Using NANDrive™ in x86-based Systems

Processors with the x86 architecture have a well established ecosystem of software and driver support, making them an excellent choice for embedded systems. With each generation, x86 processors introduce new features and improvements in performance efficiency and power consumption. The flexibility, reliability and scalability of x86 platforms support the requirements of many demanding applications, such as high-performance servers, networking and industrial systems.

Memory Subsystem

In the embedded space, while the adoption of a specific processor may be application dependent, the memory must be tailored to the specific use case. There are many choices to consider when designing in the memory subsystem, such as volatile or non-volatile, size and persistence of data, and managed or non-managed mass storage.

x86 platforms support standard memory types and the choice of Greenliant NANDrive™ as a managed memory subsystem means there is no requirement to customize the memory interface. NANDrive uses industry-standard protocols and interfaces—Parallel and Serial ATA (IDE/PATA, SATA), and Embedded Multi Media Card (eMMC)—simplifying memory subsystem implementation and accelerating the time to market. Furthermore, if the system 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.

Because of the wide choice of capacities and interfaces supported by NANDrive, it is compatible with many popular x86 chipsets. The table on the next page includes examples of AMD and Intel x86 chipsets most commonly found in embedded systems.

Implementation Considerations

Adopting the x86 architecture for embedded systems allows the designer to leverage existing operating systems and applications that have been developed for the PC environment. NANDrive simplifies this type of implementation because it looks like a traditional hard disk drive to the system, while offering the additional advantages of being surface mounted and solid state. NANDrive is therefore more robust mechanically and occupies a much smaller footprint. It also consumes much lower power than a traditional disk, which is a real benefit for energy-efficient embedded systems. Furthermore, NANDrive uses advanced wear-leveling algorithms and maintains data integrity in the event of a power failure.

Any specific implementation will depend on the processor. Embedded SSD design may require additional optimization based on processor functionality and compatibility.

Typical x86 Design Using NANDrive

www.NANDrive.com
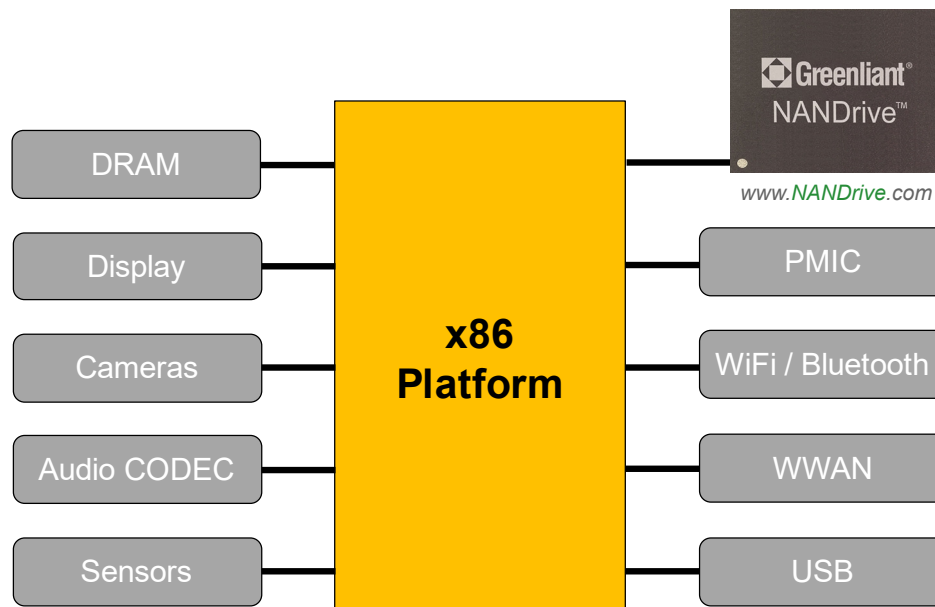
Applications

— *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 x86 Chipsets with NANDrive Support			
Family	Code Name	Processor	NANDrive Series
AMD EPYC Embedded SoC	Snowy Owl	3xxx	eMMC – GLS85VM SATA – GLS85LS
AMD Ryzen Embedded SoC	Great Horned Owl	V1xxx	eMMC – GLS85VM SATA – GLS85LS
AMD Embedded G-Series SoC	Prairie Falcon	GX2xxxx	SATA – GLS85LS
AMD Embedded R-Series APU	Bald Eagle	RX22xxx / 42xxx	SATA – GLS85LS
Intel Atom	Rangeley	C2xxx	SATA – GLS85LS
	Denverton	C3000	SATA – GLS85LS
	Apollo Lake	E3900	eMMC – GLS85VM SATA – GLS85LS
	SoFIA 3G-R	X3-C3200	eMMC – GLS85VM
	Cherry Trail	Z8000, Z8350	eMMC – GLS85VM
	Bay Trail	Z3600 / 3700 E38xx	eMMC – GLS85VM
Intel 5th Gen Core Processor Families	Broadwell	Mobile U-Processor Line	SATA – GLS85LS
Intel 6th Gen Core Processor Families	Skylake	100 Series Chipsets	SATA – GLS85LS
Intel 7th Gen Core Processor Families	Kaby Lake	iX-7x00	SATA – GLS85LS
Intel Quark SoC Host Controller	Clanton	SOC-X1xxx	eMMC – GLS85VM
Intel Xeon Processor E5	Grantley	E5-2600	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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