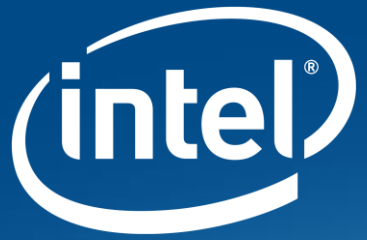

ACCELERATE DEEP LEARNING INFERENCE USING INTEL TECHNOLOGIES

HEALTH AND LIFE SCIENCES APPLICATIONS

Health and Life Sciences

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No computer system can be absolutely secure.

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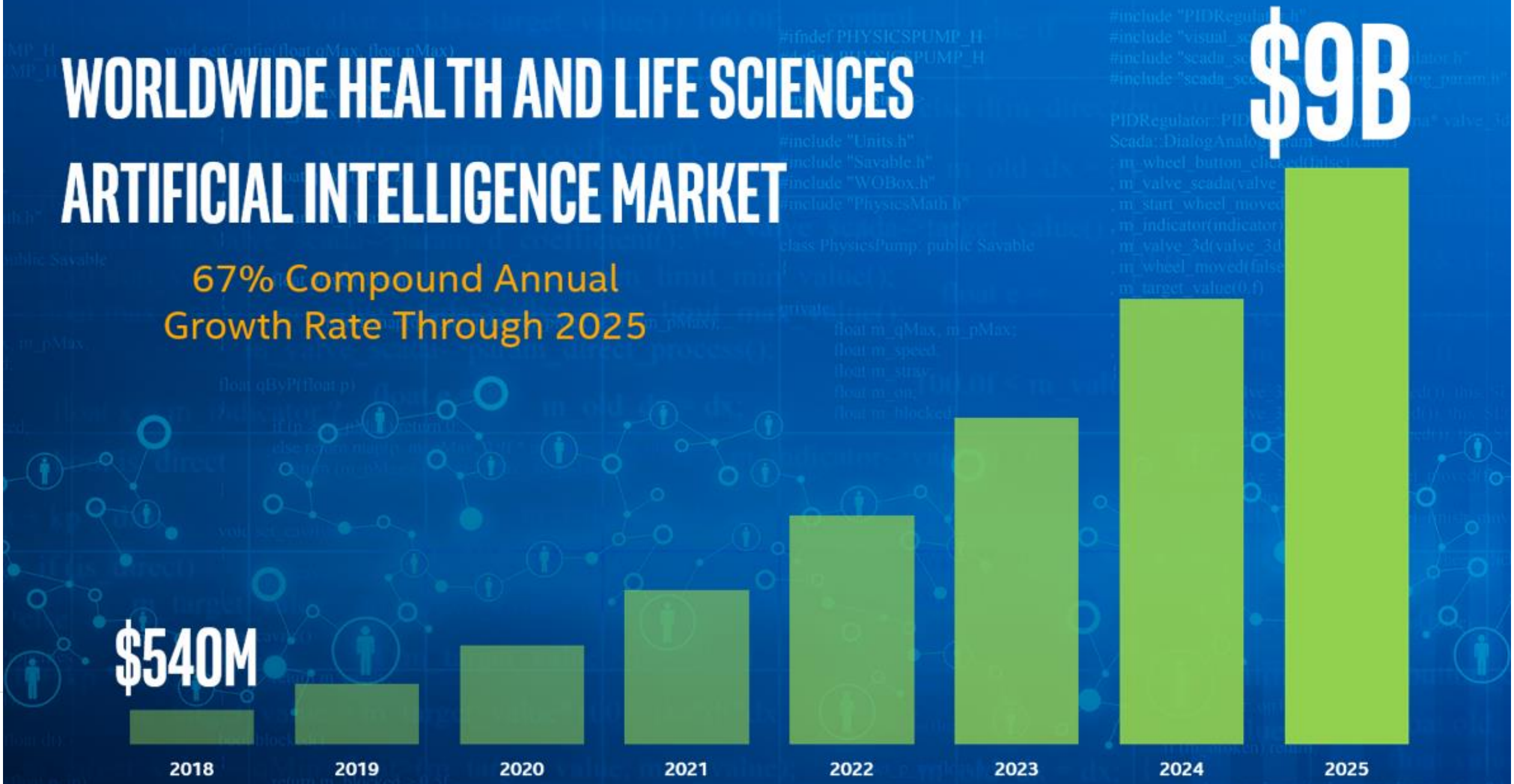
WORLDWIDE HEALTH AND LIFE SCIENCES ARTIFICIAL INTELLIGENCE MARKET

67% Compound Annual Growth Rate Through 2025

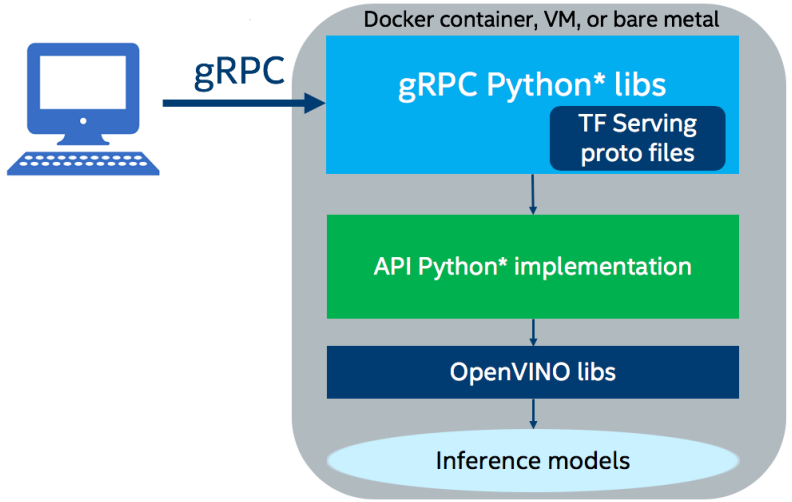


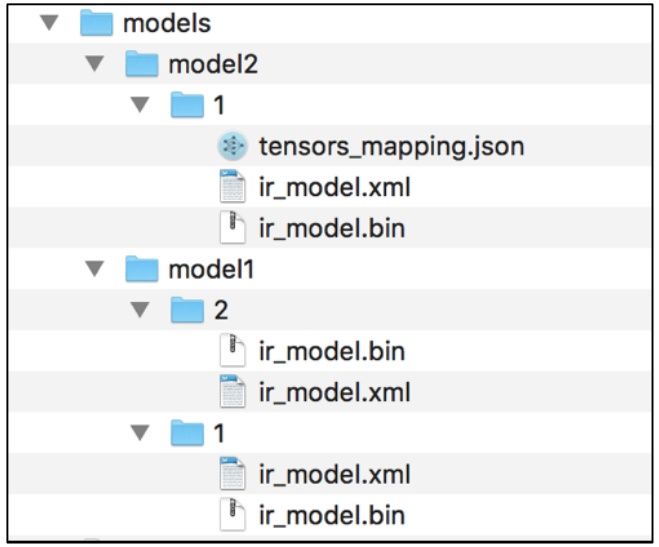
Artificial Intelligence for Enterprise Applications, Tractica, 1Q 2018

OPTIMIZING HLS APPLICATIONS WITH OPENVINO

Source: https://www.intel.ai/openvino-model-server-boosts-ai-inference-operations/#gs.m6x98m

OPENVINO MODEL SERVER





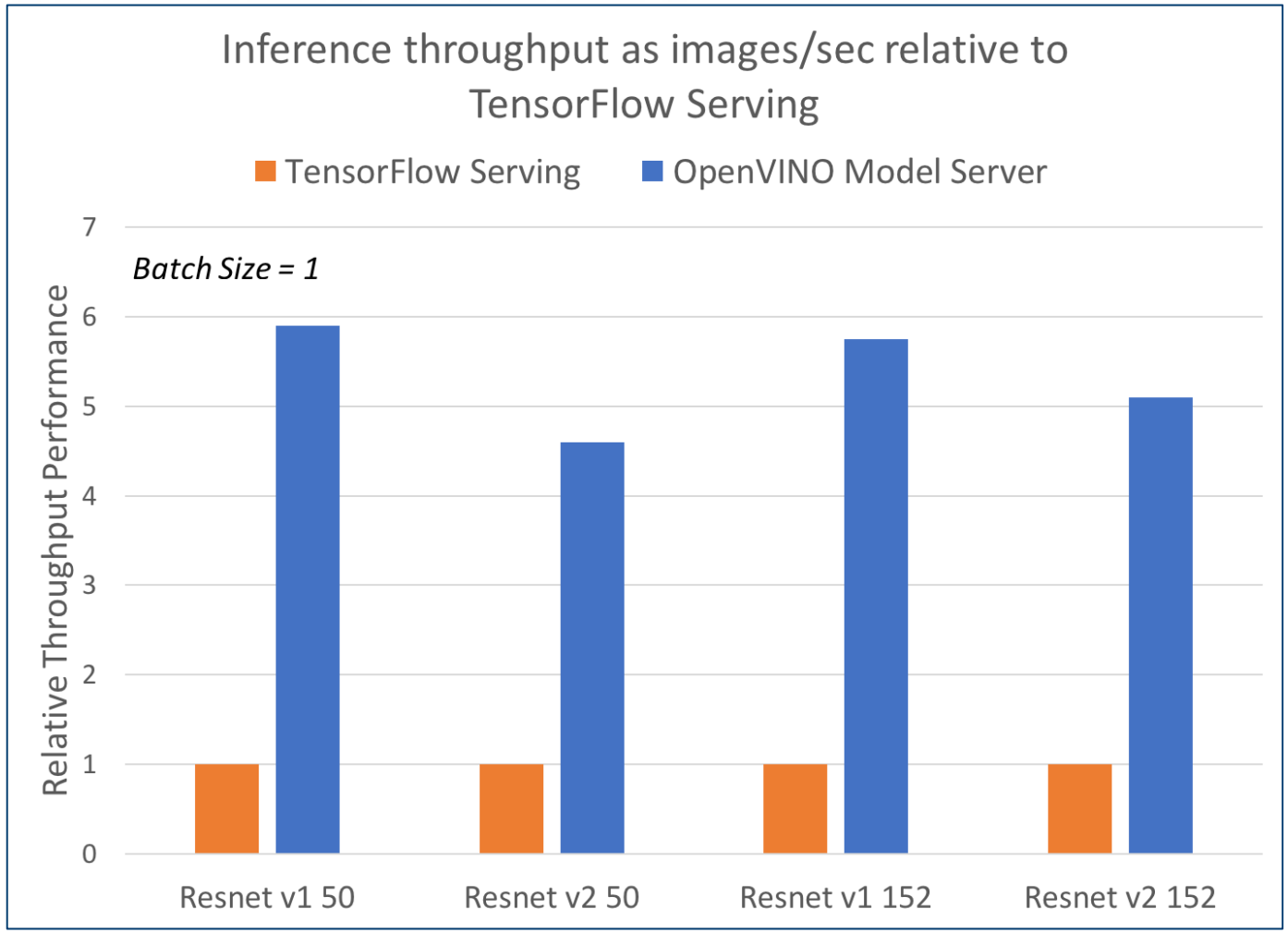
- Same gRPC API as TensorFlow Serving
- Implemented as a Python* service
- Fully compatible with same clients
- Optimized for Intel® CPU, FPGA, VPA
- Suited for Docker containers

https://github.com/IntelAI/OpenVINO-model-server

Advantages for AI Applications

- Support for Multiple Frameworks
- Support for gRPC interface
- Ease of Transition from existing API
- Improved performance
- Support for Intel FPGAs and Intel Movidius VPUs
- Ease of Python service implementation
- Ease of installation and integration

OPENVINO MODEL SERVER

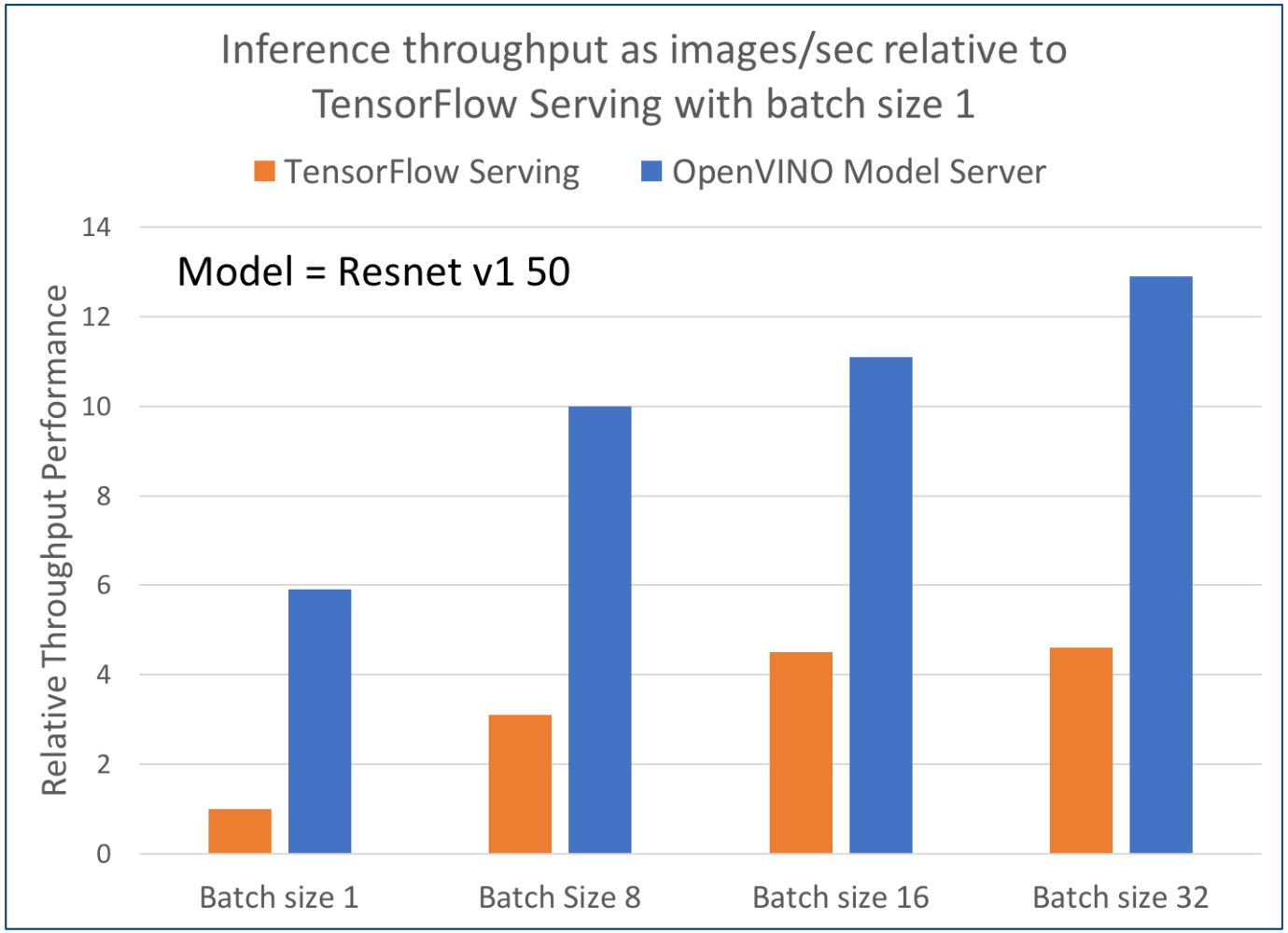


Up to 5x improvement over TensorFlow Serving

Performance results are based on internal testing done on 27th September 2018 and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure. Test configuration: Dual Intel® Xeon® Platinum 8180 processor @ 2.50GHz, 376.28GB total system memory, Ubuntu-16.04-xenial operating system.

Refer: https://www.intel.ai/openvino-model-server-boosts-ai-inference-operations/#gs.m6x98m

OPENVINO MODEL SERVER



Higher is better.

Performance results are based on internal testing done on 27th September 2018 and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure. Test configuration: Dual Intel® Xeon® Platinum 8180 processor @ 2.50GHz, 376.28GB total system memory, Ubuntu-16.04-xenial operating system.

Refer: https://www.intel.ai/openvino-model-server-boosts-ai-inference-operations/#gs.m6x98m

NETWORK LOADING OPTIMIZATIONS

Reduced model load times for faster performance

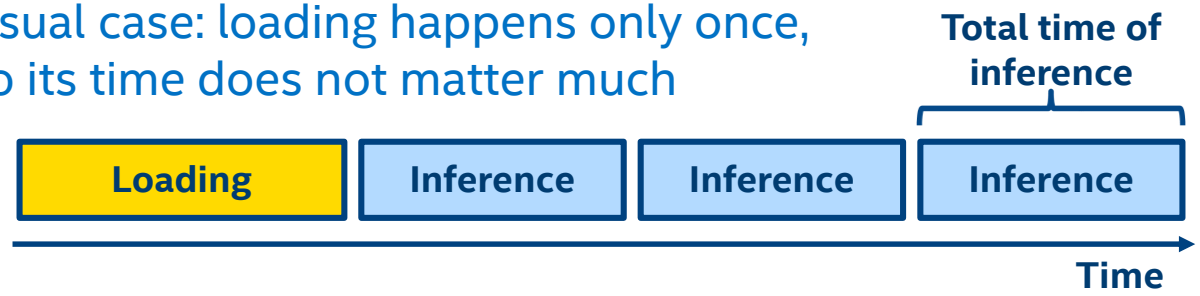
Audience: *Helpful when shape size changes from inference to inference, and resizing is undesirable (e.g., leads to accuracy degradation)*

Problem: *Shape change requires reloading of the model which can be slow*

UseCase: *Input shape is defined by a previous network in the pipeline (i.e., in the case of object detection/classification), or ROI is defined by operator (common case in medical applications)*

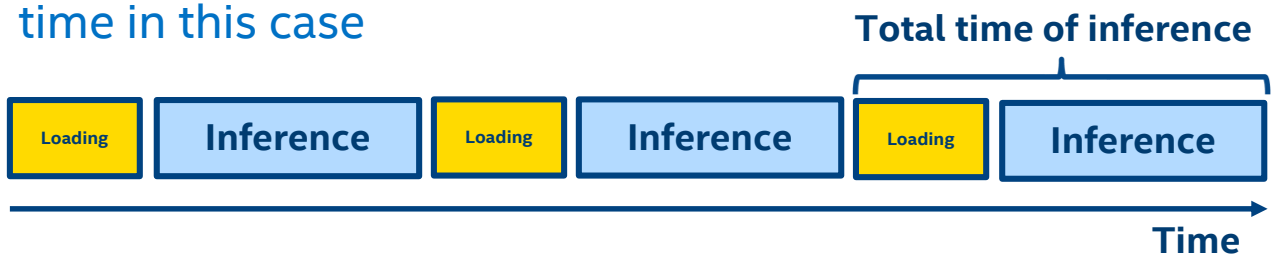
Performance

Usual case: loading happens only once, so its time does not matter much



Changing shape case: loading happens before each inference, so its time matters

Loading time optimization decreases total inference time in this case



CPU
iGPU
VPU
FPGA
GNA

Win 10
Win Serv
Linux
Mac

COMMAND LINE DEPLOYMENT MANAGER

Introducing a new tool to help generate deployment package with customer application and Inference Engine runtime on target device

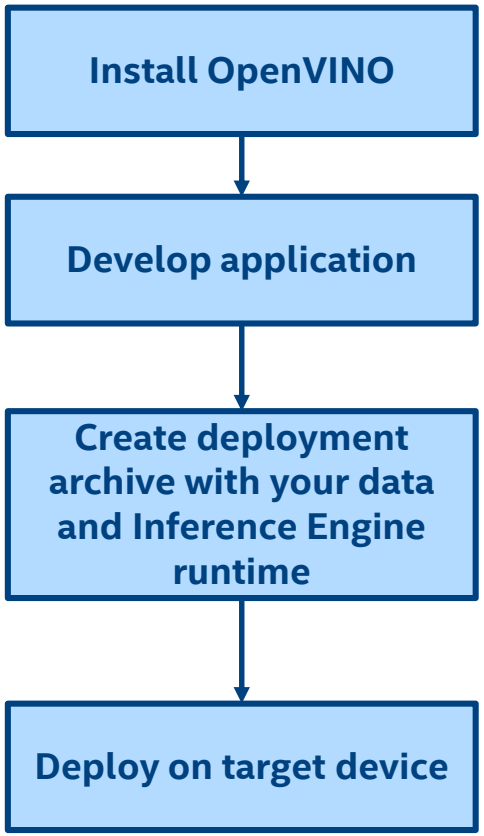
Audience: Developers that want to deploy inference-engine parts with their data (pre-compiled application with required data: models, configs, etc)

Problem: OpenVINO entire package size is too big and usually contains components that are not suitable for particular system. Not all systems have Internet access to mitigate this by online installer usage

UseCase: Generate deployment archives (tarball)

Ease of Use

Smaller deployments



CPU

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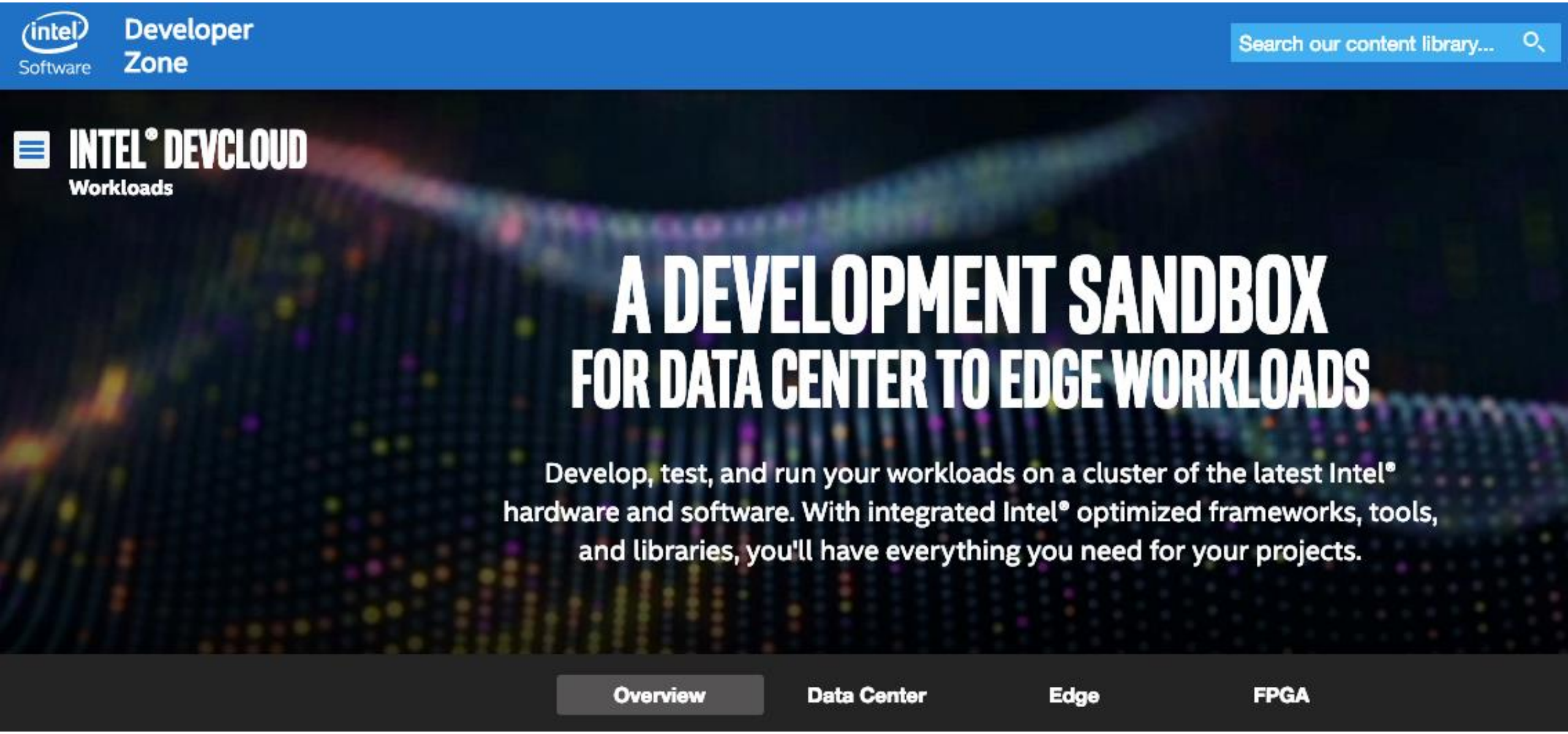

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CASE STUDIES

GE CT AXIAL CLASSIFICATION

Source: https://www.intel.ai/wp-content/uploads/sites/69/OpenVINO_GEHealthcare_DLPerf_SolutionBrief.pdf

GE PNEUMOTHORAX DETECTION

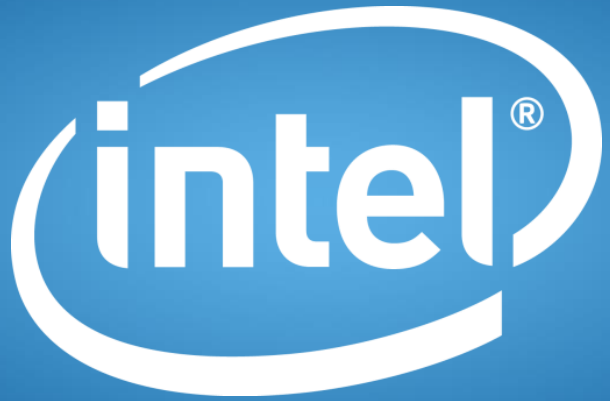
source: https://www.intel.ai/wp-content/uploads/sites/69/Pneumothorax_Whitepaper_GEHC_FINAL-1.pdf

SIEMENS CARDIAC MRI SEGMENTATION

Source: https://www.intel.ai/wp-content/uploads/sites/69/SiemensHealthineers2ndGenXeonScalable.pdf

MAXQ – ACCELERATING STRKE DETECTION

Source: https://builders.intel.com/docs/aibuilders/maxq-ai-automates-and-accelerates-suspected-intracranial-hemorrhage-ich-detection-with-ai-driven-imaging-insight.pdf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