Accelerating next-generation automotive services
Unleash automotive innovation

Advanced cloud, communications and networking technologies have the potential to transform the car into a fully connected device and change the way automotive companies engage with customers and collaborate with partners and suppliers.

Nokia has the networking, cloud and device management solutions to make the connected car a reality today. These solutions support a wide range of secure applications for connected vehicles.

Our high-performance mobile connectivity and secure device management solutions enable over-the-air connected car services like real-time software updates and sensor-based preventive maintenance. Our agile high-speed networks and data center technologies bring company branches and dealerships under one virtualized roof for closer collaboration and faster innovation.

We can also help companies streamline workflows and break down the silos in their IT environments. All of this plus access to a multi-industry innovation ecosystem brings the power to unleash a new era in automotive innovation.

Solutions for the automotive industry

With Nokia, you can:

- **Evolve your products**
  - Develop new, high-quality services and applications faster using a DevOps approach
  - Analyze data on any scale to improve vehicle performance, design and services
  - Deliver an ultra-responsive driver experience with high-performance mobile connectivity

- **Increase collaboration**
  - Join an innovation ecosystem to collaborate on concepts, business models and market trials
  - Bring new ideas to market faster through better internal collaboration

- **Boost integration and efficiency**
  - Unleash the power of the cloud with secure cloud infrastructure
  - Mix and match cloud offerings from multiple providers and use any access technology
  - Securely manage millions of connected cars to protect drivers’ information and vehicle systems
Connected car.
Connected to your customers.

Automakers, original equipment manufacturers (OEMs) and dealers already gather massive amounts of data on the vehicles they design, sell and service. Yet today much of that information remains locked away in vehicle systems or stored in isolated data silos, delivering only a fraction of its value.

We can help unlock the full value of your data to fuel innovation, strengthen customer relationships and explore the potential for new revenues and services through the connected car.

Instead of downloading vehicle diagnostics only during service appointments, for example, our secure, wireless networking technologies make it possible to access sensor data over the air, anywhere, any time. With real-time insights into vehicle performance, you can prompt customers to take advantage of preventive maintenance that will save them money down the road and cement their loyalty.

With a near real-time repository of aggregate vehicle data, you can also identify trends and make innovation a continuous, iterative process based on large-scale analytics. Our tightly integrated, high-performance software-defined networking (SDN) and data center technologies ensure your teams can access and share “big data” at high speed, wherever, whenever. Leverage the cloud to iteratively design, develop and push out groundbreaking new applications and services using the highly efficient DevOps approach. All of that means creating more opportunities to grow your business, faster than ever before.

Ultra-low latency car2x communications

Nokia is helping lead the way to make the vision of the connected car a reality. Our Mobile Edge Computing platform, for example, delivers high-performance mobile connectivity to support Advanced Driver Assistance Systems (ADAS).

On March 16, 2016, the “Real-Time Communication between vehicles via the LTE Mobile Network” project jointly launched by Continental, Deutsche Telekom, the Fraunhofer ESK Institute and Nokia and its partners won the top award in the best-practice competition of the Intelligent Networking Initiative. The project was trialed in November 2015 on the A9 motorway in Germany, with two different use cases: Emergency Electronic Brake Lights and Cooperative Passing Assistant.
Secure device and data management for millions of vehicles

To take full advantage of over-the-air monitoring, software updates and continuous communications with vehicles and drivers, you need to trust that the data involved is safe and secure. The standards-based Nokia IMPACT device and data management platform provides that assurance from device activation to comprehensive care and analytics. With more than a billion devices securely managed worldwide, Nokia is a leader for fixed, mobile and Internet of Things (IoT) device management.

Nokia IMPACT can support multiple connected vehicle services and applications that lower costs, increase efficiency and boost customer loyalty.

**Vehicles**
- Remote vehicle and component management
- Remote fault management
- Vehicle data collection and management
- Remote software updates and management
- Security management
- Automated registration and inventory management

**Fleets**
- Fleet monitoring
- Real-time vehicle tracking
- Alarm and alerts for factors such as battery charge, speed, crossing geofences
- Optimized vehicle routes
- Eco-driving education
- Driver behavior monitoring
What you get with Nokia IMPACT

Nokia IMPACT connects services to virtual vehicles, which are protected by cloud and network security. It enables high-value services and applications with:

- End-to-end security and management across millions of devices
- High-performance, reliable connectivity from a device-agnostic management platform securely accessible by multiple departments or partners
- Secure protocols to relay commands to in-car actuators and to collect data from in-vehicle sensors
- Secure over-the-air software and firmware updates of electronic components in the vehicle
- Integrated real-time visibility, analytics and sensor-driven autom

The following are some of the applications/services that you can offer with Nokia IMPACT:

- Monitor a fleet of vehicles
- Collect location information of vehicle and goods, monitor trips in real time
- Detect alarms and alerts in real time: battery, speed, geo-fence
- Correlate trips with traffic information
- Raise awareness of drivers in terms of eco-driving
- Collect information about driver behavior
Agile, highly efficient cloud networking

Companies in virtually every enterprise sector today are using the cloud to gain IT agility, control costs and do more with their data. Nokia Networks and our Nuage Networks family of cloud solutions offer the full range of cloud capabilities for the automotive sector that companies need.

Our Nuage Networks solutions use SDN technology and allow you to adopt a secure, scalable, highly programmable private or hybrid cloud infrastructure that delivers the performance, speed and responsiveness your business needs. Our offering gives you the freedom to choose technologies that best suit your needs, regardless of vendor. Thus, you can deploy virtualized services to innovate, communicate and support new applications.

Virtualized services

Our Nuage Networks Virtualized Services Platform (VSP) makes your enterprise network as “consumable” as any virtualized computing resource — enabling the real-time, live environment DevOps approach to develop applications and services for the connected car.

Moreover, with our Nuage Networks Virtualized Network Services (VNS) your network extends wherever you need it to. Adaptive, programmable and open, Nuage Networks VNS supercharges your wide area network (WAN) to connect remote locations to your data centers without proprietary hardware. It also allows your network team to mix and match cloud offerings from multiple providers and use any access technology.

Private WAN

Nokia private WAN solutions support your cloud strategy with high-performance backbone and flexible access solutions that integrate easily with managed WAN services. We provide scalability, security and control for your private cloud and enable you to implement virtual private and hybrid clouds to keep costs down and agility up.

Cloud data center interconnectivity

Scalably connecting private and hybrid cloud data centers and IT resources, Nokia cloud Data Center Interconnect (DCI) helps you to balance workloads for efficient data usage. The built-in security of our cloud DCI solutions also protects your business-critical data, including the information you gather from devices in connected cars.

Breaking down communications silos to get to market faster

Deploy next-generation communications and collaboration services to any application with our enterprise IP communications solution, Nokia Rapport. Communicating and collaborating will be faster, easier and much more productive, helping you bring new ideas to market faster.
Access an ecosystem for faster innovation

The ng Connect program brings industry-leading companies together to collaborate on solution concepts, business models and market trials as part of a tightly connected innovation ecosystem.

Founded by Nokia, ng Connect comprises more than 250 collaborating members, such as innovators and leaders in networks, consumer electronics, applications, platforms, vertical markets and the automotive industry. Drawing on expertise from across many disciplines and industries, ng Connect members can achieve more and faster by working together rather than as individuals.

Multi-member ng Connect automotive service concepts include the LTE Connected Car and the Connected Service Vehicle. In a recent pilot project in New Zealand, ng Connect members designed a service vision conceived by Chorus, a wholesale network provider. Using the Connected Service Vehicle, technicians installed broadband in customer residences more easily, faster and at lower cost.

One of the ways Nokia enables ng Connect participation for our automotive customers is easy integration with other collaborators through the Nokia IMPACT Developer Kit, which includes a broad range of application program interfaces (APIs).
Trusted. Scalable. Agile.

Nokia delivers advanced device and data management platforms and secure connectivity solutions to customers around the world.

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<th>We can help you to</th>
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<td>Deploy high-performance mobile networking at the very edge of the mobile network,</td>
<td>Nokia Mobile Edge Computing platform</td>
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<td>delivering an ultra-responsive driver experience in connected cars.</td>
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<td>Securely manage millions of devices to integrate real-time visibility,</td>
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<td>analytics and sensor-driven automation for increased after-sales revenue</td>
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<td>Enable the real-time, live environment DevOps approach to develop applications</td>
<td>Nuage Networks Virtual Services Platform</td>
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<td>and services for the connected car.</td>
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<td>Supercharge your WAN and connect branches to the data center without</td>
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<td>expensive and cumbersome proprietary hardware.</td>
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<td>Benefit from flexible and agile approaches to enterprise networking that</td>
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<td>Automate DCI in private and hybrid clouds, balance workloads,</td>
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<td>and backup and protect valuable information.</td>
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