Solution Accelerators & Services from GlobalLogic

GlobalLogic's Nautilus Platform

From real-time vehicle diagnostics to customizable entertainment apps, advanced in-vehicle infotainment (IVI) solutions are becoming a driving force in the automotive industry. However, while Android or Linux operating systems could significantly advance the development of fast, rich IVI systems, they have yet to be successfully utilized because of limitations around reliability, security, and boot time.

To overcome these roadblocks, GlobalLogic has developed the Nautilus platform, a set of automotive IVI solution accelerators that includes architectural concepts, a modified Android OS distribution, and advanced UI concepts.

How Nautilus Helps

Leveraging various automotive application processors (e.g., Jacinto 6), the Nautilus platform enables automotive ecosystem players to quickly and cost-effectively develop powerful, Android-based IVI systems on a single system on a chip (SoC).

Single SoC Hybrid Architecture with Xen Hypervisor

The most common barriers to adopting Android in automotive software include its unreliability, low security, and long boot time. The Nautilus platform resolves these issues by separating mission-critical software (e.g., CAN/MOST vehicle services, driver assistance, emergency services) from infotainment software (e.g., multimedia services, navigation, cloud apps).

By leveraging a Xen type 1 hypervisor, the platform can simultaneously run two or more different operating systems on a single SoC: (1) highly reliable Linux or RTOS for automotive grade software and (2) completely sandboxed, highly customizable Android for infotainment software.

This hybrid architecture allows you to develop an Android-based IVI system without compromising the functionality, security, or reliability of the vehicle's operational software. Nautilus leverages the latest version of Linux kernel and Android, and it enables multiple operating systems to share hardware resources (including GPUs). Mission-critical tasks can be offloaded to a dedicated Cortex-M4 core (thus achieving maximal levels of isolation), and communication between the application and real-time cores is performed through a secure communication module.

Vehicle Software

Infotainment Software
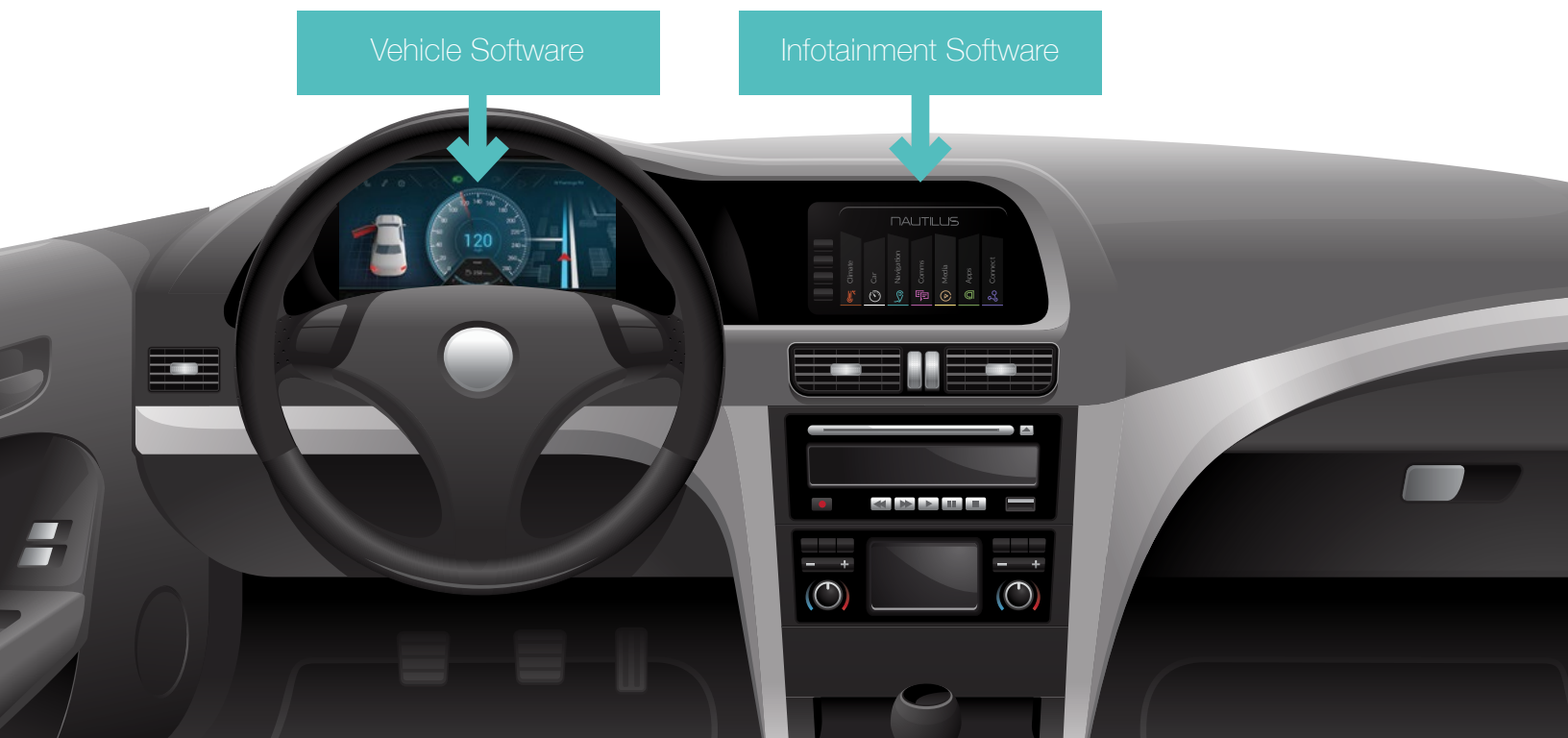
Automotive Grade Android

Nautilus ensures that your system will perform optimally on the underlying TI hardware through the Automotive Grade Android (AGA) platform, a modified Android OS distribution that significantly accelerates boot time and operating speeds. Systems built on this platform are ready to use within 5-7 seconds of powering up, and the rear-view camera on the head unit is activated within 1-2 seconds of switching into reverse gear immediately after power-up.

AGA leverages a broad array of connectivity services from Android utilizing Bluetooth, Miracast, MirrorLink, and Wireless Hotspots. Users can access vehicle performance data via the cloud, control automotive features through a mobile device, or push data from a mobile device to a vehicle display. The platform also provides custom enablement components for various multimedia services utilizing UPnP/DLNA, Audio/Video Playback, and Radio. Whether users want to access XM Radio directly from their head unit or stream media from their mobile device, Nautilus simplifies the development process for IVI systems.

Conceptual UI for Head Unit

Designing a user interface for a vehicle head unit requires a completely different approach than designing for a mobile device. In addition to creating an intuitive user experience, you must also ensure that drivers remain safe while interacting with the system. The Nautilus platform provides innovative UX/UI concepts for touch-controlled head units that ensure a superior user experience without compromising driver safety.
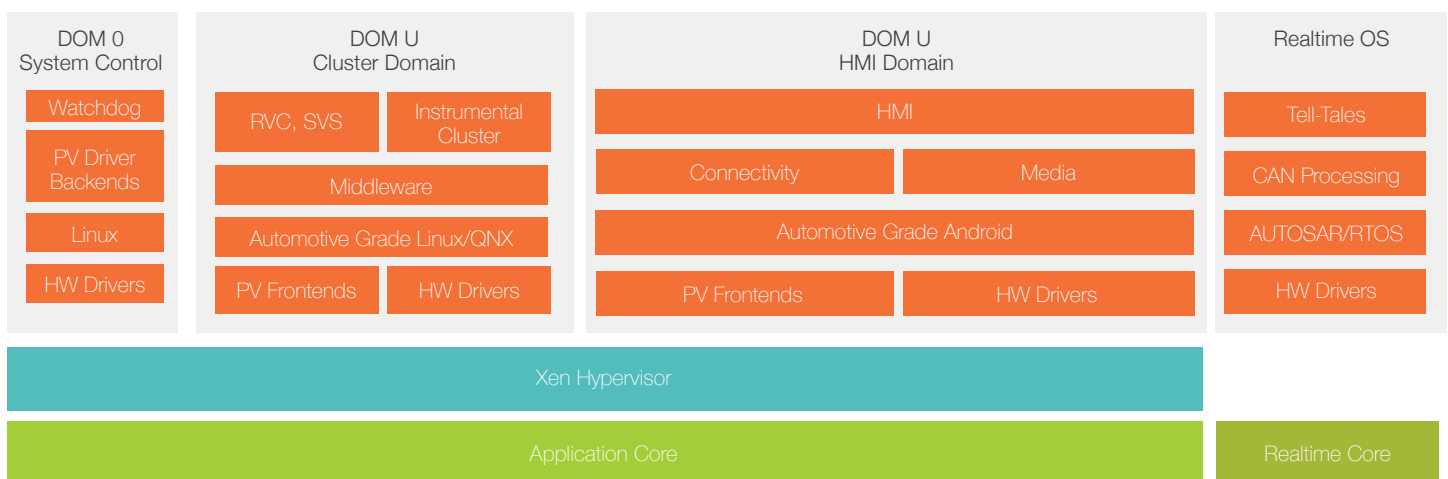
GlobalLogic's Automotive R&D Services

Leveraging the Nautilus platform as a solution accelerator, GlobalLogic partners with automotive ecosystem players to design and develop Android-based IVI systems on top of TI hardware. Our end-to-end expertise in Android OS internals, Linux kernels, and TI application processors uniquely position us to help customers quickly and cost-effectively launch innovative automotive solutions. To learn more about GlobalLogic's Nautilus platform and automotive R&D services, contact info@globallogic.com.

About GlobalLogic & Texas Instruments

GlobalLogic is a full-lifecycle product development services provider that helps businesses imagine, build, and transform their next-generation digital products.GlobalLogic is based in the U.S. and operates design and engineering centers across Argentina, Ukraine, India, Croatia, Slovakia, and Poland.

GlobalLogic is a platinum member of Texas Instruments' Developer Network and has been providing the company with software engineering services since 2011. In addition to adapting new releases of Android to TI's current and previous SoCs (e.g., OMAP, Jacinto, etc.), GlobalLogic has managed numerous integration projects for the company's OEM customers, including leading mobile device vendors and IVI head unit providers.

DOM 0 System Control	DOM U Cluster Domain		DOM U HMI Domain		Realtime OS
Watchdog	RVC, SVS	Instrumental Cluster	HMI		Tell-Tales
PV Driver Backends	Middleware		Connectivity	Media	CAN Processing
Linux	Automotive Grade Linux/QNX		Automotive Grade Android		AUTOSAR/RTOS
HW Drivers	PV Frontends	HW Drivers	PV Frontends	HW Drivers	HW Drivers
	Xen Hypervisor				
	Application Core				Realtime Core

Nautilus Platform Architecture

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