AMD DEVELOPER SUMMIT

MANTLE: EMPOWERING 3D GRAPHICS INNOVATION

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What Is Mantle?

Mantle is innovation

Just the right abstraction level

Feature set for modern GPUs

Why Mantle?

Developers want it

Performance and control

Excitement and innovation

Mantle isn’t for Everyone

Do you care about performance?

Do you want control?

Do you care about bridging multiple platforms?

Solutions for Performance

Designed for GPU efficiency

Unlocking new performance features

“Small batch” problem is history

“Small batch” Today

Amazing Developers

Mantle Target

Current Issues

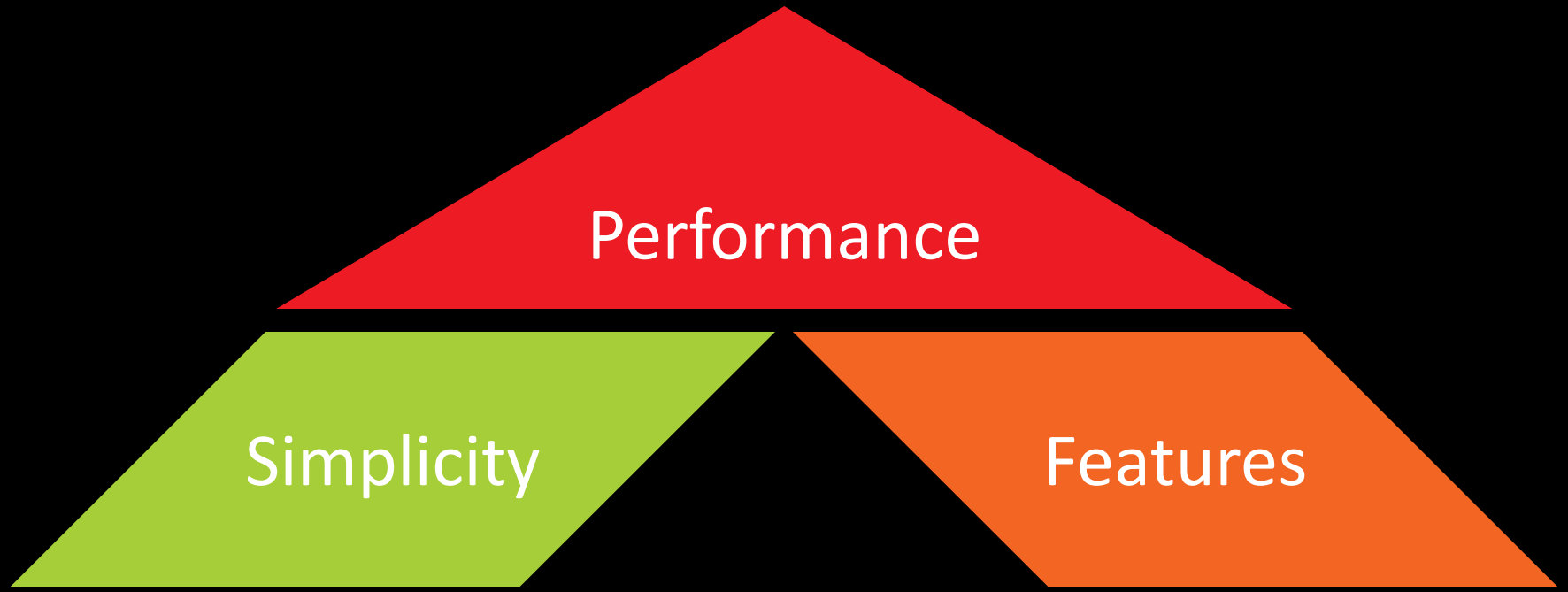
API overhead

Lack of proper threading

Memory management

Lack of direct GPU control

Design Philosophy



API Design Fundamentals

Pre-build and reuse data

Control memory management

Control command generation and execution

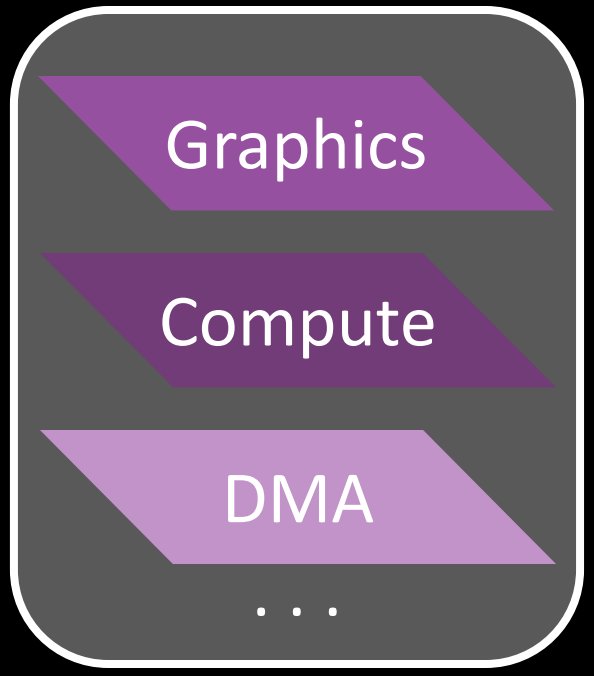
Application controls rendering

Putting Developer in the Driver Seat

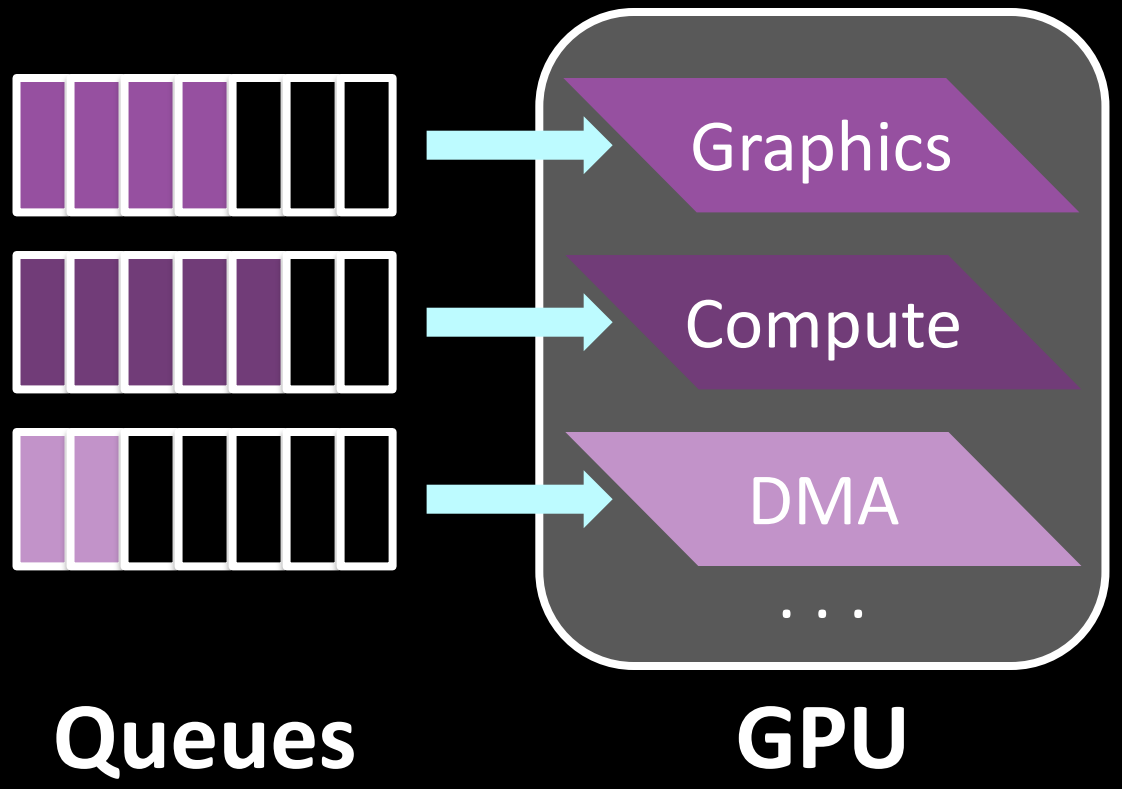
… or in the Driver Developer Seat ☺

Mantle Core Features

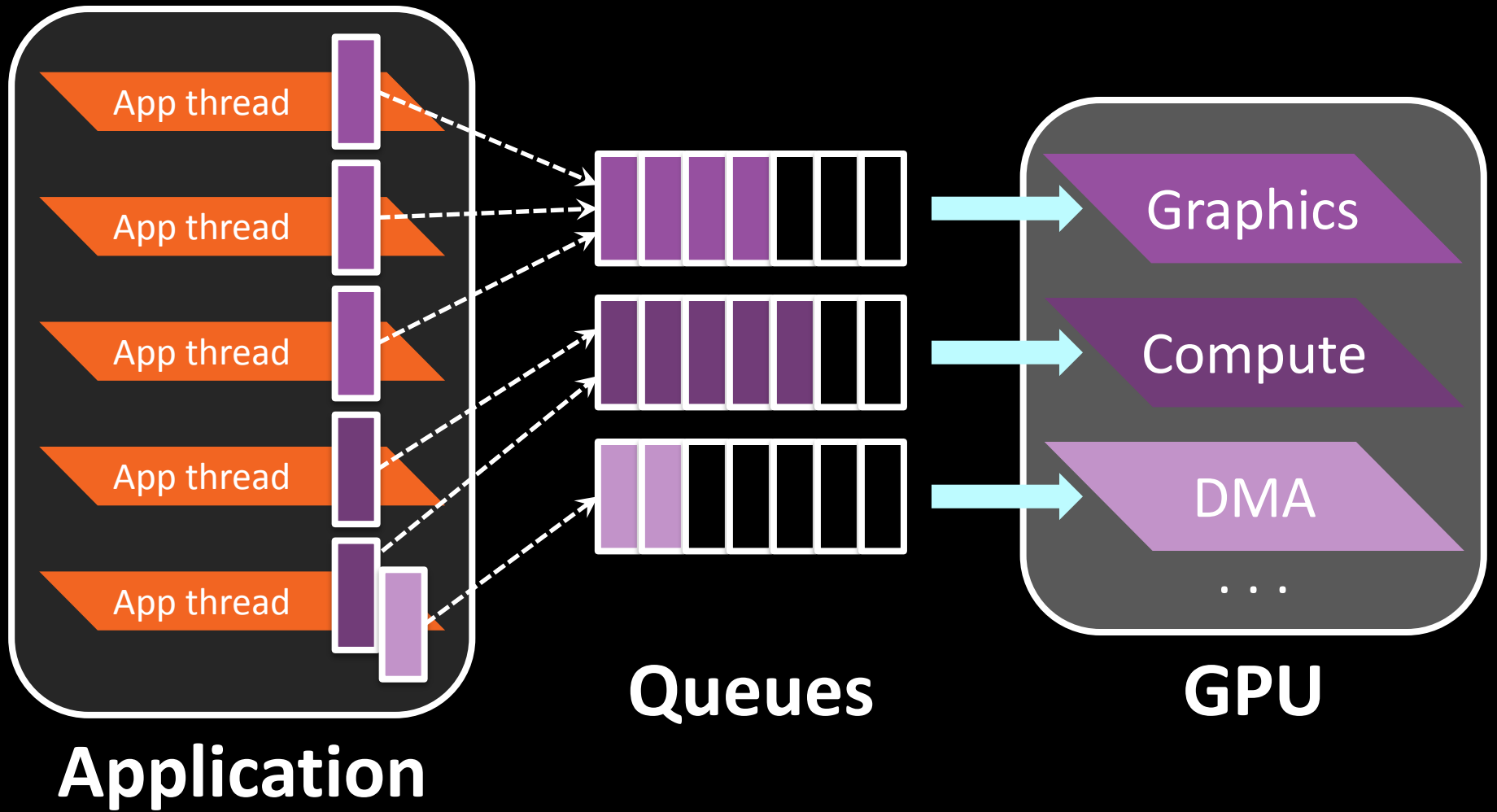
Execution Model



Execution Model

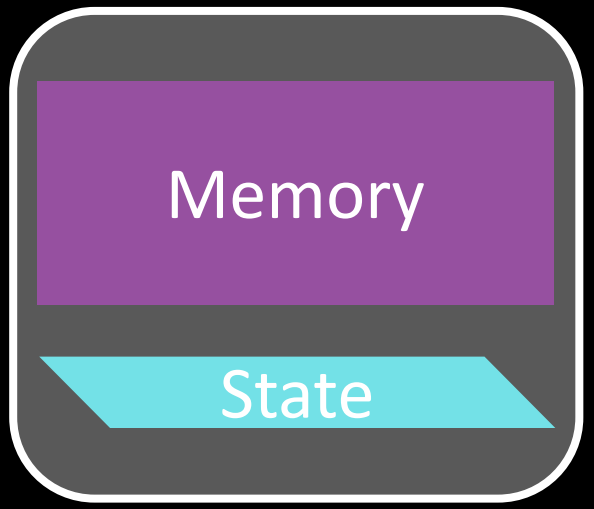


Execution Model



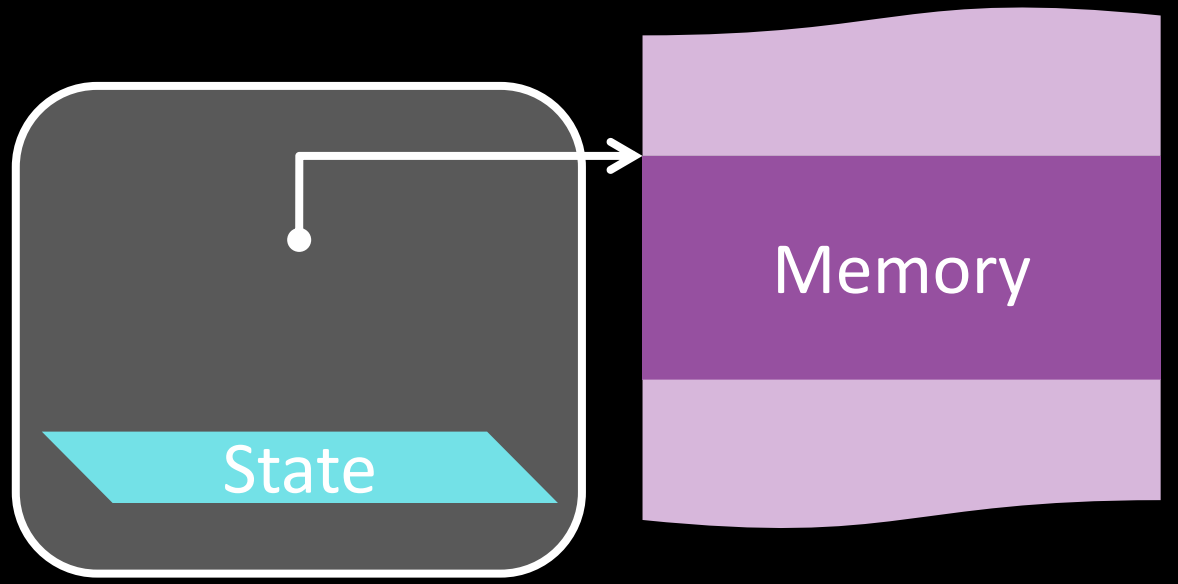
Decoupled GPU Memory

Other APIs



API object

Mantle



API object

Memory Management

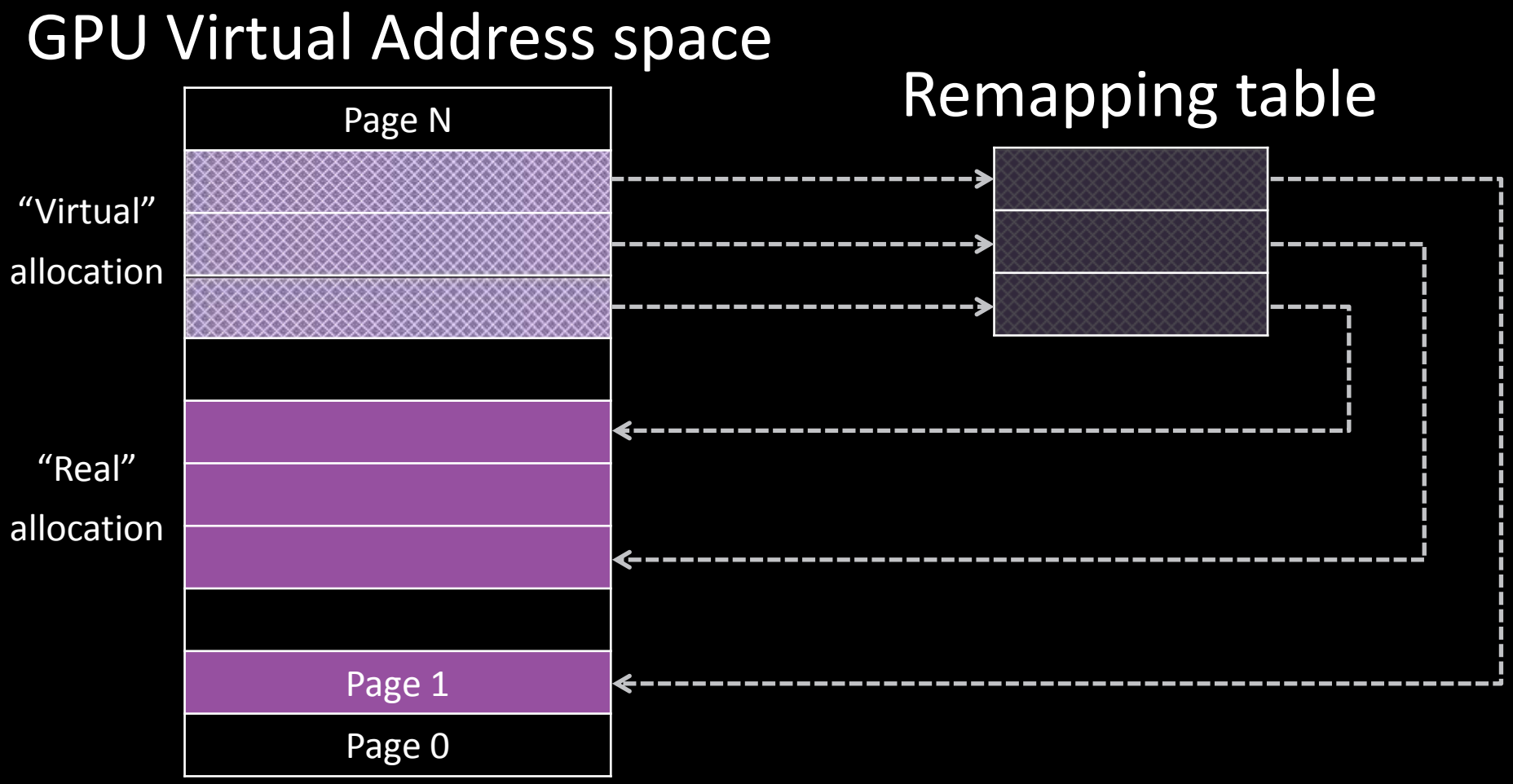
Application controls memory

… both GPU and CPU

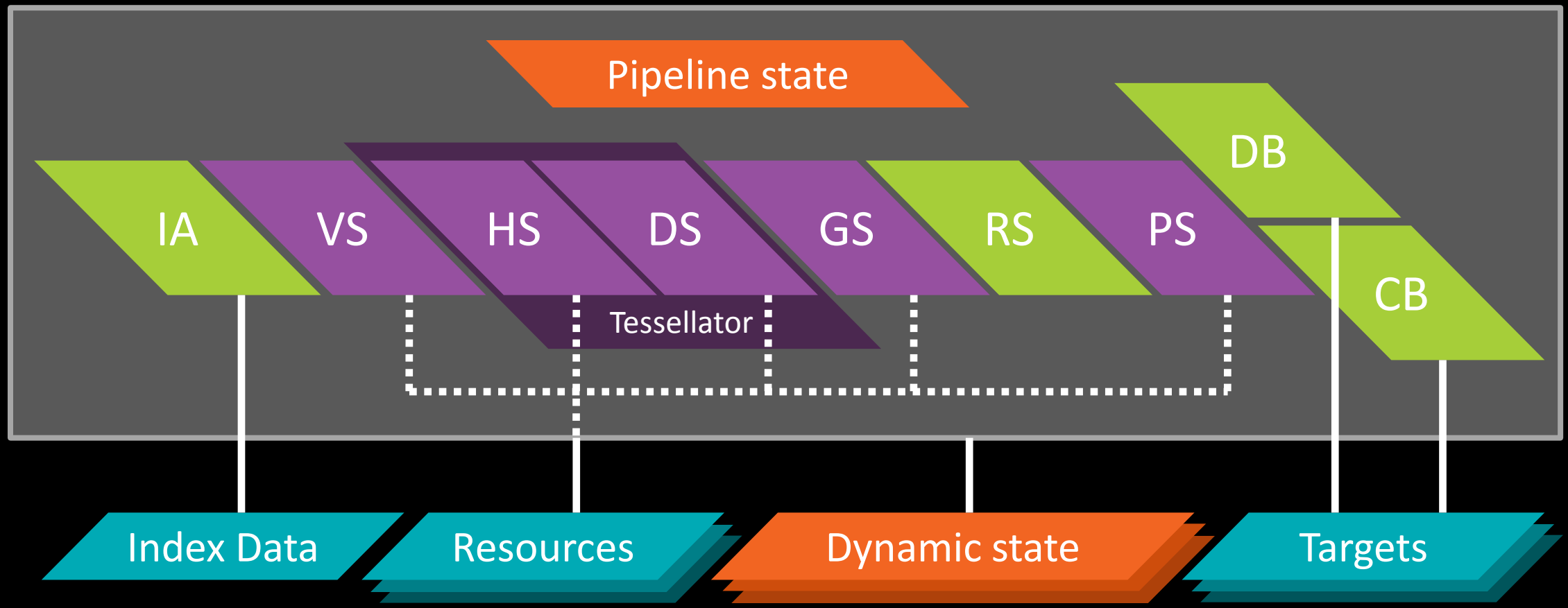
Leverages ***GPU Memory Virtualization***

Much more general than other APIs

GPU Page Table Remapping



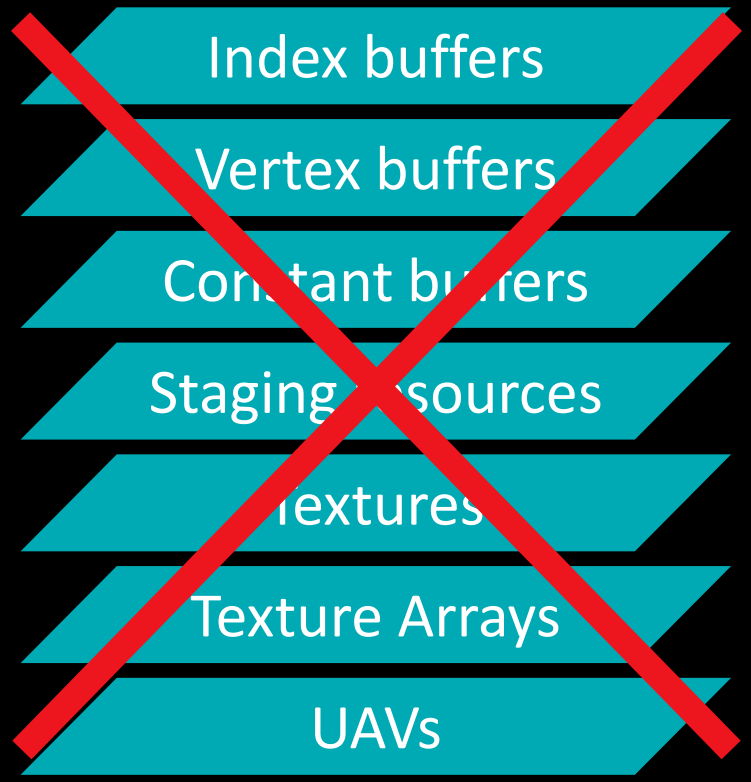
Monolithic Pipelines



Graphics pipeline example

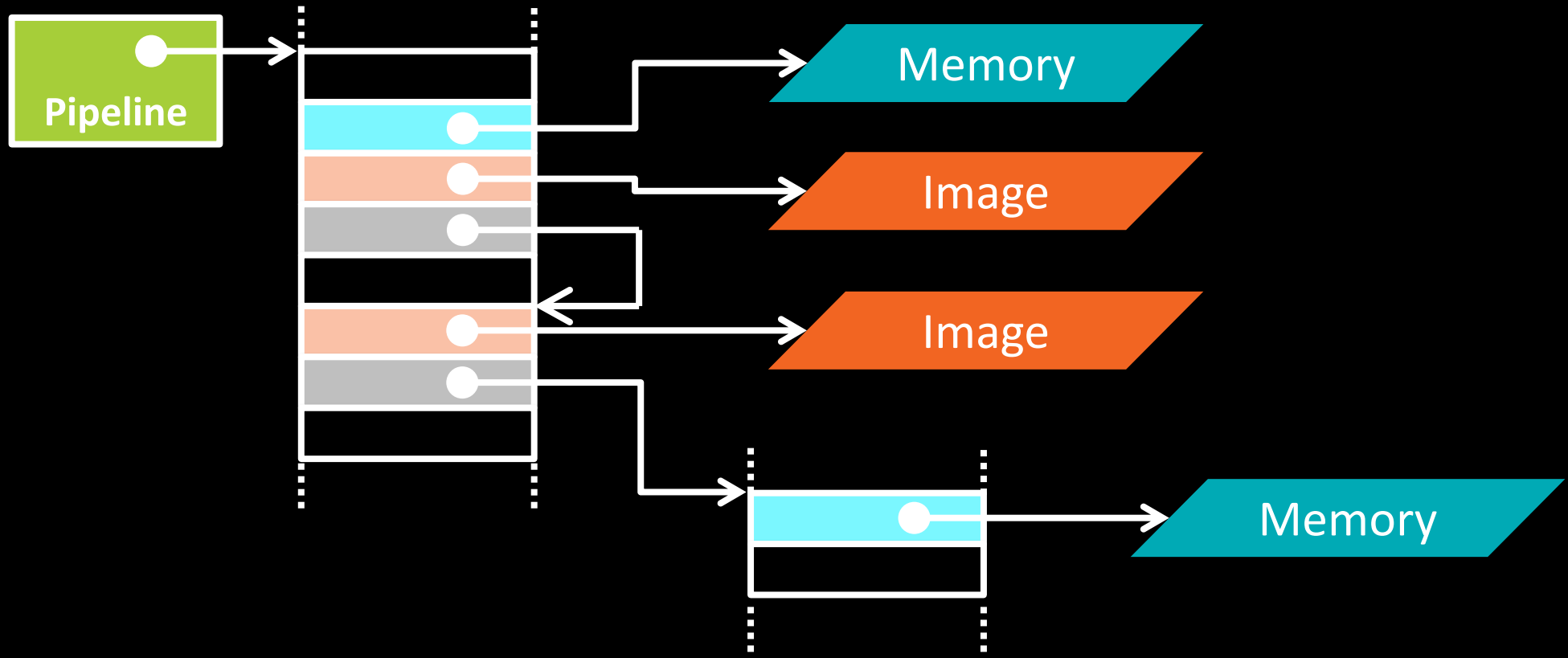
Generalized Resources

Other APIs



Mantle

New Binding Model



Best of traditional and bindless paradigms

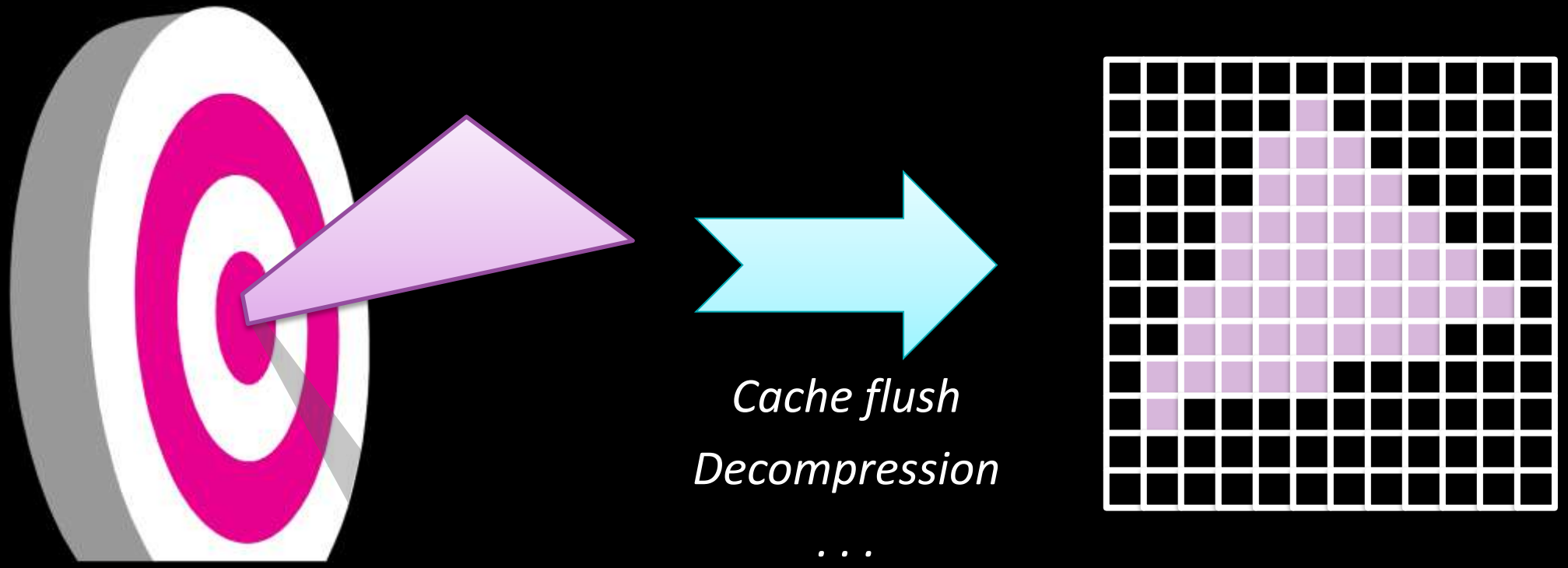
Resource Preparation

Application manages resource/memory state

Application manages hazards (e.g. RAW, WAW)

Represents translation of usage model

Preparation Example



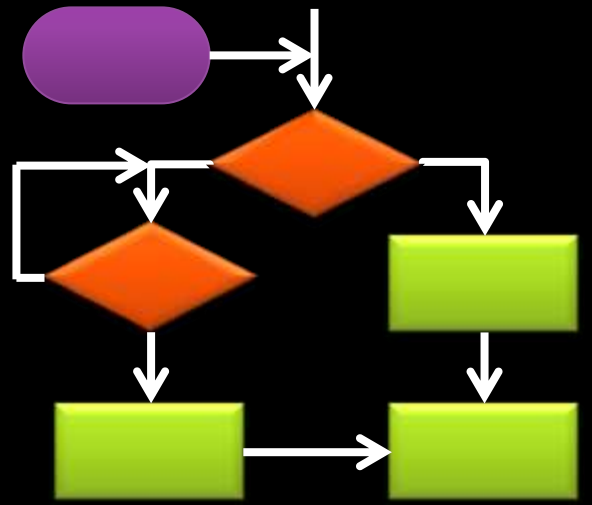
Render target

Shader resource

… and Much More

Pipeline serialization

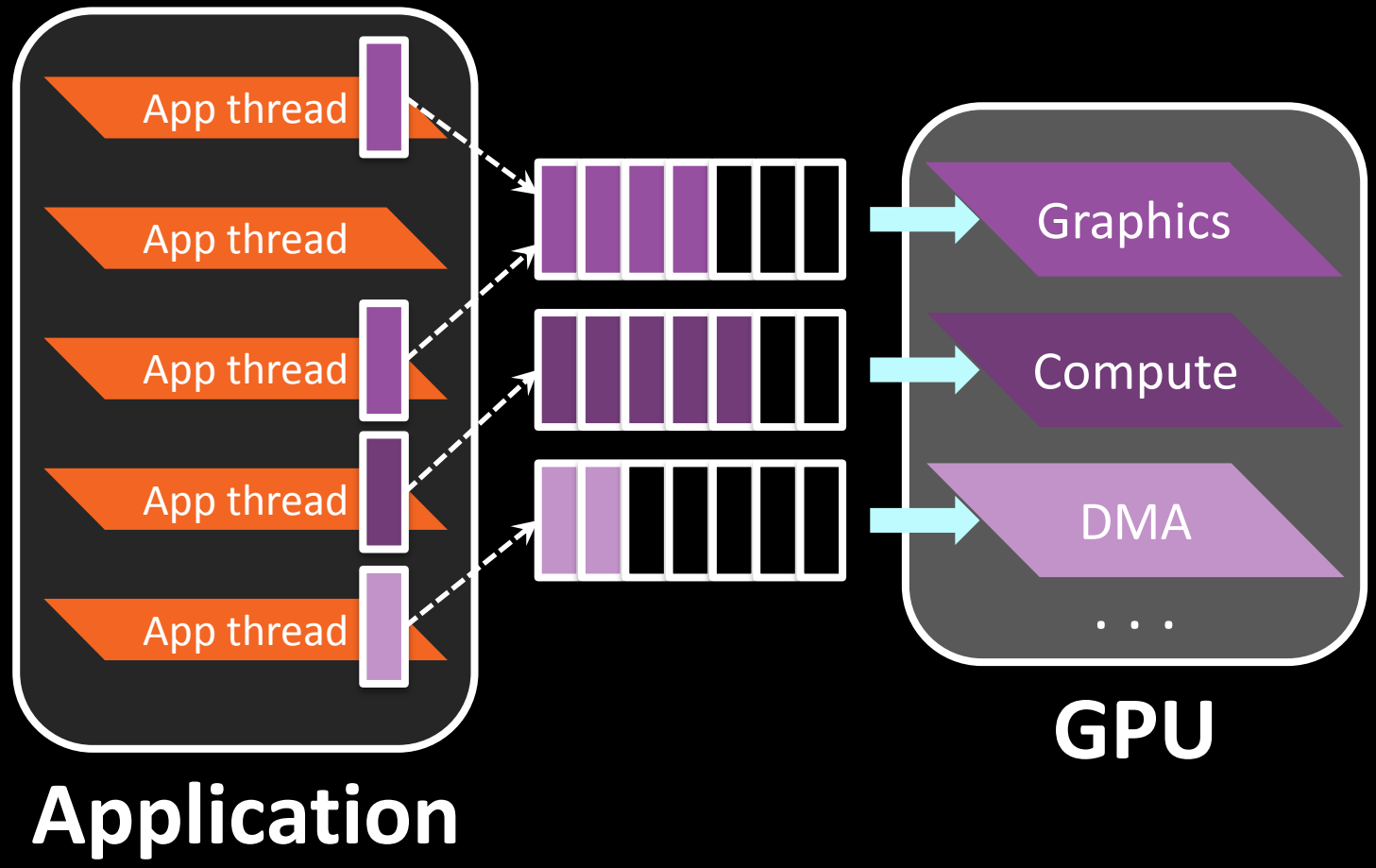
Advanced MSAA features



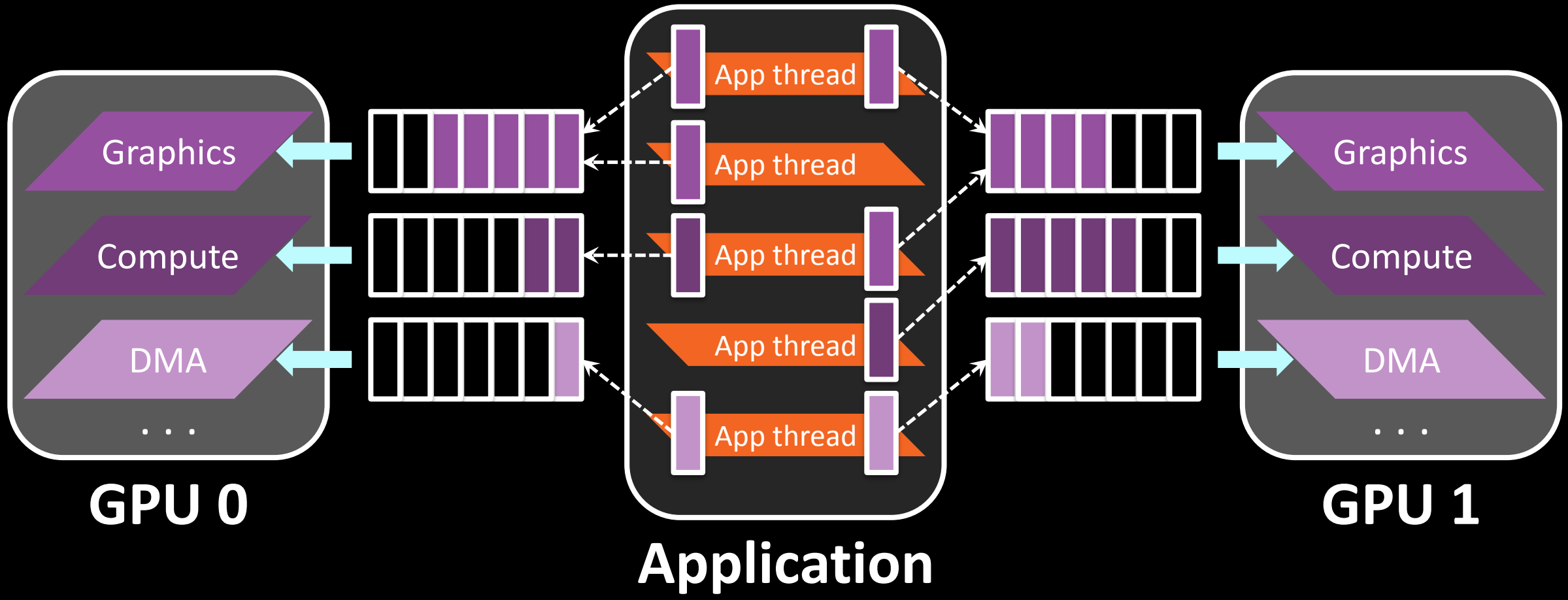
Advanced control flow

Wait, There Is More…

Multi-device



Multi-device



CrossFire Unleashed

Going beyond AFR rendering

Flexible workload scaling and partitioning

Asymmetric configurations (APU+dGPU)

Unlocking novel usage scenarios

Debugging & Tools

Tools are very important

Built-in debugging and validation

Extensive multi-level checking

Controls to stress-test application

Summary of Benefits

Empowering lower spec systems

More predictable performance and behavior

Sharing PC optimizations with next gen consoles

Opportunity for novel techniques

Want to Know More?

Beta program starts soon

Talk to AMD ISV Team

See more cool presentations today

Big thanks to Mantle dev team!

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