



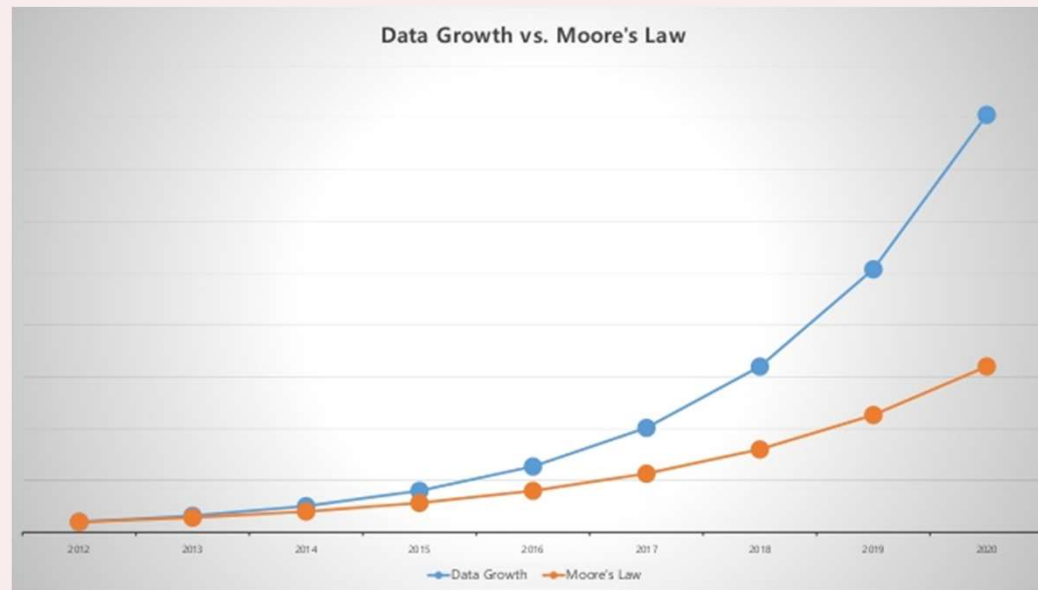
fermat

Accelerating big data Analytics



Customer Pain Point

Data increases faster than traditional systems can evolve



Source: CIO Summit 2017

It is taking longer to solve bigger problems



How do you get an answer from terabytes of data fast enough ?



For Example ... Need the sum and average for 8 TB of integers?

fermat



2 minutes

\$0.37

VS

aws



Elapsed Time

> 1 hour

Cost per run

\$318.00

Benchmark

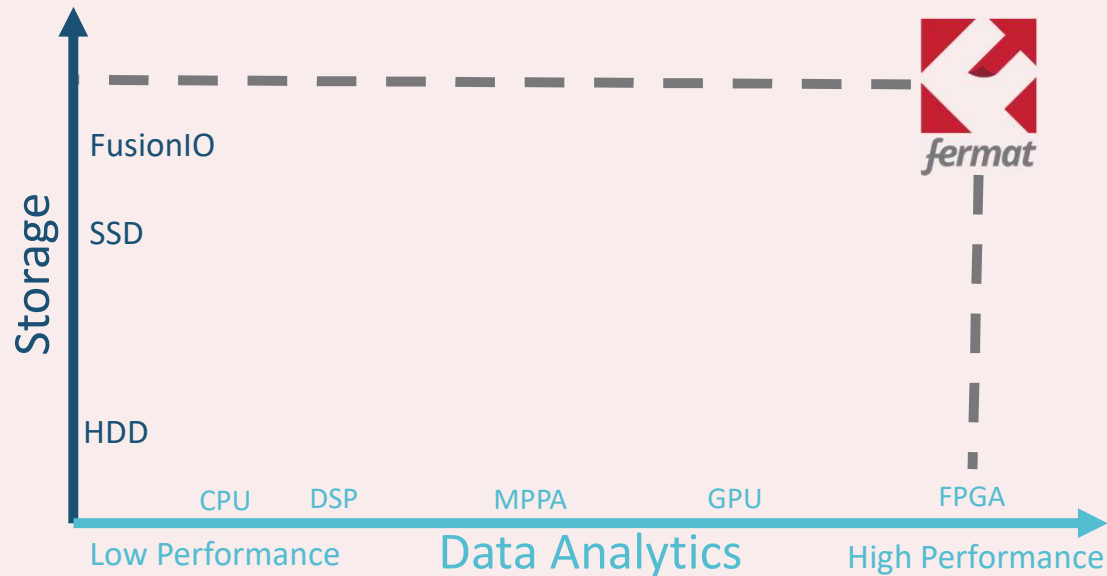
Environment:
- 1 Fermat module with 8 x 1 TB Flash nodes
- AWS 58 nodes (3,712 cores) and 8 TB RAM with Spark
Test: Sum and average of 8 TB of 64 bit integer data
Results:
- Fermat: 132 seconds
- AWS : 1 hour and 6 minutes



Solution

fermat: Game Changing Product

High Density Storage and High Performance Analytics



fermat executes any single pass algorithm at 16.5 sec per TB of data



Fermat V1 Hardware Details

One Fermat module with 8 fully configured Flash/Compute Nodes contains

- 32 x 64 bit ARM cores, 16 x 32 bit ARM cores and 20,160 DSP slices (8 x Zynq ZU9EG MPSoC)
- 32 TB high performance Flash storage
- 128 GB DDR 4 DRAM
- PCIe carrier board with Kintex KU095 FPGA managing interface with 64 GBs DRAM buffer
- GPU form factor, including electrical/thermal requirements

Performance

- 32 GB/sec MPSoCs to/from Flash & 64 GB/sec MPSoCs to/from DRAM

Design Longevity

- No changes needed for faster FPGAs or faster/denser flash/DRAM memory



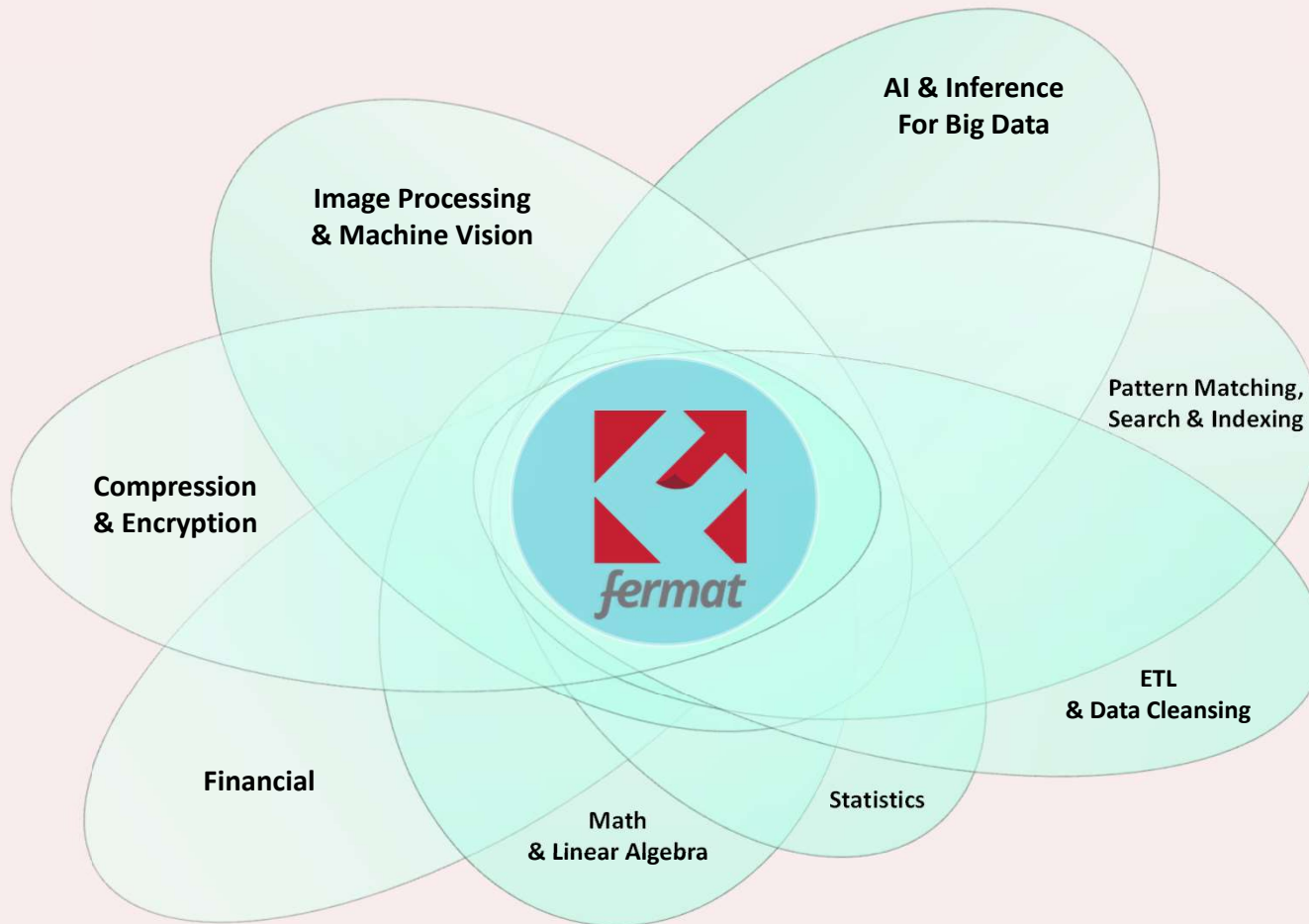
fermat: The Complete Solution

Algorithms: Fermat Library	Pre-compiled Popular Analytic Algorithms	Easy Load & Execute On Demand	User defined Algorithms (Post version1)
Software: Fermat API	C and Python Procedural API	Transparent execution and distribution of data across Processors/Flash	Easy System Configuration and Management
Hardware: Fermat Module	High speed Compute High capacity Storage	1 to 8 MPSoC FPGAs Up to 32TB of Flash Storage	Extremely high- speed interconnect FPGAs to Storage



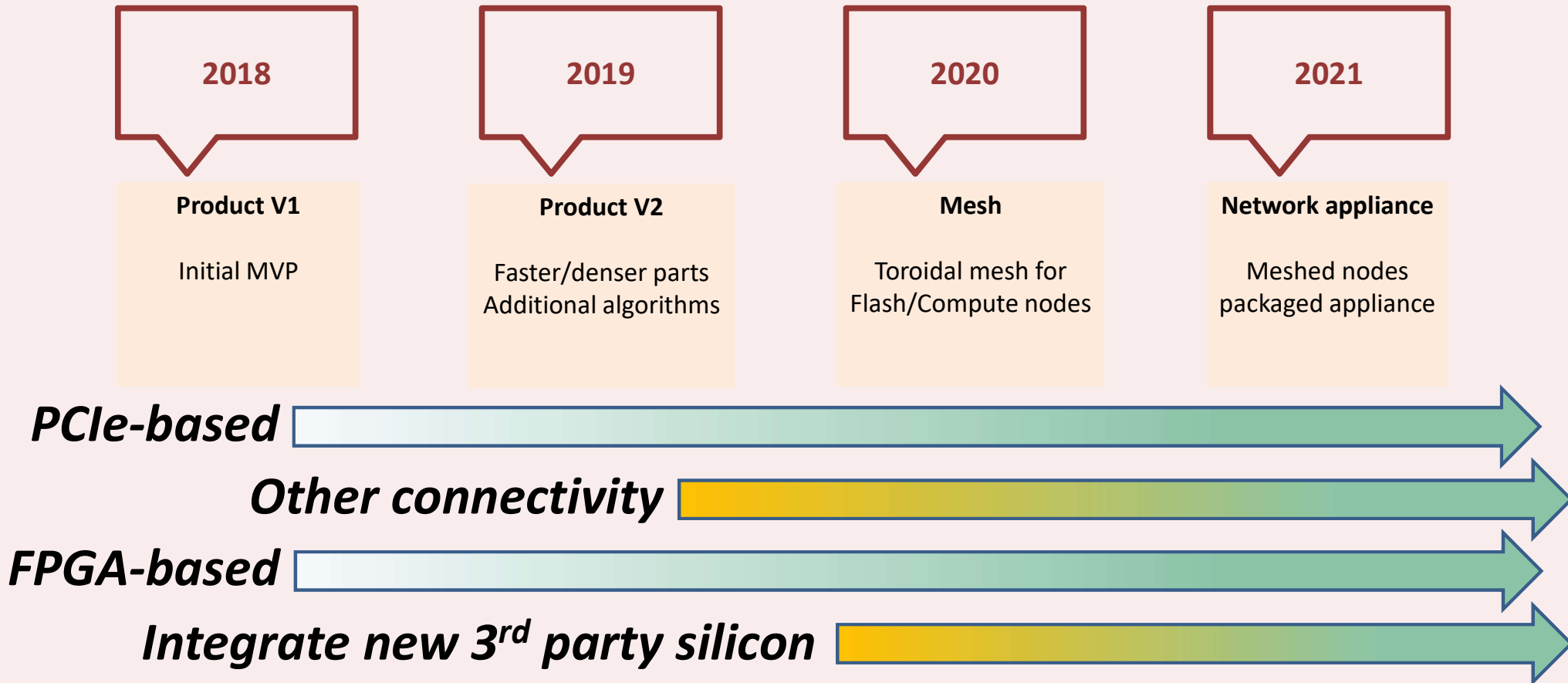
Fermat Algorithm Library

Breadth of Precompiled Algorithms for Applications





Product Roadmap

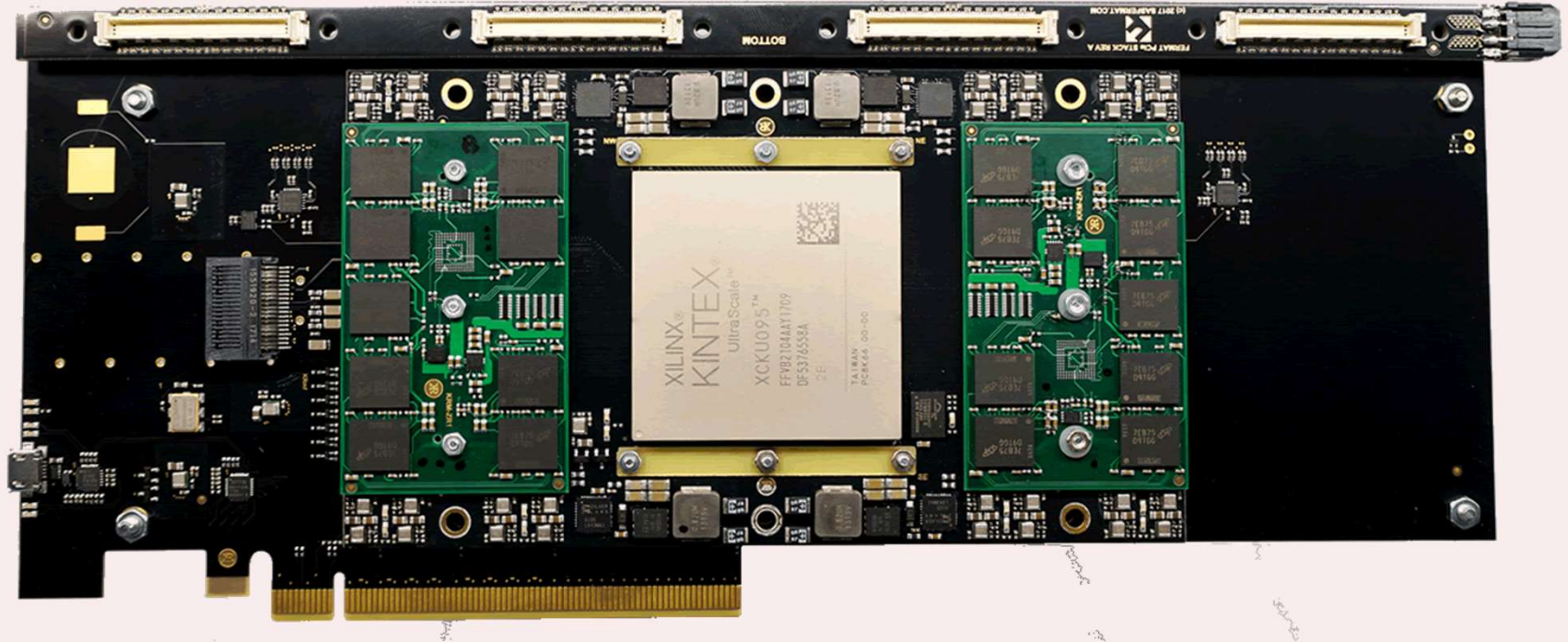




Fermat Module Images

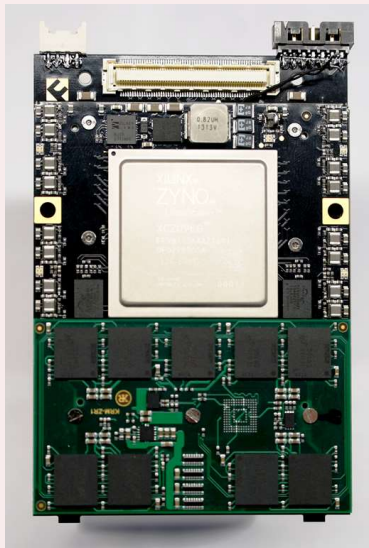


Fermat V1 Module: PCIe Carrier Supports up to 8 Flash/Compute Nodes

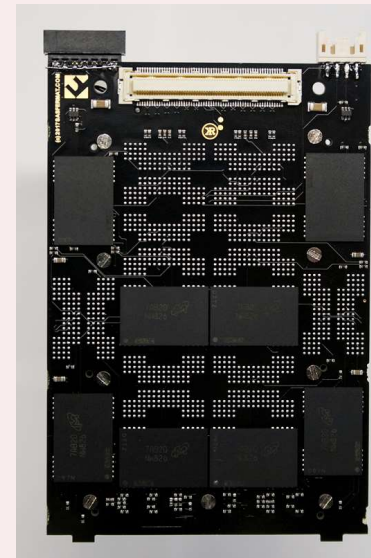




Fermat V1 Module: Flash/Compute Node



Front: Compute Node



Back: Flash Node

Up to 4 TB Flash directly interfaced via high speed bus to FPGA MPSoC processor



Fermat V1 Module: PCIe Carrier with Flash/Compute Node

