

TRULY SECURE CONNECTED CAR



Connected car benefits come with challenges

Addressing security risks associated with the connected car is becoming an increasing imperative for automakers and consumers. While the benefits are undeniable – enabling features like cloud-based services, downloadable apps, over-the-air updates, integration with personal devices and vehicle data analytics – attacks are becoming a growing concern as hackers have an increasing number of entry points into the car. HARMAN's unique "defense-in-depth" automotive 5+1 cyber security framework is changing the way we secure the connected car.

Comprehensive HARMAN 5+1 architecture

The multi-layer framework realizes a "defense-in-depth" model against known and unknown cyber threats for connected cars.

The five layers include:

- 1 Hardware Protection: Trusted Execution Environment which physically isolates sensitive information from the so called "Normal" or "Untrusted World"
- 2 Hypervisor: Isolation of vehicle-critical functions from user infotainment functions
- 3 OS level security such as mandatory access control
- 4 Application sandboxing between the entertainment apps
- 5 Network protection using mutual authentication, secure encryption, Intrusion Detection and Prevention Systems and Firewalls

+1 In addition, HARMAN's security architecture comprises OTA updateability, a crucial component responsible for installation of security-related updates and patches to guard against zero-day vulnerabilities or any security flaw that is detected in the field. With its TowerSec technology, HARMAN employs real-time, embedded software security to protect vehicles from being hacked.

Key highlights

- Comprehensive architecture for the connected car
- Best in class regarding technology and security standards
- Security by design
- Scalable, adaptive, and future-proof
- Intrusion detection and prevention

HARMAN LIVS

HARMAN's Life-Enhancing Intelligent Vehicle Solutions (LIVS) use an end-to-end approach by integrating the in-car computing platform with the cloud platform.

SCALABLE | Compute Platforms

Tailor-made for the needs of automakers and vehicle segments

CONNECTED | Modular Connectivity

Ready for delivering connected services – enhancing efficiency, productivity, and entertainment

SAFE | ADAS & E-Horizon

Monitoring and assessing the surroundings of the entire vehicle and beyond line of sight

SECURE | 5+1 Security Architecture

Full protection for the driver and the vehicle, OTA (over-the-air) updateable

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Features and benefits

Hardware Security	<ul style="list-style-type: none">• Store secret/tamper-proof keys• Encryption/decryption with secret keys• Secure encrypted boot and updates
Domain Isolation	<ul style="list-style-type: none">• Separate virtual partitions for various SW environments that have different ASIL and non-ASIL levels
Access Control	<ul style="list-style-type: none">• Policy-driven access to peripherals, storage and memory• Mandatory/discretionary access control
Application Sandboxing	<ul style="list-style-type: none">• Resource isolation between applications• Control/enforce resource access and allocation• Segregate data between users and applications
Perimeter Protection	<ul style="list-style-type: none">• Firewall policy• Manage access and separation to internal and external networks• Restrict services• Manage authentication and encryption of traffic
Updateability	<ul style="list-style-type: none">• Client/server authentication• Encrypted updates• Remedy discovered vulnerabilities immediately• Ensure coverage and traceability of updates
Network Protection	<ul style="list-style-type: none">• Two embedded software solutions:<ul style="list-style-type: none">- TowerSec ECUSHIELD provides on-board automotive cyber security against hacking, intrusion and critical communication disruptions.- TowerSec TCUSHIELD provides real-time cyber protection for telematics units and infotainment systems against intrusions over external communication.
Driver Security	<ul style="list-style-type: none">• Secured content• Privacy protection• Theft protection

An industry expert as partner

HARMAN is the market leader in connected car solutions for the world's automakers. HARMAN's innovative and highly integrated infotainment technologies offer automakers the most extensive solutions for advanced navigation, intuitive user interfaces, integrated audio, device connectivity, cyber security, and connected safety, just to name a few. From Boston to Berlin to Bangalore, HARMAN is delivering a dynamic in-car experience for an increasingly connected world.

Visit our website at www.harman.com

