



**Connected
data for
connected
vehicles**

**The future of
automotive
is in the cloud**

 NetApp

The highways of the future are digital

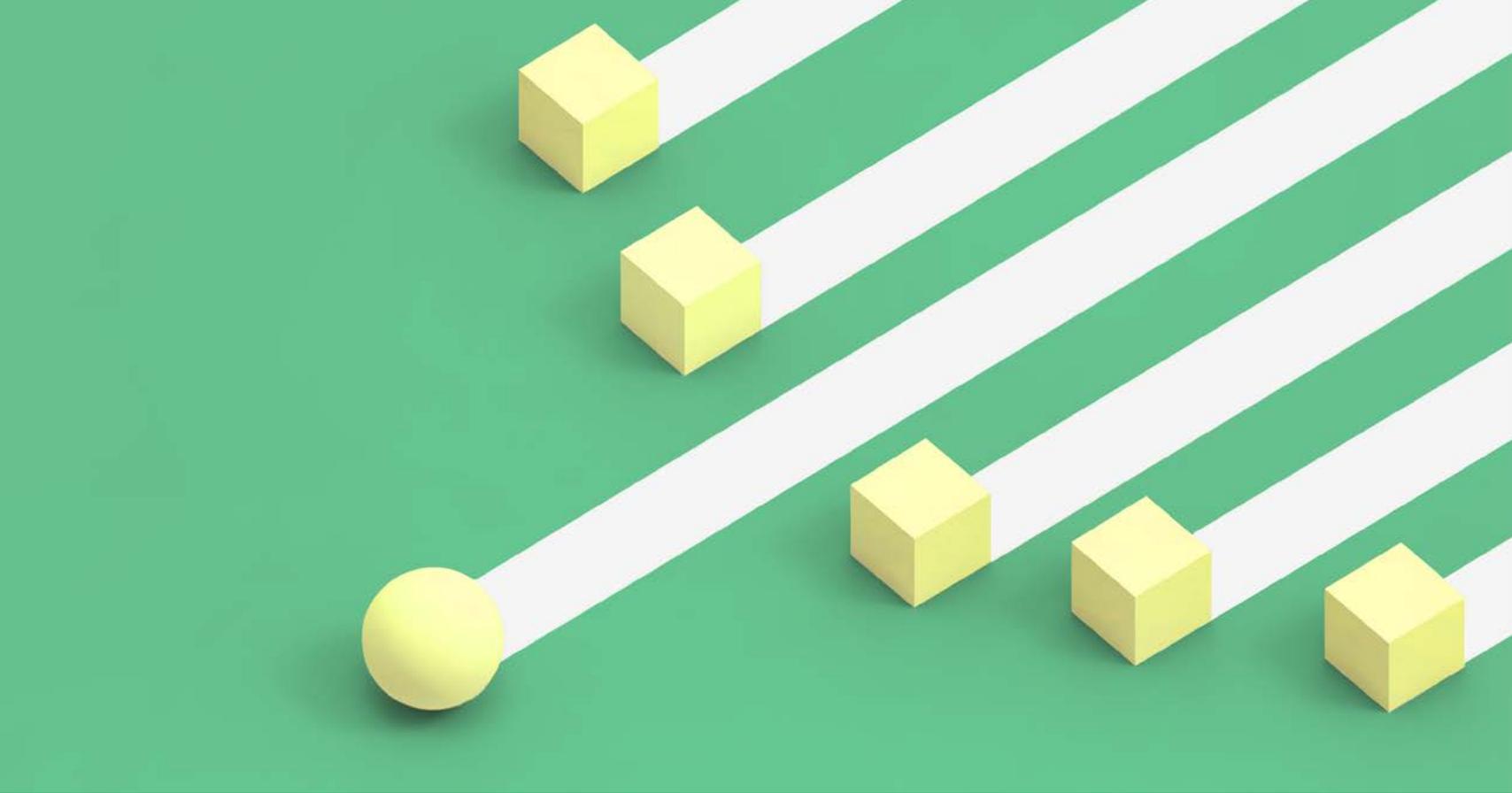
Embrace connectivity and put your data in the fast lane.

212 million miles away, cruising at a gentle 19,000 mph, a Tesla Roadster is circling the world's longest roundabout around our solar system. Publicity stunt it may have been, but it says something about how far technology has come that we can watch a live feed of a spaceborne car and track its interplanetary journey from our living rooms.

Closer to home, similar innovations in technology and connectivity are happening too. The automotive industry is undergoing a digital transformation that will fundamentally alter how consumers and manufacturers interact with vehicles, from in-car experiences to OEM simulation and test environments. Advances in cloud computing are enabling a constant flow of information to and from vehicles – making it possible to become permanently connected.

By 2030, about 95% of new vehicles sold globally will be connected, up from around 50% today. Around 45% of these vehicles will have intermediate and advanced connectivity.

Source: McKinsey, 2021



The possibilities of connected vehicles are only beginning to be realized. When data no longer has to be stored directly in the vehicles, it naturally results in an enormous advantage in terms of performance and costs for OEMs, suppliers, dealers, insurers, fleets, tech players, and beyond.

The only question is how will automotive businesses manage and maximize the value of this vast amount of new data? One single autonomous car can generate up to 1TB of data an hour. Leveraging this data to speed innovation and improve customer experience, not to mention keeping it safe and secure, will need wholly new capabilities and infrastructure.

The annual value of the connected car ecosystem is expected to have risen from \$250 billion to \$400 billion by 2030.

Source: McKinsey, 2021

Data handling is the journey and the destination

Edge, core and cloud should work as a single digital ecosystem.

Vehicles aren't just hardware anymore. Their days as simply tools to get us from A to B are rapidly fading. Digitalization is turning the vehicles of the future into commodities that are as experiential as they are useful.

Vehicle software increasingly sits within a connected ecosystem of devices. Consumer expectations are shifting to expect digital compatibility, connectivity and new functionalities. Vehicles won't be differentiated purely on practical standards of safety, fuel efficiency and so on, but how well they can mesh with this digital ecosystem. Cars that can stream video to the kids in the back, can find you the best restaurants nearby, or can seamlessly integrate road trip playlists. This kind of connectivity is becoming make-or-break for many consumers when they come to buy.

This is an excellent chance for proactive manufacturers looking to stand out in the market and bring something new to the table. But the required cloud infrastructure and software development capabilities necessary to capitalize remain relatively untrodden ground within the automotive industry.

We're used to getting updates pushed to our phones, but over-the-air updates to our cars are still something fresh for most people. As a software platform, vehicles can be continuously improved, gaining additional functionality over time. Insights derived via iterative learning from tens of thousands of vehicles can be disseminated back to vehicle fleets, from something as simple as menu layouts right down to brake parameters on different terrains.

30% of CIOs view cloud services and solutions as an essential investment opportunity.

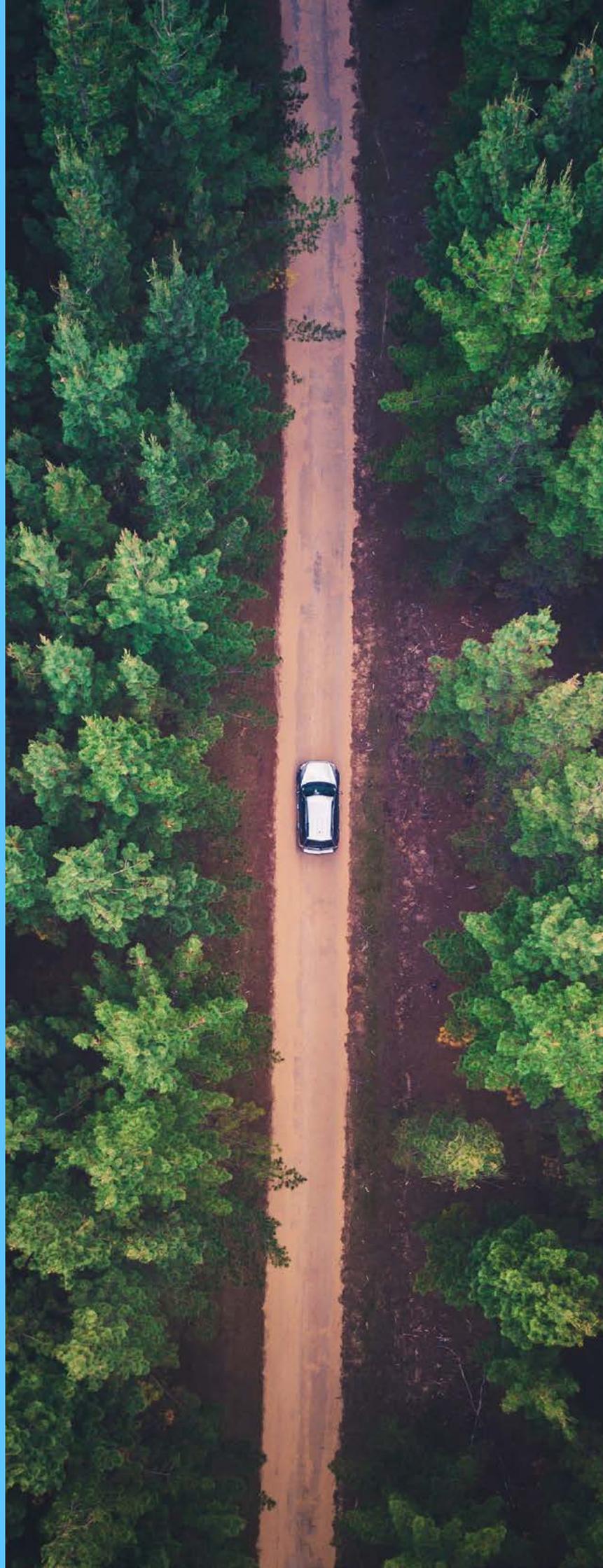
Source: Gartner, 2020

Many OEMs are only at the beginning of this transformation journey and have struggled on the software side of things, resulting in poor customer reviews and a delayed start to production. Only a few are having their efforts land, and even fewer are effectively monetizing their data.

It isn't hard to see why – even small issues are magnified when it comes to digital technology. The gap between smoothly working and not working is extremely narrow, but the potential benefits of getting it right are significant. Automotive businesses with the right capabilities will open entirely new revenue streams throughout vehicle lifecycles.

To be one of the ones getting it right requires expertise and the strong integration of cloud infrastructure – it's the only viable way to handle the complexity, elasticity and volume of data involved. The cloud-to-car dynamic is scalable, agile and digitally resilient – meaning it can adapt to changing fleet sizes, react in real time to pass on updates and new functionality, and stay on top of security threats.

The cloud is also a two-way street. Not only does it allow the extraction of the full value of vehicle data, but it brings personalized functionality to drivers and passengers, meaning better, more tailored customer experiences. Connecting data in vehicles to the cloud is a crucial element to making the most of these opportunities.



Put your IT infrastructure into gear

With data, like cars, the good stuff happens under the hood.

From edge to cloud, you can harvest all the data in the world, but it only counts for something if you can actually use it. Without the ability to step back and access the whole picture, vital insights get lost between the cracks.



The capacity to handle large volumes of data is only half the story. From end-to-end, IT infrastructure needs to act as a single unified system. By aligning all parts of the data management process, it not only boosts operational agility and workflow, but prevents silos from forming and the fragmentation of valuable data.

Automotive businesses are especially vulnerable to this kind of organizational fragmentation. Due to the disparity in workflows between OT and centralized IT, they often suffer from issues with shadow IT, effectively operating a two-tier IT system. This division creates compatibility issues and bottlenecks when digesting, analyzing and interpreting large volumes of data. If businesses aren't careful, adding cloud capabilities may only layer further issues on top, rather than act as a unifying force.

The quality of data and insights is the number one technology bottleneck for 50% of automotive organizations looking to transform.

Source: IDC, 2021

To avoid this, cloud implementation must sit within a cohesive global data strategy and a synchronized infrastructure model, which breaks down these silos and can effectively mediate the flow of data between enterprise IT, connected vehicles and manufacturing plants.

By 2023, more than 55% of enterprises will swap their outdated operational models with cloud-centric ones that enhance organizational collaboration.

Source: IDC, 2021

Implementing modernization, standardization and automation are the key steps on the roadmap towards future-ready IT operations. Building a data fabric means harmonizing all aspects of your IT infrastructure so that your data pipeline operates seamlessly and lays the groundwork for incorporating AI-enabled innovations. The ideal pipeline delivers well-structured datasets, letting you get the most from your analytics and tap into valuable customer insights.

Build an end-to-end data fortress



**Customer data isn't just an asset.
It's a responsibility.**

Connected vehicles bring new frontiers in personalizing customer experiences. However, these new frontiers come with caveats. Questions as to data ownership, access and sharing, privacy concerns and regulatory frameworks are all issues that automotive businesses have to contend with. Falling foul of regulations or suffering data breaches carry significant reputational or financial risk and can erode public trust.

56% of executives think that automotive privacy and security will drive purchasing decisions.

Source: IBM, 2020

Automotive businesses won't just be handling more data, but new kinds of data too, from streams such as vehicle sensors, telematics boxes and infotainment systems. This data goes beyond location and movement and opens windows into customer habits, from driving styles to internet usage. These can create whole new avenues of potential value but are subject to much more stringent requirements.

Connected vehicles also capture data on a wide array of subjects — the driver, the owner, the passenger, even other individuals captured by your car's sensors and recordings. Data management systems will need to account for these privacy concerns, down to the level of cars crossing state or national borders with different legal requirements.

Shifts in the privacy landscape, embodied by acts like the California Consumer Privacy Act and GDPR, put deeper obligations on businesses to handle their data more carefully. For the automotive industry, operating globally, this increasing trend of localized data restrictions poses some serious speedbumps.

These issues combine to leave automotive companies with a very complex data landscape that they must consider, in addition to the legal requirements they need to comply with governing the privacy and security of data processed in the context of connected vehicles.

In order to move forward with confidence, automotive businesses must be prepared to make privacy a key part of their culture and approach these challenges with a holistic view on data management. Organizations will need to remain compliant with regulatory requirements in virtually all facets of the business, properly plan and implement protections and prepare for compliance with new and expanding regulations and consumer demands. As consumer expectations continue to drive privacy scrutiny, there is an opportunity to lead the pack in this evolving area.

62% of customers said they would consider one automotive brand over another if it had better security and privacy.

Source: IBM, 2020

The NetApp difference

How we can unlock the potential in your data.

Connected vehicles are here to stay, and they're bringing a huge amount of data with them. To capitalize on that data, and provide a top-tier customer experience, you'll need to modernize your core processes.

NetApp's future-proof platform enables you to be nimble enough to perform optimally across an ever-changing digital landscape. Our expertise in hybrid and multi-cloud systems enables you to integrate new projects into your existing infrastructure cost-effectively and efficiently, making your business more agile and able to adapt to whatever the road ahead brings.



Connected experience in the cloud

We are a software company focused on one thing: unlocking the best of cloud. We can help you build a unique data fabric—an architecture of systems, software and services that manages your data as a simple, connected experience, easing data exchange across all sites.

By creating a unified, resilient, scalable platform that connects data across edge, core and cloud, we'll help you break down silos and digitally transform to meet the demands of the automotive industry.



Seamlessly access your data with speed

Our range of cloud solutions provide constant connectivity that makes data available in the right place, at the right time. We help you to capture and transport data in real time using our expressways into all major hyperscale cloud providers, including AWS, Azure and GCP.

We simplify your cloud management landscape while unlocking the speed, efficiency and flexibility to shift focus from administration to innovation. Our services give you speed and reliability you can depend on, letting you move forward with confidence and improve customer experience.



Robust protection and compliance

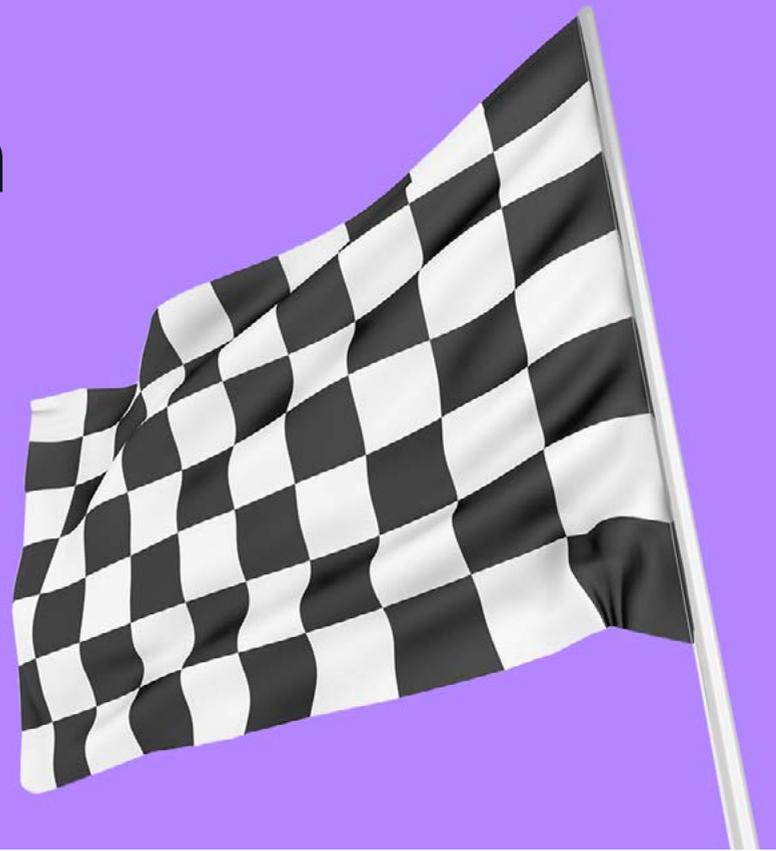
NetApp provides you with an advanced storage offering deployed in your cloud of choice, giving you added control and data efficiency. Our shared file and block storage comes with in-place and inline encryption, integration with the leading authentication services, and advanced features to rapidly recover lost or stolen data and repel security attacks.

Our AI-driven algorithms identify, classify and categorize your data and apply policies to report and recommend remediation according to modern compliance regulations.

This ensures data is processed in the right way and stored where it needs to be, allowing you to remain ahead of the curve around data privacy and security.

The race is on

Real-time data-driven decisions for motorsport.



A motorsport team from a leading car manufacturer approached us to see how our solutions could help them capture the data they needed to deliver peak race performance.

The problem

During races, speed is of the essence. Not just for the cars themselves, but being able to monitor and react on the fly to changing conditions. Cars generate vast amounts of telemetry data every race, but the systems used to analyze this data are often hundreds or thousands of miles away.

Simply transferring the data back and forth was too slow, and the problem was getting worse as data volumes increased. The team understood they needed a solution for real-time, location-agnostic data collaboration that was as fast on the cloud as it was on the track.

The solution

The quality of the real-time decisions not only affects the outcome of the race, but also contributes to future developments of the race car and innovation more broadly. To get it right, a data management solution that was fast, reliable and mobile was needed.

NetApp worked with the team to develop a solution that was comprised of Cloud Volumes ONTAP to act as a hub to consolidate data and Global File Cache to provide local edge instances, enabling low-latency access between an on-prem R&D center and the racetrack. Our Cloud Backup was also included to act as a backup and archive layer for the consolidated cloud data, ensuring redundancy and total reliability.

The results

For the team, their partnership with us is not merely a data management solution – it's a sustainable innovation enabler. Our suite of solutions helped the team extract the maximum value from their data and leverage it towards future innovation. They're currently presenting this success story internally, looking at ways to expand its scope to work for their broader business.

Ready to take advantage of next-generation data mobility?

Unlock the power of cloud
and accelerate your digital
transformation with NetApp.

Check out our website to find out more,
or you can get in touch with us by email
at automotive@netapp.com.

