Introducing the Vitis Unified Software Platform

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VP Software & AI Product Management

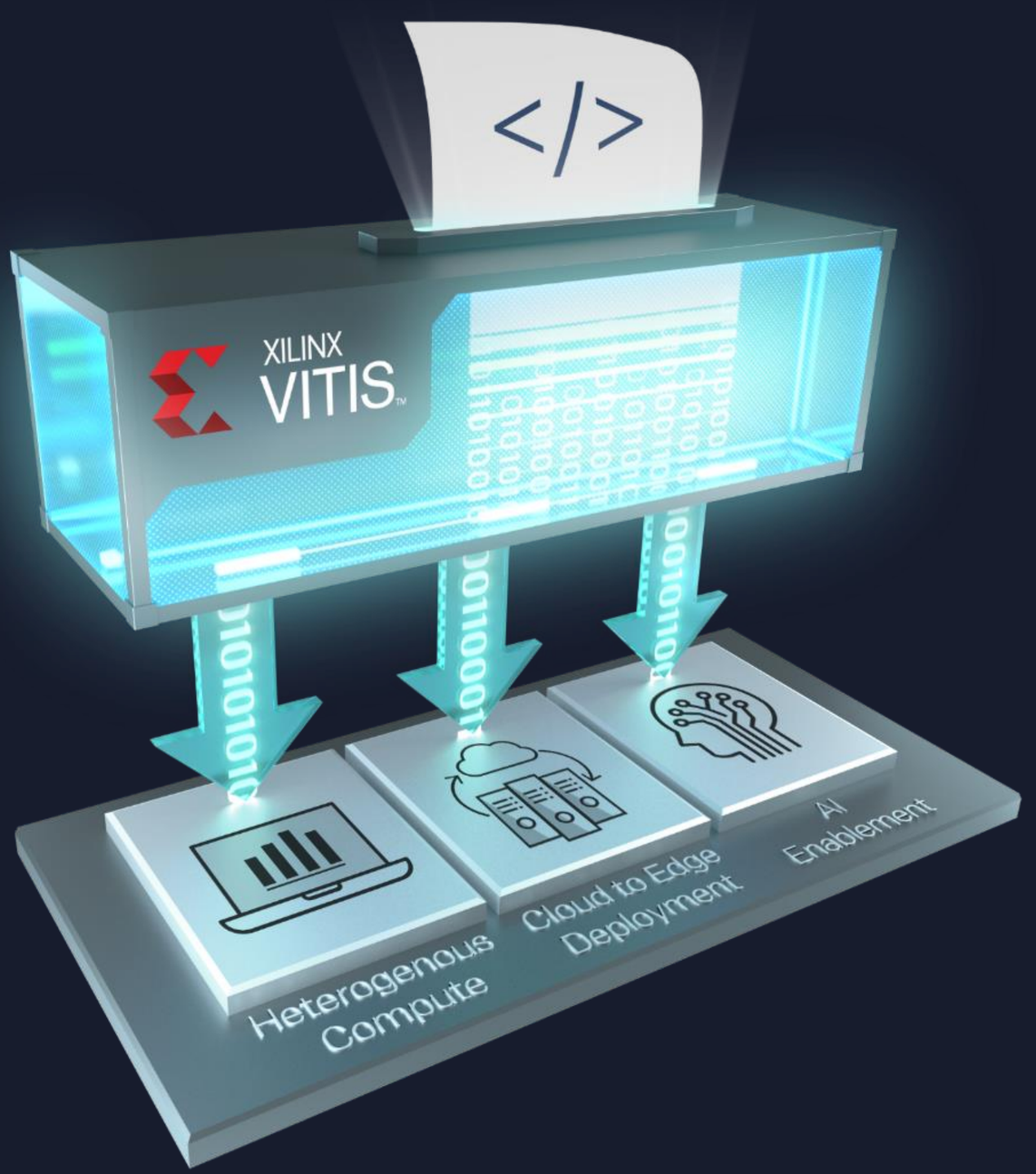
Under embargo until Oct. 1, 2019 @ 9 am Pacific, noon Eastern

Announcing…

XILINX VITIS™

Unified Software Platform

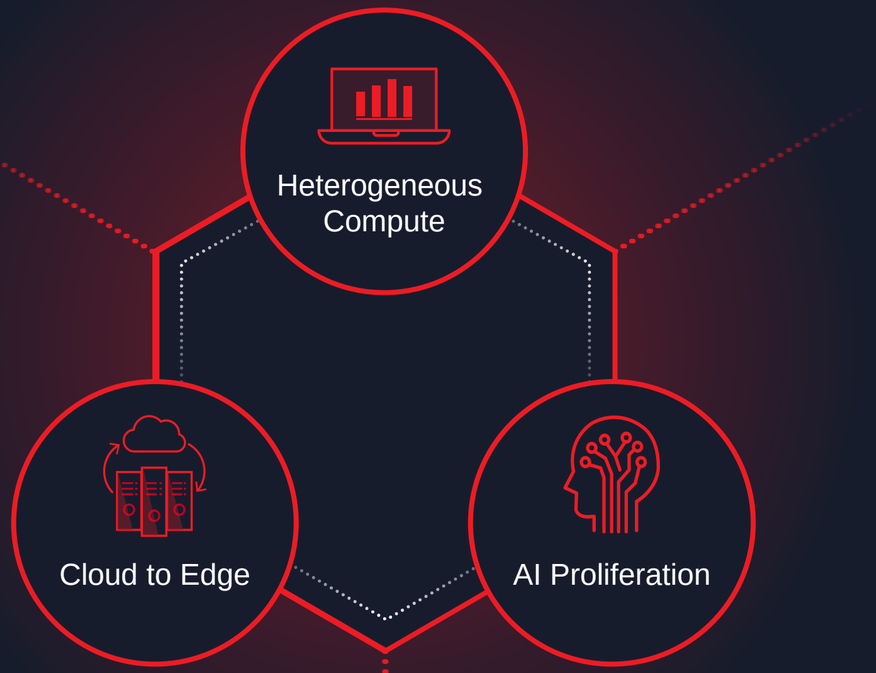
- Available in a month
- Standards, Open
- Free!



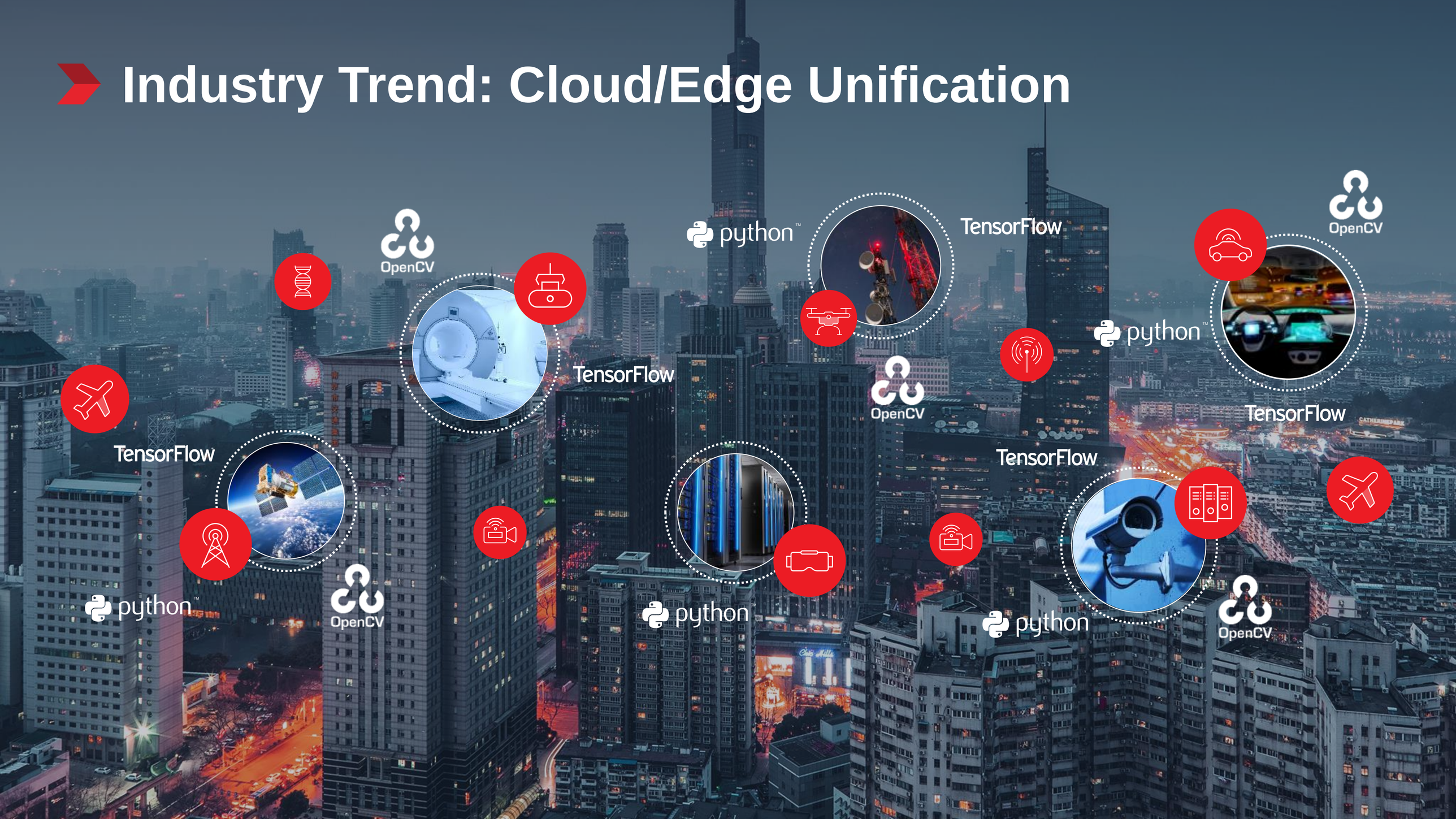
VITAL

VITALITY

Industry Trends



Industry Trend: Cloud/Edge Unification



Industry Trend: AI Proliferation

Power efficient inference along with traditional software

Data Center

5G

Autonomous Driving

Security

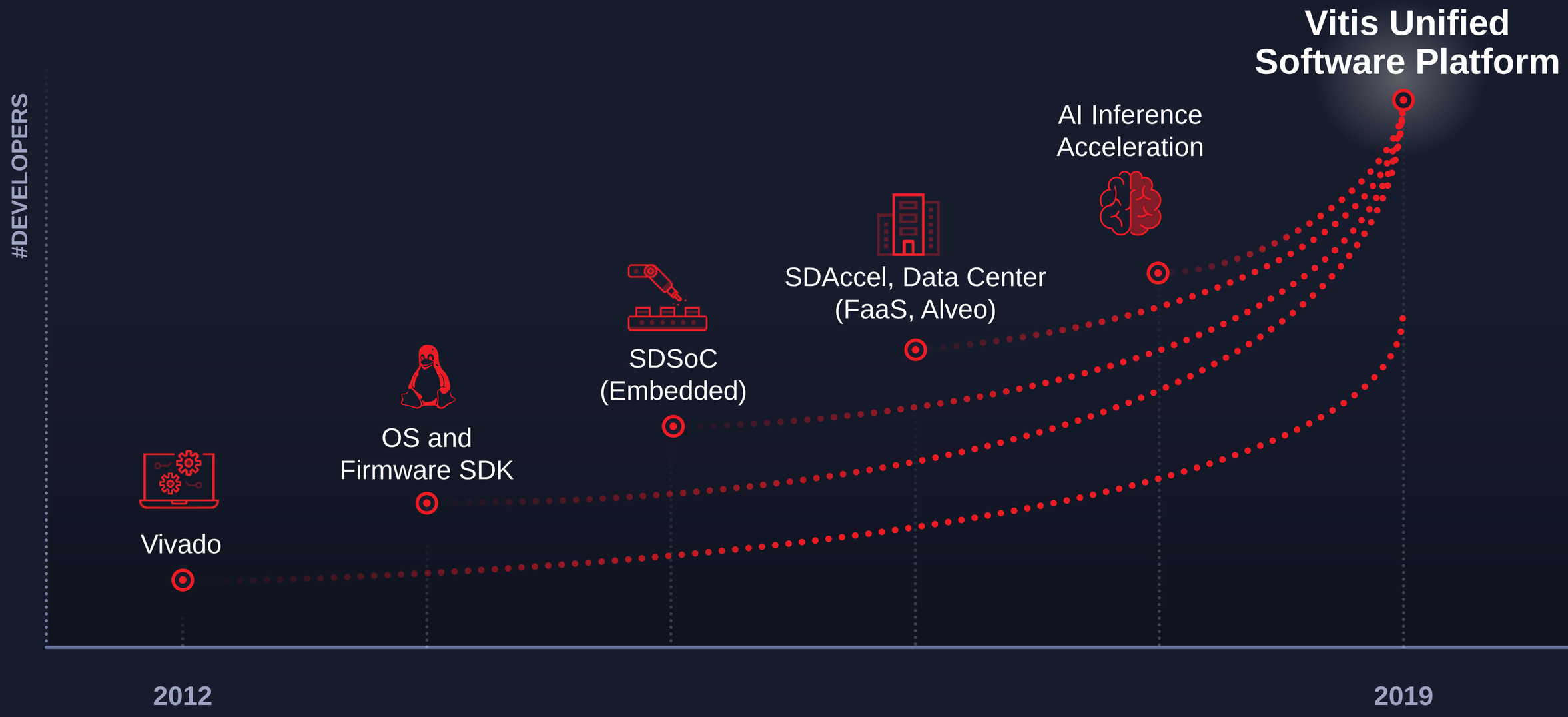
Genomics

Video Analytics

Healthcare

Finance

Platform Transformation



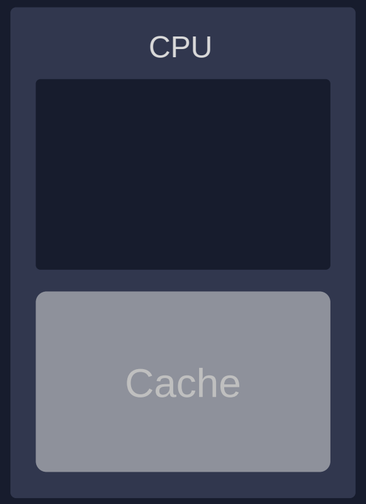
Industry Trend: Heterogeneous Compute

SINGLE CORE

1980-2000

2x/ 1.5y

process → Dennard scaling

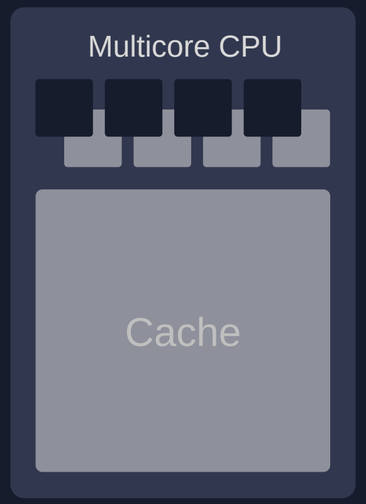


MULTICORE

2000-2010

2x/ 3.5y

multithreading → Amdahl's law

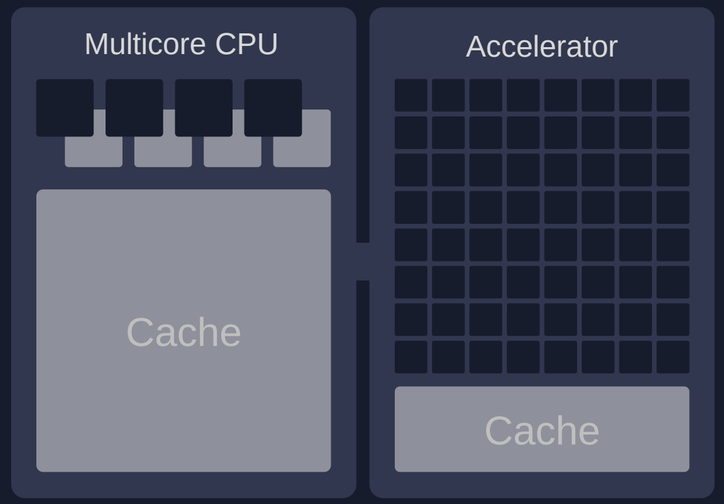


HETEROGENEOUS

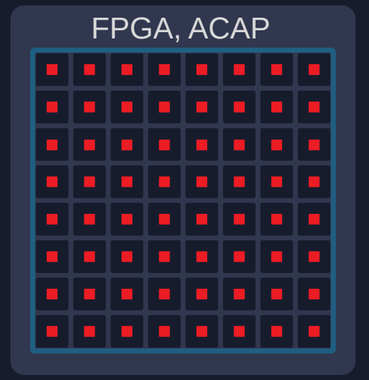
2010-2020

2x/ 10y

density → Moore's law

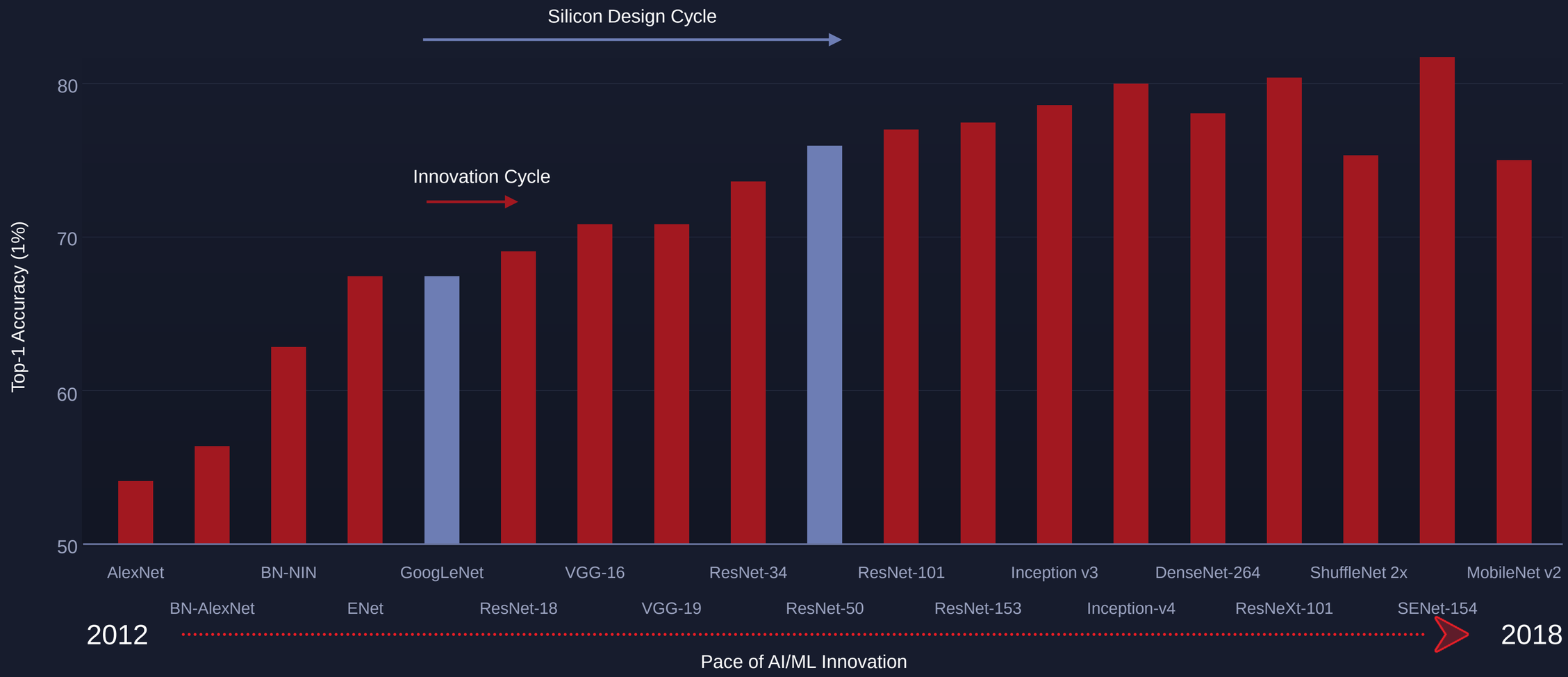


ADAPTIVE HETEROGENEOUS

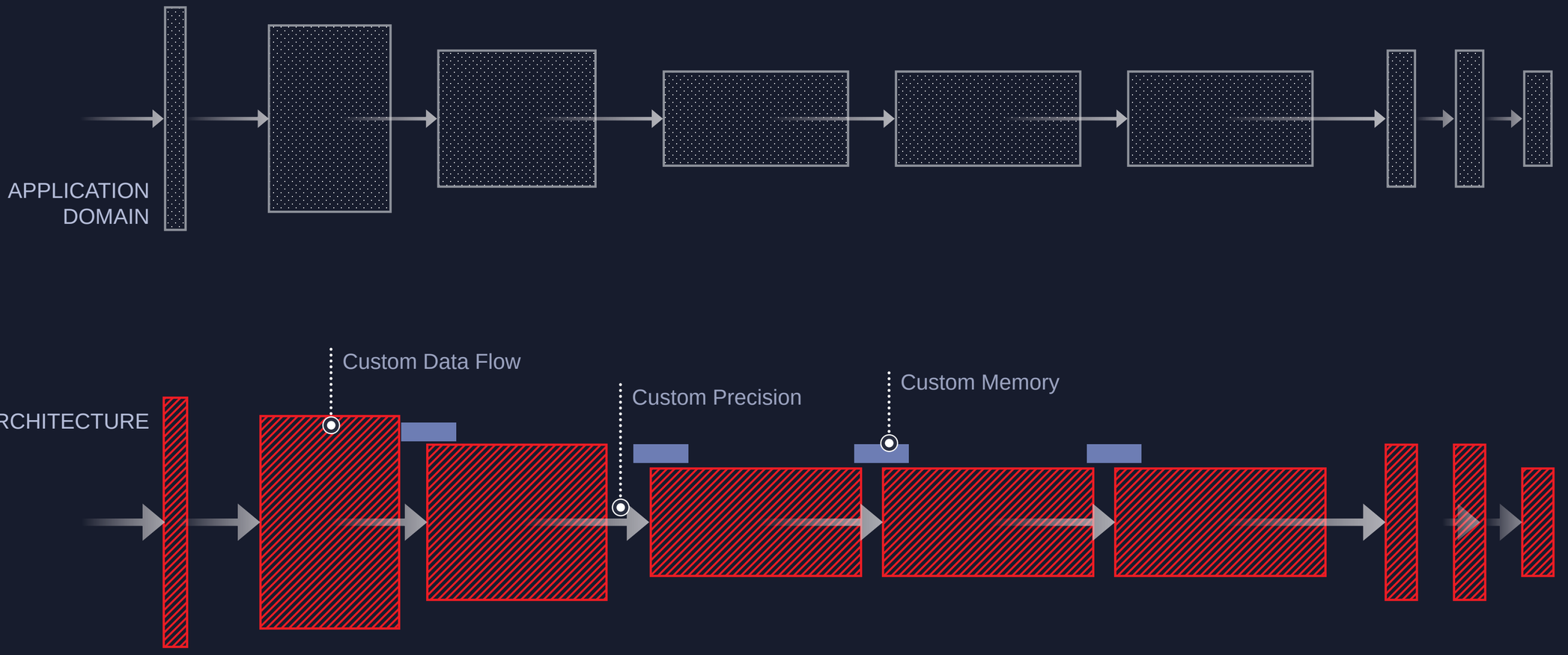


Scaling from: Silicon process → Architecture-aware software → Software-aware architecture

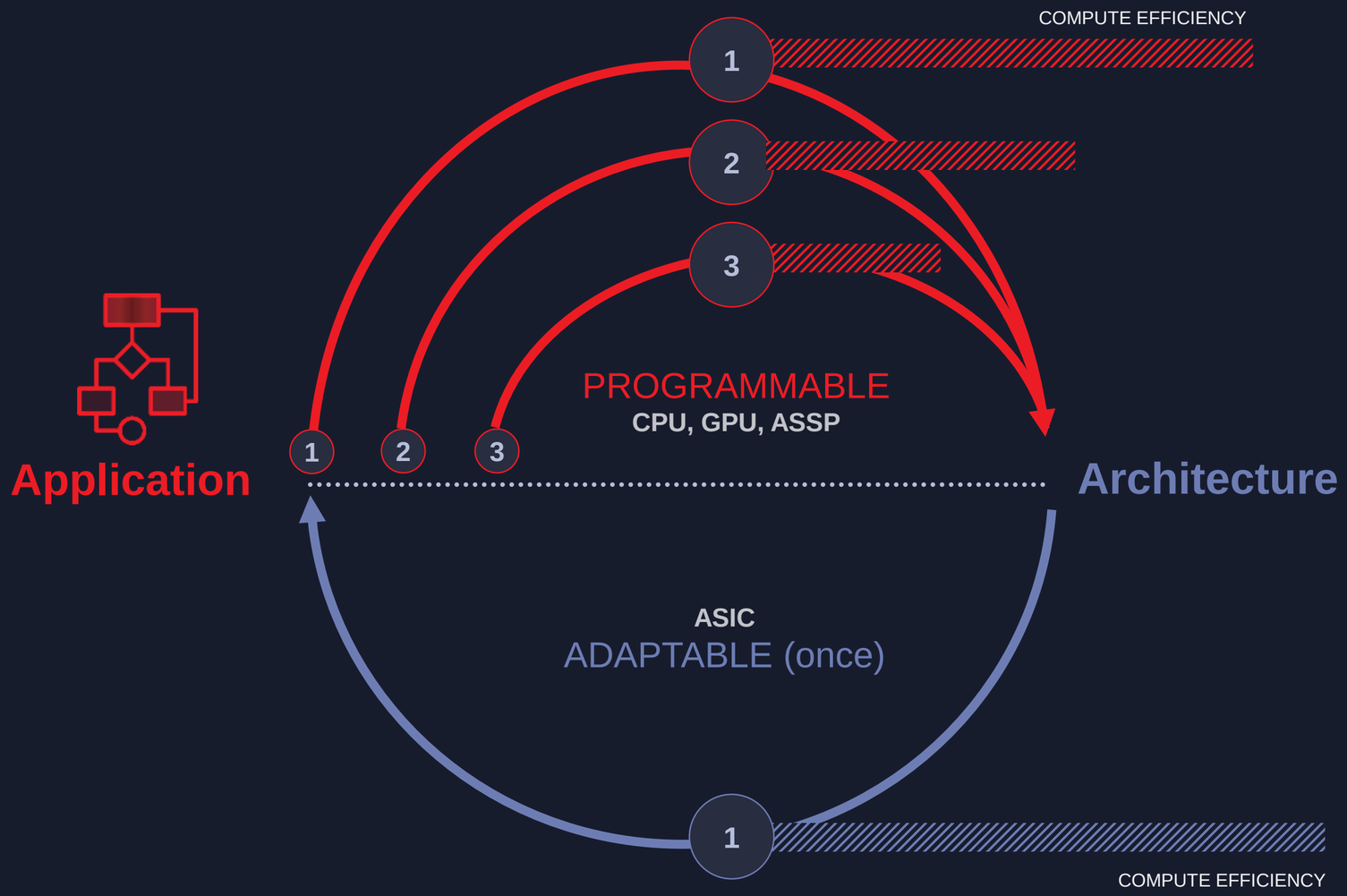
Speed of Innovation Outpaces Silicon Cycles



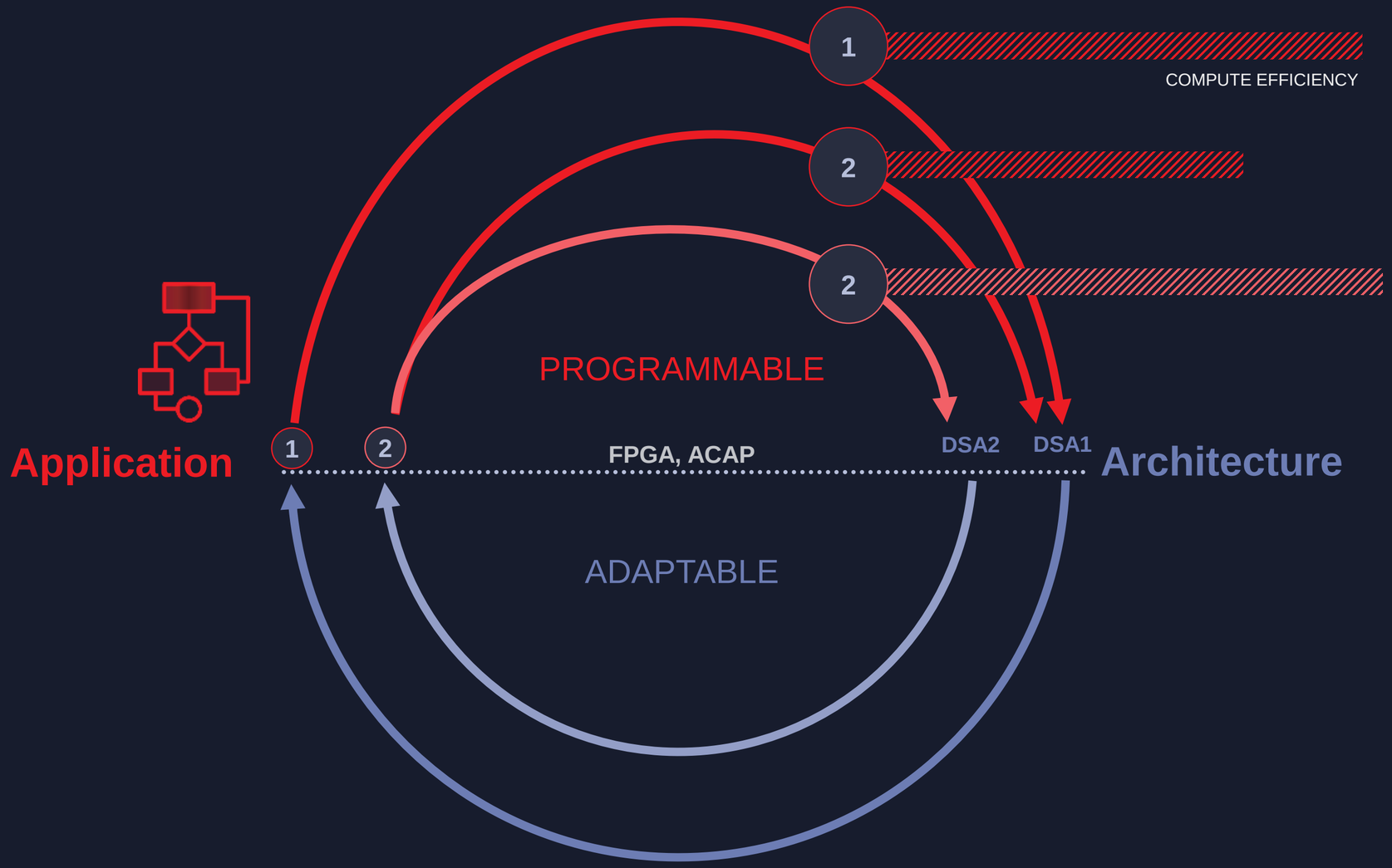
Architecture Adaptability



Programmable OR Adaptable



Why Not Programmable AND Adaptable?



Vitis: Unified Software Platform

Coming soon…

Domain-specific development environment

Vitis accelerated libraries

Vitis core development kit

TensorFlow

Vitis AI

FFmpeg

Vitis Video

Partners
Genomics,
Data Analytics,
And more

OpenCV Library

BLAS Library

Finance Library

Compilers

Analyzers

Debuggers

Xilinx runtime library (XRT)

Vitis target platform

Deep Learning vs. Traditional Software

Deep Blue (traditional software)
beats Garry Kasparov

Complexity: 10^120

IBM Watson becomes
Jeopardy champion!

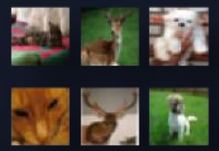


Image
classification

Classification
better than humans

AlphaGo beats
Lee Sedol

AlphaZero
chess champion!

ADAS

Robo-taxis
(geofenced)

Fully
autonomous
vehicles

1997 2004 2009 2014 2019 2024

Announcing Vitis AI

Coming soon…

Domain-specific development environment

Vitis accelerated libraries

Vitis core development kit

OpenCV Library	BLAS Library	Finance Library	TensorFlow **Vitis AI**	FFmpeg **Vitis Video**	**Partners** Genomics, Data Analytics, And more

Compilers | Analyzers | Debuggers

Xilinx runtime library (XRT)

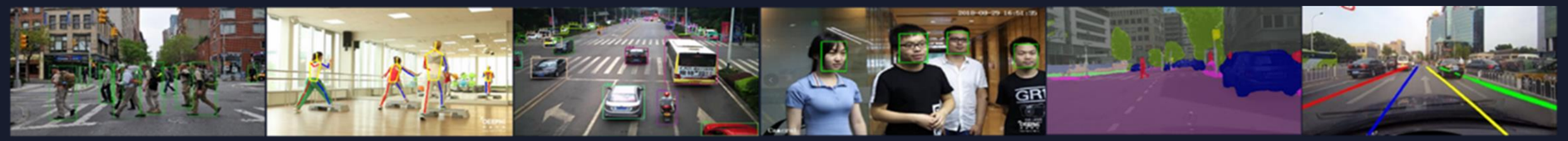
Vitis target platform

Vitis AI: Deep Learning Acceleration

Frameworks

TensorFlow Caffe PyTorch

Vitis AI models



Vitis AI development kit

AI Optimizer | AI Quantizer | AI Compiler | AI Profiler

Xilinx runtime library

DSA

CNN DPU | LSTM DPU | MLP DPU

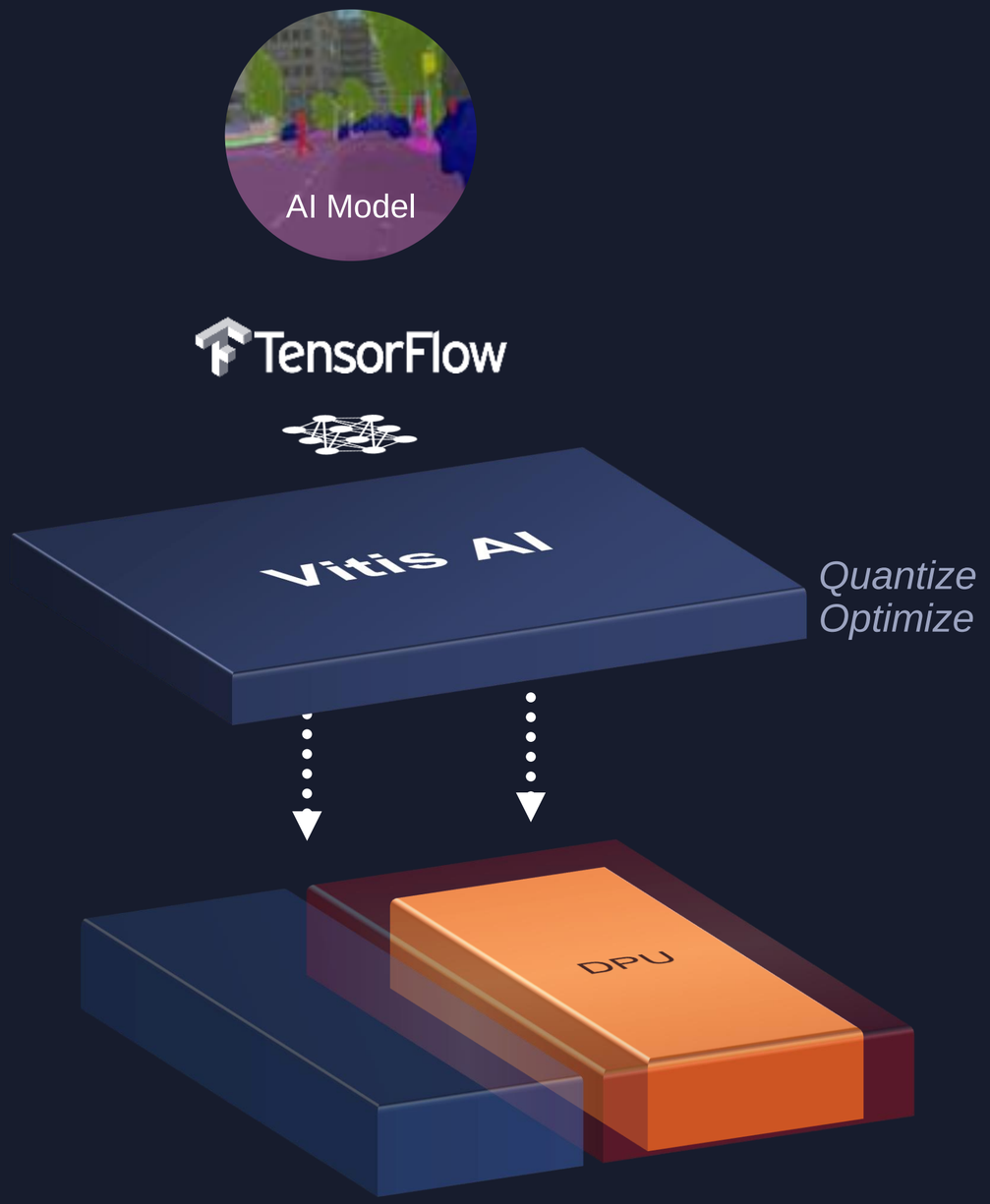
Vitis AI

Rapid Iterations from TensorFlow

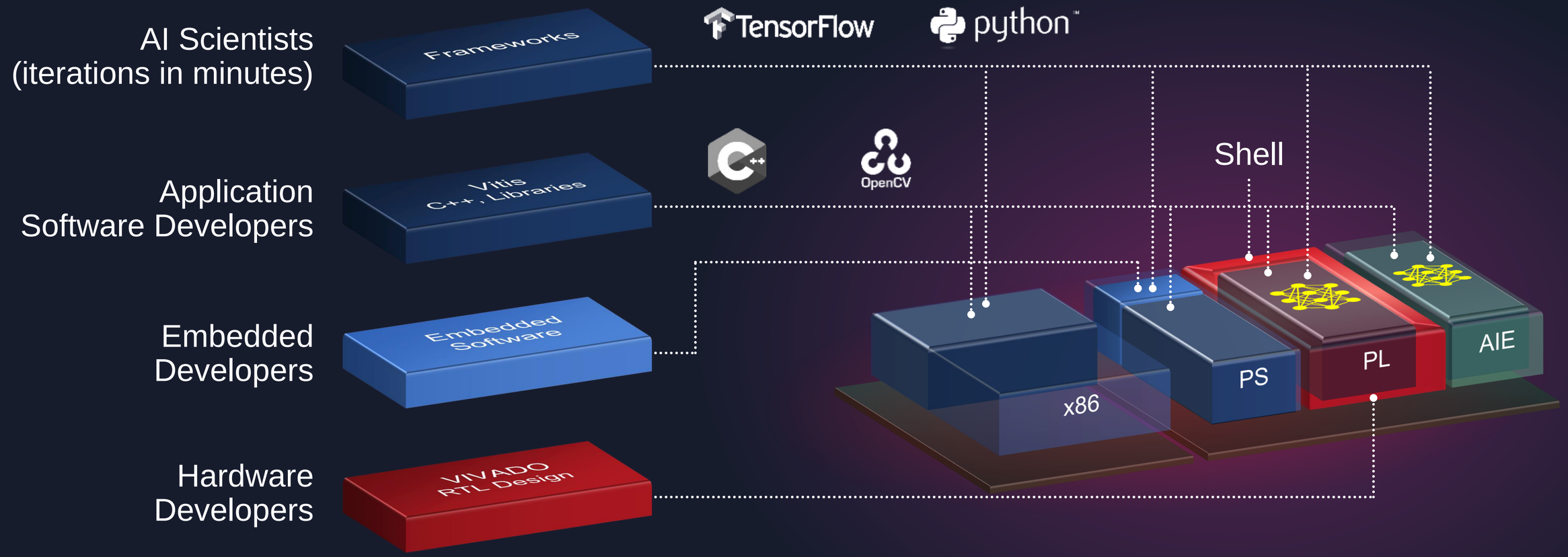
DNN Processing Unit (DPU)

Direct Framework Compilation

Minutes of Compile Times

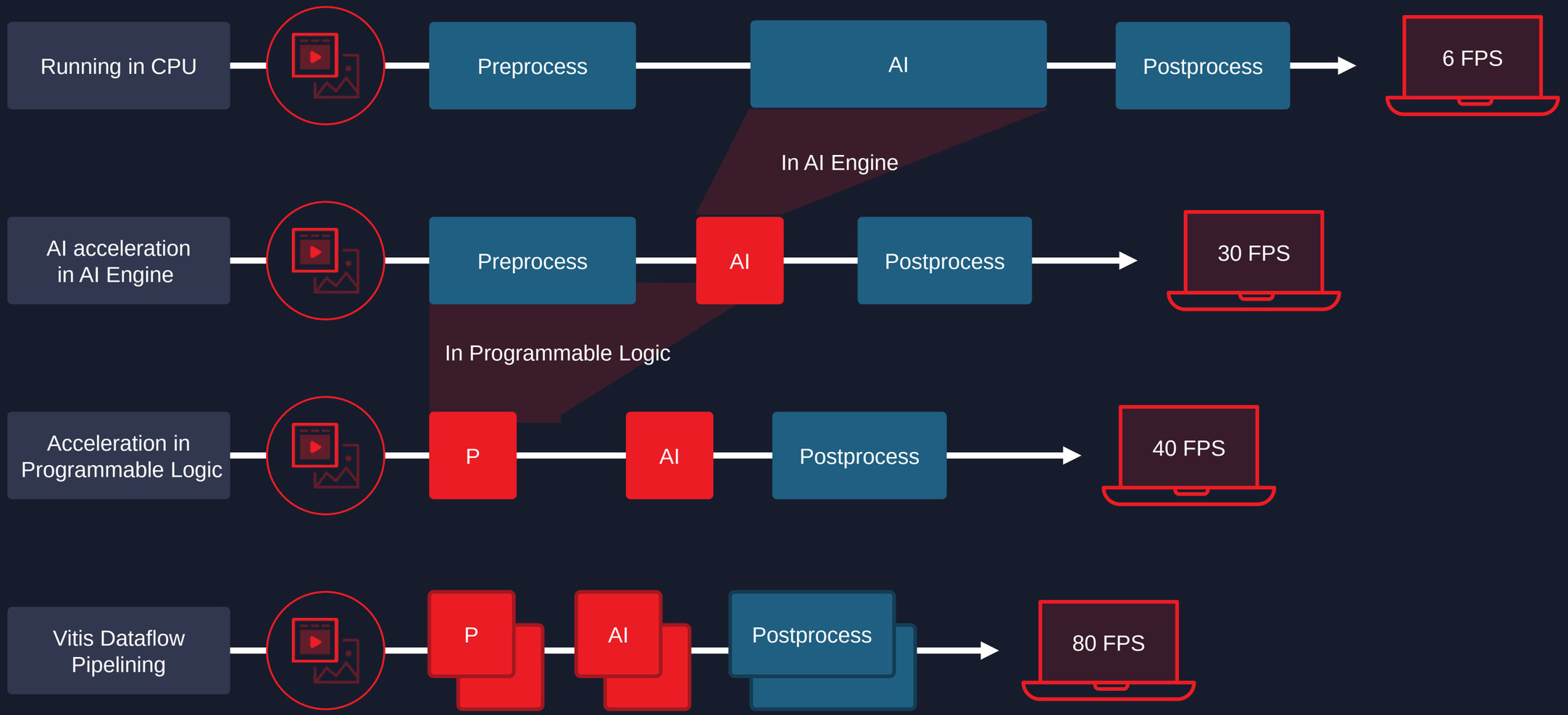


Putting it All Together

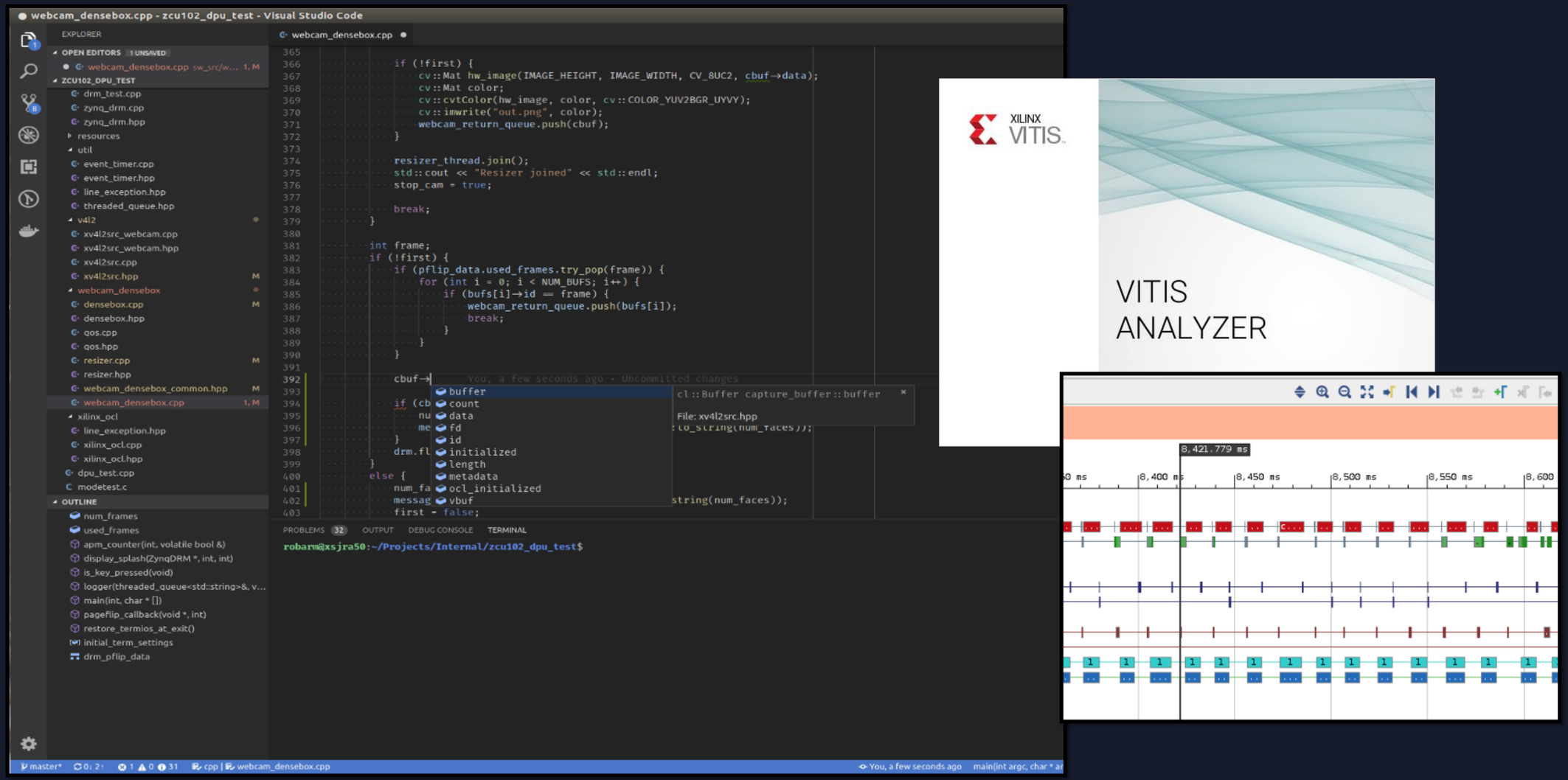


Application Example: Smart City

Adaptive Architecture for Smart City Application



Live Demo

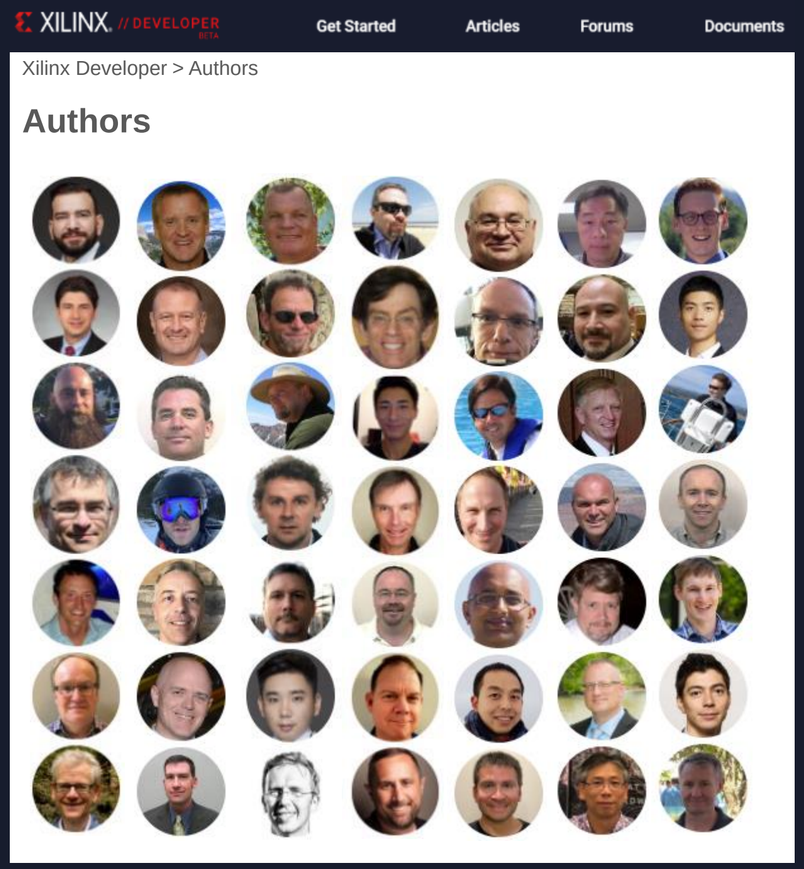

webcam_densebox.cpp - zcu102_dpu_test - Visual Studio Code
EXPLORER
webcam_densebox.cpp
OPEN EDITORS 1 UNSAVED
ZCU102_DPU_TEST
drm_test.cpp
zynq_drm.cpp
zynq_drm.hpp
resources
util
event_timer.cpp
event_timer.hpp
line_exception.hpp
threaded_queue.hpp
v4l2
xv4l2src_webcam.cpp
xv4l2src_webcam.hpp
xv4l2src.cpp
xv4l2src.hpp
webcam_densebox
densebox.cpp
densebox.hpp
qos.cpp
qos.hpp
resizer.cpp
resizer.hpp
webcam_densebox_common.hpp
webcam_densebox.cpp
xilinx_ocl
line_exception.hpp
xilinx_ocl.cpp
xilinx_ocl.hpp
dpu_test.cpp
modetest.c
OUTLINE
num_frames
used_frames
apm_counter(int, volatile bool &)
display_splash(ZynqDRM *, int, int)
is_key_pressed(void)
logger(threaded_queue<std::string>&, v...
main(int, char * [])
pageflip_callback(void *, int)
restore_termios_at_exit()
initial_term_settings
drm_pflip_data
PROBLEMS 32
OUTPUT
DEBUG CONSOLE
TERMINAL
robarm@xsjra50:~/Projects/Internal/zcu102_dpu_test$
XILINX
VITIS
VITIS
ANALYZER
8,421.779 ms
8,400 ms
8,450 ms
8,500 ms
8,550 ms
8,600

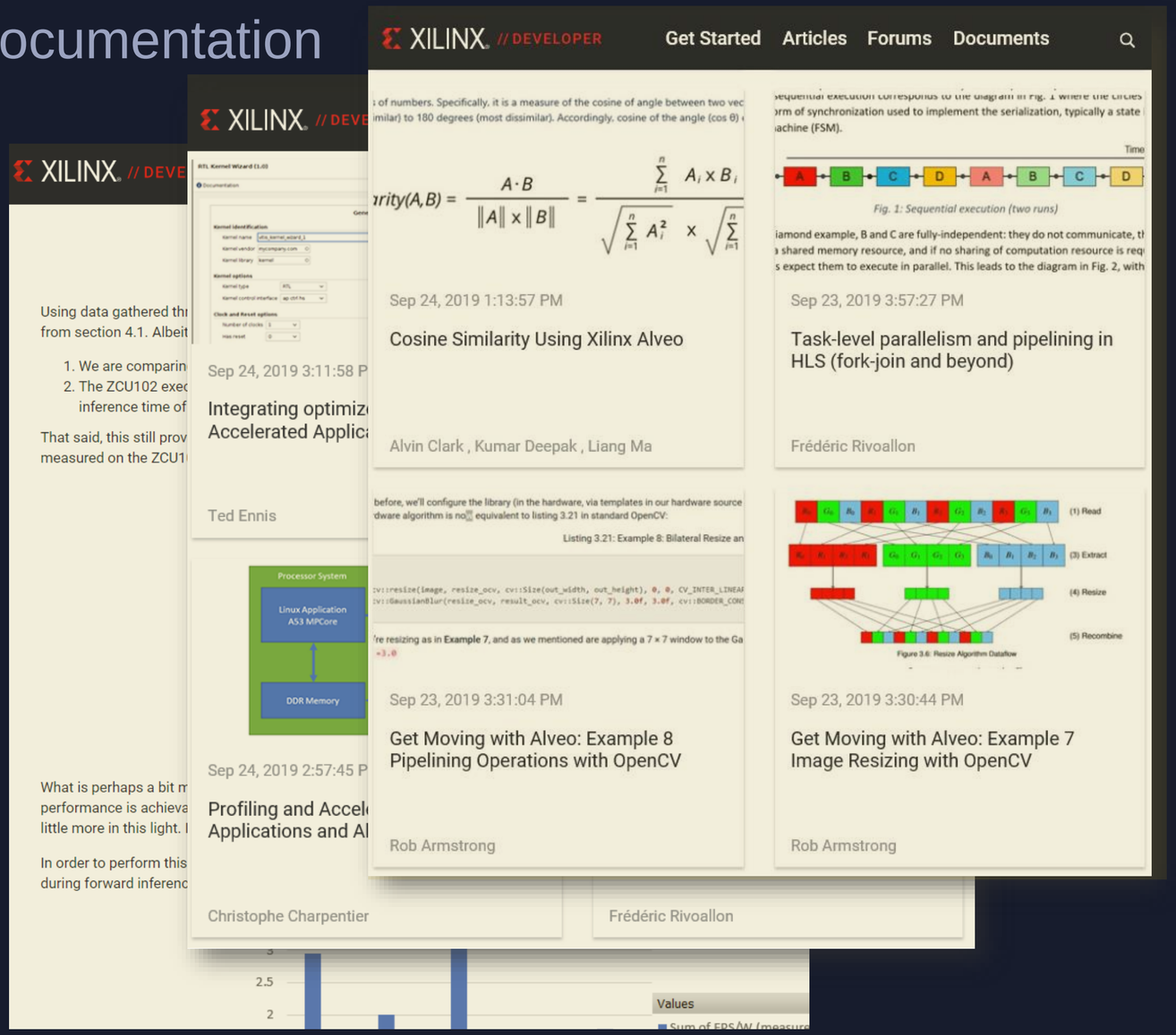
Empowering Software Developers

- Standard, Open
- Free for Xilinx Boards
- Easily Accessible Examples, Tutorials, Documentation
- Extensive Open Source Libraries

Launching *developer.xilinx.com*

Easy Access to Examples, Tutorials, Documentation





Connecting developers to experts

30+ expert articles & projects and growing

Covering 9 segments

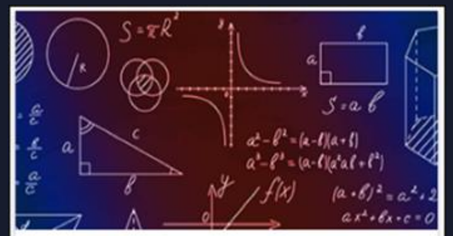
Extensive Open Source Libraries

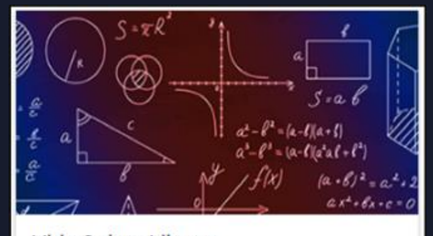
400+ functions across 8 libraries

Open source, performance-optimized out-of-the-box acceleration

GitHub

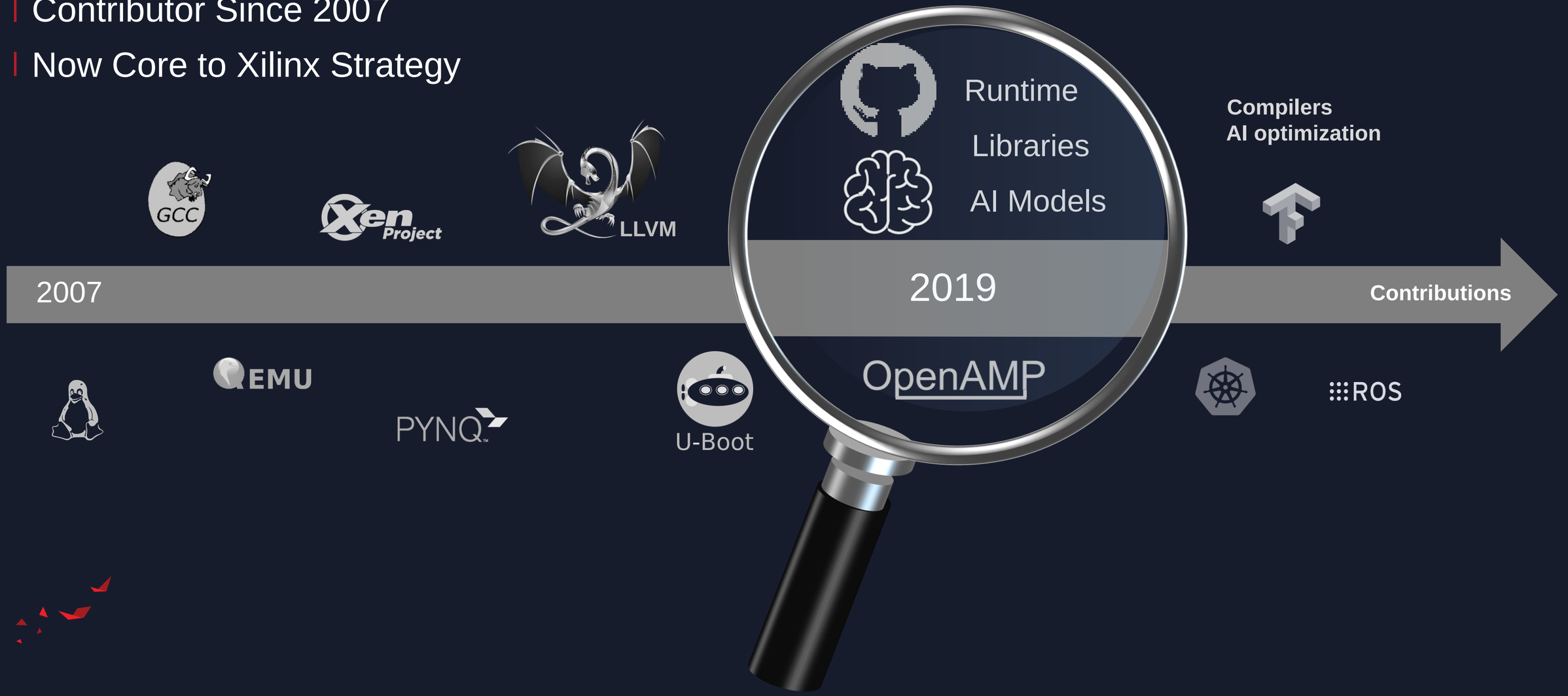
- Library
  - Docs
    - Source
    - Tests
    - Examples
    - Benchmarks



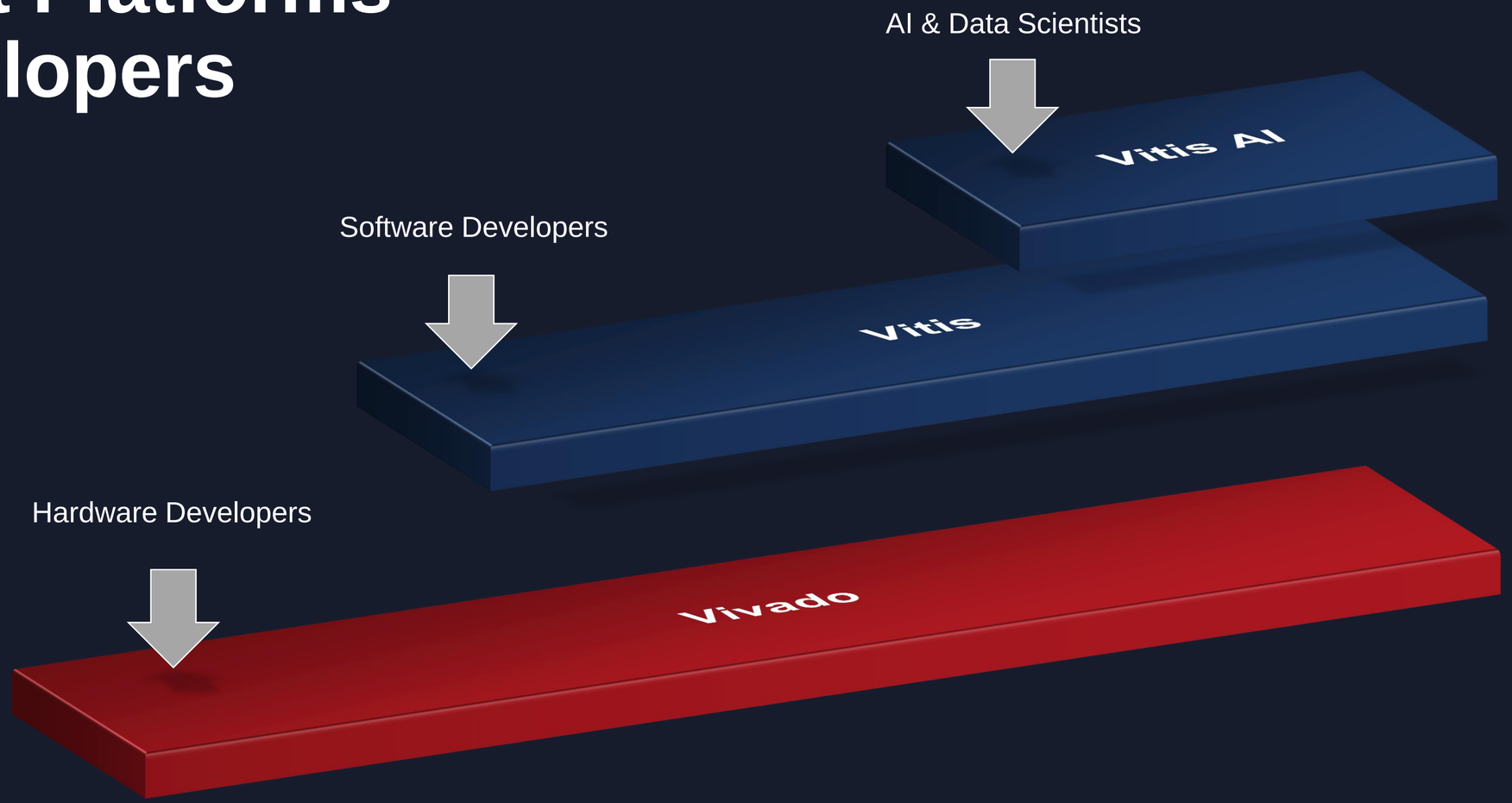


Committed to Open Source

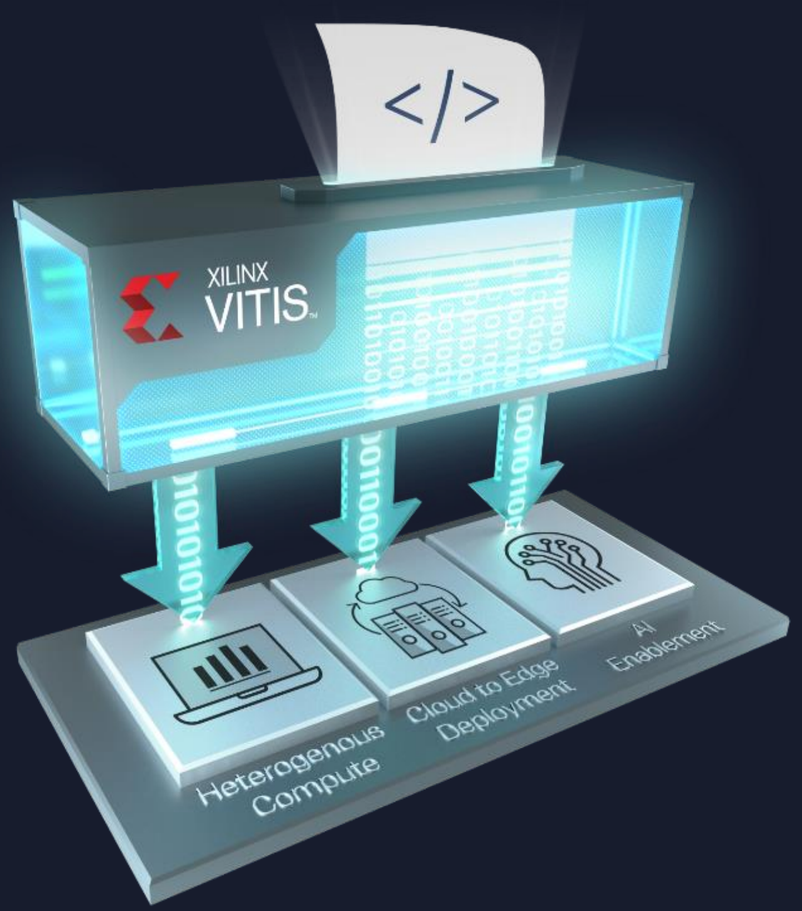
- User Since 2001
- Contributor Since 2007
- Now Core to Xilinx Strategy



Development Platforms for ALL Developers



Key Takeaways



Unified Software Platform

Cloud to edge, software and AI

Comprehensive libraries and models

Work at Speed of Innovation

Hardware adaptable to software

Software programmable DSA

Standards, Open Source, Free

Embracing & participating in open source

Use of standard environments & APIs

Mission

Building the Adaptable, Intelligent World