



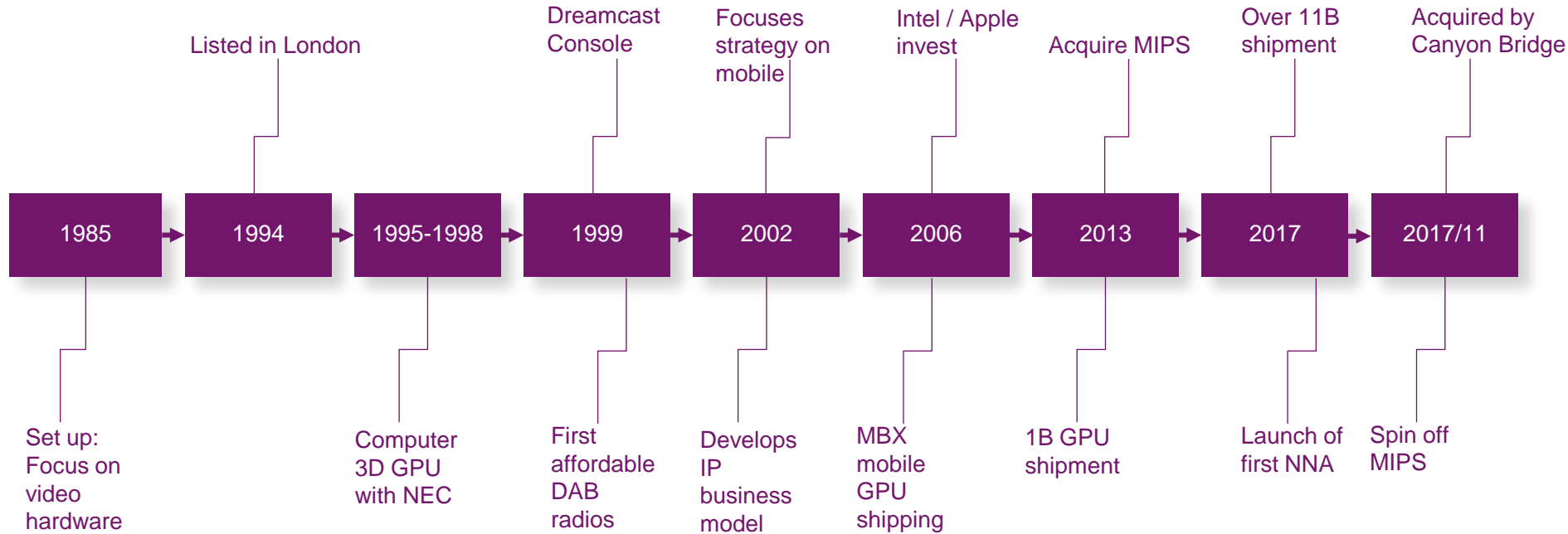
Imagination

运用GPU + NNA 实现设备端异构计算

2018年11月

www.imgtec.com

A history of Imagination



CANYON BRIDGE



PowerVR Vision & AI portfolio

Combination of hardware, software, and ecosystem integrations

Ecosystem

Open source tools & machine learning frameworks

Software

Drivers &
Low-level
APIs

SDKs &
high-level
APIs

Compilers &
tuning tools

Debugging &
analysis
tools

Hardware

Neural
Network
Accelerator

GPU

Dedicated
Processors

PowerVR GPU

Efficient compute across a wide range of markets

- **Flexible range of solutions**
 - XE/XM/XMP Series: Cost efficiency focussed
 - Performance/mm²
 - XT Series: Power efficiency focussed
 - Performance/mW
- **Highly scalable and configurable**
 - Adapt to range of market requirements
 - Feature set, performance characteristics
 - Compute versus Graphics balance
- **System focus**
 - Optimised to work with PowerVR NNA



PowerVR Neural Network Accelerator (NNA)

Complete neural network inferencing solution

- **Brand new architecture**

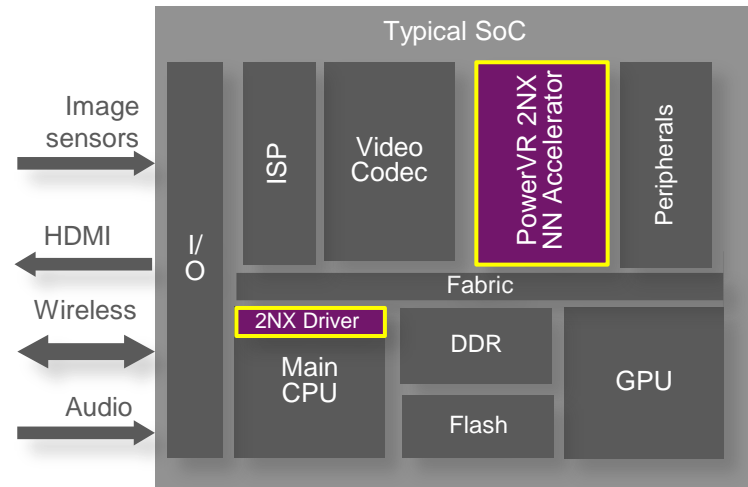
- Provides the best performance for even the smallest area budget

- **Complete solution for NN acceleration**

- Offload up to 100% of NN processing

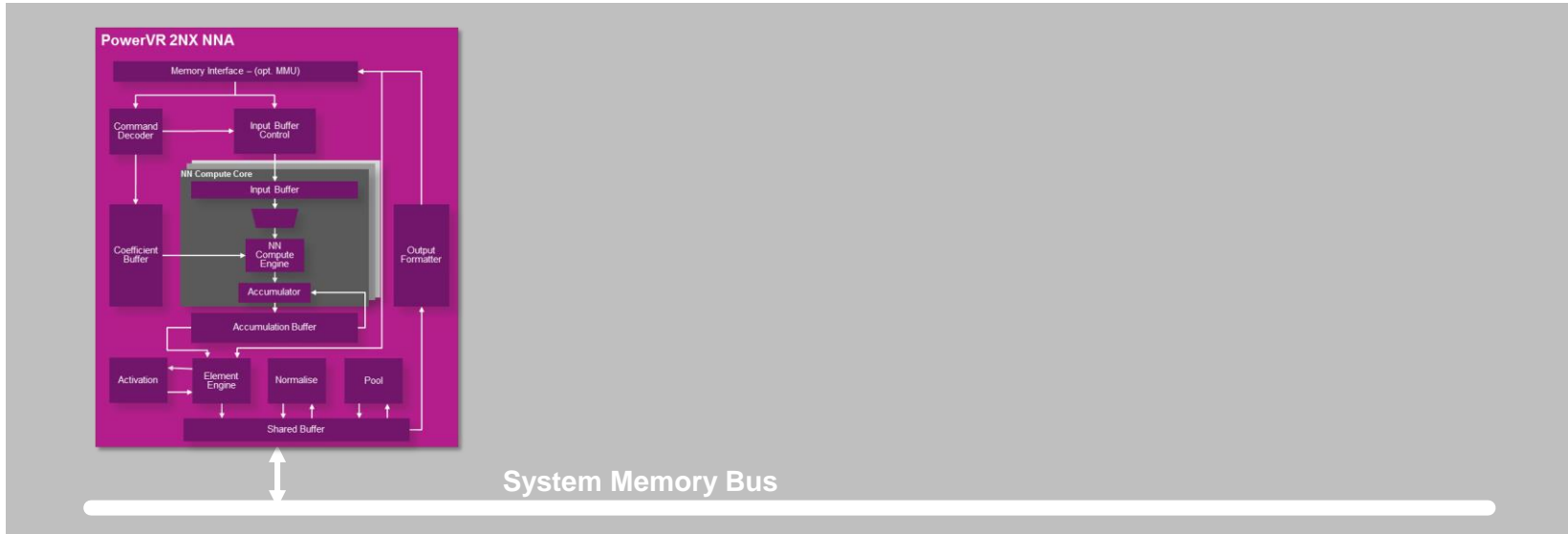
- **Optimised for low bit depth**

- Minimises the system bandwidth load



Flexible AI offerings: PowerVR NNA

Fastest performance with PowerVR NNA

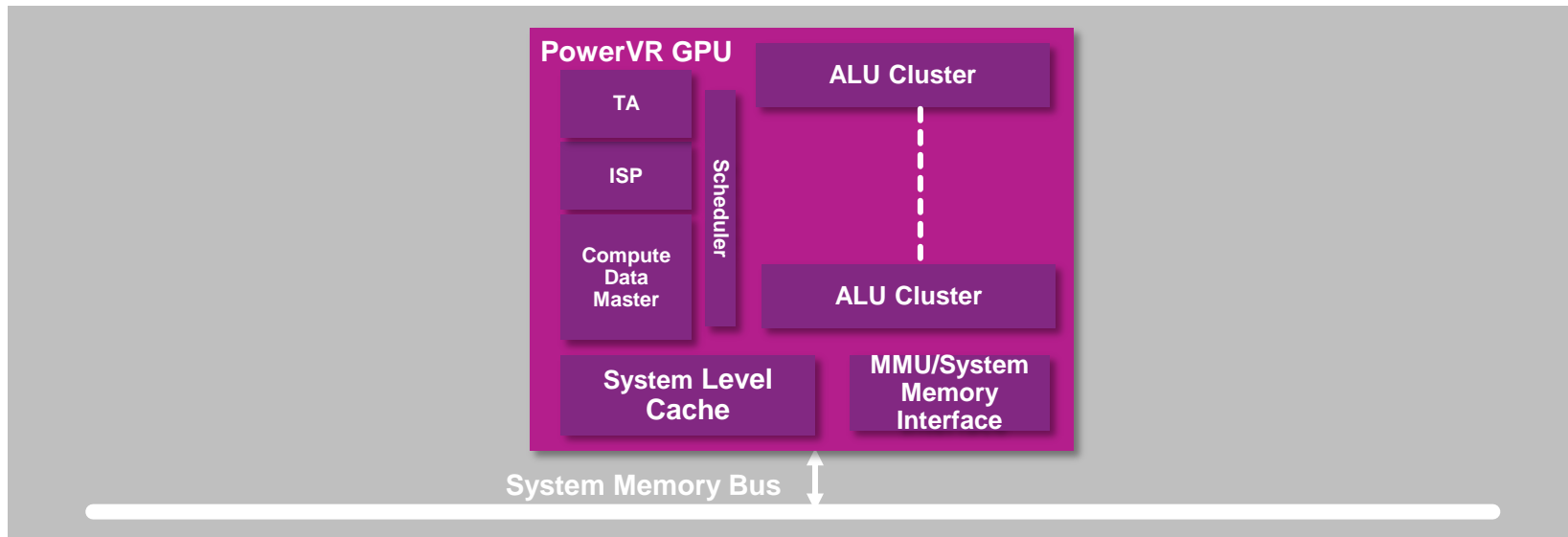


PowerVR NNA

- Fastest performance
- Lowest cost
- Supported feature set

Flexible AI offerings: PowerVR GPU

Fully flexibility with PowerVR GPU

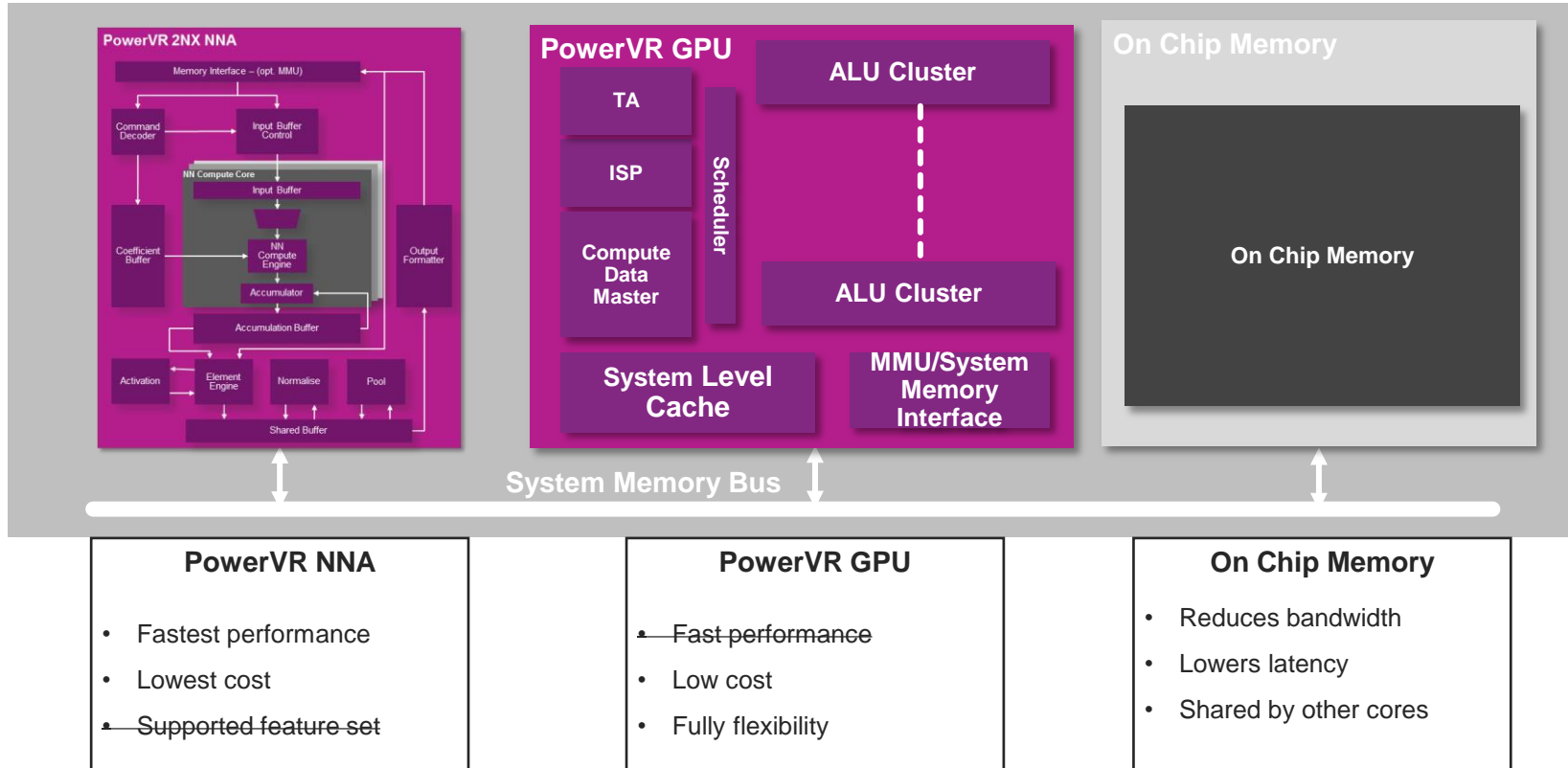


PowerVR GPU

- Fast performance
- Low cost
- Fully flexibility

Flexible AI offerings: PowerVR NNA + GPU

Fastest Performance and fully flexibility



Moving beyond hardware

- AI has no open-standard API
- Popular frameworks are desktop first
- Requires rich software environment to compliment hardware





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Software for AI

PowerVR AI Software Overview

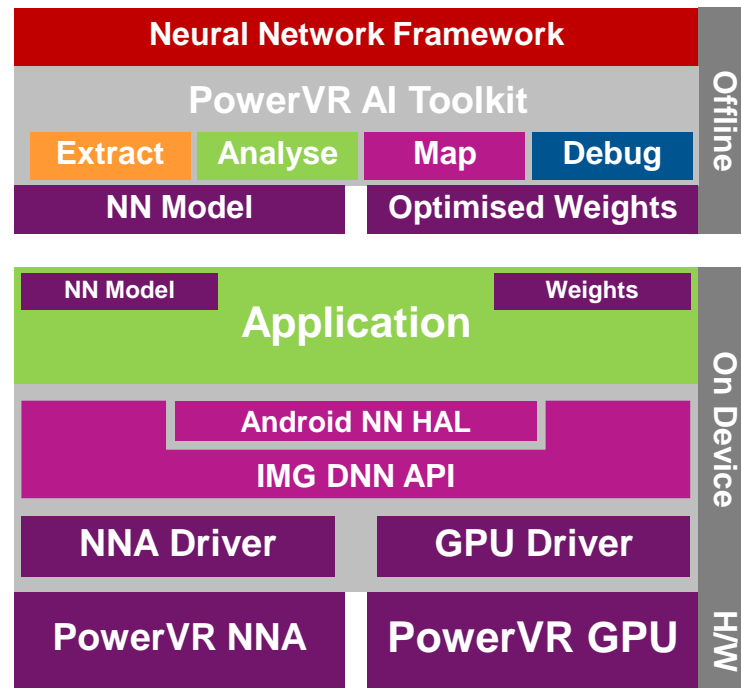
Unified solution across NNA and GPU

■ PowerVR AI Toolkit

- Simplifies deployment workflow
- Easy debugging and network analysis
- User optimisation networks possible

■ Supported APIs: IMG DNN & Android NN

- Seamless operability between GPU & NNA
- Straight forward development
- IMG DNN API available on GPU today



IMG DNN API

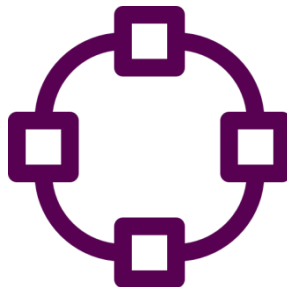
Cross core low-level interface for easy integration for applications or SDKs

Common interface



**Simplifies
development**

Target selectable



**Maximises
flexibility**

Model importable



**Easiest
deployment**

Android Neural Network API support

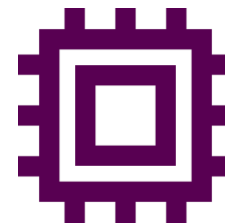
Google's brand new interface for AI acceleration



Introduced in 8.1



Extended in P



**Available for
NNA and GPU**

Summary

Imagination provides flexible, efficient solutions for dedicated AI processing

- **Complimentary range of hardware offerings**
 - Select the best combination to match any requirements
- **Highly efficient Vision and AI IP**
 - Efficient mapping of neural network models
 - Highly optimised inference execution
- **Single common NN API**
 - Integrate once and utilise all our hardware
- **Android supported**
 - Perfect for mobile developers



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Thank You!