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4W Digital Cockpit BSP(OKT507C vs BenchMark)

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Why Multi-Display?

Entry-level IVI platforms are cost-effective, but modern cockpits demand centralized, multi-display, software-defined platforms

Challenges: Separate ECU per display, Independent OS/UI stacks, Limited cross-display data sync, Higher BOM & wiring complexity

Tesla: Fully centralized cockpit, single OS, OTA-first
BMW: Curved multi-display, hypervisor-based multi-OS, strong safety & UI isolation
MahindraXUV700: Centralized SoC, Linux/Android IVI, cluster, synchronized navigation & ADAS alerts

Industry is focusing on centralized, software-defined, multi-display cockpit platforms

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Multi-Display IVI Architecture

Layer	Element	Description
Hardware Layer (Bottom)	Qualcomm SA8155P SoC	8-core Kryo prime 260 architecture (4x ARM Cortex-A76 + 4x ARM Cortex-A55), Adreno 640 GPU, Full Virtualization-Xen/QNX Hypervisor, NextGen smart cockpit.
	TI TDA4 SoC	2x Cortex-A72 cores, 6x R5 cores, DSP, Safety Island, Supports Jailhouse/ Hypervisor integration, Strong AI for vision. ADAS+Perception+real time control
	Qualcomm Snapdragon SD6xx series SoC (Mahindra XUV700)	**8-core Kryo 260 architecture (4 ARM Cortex-A73 + 4 ARM Cortex-A53), Adreno 610 GPU, Qualcomm AI Engine, X12 LTE, No hypervisor support in SD6xx BSP, IVI, Cluster**
Hypervisor Layer	Type-1 Hypervisor	Xen/QNX Hypervisor
VM / Domain Layer	VM1 – Infotainment	Linux / Android → Center Display
	VM2 – Instrument Cluster	QNX / Safe Linux → Digital Cluster
	VM3 – HUD / Safety	QNX / RTOS → HUD
	Inter-VM Communication	Shared data: Navigation, ADAS, Vehicle status
Display Layer (Top)	Center Display	Driven by Infotainment VM
	Digital Cluster	Driven by Cluster VM
	HUD	Driven by HUD VM

Dimension	T507	Benchmark	Gap Impact
CPU/GPU	Cortex-A53 + Mali	High-end CPU + Adreno / AMD	T507 limited for advanced UI & multi-display
Multi-Display	1–2	3–4 + HUD	T507 not scalable for full cockpit
OS Strategy	Single Linux/Android	Linux + QNX + RTOS	T507 lacks mixed-criticality isolation

Dimension	T507	Benchmark	Gap Impact
Virtualization	Limited / immature EL2	Mature Hypervisor	T507 cannot safely partition VMs
Safety	No ASIL-certified cluster	Safety-certified cluster & HUD	T507 not suitable for safety-critical domains
OTA & Lifecycle	Basic	Full OTA, rollback, A/B	T507 not SDV-ready
HMI / UX	Basic	Rich, synchronized multi-display	T507 cannot provide advanced multi-display HMI

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Thank You