Using NANDrive™ in Arm®-based Systems

The Arm® architecture is based on an extremely flexible and powerful processor core, making it an ideal choice to license for numerous companies manufacturing embedded processors. Processors from these companies feature heavily in embedded systems and although they have the same basic core, the peripherals and I/O will vary from manufacturer to manufacturer based on the end applications. A common theme, however, is the Arm bus architecture and the standard interfaces and peripherals that it supports. The popularity of the Arm core architecture means that there is a well established ecosystem of software and driver support, making these processors an excellent choice for embedded systems.

Memory Subsystem

The adoption of a specific processor core may be application dependent, but the choices when considering the memory subsystem will largely depend upon the peripheral IP implemented by the processor vendor.

Applications that require an embedded operating system will benefit from a managed NAND subsystem and Arm-based processors offer excellent support for this. One such example is the Embedded Multi Media Card (eMMC) protocol support. In addition, using Greenliant NANDrive™ as the managed memory subsystem means there is no requirement to customize the memory interface.

The powerful, energy-efficient cores offered by Arm together with the proven peripheral IP make this technology well-suited for portable and embedded applications. NANDrive is the ideal choice for mass storage in these applications because it is surface mounted and has a small footprint. As a solid state device, it is more robust mechanically than a traditional hard disk drive. The Serial ATA (SATA) and eMMC versions of NANDrive can interface directly with Arm-based processors, with the added benefit of being lower power than traditional mass storage solutions. In embedded systems where data integrity is paramount, NANDrive has the added advantage of a proven flash file system which maintains data integrity even in the event of a power failure.

Because of the wide choice of capacities and interfaces supported by NANDrive, there are many compatible Arm-based processors available. The table on the next page includes some of the Arm-based processors most commonly found in embedded systems.

Implementation Considerations

NANDrive uses industry-standard protocols and interfaces—Parallel ATA (IDE/PATA), SATA and eMMC. This means that after the designer has considered the memory subsystem needs, the implementation is straightforward, thus accelerating the time to market. Furthermore, if the design goals change and more (or less) storage is required, NANDrive has a common footprint to enable various capacities to be used on the same board. Any specific implementation will depend on the processor. Embedded SSD design may require additional optimization based on processor functionality and compatibility.

Typical Arm Design Using NANDrive
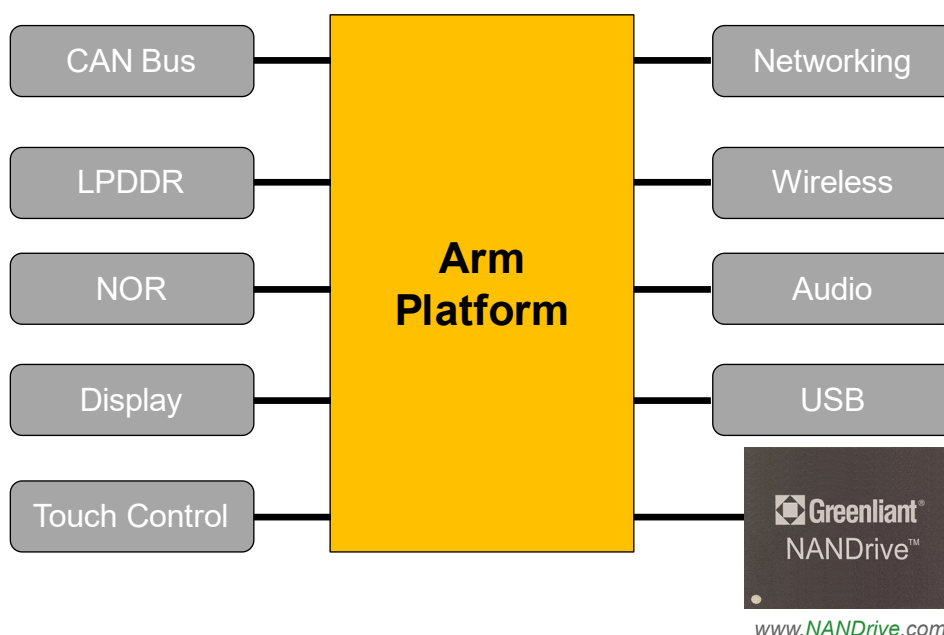
Applications

— *In-vehicle infotainment*
— *GPS and telematics*
— *Data recorder*
— *Video conferencing*
— *Rugged tablet PC*
— *Multi-function printer*
— *Point-of-Sale terminal*
— *VoIP system / PBX*
— *Wireless base station*
— *Router / Gateway / Switch*
— *Set-top box*
— *Industrial PC / Single-board computer*
— *Ultrasound and medical imaging*
— *Industrial automation and control*
— *Test and measurement equipment*
— *Video surveillance / ID terminal*

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Example of Typical Arm Chipsets with NANDrive Support		
Manufacturer	Processor Family	NANDrive Series
Marvell	Armada XP MV78xxx	eMMC - GLS85VM SATA - GLS85LS
	Armada 38x	SATA - GLS85LS
	Armada 375	SATA - GLS85LS
NVIDIA	Jetson	eMMC - GLS85VM
	Tegra	eMMC - GLS85VM SATA - GLS85LS
NXP	i.MX6 Dual / Quad	eMMC - GLS85VM SATA - GLS85LS
	i.MX7 Family	eMMC - GLS85VM
	i.MX8 Family	eMMC - GLS85VM SATA - GLS85LS
	QorIQ Family	eMMC - GLS85VM SATA - GLS85LS
ST Microelectronics	STM32 H7	eMMC - GLS85VM
	Cartesio STA20xx	eMMC - GLS85VM
Texas Instruments	Sitara AM3xxx / 4xxx	eMMC - GLS85VM
	Sitara AM17xx / AM18xx	eMMC - GLS85VM SATA - GLS85LS

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NANDrive FAQs: www.greenliant.com/nandrive-faqs
Evaluation Boards: www.greenliant.com/nandrive-eval-boards
Long-Term Availability: www.greenliant.com/support/#LTA-program
For more information, contact your Greenliant representative: www.greenliant.com/sales

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