

DISRUPTIVE TELECOMS

Enable. Innovate. Transform

WORLD REPORT

JUNE 2020

Powering the New Normal

*Cloud technologies, collaborative tools and SD-WAN
are powering the new normal today*



**Ribbon Looking at
Combining Efforts
on SDN, NFV**



**Celebrating 25 Years
of India's
Mobility Revolution**



**Guavus - Enabling
CSPs to Win with
Big Data**



ribbon®

Packet Optical Networking Solutions & Cloud-based Communications Services

Enabling Service Providers



5G and 4G
Mobile Backhaul



Metro Aggregation & Access-
to-Core Optical Networking



Managed Enterprise Edge for
Cloud Communications Services



Session
Security & Policy



Network Transformation
for Transport & Voice Services



Cloud
Communications Services



Microsoft
Teams Migration



Nuisance
Call Mitigation

Enabling Enterprise Verticals with Critical Infrastructure



Optical & Packet Networking
for Critical Infrastructures & Utilities



Data Center Interconnect
& Private Optical Networks



Intelligent Edge for
Cloud Communications



Analytics for Network
Insights & Security



Microsoft
Teams Migration



UC Security &
Session Management



US Fed Ramp & Integrated
Defense Infrastructure



Cloud Unified
Communications & APIs

From the Editor



Zia Askari
Editor, TelecomDrive.com

Embracing The New Normal

We are living in a new era today – indeed, these are challenging times, none of us imagined or experienced before – but we can win by embracing this new normal whole heartedly and enabling opportunities thrown open by technological advancements in communications and cloud services.

Work from home or rather, work from anywhere has become the new normal, yet it also imposes challenges to employers and employees. Handling information security, privacy and timely tech support can be big issues in home environment. Remote work can also complicate labor law issues, such as those associated with providing a safe work environment and income tax issues.

Employees may experience loneliness and lack of work-life balance. If remote work becomes more common even after the COVID-19 pandemic, there is a strong probability that employers may decide to reduce costs and hire people from regions with cheaper labor costs.

And from the government side of things - laws and regulations must be updated to accommodate remote work in this new normal – and further psychological studies need to be conducted to understand the effect of remote work on people on long term basis.

Technologies such as AI, VR and AR are also likely to enable interesting experiences while this new normal lasts till the end of this pandemic



situation. And as a result, in the coming months, we are likely to digitally visit global events while sitting in our living rooms (workspaces) with the help of VR/AR.

The big key lies in making the most of this situation. There is no going back. And most importantly all the advantages that technology has to offer, are on our side to make it happen, take us there, help us live that extra mile. Let's keep on disrupting the normal that is outside our homes and embrace the new normal inside our places!

CONTENT

<i>Living The Future Of Work</i>	4	<i>Guavus – Enabling CSPs To Do More With Big Data Analytics</i>	27
<i>SD-WAN Powering WFH</i>	8	<i>Winning Against COVID-19’s New Normal: 50 Years Of Optical Innovation</i>	30
<i>Better Medicine Requires Best Broadband</i> ...	10	<i>Unlocking New Revenue For Operators With Satellite And Cloud Integration</i>	31
<i>“We Are Looking At Opportunities To Combine Efforts On SDN And NFV”</i>	13	<i>To Cloud Or Not To Cloud... Here Is The Answer</i>	33
<i>15 Technology Trends To Watch In Post COVID-19 Era</i>	16	<i>G-Core Labs: Is Online Entertainment An Interim Solution Or A New Global Trend?</i>	36
<i>Celebrating 25 Years Of India’s Mobility Revolution</i>	20	<i>Demystifying Mesh Networks</i>	37
<i>A New Perfect Storm Is Driving Business Model Transformation</i>	23		
<i>Consumers See Benefits Of 5G fixed Wireless Access</i>	25		

Living The Future of Work

In this new normal - technology is enabling rapid transformation of workspaces and as a result – we are living the ‘future of work’ today



Digital technology is having a profound effect on the 21st century organization. It is fundamentally changing the way we work, the way we manage, where we work, how we organize, the products we use, and how we communicate.

We are just learning how to use new technologies for our benefit, and in the process, we are uncovering new challenges and opportunities.

Throughout the 1990s and early 2000s, global telecommunications, data networking, and the Internet moved business to a new era

originally called electronic business or e-business. Today, several decades later, we have moved beyond this reality in some areas of business, while others remain largely unchanged.

Business operations have made formerly unimaginable advances using these modern technologies to

become more efficient and productive than ever in diverse areas of business, such as customer, product, and enterprise operations.

Quite arguably, technology advances of this new era may have had a net negative affect on our ability to communicate and collaborate. Work, which used to fit relatively neatly into hierarchical organization structures, now more closely resembles a web that crosses structures, P&L boundaries, legal entities, cultures, multiple time zones, and various languages.

Adding complexity, the lines across industries are blurred. Project teams are spread across the globe. Responding to rapidly changing threats and opportunities requires dynamic allocation of people's time and the organization's resources. Organizing all of these activities is time consuming for most and overwhelming for many.

Today leaders, managers, and other knowledge workers struggle with proliferation, information overload, and attention fragmentation.

The pace of communications has increased exponentially. In previous generations, dictated memoranda typed by assistants were issued typically a handful of times a week. Today, many managers, leaders, and knowledge workers wake up each morning and scan tens or hundreds of emails and texts before they get out of bed. Communication volume has increased from all directions. Internally, tracking the status of work takes countless emails, status meetings, and phone calls.

Systems and sensors all around us track operations and produce data as never before. Externally, customers and partners are increasingly informed, empowered, and vocal. At the same time, so-called productivity tools have replaced many executive assistants who used to sort, filter, organize, and block wasteful communications.



With all this change, some things remain constant. Organizations, filled with people, still exist to unite around a common purpose, common values, strategic objectives, and getting things done. People remain the most critical asset of most organizations—but are increasingly in the shadow of machines and in a maze of technologies. Individuals are still bound by hours in the day and their mental ability to process information.

And hence, work (done by computers and people) must be coordinated to create maximum value. Organizations still need great leaders, managers, and employees at all levels to get things done in an efficient and effective way.

We believe there is tremendous unrealized value from this new era yet to be claimed in how we communicate and collaborate in the future work environment.

The Critical Question of Culture

Culture is a perennial top concern of executives, and the growing interest in employee engagement is part of the same focus on how to build a sense of belonging in a workforce that is increasingly dispersed, global, and mobile. The larger the company, the more important this issue becomes.

Another piece of information

reflects the importance of the way people feel at work, with a majority of respondents prioritizing the importance of feeling welcome and included at work.

Engaging people in the organization, making them feel part of something special, and having a network that enables them to realize their ambitions are factors leaders are increasingly paying attention to as they struggle to balance the demands of growing the top and bottom lines while needing to attract and retain the best talent possible.

New Normal and Culture Transformation

In this new normal - cultural transformation will be needed over the next five years. Communication and collaboration challenges are growing as those in the workforce become more untethered and fluid in the roles they undertake and in their interactions with others.

Fortunately, the rapid development of increasingly digital technologies is enabling a massive change in how to accomplish better communications, collaboration, and connectivity across this increasingly diverse population of employees.

Most of the employees working in today's new normal believe that

transparency in communications is a critical priority for achieving their organization's goals.

Communication, collaboration, and connectivity are being transformed. And hence, companies should be proactive in creating greater transparency in their communications, and adopt new systems and policies to help drive this strategy. Also, it is important to reinterpret corporate culture to take greater account of digital in the workplace, even if for no better reason than to reduce the risk of losing employees, productivity and, potentially, customers.

Not surprisingly, there has been a lot of focus on the influence of Millennials on the way talent is recruited and developed. But we also cannot ignore the fact that Baby Boomers are working longer, often into their 70s and 80s. So, the need to manage across generations remains as important now as it ever was, if not more so.

However, the changed expectations of the Millennials, coupled with opportunities to have greater choice in how, where, and when they do work, point to leaders needing to enable networks across the organization.

To keep Millennials, companies should place greater emphasis on

A mix of cloud technologies and collaboration tools are helping maintain productivity levels, but organizations still need leaders, managers, and employees at all levels in this new normal – to get things done in an efficient and effective way.

nurturing and developing their people, creating interesting and purposeful work, and building an environment with career flexibility and tools that enable employees to collaborate and exchange ideas transparently.

Communication, collaboration, and connectivity are at the core of much of what most of the business leaders believe will drive the major changes in the future of work. The reason for investing heavily in these aspects of work is the belief they represent hard business benefits for their companies.

A Story of Realizing Business Benefits

The future working environment will require a shift in how we communicate and collaborate, a lot of executives predict a move away from email and toward more sophisticated digital tools. These digital tools will be critical enablers for increased cross-cultural teaming of activities and free-flowing deliberations.

Collaboration strengthens relationships, so the choice of technologies should ideally allow for relationship building activities as well as efficient communications.

And as companies move from email to other tools for communicating, collaborating, and connecting, they will need to develop the right cultural context and adapt work policies and processes to help ensure the new environment and expectations enable successful adoption of whatever digital capabilities are implemented. More and more companies are today keeping in mind the Work From Home or rather Work From Anywhere scenarios while implementing technology tools and applications.

New-age digital tools, applications are changing how we use our screen time

We have seen that expectations of leaders are changing not only in terms of how they interact and engage with their employees but also in how they



see their role changing.

More and more business leaders are now increasingly placing more focus on facilitating the exchange of ideas, the flow of conversations across the organization, and providing greater autonomy at team and individual levels. This shift from “topdown approach” to what we might see as “alongside approach” is a crucial component of this new equation.

In the highly networked, more fluid organizations of the future, business leaders will need new ways to communicate with employees and keep a pulse on their organization.

Being in the flow of what is happening in their organization, rather than waiting on management reports that are time delayed, often by weeks, can enable an immediacy of communication and opportunities to motivate employees in real time.

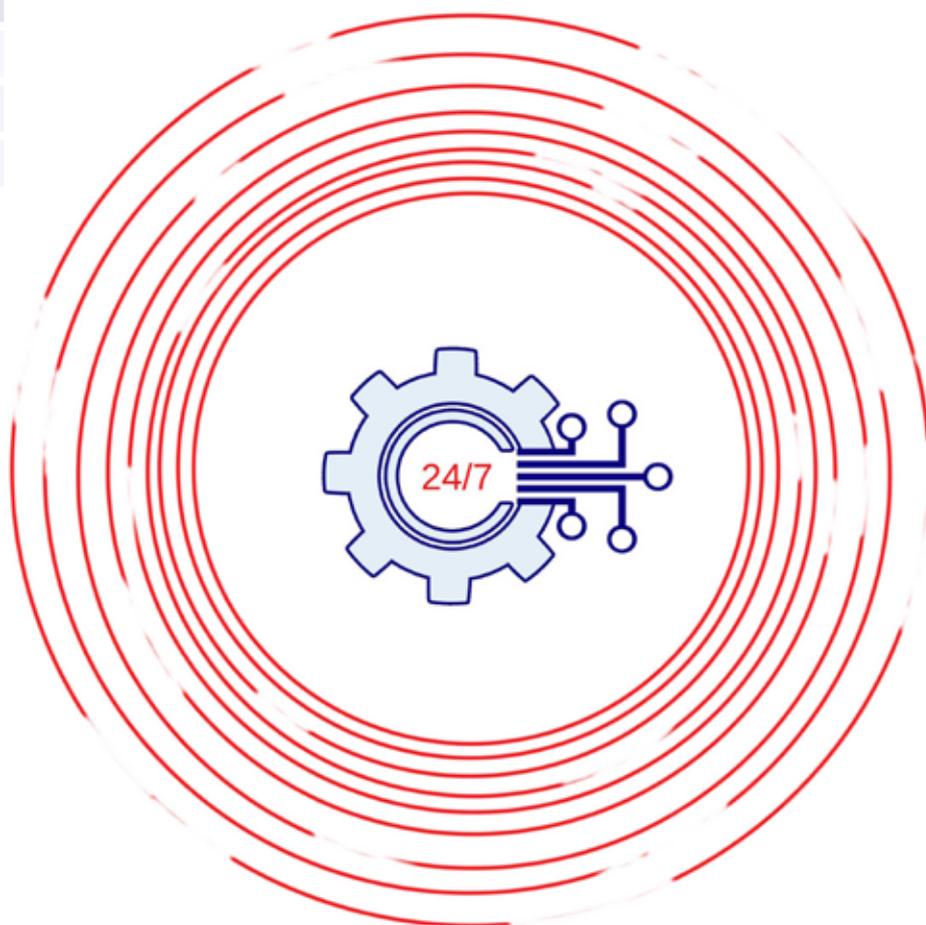
This shift also presents opportunities to intervene more effectively as management tracks performance of work teams and projects through the use of enterprise-wide collaboration platforms.

The high level of transparency that is now possible also encourages and supports a higher sense of personal accountability, whereby problems are owned, rather than put aside for someone else to solve. This is not to ignore concerns about privacy, morale, and trust that can arise from a more transparent environment, but given appropriate care over these factors, the potential benefits can be substantial.

Leading networks and teams, not hierarchy

Leaders can often underestimate the benefits of social tools at work and need to be educated in how to use collaboration and business social tools for improved communication, collaboration, and connectivity.

In today’s challenging scenario, companies, executives, particularly



in larger companies, recognize both that the future of work will be very different from the way things have happened in the past and that their roles need to adapt to the new organizational environments they will be leading.

The Road Ahead

As we move ahead, technological advancement of collaboration tools will get increasingly utilized by small and medium sized organizations.

And as companies grow past a critical mass, efficiency of process, communications, and networks become increasingly critical. This is something to note for any small but high growth company.

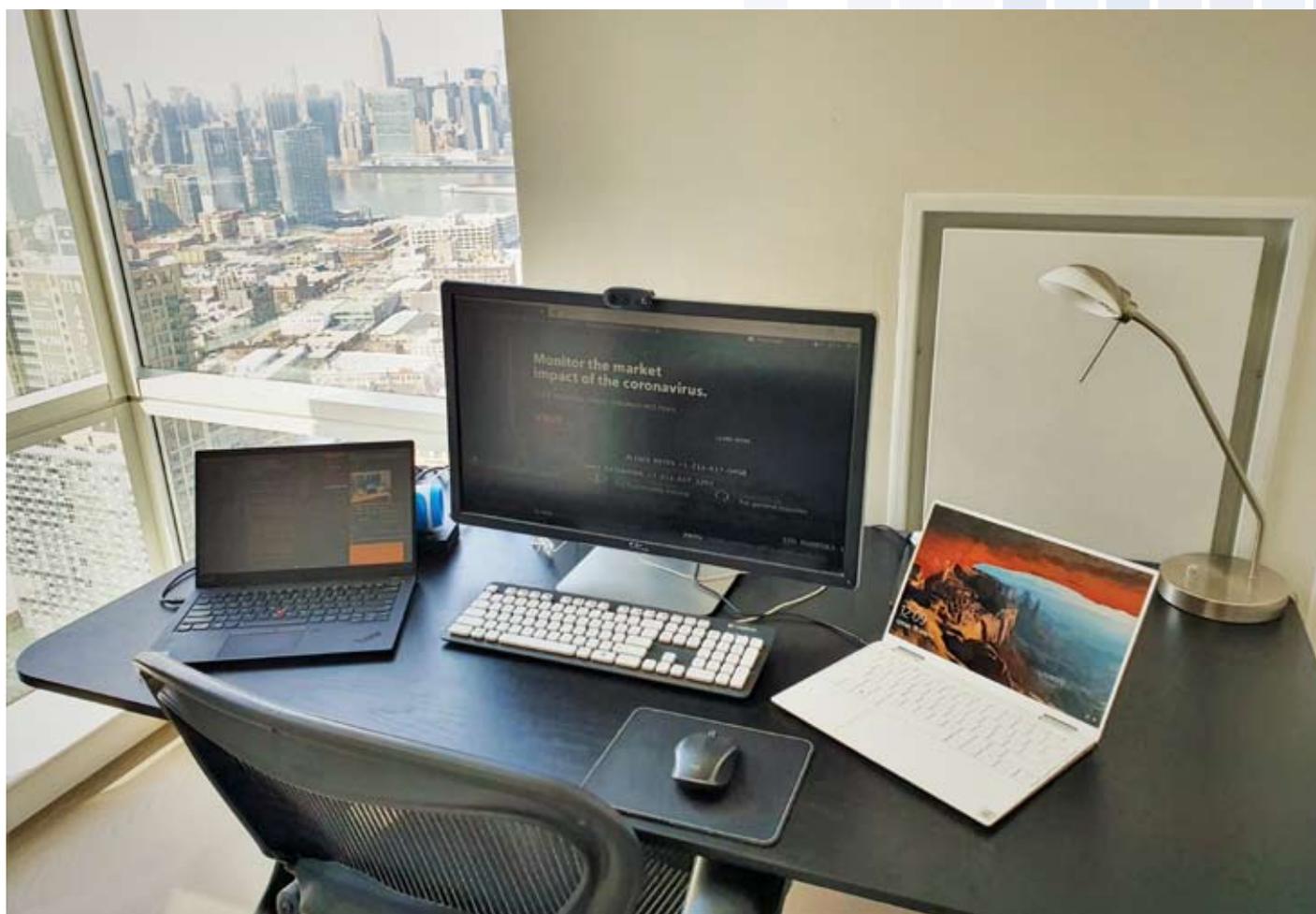
And with all the advantages that technology, networks and communications can bring to the table, work in future will be more networked, more devolved, more

mobile, more team- based, more project-based, more collaborative, more real-time, and more fluid. The challenge will to be make sure that it is not more complicated, confusing, or overwhelming.

This will require better and different ways to communicate, collaborate, and network within teams – in a seamless manner. Large multi-nodal fluid networks will rely increasingly on new pathways for information to be exchanged and lessons shared, leaning heavily on new, enabling digital technologies.

And it will also require leaders to act increasingly as network architects and role models for the new ways of working. Done well, after decades of aspiring to the idea, the future of work offers the opportunity to provide the most engaging and motivating environment we have yet experienced.

SD-WAN Powering WFH



At a time when business continuity is of paramount importance, enterprises are looking for technologies that enable and enhance their employees' productivity, while working away from a traditional office setting environment.

Although increased workforce mobility delivers proven benefits, it also presents some challenges related to enabling remote access to corporate communications, applications, and data etc.

Using software-defined networking (SDN) principles, SD-WAN is powering this new normal situation and addresses workforce mobility challenges by enabling IT organizations to dynamically mix

and match connectivity options to optimize traffic, improve application performance, and help control expenses and at the same time deliver flexibility of operations for enterprise.

Under normal conditions, most employees of small & medium businesses (SMB) or larger Enterprise corporations work from within the company's premises and use their internal IT environment to access tools and applications necessary for their daily work.

These encompass company-wide systems such as CRM (Customer Resource Management), ERP (Enterprise Resource Planning), and other documentation, inventory or billing systems, as well as the company's business communications

infrastructure (phone, email, instant messaging – now often combined under a UC – Unified Communications platform).

On-premise employees access these systems either locally via the company's LAN (Local Area Network), if the systems are physically located within the same building, or across a WAN (Wide Area Network) when those systems are remote, either as physical servers located in other offices (such as Headquarters), data centers (either company's own, or large, shared, CNDs - Carrier Neutral Data Centers) or in the Cloud.

From the company's network, in-office users access the Public Cloud, as well as the entire Internet, via dedicated gateways, i.e. breakout

points equipped with security features (firewalls, VPN – Virtual Private Network – concentrators, etc.)

Some employees always require remote access to the company's IT infrastructure, notably mobile or nomad users, through the Internet (from their home fiber/DSL/CATV or wireless 4G connection) and the company's secure gateways – however only a very small fraction of the work force usually requires such remote VPN access, and then not on a regular and sustained basis.

These are essential capabilities for organizations looking to deploy and manage connectivity for small office / home office (SOHO) employees and hence a technology like SD-WAN is driving a lot of WFH innovation today.

Just thinking beyond the fact that we are living in a pandemic situation where working from office is still difficult in many geographies – it is actually the rise of cloud computing, mobile access, and unified communications has contributed heavily towards establishing remote work capabilities. However, these changes have also dramatically

increased network traffic and intensified connectivity demands in ways that outstrip legacy WAN capabilities. This can be particularly problematic for SOHO workers, who generally have access to residential-grade internet connections.

Connecting to an IP phone system via the typical broadband internet service often results in garbled calls, delays, echoes, and other issues.

SD-WAN delivers highly reliable and assured performance for applications such as Voice over Internet Protocol (VoIP), Unified Communications as a Service (UCaaS), Virtual Desktop Infrastructure (VDI), and Software as a Service (SaaS) to work-from-home users. This becomes extremely important for voice and video applications, which are latency sensitive.

Simplified monitoring and troubleshooting with cloud-based management

And as a result - SD-WAN Work from Home solutions are being deployed by a number of global telecom operators and

communications service providers such as Starhub, British Telecom, AT&T, T-Mobile etc. This is enabling organizations to dynamically scale and easily manage work from home deployments. It provides seamless support including monitoring, troubleshooting, and ongoing management of the home network SD-WAN component.

In a typical SD-WAN powered work from home environment - application-based policies are pre-defined to provide a standardized template for simplicity and ease of use. These policies can be minutely customized, allowing for extreme level of flexibility when needed. And as a result – this delivers a seamless office experience in a home environment.

Impact of Users Working From Home

During crisis times, such as the current COVID-19 stay-at-home orders or general lockdown conditions – the situation entirely reverses: now all employees able to perform their duties remotely are required to Work From Home (WFH), leading to a surge in remote VPN access.

This creates a challenge for most businesses, at different levels:

Employees need to be equipped with laptops;

New firewall and VPN devices and licenses need to be implemented;

And most importantly, fast and reliable Internet access to the company's network infrastructure is required.

SD-WAN is a technology that is enabling telecom operators and CSPs to realize the work-from-home opportunity for their customers. It plugs right into their existing home networks and caters to both business and residential demands for access to applications and data using residential-grade internet service, thus offering a superior user experience for employees, the enterprise, and customers.

Decoding SD-WAN

SD-WAN (Software-Defined WAN) is in effect a concrete example of an end-customer service based on SDN and NFV for enterprises.

SD-WAN service is usually based on the following four pillars:

- 1) Support multiple access technologies, i.e. copper, fiber and radio, such as MPLS links, consumer- and business-grade internet access connections such as xDSL, LTE etc. It could be said that SD-WAN is access-agnostic, or else that it provides an overlay on top of the underlay (the various access technologies).
- 2) Enable dynamic path selection, i.e. allowing for load balancing in a dynamic fashion over the various access technologies and the various WANs (MPLS, IPsec, cloud services etc.).
- 3) Provide a simple management interface, including customer self-care portal, APIs (Application Programming Interfaces) and ZTP (Zero-Touch Provisioning).
- 4) Support of Virtual Network Functions (VNFs), such as security, WAN optimization, cloud connectivity etc.

Better Medicine Requires Best Broadband

By Gary Bolton, VP Global Marketing at ADTRAN



Telemedicine was a niche option at the beginning of 2020, viewed as a potent tool for delivering better health care to rural America and for the rest of us a quick doctor's consult for minor ailments if you couldn't get a same-day office appointment and didn't want to pay for an expensive ER visit. Digital health care solutions enabled

physicians to deliver faster and more effective outcomes to people distant from a big city hospital. At the same time, the need for gigabit speeds and fiber networks to support health care became clear.

COVID-19 and social distancing moved tele out of the niche and into the mainstream. By the end of March, telemedicine video calls became the first option for doctors and

patients alike, enabling health care workers to gather basic information, screen patients, and provide prescriptions when appropriate. The psychiatry profession went all in on videoconferencing, with the Department of Health and Human Services (HHS) waiving penalties for using non-HIPAA solutions such as Skype and Facetime so therapists could continue to work with patients

using available tools during the current crisis.

Telehealth refers broadly to the use of technology and services to provide care and services at a distance, while telemedicine is the formal practice of medicine using technology to deliver care at a distance, usually with a physician in one location using broadband services to deliver care to a patient at a distant site. Today's telemedicine boom is driven by virtual office visits between patient and doctor but there has been a steady business of conducting medical imaging tests remotely, since an X-ray, CT, MRI, or ultrasound can be read just as easily by a specialist two hours away using a broadband connection from his home rather than in an office down the hall from the equipment.

Today's and tomorrow's digital health solutions need broadband and lots of it. Successful rural telemedicine practices cite requirements of 100 Mbps or faster speeds for the most effective use of time and equipment by doctors, specialists, and patients – anything less and time is wasted waiting on image transfers and cloud applications to load. Gigabit fiber is preferred, with the speed necessary to support easily and quickly moving images between diagnostic equipment, cloud storage, specialists, and hospitals, permitting simultaneous access to high-quality imagery and electronic health records (EHRs).

Satellite Med, based in Cookeville Tennessee, initially used the area's copper-based network for telemedicine but found the experience frustrating since too much time was wasted on waiting for diagnostic scans and EHR information to download. The arrival of fiber broke the bandwidth bottleneck, enabling doctors to make the best use of their time while patients could be seen sooner and diagnosed more quickly.

In addition, fiber provides better physical security, symmetrical



Gary Bolton, VP Global Marketing at ADTRAN

bandwidth – especially important for the growth of multi-party video conferencing between doctors, patients, and specialists across multiple locations – along with a clear upgrade path to faster speeds by replacing electronics. Copper-based networks, including xDSL and cable plant, are reaching the end of their useful life and extremely limited or incapable of delivering symmetrical gigabit-class bandwidth services.

Prior to the second quarter of 2020, telemedicine was siloed and not integral to a typical doctor's office practice. The medical community at large was slow to wholeheartedly embrace EHRs replacing paper files with a centralized system for more accurate patient records and faster billing. Telehealth solutions had more success, enabling patients to schedule appointments, access billing and medical records, and engage with their doctors and their health care systems more conveniently

and directly outside of office visits and phone calls

After the crisis is resolved, doctors and health care systems will have to process the industry's crash course in telemedicine and integrate it into daily practice. Like the arrival of email, websites, and Amazon delivery, once people get a taste of a useful service that saves time and promotes safety, they don't want to turn the clock back. In addition, the medical community will have to figure out best practices for broader telehealth initiatives for in-home/on-the-go monitoring, seamlessly incorporating data from IoT health tech devices such as blood pressure cuffs, pulse oxygen monitors, and electrocardiogram capabilities built into smart watches.

The MAGIC Healthy Smart Home project in Westminster, Maryland is one effort to bring together medical best practices with off-the-shelf



consumer health and fitness tech and gigabit broadband.

“We are collaborating with local non-profits to put sensors in two group homes serving adults with disabilities,” said MAGIC President Dr. Robert Wack. “We’re trying to create technology to generate insights into their health status, keeping them out of the ER and hospital, helping them lead healthier lives.”

Heathy Smart Home hopes to improve health outcomes and quality of life for adults with disabilities, storing fitness and health data in a secure and controlled manner rather than letting it being assimilated into separate third-party silos for resale without benefit to the individual. Information over weeks, and months will be collected and used to train proprietary clinical algorithms for the benefit of the individual.

Regardless of what you call these technologies today – telemedicine, telehealth – it will all just be “medicine” five years from now, with currently siloed and emerging applications fine-tuned for HIPPA compliance, optimized for ease of use for doctors, patients, and

specialists, and integrated into the mainstream instead of viewed as nifty toys. Normal usage and acceptance of digital health care doesn’t happen without the best broadband possible, requiring gigabit or faster speeds today and a fiber network architecture able to easily scale and cope with future applications. Legacy solutions such as xDSL and cable have already demonstrated strains in supporting large scale demands for symmetrical bandwidth, a deficit slowing adoption and efficiencies in providing care.

Gigabit-class broadband is also necessary for the latest wave of lower-cost, network-enabled imaging equipment, tapping into off-the-shelf tablet power. Today’s portable ultrasound equipment from Butterfly, Clarius, and Phillips leverages Apple IOS and Android to keep costs in line. Connecticut-based Hyperfine has rolled out a portable \$50,000 MRI system for bedside use, designed to be wheeled between rooms, plugged into a standard wall outlet and uses an iPad to display imagery at point of care. Portable CT scanners are being incorporated into ambulances to

create specialized mobile stroke units, enabling immediate diagnosis and rapid treatment options.

Smaller, more affordable imaging equipment opens new opportunities for rural health and time critical care for trauma, heart attack, and stroke. Diagnostic gear can become more distributed for more efficient and effective care to patients by health care systems. In combination with specialists only a click away, time, money, and lives will all be saved by leveraging gigabit-class broadband to provide improved medical care to a broader population beyond big city hospitals and specialized clinics.

Access to the best medical care today and in the future will only be possible through gigabit speed fiber networks, increasing access to and options for doctors, patients, and health care systems to save time and lower the cost of delivering care while providing better outcomes for society and the individual. Communities, service providers, and health care organizations need to realize investing in fiber today is the best option today and for the future.

“We are looking at opportunities to combine efforts on SDN and NFV”

The addition of ECI's portfolio has expanded Ribbon's addressable market beyond telephony-related services into highly complementary data communications products and technologies. And as the ongoing growth in bandwidth consumption and device connectivity continues to put stress on the communications networks, the company's Packet Optical portfolio is ideally poised to drive additional benefits for its customers. The company is also looking at opportunities to combine efforts focused on Software Defined Networking and Network Functions Virtualization across the portfolio.

***Bruce McClelland, CEO, Ribbon** speaks with **Zia Askari** from **TelecomDrive.com** about the company's integration with ECI and how it is working towards driving greater value for its customers.*

Ribbon and ECI are together now, and present a formidable force on the global telecoms and communications turf. What are your key priorities while driving the integration of business opportunities?

The Covid-19 pandemic has affected everyone, so my answer is going to be a little bit different today than a few months ago: my top priority is steering the company through this crisis and ensuring that we continue to support



and empower our customers while taking care of each other. I'm confident that we have the people, relationships and services to do just that.

Businesses have to be even smarter with their resources and strategy in the current situation, so driving a successful integration is paramount. We've already made significant progress, including a revamped internal

organization aligned along a business unit model with regional sales teams and integrated corporate functions, as well as announcing our new leadership team. I've led major integrations previously and getting the culture right is critical, so we are also putting a lot of energy there.

On a solutions and services level, our top priorities are:

- Unlock the value of the ECI Optical Packet Networking portfolio by growing share in the North American market, leveraging the extensive deployment base and relationships that Ribbon has with Service Providers and Enterprise customers and cross-selling the complete portfolio.
- Continue the transition of the Ribbon portfolio and business model towards software and as-a-Service solutions. More than half of the Ribbon stand-alone revenue over the last 3 quarters have been from this growing software portfolio, improving profitability and competitiveness. Of course, the value of virtual, software-driven solutions deployed in the cloud has only grown in the wake of Covid-19, making this a crucial initiative.
- Prepare our customers for the deployment of 5G on two major fronts: providing for metro, backhaul and long-haul transport solutions in service provider networks, industry verticals and

critical infrastructure, as well as supporting their needs as new applications including IoT (Internet of Things) come on board with 5G.

- Finally, the market need and growth rate are higher at the network edge than at the core, and that's an area of the business we want to grow through our enterprise edge solutions, which are typically geared towards small and medium enterprises.

We are continuing the transition of Ribbon portfolio and business model towards software and as-a-Service solutions

On the technology side – how do you foresee things shaping up within the company? What product innovations can we expect from Ribbon especially after the integration of ECI into its product and solutions DNA?

The addition of the ECI portfolio expands Ribbon's addressable market beyond telephony-related services into highly complementary data communications products and technologies. The growth in bandwidth consumption and device connectivity continues to put stress on the communications networks, and the Packet Optical portfolio is squarely focused here. Our expanded portfolio makes us more relevant and strategic with our customers, and able to invest in new solutions aligned with their priorities.

From a network automation and orchestration perspective, the combined visibility we have of the network will allow our customers to extract additional value and improve network visibility, customer experiences and security. We're also looking at opportunities to combine



efforts focused on Software Defined Networking (SDN) and Network Functions Virtualization (NFV) across the portfolio.

What are the key geographies where Ribbon will be putting its effort in the coming months? Will there be any additional effort towards strengthening R&D or hiring new manpower in the coming months?

Combining the two companies makes sense on a number of fronts: strategic, technological, and geographic. ECI was very strong in Israel and across EMEA, but with a smaller presence in North America and Japan, where Ribbon has a strong foundation of business. It's important that both business units, Packet Optical Networking (former ECI) and Cloud & Edge (former Ribbon) come together and serve customers globally, strengthening the areas where one business unit previously lacked a strong foothold. In fact, we are already offering combined solutions into several of these markets.

Our R&D teams are leveraging and enhancing modern software development approaches with continuous integration, continuous delivery and deployment, which is very much aligned to cloud-based microservices, containerization and software-defined technology approaches for our products.

We are going through a tough time and almost everywhere, every geography - it is a difficult situation. In such a scenario what is your message to Ribbon's employees and partner communities?

We are all in this together. We're living through an unprecedented time but if we stick together and do our best we will make it through as a team. Actions count and doing what's best for our customers and partners is not only what's right, but also the path to success. And of course, nothing in this kind of journey is as important as the

people you're with – I know that our team is the one I want with me as we face and conquer this challenge.

Ribbon has its set of business partners, channel partners as well as distributors of its products and solutions. How do you ensure business continuity in difficult times such as today?

As a company we have been highly distributed for a long time, with many employees already working remotely -- just about everyone is used to collaborating across time zones and geographies, which helps to minimize the learning curve. We've got solid infrastructure in place and know how



to respond to any issues thanks to our engineers, IT teams and others.

We also maintain the ISO 22301 standard, which provides a framework for an organization to establish, monitor, review, and continually improve its business continuity management system. We have continued to leverage these processes to monitor and mitigate any possible disruptions during the pandemic.

A number of our products are designed to enable remote collaboration and we've introduced new offers during the past several weeks that are designed to assist our customers with

their business continuity. Our cloud-based Work@Home solution delivers advanced remote working capabilities to enterprises and contact centers of any size, and we have partnered with IBM to deliver free cloud-based Unified Communications and Collaboration (UC&C) technology on the IBM public cloud and support their enterprise clients' remote staff.

Ribbon has a strong relationship with Microsoft: our Session Border Controllers are certified for Direct Routing for Microsoft Teams, which allows users to make external voice calls directly from Teams. Our all-software SBC, the SBC SWe Lite is also available in the Azure cloud for additional flexibility and ease of use with efficient resource expenditures and as an IP co-sell Microsoft partner we collaborate directly with Microsoft on joint selling opportunities.

We have continued to provide our customers with the solutions and performance they need during this trying period:

- We recently announced that LogMeIn leveraged key solutions from our cloud and edge software portfolio to help meet increased network traffic demands brought on by the surge in remote workers using its collaboration tools such as its market-leading GoToMeeting.
- We've seen that the government of the United Arab Emirates is leveraging our partner Etisalat's Cloud Talk offer, powered by our UCaaS solutions, for cabinet and other critical meetings.
- We are partnering with IBM to offer their end clients free UCaaS and collaboration rooms on the IBM Public Cloud.

Examples like these make me very proud of the way we have been and will continue to support our customers and partners during COVID-19 and beyond. I'm confident that together we can weather this storm.

15 Technology Trends to Watch in Post COVID-19 Era



The ongoing COVID-19 pandemic has accelerated 10 key technology trends, including digital payments, telehealth and robotics. These technologies can help reduce the spread of the coronavirus while helping businesses stay open. Communications technology advancements such as the 5G can help make society more resilient in the face of pandemic and other threats.

During the COVID-19 pandemic, technology is playing a crucial role in keeping our society functional in a time of lockdowns and quarantines. And these technologies may have a long-lasting impact beyond COVID-19.

Here are 10 technology trends that can help build a resilient society, as well as considerations about their effects on how we do business, how we trade, how we work, how we produce goods, how we learn, how we seek medical services and how we entertain ourselves.

1. Online Shopping and Robot Deliveries

In late 2002, the SARS outbreak led to a tremendous growth of both business-to-business and business-to-consumer online marketplace platforms in China and working on similar lines - COVID-19 has transformed online shopping from a nice-to-have to a must-have around the world.

Today's online shopping needs to be supported by a robust and resilient logistics system. We know that in-person delivery is not virus-proof. And a result, many delivery companies and restaurants in the US, India and China are launching contactless delivery services where goods are picked up and dropped off at a designated location instead of from or into the hands of a person.

e-Commerce companies are also ramping up their development of robot deliveries. However, before robot delivery services become prevalent, delivery companies need to

establish clear protocols to safeguard the sanitary condition of delivered goods.

2. Contactless Payments

Cash might carry the virus, so central banks in China, US and South Korea have implemented various measures to ensure banknotes are clean before they go into circulation. Now, contactless digital payments, either in the form of cards or e-wallets, are the recommended payment method to avoid the spread of COVID-19. Digital payments enable people to make online purchases and payments of goods, services and even utility payments, as well as to receive stimulus funds faster.

But on the other hand, according to the World Bank, there are more than 1.7 billion unbanked people, who may not have easy access to digital payments. The availability of digital payments also relies on internet availability, devices and a network to convert cash into a digitalized format.

3. Work From Home Culture

Many companies have asked employees to work from home. Remote work is enabled by technologies including virtual private networks (VPNs), voice over internet protocols (VoIPs), virtual meetings, cloud technology, work collaboration tools and even facial recognition technologies that enable a person to appear before a virtual background to preserve the privacy of the home. In addition to preventing the spread of viruses, remote work also saves commute time and provides more flexibility.

4. Rise of Virtual Conferences and Mega Events

With a focus on maintaining social distancing and minimal contact with humans, global organizations such as the GSMA and a number of companies are opting for virtual events, summits, seminars and webinars. In the new normal, industry is all set to witness an increase in virtual meetings and conferences for announcements, product launches etc.

Globally well established events such as Mobile World Congress, Computex, ConneCTechAsia etc are already set to happen in the online space.

As a result of this trend, a number of video conferencing applications have witnessed a huge surge in usage in the past few months as employees are connecting with each other virtually. From internal meetings with limited participants, to a full-fledged webinar or conference wherein thousands of people can participate, events will continue to take place online. This new trend is likely to continue for a long time with an aim to maintain social distancing etiquette and ensure everyone's safety.

5. Emergence of eLearning

So far there are 191 countries which have announced or implemented

school or university closures, impacting about 1.57 billion students. Many educational institutions have started offering courses online to ensure education was not disrupted by quarantine measures.

Technologies involved in distant learning are similar to those for remote work and also include virtual reality, augmented reality, 3D printing and artificial-intelligence-enabled robot teachers.

Concerns about distance learning include the possibility the technologies could create a wider divide in terms of digital readiness and income level. Distance learning could also create economic pressure on parents – more often women – who need to stay home to watch their children and may face decreased productivity at work.

6. IoT Enabled Solutions:

There is a rise in demand for smart devices across the country owing to factors such as enhanced lifestyles and the need to stay connected virtually. There is also a growing need for smart products that can be controlled through voice commands or remote commands for minimal physical contact.

From remote monitoring of patients in hospitals to remotely operating the equipment in a factory, IoT adoption is likely to get a major boost in the changed world post COVID world.

7. Telehealth

Telehealth can be an effective way to contain the spread of COVID-19 while still providing essential primary care. Wearable personal IoT devices can track vital signs. Chatbots can make initial diagnoses based on symptoms identified by patients.

However, in countries where medical costs are high, it's important to ensure telehealth will be covered by insurance. Telehealth also requires a certain level of tech literacy to operate, as well as a good internet connection.

And as medical services are one of the most heavily regulated businesses, doctors typically can only provide medical care to patients who live in the same jurisdiction. Regulations, at the time they were written, may not have envisioned a world where telehealth would be available.

8. Online Entertainment and eGaming

Although quarantine measures have reduced in-person interactions significantly, human creativity has brought the party in the online realm. Cloud raves and online streaming of concerts and online gaming sessions have gained huge traction around the world. Museums and international heritage sites offer virtual tours.

Most of the movies are now getting released on online streaming platforms and gaming platforms such as Fortnite and regularly organizing special events where thousands of gamers converge to attend, right from their living rooms. This has prompted a huge surge in online gaming traffic since the outbreak.

9. Use of Shared Spectrum

With this pandemic, most of the telecom operators have experienced an upsurge in content being consumed on mobile devices. This is particularly seen in the use video conferencing platforms for team meetings, attending lectures online, or watching video for leisure and playing graphic intensive games and entertainment. Prior to the pandemic hitting the country, video occupied over 70% of the content transmitted over mobile networks. This video consumption has increased multi-fold and is already creating challenging situation for telecom networks that have not been designed to handle huge amount data being consumed at such a rapid pace.

This causes the mobile networks to jam and slows down streaming and downloads on devices. To

avert network jamming and create a superior user experience, more and more communication service providers will use “Shared” spectrum.

There are various types of shared spectrum options available. Dynamic shared spectrum such as TVWS, CBRS give additional coverage and have the capacity to provide connectivity to the unconnected population.

Sharing of spectrum amid two diverse networks – such as Broadband and Broadcast networks can be a possibility. Through the use of 5G broadcast consumers can enjoy hassle free video consumption, for increased productivity. This trend is likely to gain greater traction in the coming months.

10. Rise of AI and ML in Networks

Communication solutions such as Artificial Intelligence and Machine Learning (AI/ML) are crucial for the future. Whether it is for learning to steer the traffic using most efficient path or to dynamically adjust the network parameters to provide most optimal user experience in a given region, AI/ML will become integral part of communication networks.

When wireless networks are using shared spectrum, AI/ML systems will uninterruptedly monitor the load on various networks. Basis the data type, network load and number of users the AI/ML systems can support networks with a choice to select the utmost optimal parameters to distribute content. These systems will help enhance user experiences significantly.

11. Supply Chain 4.0

The COVID-19 pandemic has created disruptions to the global supply chain. With distancing and quarantine orders, some factories are completely shut down. While demand for food and personal protective equipment soar, some countries have implemented different levels of export

bans on those items. Heavy reliance on paper-based records, a lack of visibility on data and lack of diversity and flexibility have made existing supply chain system vulnerable to any pandemic.

Core technologies of the Fourth Industrial Revolution, such as Big Data, cloud computing, Internet-of-Things (“IoT”) and blockchain are building a more resilient supply chain management system for the future by enhancing the accuracy of data and encouraging data sharing.

12. 3D Printing

3D printing technology has been deployed to mitigate shocks to the supply chain and export bans on personal protective equipment. 3D printing offers flexibility in production: the same printer can produce different products based on different design files and materials, and simple parts can be made onsite quickly without requiring a lengthy procurement process and a long wait for the shipment to arrive.

However, massive production using 3D printing faces a few obstacles. First, there may be intellectual property issues involved in producing parts that are protected by patent. Second, production of certain goods, such as surgical masks, is subject to regulatory approvals, which can take a long time to obtain. Other unsolved issues include how design files should be protected under patent regimes, the place of origin and impact on trade volumes and product liability associated with 3D printed products.

13. Robotics and Drones

COVID-19 makes the world realize how heavily we rely on human interactions to make things work. Labor intensive businesses, such as retail, food, manufacturing and logistics are the worst hit.

COVID-19 provided a strong push to rollout the usage of robots and research on robotics. In recent weeks,

robots have been used to disinfect areas and to deliver food to those in quarantine. Drones have walked dogs and delivered items.

While there are some reports that predict many manufacturing jobs will be replaced by robots in the future, at the same time, new jobs will be created in the process. Policies must be in place to provide sufficient training and social welfare to the labor force to embrace the change.

14. 5G – Reinventing Communications

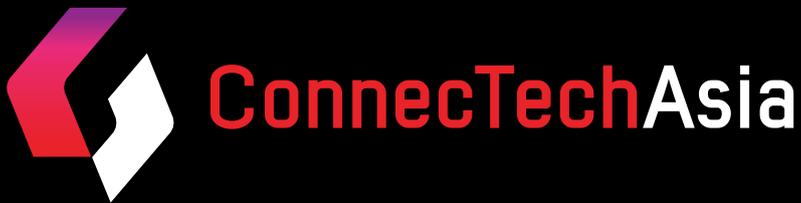
All the above mentioned technological advancements and technology trends rely on a high-speed, resilient and affordable internet connectivity. While 5G has demonstrated its importance in remote monitoring and healthcare consultation, the rollout of 5G is delayed in Europe at the time when the technology may be needed the most.

Further adoption of 5G will increase the cost of compatible devices and the cost of data plans. Addressing these issues to ensure inclusive access to internet will continue to be a challenge as the 5G network expands globally.

15. Importance of Digital Enablement

COVID-19 has demonstrated the importance of digital enablement, which allows business and life to continue as usual – as much as possible – during a pandemic situation such as the one we are experiencing today.

Building the necessary infrastructure to support a digitized world and stay current in the latest technology will be essential for any business or country to remain competitive in a post-COVID-19 world, as well as take a human-centered and inclusive approach to embrace technology-led governance and work towards driving productivity gains.



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Celebrating 25 years of India's Mobility Revolution

As a country, India is completing 25 years of driving mobility for its huge population of well over 1 billion people. Over the past many years, networks, devices and technologies have changed but the idea of mobility has enabled innovation and given innumerable opportunities for citizens.

Rajan S Mathews, Director General, Cellular Operators Association of India (COAI) speaks with Zia Askari from TelecomDrive.com about some of the biggest achievements of this revolution and how is India's telecom industry going to move ahead and embrace new technologies and deliver future-proof innovations.

We are now completing 25 years of mobility in India. I want to take some of your thoughts on this? What are some of the big achievements that we have and how do you look at the future?

First of all in the last 25 years, what we've seen is nothing short of a revolution and what that means is that we went from a landline oriented country which had less than 7% penetration today to being a country where, just about every citizen can demand a mobile phone and get basic telephony service.

70% to 80% of the population can have access to broadband services and the internet that is a tremendous revolution which is allowing our population and our citizens to have not only telephony communication, but data communication, and access to application ecosystems. I think that is one of the most fundamental achievements in the last 25 years.



The second larger achievement in the 25 years is the scope and scale of the spread of our networks.

All the way from Kashmir to Kanyakumari – the scope and the coverage, availability of our mobile network is just about fantastic. So, that is the other part of the revelation & the third part comes from the fact that today, we have been able to also penetrate the rural market place and the rural areas, almost 50% or 60% of all of our villages, our rural areas are covered by telephony. This brings all of the opportunities for connectivity to the internet, for communication services.

It has been one of the prime movers to improve or enhance and lift people out of poverty. And two, it has brought in the female component of

our population and has empowered the woman to begin to participate in our culture and in our business and economy. So these are some of the significant issues and if you look at the investments that have been made today, the mobile industry is the largest – attractive segment for foreign direct investment.

So when you look at all of those parameters, you can see why we say that it has been truly a revolution in the last 25 years.

And, how do you look at the way forward? What more can be done and what are some of the opportunities that are opening up now?

One of the things that we have

done, and obviously, with the participation of the government very earlier on, the government decided that we were going to go with what was called 2G. And because we made the decision to go with 2G from the very beginning, our networks were all digitized. So, we were able to ride the whole phenomenon that we call convergence.

That means anything that can be digitized can in effect travel over our networks. Right, so that is why increasingly you'll find more and more businesses can use our networks for conducting their essential business. 2G obviously has gone through the 3G and 4G, we are in the height of 4G and very soon we will be looking to start introducing 5G.

The technological growth is what we are looking forward to, because of digitalization, more & more businesses and more & more economic activity will be conducted over our networks and as we move to 5G, increasingly larger sections of industry will be brought online because 5G facilitates what we call, Industry 4.0. Industry 4.0 means that mobile applications and solutions will increasingly be used in industry.

For example, things like robotics, logistics, will increasingly benefit from the presence of our network. Secondly, what we are going to see great opportunity for the Internet of Things or IoT. The global population today is expected to be somewhere around 6 billion people. So at the most you can get 6 billion connections today, because of the Internet of Things, we are expecting that just IoT itself will provide another 6 to 7 billion connections.

And IoT obviously brings in lot more opportunities, things like drones, automated vehicles, autonomous vehicles, remote surgeries, waste management opportunities, remote education facilities, you know all of these become feasible because - not only are we moving to advanced

technologies like 5G, but also because we can deal with the requirements of the IoT.

For example, if you are doing remote surgery, our present 4G networks can't support that because you need high speed and low latency network and that can only be provided by 5G. So that is a point where we are looking forward to embracing 5G. So the citizens very soon will be able to benefit from this. No matter where you are, wherever you're living, you will have the best services from medicine from education and that is seen today in the form of Work From Home, you can still teach your children right, and you can still conduct business, you can pay for things you can have things delivered & all of those things are feasible because of our networks.

We are looking forward to the technological explosion that is going to come through the introduction of 5G.

Moving forward, what all technologies do you think are really going to be very important for operators to sustain in a situation like this?

Very clearly we need increasingly to move from 4G to 5G. We have to adopt the Internet of Things. We have to accelerate our adoption for cloud computing technologies, we have to adopt artificial intelligence. So, robotics will increasingly become important for manufacturing. Drones will increasingly become important for logistics.

So, these are all examples of technologies that we will have to adopt. Autonomous vehicles will increasingly become important to deal with the increasing levels of pollution. And smart traffic management will become increasingly important in managing traffic congestion and pollution. So these are all the technologies that will be introduced as a result of advanced 4G, 5G, IoT,

cloud computing, edge computing all these technologies will be there to enable & enhance citizens to enjoy the services they want and all and enterprise to do the types of business they want. So these are clearly the technologies that we are looking for in the future. And in order to achieve all this, operators will need massive amounts of investments in our network.

What according to you are some of the big challenges that you see for India's telecom industry? I'm sure AGR would be one of them.

Three things will be important in this context. One is the financial health of the industry and how do we improve on that? We have to redefine AGR going forward. That's one. Secondly, we have to review license fee & spectrum usage charges - today the combination of all of that takes 30% off the top of every Rupee that operators earn. No other industry has this problem. You know, when you go and buy a car, it's not the 30% of every Rupee that goes to the dealer that goes back to the government. So our industry does have that problem. So that has impacted the financial health because too much debt and too much taxes and levies up to 30% going back to the government that has to be paid.

Financial health has to be fixed. Part of the problem, is the taxes and levies and also GST. GST today is at 18%. And GST is being imposed on things that were never intended to be taxed. For example, when we take a loan from the government to pay for our sector, it goes into billions of dollars. Every time I repay that loan, the government is saying, oh, but you also have to now pay 18% from that.

So, this is an example of the government extracting resources from the industry. Second thing that we have to address is the extremely high pricing of spectrum. Spectrum is like what cement and

iron is for the construction industry if you don't have iron & cement the construction industry is not going to move at all.

And when we continue to keep the prices of that essential commodity high then it becomes very difficult for us to roll out affordable services to the consumer. So, in those areas spectrum has to be looked at both in terms of the costs, as well as the availability of it.

The third thing is what I call 'Right of Way'. Today, increasingly, I am facing a lot of problems from local municipalities and state government in terms of getting permissions to put up the cell towers and roll up the fiber and because of those delays, and also the costs being imposed on us by the local municipality, again, right of way is becoming an increasing problem. And if you don't have new cell towers coming up, if you can't hybridize the network, you will never get the speed and you will never get the coverage and the capacity that you need.

When it comes to 'Make in India' - where do you think we are today and what more can be done? I mean today if you look at networks, almost everything is coming from Nokia, Ericsson or Huawei. So where does India stand there?

First of all, no country in the world produces 100% of all of its needs, even China if you look at just equipment, in terms of telephony and telecom networks, only 45% to 50% is from indigenous sources and the rest of 50% comes from outside. Even a country like China with all of its focus on manufacturing, everything out there big focus is also on exports. Why is that? Because you can never get the scope and scale if you just rely on the domestic markets, even a country as large as China realizes that – if you really want to get the scale of the demand of the units right, you have to go after the

global market.

So, when you 'Make in India' you have to make not only for India, but for the world. So the first thing is that you have to do, is to be globally competitive. We get to be globally competitive, that means you have to be globally integrated into the global economy. And you can't say, Oh, you know, we won't, because you cannot put very high tariff, because other countries will do it and then you have to just rely on your domestic demand, which is not really going to get you to the scale that you need. And that's why research and development becomes extremely important. It is quite unfortunate that we as a country have not highlighted the importance of investment in research and development.

We have not developed IPR or intellectual property. As we move to a knowledge economy, more and more of our products, the value of our product is not going to be in the plastic and the glass in the steel, it is all going to be in the value of the IPR. Today, every box that I import or I put into my network, only 20% of it is truly as a result of local manufacturing, 80% of it comes from the result of the value of the software that is embedded inside it.

So therefore, that is why companies like Huawei, Ericsson and Nokia have basically been able to capture the global market at the scale they have, because they have invested heavily over the years in research and development. They have invested in developing IPR and being able to earn royalties out of that, whereas the Indian companies, on the other hand, have not done the same. Today, companies like Ericsson or Nokia invest 20% of its revenue in R&D. Tell me one company in India that does that?

So, I'm saying if you want to do 'Make in India', especially the telecom network where it's all high tech and high knowledge based capabilities

– we have to focus on these two areas right to be able to enhance our productive capacity and succeed in our 'Make in India' efforts.

There are a lot of people globally as well as in India, who are working from home. What is your suggestion to people who are feeling a little dejected? How can they re-skill themselves? How can they look at, little bit of training to move up?

One thing that we have to realize is that computing is going to be the basis of all industries. So you have to get a basic understanding of how computer systems work, how applications work and then you've got to develop a skill set in some area of computing, it could be in application, it could be in, administration. It could be in network, it could be in maintenance and support.

Secondly, increasingly, if you're going to move to the higher end of the wage scale, you have to learn two or three critical areas that are going to become important, one is artificial intelligence. You have to know how to develop software and utilize artificial intelligence software and interact with it. So that is one area. The second important area is security. Increasingly, more and more people are going to be very concerned about security around your children utilization of software and systems. You don't want them to be exposed, again, to the wrong things when they're playing games, so the security of the application, the security of your network and the security of your systems becomes very important.

So people need to get trained in the area, computing in the area of security and management of security. And so these are areas which are going to be in high demand and we have to encourage our people depending upon the educational background, to continue to move towards computing.

A New Perfect Storm is Driving Business Model Transformation

By Haifa El Ashkar, Executive Director of Managed Services at CSG

Several years ago, the combination of four specific technologies—Social, Mobile, Analytics and Cloud, or SMAC—was touted as a “perfect storm” that threatened operators’ very existence, re-shaped consumer expectations and also provided opportunities for growth.

Today, the mobile industry is experiencing a new perfect storm that is being shaped by the collision and interplay between four new technologies: Internet of Things, eSIM, Digital Identity and Blockchain. At CSG, we are calling this perfect storm “The Intersect of Things” and it will have a profound impact on how operators do business in the next decade.

Internet of Things: By 2025, the GSMA predicts there will be more than 25 billion connected devices worldwide. This includes everything from smartwatches to smart cars to smart streetlights. The challenge of identifying and managing individual devices within a networked M2M ecosystem or a smart city is providing the catalyst behind trend number two: eSIM – embedded/virtual sim cards.

eSIM: In M2M applications, eSIM makes it possible to maintain and calibrate a network containing thousands of IoT devices — which may be spread out over an entire metro area — from one remote location. While eSIM is a lifesaver for CSPs offering M2M connectivity, eSIM is also anticipated to create a seismic disruption for mobile carriers when paired with mobile phones. With a virtual SIM card, mobile phones no longer need to be tied to just Verizon



or AT&T with a specific plan. Each SIM card can have multiple carriers and multiple data plans. Apple and Google have started outfitting their newest smartphones with eSIM cards and the global eSIM market is expected to grow at a CAGR of over 90 percent from 2019-2025.

Digital Identity: Digital Identity allows consumers to verify their identity on one device to access services on multiple devices. The next link in the perfect storm chain, a digital identity is needed when SIMs are being managed remotely – a reality of tomorrow’s e-SIM world. Growth in mobile digital identity could surpass 800 percent by 2024, with mobile likely to be the primary source of identification for over three billion people.

Blockchain: With digital identity

comes concern over security. This is where blockchain comes in. Blockchain is decentralized and far more secure than most other identity management models, because each transaction or interaction is independently verified. According to Deloitte, half of executives polled say their company is working on blockchain identity solutions. And blockchain is already being adopted at a country level for citizen identity, from Estonia to the United Arab Emirates to the United Kingdom. Blockchain in these countries is now powering smart cities — a fundamental area of IoT.

As these trends converge in the next decade, there will be a self-fueling cycle between IoT, eSIM, digital identity, blockchain and back to IoT that increases the industry

impacts of each of these trends and provides a catalyst for a more empowered digital citizen than ever before.

Digital Customer Experience 2.0

Tomorrow’s digital citizen will have absolute freedom of choice and access to any vendor, any plan, any device, anytime and anywhere. This provides a catalyst for customer experience on steroids as companies will need to compete based on the strength of their customer experience and value propositions.

In this new landscape, MVNOs have the ability to rise to a position of power. Given their ability to be vendor-neutral, MVNOs are able to position themselves as a mobile data super aggregator - offering eSIM-equipped smartphones that allow consumers to seamlessly switch between carriers and plans at will. Think one step further and MVNOs could leverage the power of eSIM, Digital Identity and Blockchain to create a consumer exchange where consumers are able to buy and sell data from each other if they have surplus data or run low at the end of the month. This “data eBay” will also empower consumers roaming in foreign countries to buy data from the local subscribers in that country more cost effectively than purchasing official plans or incurring charges.



Haifa El Ashkar, Executive Director of Managed Services at CSG

This kind of consumer coup d’état might seem far-fetched, but it’s already beginning. Keepgo – a mobile broadband service provider with 119 operators signed up as MVNOs across 105 countries – is already selling eSIM phones with Digital Identity and Blockchain built in. As new incumbents like GoogleFi double down on their MVNO services, the future of consumer offers and how consumers view their role in the connectivity equation will rapidly transform.

How Telecom Companies Can Win With Customer-Centric Business Models

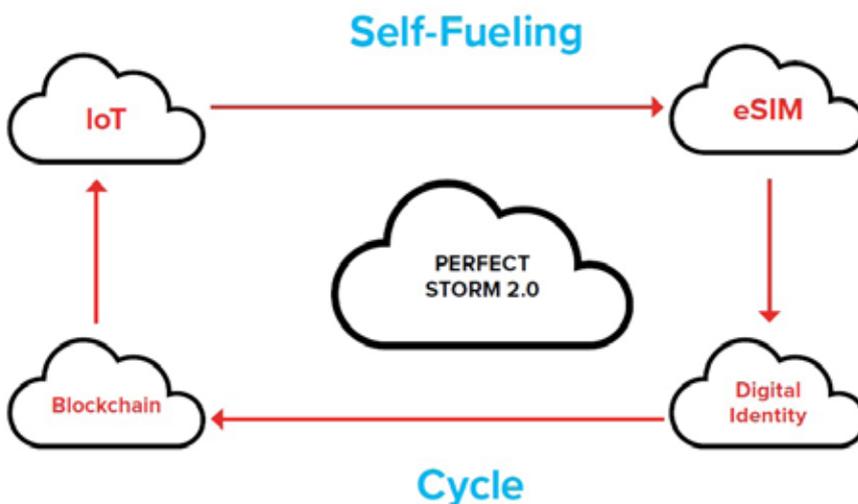
Mobile operators can support customers’ freedom of choice to switch between plans and explore new business models. Alternatively, operators can focus on B2B. In a 2018 TM Forum survey, nearly three quarters of respondents said they expect to be generating more than half their revenue from B2B services in the long term. Either way, both paths will require a fundamental change in how telecom companies serve their customers, which in turn implies a fundamental change of business model.

Finally, there are three principles telecom companies should consider to transform their business models and ride out the new perfect storm:

Be customer obsessed. Business model transformation succeeds when it’s focused on customer pain points and how they can be solved. Take Marriott’s lost wallet service, which turned a common problem into an exceptional experience. In order to achieve this, companies need to better understand and anticipate their customers’ needs.

Simplify complexity. It might be hard to believe, but Netflix was initially scoffed at for its simplistic business model. Companies like Southwest and Netflix have thrived because they simplified the offerings that incumbents had traditionally sold. They also avoided the technical debt of their predecessors with lower hardware and software operating costs.

Connect the company. Companies say the biggest challenge they face with respect to collaborating effectively is culture, followed by structure (silos and legacy systems). Aligning around a common goal—a business model focused on the customer—will connect every part of the business, from technology to finance and beyond.



Consumers see benefits of 5G Fixed Wireless Access

By Patty Wong, Director of Market Insights, Nokia



Nokia commissioned a study prior to the current global coronavirus pandemic that examined consumer understanding, awareness and desire for different 5G services. The world has of course changed dramatically in the space of a few short weeks but the insight from this research is still valid and applicable for when things start to return to normal.

The quantitative market research surveyed 3,000 people in the UK, US and South Korea, across five different use cases: video monitoring, fixed wireless access, immersive experiences, smart venues, and connected vehicles. Broadly, it highlighted an opportunity for Communications Service Providers (CSPs) to ramp up 5G awareness campaigns that help consumers better understand its capabilities and benefits. Although awareness of 5G with the general public remained quite low with just half of consumers claiming any level of familiarity, the good news is that appeal follows education, 80% of those very familiar with 5G found it appealing versus 23% of those who aren't familiar. Cost, of course, remains a key consideration for consumers but is not necessarily a barrier to entry with the majority of smartphone owners saying they'd be willing to pay more for 5G services. Additionally, over 50% said they are likely to switch providers if their current provider didn't offer them 5G in the next 12 months. The availability and cost of 5G capable smartphones is currently a potential barrier to mass consumer adoption but the introduction of more models from multiple brands and at different price points should encourage greater adoption.

Operator opportunity with Fixed Wireless Access

Across all markets, 76% of people surveyed worldwide (US 82%; UK 74%;

South Korea 71%) rated Fixed Wireless Access service as the most appealing use case for 5G. 5G FWA can be an alternative to a wired home internet service so instead of getting internet access into your home through cable, DSL, fiber optic or satellite, it would come into your home wirelessly using an easy to install 5G wireless internet modem.

While most respondents were satisfied with the performance of their current broadband believing it to be reliable and fast enough, they are relatively less satisfied with service costs and choice of providers. Forty-one percent of consumers indicated they have a single broadband provider option and thus value the prospect of more provider choice. Two-thirds, or 66%, said they would be willing to subscribe to 5G FWA if it cost the same as their current wired broadband service. This can be an opportunity for mobile operators to compete with low cost bundles that can be offered to consumers as a new way of receiving broadband at home. Of course, operators must prove to consumers that 5G will perform just as well if not better than the status quo. CSPs can offer free or discounted trial periods that allow consumers to experience service quality first-hand, which also showcases the ability for easy, do-it-yourself installation given 83% of consumers find it a valuable aspect of FWA. It's worth noting that our companion research into 5G use cases for enterprise also showed that 5G FWA is the most appealing use case for small and medium businesses.

FWA can be an attractive use case for 5G but operators must make an informed decision about how to invest and where. Research from Technology Business Research Inc. (TBR) recommends deployment in relatively high GDP per capita populations with limited access to high-speed internet services, as well as underserved areas



Patty Wong, Director of Market Insights, Nokia

which can benefit from 4G FWA until 5G is deployed.

Nokia's research into 5G use cases also showed that there are opportunities for CSPs to go beyond connectivity services to higher-value 5G services. The survey revealed a strong appetite for 5G-enhanced services in many areas including 5G video. Even before COVID-19 turned video into a bedrock of personal and business interactions, 69% of consumers found 5G video monitoring and alerts appealing, and expect to see a difference in video quality between 4G and 5G. Social and physical distancing habits may also accelerate demand for 5G-enabled immersive experiences such as augmented reality, virtual reality, and cloud gaming. While a majority of consumers found immersive experiences appealing, there remains a gap in familiarity with how these technologies can be used and how 5G makes it better.

Across the board, consumers look to their mobile carriers as their preferred provider. CSPs can drive demand by demonstrating that 5G offers much more than "faster 4G," and investing in targeted campaigns to help a wider consumer population understand how 5G can enrich many areas of their life.

Guavus – Enabling CSPs to Do More with Big Data Analytics



When it comes to Big Data Analytics space – Guavus is playing a pivotal role towards delivering a unique value for communications service providers (CSPs) and Industrial IoT. The company handles very large volumes of data that's sourced from subscribers and devices in the network and applies analytics to this data, delivering critical insights, key value-add use cases that customers seek. These use cases ultimately aim at maximizing subscribers' experiences.

Stephen Spellicy, SVP of Products & Marketing at Guavus (a Thales company) speaks with TelecomDrive.com about the company's focus on AI and analytics and how it is adding value to enterprise offerings today.

What's the state of play in the IoT domain, what kinds of AI and analytics use cases do you see really taking off?

With IoT, the CSP use cases typically break down into 4 major areas, where we see the most traction:

- Monitoring - business-intelligence-style activities where you generate reports for certain key operations performance indicators.
- Profiling of the devices themselves - what is it spending most of its time doing, etc.
- Predictive Maintenance - interpreting the behaviors of the devices to predict the need for unplanned maintenance.
- Device Security - interpreting the behaviors of the devices to

determine if they are engaging in suspicious activity

Which of these areas offer the greatest value to companies today in your opinion?

All have business value. However, generally speaking, as you increase the sophistication beyond monitoring, the ROI increases.

Monitoring is clearly the most mature area to-date as it yields immediate value, is comparatively simple to do and everyone understands it. This informs capacity planning, investments, preventative maintenance, etc.

In predictive maintenance we are focused on failure prediction. If it's going to fail, you want to diagnose what's going on. With such analysis, it's hard

to do as you can't touch these devices. After you've found the root issue, a key cost saving results from figuring out if it can be resolved remotely rather than incurring the expense and delay of direct intervention.

How do you determine if a device will fail, what kind of indicators do you have and how is your system set up to monitor that?

A simple analogy might be our laptop devices. For example, your fan on your laptop is constantly on. Typically the fan is on with high CPU usage. If we see it is always on even when CPU usage is low – what does this mean? Is this normal behavior or is something wrong such as with the fan itself? So, these KPIs help you tease out abnormal behaviors and also provide you with diagnostic information. The KPIs themselves include the device's ever-changing physical characteristics, its upstream and downstream traffic frequency, amounts, types, etc.

In addition, devices log their activities. These are interpreted to add to their behavioral profile and typically provide more contextual information about what might be going on in the device.

Are you hardware agnostic? Who do you work with in the IoT ecosystem?

We are hardware agnostic. Let me go back to how companies get data. There are 2 principal ways of getting this data. Observing the device in its operating environment by looking at the device doing its job, collecting the data, and monitoring use cases. IoT devices were never designed for that purpose, to manifest that data so you need to infer that from the network. Guavus has spent a lot of time looking at that, looking at the periphery of the device and what's happening around it. And by virtue of doing that, we're hardware agnostic.

Now some manufactures have started instrumenting their devices to directly provide key performance

indicators. For example, your cable modem at home – you can log in to see the signal, metadata can indicate if the device has failed, and so on. We're getting these things in real-time, so we are then able to understand what's happening with the device.

We're uniquely positioned in our space and it gives us the opportunity to work within the ecosystem. Those IoT devices are like your cell phone on your network. Our technologies have been enabling the improvement of the performance of devices in CSP networks for more than a decade. So, technically, it's just a straightforward extension for us. We have that as part of our DNA.

Are there additional issues you see for CSPs and their customers?

The majority of IoT devices, especially those in smart city and industrial sectors, don't require the same speed and bandwidth as consumer cellular devices. However, power consumption can be an issue where analytics can be applied, especially to enable the understanding of battery consumption for long lifecycle devices, such as smart meters. Excessive network communications can prematurely drain battery resources.

Analytics can assist utility operators to reduce and refine the data collection frequency to limit impact. In addition, utilities can better protect their grids with an understanding of device behavioural patterns to identify potential intrusion or infiltration.

On the opportunity side of the equation, IoT technology can help make our economy and society more sustainable. IoT can be leveraged to save energy in the long run. Smarter objects mean more efficiency.

Collecting, analyzing, and measuring the behavioral aspects of IoT devices will enable societies to finetune their energy consumption and can be used to reduce the impact on the environment. An example use case would analyzing

the data from traffic sensors. By doing so, cities and governments can measure, then predict, vehicle traffic patterns to better optimize commuting at peak times. Beyond that, insights into the data can be used to model the impact of carbon emissions on specific geographies. Regional governments can leverage this data to apply and enforce vehicle traffic policy. Smart cities thus become smarter, more responsible societies. That is a win-win for us all.

Some companies want machine learning and AI but forget that they need data, and how to get that data. Is that a common problem you run into or do your customers already understand what data they need and how machine learning/AI fits into their solution?

People intellectually understand data, but from an operational perspective that's where people are lost...where do you get the data. We have a consultancy approach to this with our customers. It's a fundamental paradigm shift that we try to get across to our customers. Normally people think of technology as in/out -- performs a specific function and that's clearly understood.

Yes, analytics are primarily delivered through software but there's also the data. Machine Learning and Artificial Intelligence are designed to take that data and turn it into value to a human or downstream to optimize itself. The nature, statistics and quality of the data, relative to the information you need, is a new dynamic in addition to the otherwise deterministic functionality of the software.

In the IoT world, data matters now more than ever...

Definitely. But data is an alien concept...what do you need in the context of that data? What is the actual info you're seeking and what data do you need to support that, how can you find it (executing processes in the org that can pull data)? In some cases, it requires going back to the vendors of the IoT devices to make

changes in their systems so they're providing the right data. Even if machine learning is not in place, you still have these problems.

A lot of our value is in helping customers to think through those challenges – what's the use case, how does it relate to business value, what info. is needed, what data is needed from which to derive that info, where in their organization can they get it, how can they ensure its of quality, curate it, etc. That's part of our collaboration with our customers.

Isn't security an issue as well?

Yes it is. In the world of IoT, it's important to have robust security measures. In critical environments where there's no margin for error – in industries such as transportation, defense or cybersecurity -- solutions can't be the same as those developed for the general public and trust is crucial. It's our responsibility to help customers build a trusted environment by providing for instance strong encryption and secure authentication solutions for data, devices, networks and platforms.

Any data flowing through a network-based system needs strong encryption and authentication technology to ensure integrity. Furthermore, the identity of each user or device needs to be authenticated and verified. Every part of the ecosystem requires trust implicitly. This is why Thales adapts technology – and more explicitly AI through our Thales TrUE AI approach - to the constraints of the environments in which our customers operate, where critical operations require safety, responsibility and compliance with standards, laws and ethical principles.

Trust comes only if users or devices can be identified, their identity authenticated, verified and we can understand and explain what the decision is and why we the decision has been taken. These principles extend beyond network entities such as users or devices to the actual integrity of

data that is collected and analyzed. This is why the entire end-to-end operation of network communications requires security at its foundation and core -- all the way up to the top of the stack to the data interaction layer.

Machine learning and AI are used as buzzwords a lot and there's a lot of confusion. How do you define them, what's the distinction?

In terms of distinction, the key word is intelligence. It's like if you are walking on your favorite hiking trail and see an army of ants going in one direction and another army going in another. You might at first think they're intelligent, but on second thought realize they're following pheromones and matching them with their reflex reaction until they get to a food supply. That's just pattern matching – that's machine learning, it's trained to learn patterns... and coming up with a mathematical model, and every time data comes in, it runs it through this model.

Contrast this with crows, which do problem solving...they've been known to drop stones in vials of water to get food to rise to the top. That's transferring an experience they've done into a reasoning process, extrapolating to create hypothesis, test, improve and ultimately achieve an objective – inventing completely new information/patterns.

You're applying reasoning and predictive analytics so customers can take prescribed actions?

Yes. The applications of analytics to IoT fall into two basic areas: the application of the device itself, like a smart thermostat, so that the manufacturer can leverage data to know when to turn up the thermostat, for example. Then there is the data that runs over the network -- so the network provider has to have the smarts in the system to ensure continued connectivity, to ensure the device is performing, not going to a strange IP address (for security

reasons)...that's the network layer of the IoT device and that's where Guavus specializes.

How critical do you think AI and machine learning really are to IoT? What's their ROI?

The interesting thing about analytics is you can do it offline and show the potential functionality of the analytics of machine learning and AI and the calculated ROI from it. But, in the end, most customers want to see it trialed in their system and see the ROI at the end of the quarter. These applications aren't just about processing but translating the results of AI and then customers can use them in their day-to-day jobs.

We have lots of predictive analytics, 24 hours in advance, that a device will fail but then Guavus makes sure it gets into the right hands so action can be taken. The ROI then can be completely recovered because of that. If it sits on someone's screen, it loses that value.

What does the future hold?

We're focused on business value problems we can solve, and we can leverage artificial intelligence/machine learning for that purpose. We're driven by the current problems our customers are facing. The holy grail is to make these devices autonomous, so they can recognize when there are issues using a knowledge base on their own - in other words, self-optimizing systems.

Bear in mind these things don't happen overnight...we're slowly getting there, that's the nature of technology. For certain devices and their operations, it's a piece of cake – you just need to update the firmware or reboot the device -- we're already at that point today. But then there are the interactions of the network -- that will be next, and the way companies deal with the network will change. It will evolve over the next 3-5 years towards doing its own optimization and maintenance.

Winning against COVID-19's New Normal: 50 Years of Optical Innovation

By Geoff Bennett, Director of Solutions & Technology, Infinera

2020 marks the golden anniversary of two major milestones that marked the beginning of the optical communications age. To be clear, a staggering amount of foundational work was already in place by 1970, but in that year, two entirely independent technologies reached the point where it was clear that their combined use could transform the way we communicate across the world.

These two technologies are the semiconductor laser and low-loss optical fiber – and without them, we would not have the option to “work from home” today. Every Zoom conference call you attend, every email you send, and every document you upload to your company intranet will surely involve optical fiber communications. In our “new normal,” a significant proportion of the workforce will be able to avoid the daily commute, forget about fighting for the hot desk nearest the window, and actually get on with doing our jobs. It’s no surprise that various studies tell us that working from home saves \$11,000 per year, per employee; increases productivity by 13.5%; and results in employees feeling 60-80% more engaged. This way of working could help our economy get back into the fast lane – but only if we can supply those home workers with fast, reliable communication services.

So let’s turn the clock back to 1960. Theodore Maiman, who was an engineer at the Hughes Aircraft Company, demonstrated the first laser. But for several years, these devices were seen as a “solution in search of a problem” because they

were large and cumbersome, often involved the need for liquid nitrogen cooling, and were only able to transmit light in short bursts before they were damaged. The key to practical telecommunication lasers would be to master semiconductor structures at the molecular level. In particular, the 1970 milestone in laser development was based on the idea of heterostructures – microscopic layers of different materials, which were first proposed by Herbert Kroemer in the U.S. in the 1950s. But in 1970, Zhores Alferov in the Soviet Union created the first double heterostructure laser that dramatically increased efficiency, allowed continuous beam operation, and paved the way for room temperature stability. For their work, Alferov and Kroemer shared the 2000 Nobel Prize for Physics.

The second half of the solution – optical fiber – dates back even further. In 1842, the Swiss physicist Jean-Daniel Colladon demonstrated how light could be trapped inside a tube of water that was allowed to pour from a glass container. At the time, it was just an impressive science demonstration, but in the 1960s, Charles Kao, a researcher at Standard Telecommunications Laboratories in the U.K., suggested it might be possible to create very low loss “light pipes” using specially constructed glass fibers far thinner than a human hair. In 1970, a team at Corning managed to create a fiber with a low enough signal loss that it could be



used in a practical communication system. Kao shared the 2009 Nobel Prize for Physics, and is known today as the “father of broadband.”

So, the roots of optical communication may stretch back even further, but 50 years ago, we saw these two vital milestones that showed that practical, high-speed, long-distance communication using semiconductor lasers over optical fiber was a practical and economic reality.

Next time you connect to your Zoom conference, perhaps you’ll remember Zhores Alferov and Charles Kao, and the contribution they made to making our new normal work so much better.

Unlocking new revenue for operators with satellite and Cloud integration

By Michel Dothey, CCO at SatADSL



Cloud technology has made an increasingly visible mark in the satellite sector over recent years. Beginning with the delivery of Cloud-based applications to remote locations via satellite, fully managed satcom services are on the rise. Platform-as-a-Service (PaaS) offerings, for example, can provide teleport operators the benefits of managed cloud applications whilst avoiding the expense and complexity of establishing and owning the software itself.

The marriage between satellite – delivering flexible, high-bandwidth and cost-effective connectivity – and Cloud platforms – offering scalability

and reduced IT cost for services – can give operators in nascent markets and hard to reach areas needing to deploy easy, cheap, scalable solutions to meet new and rising demands.

Yet to fully exploit new revenue streams, operators need a truly disruptive and innovative platform to maximise the technology's potential.

Changing landscapes

The satellite industry is realizing the potential of Cloud-based applications via satellite, going beyond just delivery to remote locations. Although still a vital component of the satellite-Cloud partnership, recognition of further and broader opportunities are emerging and are poised to reap benefits for the

whole satellite industry value chain.

The advantages of incorporating the Cloud into satellite businesses are clear. Satellite access to the Cloud brings with it a form of flexibility not available on terrestrial networks. Cloud allows operators to circumvent prohibitive upfront capital and reduce operational costs. It also gives operators the ability to scale rapidly, develop and deploy easily, and benefit from ubiquitous accessibility. Also, regardless of the application, Cloud platforms can reduce the barrier of entry to market.

Digitalization is becoming increasingly important for industries as we enter Industry 4.0 and Industrial Internet of Things (IIoT) technologies

emerge. This will be especially true for sectors such as energy and maritime, which are heavily dependent on satellite services for remote communications. The IoT revolution has over spilled into this world, driving further demand for connectivity and advanced analytics, and satcom managed services will be a key enabler here.

There is also increasing user demand for bandwidth-intensive applications delivered over the Cloud, from Over-the-top (OTT) services to mobile applications. Research from the GSMA shows that mobile device penetration is expected to rise over the coming years, and that the primary means of internet access in Low- and Middle-income Countries (LMICs) is mobile. Satellite network operators and service providers looking to improve their bandwidth delivery services to meet this demand can turn to Cloud technologies for increased capacity and low-cost services.

New sats on the block

Alongside the changing digital landscape, innovation and new trends in the satellite ecosystem are enabling Cloud's power. Newer constellations in low earth orbit (LEO) and medium earth orbit (MEO) will alleviate the Achilles' Heel for satcom: latency. As LEO constellations are closer to earth than GEOs (orbiting at 160 to 2,000 kilometres compared to 35,000 kilometres) latency is massively reduced which can present huge advantages for the delivery of real time applications like VoIP.

The emergence of LEO as the first-choice satellite technology presents operators with an immeasurable opportunity – so long as they have the tools to fully realize the benefits.

Introducing the Cloud-based Service Delivery Platform

A revolutionary idea introduced by SatADSL, a provider of professional VSAT services via satellite, is to



Michel Dothey, CCO at SatADSL

interconnect satellite hubs on the ground to allow operators to reap the benefits of satellite connectivity using a PaaS solution - Cloud-based Service Delivery Platform (C-SDP). This would enable operators to provide omnipresent, low-latency high-bandwidth satellite connectivity to the regions where high-CAPEX connectivity solutions, such as fiber, are just not feasible. The PaaS solution requires no upfront investment and its quick deployment time allows operators to roll out their services to market immediately. It is carrier-grade, technology-agnostic, and works on all bands (Ku, C, and Ka).

By interconnecting hubs worldwide, the platform has the capability to offer any kind of service worldwide through the aggregation of multiple satellite operators. For the first time, teleports and hub operators can sell and purchase on the fly packaged services to and from each other.

New revenue streams

SatADSL offers pre-configured, redundant routers that enable the operator to connect its hub to the C-SDP through redundant optical fiber links. Operators can then choose how much Virtual Network Operator (VNO) capacity to sell through the C-SDP and define their service packages portfolio and tariffs. Following this, SatADSL can then configure and implement this

portfolio, along with online payment tools. In addition, SatADSL provides the tools to manage and monitor the VNO bandwidth, as well as technical support.

With the C-SDP in place, operators can extend their hubs' capabilities to offer any contention, volume-based, or voucher services, whatever the technology – be it ST Engineering or Hughes, for example. As an industry first, VNOFlex allows customer organizations operating across multiple sites the ability to dynamically self-manage bulk bandwidth capacity delivered by SatADSL.

By acting as a broker or aggregator service, SatADSL offers to hub operators various ways to sell capacity, which suits the majority of teleports who have excess capacity and are looking for an outlet to monetize it.

Thanks to SatADSL's worldwide network of hubs already connected, it can offer the benefits of the Cloud platform on any available bandwidth, aggregating capacities while optimizing bandwidth management. The company currently connects 13 different capacity providers, including 15 teleports with coverage already on 20 satellite beams.

More Cloud forecast

As our connectivity demands increase, and become increasingly complex, Cloud will continue to play a vital role especially in emerging and developing markets.

Over the past year, SatADSL has accelerated the global expansion of its Points-of-Presence (PoP) globally, reaching new regions to deliver its solutions and extensive value-added services portfolio worldwide. The PoP, which has been introduced in Singapore and Miami, replicates SatADSL's European and African models to enable operators to offer satellite services via the Cloud – unlocking new revenue streams to operators worldwide.

To Cloud or not to Cloud...

Here is the answer

The benefits of outsourcing an international switching hub to a cloud platform and the possible use cases

By Andreas Hipp, CEO of Cataleya

In the current environment, which is defined by declining voice traffic in many cases, stagnating revenue and squeezed margins, two key challenges present themselves to international operators and wholesalers: optimizing operational efficiency, while generating innovation and new initiatives - all this at minimal risk and cost.

And in a world where everything is expected to work at all times, on all devices and from everywhere, the need for efficient and flexible high quality international interconnection capabilities has never been so critical to operators' success.

Additionally, innovation and the expectation for new services is moving at an ever-increasing speed and operators therefore must completely reinvent the way they launch new services or solutions: with speed, agility, low cost and openness.

Outsourcing versus building and owning your own infrastructure, especially for international non-core network segments or services, is therefore worth serious consideration.

The true complexity and cost of ownership

When looking at the cost of ownership of such facilities, it is not only the expense of buying and maintaining switching and BSS platforms that are cash intensive. The required colocation and technical support needed on site adds a considerable amount to the operating cost of such platforms.

Dimensioning and scaling are additional issues to consider, especially if one doesn't know exactly how the business will grow or sometimes even how the business might decline.

In addition, the need for geographic diversity, or regional nodes for better quality of service, could essentially double the cost of owning international interconnect hubs, which adds further strain on operators' networking budgets.

On the other side of the coin, there is a cost of ownership that is rarely considered: the loss of revenue due to the time it takes to launch new services or innovations. When choosing to build and own their own international hub, either to address a new segment, launch a new service or reach a new geography, it can take operators and wholesalers many months to bring such projects to fruition. This translates into a considerable loss of potential revenue, which could have been harvested much earlier if time to market was kept to a minimum. This is compounded by the fact that if the time to market is not rapid enough, the window of opportunity for this new service or solution may have been missed.

All this results in a significant Total Cost of Ownership (TCO), which goes well beyond just the cost of buying and maintaining equipment and networks.

Simplification through hosted voice cloud platforms

One solution to consider to minimize

cost, risk, as well as time to market for new products, is the outsourcing of the international hub function to a Cloud Platform as a Service provider such as Cataleya.

Business ready platforms, such as Cataleya's Orchid Cloud, enable operators to start interconnecting only days after signing up to the platform, while paying only for what they use. This translates into immediate time to market, ultimate flexibility in terms of traffic growth and business model, low cost and low risk.

Key Orchid Cloud benefits:

Network flexibility: Orchid Cloud offers fluid scaling and therefore empowers operators to grow their business from zero to almost infinity, at the speed and increments that suits their business. Once interconnected, the platform grows with them in real-time. In addition, short term volume increases or overflow traffic requirements, that would not warrant the upgrade of an existing owned platform, can be sent to the Orchid Cloud platform. Finally, bridging migration periods caused by internal network upgrades or changes can also be handled very cost effectively by Orchid Cloud, rather than purchasing or deploying duplicate switching platforms during such periods.

Business model flexibility: The Orchid Cloud pricing structure is built to mirror operators' needs and business. Such a platform requires only a minimum monthly subscription

commitment. From there, operators will only be charged based on actual minutes sent through the platform on a monthly basis. The higher the volume, the lower the platform cost per minute.

High carrier grade quality: Orchid Cloud is based on fully redundant Orchid One SBC nodes in high specification datacenters to ensure high availability. If, however geographic redundancy is required, or if other regional nodes need to be accessed to keep the call media in region and reduce latency, operators can simply subscribe to another partition in a different location, instantly. All this while having the benefit of managing the cloud platform via one single management interface.

The proof is in the numbers

To better understand the financial benefits for operators to outsource their international hub to a cloud platform such as the Orchid Cloud, we have analyzed the difference in total cost of ownership of building and running an overseas switching hub versus using a hosted platform service for two main business cases.

The first use case discusses the establishment of an international hub in comparison to using a hosted platform service for an existing business or service. This could be for example for the decommissioning of a hub to be replaced by an outsourced solution or for a group wanting to aggregate its Opcos' operations within a central outsourced hub. In these two cases the business and traffic is already ongoing.

While the second use case discusses the introduction of a new switching hub for a new business or service altogether, where traffic will be ramped-up from zero.

Use case 1: Existing business use cases

a) New interconnect hub

When choosing to outsource your international switching hub function

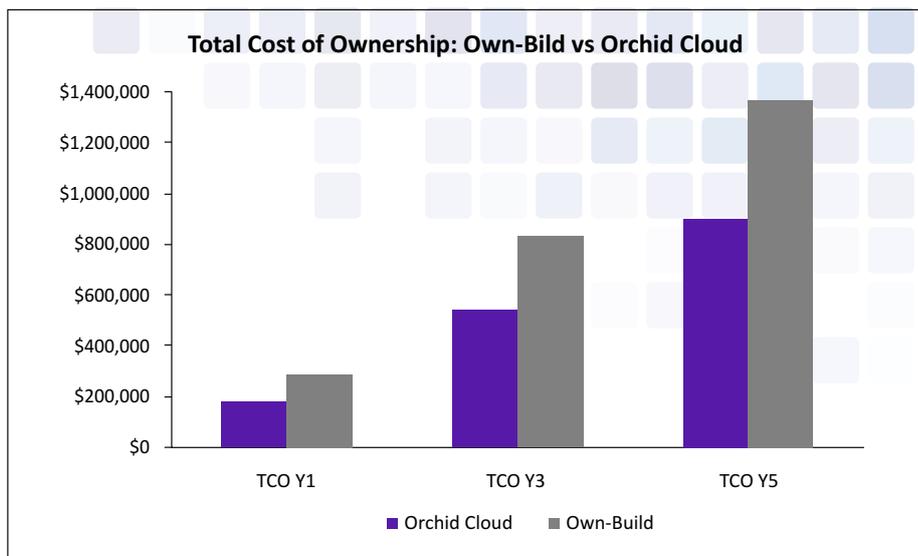


Table 1: Total Cost of Ownership scenario: Existing business – Own-Build vs Orchid Cloud

Term	Own-Build	Orchid Cloud	Saving Own vs Orchid Cloud
TCO Y1	\$290,500	\$182,500	\$108,000 59%
TCO Y3	\$831,500	\$542,500	\$289,000 53%
TCO Y5	\$1,372,500	\$902,500	\$470,000 52%

instead of building your own, we found that in the first year (when based on a running rate of 100 million/month), the total cost of ownership when owning the international switching hub amounted to US\$290,500, compared with US\$182,500 with a hosted solution such as Orchid Cloud. This equates to a cost difference of US\$108,000 and savings of 59%.

When looking at the total cost of ownership savings for longer periods of operation, cost savings amount to US\$289,000 and US\$470,000 over the course of 3 and 5 years respectively.

b) Decommissioning of an interconnect hub

Operating existing international switching nodes can also be considerably costlier than outsourcing

to a cloud provider. The hosting cost alone, plus the 24/7 technical support required to ensure high uptime and fast response times in case of system failures, plus the management time to deal with the hosting provider and the support company, represent a significant cost year after year.

The depreciation of the platform over its lifetime also needs to be factored in. Even more costly is when operators have their own dedicated engineering support team in each overseas location.

Therefore, the decommissioning of an international switching hub, to be replaced by an outsourcing solution such as Orchid Cloud, is something to consider to minimize the cost of operation of your network, while continuing to ensure similar or better

Table 2: Total Cost of Ownership scenario: Existing business - Decommissioning vs Orchid Cloud

Term	Own-Build	Orchid Cloud	Saving Own vs Orchid Cloud
TCO Y1	\$270,500	\$182,500	\$88,000 48%
TCO Y3	\$811,500	\$542,500	\$269,000 50%
TCO Y5	\$1,352,500	\$902,500	\$450,000 50%

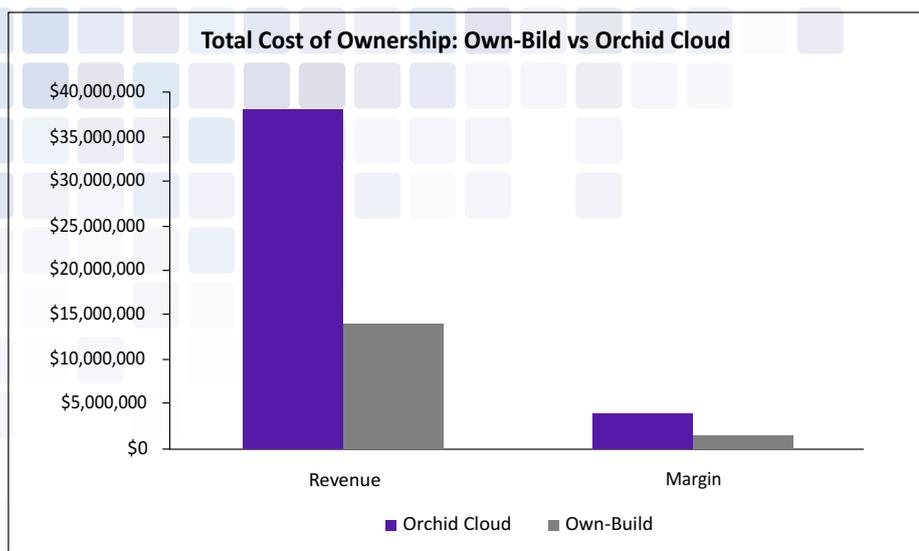


Table 3: Potential increase to the bottom line using Orchid Cloud

	Own-Build	Orchid Cloud	Difference between Own and Orchid
Service launch month	Month 7	Month 1	6 months
Total minutes transported	350 million over 12 months	950 million over 12 months	600 million over 12 months
Average revenue per minute	US\$0.04	US\$0.04	-
Average margin %	10%	10%	-
Total cost of the hub (Year 1)	\$145,250	\$182,500	(\$37,250)
Total minute revenue	US\$14 million	US\$38 million	US\$24 million
Total minute margin	US\$1.4 million	US\$3.8 million	US\$2.4 million
Total profit	US\$1.2 million	US\$3.6 million	US\$2.4 million

functionalities and high quality.

When looking at the savings, again based on a platform that caters for around 100 million minutes per month, we found that in the first year, the total cost of ownership when owning the switching hub amounted to US\$270,000, compared with US\$182,500 with a hosted solution such as Orchid Cloud. This equates to a cost saving of US\$88,000 or 48%.

When looking at the total cost of ownership savings for longer periods of operation, cost savings amount to US\$269,000 and US\$450,00 for a similar platform over the course of 3 and 5 years respectively.

It is important to note, that there are a number of unquantifiable benefits attached to outsourcing switching hubs to a solution such as Orchid Cloud. For example, people, time and money spent

to maintain, upgrade and manage such a hub can now be focused on the core business or even on innovations and new services in segments other than voice. This solution therefore enables operators to continue running their voice business (as long as it lasts) as efficiently as possible, without the time and effort required to do so.

Use case 2: New business, service or solution use case

Now if we look into the launch of an entirely new service, with traffic ramping up from zero to 100 million over 6 months, the above analysis does not take into consideration the lost revenue and margin when choosing the build option. Based on 100 million minute (after a 6-month ramp-up), and an average revenue per minute of US\$0.04/minute, if a 6-month delay occurred in the time to market of a new voice product, this could represent a loss of revenue of US\$24 million over the course of the year. Further on, based on a margin of 10%, this would represent a potential loss of margin of US\$2.4 million.

This means that in the first year, an operator’s net profit could be improved by US\$2.4 million, if choosing a hosted voice platform option such as Orchid Cloud.

Definitely not a small sum!

To cloud or not to cloud – And the answer is...

The above use cases clearly show that outsourcing international switching hubs should deliver substantial savings and/or improved business results. Even though individual scenarios may vary, we believe that exploring the option is a must and good business practice.

Learn how Cataleya’s Orchid Cloud platform can enable service providers to outsource their international voice business to a hosted environment with less hassle and at a fraction of the cost, this with many additional benefits gained at the same time.

Contact us at: info@cataleya.com

G-Core Labs: Is online entertainment an interim solution or a new global trend?

By Dmitry Samoshkin, Vice President of Products;

G-Core Labs, an international provider of cloud and edge solutions, observed in springtime an IT infrastructure load burst for web entertainment and media. Mass self-isolation and quarantine measures unsurprisingly changed user behavior and caused an increase in web data. The question remains though: what will happen when the restrictions are lifted? Will traffic consumption return to previous levels or will the pandemic cause an additional large boost to the digitalization of leisure activities?

G-Core Labs has its own cloud infrastructure spanning 5 continents. Thousands of clients worldwide use G-Core Labs services. The network is comprised of 100+ points of presence in reliable Tier IV and Tier III data centers in more than 65 cities around the world. Such coverage allows G-Core Labs to both see the global picture and analyze data by region and country. Unlike previous years when we usually see a decrease in web activity at the end of winter, the situation this year was reversed. The highest traffic increase for April was observed in North America and Europe where total traffic consumption grew by 33 % and 18 %, respectively, during the pandemic. In Latin America, the network load increased by 12 % since the beginning of the year.

How to handle the increased load

To handle the increased load, the company bought up channels and

redistributed traffic flows between its servers. Thanks to its own content delivery network G-Core Labs can direct traffic from the busiest locations to servers in other countries which have free capacity. For example, it will take only 10 to 30 minutes to lessen the load in any European capital even at traffic bursts. At peak times the load is handled using our DNS service with geo-balancing allowing to direct the clients' traffic from a particular continent/country/city to the desired location.

Remarkably, the online entertainment sector showed the biggest growth. For example, in Europe, there was a traffic spike in both the game industry (+51 %) as well as streaming platforms and online movie theaters (+67 %). The situation is similar in North America where online game load and video traffic consumption increased by almost half (+47 % and +48 % respectively).

The traffic load burst caused by the pandemic became a real challenge for game companies and the media industry. Even though self-isolation is a temporary thing, we still see a clear trend towards the digitalization of entertainment. The longer people stay home, the stronger the habit to spend leisure time online. With the rise in access to the Internet all over the world and the willingness of online businesses to invest in additional capacity, the online entertainment industry will be able to meet even the



highest user expectations for content delivery quality and speed. These are the things that greatly determine user satisfaction and the time users spend online.

Now also in Singapore

This spring G-Core Labs opened a new point of presence of hosting and CDN in Singapore. The location offers customers secured dedicated and virtual servers, as well as services for the fast delivery of content with an average response time of 30 ms (according to Citrix independent analytical system). G-Core Labs virtual server is based on KVM virtualization technology, which guarantees high and uninterrupted performance and is equipped with fast SSD disks. You can get acquainted with the configuration options of dedicated and virtual servers by the link.

Demystifying Mesh Networks

By Max Clarke, Wyld Networks



Every generation sees its share of innovations that completely change the way we approach technology. Telephones made communication instantaneous and easy, as the internet did a century later for information and interactivity. Both of these inventions have since paved the way for countless other developments that we take for granted now, so ingrained in our lives that to live without them would be strange.

The concept that single devices can connect to each other directly is not new, after all Bluetooth has existed in mobile phones since 2001. But mesh networks are undergoing a revolution. They work with the concept of

connecting devices via an app or SDK that integrates with Bluetooth and peer-to-peer wifi functionality that are built into every smartphone and tablet.

Applied to a full scale network of devices this brings everyone nearby onto the same network regardless of their device. Everyone can connect with each other without the need to go through a cellular network or wifi.

These networks are also decentralised, meaning that a server going offline far away will not affect how you connect. If you lose connection to another person, it's only one strand of a large web that can intelligently reform again. The mesh is self-forming and self-healing. There is no need to sign in or out. As

you come into range, if you have the app/SDK then you will automatically join the mesh.

By operating like this, a user doesn't necessarily need to be connected to the internet or a mobile network to exchange and receive data. You might often find that crowded spaces band width issues make it impossible to get a reliable connection to Wi-Fi, but a mesh network thrives in these situations, making use of its many available connections to reliably route data between people.

A mesh can offer benefits beyond connecting people directly that other networks just cannot provide. Given its flexible nature and lack of infrastructure, mesh excels at extending the range of connectivity.

For example, subway travel in a city is a huge deadzone for Wi-Fi and LTE, but with a mesh network, messages and data can still be carried between devices.

Although this does not mean the devices on the mesh can have access to the internet it does mean that messaging and data can be passed through the mesh. If no single device is connected to cellular or wifi the mesh will be free floating and phones and tablets still able to connect. Later when a connection to cellular or wifi is made again then information from the mesh - activity of the mesh - can be returned to a software platform.

As everything is done peer to peer, you can only truly be offline when not in range of another device on the mesh, and to get around the short ranges imposed by protocols like Bluetooth, mesh networks hop data between users, extending the reach of information indefinitely.

Mesh Management Platforms

Managing a mesh network can be done from a software platform. A microservice architecture supporting content curation, intelligent real-time content delivery, integration, geozone management, cloud streaming and analytics services.

This allows stadiums and events, retail, enterprise, construction and transportation organisations to manage a local mesh network to offer not just connectivity for staff and public but a unique network they control.



Max Clarke, Wyld Networks

Messaging across the mesh network can be very sophisticated, utilising geolocation, geo zones, and policy to deliver the right message to the right person in the right place at the right time. This could enhance the users experience enormously. No need to bombard messaging on mass when user and context can enable targeted communication. For example in a healthcare environment different job roles in different areas could be sent different messaging. In retail offers could be delivered in the right place at the right time to the right people.

Use cases for Mesh Networks

The uses of a mesh network are countless. Enhancing asset tracking in warehouses as multiple devices can pinpoint locations, creating hubs in offices to improve intra-office communication, creating new live experiences, enhanced engagement and gamification in venues such as stadiums through mesh interactivity. One such example relevant to recent events is how a mesh network in a care home alerts people when about social distancing, using positional data for a low cost, life saving solution.

Mesh Networks and 5G

You might be asking yourself now how a mesh is relevant if superfast 5G rolls out to everyone. This is a legitimate question, as something that people have been confused about is where a mesh sits in relation to its network compatriots.

Where 5G offers speeds faster, mesh was never about competing in this space. The two technologies can exist simultaneously and even augment one another, with 5G providing the raw power of gigabytes of data per second whilst a mesh ensures that everyone is connected beyond the typical range

The Future of Mesh Networks

There is still a lot of work and research going on to understand how best to implement and utilise mesh networks. Mesh is still relatively speaking in its infancy as a technology with many yet unexplored potentials and boundaries.

Engineers within various companies are still working towards refining the core features of mesh networks. Getting data to route itself to the right person in a large crowd whilst considering and managing issues of privacy and data protection takes a very smart system, but great steps have been made and mesh is continuously being finessed.

There is great potential for mesh networks to expand the realms of connectivity in the near future. From eliminating zones of no connection to every major app being integrated into the mesh - the way we handle data and communication is going to change.

Whilst the focus today is 5G, there is only so far we can go with adding more infrastructure to widen our connections. Mesh is the infrastructure-lite, quiet tech revolution to watch out for.

Mesh could be the stealth innovation of the 2020s.





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