Hewlett Packard Enterprise

Making autonomous driving a reality

Zenseact builds a safer future on AI and real-time insights

If there's an auto brand synonymous with driver safety, it's Volvo. And if there's a new technology pushing the automobile into the vast unknown, it's autonomous driving. At the center of that crossroads is Zenseact—a Volvo Cars-owned startup that built a consumption-based platform to deliver thousands of simulations per second and make cars safer.

Where are all the driverless cars?

For the amount of attention they get, driverless cars almost feel like old news. Every major technology company seems to be developing one. But there's a reason they don't exist yet.

It all comes down to one factor. "You can approach autonomous driving from many different directions, but for us it's really all about creating safety," says Ödgärd Andersson, CEO of Zenseact. "With a mother company like Volvo Cars, safety is in our DNA."

Created by Volvo Cars as a software startup, it's up to Zenseact to develop tools for the future of driving—everything from driver assistance to fully autonomous driving.

Making it real

"Driving autonomously is really quite simple to some degree," Andersson explains. "You need to see really far in all directions and have multiple ways of sensing the surrounding environment. Then you need to take all that information and process it to understand what you're seeing, and finally act on it."

Training the software to become better at seeing, processing, and acting makes the cars smarter over time. "Once cars learn to navigate more and more complex environments, they can fully take over. That's when we make it real."

zenseact

Industry: Automotive

Country: Europe

Vision

Build the safest driverless cars on the planet

Strategy

Develop, train, and validate an AI algorithm to think for itself in real time

Outcomes

- Develops and deploys AI solutions faster than the competition
- Builds the foundation for fewer accidents and a safer world
- Gains more agility at a lower cost with HPC delivered as a service

Make it real is the goal and the motto of the company. "Everybody talks about autonomous driving. Many of our competitors have even made bold public statements about it," Andersson says. "But our approach is to just make this happen for real. We believe a world with more self-driving cars is a safer world. That's where we come from, and that's where we're headed."

Training an AI brain

In order to do that, Zenseact built test cars packed with technology. "They're like data centers on four wheels," says Robert Tapper, CIO of Zenseact. "It requires vast amounts of data to train an AI brain capable of driving a car safely."

A typical test car features up to 23 sensors capturing radar, lidar, sonar, and video data. "We're collecting gigabytes every second. During a day's drive, we generate more than 50 terabytes per test car," Tapper explains. "And over the course of the project, we've amassed hundreds of petabytes of data."

A partner approach

There's no fast way to transfer 50 TB over the air, or even over a network. But that daily test data needs to be validated for accuracy to make sure the artificial intelligence (AI) is learning the right behaviors. Crunching the data to perform validation and train Zenseact's algorithm requires serious compute power.

Zenseact also realized it would need to quickly spin up new services locally to support approved driverless locations as they become available. "Autonomous driving won't happen simultaneously around the world. And it's hard to predict exactly when it will be legally allowed in different countries," Andersson explains. "So, for us, flexibility is incredibly important."

"Very early on, we realized we didn't want to build every aspect of this technology ourselves," Andersson recalls. "And we weren't necessarily looking for a hardware vendor. We really wanted to have someone to partner with around innovation."

A future of innovation

When Zenseact began exploring solutions with Hewlett Packard Enterprise, it was really thinking about the future of its business. "We liked the HPE GreenLake model of consuming technology as a service and paying for it over time," Andersson says. "But it's more than that. Selecting HPE was about looking at the future—thinking about what we need now, but also what we might develop as a result of our partnership going forward."

Success at Zenseact—and for autonomous vehicles in general—depends on delivering tens of thousands of simulations each second. Zenseact performed a benchmark test that demonstrated building a private cloud with HPE solutions was its best choice. "We compared available public cloud and private cloud solutions, and HPE GreenLake came out the winner," Tapper adds.

As new self-driving features roll out and the business moves forward, Tapper and his team looked for an adaptable, agile platform, "we have an ever-changing demand of business requirements,"

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– **Ödgärd Andersson,** CEO, Zenseact
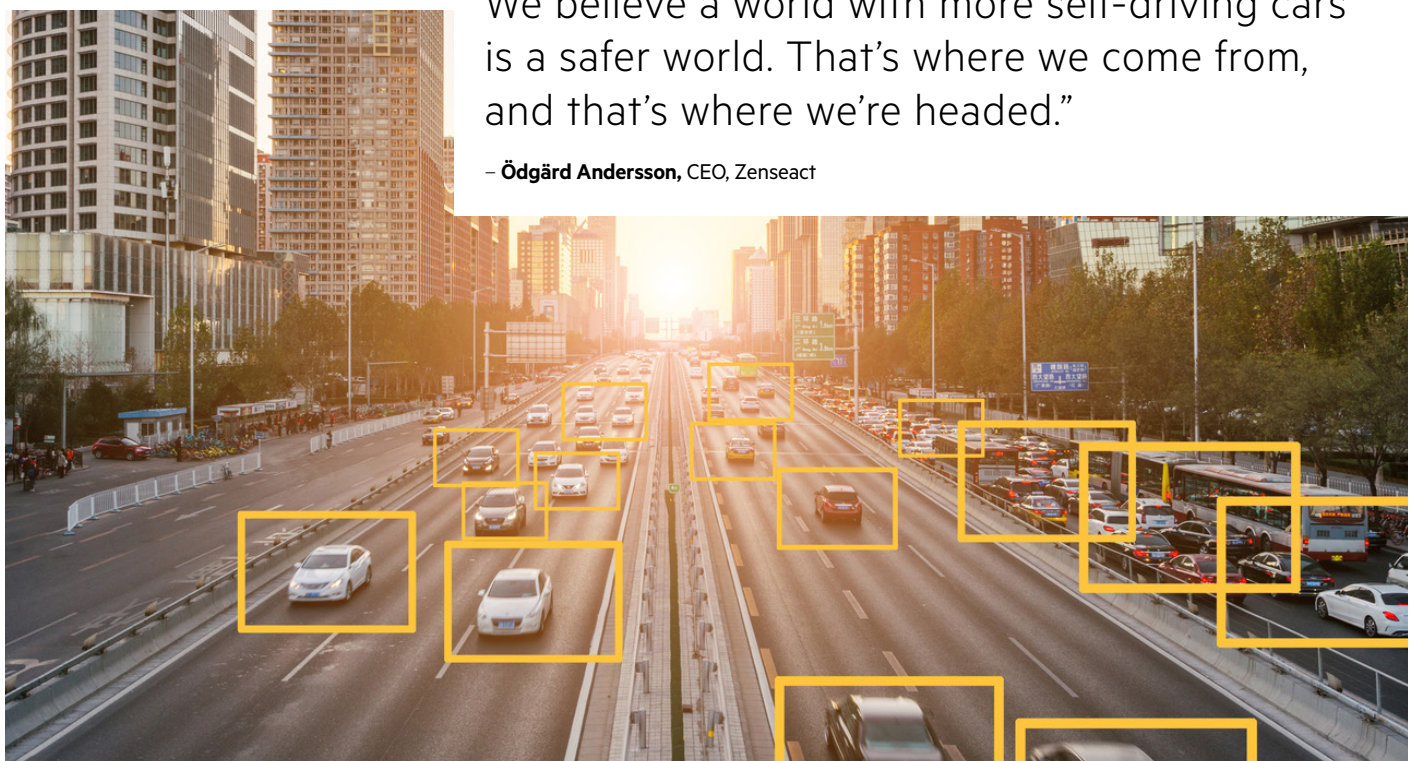
he says, "HPE GreenLake Cloud Services gives us flexibility, which was the key requirement for our development process."

Partnering with HPE, Zenseact is fully equipped for today and beyond, Andersson says: "It's about being able to provide the services we need. Both here, where we are now, and of course we need to scale across the globe."

HPC delivered as a service

Built on clustered HPE ProLiant Gen10 servers and HPE Data Management Framework, the high-performance computing (HPC) system is designed for high availability, parallel performance, and petabytes of data. The entire platform is managed and supported by HPE GreenLake Management Services.

"Having a high-performance platform is the key to everything we do. All the data coming in from the cars has to be processed in one way or another," Tapper explains. "Being able to perform that processing across a platform is very important for us. And we can develop faster than the competition because we can process in parallel."

This scalable, pay-per-use platform delivers insights from growing amounts of data in a cost-efficient way. "It's not just the cost for everything we store, but it's also creating a system where we can clean out data and keep high value over time, really optimizing the cost", says Andersson.

And a fully managed experience enables staff to focus on Zenseact's mission, "leveraging the expertise HPE has with high performance computing frees up our developers to focus on improving our software, which is the most important thing for us," Tapper says.

Expertise for an end-to-end data pipeline

Because the system processes commercially sensitive data, Zenseact worked with the HPE Pointnext Services experts to build and deploy the security architecture around the on-premises HPC platform. Leveraging third-party solutions and security by design principles, the framework allows the team to prevent, monitor, and react to any potential risks or incidents.

Security isn't the only area where Zenseact benefits from HPE expertise: "We get access to some of HPE's brightest AI scientists. Together, we believe that we're able to solve the challenge of the century," Tapper explains.

HPE is also solving the problem of delivering 50 TB per car of daily drive data to Zenseact's data center. "HPE Pointnext Services serves a critical role in our data collection process," Tapper says. "At the end of eight hours of test driving, HPE manages the secure delivery of the data from the drop-off location to the data center where it is decompressed, ingested, and then shared with developers. Data integrity is incredibly important to us because better data ultimately means better simulations."

The race is on

So, when is it all happening? Afterall, driver-assisted technology has been infiltrating vehicles for decades. From emergency braking systems to forward-collision detectors, it's only a matter of time before the car can think for—and drive—itself.

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"I think we'll see more common features like highway pilot being launched in the next few years. More advanced features like city driving are further out," Tapper predicts. "I think the move to full, autonomous vehicles is still between five and 10 years away."

But when it does arrive, the world could finally experience roads where all automobiles actually follow traffic laws. "We can expect to see everything from increased traffic flows to a reduction of fatalities and positive impacts on the environment," Tapper says. "I'm a true believer in autonomous driving. It's been called the engineering challenge of the century, but it's also where all the fun stuff is happening right now."

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- HPE GreenLake Cloud Services
- HPE GreenLake Management Services

Hardware

- HPE ProLiant DL Gen10 servers

Software

- Lustre filesystem
- HPE Data Management Framework

HPE Pointnext Services

- Advisory and Professional Services
- HPE Security and Risk Management Services

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