

# S1 EP8 - Automotive Megatrends

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Will Chu, Senior Vice President and General Manager of Marvell's Automotive Business Unit discusses Automotive Megatrends with podcast host Chris Banuelos. In this episode, hear Will's insights on the current trends: autonomous, software-defined, vehicle connectivity and security. As next generation vehicles require zonal architectures enabled by Ethernet, Marvell is poised to enable customers with optimal solutions for smarter, safer and greener vehicles.

## Speaker

**Will Chu**

Senior Vice President and General Manager, Automotive

## Host

**Christopher Banuelos**

Senior Manager of Global Social Media Marketing

### **C Christopher Banuelos 00:04**

Welcome to the Marvell Essential Technology Podcast. I'm your host, Chris Banuelos. And today I'm with Will Chu, senior vice president and general manager of the automotive business unit discussing the latest in automotive mega trends. Will wanted to welcome you to the podcast. I'm actually very excited to have this discussion with you today talking about automotive mega trends. You recently had a presentation at Semicon Japan, I wanted to start our conversation off with what were some of the main topics that you discussed?

### **W Will Chu 00:45**

Yeah. So semicon, Japan, we had a great opportunity to present on the automotive mega trends in the industry parts have been around for more than 100 years. But I don't think we've ever seen as much change in the space until now. And that's really driven by four big trends. Right? So the four big trends are autonomous, software defined, connected and secure. In terms of autonomous, I think everybody's aware that cars are becoming more autonomous, right, they're gonna have more functions that they'll do on their own. I think most people can accept also that cars will be connected, connected to the cloud, connected to their phones, or even connected to other cars or their infrastructure. I think the last two can be a little bit more harder to understand software defined, cars are really becoming more like data center on wheels. And that requires a lot of software, because with more processors, that cars can do a lot more new things. Right. And that all ties, cars being autonomous, because that means a lot of software as well as connected. Because when it's connected to the cloud, you have the opportunity to change the behavior of a car through software. And those three trends really require the car to be much, much more secure. Right, you definitely have an autonomous car, you don't want somebody to hack, right. And there's a lot of software there. And obviously the same thing, if the car is connected to the internet, there's a lot of threats that can come from, you know, from the cloud, or you know, so you need a high level of cybersecurity. So these are really the mega trends that haven't existed in the automotive space, even 10 years ago.

**C Christopher Banuelos 02:31**

So based on these four mega trends, how is that impacting the semiconductor industry?

**W Will Chu 02:37**

Yeah, so these mega trends are what's motivating Marvell to be in the automotive space. You know, we have some core technologies, we do processors, you know, we develop processes, we develop storage products, we develop networking products, we develop security products. And all of these technologies are needed next generation cars. That can be autonomous software defined, connected, and secure. Automotive is one of the fastest growing segments of the semiconductor space in general. And within Marvell, with our technologies, the automotive market for us. So the customers that we serve, we're growing even faster than the automotive space generally, or the semiconductor space generally, because it's a good intersection of our technologies and the needs of the customers. Will, how is Ethernet technology shaping the automotive industry? Yeah, so when I joined Marvell, in 2017, the main focus, and it continues to be a large focus was our Ethernet technology. And Marvell has been in the Ethernet space for more than 25 years. Right? We're one of the largest Ethernet providers in the world. And there was a time let's say, even four years ago when you'd say okay, why do you need Ethernet in a car? Today, four years later? At least for those in the automotive industry? Nobody questions that anymore. It's not a question of if you'll need Ethernet, but you know how much you know and how quickly for Ethernet products we have won over 28 OEM wins. So what that means is we have gotten the confidence of 28 different car companies to use our Ethernet products and our next generation vehicles. And in fact, even today, we have shipped into millions of vehicles on the road already. And that number will continue to grow. That's kind of the first area we've looked at within Marvell taking our networking or Ethernet technology into the automotive space. And then but we have the others. Most of our products have security embedded in it. So we're already bringing security technology into the automotive space through our Ethernet products. And then we recently have won a processor or custom compute Customer to bring our process of technology into the automotive space. And then eventually we have storage. And we'll look into that bringing our storage technology into automotive as well.

**C Christopher Banuelos 05:09**

In the automotive segment, what would you say is Marvell's vision? And where do you see things going?

**W Will Chu 05:15**

Sure. So, you know, my Well, we have a, we have a vision for automotive. And it's enabling safer, smarter and greener vehicles with innovative automotive networking, storage, compute, and security semiconductor solutions. So what does that really mean? Right, so cars in the future are going to be smarter. And, you know, I use this term to represent a couple of different ideas. So smarter means autonomous. But also smarter means giving you the driver, the passenger, a much richer experience, meaning from an infotainment perspective, smarter integration with your phone, or providing more services. For example, if a car is autonomous in the future, and it sounds funny, you're going to honestly take zoom calls while you're driving and interact with people while you're on the road. Right. So that's the that's the smarter angle, of course, cars are going to be safer, right? So all of this technology, and I'm super proud of Marvell, we have the opportunity to help make cars safer. And that really comes from, you know, cars, that more sensors, and to detect the world around them. And even information right there connected to the internet to have information about where, you know, what are the accidents and things like this. And all of this requires Marvell Technology to move the data, you know, to process the data, right, and even store the data. So we're really helping make cars safer, and then cars in the future will be much safer than they are today. And then finally, I think we're all familiar with cars being greener. So a part of that's electrification, which Marvell supports a little bit. But really, the greener aspect of what we do, and it's more esoteric, is cars are heavy, they weigh 1000s of pounds. Most people don't understand this, but you know, the wires inside of a car are the third heaviest component. And as well as the third most expensive after the the end in and the chassis, it seems phenomenal. Right? But you know, a wiring harness, which are all the wires in the car, can weigh couple 100 pounds. That sounds incredible. Right? So our technology, actually, in fact, in terms of Ethernet can actually reduce the cabling cost of a car. So obviously, if the cabling the wire harness can weigh a lot less, you'll get better gas mileage, or for as an EV, you'll get longer

range, right? Or you can optimize things for, you know, different results. So in fact, we help cars be greener. And there's other aspects of helping cars be greener. You know, in terms of our processing technology. If again, we can help avoid congestion and things like this, that can also help cars be greener in the future.

**C Christopher Banuelos 08:06**

Will, as we wrap up our conversation, I wanted to talk about the connected car just a little bit more in what is going to be the overall impact on cloud data centers, and how is it going to affect society as a whole?

**W Will Chu 08:18**

Yeah, it's really interesting. So as we see with many, many other let's say, devices, or everything, literally, everything is getting getting connected to the cloud. Right. And the emergence of the cloud is like a super, super mega trend that's going to impact society. For the next, you know, few decades. Automotive is no different. Right? So cars will be connected to the cloud, or the internet. And that connection with all that information, just allows cars also be smarter, safer and greener. Right. And there's also a trend for cars to be connected to talk to each other, let's say locally, right? And there's a technology called V to V or vehicle to vehicle connectivity, right? So if cars can talk to each other, and pass data, then the cars themselves, the primary use case for V to V, vehicle to vehicle communication was really safety. So the classic example would be, you know, you're going down a road, and somebody's on another road that intersects with your road, and you can't see that other car. But the cars can communicate to each other, let's say wirelessly, and you can prevent an accident, you know, classic, like I don't want to get T boned by another car. So that for sure can enable safety. And of course, if there's a traffic jam, and you're driving on the highway, going very fast, but all the cars in front of you and you can't see them are stopped, right if there's technology to inform the car ahead of time, you know, a mile away or you know, at least you know, quarter mile away to hey, there's a big traffic jam, you know you're going Going at really high speeds, they're going really slowly you have to slow down and give you that extra time to make that decision, then that can also of course, help cars be a lot safer. And of course in the end that information to help cars be like greener because you can avoid congestion and take other routes and you know, get to your destination and more comfort with using less fuel.

**C Christopher Banuelos 10:19**

Will wanted to say thank you for participating on today's episode. I'm looking forward to having future discussions about automotive mega trends and what's next.

**W Will Chu 10:27**

Yeah, Chris. I'm proud to be at Marvell and supporting the automotive industry, the automotive space at Marvell. It's gonna be really, really exciting, and I look forward to having the chance to give you an update in the future.

**C Christopher Banuelos 10:42**

Thank you for listening to the Marvell Essential Technology Podcast. As always, please feel free to visit our website to learn more, and we'll see you on the next episode.



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