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3½ years at Intel
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The winning
partnership
Red Hat Open Tour

Good morning, Oslo!

Intel and open source

ICYMI what we offer to the industry

Intel and Red Hat – the process

How do we work globally together in the background

What we've been up to lately

Just few things on Intel which you might have missed



intel.
XEON
PLATINUM

What does Intel offer to developers? As open source?

- During the years, it has been often Intel which has provided most contributions to **Linux kernel**
- We have supported the community on the other groundwork as well – **security** with SGX enclaves technology and TDX full virtual machine encryption
- We are particularly vested in **Linux graphics**
- **AI** - optimized frameworks and kits for Intel processors, for TensorFlow, NLP/BERT, MXNet, Caffe, Theano, Chainer, ...
- For **computer vision** specifically, OpenVINO toolkit for decreasing the size of the model, increasing frame rates
- And finally, there is a **whole open source programming model oneAPI**, under which brand we offer AI tools, data tools and migration tools, off closed source paradigms such as CUDA

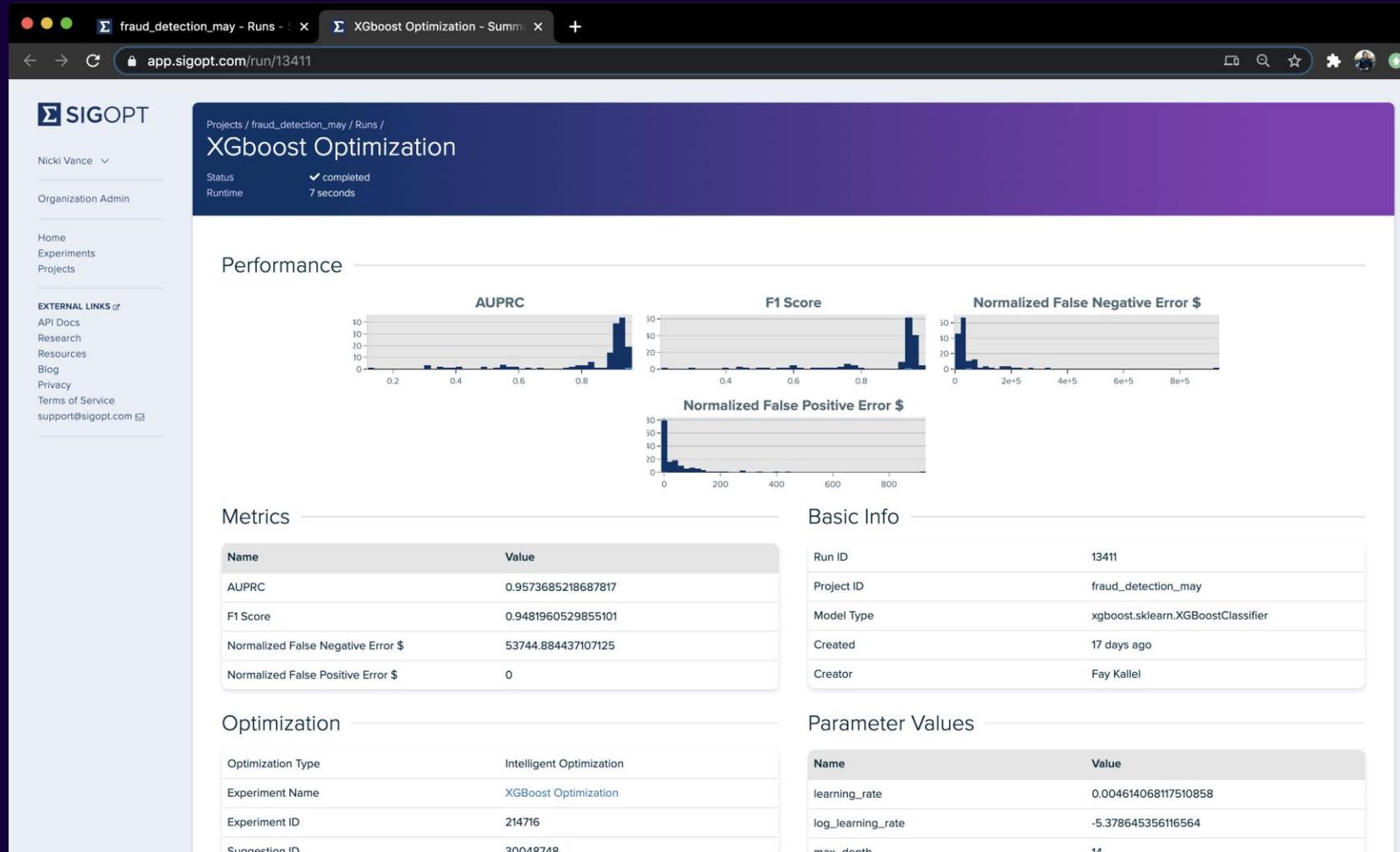
intel.
EMBREE

Intel Embree open source raytracing library has an Academy Award for its contributions to the movie making process.



Intel has worked together with Red Hat for 25 years to contribute to the software making process

Latest news – SigOpt offered as open source



SigOpt is an Intel company offering a SaaS-based experiment management tool for data/AI scientists.

The tool supports any framework, any model, any accelerator equipment.

SigOpt's open source release provides a self-hosted server and in-memory versions.



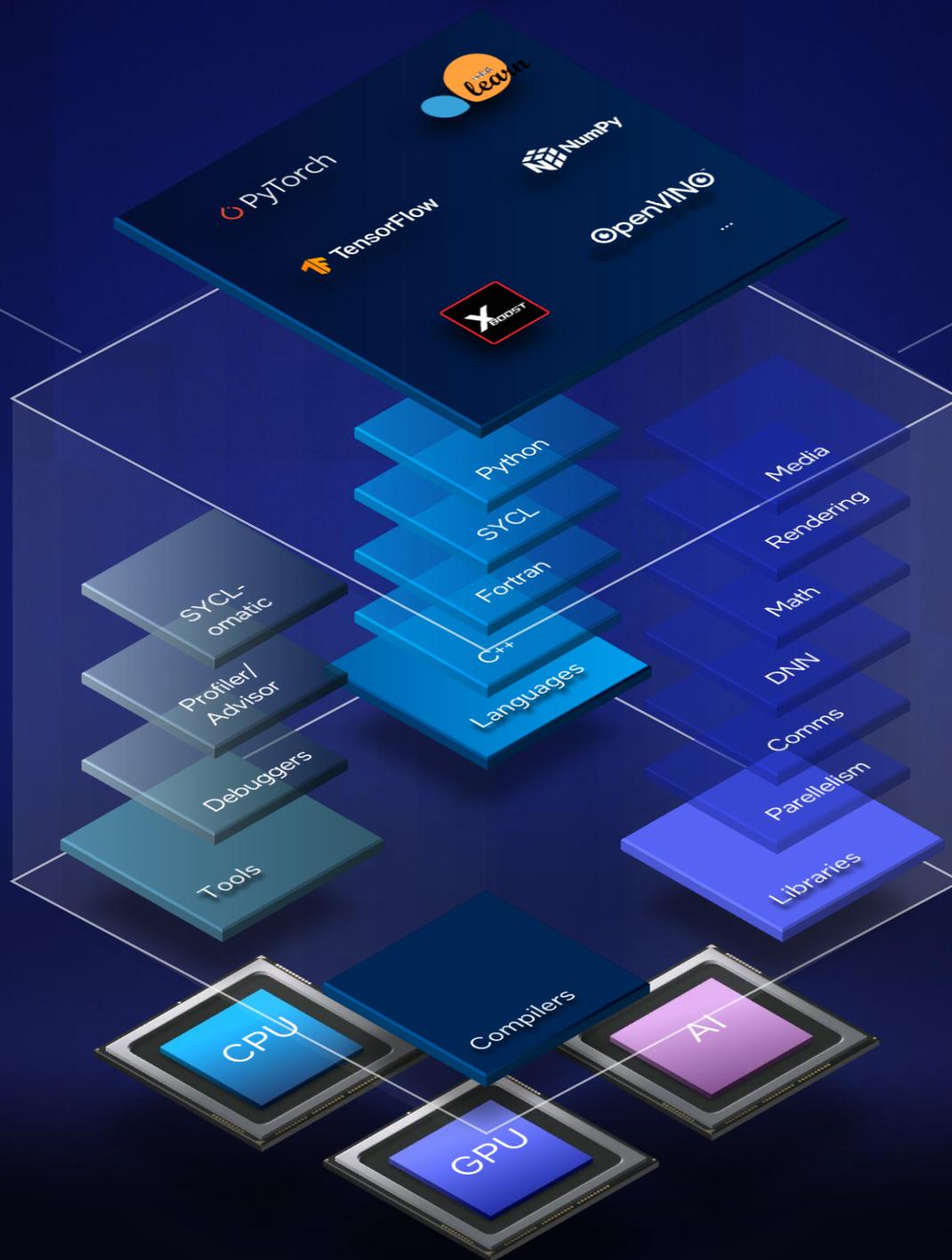
open, multiarchitecture,
multivendor programming

Open industry specification

Freedom in hardware choice

Performance, productivity
& portability

Standards-based, community-
driven



Intel's implementation
with a set of tools

Optimized for Intel hardware

Proven performance,
best-in-class capabilities

Supports Fortran, Python,
OpenMP, MPI...

Download free, commercial support
available

Intel and Red Hat on the global level

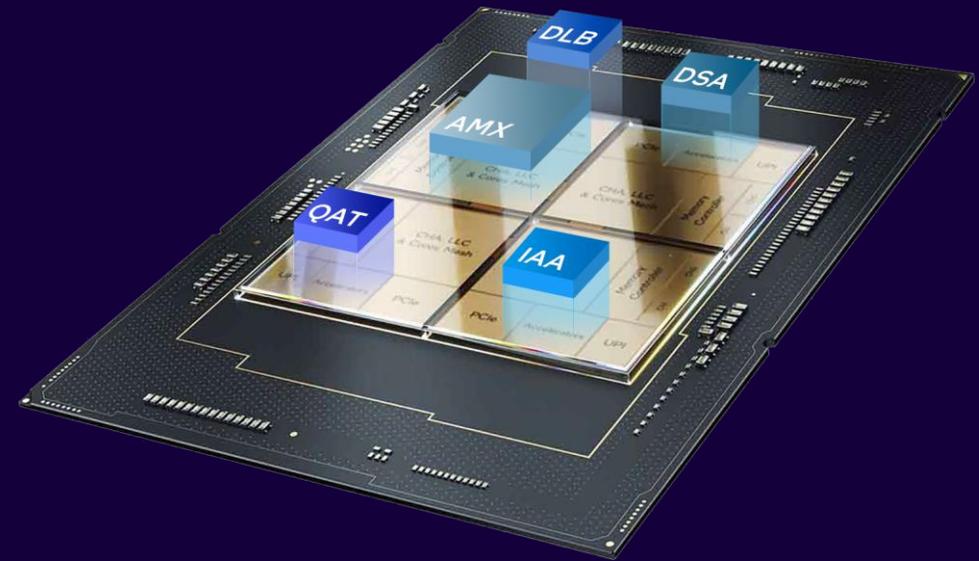


- Our goal is to implement an **open hybrid multi cloud** together and we verify it through common 5G, AI and Intelligent Edge solutions
- An important part of that is **testing and predefining** what you would need during the system's life cycle
 - **Day 0** from the customer's point of view through measurements and recommended configurations made together
 - **Day 1** supporting installation and provisioning, documentation as a solution model, also when the environment is public cloud
 - **Day 2** the everyday - even if they are implemented for you by the server manufacturer and/or service provider
- We have selected few **target verticals and joint partners** which we then support also commercially
- Externally visible work includes e.g. **OpenShift Platform Plus and OpenShift Container Platform reference architectures**, on recommended OEM server models

Intel and Red Hat on the global level



- Most of the testing and architecture work is around standard **Intel Xeon server CPUs and NICs**
- For the telecom area, testing also based on Xeon D (lower-end IoT/edge processors, 4-20 cores)
- For **OpenShift Data Science & Open Data Hub**, "Operators" have been created, e.g. For Intel's OpenVINO and oneAPI AI Toolkit
- Integrations in progress for Intel's **recent acquisitions** (Habana AI GPUs in AWS, Granulate i.e. optimization in public cloud, cnvrg.io MLOps environment support)
- **Redhat OCP and Intel 4th Gen Xeon "Sapphire Rapids" is an excellent combination** - even the inexpensive Xeon Silver products have performance improvements of up to 62% percent compared to the previous generation, at same price (4309Y versus 4410Y in SPECinrate2017)



4th Gen Xeon Scalable Processors have built-in accelerators on the die – put them into use!
AMX to speed up low-precision math and accelerate AI/ML
DSA to copy and move data faster and assist SPDK
QAT to accelerate compression, encryption, and decryption,
IAA to speed up query processing performance and
DLB to help speed up data queues.

What Intel has been up to lately?



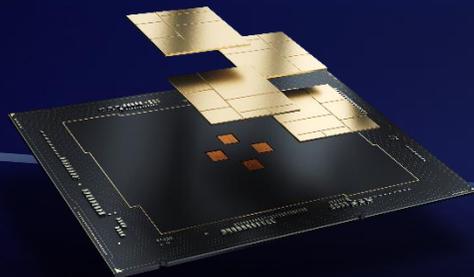
4th Gen Intel® Xeon® Processors

400+ **Design Wins**
The most ever for any Xeon family

Top 10 Global CSPs*
deploying now and throughout 2023

* Cloud service providers

Shipping Today



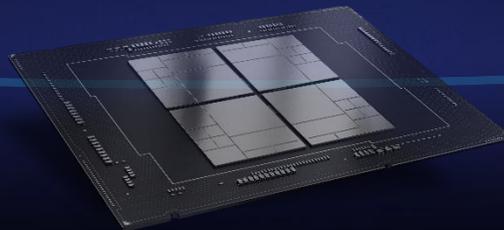
5th Gen Intel® Xeon® Processors

Codenamed Emerald Rapids

Higher performance-per-watt

Same platform as
4th Gen Xeon

Sampling Today
on schedule to deliver in Q4 2023



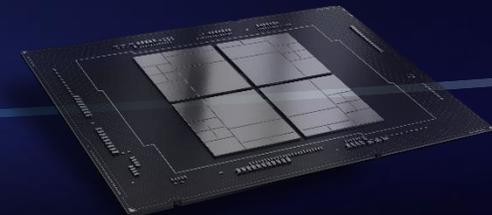
Intel® Xeon® Processors

Codenamed Granite Rapids, Sierra Forest

First P-Core and E-core Xeons
on Intel 3 process

Increased core density,
memory & I/O innovations

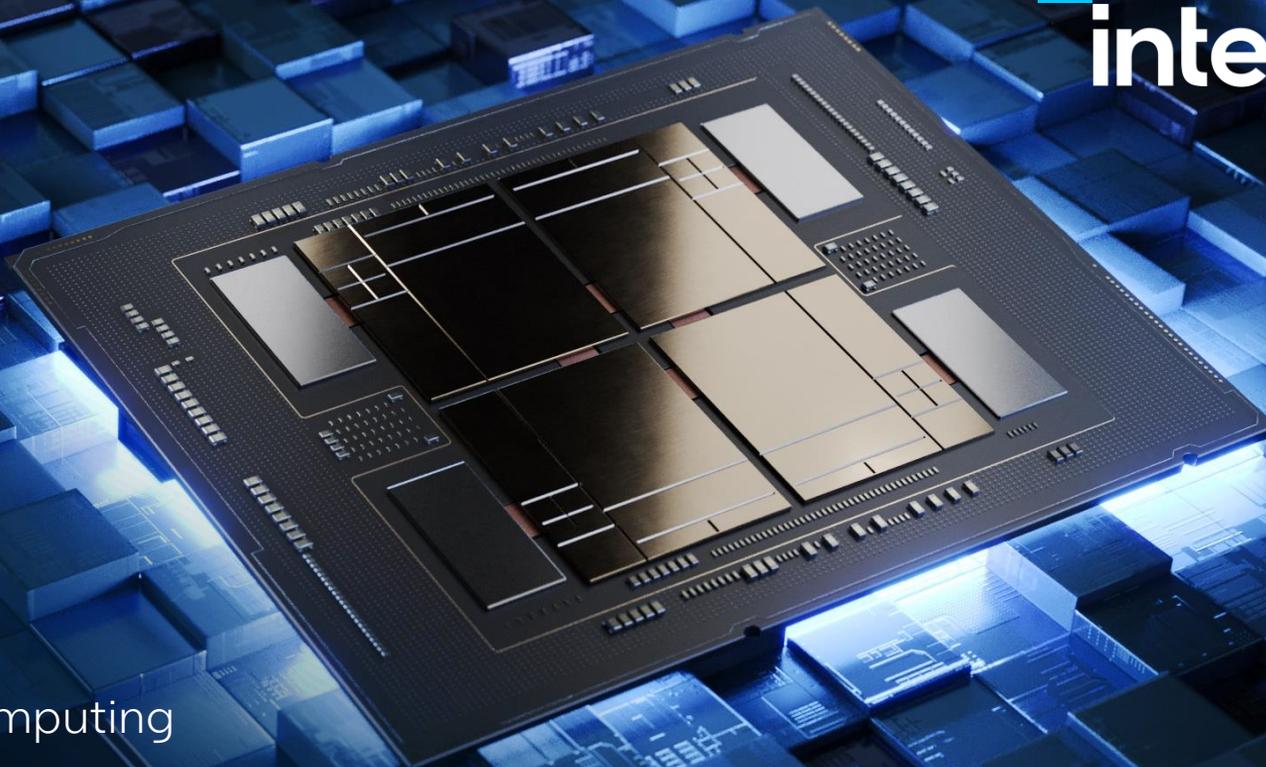
On schedule to
deliver in **2024**





First & only x86 CPU with HBM

Intel Xeon Max Series for high performance computing



Memory Modes

64GB

HBM2e

4 stacks of 16GB

Up to

220GF/s

HPCG

Up to

2GB

HBM per Core

HBM Only

Bootable from HBM

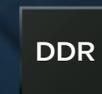
No code change



HBM Flat

2 Memory Regions

SW Optimization Needed



HBM Caching

HBM as cache for DDR

No code change





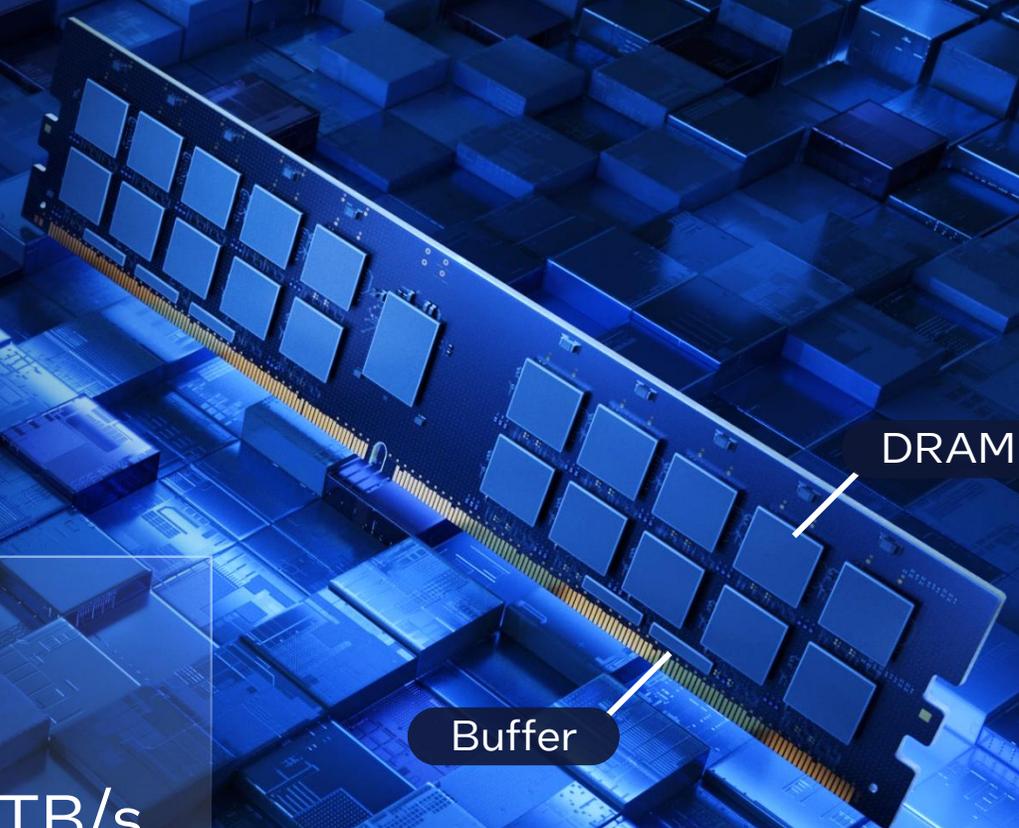
MCR DIMM Memory

Higher Bandwidth at Same Capacity
as 2-Rank RDIMM for Granite Rapids

Up to
8800
MT/s

Up to
83% peak
B/W increase

2 socket
>1.5 TB/s



4 x product lines of GPUs

ARC for consumers and gaming

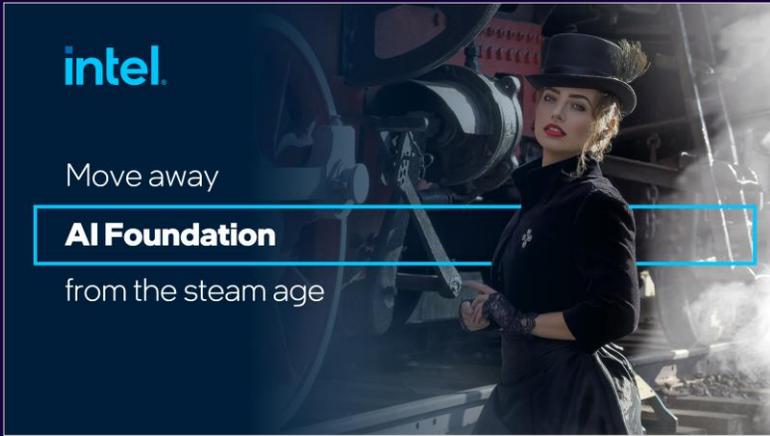
ARC Pro for certified CAD workstations

Flex for media & cloud gaming & metaverse

Max for highend exascale HPC/AI



Nordic technology strategy definition services



intel.

Move away

AI Foundation

from the steam age

AI strategy definition and documentation



Make you into a

Data Foundation

data superhero

intel.

Data strategy definition and documentation



intel.

Define your instruments

ICT sustainability

Pack

of sustainable computing

Definition of emissions decrease actions



intel.

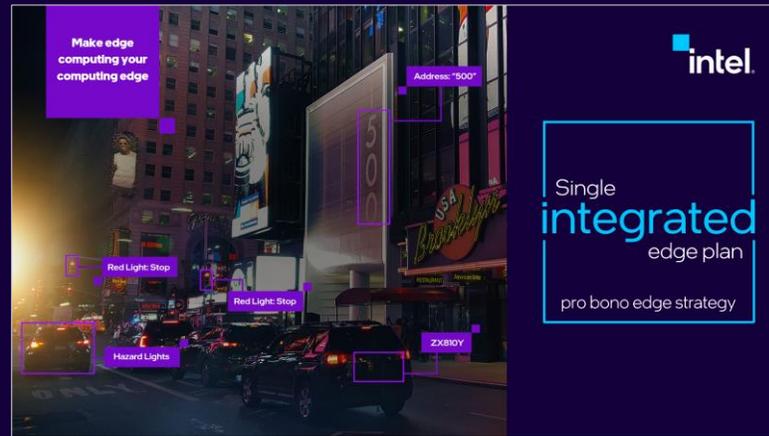
Single

integrated

HPC plan

pro bono HPC strategy

HPC strategy definition and documentation



intel.

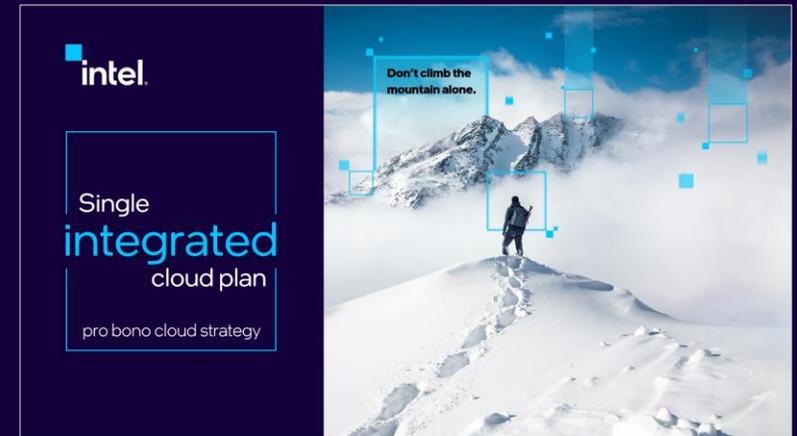
Single

integrated

edge plan

pro bono edge strategy

Edge computing strategy definition



intel.

Single

integrated

cloud plan

pro bono cloud strategy

Finops, industry, sovereignty, repatriation.



Annika also says hi

See Annika 5000 our Nordic AI avatar in
LinkedIn and Twitter, inviting you to events.

