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PRESENTATION

**Voice-Over**

What do we mean when we say, "All you need is an idea and Intel Inside?"

That in today's fast moving high-tech world, big ideas are powered by a one-of-a-kind partnership with Intel, because our customer-first approach is more than just a byline.

From the moment we put the silicon in Silicon Valley, Intel has been accelerating the industry in big ways.

Setting a course for a new era of bold innovation.

No one else is this obsessed with engineering a brighter future.

That's why we're driving the industry’s biggest inflection points, putting intelligence where it's needed most, in ways that only Intel can, with the multi-architecture approach that empowers our customers to transform their businesses from the inside out.

We're democratizing AI in big ways, combining software and hardware to open up new possibilities.

And we're moving that innovation around the world at lightning speeds with our advances in 5G. Collaborating with global operators and creating a new vision for networks of the future.

We're taking intelligence and bringing it to the Edge. Accelerating business outcomes with over 30,000 Edge to Cloud solution deployments.

And we're taking that same innovation to the streets, deploying new technology and advanced data layers to make autonomous driving not only possible, but safe and seamless.

Every day, we create world-changing technology that enriches the lives of every person on earth, making bold moves, because Intel has the unique portfolio breadth and depth, plus the global scale to serve as an unparalleled catalyst for our partners’ biggest ambitions.

So, if you've got a big idea, let's go off and do something wonderful together.

**Andrew Tang**

Welcome, everyone, to the Intel Network Builders Enterprise Networking Insights Series. I'm Andrew Tang, Regional Alliance Lead for Team Microsoft at Intel, and your host for today's webinar. Thank you for taking the time to join us today for our webinar titled “Monetizing Enterprise Services with Private 5G, LTE and IoT”. We will start today with a presentation by Microsoft and then head into a fireside chat with our presenters.

Before we get started, I want to point out some of the features of the BrightTALK tool that may improve your experience.

There is a Questions tab below your viewer. I encourage our live audience to please ask questions at any time.

There is also an Attachments tab with additional documentation and reference materials, which pertain to this presentation.

Please take the time to provide your feedback using the survey link. Your feedback is incredibly invaluable to providing the content you want to see and the solution you need. Please take five minutes to give us your thoughts after the webinar.

Intel Network Builders Enterprise Networking Insights Series takes place live every month, so check the channel to see what is upcoming and access our growing library of recorded content. In addition to the resources you see here, we also offer a comprehensive NFV and 5G training program through Intel Network Builders University. You can find the link to this program in the Attachments tab as well.

Today, we are pleased to welcome Tang Kit from Microsoft and Hans Chuang from Intel. Tang is the Regional Pre-Sales Lead for Microsoft Azure for operators in APAC. He is responsible for the solutions architecting, systems engineering, and pilot projects for Microsoft's 5G core networks, and cloudification. Tang has spent his career immersed in telco networking consulting, design, deployment, and innovation. Prior to Microsoft, Tang has extensive technical strategic planning and leadership experience in implementing operator core networks. Outside of his professional role, Tang enjoys swim training with his wife and kids, who each are competitive swimmers.

Hans Chuang joined Intel's Data Center Group Network Communications Sales staff as VP and Sales and Marketing Group Director for Greater Asia in December 2020. For the past four years, Hans led the SMG Huawei Global Account Team. Prior to that, he was in Intel's Programmable Solutions Group, where he led its Asia Pacific, PRC, and Japan sales team as regional VP and Country Manager. Hans holds a Bachelor of Science in Electrical Engineering from University of British Columbia and an MBA from McGill University. He is fluent in Mandarin, English, and Japanese.

Welcome, Tang and Hans, and thank you for taking the time to join us today. And with that, Tang, I will hand it over to you to start off your presentation.

**Tang Kit**

Thanks for having me, Andrew, on this Intel Networks Insights Series webinar. Today I'm going to be presenting on Monetizing of Enterprise Services with Private 5G, LTE and IoT.

Our shared vision with Microsoft and Intel, actually, Intel and Microsoft have been the sine qua non of each other since the very get-go, and Azure and Intel are accelerating cloud adoption by bringing in feature-rich, easy-to-deploy cloud solutions to the market, and together we want to empower every person and organization on the planet to achieve more and do better.

Here we have the key principles of Microsoft’s Operator strategy. Number one, we're bringing the power of the cloud to future-proof your network, driving down costs and opening new revenue streams. Just like the internet, the cloud is a global ecosystem that allows you to draw from a plethora of applications, resources, and developments to suit your needs without having to build and manage your own infrastructure. As you may know, there's plenty of efficiencies, as this allows for less upfront costs, greater economies of scale, where you can scale up rapidly and as large as you need, all at your own pace.

Number two, we'll partner with you. You own the customer, you own the branding, the ideation, and the experience. Microsoft has prided itself on Enterprise Partnership. This has been our pedigree since inception.

Number three, we remain a platform business. Our focus is on moving workloads into carrier-grade cloud. As mentioned above, the modern networks are seeking to shift into the cloud, as that is where the applications, the avant-garde developments reside, and is essentially the epicenter of intelligence.

Number four, we will meet you where you are-- on-premises, at the Edge, or in the cloud. We're here to give you a solution that best fits your current needs and evolution. We don't force the cloud on to you from the beginning. We're here to serve your needs. We're here when you're ready.

Number five, we support an ecosystem. We will work closely with providers of radio access, core networks, cloud native functions, and OSS/BSS to integrate and innovate. Though we have our first party 5G control and user plane functions, we come together with a growing ecosystem of innovative partners, and who bring their technologies for a total end-to-end 5G solution.

Number six, it is a journey. We act as a trusted partner to help you transform at a pace that makes sense for your business. As we embark on this journey with you, we want to be very clear about our intentions and always to earn your trust.

So, here we're going to talk about Private 5G for Enterprise. Today's webinar is about Private 5G and its monetization, but just now we give an intro of our 5G solution in the context of telco operators. Well, the agility is our 5G technology is such that we can scale to the large magnitudes of the operator networks. Yet when it comes to enterprise deployments, we can also compact size down to the efficiencies of small-to-medium enterprise premises.

In a 5G network, there's four phases or components that come together in the end user device, and in today's modern networks, it's no longer just a mobile phone. It can be a drone, an AGV, AR/VR lens, intelligent machinery, cameras, sensors, and the like. The second component is the radio and that provides the spectrum for the wireless access. We have an array of O-RAN/vRAN partners, which we're adding to our interop list, and it's growing. Next is our network function, and this is where we develop our network functions in-house at Microsoft. This is the heart and brains of the 5G network that authenticates the session management, that processes the signaling, that spheres and transports the data packets towards each and every respective application, be it generally user data, IoT, or mission critical. And the next component is the cloud and all that specialized innovation that resides there. The Microsoft 5G facilitates the mobility and connectivity into the Azure Cloud.

Just an overview of our Microsoft 5G for Enterprise, our capabilities. We offer a complete set of 5G SA core network functions with 4G interworking, and even Wi-Fi interworking. This comes with rich dashboards and APIs for enterprise and operator management, administration, and ease of provisionability. Our network functions have all been developed to run on Intel x86 COTS, be it HPE, Dell, Supermicro, Quanta, or the ODMs or any of the white labels, and certainly we run Azure Stack Edge and in the Azure cloud. The Microsoft Unity cloud comprises our 5G suite of telco functions developed for large scale mobile networks, as well as smaller architectures, or private networks deployed by our enterprise and industry customers. Our 5G function spans the control plane signaling and is one of the industry's highest performing user planes in terms of throughput speeds, all running on Intel x86 and Intel Fortville technology.

Next, we talk about our target vertical applications, and some of the target verticals really span from industrial automation, smart cities, defense, retail/warehouses, healthcare, live events, smart agriculture, and gaming and AR/VR. Industry 4.0 deployments are what I have had experience with, and there are numerous factory floor scenarios that involve some of the computer vision to solve for product quality assurance checks. Some manufacturing processes require pass/fail validation through manufacturing process. This pass/fail could be tied to how a certain part undergoes a cutting process or casting process or assembly step. We're doing post-assembly where certain warning labels are placed and any of these process checks can be done through the use of computer vision algorithms that are specially trained to check for deviations and anomalies.

So, some of the other applications that we've had experience with is also what we call the complete factory digital twin, which is a digital replica of the entire factory floor, including a digital 3D representation of the floor and equipment, a twin graph that represents core data hierarchy and ontology, an IoT Hub architecture to capture and process all the sensors and telemetry feeds being ingested. These generate insights. To generate insights, the digital twin includes capabilities such as advanced analytics and time series models, including AI/ML models, and spatial analytics techniques to further project these insights into a set of application canvases. Certainly, the use of augmented reality and 3D canvas further enhances the experience it offers and experience with a real-time model of a factory floor. And even in defense, there's use of AR/VR. One of our partners, Taqtile, they have an AR/VR ISV solution the personnel can use to expedite the learning and operations of the aircraft ships, the machinery, for the defense.

We also have the digital worker enablement leveraging the AR or VR that involves a variety of use cases, from the remote workers scenarios where a remote expert can see floor workers’ fields of view and provide instructions remotely that are then augmented on the floor workers’ AR-enabled display, to other scenarios where floor workers can activate guided instructions that are then augmented on the worker’s field of view for carrying out instructions. This could be instructions to carry out a maintenance operation or to activate a guided training operation process. In either of the scenarios, the data being transferred to and from the device is a dense data set, and augmented reality features are enabled on the floor workers’ field of view are highly sensitive to latency. So, that's really key for 5G, the ultra-low latency capabilities of 5G, because any type of lag time or latency really offers for a non-realistic type of experience, and so with the ultra-low latency, it really helps to enable these types of applications where you're using AR/VR, we're using mission critical, and certainly we have for smart warehousing robotics in general in the use of AMR, autonomous mobile robots, or AGVs, autonomous guided vehicles, that has a need for real-time sensing.

So, under retail and warehousing, for smart warehousing, robotics in general, and the use of AMR, autonomous mobile robot, or AGV, autonomous guided vehicle, has a need for real-time sensing in order to fully connect with the environment they are operating, as well as collaborative robot scenarios, coordinating the actions with other machines. These mobile robot units are equipped with cameras and computer vision based sensing, along with other sensors like LiDAR, 5G, and MEC that can allow offloading of the compute, whether it be tied to the CV models or other compute activities like route path planning. So, the MEC compute environment can also run services that manage the coordination of tasks for these specific AMRs like mission initiation assignments and act as an endpoint for a broader fleet management system.

So, Private 5G and MEC provides a well-needed underlying connectivity and Edge compute fabric that helps with both throughput and latency of this data exchange to and from the devices. By enabling near real-time access to Edge compute, any AI/ML model inferencing can be offloaded from the device, along with rendering operations while providing a near real-time user experience.

In the healthcare vertical, we have, of course, the remote patient monitoring. This solution provides a mixed set of technology capabilities embedded in devices, software, and services to light up remote monitoring and diagnostic capabilities for members. So, we also have the AR/VR surgical coordination and education digital worker enablement leveraging augmented reality and virtual reality that can involve a variety of use cases. Here, both 5G and MEC provides needs.

Here are some Microsoft ISVs. Attabotics, they specialize in warehouse automation with AGVs. They offer improved operational efficiency leveraging AGVs and 5G for material handling across the factory floor. And with Attabotics, we actually did a pilot together in one of the telcos with Rogers Communications, actually, for which we leveraged Attabotics together with our 5G systems.

And Taqtile. Taqtile really is a mixed reality immersive training and assistance. They use the Microsoft HoloLens, and what they really do is provide real-time instructions to workers through guided tasks, all through the HoloLens, to give feedback as a digital twin, and they improve learning, task consistency, worker safety, and productivity. And it's really cool to really see a lot of their applications on this because it's used very much in a diverse setting from defense to machinery, industrial applications, anywhere pretty much that AR/VR can help to expedite the learning using the Taqtile technologies.

The next is Everseen, and this is the real-time workplace safety and productivity and, you know, people… here, we find things that, and people to take action and improve safety and productivity. Here, they leverage the real-time streaming video analytics and integration with the business processes.

Let’s go over some of the use cases. One of the first use cases that I would like to present is the Wave In–Inventec project. And this is the project that I had firsthand implementation experience with. So, I participated in it from the very initial deployment and implementation and saw it through to actually the commissioning.

So, here, basically, Inventec is a large electronic ODM manufacturer headquartered in Taiwan with several campuses overseas. And what they were looking into Private 5G to do was to facilitate their Industry 4.0 transformation. Their manufacturing processes needed to have lower latency connectivity, telco-grade mobility, resiliency, and security, which their phase one entailed a digital transformation of their new AOI process. Now, AOI stands for the Automated Optics Inspection.

And so, they were looking into 5G because Wi-Fi doesn’t offer the same telco-grade connectivity and mobility as 5G does. And so, their proprietary AOI process, this was their existing proprietary one, was issuing a lot of false fails at a higher speed of production, so they had to find a way to mitigate these false fails.

And so, the new AOI process transfers the image of defects from the original AOI through the 5G network to the Edge computing for preliminary re-inspection. And the integrated manufacturing cloud, the data center will record the past misjudgment traits and deduce a second filtering algorithm by AI for a secondary re-inspection.

And so, the images and the results of both the preliminary review and the second review are sent to the factory via a smart gateway through the 5G network. And if the board shows up as a defect after the secondary judgment, the conveyor belt PLC controller will be notified immediately to change its path for manual inspections.

And so, the analyzed data are fed back into re-inspection stations for real-time reviews, and as a result of this new process using the Microsoft AI and Microsoft 5G, Inventec was able to increase the auto-inspection accuracy to over 90%, improving the SMT first pass yield to over 85%, and reducing the re-inspection by 50%.

So, these are the efficiencies of scale that Inventec had implemented.

And so, Inventec here was our end customer and Wave In was our reseller and supplier. And Wave In was very versed in the radio as well as, you know, versed in the core network, and so they partnered up with us to implement this on Inventec.

Next is our HPE–Infosys–Daimler. And the use case for this was very interesting, because it’s a manufacturing use case that I explained earlier. They deployed our Private 5G SA UnityCloud, and they used it for the M2M, machine-to-machine factory automation. They implemented it for autonomous guided vehicles using AR/VR and low latency types of applications for their manufacturing needs.

Next is Tampnet. And Tampnet’s end customer is Maersk here. And the use cases here, it’s a connected ocean oil rig. And in this case here, they actually deployed our 4G Edge systems, for which the Edge was on-site, on the oil rig, and they offered, obviously, the Connected Worker, the Corrosion Under Insulation. And one of the advantages of deploying wireless on-site into the connected oil rig was that they were able to offload off of their fiber. There's a lot of vibration, there's a lot of, you know, basically hauling of the containers and whatnot. And sometimes the fibers were disrupted. And so, when the fiber connectivities were disrupted, it was very debilitating.

So, in terms of the… you know, basically transforming to the 4G Edge, they were able to offer much more resilient types of connectivity, that was somewhat sufficient or close enough to the fiber. Now, once they transform into 5G, they will essentially get something that’s really on parity. And they used it not just for the connectivity, but also for the remote inspection of AV/VR, vibration monitoring, they used it for the asset tracking and, certainly, the admissions monitoring for their sensors.

So, here we come up with the wrap-up and summary. Here, I want to quote Satya Nadella, our CEO of Microsoft.

“I have been very clear about our business model-- we’re not trying to become a telecommunications company, or a drug company or an automobile company. We want to partner with them.”

So, this is the credence of Microsoft for which we would like to partner with our enterprises. This is the pedigree for which we've worked since the inception of Microsoft together with our enterprises and our industries. We’d like to partner and we’d like to partner in the new era of 5G and in the new era of cloudification, Azure Cloud that is.

Thank you everybody for joining and thank you everybody for allowing me to present at this Intel Networks Webinar Series.

**Andrew Tang**

Thank you, Tang, for that excellent presentation. Now, let’s transition to the fireside chat section of our webinar where we will speak to both Hans and yourself.

Welcome both.

**Hans Chuang**

Thank you.

**Andrew Tang**

OK, great presentation by Tang earlier and, you know, we’d love to have-- get both your thoughts on some of the topics that are relevant to our attendees today. So, I think the first one, you know, for Tang, right. You spoke about the use cases that Azure engaged with customers before. What has been your insights and learnings from those engagements with the customers across, you know, the region that we’re in?

**Tang Kit**

Thank you, Andrew. We’re seeing loads of excitement, opportunities, and implementations in the marriage of 5G networks with the Azure Cloud. The Azure Cloud has the ecosystem of all the latest ISPs and developments, cognitive services for which is really helping to transform a lot of our enterprises and industries. And some of our customers, actually, are looking to fully cloudify, while others are looking to hybridize, which means that they have their on-premise for which they're hybridizing into the cloud some of the functions and the workloads.

And whichever the case, we have the technology and solutions to meet both their needs today. And a lot of the drive for the customers have been the new monetization streams by drawing from all the innovative developments happening on the cloud, while optimizing the economics of their implementation, maintaining, administering, and all the while being poised for rapid growth and proliferation, and these are the really key advantages to, basically, having a Private 5G network with the Azure cloudification.

So, whether it’s on-premise or whether it’s in the cloud, our 5G workloads are running on Intel x86 base technologies.

**Andrew Tang**

Thank you, Tang. That’s great insights. And you know, just from the sound of that, that looks to be-- you know, the 5G enterprise network has been gaining more momentum, right. So, I think for Hans, you know, just based on you being in the region and working with different end customers as well, what do you see the opportunities are for 5G enterprise network adoption and what are the challenges for us out here in APJ?

**Hans Chuang**

Sure, Andrew. So, we’re happy to see that many 5G enterprise network use cases, which started out as POCs, are now becoming real deployments. We also see many industries, such as manufacturing, campus management, healthcare, retail and others are seeing the values in adopting Private 5G networks.

At Intel, we also see that ecosystems continue to grow, including our OEM/ODMs, SIs, ISVs, and our hyperscalers like Microsoft Azure are all taking active roles to promote enterprise 5G.

We believe that coupled with local Government incentives and support, we are going to see a lot more deployments in 2022 and years to come.

On the other hand, for end customers, how to quickly deploy a 5G enterprise network with end-to-end solutions could be a challenge. This is where Intel can come in and help by introducing many of our ecosystem partners to tailor-make solutions to satisfy their requirements. Customers can also work with, for example, Microsoft Azure who also can provide end-to-end solutions with its partners and offer hybrid cloud implementations, like Tang just talked about, which combine the best of the private and public cloud offerings.

**Andrew Tang**

Got it, that’s good insights into the region, Hans. Like as you’ve mentioned earlier as well, right, like we, as Intel, have been working with enterprise customers and partners on the 5G enterprise network. Maybe let’s elaborate a little bit more, how has Intel been able to help end customers to address those challenges on the 5G enterprise network adoption?

**Hans Chuang**

Sure. Even though Intel is a silicon provider, we engage directly with many end customers to understand their business problems, and we also analyze many industry requirements for 5G enterprise networks. Those problems can be in the form of how to reduce cost, how to increase productivity, and also how to deploy new business models with 5G enterprise networks.

And based on our findings, we will engage with ecosystem partners in the value chain. We also… we provide many platform level software stacks, both open source or as commercial production qualities to our partners to help them accelerate their products or solution developments. We also work with ISVs to on-board their industry specific solutions onto our software stacks. We also work with SIs and hyperscalers who can put together end-to-end solutions so that we can help end customers to solve their business problems.

To our customers, Intel can be a trusted advisor when they want to deploy 5G private networks.

**Andrew Tang**

That’s good for our audience to know, Hans. Thanks for giving that insight into how Intel can help.

Now, I think let’s switch over back to Tang, I want to tap on his extensive experience like in the telco space, right. Tang, with telco operators, they’ve been building public networks for decades, and it’s aggressively building out 5G networks in the region. Now, just tapping on your experience and what you're seeing out here with Azure, how should enterprise networks interact with the public network like, for example, roaming or existing partial cover of a site with MEC or RAN, that type of scenario, so enterprises can really take advantage of telco operators’ public networks to enlarge the enterprise network’s value to the rest of either the field or the other enterprises. Any insights to that part of the development, Tang?

**Tang Kit**

Yes, well, first of all, the Microsoft 5G technology is already equipped with telcos to calibrate features, functionalities, interfaces, and 3GPP specifications that you find prevalent in the telcos. So, that same technology that we employ in the telcos, we work a lot with a lot of the tier one telcos in each and every one of the regions, be it North America, Europe, Asia Pac here, Japan.

So, our same software for operators also has the same agility to scale down for enterprise compactness, while still maintaining the operator features. And so, an integrated telco offering is usually in the form of mobile Edge computing architectures whereby, you know, the user plane function is delegated on-site at the enterprise site and, thereby, connecting back into the operator core, leveraging the operator’s spectrum.

And so, those are the, you know, types of topologies and architectures and technologies and solutions that the enterprises can leverage the operator core. And with the-- harnessing the operator core, you can also leverage, you know, obviously the public spectrum for those spectrums that are beyond your existing facilities.

And so, it’s an agreement that, you know, basically the operators and the enterprises would forge together. And certainly, leveraging the public network, then use even beyond the enterprises for outbound roaming or inbound types of traffic steering. Those are all feasible right now with our technology.

And so, our Private 5G technologies and topologies the enterprise can integrate into the carrier’s RAN also for the spectrum. So, the difference between the mobile Edge computing architecture and the Private 5G architecture is that one is a full standalone stack, and then the mobile Edge computing is just one portion, which is the user plane function that is almost like an offshoot of the telco network onto the enterprise site.

But essentially speaking, Microsoft, you know, we offer-- whether it’s a mobile Edge computing or a Private 5G, both can tie into the cloud seamlessly. And so, thus, we integrate the enterprises with the telco networks, that can be done with ease, essentially, with Microsoft’s 5G, and essentially, bringing in the Azure Cloud and essentially, ultimately, the Azure ecosystem that is.

**Andrew Tang**

Thank you. And I think there's a lot that Azure is offering through those services. Great, so, I think for Hans, you know, as Tang talked through the opportunities on the public cloud with Azure, and that’s, you know, enterprises moving to cloud, right, as they look at cloudification. What's your thought around enterprise customers’ needs to pay more attention to when they plan their private wireless network deployment? Give us some insights on that.

**Hans Chuang**

Sure. Yes, there are many factors end customers need to consider when deploying their own Private 5G network. For instance, to address cost and bandwidth concerns, a customer may choose to use either network slicing from public 5G networks or implement their own Private 5G network using private spectrum with dedicated equipment, like small cell or Private 5G core network. They can work with-- like Tang just said-- right, they can work Azure, for example, which can also help them provide that private networking implementations.

And to address concerns such as security or latency, a customer may choose to put a dedicated Edge compute resource on the premise, or use Edge compute resources from hyperscalers or telcos, Edge cloud, or Edge data centers. Customers may also choose a hybrid approach where sensitive and real-time data can be processed on-site/on-prem, while less sensitive data can be sent to the public cloud through a dedicated connection process there. And the benefit of that is you can utilize the almost infinite compute resources and the different services provided by the hyperscalers, like Microsoft Azure.

And once the network and Edge compute topologies are decided, customers then will have to choose the OEM, ISV, the telcos, or hyperscaler partners for the actual implementations. Obviously, this could be a daunting task. Intel, together with our partners, like Azure, we have experience working with customers in different industries on different workloads, and we can share best practices and BKMs, and can be the trusted advisors for our end customers when they actually want to go deploy 5G enterprise networks.

**Andrew Tang**

Thanks, Hans, for that. And anything, Tang, for you to add onto that from a private wireless network, what enterprises should look out for as they look to do their cloudification and build wireless networks?

**Tang Kit**

Yes, private networks is more so needing the enterprise transformation, and it’s not just needing and deploying the infrastructure. So, you know, selecting your partner is really about selecting a partner that understands your transformation needs, in terms of your use cases, that is. And so, it’s not just about the connectivity anymore, and it’s really more so about the applications of that connectivity.

So, since the early days, Microsoft was founded as an enterprise pedigree. We've built our business partnering with understanding our enterprise partners’ needs and developing the tools to suit them. And so, I think our Microsoft 5G along with the Azure Cloud really brings the value to the enterprise in terms of partnering on this journey towards modernizing the enterprise transformation.

**Andrew Tang**

Got it. No, that’s good to share. And based on all of this that’s happening in the space, in the telco space and with 5G, for Tang, what excites you about the prospects for the business as we look into 2022 and beyond?

**Tang Kit**

What excites me most would be to see the ultimate transformation of enterprises and industries and their modernization process. So, we've talked about the transformation to smart industries, smart cities, advanced healthcare, smart retail and the like. And as a society, or as humanity, we've evolved from the industrial revolution where we started with the specialization of labor, mostly manual hands-on, and then into the operation of machinery. And then from the operation of machinery, we’re now into, you know, basically the digital transformation, leveraging virtualization, leveraging the cloud native services, automation, all sourced pretty much from the cloud.

And so, we’re excited to offer our 5G and Azure Cloud solutions to suit each and every one of our enterprises in this evolution path.

**Andrew Tang**

Great to hear that. Great to hear that. I think there are a lot of opportunities ahead for us. And you know, over to Hans as well. As Intel, we work with many various industry partners in the space, we’d love to hear from you also what excites you about the prospects for the business collaboration with Azure and what do you see going into the future as well.

**Hans Chuang**

Sure. Our collaboration with Azure is wide across multiple aspects, as enterprises look at the IT transformation on workloads such as SAP, data analytics, virtual desktops and so on, we partner closely with Azure to bring the right solutions to our joint end customers, to meet their performance and flexibility requirements.

As we expand to opportunities such as the 5G enterprise network, we bring connectivity and compute closer to where they are needed. The collaboration we have, Azure Arc, Azure Stack HCI helps enable industry workloads such as smart manufacturing, smart campus, retail to run on hybrid cloud environments. Thus, allowing enterprise customers to choose where to best place their workloads for their-- to meet their security, latency, or performance requirements.

At Intel, we often talk about the four superpowers. Ubiquitous computing. Pervasive connectivity. Cloud-to-Edge infrastructure. And AI. We believe 5G enterprise networks provides the perfect stage for those four superpowers, and we look forward to unlocking their potential with Azure, with our telcos, and also our ecosystem partners, and most importantly, our joint end customers together.

Thank you.

**Andrew Tang**

Thanks, Hans. And thanks, Tang. Great conversation and really, thank you both for bringing such in-depth and extensive insight.

Unfortunately, we have run out of time for today, but we’d love to hear more from the audience. If we didn’t address your question today, please feel free to reach out to us at the email address included here.

And again, thank you for joining us today. Please be sure to complete our quick five-minute survey under the Attachments tab. Your feedback is incredibly valuable to providing the content you want to see and the solutions you need.

Thank you again for joining us today. This concludes our webcast.