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The Future of Automotive is Software-defined

Self-driving cars will transform transportation, making it safer and more efficient. However, today's vehicle architectures cannot support the AI software needed to realize this technology. Currently, a vehicle's software functions rely on dozens of electronic control units, known as ECUs, distributed throughout the car. Each ECU is responsible for specialized tasks.

Rather than lines of code dedicated to a single function, AI software is complex and wide-ranging, requiring centralized, high-performance computing. With such a unified architecture, OEMs can integrate and update advanced software features as they are developed. Just like a mobile phone, which periodically gets software updates, these software-defined vehicles will be perpetually updateable machines. They will get better and better over time.

Centralized vehicle architectures are also driving the single biggest business model transformation the automotive industry has ever seen. By implementing a new vehicle computing architecture, one that's upgradeable and built around high-performance computers, automakers can develop a loyal installed base that can take full advantage of this new technology. Mercedes-Benz will be one of the first to implement this new architecture, with a software-defined, upgradeable fleet built on Nvidia Drive AGX Orin starting production in 2024.

When entire fleets of vehicles are supported by teams of AI experts and software engineers delivering advanced features to continuously improve the driving experience, the opportunities to delight customers are boundless. New features, new capabilities and new business models go hand-in-hand, benefitting the consumer and the industry. These new business models will transform the relationship between OEM and end user. With a software-defined architecture, cars can add capabilities and services over the air at any time across multiple customers through the life of the car.

It will also open up opportunities for developers. The Nvidia Drive ecosystem already includes hundreds of OEMs, suppliers, sensor companies, mapmakers and software startups. With the capability to provide new apps in the vehicle, more developers can contribute and expand this ecosystem into even more technologies. And these new services require increased support. Software, once built, lives forever, and companies who deliver software must be able to support it for as long as they live. This is what Nvidia has been doing for decades, beginning with the gaming graphics cards, moving to the enterprise and mission critical business applications and will continue to do for vehicles of the future.