

EDGE-COMPUTING WILL BE A CATALYST FOR 5G, AIoT AND INDUSTRY 4.0 TO MANAGE COVID-19 IN SOUTHEAST ASIA



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ABOUT THE AUTHOR



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Daniel is the founder of ArcTiv Technologies & co-founder of Olympia International Consulting. He brings over 15 years of experience in both the data center and industrial automation industries having worked for Fortune 500 technology companies in various roles including Corporate Strategic Planning, M&A, Product Management and International Sales & Marketing. He currently resides in Taipei, Taiwan & St. Louis, MO, USA.

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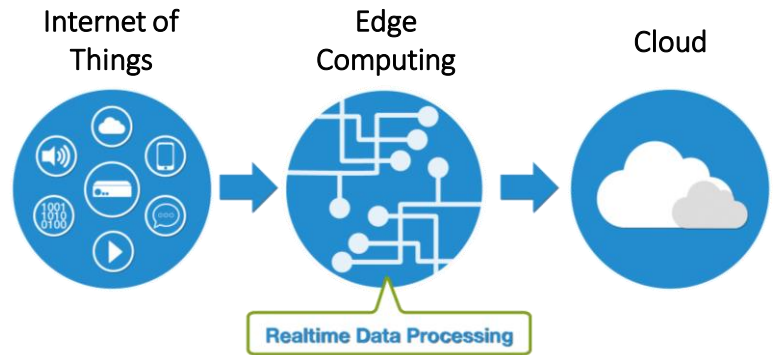
Edge-Computing Offers Low-Latencies to Allow 5G Application Developers to Design Future Technologies, Today

What is the Edge?

The Edge is the Link Between IoT & the Cloud, and is Located on the 'Last-Mile' of the Network

The Benefits of the Edge Include:

- Real-Time, Low-Latency Data Processing
- Greater Data Security
- Lower Operating Costs
- Reduced Network Traffic
- Improved Application Performance



What are the Drivers of Edge-Computing and its Applications?

Source: Tolaga Research

As Devices and User Experience Technologies Advance, the Communication Architecture Needs to Adapt

Billions of IoT Devices Coming Online

Data Centers & ISP's Need to Manage Data Close to the Source

Lower Costs of Computing & Sensors

Rapidly Decreasing Costs Enable Industrial and Consumer Applications

Machine Speed, Learning & Analytics

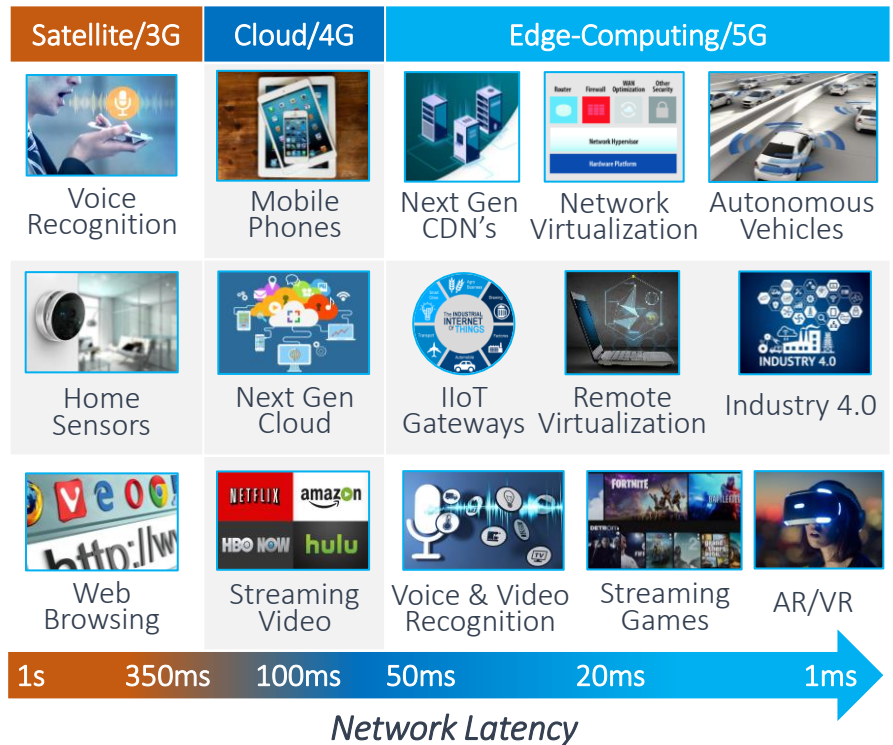
High-Speed Robotics Require Data Processed Close to the Machines

Higher Gateway Computing Capacity

Industrial Gateways Utilize Wifi, LoRA, 4G LTE & 5G Communications

Multi-Dimensional Experiences

Consumers & Businesses Expect AR & VR Technologies to be Available





The Edge Infrastructure Will Act as a Key Platform to Integrate a Wide-Range of Future Technologies

How will the Edge be Deployed?

Source: Tolaga Research

The Infrastructure & Device Edge will be Deployed in the 'Last-Mile' Network in Coordination with the Cloud & AI

The Cloud



Cloud Data Centers







- Private, Public & Hybrid Cloud
- AI & Deep Analytics
- Hyperconverged Servers



Software Defined Data Center

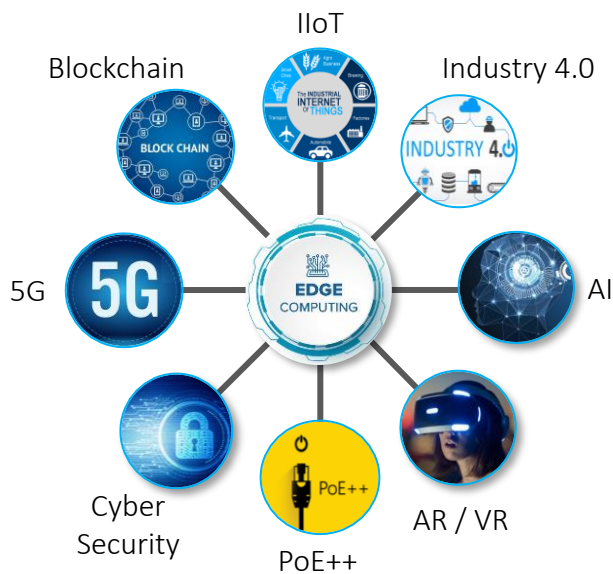
- Computer Virtualization
- Software Defined Networking
- Software Defined Storage

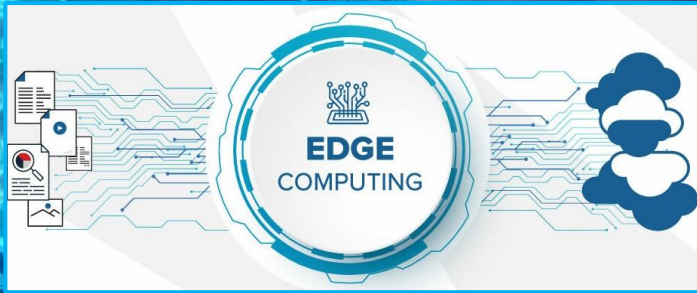
The Edge - The 'Last Mile' Network

| Infrastructure Edge | Device Edge |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Regional Data Centers  | On-Premise Servers  |
| Aggregation Hubs  | Gateway Devices  |
| Access Sites  | End-Point Devices  |

Which Technologies and Industries Will Use Edge Computing?

A Wide Range of Industries will Invest in Edge Infrastructure as they Incorporate IIoT Solutions in their Operations





Edge-Enabled Technologies Will Provide Immediate Transformation of Global Industries and Applications

What Applications Can the Edge Solve to Help the World Rebuild from the Global Pandemic?

A Fundamental Shift in Operations and Mindset to Provide Social Distancing and Automation of Vital Services

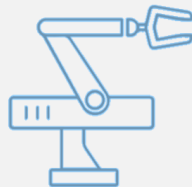
| Enterprise IT | Retail | Manufacturing | Education | Entertainment |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Work-from-Home • e-commerce • High-definition A/V Systems | <ul style="list-style-type: none"> • Customer Experience • Point-of-Sale • Remote Security | <ul style="list-style-type: none"> • Advanced Robotics • Factory AR / VR • Supply Chain Synchronization | <ul style="list-style-type: none"> • Online classes • Remote Corporate Training | <ul style="list-style-type: none"> • Virtual Reality • Streaming games • Content Production |
| Mining | Service Providers | Smart City | Hospitals | Restaurants |
| <ul style="list-style-type: none"> • Autonomous Vehicles • Drones & Surveillance • 3D Metal Printing | <ul style="list-style-type: none"> • Streaming Games • 4k Streaming Video's • AR / VR | <ul style="list-style-type: none"> • Social Distancing • Temp Monitoring • Facial Recognition | <ul style="list-style-type: none"> • Remote diagnosis • Artificial Intelligence • Advanced Robotics (Surgery & Care) | <ul style="list-style-type: none"> • Automation & Food services • Online ordering • Online delivery |

What Edge-Enabled IIoT Solutions Will Have the Greatest Impact in Rebuilding from the Pandemic?

Current Automation Systems Need to Be Upgraded to Allow Operational Transformation



Autonomous Vehicles



Robotics & Automation



Predictive Analytics



3D Printing



Sensors & Identification



Wearables & Mobile



Drones



Inventory Optimization

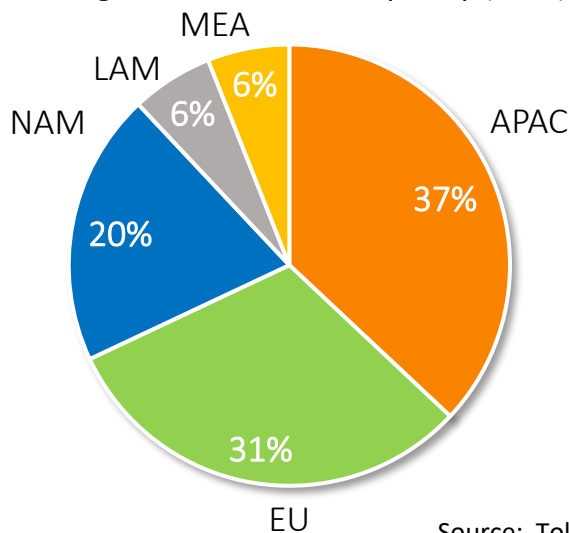


Edge-Computing Will Drive Innovation Across the World and Impact Both Mature and Emerging Markets

Which Regions Will Be the Most Impacted by the Edge-Transformation?

Both Mature and Emerging Markets will Need to Incorporate Edge-Enabled Technologies, Led By Southeast Asia

Global Edge Infrastructure Capacity (MW), 2028F



Source: Tolaga & Gartner Research, 2019

Major APAC Regions for Edge Investment

- India
- China
- Japan
- Australia



3 Common Myths Assumed About Edge-Computing

Debunking misconceptions about the edge and its ability to solve immediate problems worldwide

Myth #1: New technologies will not apply for regions slow to adopt 5G.

Truth: Edge computing can be combined with 4G systems to create a low-latency environment similar to the performance of 5G. This will allow application developers to begin creating new technologies which can apply to most regions, regardless of their 5G launch plans.



Myth #2: The Edge will have increased security risks.

Truth: The Edge allows end-users to manage data locally, rather than relying on cloud systems which could be compromised. There are many security advantages to storing sensitive data in a local, distributed network with unique mitigation systems than a centrally managed network.



Myth #3: The edge infrastructure is too expensive compared to the cloud.

Truth: The cost of network downtime or slow performance of the new, high-speed applications will far exceed the infrastructure costs of edge-servers and infrastructure. Typical payback periods range from 6-12 months for most infrastructure devices.



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Technology Overview & Market Readiness

Bonus: Covid-19's Impact on the Edge in SEA

Integration of the Edge with Next-Gen Technologies
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Bonus: The Edge & Cybersecurity

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Who Can Benefit?

Technology Executives
& Investors



Industry
Professionals



Professors &
Researchers



Meet Your Instructor – Daniel S. James II, MSEE, MBA



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H. Suryakusuma
CEO, Elitery Data Center
Jakarta, Indonesia



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