REINVENTING TELCO SERVICES WITH EDGE AI

A NEW ERA PROVIDES NEW OPPORTUNITIES FOR TELCOS

The advent of 5G and the Internet of Things (IoT) kicked off a new phase of enterprise digital transformation. 5G now provides the ultra high speed connectivity that can mesh billions of sensors and devices, from cameras to scanners to head-mounted displays, from global industrial supply chains to national retailers.

AI enables automation and data analysis at a precision, speed, and scale not previously possible. Many industry leaders are turning to AI, using deep learning (DL) algorithms, to improve quality, streamline logistics, and provide new virtual customer experiences.

New high-value revenue streams are unlocking for network providers. Existing business services can be revitalized by AI and the potential for new services, which is nearly limitless, includes software defined networks that automate self-checkout for convenience stores, private 5G wireless in factories equipped with sensors and cameras for QA/QC inspection, and AI-enabled immersive business and consumer experiences.
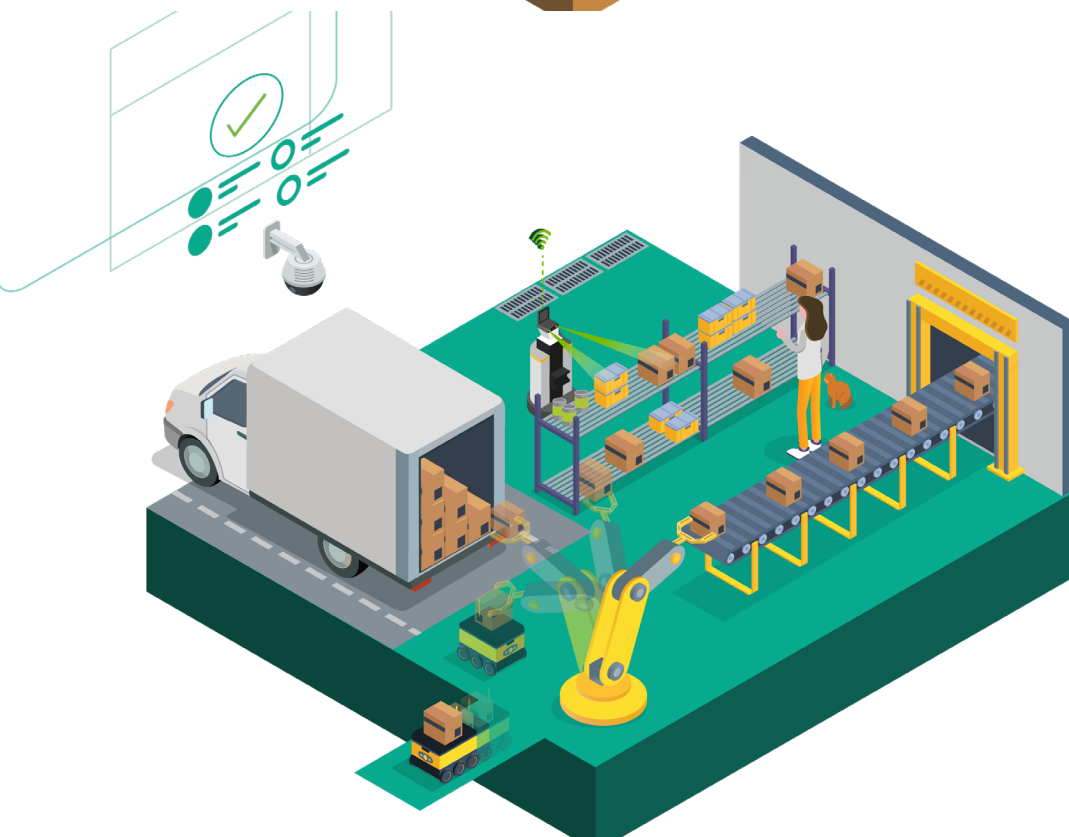
COMPUTER VISION AT THE EDGE

Video cameras are the most deployed IoT sensor. With the ever-growing amount of content being generated, businesses and organizations need to instantaneously pull insights that require GPU compute power, working with AI software, to handle real-time processing at the edge.

NVIDIA Metropolis is an application framework and partner ecosystem designed to develop, deploy, and manage intelligent video analytics solutions. It includes NVIDIA GPU-based hardware for faster edge computing, rich software libraries to train AI models and build and deploy applications, and a comprehensive set of ISV and ecosystem partners that help bring the solutions to market.

SAFETY FOR BUSINESS AND PUBLIC SPACES

Offices, malls, stadiums, and casinos are a few examples of environments that can leverage smart sensors and AI to monitor large areas in real time. These measures can help improve safety, prevent vandalism, streamline access control, monitor occupancy and safe social distancing, locate missing people, explore new business models, and alert for medical emergencies.
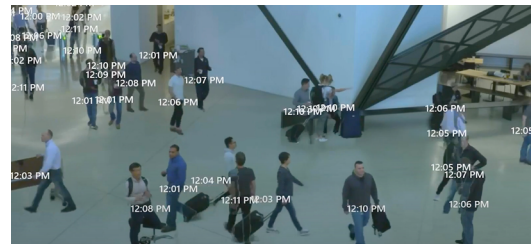
SMART CITIES

5G-enabled cameras combined with edge AI can turn a river of data from sensors on buildings and street lights into real services for city managers, such as managing parking, improving traffic safety, and reducing congestion.
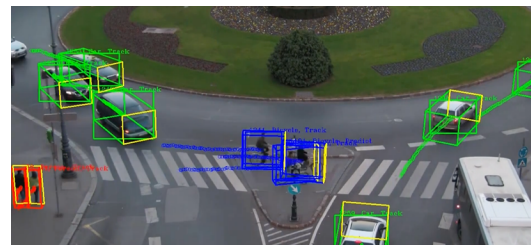
RETAIL INTELLIGENCE

Retail stores are turning to AI to provide seamless experiences like autonomous shopping, self-checkout, and special VIP treatment. Retailers are also looking to edge AI to help with loss prevention, store analytics, and automatic stock replenishment.

INDUSTRIAL EFFICIENCY

In manufacturing and industrial environments, AI is now being used for non-contact automated visual inspection, and robots are learning to see and react to their environment for improved production and quality control.

EXTENDED REALITY AI FROM NVIDIA CLOUDXR

Extended Reality (XR) is the combination of augmented reality (AR) and virtual reality (VR). With **NVIDIA® CloudXR™**, XR is available as a cloud service, creating a powerful category of apps that can enable new services never before possible. These applications require superfast, always-available networks and compute that is close to users. Telcos are uniquely positioned to deliver this new class of service.

NVIDIA CloudXR enables immersive experiences via mobile devices, cameras, or head-mounted displays. Head-mounted displays can be used by industrial designers for global collaborative design reviews, so industrial designs can be completed faster, with fewer mistakes. Enhanced shopping experiences can increase revenue and customer satisfaction. For instance, 5G can enable consumers to select, configure, and explore a range of automobile customizations, including paint colors, alloys, and interior trims, without ever visiting a showroom.

To bring the experience home, consumers can see their custom vehicle parked in their garage or driveway, using NVIDIA CloudXR and AR on a simple 5G phone. This is available for any digital asset, enabling consumers to visualize new furniture in place or a prospective home remodel. The potential for these experiences is boundless.

High-fidelity, immersive VR applications often include use of a tethered, head-mounted display. NVIDIA CloudXR is a hybrid edge computing architecture that renders high-quality AR/VR content at the edge and streams it over the 5G network using dynamic quality of service mechanisms. This allows VR users to move to wireless head-mounted displays, without any noticeable degradation in the experience, for a high quality wireless XR experience that uses simpler devices with longer battery life.
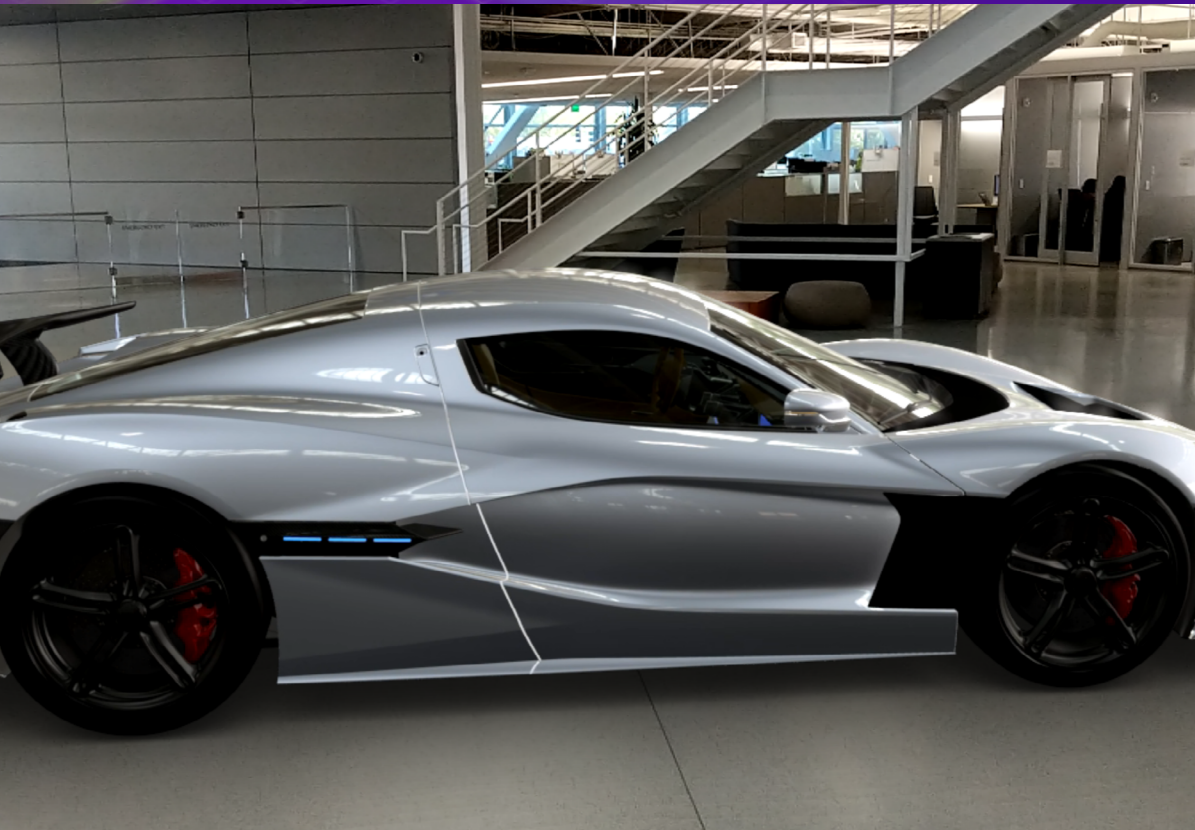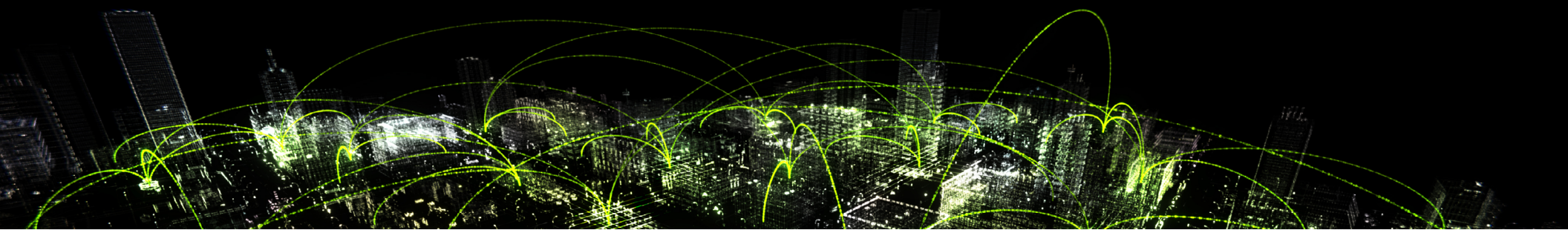
THE NVIDIA PLATFORM FOR EDGE COMPUTING

NVIDIA has created a new computing platform optimized for the edge. The **NVIDIA EGX™ platform** delivers the power of accelerated AI computing to the edge with an easy-to-deploy cloud native software stack, a range of GPU-powered and software-optimized servers and devices, and a vast ecosystem of partners who offer EGX through their products and services.
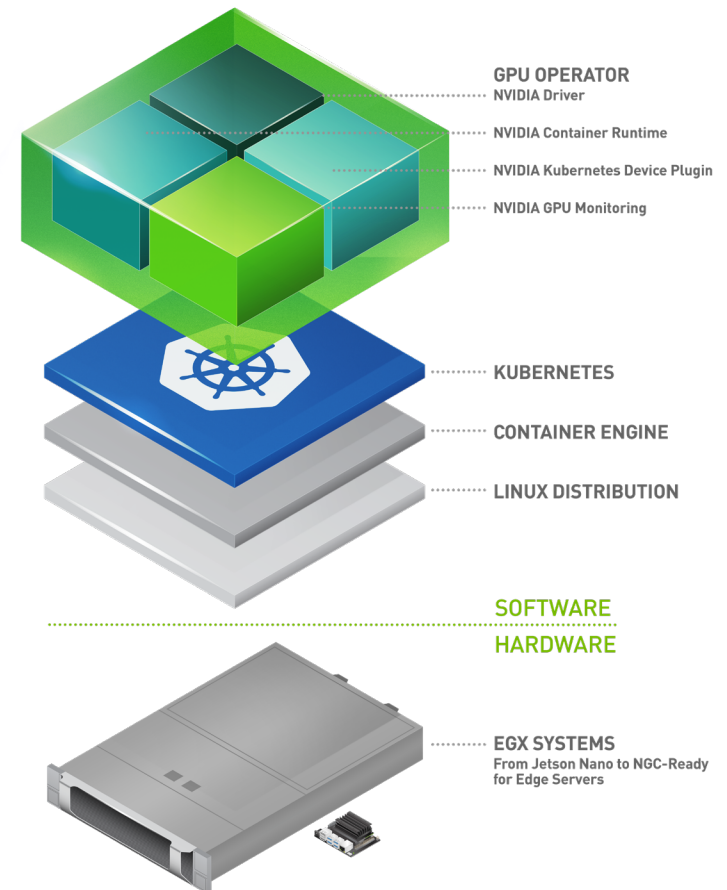
CLOUD NATIVE, EDGE FIRST

The NVIDIA EGX software stack enables IT to quickly and easily provision edge AI services. A primary component of NVIDIA EGX stack is the NVIDIA GPU Operator, which standardizes and automates the deployment of all necessary components for provisioning clusters of edge servers.

AI ECOSYSTEM

NVIDIA provides different application frameworks that enable developers to build new products for the AI ecosystem, including NVIDIA Metropolis for smart cities, NVIDIA Clara™ for healthcare, NVIDIA Aerial™ for telecommunications, NVIDIA Jarvis for conversational AI, and NVIDIA Isaac™ for robotics. These frameworks can be used together or individually and, when combined with NVIDIA EGX, open up new possibilities for a variety of edge use cases. Also, transfer learning enables teams to fine-tune these pre-trained models to fit specific needs.

AI CONTAINERS FROM THE CLOUD

The **NGC™ software hub** features an extensive range of software for the edge, covering the top AI and data science software, tuned, tested, and optimized by NVIDIA. NGC also gives users access to third-party, pre-trained models and Kubernetes-ready Helm charts that make it easy to deploy powerful software or build customized solutions.

GPU OPERATOR
NVIDIA Driver
NVIDIA Container Runtime
NVIDIA Kubernetes Device Plugin
NVIDIA GPU Monitoring

KUBERNETES

CONTAINER ENGINE

LINUX DISTRIBUTION

SOFTWARE
HARDWARE

EGX SYSTEMS
From Jetson Nano to NGC-Ready for Edge Servers

LEADING TELCOS ARE DEPLOYING NVIDIA AI AT THE EDGE

Leading telcos are already driving the next phase of the digital transformation, leveraging edge AI capabilities, including:

NTT EAST

NTT East REIWA provides new AI-powered edge services, ranging from smart retail and manufacturing solutions to fishery identification and agricultural applications.

SK telecom

SK Telecom uses NVIDIA GPUs to power up T-View, its AI video surveillance-as-a-service (VSaaS) solution. With Intelligent video analysis (IVA), SKT safeguards citizens and property by analyzing data from millions of cameras, in real-time, leveraging deep learning and intensive computing power provided by NVIDIA.

verizon✓

Using NVIDIA Metropolis, an edge-to-cloud video platform for building smarter, faster AI-powered applications, Verizon is working to collect and analyze multiple streams of video data to improve traffic flow, enhance pedestrian safety, optimize parking, and more.

ERICSSON

Ericsson Dedicated Network solution, with its radio network and high-performance distributed cloud native 5G core, is providing the 5G radio connectivity between the Cloud XR device and the NVIDIA RTX™ GPUs executing the GPU virtualization software.

PARTNERS TO SPEED YOUR TIME TO REVENUE

AI is no longer just the domain of a few global companies. Building services that enable the factory or store of the future over 5G does not mean starting from scratch. NVIDIA holds a decade of experience delivering AI in numerous industries and works closely with leading-edge software companies who offer ready-made platforms, applications, and pre-trained AI models that can deliver your service, including:


Deep North is a video intelligence company that helps enterprises achieve growth by translating video data from their physical environments into actionable insights. Advanced video analytics can measure footfall, engagement, conversion, and consumer experience at various locations, such as retail stores, shopping centers, airports, travel and leisure spots, and quick-service restaurants.
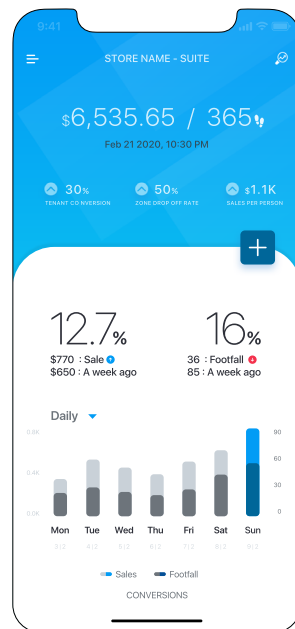

SAFR applications include deployment to reduce friction as passengers move through an airport, automation of entry at VIP parking lots and lounges, and personalization of signage with custom content to build loyalty at shops, kiosks, and eateries.

VAAK offers solutions ranging from image analysis AI that eliminates the need for face-to-face cashiers at retail locations, to safety, fire, and equipment-monitoring at commercial facilities, warehouses, sports facilities, and construction sites.
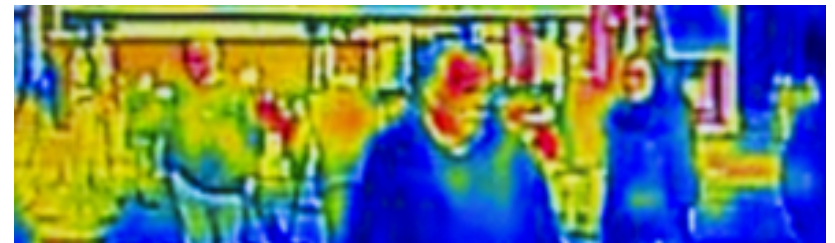
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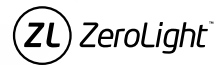
ZeroLight offers a fully wireless, 5G, six-degrees-of-freedom (6DoF) standalone VR experience that allows consumers to configure and explore a range of Pagani vehicles and choose from a selection of paint colors, alloys, and interior trims. The experience is enabled with content rendered on NVIDIA RTX edge servers and sent over a 5G network to the Qualcomm® Snapdragon™ XR2 5G-enabled reference design headset.

PresenZ VR technology enables content creators to easily design full-scale, immersive experiences from already existing assets. With use cases ranging from architecture and design to advertising and movies, PresenZ VR allows the audience to feel like they are inside their favorite animation or visual effects movie, or a stunning architectural or design project.


Masters of Pie Radical software improves the effectiveness of teams working in manufacturing to construction to medical. They allow for the secure sharing of live design data direct from host packages like CAD systems, to all stakeholders, regardless of device or location.

VMware securely delivers AR and VR applications running on VMware vSphere, streamed using NVIDIA CloudXR to VMware's Project VXR client application, and running on standalone headsets. AR/VR applications operate on VMware vSphere in the data center or at the edge and streamed to users for easy access.
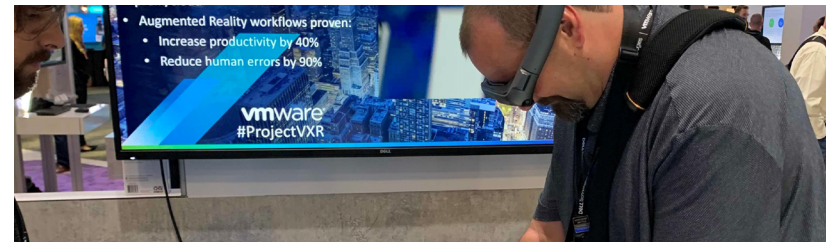
NVIDIA HELPS YOU REALIZE THE POTENTIAL OF AI

AI is fundamentally changing every industry, improving everything from customer experiences to logistics and product quality. By taking advantage of the massive amounts of sensors and data available with AI, companies can move from traditional to disruptive solutions that increase revenue and delight customers.

With their global networks close to the edge, telcos are positioned to play a critical role in the delivery of these new services and experiences. To capitalize on the potential revenue opportunities, they need to access advanced infrastructure, an ecosystem of software, and technology experts. NVIDIA is at the heart of these technologies, has a network of software partners to enable implementation, and is ready to enable telco partners to benefit from the new revenue roadmap unlocked by AI, 5G, and edge.

To learn more about AI for telecommunications, visit **www.nvidia.com/telco**