

# How Zebra and Qualcomm Technologies collaboration enables operational workflows and benefits of enterprise grade devices

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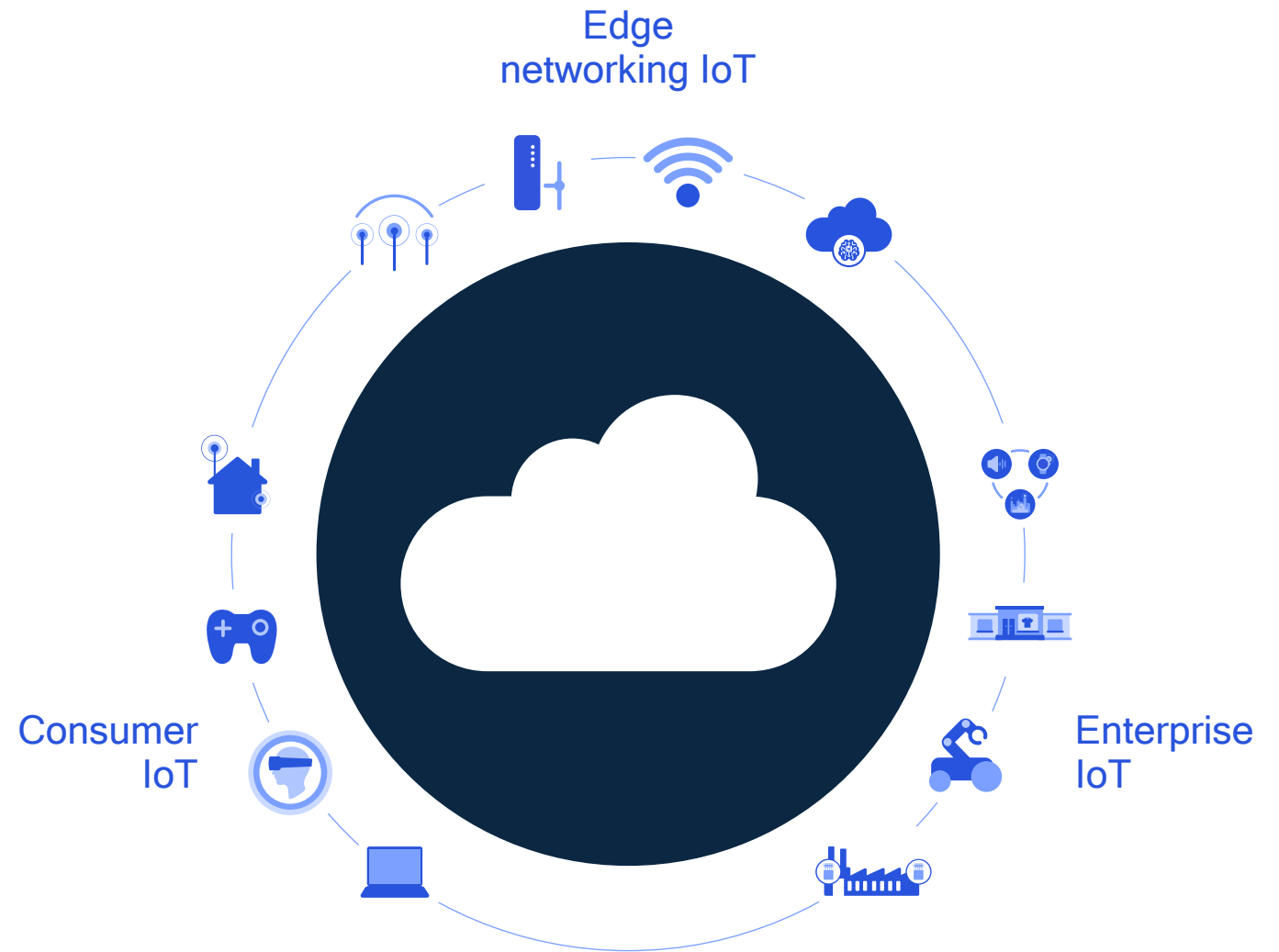
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# Digital transformation of industries drives demand for our technologies

Advanced connectivity

Low-power, high-performance computing

On-device artificial intelligence



Qualcomm Technologies is the natural edge partner for industries and the cloud

To efficiently scale,  
intelligence is expanding  
towards the edge



Cloud



Edge device



On-device

- Privacy
- Reliability
- Low latency
- Efficient use of network bandwidth

We are leading the realization  
of the intelligent computing at the edge

Convergence of:  
Wireless connectivity  
Efficient computing  
Distributed AI

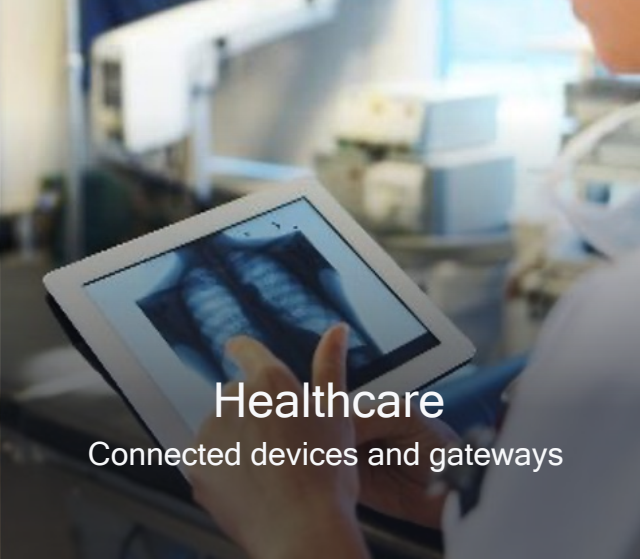
Unleashing massive amount of  
data to fuel our digital future

# Qualcomm

## Contributing to a comprehensive ecosystem for the IoT

Helping to accelerate the digital transformation and development of new intelligent connected products





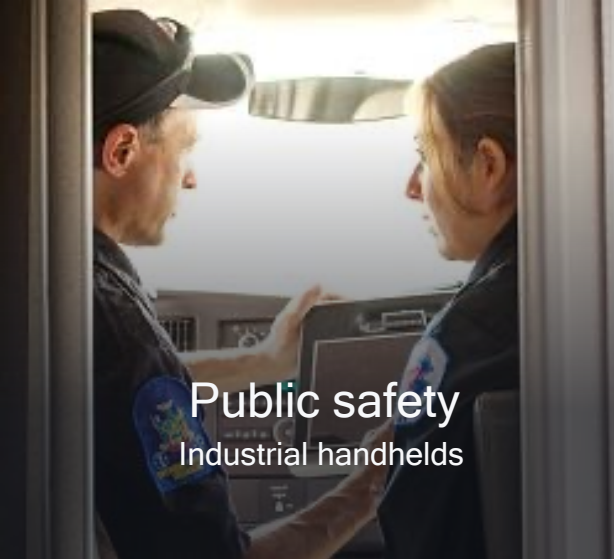
## Healthcare

Connected devices and gateways



## Manufacturing

Industrial gateways, robotics



## Public safety

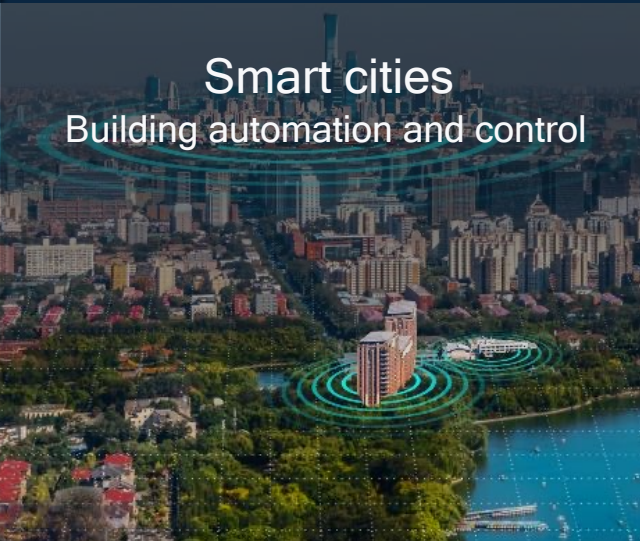
Industrial handhelds



## Retail

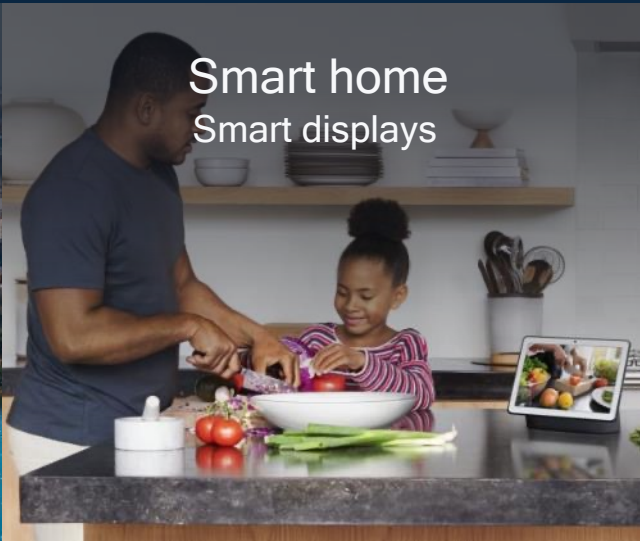
POS, digital signage

# Driving digital transformation across industries



## Smart cities

Building automation and control



## Smart home

Smart displays



## Transportation and logistics

Asset tracking



## Utilities

Electric, gas, water meters

# Warehouse management

- Real time asset monitoring and more accurate location within warehouse
- Monitors inventory levels and individual stock levels
- Enhance safety, reduce potential collision risk
- Edge AI and analytics to improve productivity and efficiency
- Optimization of end-end delivery



Cloud Edge AI  
+ Analytics



Environmental  
sensors



5G &  
Wi-Fi 6E



Handheld  
computing



Mobile asset  
management



Indoor  
location



Placement and  
collection robot

# Shipping and delivery

- Real-time precise location and tracking of your packages and assets via fusion of sensors and GPS
- Environmental sensors for monitoring condition of sensitive shipments
- Computer vision for damage detection, visual inspection and predictive maintenance and analytics
- AI and 3D ToF cameras to improve productivity and driver safety: monitor for distracted driving, real-time alerts, live scene analysis, object classification and counting, assisted driver navigation and route optimization
- Ubiquitous connectivity for a global logistics deployment and management



# Collaborating to Deliver Productivity and Mobility Tools based on Qualcomm® IoT processors



## Workers



## Managers and Supervisors



## Hands-Free Solutions

Picking

Sorting

Replenishment

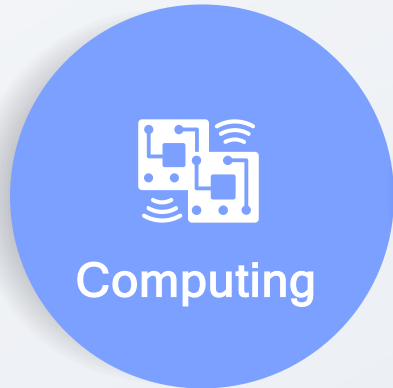


## Lift Truck Mobility

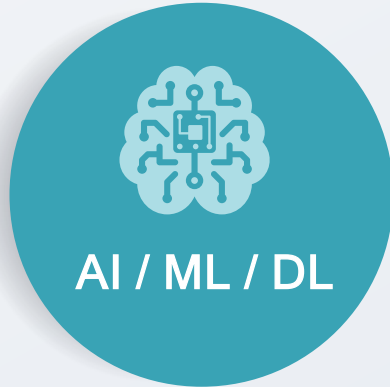




# Inventing breakthrough technologies that fuel innovation



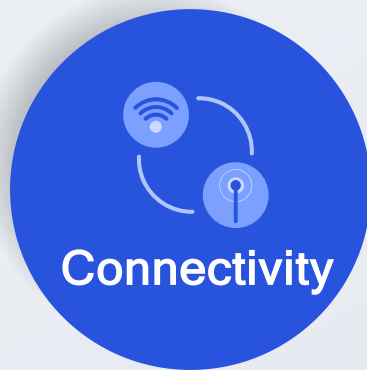
Computing



AI / ML / DL



Security



Connectivity



Power management



Location



Security



Carrier aggregation



Massive MIMO



Fingerprint



Sensors



Gesture



Multimedia



Imaging



Computer vision



RFFE



5G technology



AI



C-V2X



Envelope tracking



mmWave



Bluetooth



Wi-Fi



Modules



CPU



DSP



GPU

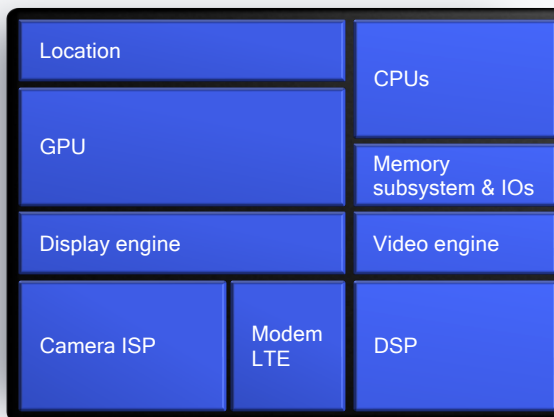


Advanced channel coding



Voice recognition

# Qualcomm® QCM6490



## Best-in-class CPU, GPU, VPU



6<sup>th</sup> Gen Qualcomm® Kryo™ CPU  
(A78+A55)  
Up to 90% higher CPU benchmarks  
400% increase in GPU



## AI / Machine learning

Dedicated NSP for AI  
Dual HVX + HMX-4K/1K  
600% increase in INT8 TOPS

## Security features



Secure camera/UI, QTSEE5,  
HW key wrap, ECC core



## Connectivity

Tri-band Wi-Fi 6E,  
5G/Sub6, CBRS

## HLOS



Android, Linux,  
Ubuntu, Windows



## Display

FHD+ 120fps, 8L4K60 SST  
UHD60 over DP/Type-C

## Camera



Triple ISPs for advanced dual  
camera experience with up to  
192MP

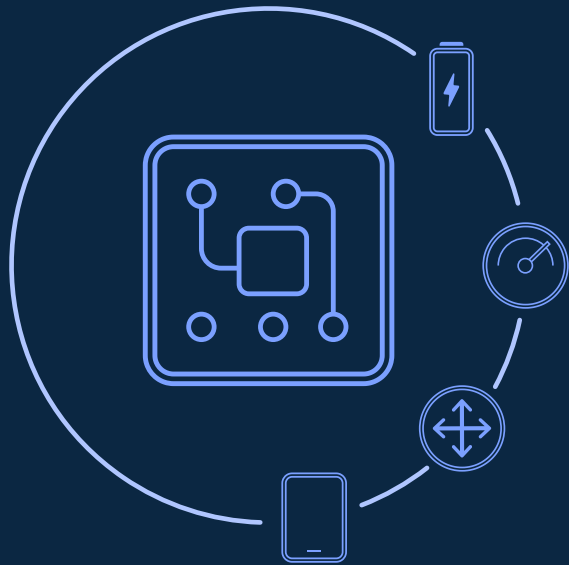


## Video

4K30 enc, 4K60 dec, 10-bit VPU  
Smoother motion, wireless display  
concurrency, HEIF encode

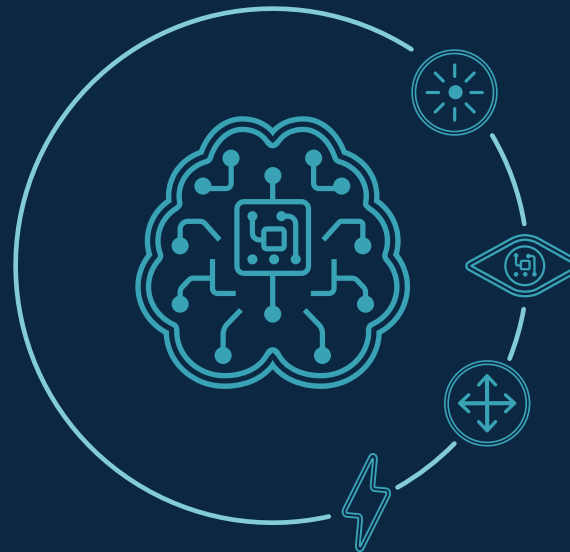
# Qualcomm Making AI Power-Efficient & Pervasive

Focusing on high-performance hardware/ software and optimized network design



## Efficient hardware

- Adapting to the state-of-the-art
- Heterogeneous compute
- Low power



## Algorithmic advancements

- Research that benefits from state-of-the-art
- Optimization for space and runtime efficiency



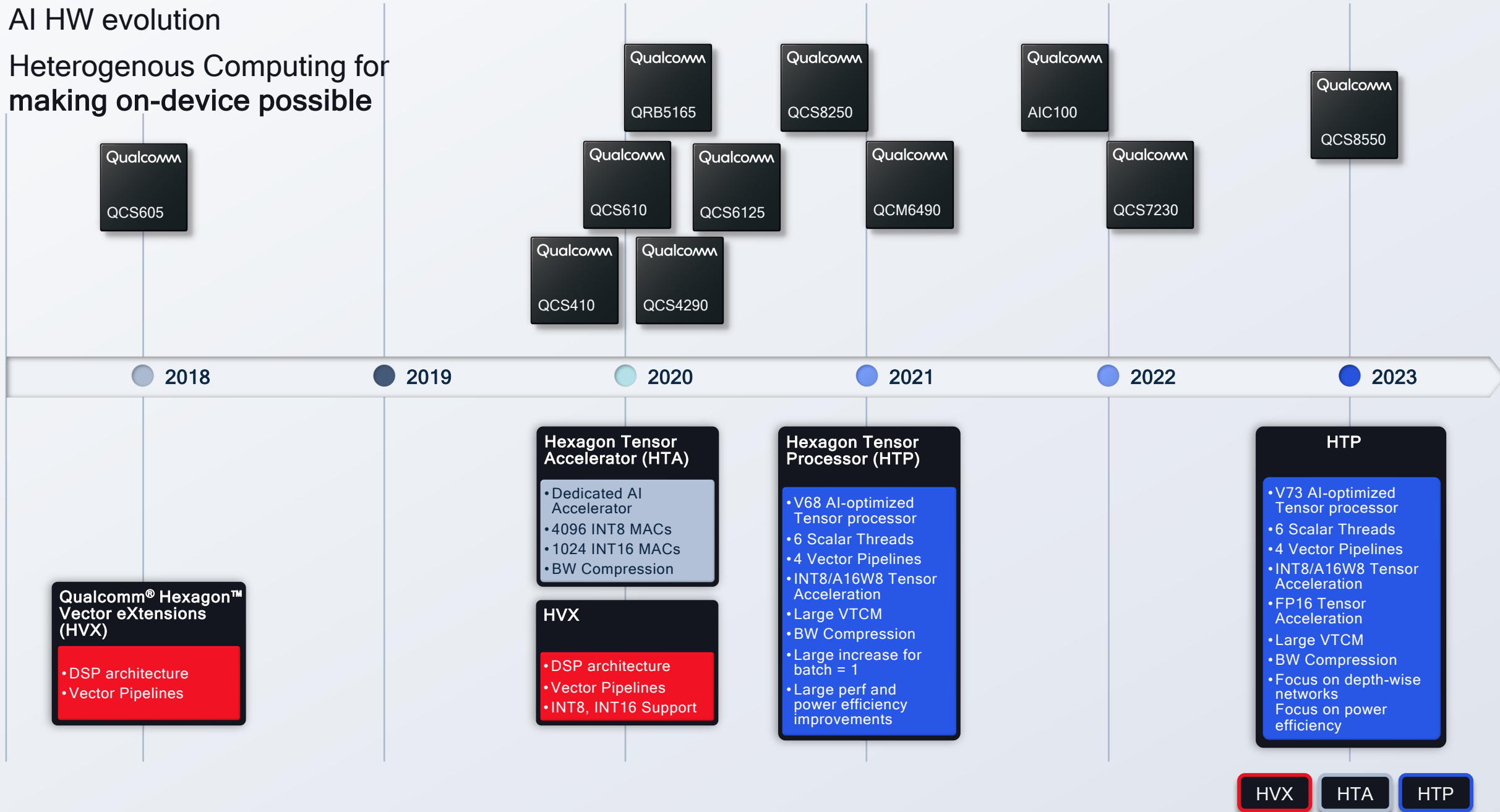
## Software tools

- Unified End-to-End Software stack
- Seamless run-time acceleration
- SDK/development frameworks

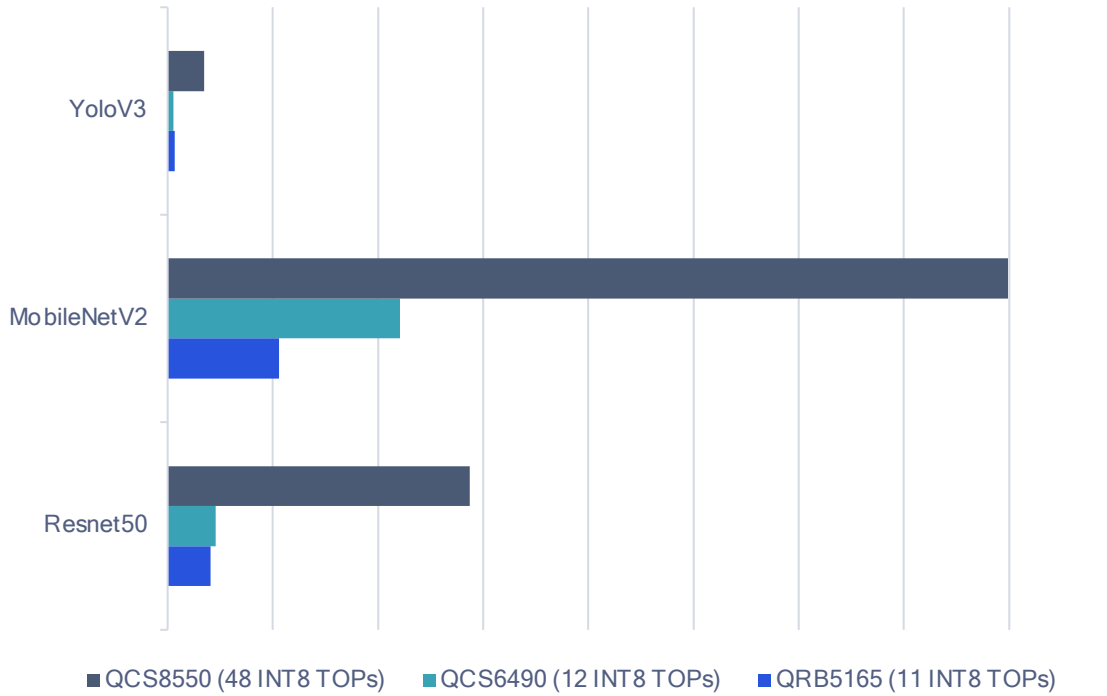
# AI HW evolution

## Heterogenous Computing for making on-device possible

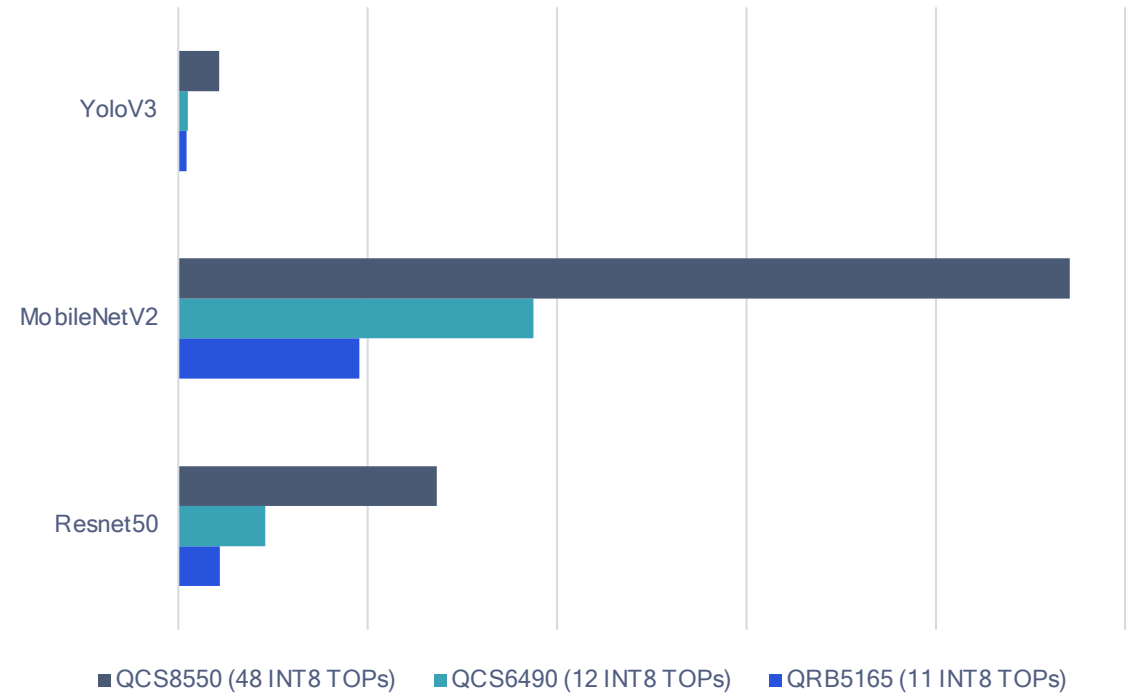
Performance



Peak Performance



Peak Power Efficiency



Notes: Qualcomm® Neural Processing SDK is used for benchmarking. Data is based on INT8 based inferencing.

# AI HW Evolution - Performance & Power Efficiency



## Manufacturing

### Robot Navigation & Management:

Latency driven real-time defect inspection on conveyor belts



## Warehouse & Logistics

### People Navigation:

Latency driven quickest route  
Real-time package sorting



## Retail

### Intelligent Inventory Management:

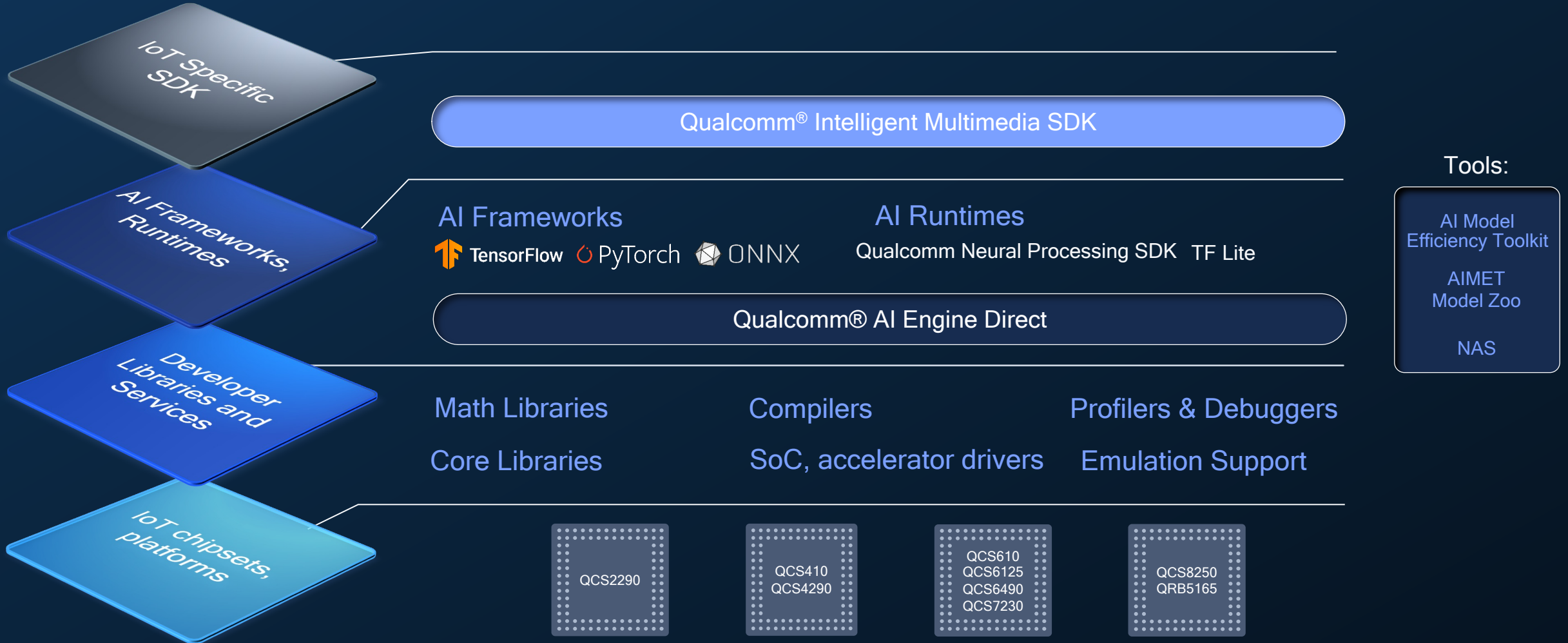
Latency driving productivity  
Security-focused & Bandwidth driven last mile delivery

# Intelligent Edge use cases growing at exponential scale in IoT

Provides a huge fragmented opportunity | Requires Unified AI Stack

# End-to-end unified SW stack

IoT as a simple software problem



# IoT begins with Qualcomm

Let's accelerate digital transformation



Enterprise



Energy



Industrial



Retail



Manufacturing



Warehouse/Logistics





# Thank you

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