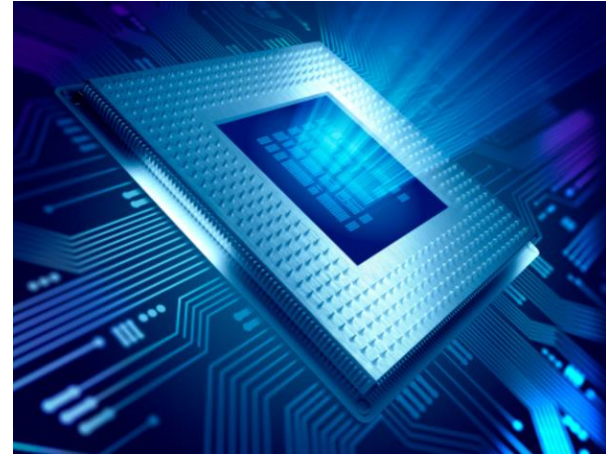


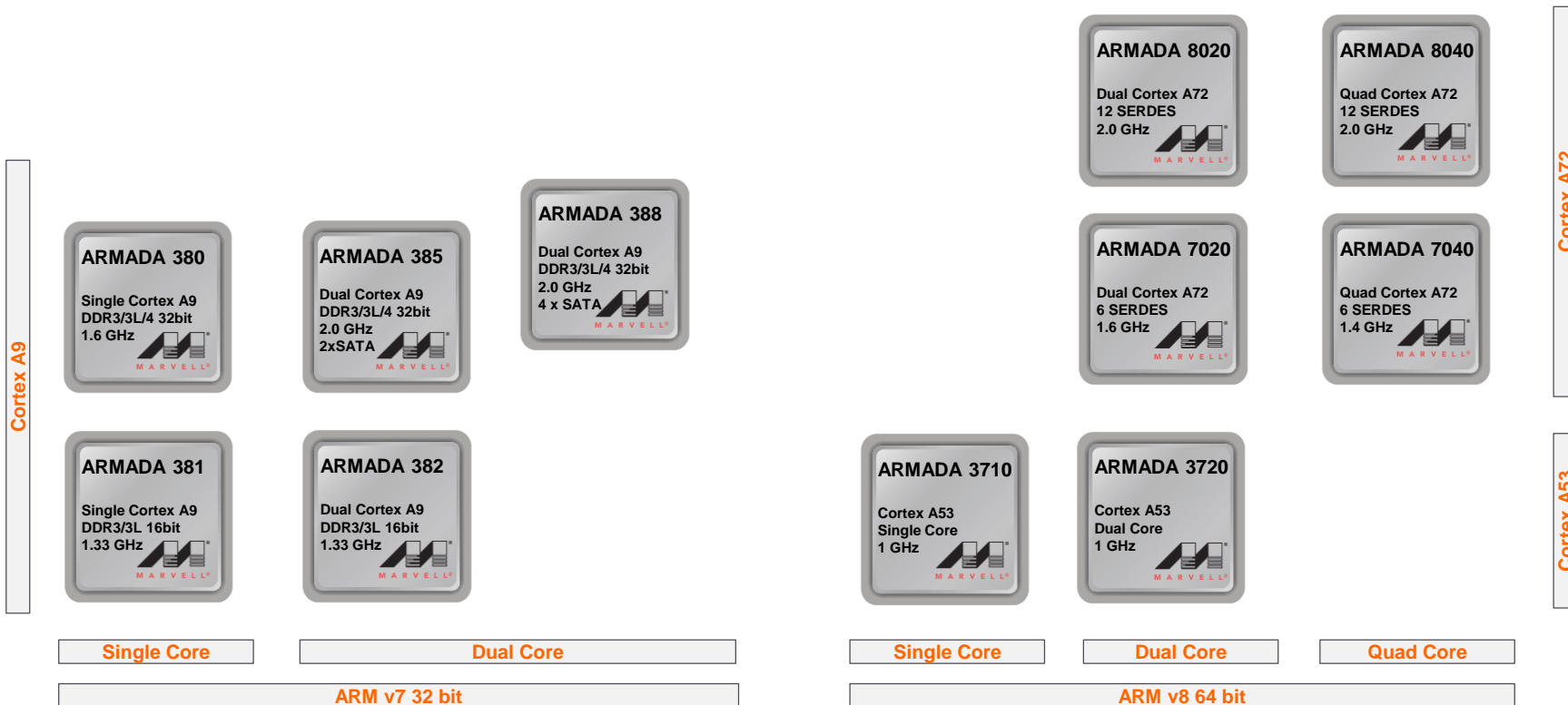
ARMADA Embedded Processors

ARMADA 38x/37xx/70x0/80x0 SoC families



ARMADA Embedded Processors

Supporting Commercial and Industrial grade



ARMADA 7K

Dual/Quad Cortex A72 with one 10GbE Ports

- **Dual/Quad ARMv8 A72 @ up to 1.6 GHz**

- One/two Clusters of dual Cores A72 with 512K/1MB Shared L2 Cache
- High performance Coherent interconnect (Aurora2) @ 1.2GHz
- 1MB L3 Exclusive
- Support up to 32b+ECC DDR4-1600
- Virtualization support
- Secured boot support
- Trustzone support

- **Networking subsystem**

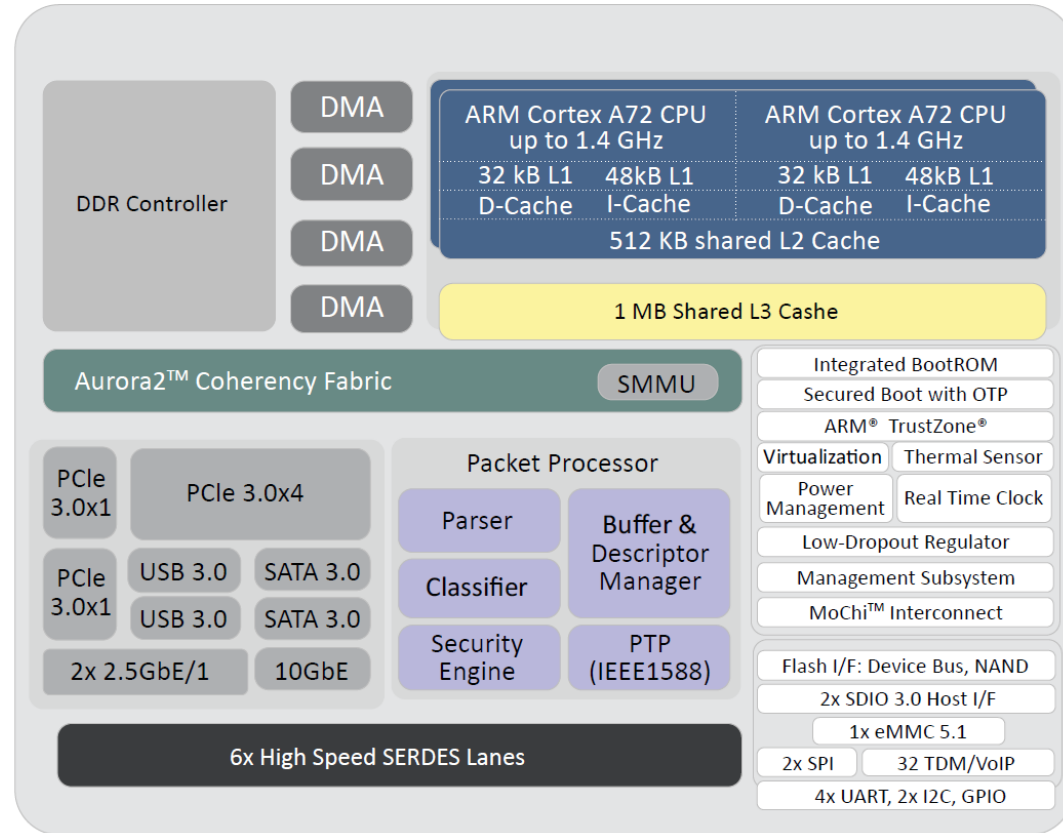
- Configurable Packet Processor
- 12Gbps aggregated throughput
- 1x 10GbE + 2x 1GbE connectivity

- **Offload engines**

- SuiteB compatible, high throughput security engine, IPSEC and SSL protocols offload
- Management Environment micro-controller
 - Advanced power management
 - Board management

- **SATA3.0, USB3.0, PCIe3.0**

M A R V E L L



ARMADA 8K

- **Dual/Quad ARMv8 A72 @ up to 2 GHz**

- One/two Clusters of dual Cores A72 with 512K/1MB Shared L2 Cache
- High performance Coherent interconnect (Aurora2) @ 1.2GHz
- 1MB L3 Exclusive
- Support up to 32/64b+ECC DDR4-2100
- Virtualization support
- Secured boot support
- Trustzone support

- **Networking subsystem**

- Configurable Packet Processor
- 24Gbps aggregated throughput
- 2x 10GbE + 4x 1GbE connectivity

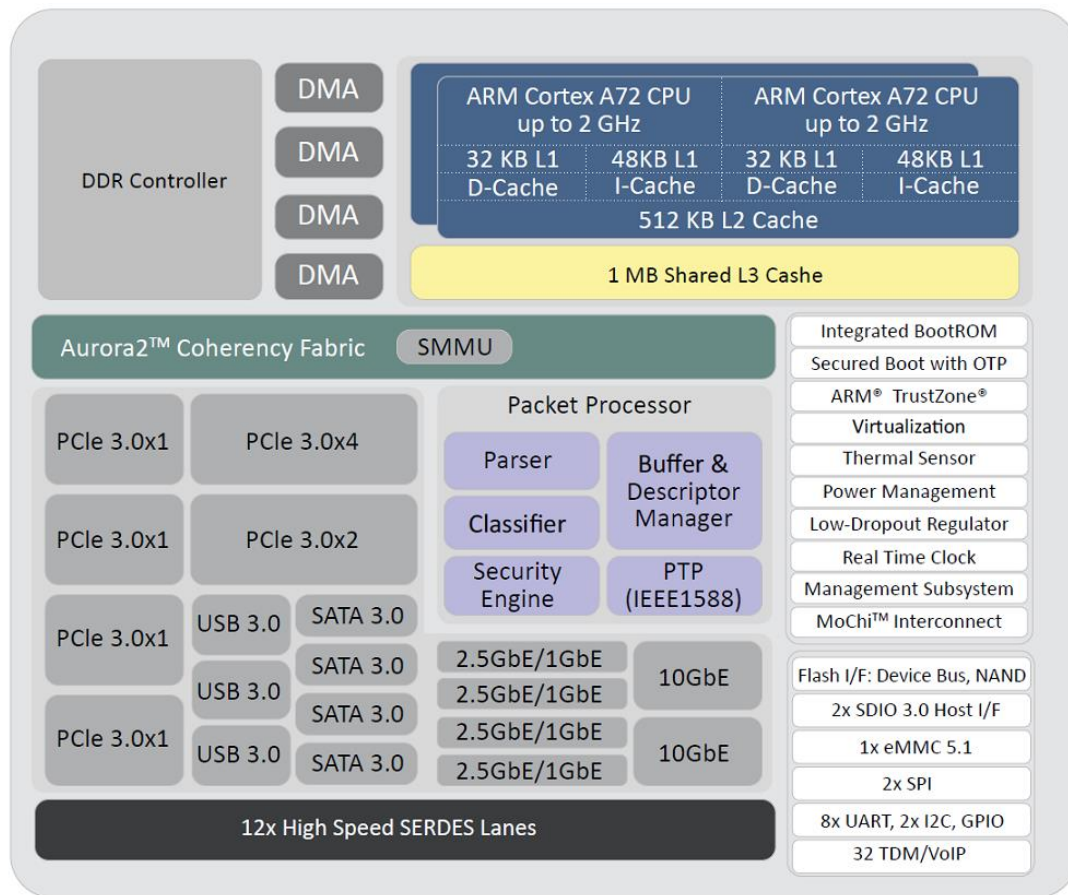
- **Offload engines**

- SuiteB compatible, high throughput security engine, IPSEC and SSL protocols offload
- Management Environment micro-controller
 - Advanced power management
 - Board management

- **SATA3.0, USB3.0, PCIe3.0**

M A R V E L L

Dual/Quad Cortex A72 with two 10GbE Ports



ARMADA 7K/8K Product Flavors

	ARMADA 7K (Cortex A72)		ARMADA 8K (Cortex A72)	
	Dual Core	Quad Core	Dual Core	Quad Core
Name	Aramda-7020	Armada-7040	Armada-8020	Armada-8040
Part number	88F7020	88F7040	88F8020	88F8040
Secure Boot	Yes	Yes	Yes	Yes
Industrial grade support	Yes	Yes	Yes	Yes
Max Core Speed [GHz]	1.6 GHz	1.4 GHz	2.0 GHz	2.0 GHz
GbE Ports	2x 1/2.5GBE + 1x 10GbE	2x 1/2.5GBE + 1x 10GbE	4x 1/2.5GBE + 2x 10GbE	4x 1/2.5GBE + 2x 10GbE
UART	4	4	4	4
Device bus	8/16 bit	8/16 bit	8/16 bit	8/16 bit
DDR	DDR4 32bit+ECC 800MHz (DDR1600)	DDR4 32bit+ECC 800MHz (DDR1600)	DDR4 64/32bit+ECC 1050MHz (DDR2100)	DDR4 64/32bit+ECC 1050MHz (DDR2100)
PCIe3.0	1x PCIe3.0 x4/x2/x1 + 2x PCIe3.0 x1	1x PCIe3.0 x4/x2/x1 + 2x PCIe3.0 x1	1x PCIe3.0 x4/x2/x1 + 1x PCIe3.0 x1/x2 + 4x PCIe3 X1	1x PCIe3.0 x4/x2/x1 + 1x PCIe3.0 x1/x2 + 4x PCIe3 X1
USB3.0	2	2	3	3
SATA3.0	2	2	4	4
SDIO3.0	Yes	Yes	Yes	Yes
I2S / SPDIF	Yes	Yes	Yes	Yes
TDM	32 channels	32 channels	32 channels	32 channels
High Speed SERDES	6	6	12	12
GPIO	63	63	63	63

ARMADA 7K/8K Software Ecosystem

SDK 17.06

NEW

Standalone Deliveries

Linux Kernel

- Linux Kernel 4.4.52

Boot Loaders

- U-Boot 2017.3 (with ATF 1.3)
- UEFI 2.6 (with ATF 1.3)
 - SBBR & ACPI

User Space networking

- netmap
- Marvell User Space SDK (MUSDK)
- OpenDataPlane (ODP)
- Data Plane Development Kit DPDK
- OpenFastPath (OFF)

Tool Chain

- Linaro gcc 5.3.1

Documentation

HTML Doxygen based documentation

Yocto SDK

Yocto 2.1

- Linux Kernel
- Boot Loaders
- User Space Networking

yocto
PROJECT



OpenFastPath



Software is Publicly available @



Up-streamed Software

- Mainline UEFI
- Mainline U-Boot
- Mainline Linux

OpenWrt
Wireless Freedom

- OpenWrt-DD/LEDE
- Kernel 4.4.8 (SDK 17.02)

Carrier Grade Operating Systems

- Windriver Linux
- Montavista Linux
- ENEA Linux



Enterprise Linux OS

- Suse Enterprise Linux
- Open Suse



MACCHIATObin

Community Board



<http://www.macchiatobin.net>

NFV PicoPod



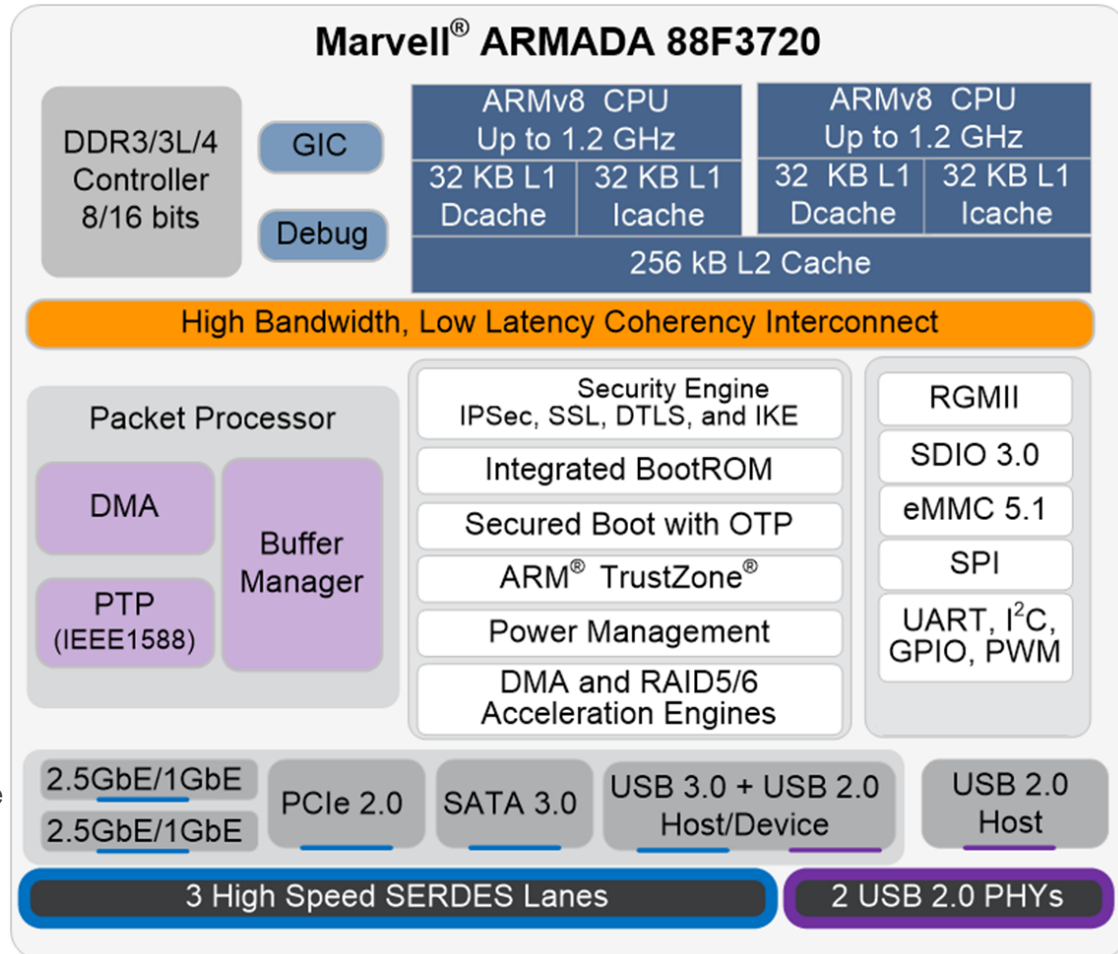
<https://www.picocluster.com/products/nfv-picopod>



<https://github.com/MarvellEmbeddedProcessors>

ARMADA 37xx

- **Dual/Single A53 up to 1 GHz**
 - 256KB Shared L2 cache
- **16bit DDR3L/DDR4**
 - 4GB memory space
- **USB 2.0 + PHY**
- **SDIO 3.0/eMMC 5.0 , UART, RGMII**
- **3 multiplexed SERDES lanes**
 - 2x GbE (1/2.5 GE)
 - 1x PCIe Gen2.0 x1
 - 1x USB3.0 H/D
 - SATA 3.0
- **Acceleration engines**
 - DMA with XOR offload
 - SuitB compatible, High throughput crypto engine
- **Advanced power management**
- **Trustzone support**



ARMADA 37xx Product Flavors

	ARMADA 37xx	
	Single Core	Dual Core
Name	ARMADA 3710	ARMADA 3720
Part number	88F3710	88F3720
Secure Boot	Yes	Yes
Industrial grade support	Yes	Yes
Max Core Speed [GHz]	1 GHZ	1 GHZ
GbE Ports	2 x 1/2.5GbE	2 x 1/2.5GbE
UART	2	2
Device bus	no	no
DDR	16 bit DDR3/3L/4	16 bit DDR3/3L/4
PCIe	Gen2.0 1 x PCIe 2.0 x1	Gen2.0 1 x PCIe 2.0 x1
USB3.0 (Host)	1 x USB3/USB2 and 1 x USB2	1 x USB3/USB2 and 1 x USB2
USB3.0 (Device)	USB3/USB2 can be configure as device	USB3/USB2 can be configure as device
SATA3.0	1	1
SDIO3	yes	Yes
I2S / SPDIF	no	no
TDM	no	no
High Speed SERDES	3	3
GPIO	76	76

ARMADA 37xx Software Ecosystem

SDK 17.06

NEW

Standalone Deliveries

Linux Kernel

- Linux Kernel 4.4.52

Boot Loaders

- U-Boot 2017.3 (with ATF 1.3)

User Space networking

- Marvell User Space SDK (MUSDK) NEW

Tool Chain

- Linaro gcc 5.3.1

Documentation

HTML Doxygen based documentation

Yocto SDK

Yocto 2.1

- Linux Kernel
- Boot Loaders

yocto
PROJECT



Software is Publicly available @



Up-streamed Software

- Mainline U-Boot
- Mainline Linux

OpenWrt
Wireless Freedom

- OpenWrt-DD/LEDE
- Kernel 4.4.8 (SDK 17.02)

Carrier Grade Operating Systems

- Windriver Linux
- Montavista Linux



Enterprise Linux OS

- Suse Enterprise Linux
- Open Suse



ESPRESSObin

Community Board



<http://www.espressobin.net>

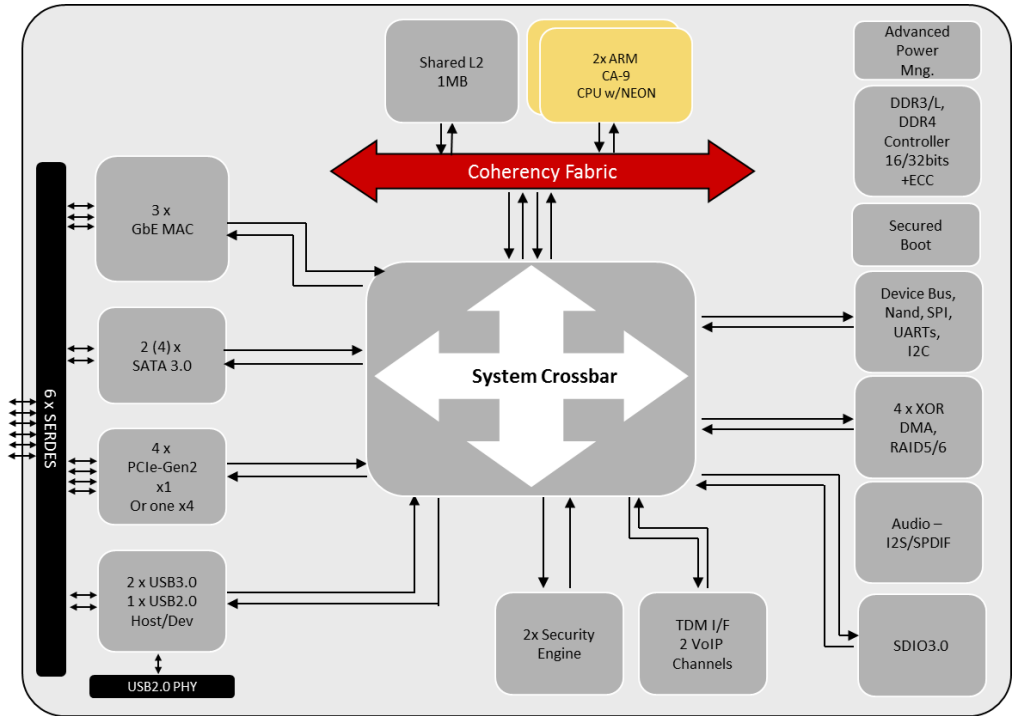
<http://wiki.espressobin.net>

<https://github.com/MarvellEmbeddedProcessors>

ARMADA 38x

High performance Dual ARMv7 @ 2.0 GHz

- **Dual ARM Cortex A9**
 - Up to 2.0 GHz
 - NEON
 - Shared 1MB L2 cache
 - MESI and IO Cache Coherency
- **16/32-bit DDR3/3L/4 + ECC**
 - 4GB memory space
- **6 multiplexed SERDES lanes**
 - 3x GigE
 - 4x PCIe Gen2.0 x1 or One x4
 - 2x USB3.0
 - 4 x SATA3.0
- **USB 2.0 + PHY**
- **Rich IOs**
 - SDIO 3.0, NAND, SPI, UART, I2C
 - 16-bit Device bus
- **Secured boot**
- **Acceleration engines**
- **Advanced power management**



ARMADA 38x Product Flavors

	ARMADA 38x				
	Single Core		Dual Core		
Name	ARMADA 380	ARMADA 381	ARMADA 382	ARMADA 385	ARMADA 388
Part number	88F6810	88F6811	88F6821	88F6820	88F6828
Secure Boot	Yes	Yes	Yes	Yes	Yes
Industrial grade support	Yes	-	-	Yes	Yes
Max Core Speed [GHz]	1.6GHz	1.33GHz	1.33GHz	2.0GHz	2.0GHz
GbE Ports	2	2	2	3	3
RGMII	2	1	1	2	2
SGMII	2	2	2	3	3
QSGMII	-	-	-	Yes	Yes
DDR3/3L/4	DDR3/3L/4 16/32bit+ECC 800/900MHz	DDR3/3L 16bit 667MHz +ECC	DDR3/3L 16bit 667MHz+ECC	DDR3/3L/4 16/32bit+ECC 800/900MHz	DDR3/3L/4 16/32bit+ECC 800/900MHz
PCIe2.0	3 x1	3 x1	3 x1	1x4+2x1 or 4x1	1x4+2x1 or 4x1
USB2.0 (Host/Device)	1	1	1	1	1
USB3.0 (Host)	2	2	2	2	2
USB3.0 (Device)	1	1	1	1	1
SATA3	2	2	2	2	4
SDIO3	Yes	Yes	Yes	Yes	Yes
I2S / SPDIF	Yes	-	-	Yes	Yes
2 Channel TDM	Yes	-	-	Yes	Yes
High Speed SERDES	5	4	4	6	6
GPIO	60	48	48	60	60

ARMADA 38x Software Ecosystem

SDK 17.06

NEW

Standalone Deliveries

Linux Kernel

- Linux Kernel 4.4.52
- Linux Kernel 3.10.x

Boot Loaders

- U-Boot 2013.1

Tool Chain

- Linaro gcc 5.3.1

Documentation

HTML Doxygen based documentation

Yocto SDK

Yocto 2.1

- Linux Kernel
- Boot Loaders

yocto
PROJECT



open source



Software is Publicly available @



Up-streamed Software

- Mainline U-Boot
- Mainline Linux

OpenWrt
Wireless Freedom

- OpenWrt-DD/LEDE
- Kernel 4.4.8 (SDK 17.02)

Carrier Grade Operating Systems

- Windriver Linux
- Montavista Linux
- ENEA Linux



Enterprise Linux OS

- Open Suse



SolidRun ClearFog community boards




<https://www.solid-run.com/marvell-armada-family/clearfog/>



<https://github.com/MarvellEmbeddedProcessors>

ARMADA 38x/37xx/7K/8K Applications

Access Routers



Wireless Controllers

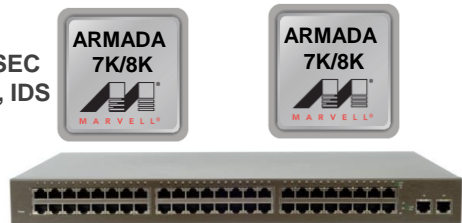
Enterprise Network Appliances



Universal Network Appliances (uCPE)

Data Plane CPU Control Plane CPU


IPSEC IPS, IDS




Switch CPU



Home Routers

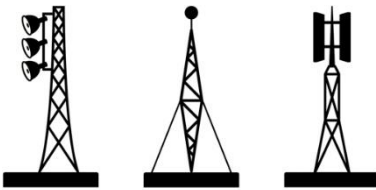


Distributed Storage



Network Attached Storage (NAS)

Storage Appliances



Backhaul Networking



Smart Grid Industrial Transportation

IoT Gateways



Security Appliances

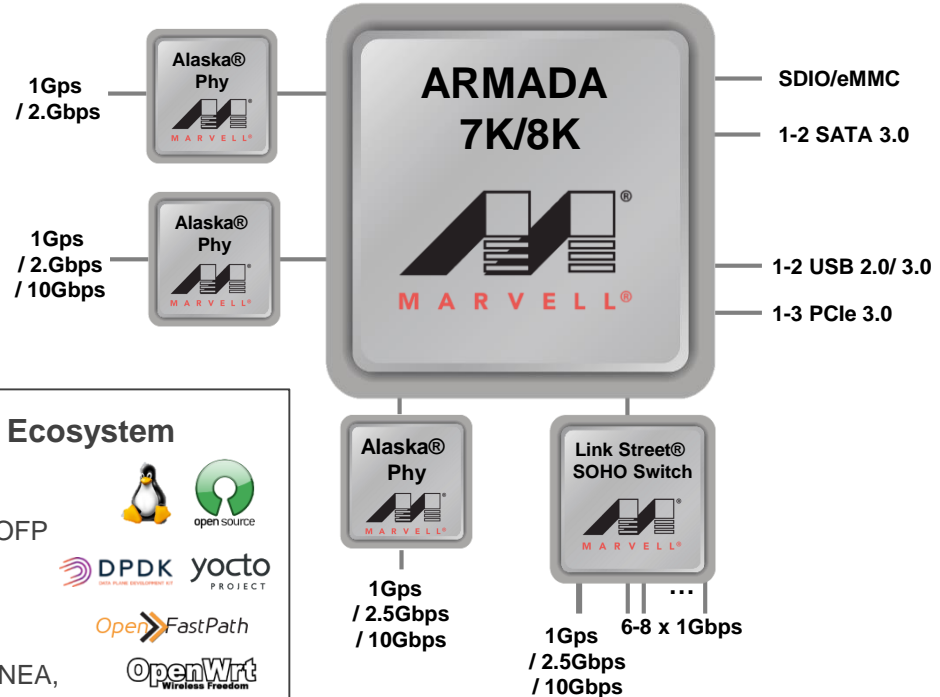
Network & Security Applications

- **Secure Boot** and **Trust Zone** support
- **Commercial** and **Industrial Grade**
- **Dual core** and **Quad core** flavors.
- **CPU frequency** - 800MHZ to 2.0GHZ
- High Performance: **Up to 38K DMIPS**
- **Low power SoC: 5W-15W**
- **A7K Fan-less design**
- **Cost effective** integrative solution that include **CPU, PHY** and **SOHO switch**
- Network Connectivity: **1Gbps, 2.5Gbps, 10Gbps**
- **10Gbps** network processor
- Up to **10Gbps IPSEC** engine
- High performance **DMA engines**



Rich Software Ecosystem

- U-Boot, UEFI, Linux
- Netmap, ODP, DPDK, OFP
- Yocto, OpenWrt
- Suse Linux Enterprise
- Carrier Grade Linux : ENEA,
Windriver, Montavista



Access Routers, Security Appliances, Wireless Controllers, Universal CPE, IoT Gateways

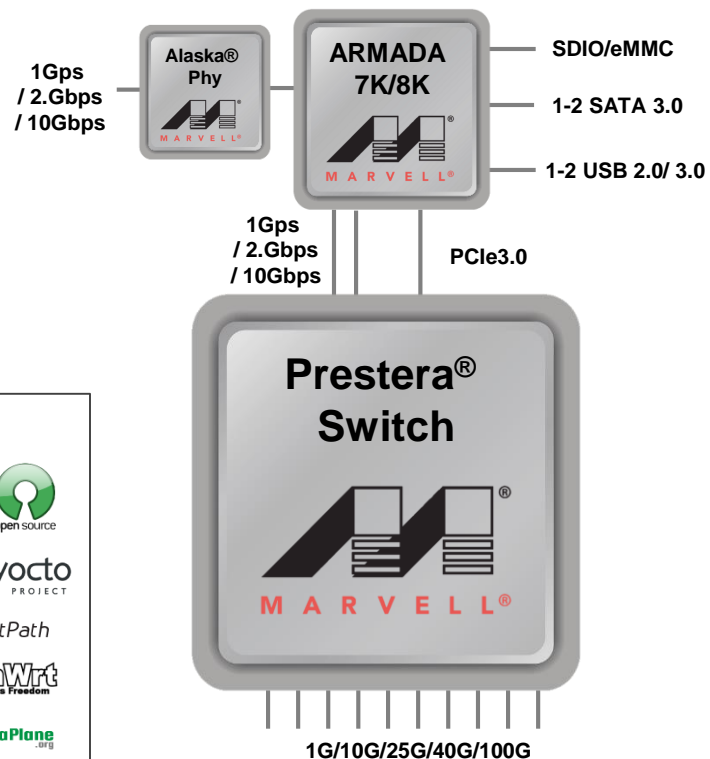
Switch CPU

- **Secure Boot** and **Trust Zone** support
- **Commercial** and **Industrial Grade**
- **Dual core** and **Quad core** flavors.
- **CPU frequency** - 800MHZ to 2.0GHZ
- High Performance: **Up to 38K DMIPS**
- **Low power SoC: 5W-15W**
- **A7K Fan-less design**
- **Cost effective** integrative solution that include **CPU, PHY** and **SOHO switch**
- Network Connectivity: **1Gbps, 2.5Gbps, 10Gbps**
- **10Gbps** network processor
- Up to **10Gbps IPSEC** engine
- High performance **DMA engines**



Rich Software Ecosystem

- U-Boot, UEFI, Linux
- Netmap, ODP, DPDK, OFP
- Yocto, OpenWrt
- Suse Linux Enterprise
- Carrier Grade Linux : ENEA, Windriver, Montavista












Management CPU, Control Plane, Data Plane CPU

Marvell SDK 17.06 Public Git Repositories

	Supported SoCs	Git repository address
ARM Trusted Firmware (ATF)	ARMADA 37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/atf-marvell/tree/atf-v1.3-armada-17.06
U-Boot 2013.01 boot loader	ARMADA 38x	https://github.com/MarvellEmbeddedProcessors/u-boot-marvell/tree/u-boot-2017.03-armada-17.06
U-Boot 2017.03 boot loader	ARMADA 37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/u-boot-marvell/tree/u-boot-2017.03-armada-17.06
UEFI boot loader	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/uefi-marvell/tree/uefi-armada-17.06
Linux Kernel	ARMADA 38x/37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/linux-marvell/tree/linux-4.4.52-armada-17.06
Yocto	ARMADA 38x/37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/marvell-embedded-linux-platform/tree/krogoth
OpenWrt	ARMADA 38x/37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/openwrt-dd/tree/openwrt_17.02_release
netmap	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/netmap-marvell/tree/netmap-armada-17.06
Marvell User Space SDK (MUSDK)	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/musdk-marvell/tree/musdk-armada-17.06
Open Data Plane (ODP)	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/odp-marvell/tree/odp-armada-17.06
Open Fast Path (OFP)	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/ofp-marvell/tree/ofp-armada-17.06
Data Plane Development Kit (DPDK)	ARMADA 7K/8K	https://github.com/MarvellEmbeddedProcessors/dpdk-marvell
Buildroot	ARMADA 38x/37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/buildroot-marvell/tree/buildroot-2015.11-16.08
Marvell DDR Training library (mv-ddr)	ARMADA 38x/37xx/7K/8K	https://github.com/MarvellEmbeddedProcessors/mv-ddr-marvell/tree/mv_ddr-armada-17.06
ARMADA 37xx boot loader utilities	ARMADA 37xx	https://github.com/MarvellEmbeddedProcessors/A3700-utils-marvell/tree/A3700_utils-armada-17.06

Software Partners

	Linux , U-Boot, FreeBSD, ODP, DPDK	http://www.semihalf.com/
	Linux , U-Boot	http://free-electrons.com/
	Linux , U-Boot	http://www.denx.de/
	Yocto, Linux	https://www.ossystems.com.br/
	OpenWrt, Linux	http://sartura.hr/
	Windriver Linux	https://www.windriver.com/
	CGX Linux, CGE7 Linux	http://www.mvista.com/
	ENEA Linux, ODP, OFP	https://www.enea.com/
	Suse Linux, Suse Enterprise Linux	https://www.suse.com/



For more information:

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maen@marvell.com