



Elektrobit

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# End-to-end software solutions for connected cars

Cloud computing | Software over-the-air | Big data analytics | Remote diagnostics



## Connectivity – the key to a superior driving experience

Today's cars are part of the internet of things and expected to fit into consumers' digital lifestyles, while providing secure connected services and enabling a safe driving experience. It's a big challenge – but one EB is up to.

Consumers want to be connected all the time. They want their devices to integrate with the vehicle, and they want all the latest features available. With mega-cities, traffic congestion, and pollution as constant challenges, e-cars, CO2 reduction, increased fuel economy, smart navigation, and driver assistance features are becoming mandatory solutions. On top of that, carmakers have to provide new and exciting services to

consumers to differentiate themselves from their competitors. Connectivity enables essential services like live traffic information and breakdown assistance, as well as the many conveniences that drivers expect, and the features that set you apart. EB provides technologies that connect the car to the cloud in innovative ways to meet and exceed consumer expectations.

EB's team of international experts has delivered the industry's leading software solutions for more than 25 years. Our embedded expertise and cloud computing know-how can help you develop automotive products with the same speed and agility found in the consumer industry. EB lets carmakers innovate and develop with confidence.



## Scalability based on microservices = reliable connectivity

To offer reliable connectivity, embedded expertise and cloud computing know-how are essential. EB has both: more than two decades of embedded experience plus extensive cloud knowledge – and a reliable backend infrastructure with all the services necessary to run, maintain and improve it.

More and more functions are moving to the backend in order to ease the complexity of embedded functionality on the E/E architecture. That means carmakers need flexible solutions. EB's backend infrastructure uses a modular architecture based on microservices to ensure that our cloud scales to meet customer needs. Our secure cloud infra-

structure gives carmakers a competitive advantage by scaling the most important services on demand through replication. We have expertise and experience in developing electronic control unit (ECU) software certified for the highest safety levels. Add our cloud computing know-how, and EB is uniquely positioned to deliver end-to-

end solutions for the connected car. And, as an independent software supplier, EB is a trusted partner for developing state-of-the-art approaches, supporting innovative concepts, and delivering essential components for the road ahead.



## Direct implementation in the cloud

See what you'll get in the cloud, immediately. Our continuous software deployment lets you directly visualize development results for review and testing, saving development time and cost. Customers can see how the software works in the target environment and provide feedback.

We live the DevOps principle: our cloud development and cloud operations teams are merged. The infrastructure as code architecture and our configurations management ensure that EB's cloud platform is tailored to the needs of carmakers and suppliers. Definitions are clear and can be extended more easily enabling scalability. Auditing is facilitated, that guarantees the best possible quality.

Software is deployed in an automated fashion, this allows adding and changing new features quickly and repeatably, ensuring fast customer feedback and minimizing project risks. EB implements and constructs services on the basis of Amazon Web Services (AWS) with a clear understanding of what it means to deploy on premis. This lets us focus on our core competence namely developing and operating services.

A cars sensor data can be sent to the cloud and received there, we ensure that they have the right format for our customers data storage. Carmakers can enjoy an all-round care free package and use the sensor data to enrich maps for more comfortable navigations systems and driver assistance functions, which are on the edge of the latest technology.



## Sophisticated security solutions to ensure driver safety

Connectivity, while beneficial, comes with new risks. Carmakers and suppliers need solutions that protect them from cyber-attacks. Especially in a vehicle, outside attacks can directly impact not only security, but safety. EB has extensive experience with both security and automotive safety, so we're uniquely positioned to ensure drivers and passengers are protected in the connected world.

EB offers consulting and implementation of security solutions to help carmakers avoid remote third party attacks on individual cars or the entire fleet. Our knowledge of on-board software components enables us to provide a secure connectivity gateway for our customers. This connection to the cloud sets the parameters for secure data transfer. Our secure backend infrastructure enables secure over-the-air-data and service updates.

Our rock-solid security solutions include:

- ▶ Standardized and efficient embedded cryptography architectures, based on AUTOSAR
- ▶ Secure connections between the car and the cloud
- ▶ Token-based authentication
- ▶ Live monitoring of backend systems
- ▶ Vulnerability monitoring of deployed software
- ▶ No snowflake servers

We consistently implement the latest security technologies to protect the vehicle from outside attacks while delivering the right solution based on the needs and requirements of our customers. Our software has already been successfully approved in multiple mass production projects.



## Monetize information with big data analytics

Data has become a valuable commodity. For example, in the automotive world, access to data can help improve traffic flow or enrich maps. With vehicles moving on the road, data changes frequently, requiring connectivity to gather and share the latest information. The amount of data will only increase over time, making it important to choose solutions that can adapt and scale.

Carmakers need to be able to collect and analyze vehicle data, as well as information about the surroundings of vehicles. The knowledge you derive from sensor data can help enrich maps, provide timely services to drivers, and improve vehicle features. EB's deep understanding of the automotive industry puts us in a unique position to offer

carmakers big data analytics services tailored to automotive needs. Our offering includes machine learning, geo-analyzing, and more. Our real-time and batch processing technologies plus distributed processing guarantees scalability. We help carmakers make sense out of their data with data mining. At the same time, EB knows the importance of

consumer's privacy and provides innovative new methods of data protection and anonymization. Don't forget that each step towards data monetization through analytics requires reliable software components – something EB can deliver.



## Remote diagnostics – the next step in optimizing supply chain efficiency

Carmakers can save lots on warranty costs by managing their vehicles over the entire lifecycle of the car. Optimizing the supply chain can significantly improve and speed up vehicle development.

A car's lifecycle starts with the design process, the evaluation of components, continues through the production process, and includes the vehicles on the road. EB has over two decades of experience in diagnostics for mission critical client- and server- systems.

This paired with our ability to send collected data to the backend, store it and process it intelligently, makes new scenarios like real-time remote diagnostics and prognostics to assess the operating conditions of vehicles possible. Stored vehicle data can be exported to standardized file formats or to analytics cloud services.

Our dashboard, backend and client-software are configurable and customizable. Carmakers could also get better insight into consumer's behavior in the vehicle, which would let them offer services tailored to consumer needs.

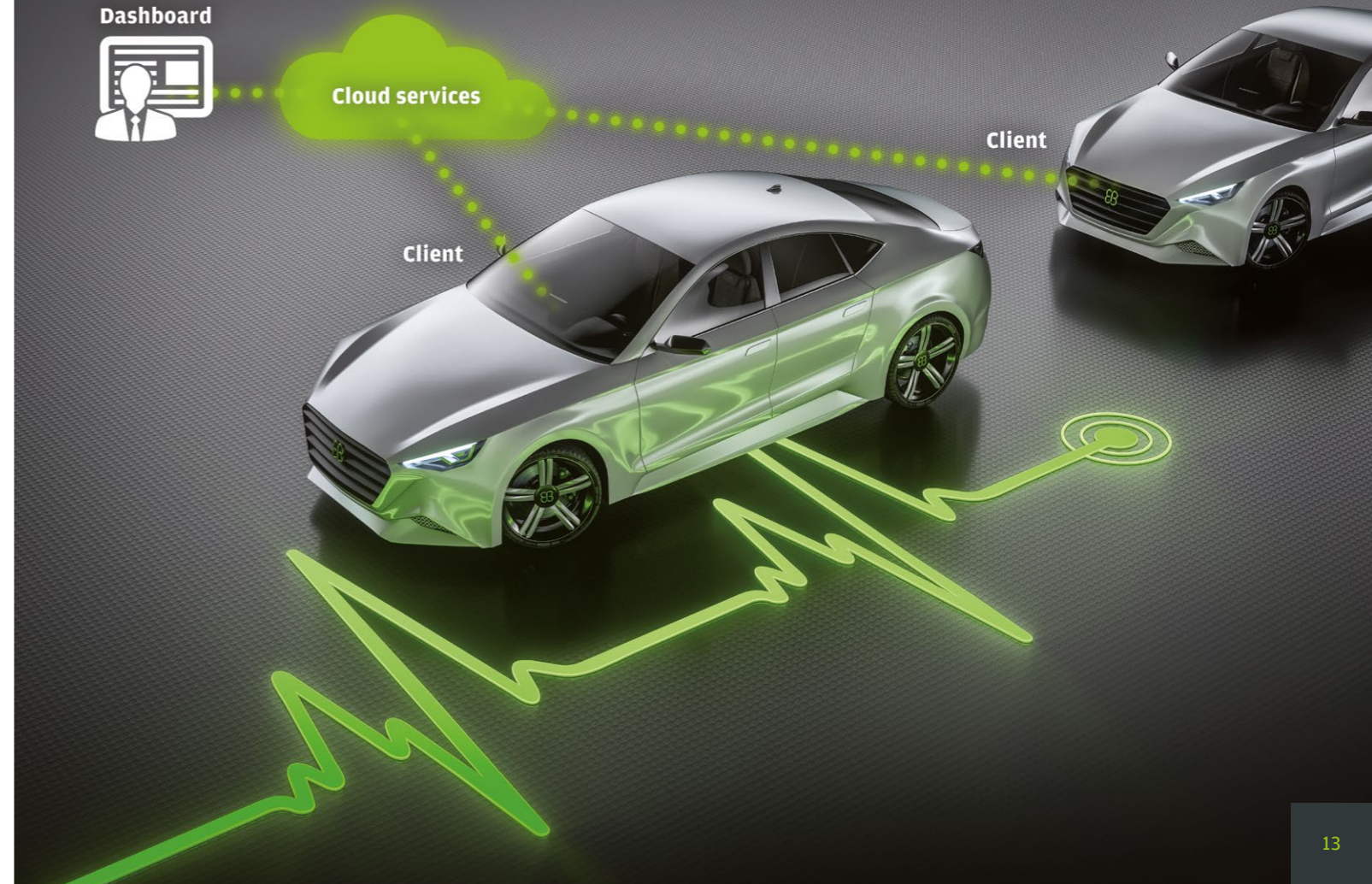


Dashboard

Cloud services

Client

Client



## The key to fast innovation: software updates over-the-air

Consumers are used to frequent updates from their electronics. Over-the-air updates will soon be the method of choice for the automotive industry as well, once secure gateways are in place. EB's international automotive experts are working to make this happen.

Today, cars lose value right after the purchase. Depreciation is normal, but it doesn't help that the technology in cars gets outdated quickly. So what happens if the technology in cars improves over time with software updates over-the-air? Offering new software products to consumers after the vehicle purchase also opens additional revenue streams to carmakers. And new

software products can be introduced to the market faster when they are not tied to a specific car release.

EB offers advanced technology expertise on embedded systems like EB tresos and AUTOSAR solutions to spare battery power, and a solid understanding of cloud computing. As a result, we're positioned to be the

right partner for OEMs and Tier 1 suppliers wanting to offer software updates over-the-air. Our vision of future vehicle networks and our overall systems security expertise ensure that our customers can rely on an allround innovative package. With EB as a partner, the automotive industry can make taking cars to the dealership a thing of the past.



## Comfortable navigation and reliable driver assistance features powered by connectivity

EB's connectivity solutions help OEMs and suppliers avoid accidents and improve safety on the road through intelligent processing of map data plus sensor data in the cloud. This improves navigation systems and makes driver assistance products, that guide cars more smoothly and efficiently.

Drivers want automated, in-car systems to enhance their overall driving experience, improve comfort, prevent accidents, and help them navigate. Connectivity enables global online navigation with highly precise and up-to-date maps. Giving customers what they want, especially with autonomous driving on the horizon, requires a connection to the cloud so that the most accurate map and

traffic situation information is available at all times. EB provides proven tools, solutions, and engineering services to integrate all these increasingly sophisticated software building blocks. And we let you offer added value to the driver by intelligently combining map data, crowd-sourced data collected by the cars sensors, or camera data. Sensor data is becoming especially critical—EB provides

new approaches to exploit the potential of sensor data. All of this combined data can be used to improve traffic flow and increase fuel-efficiency. EB is a trusted partner in developing new state-of-the-art software components for the road ahead in automotive systems.



## Partnerships with EB pave the way to connected cars

We pride ourselves on our long-term and stable customer relationships. Our ultimate goal is to help our customers and partners achieve development speed, flexibility, customization, compatibility, and productivity in all their product development efforts.

With the gradual separation of hardware and software, car manufacturers have an even broader choice of components, and need a capable integration partner to support them in finding the smartest solutions available. Carmakers can benefit from standardized tool suites, reusable components and products. This results in less time and money spent on individual solutions and more time spent on creating inventions of value to automotive companies.

Our constant engagement with industry leaders and our broad partner ecosystem strengthens our ability to innovate. EB's end-to-end solutions connect cars to the cloud and enable carmakers to benefit from countless new business opportunities—from new mobility services like car sharing to the management of a vehicle's lifecycle. Carmakers benefit from our holistic approach. EB's offer includes smart HMI tools, operating systems for ECUs, scalable navigation technology, and

reliable driver assistance software. All our successful products are closely intertwined and meet the newest requirements that come with connectivity.

We help carmakers meet consumer needs and improve safety. In-vehicle connectivity speeds the way to the software-defined cars of the future.



# Contact us



EB is a global company with branch offices all over the world.

## About Elektrobit

Elektrobit (EB) is an award-winning and visionary global supplier of embedded software solutions and services for the automotive industry. A leader in automotive software with over 25 years serving the industry, EB's software powers over 70 million vehicles and offers flexible, innovative solutions for connected car infrastructure, human machine interface (HMI) technologies, navigation, driver assistance, electronic control units (ECUs), and software engineering services. EB is a wholly owned, independent subsidiary of Continental AG.



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