

Workload Optimized[®] ARMv8 Processors

ThunderX2™ Family of Workload Optimized Processors



Product Brief

OVERVIEW

The ThunderX2™ product family is the second generation of 64-bit ARMv8 Data Center & Cloud Processors, offering unprecedented level of integration and industry leading SoC performance. The product family comprises of high performance fully out-of-order (OOO) custom ARMv8 cores supporting single and dual socket configuration. The SoC integrates hardware accelerators, scalable fabric, feature rich 25Gbps I/O's supporting full level of virtualization along with high memory capacity thereby providing the best in class performance/\$ and performance/watt. The ThunderX2™ family includes multiple Workload Optimized SKUs that enable servers & appliances that are optimized for compute, storage, networking and secure compute workloads in the cloud. This product family is based on highly efficient full custom processor cores designed by Cavium in 14FF process technology under architectural license from ARM. It is fully compliant with ARMv8 architecture as well as ARM's Server Base System Architecture (SBSA) standard.

FEATURES

Processor Sub-System:

- ARM based server class SoC that integrates a large number of custom ARMv8-A cores and scales to high core frequency
- ARM based SoC to be fully cache coherent across dual sockets using 2nd generation of Cavium Coherent Processor Interconnect (CCPI™)
- The largest integrated I/O capacity with 100s of Gigabits of I/O bandwidth using integrated 25Gbps SerDes
- Multiple DDR4 72 bit memory controllers capable of supporting highest performance server memories with 1+TB of memory in a dual socket configuration
- Hundreds of integrated hardware accelerators for security, storage, networking and virtualization applications
- Virtualization everywhere with Cavium virtSOC™ technology – Full system level low latency virtualization solution from core to I/O
- Support for PCIe Gen3 x16 along with integrated IO and SATAv3 ports

Memory Interfaces:

- Up to 6 DDR4 memory Controllers
- Up to 3TB of memory capacity in dual socket configuration

I/ O Interfaces:

- Multiple 10/25/40/50/100GE ports
- Multiple independent SATAv3 interfaces
- Multiple PCIe – x4 , x8, x16

Virtualization:

- End-to-End virtualization from I/O to core (virtSoC™)

Accelerators:

- Integrated accelerators for virtualization, storage, networking and security
- OCTEON® style packet Parsing, Shaping, Lookup, QoS and Forwarding

Operating System and Related Software Support:

- Server Base Boot Requirements (SBBR), UEFI, ACPI support
- SBSA Level 2 compliant
- Ubuntu 16.04 LTS and later
- Red Hat Early Access for ARMv8
- SUSE SLES SP2 and later
- CentOS 7.2 and later
- FreeBSD 11.0 and later

Management:

- External Baseband Management Controller (BMC)
- Supports standard BMC interfaces & functions
- IPMI 2.0 compliant
- Redfish

Reference Platforms:

- Available from ODM partners

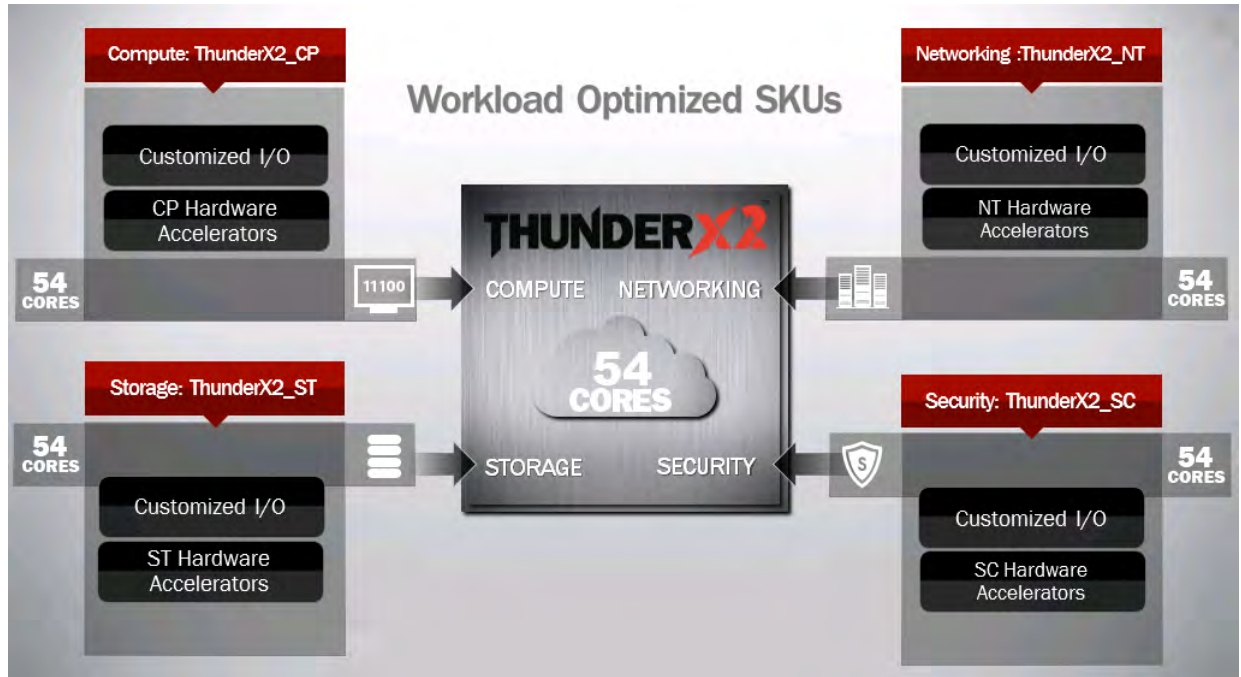
BENEFITS

Delivers workload optimized server class processing providing the best performance/watt and performance

Workloads:

- Public & Private Cloud
- Web Caching, Web Search, Web Serving
- Secure Web servers
- Distributed and Massive Parallel Databases
- Data Analytics and Big Data
- Cloud Storage
- Telecom servers
- Network Function Virtualization (NFV)





ThunderX2_CP™: Up to 54 highly efficient cores along with integrated vSoC, multiple 10/25/40/50/100 GbE and high memory bandwidth. This family is optimized for private and public cloud web servers and content delivery, web caching and social media data analytics workloads.

ThunderX2_ST™: Up to 54 highly efficient cores along with integrated vSoC, multiple SATAv3 controllers, 10/25/40/50/100 GbE & PCIe Gen3 ports, high memory bandwidth, dual socket coherency, and scalable fabric for east-west as well as north-south traffic connectivity. This family includes hardware accelerators for data protection/integrity/security, user to user efficient data movement (RoCE) and compressed storage. This family is optimized for Hadoop, block & object storage, distributed file storage and hot/warm/cold storage type workloads.

ThunderX2_SC™: Up to 54 highly efficient cores along with integrated vSoC, 10/25/40/50/100 GbE connectivity, multiple PCIe Gen3 ports, high memory bandwidth, dual socket coherency, and scalable fabric for east-west as well as north-south traffic connectivity. The hardware accelerators include Cavium's industry leading 5th generation NITROX and TurboDPI technology with acceleration for IPSec, SSL, Anti-virus, Anti-malware, firewall and DPI. This family is optimized for Secure Web frontend, security appliances and Cloud RAN type workloads.

ThunderX2_NT™: Up to 54 highly efficient cores along with integrated vSoC, 10/25/40/50/100 GbE connectivity, multiple PCIe Gen3 ports, high memory bandwidth, dual socket coherency, and scalable fabric with feature rich capabilities for bandwidth provisioning, QoS, traffic Shaping and tunnel termination. The hardware accelerators include high packet throughput processing, network virtualization and data monitoring. This family is optimized for media servers, scale-out embedded application and NFV type workloads.

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ThunderX2_CP – Compute

Workloads

- Public & Private Cloud
- Web Caching
- Web Serving
- Search
- Social Media Data Analysis

ThunderX2_CP

- High performance compute
 - 54 cores
- High network bandwidth & capacity
 - 10/25/40/50/100G
- High memory BW, Low memory latency
- Full end to end virtualization

ThunderX2_NT – Networking

Workloads

- Telecom Server
- Media Server
- NFV Appliance
- Gaming Server

ThunderX2_NT

- High network bandwidth
 - Multi-10/25/50/100G ports
- Scalable compute performance
 - 54 cores
- High performance packet processing
 - Integrated fabric
- virtSOC: Core to I/O virtualization
- High memory bandwidth / capacity
 - 6 DDR4 controller

ThunderX2_ST – Storage

Workloads

- Block, Object & Distributed File Storage
- Data Analytics
- Distributed Databases

ThunderX2_ST

- High network & storage I/O
- Highly scalable platform
 - Multi-SATAv3 ports
 - Multi-10/25/40/50/100G ports
 - Multi – x4/8/16 Gen3 PCIe
- Storage Accelerators
 - Data Protection/Compression
 - Big Data Search
 - RAID / CRC
- Integrated low latency fabric for NAS
- NVMe/SSD interface support

ThunderX2_SC – Security

Workloads

- Secure web front end
- Cloud RAN

ThunderX2_SC

- High network bandwidth
 - Multi- 10/25/40/50/100G ports
- High compute performance
 - 54 cores
- Security Accelerators
 - SSL/ IPSEC/ DPI