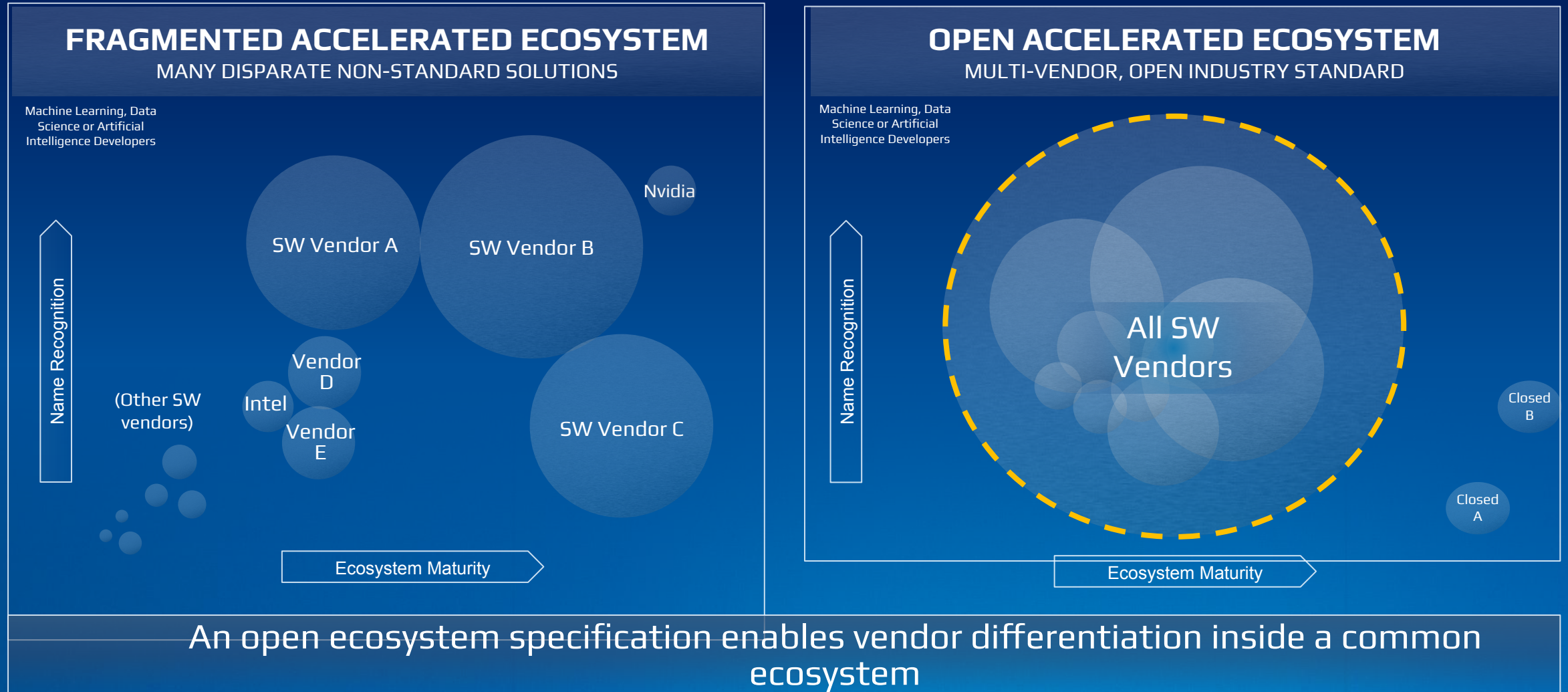


# Standards Drive Scale for Accelerated Computing



IHV and SW developers incur cost, time to market, and complexity impact of per device developer stacks.

# Provide Developers an Open Standard Alternative



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# Delivering Performance

## Accelerating Your Pandas Workloads with Modin



**Mehdi  
Brahimi**  
MyCom



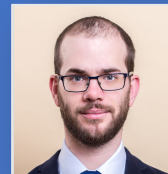
**Roy Allela**  
Intel

## Dynamic Task Fusion with SYCL for an Explicit Hyperbolic Equation System Solver with Dynamic AMR and Local Time Stepping



**Tobias Weinzierl**  
Durham University

## Intel CPUs and GPUs on structured-mesh stencil workloads with oneAPI



**István Reguly**  
Pázmány Péter Catholic  
University

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# An Open Accelerated Ecosystem

## Powering heterogeneous computing with oneAPI on ARM and Ponte Vecchio with SiPearl



**Vincent Casillas**  
SiPearl



**Shailen Sobhee**  
Intel



**Gilles Civario**  
Intel

## HIP on Aurora: Bringing HIP to oneAPI



**Brice Videau**  
Argonne  
National  
Laboratory

## Julia Computing: Advancing Scientific Discovery Across Architectures



**Jacob Vaverka**  
Julia



**Tim Besard**  
Julia



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# Building SYCL Ecosystem

## How to Port your code from CUDA to SYCL, targeting Nvidia GPUs and more



**Joe Todd**  
Codeplay

## SYCL Best Practices and Challenges



**Rod Burns**  
Codeplay



**Kevin Harms**  
Argonne  
National  
Laboratory



**Garth Wells**  
University  
of  
Cambridge



**Thomas Steinke**  
Zuse  
Institute  
Berlin



**Tom Deakin**  
Universit  
y of  
Bristol

## oneAPI SYCL Programming for Heterogenous Computing on Intel® DevCloud

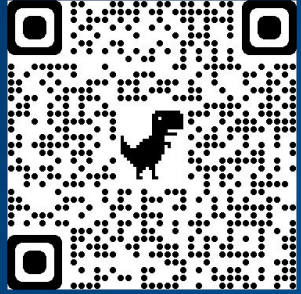


**Ben Odom**  
Intel



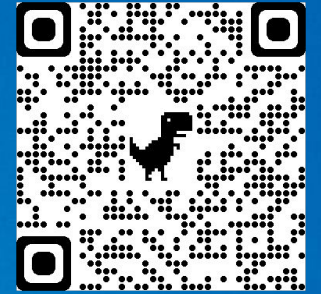
**Praveen Kundurthy**  
Intel

# During and after this Summit What can you do next?



Join the community at [oneapi.io](https://oneapi.io)

Develop for your product  
through open-source



Ask questions, provide feedback, enjoy!

# Thank You