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# A Flexible Enterprise SSD Architecture for Fast Growing China Data Center Market



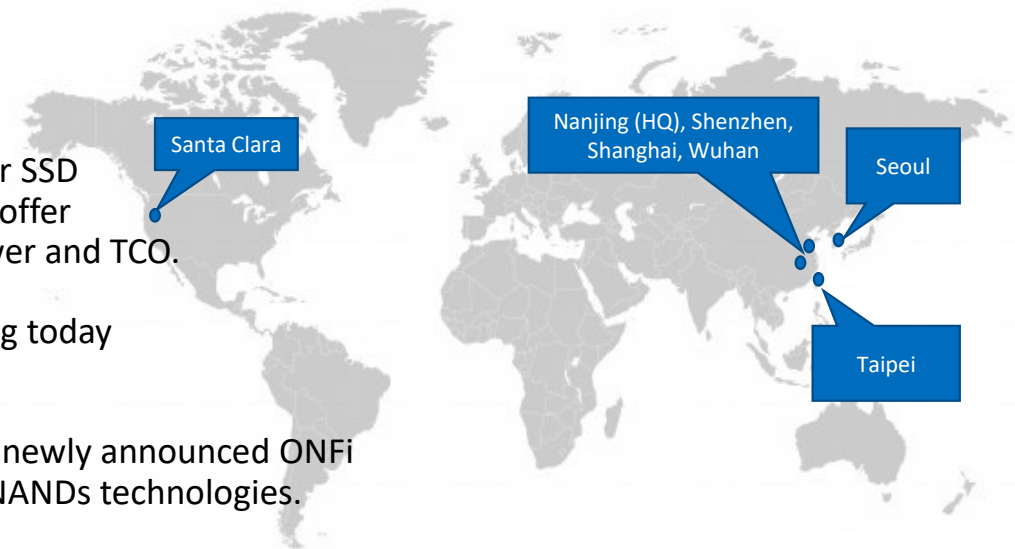
# About PETAiO



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- ❑ PETAiO was founded by a serial entrepreneur and several SSD's experienced engineers
- ❑ We are a global team with China's main operation in Nanjing, R&D offices in Shenzhen, Shanghai, and Wuhan. Other R&D and product engineering locations include Santa Clara, Seoul, and Taipei.
- ❑ PETAiO is a leading storage provider, focusing on Data Center SSD based on the proprietary Titanium controller architected to offer superior performance and consistent QoS at the lowest power and TCO.
- ❑ PCIe Gen4x4 SSD based on Titanium-DC controller is shipping today supporting the latest 3D-NAND from all the major vendors.
- ❑ PCIe Gen5x4/CXL SSD with Titanium-XP controller, supports newly announced ONFi 5.0 at 2.4GT/s flashes and future (200+ and beyond layers) NANDs technologies.
- ❑ Titanium-XP supports SCM, AI/ML computational engine, and up to 64TB flash capacity for HPC, High Capacities Servers, Genomic and hyperscale data-center usages.



# China Market Trend

- ❑ China market has been dominated by Samsung, Intel ... major OEMs.
- ❑ China market and government officials are requesting enterprise solutions for China's massive IDC across the wide range of national geographic locations.
- ❑ Local governments are investing heavily into **Data Business**, which is the **New Construction initiative** for future growth: from AI-enabled analyzing of consumer behaviors and shopping habits to motivated B2C promotions.
- ❑ China's Digital Market and eCommerce are probably growing toward 5-10x US volume. Mobile currencies infrastructure has already enabled China to become a **fully digital and data-driven country**, well ahead of the US and EU.
- ❑ Private Sector and Government are driving hard to move everything to IDCs
- ❑ 5G infrastructure and Edge computing are also well ahead of US and EU deployment.

# China Storage Reality - Shortage of Talents and Proven Solutions



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- ❑ History: China didn't go through magnetic media (HDD) as main solutions technology cycle. China is directly jumping to SSD with semiconductors (NANDs) as major storage media.
- ❑ Curving ahead means China didn't accumulate a large talents pool in the last 20-30 years. Most senior-experienced engineers are coming from large OEM companies in US and Korea. China is currently short of 2000-3000 talented engineers for the domestic storage industry.
- ❑ Within a globally competitive environment with high entry barriers, PetaIO's global presence is leveraging key storage talents with 10-20 years of experience to build a platform approach that enables a broad range of partners and customer to quickly adopt and personalize proved SSD solution to the newest generation of China's Data Storage Systems.
- ❑ SSD QoS and Reliability, comparable to Samsung & Intel products, are KEY to win large businesses in China
- ❑ Chinese government also drive hard on Carbon Footprint targets: carbon neutral in 10 years!
- ❑ China customers range is broader than US ones: Hyperscalers, Server OEMs, Gov drive private cloud builders, industrial usages, special purpose applications etc..

# PETAiO Titanium Architecture Driving Factors



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# PETAIo Titanium Controller “4-ABLE” Architecture



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## ❑ PETAIo 4-ABLE Architecture Key Factors

- ❑ **Flexible** to optimize interoperability between FW functions and HW automation
- ❑ **Scalable** to seamlessly scale up/down ASIC # of Channels and # Flash CE per Channel
- ❑ **Configurable** to maximize resources utilization, their parallelism and concurrent functions
- ❑ **Customizable** to support special functions of new features without performance impact

## ❑ PETAIo 4-ABLE Architecture Competitiveness

- ❑ Gen4x4 Top-Notch Performances with Max Power < 12W, Multiple Flash Vendors
- ❑ 8 Channels Low-Cost SoC
- ❑ Demonstrated Best-in-Class Controller with consistent QoS Latency

# Titanium-DC Architecture optimized for Data Center

## ❑ Performance Path (HW) Acceleration

- ❑ Maximum Performance throughput
- ❑ Minimum QoS latency and Power

## ❑ Tightly Coupled (TC) Firmware

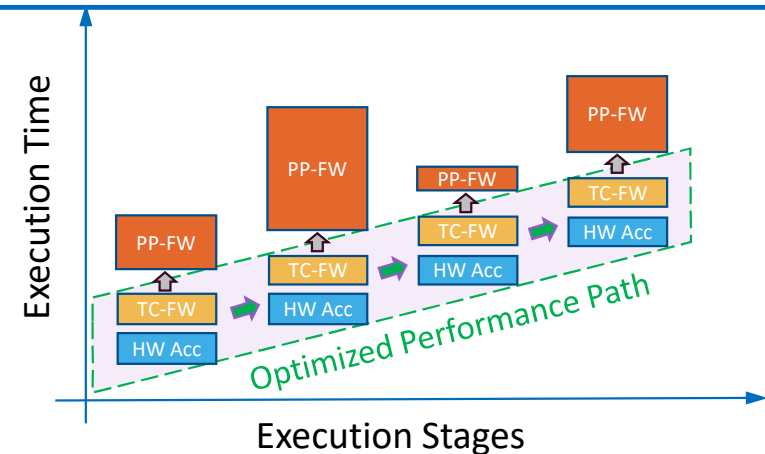
- ❑ Real-time operations control and data management

## ❑ Pipelined (PP) Firmware for Non-Critical Performance functions

- ❑ Flexibility, extensibility, customizations

## ❑ Host Data and Background Data(GC, WL, BGMS) separation

- ❑ Multi-stream operations with priority queues management
- ❑ Host data : performance and QoS
- ❑ Background data : WA optimization, Flash data integrity



# PETA8118 Results



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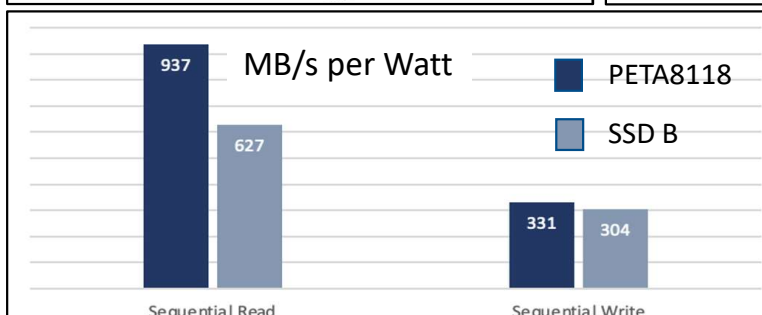
## Full PCIe Gen4 class Performance

Workload	PETA8118 U.2 SSD
Sequential Read	7.0 GB/s
Sequential Write	3.6 GB/s
Random Read	1,100 KIOPS
Random Write	170 KIOPS

## Best in Class QoS consistency



## Most Competitive Power Efficiency





THANK YOU