



TELECOM INVESTOR ROUNDTABLE by Ministry of Communication

At Hotel TAJ Lands End Bandra
30th July 2022

Consolidated Profile of participating Exhibitors and Delegates

Private 5G networks

Enterprise Communication, in future will require reliable high performance, high bandwidth & low latency 5G networks that are device, media and protocol agnostic. Converged core will connect mobiles as well as wired devices offering common management and provisioning interface. These Private 5G Networks, would converge Voice, Data, IOT & M2M communication within the enterprise and will open up a plethora of applications to address diverse customer requirements.

Private networks are already being deployed in a wide range of industries for indoor and outdoor applications but "Private 5G Networks" will accelerate the process as every industry including mining, ports, automotive, durable goods and chemicals would need them for their digital transformation that would include IOT & M2M applications. Voice and Data Communication may be peripheral use cases.

Campus Deployments

Campus deployment as an extension of the enterprise PABX where Private 5G can support mobility requirements within large campus of an integrated factory with Residential blocks, Hotels, Hospital & Institutions where some staff is on the move. Off shore drilling rigs, construction and mining sites are potential customers. Once high speed low latency network is established, it would double up for IOT & M2M applications for plant monitoring maintenance and predictive alerts regarding impending fault.

Ships and Islands

Ships / Islands and Forest guards need quick deployment of complete networks that may be backhauled on Satellite / UHF or VHF where such 5G based private networks would be an ideal choice for basic communication.

Submarines & Industry 4.0

Submarines & Industry 4.0 would need it for communication as well as predictive fault alerts by use of appropriate sensors and AI algorithms. Time-Sensitive Networking (TSN) and Real-Time Based decision making is rapidly finding role in several mission-critical applications across many industries, including manufacturing, oil and gas, aerospace, and transportation that will require such 5G networks.

Tactical Deployments

Battery powered, Tactical Deployments mounted on vehicle in a compact single box for quick deployment of wired and wireless service could be an ideal communication box for Disaster Management Teams or for defense setups. These could be housed in jeeps or ships with onboard gensets and can cover 5 to 7 Kms radius. Deployment of half a dozen such Mobile Communication Systems can cover a larger area seamlessly communicating between each other as part of Tactical deployment. UN peacekeeping forces or troops stationed in any part of the world can be customers for such applications. IOT devices tightly intertwined on the 5G network will help identify, locate threats and protect critical assets as well as enhance predictive preventive maintenance of critical equipment and services.

Railways / Metro / Airports

Utility companies, Railway stations, Airports & Accident sites where this network would support all legacy communication including communication on Quad cable, E&M, BWT & even Magneto Trunks. Railway accident relief trains can provide immediate voice and data communication that will work seamlessly with their laid-out communication system. Railways could use it for specialized Train Control and Communication System (TCCS).

Effective replacement for imported Tetra based communication systems with 5G based high bandwidth low latency communication. Metro projects, Airports, Disaster management teams will find them cost effective and far more efficient. PTT and broadcast communication modes developed to address these requirements.

Disaster Management

Disaster Management to cater to emergency services & rapid deployment of GSM network. Wherever existing GSM network is destroyed due to natural calamity such as hurricane & earthquake. These private networks can quickly set up reliable communication system that can be used by all agencies working at the site viz NGO, Red Cross, Paramilitary, Army, State departments, Fire service thus Security agencies including Police & National Security Groups. They will find immense applications to extend emergency services during natural disasters or man made crisis like terror strikes where need of the hour would be to provide voice, video text and high speed low latency data services.

Mines & Construction Sites

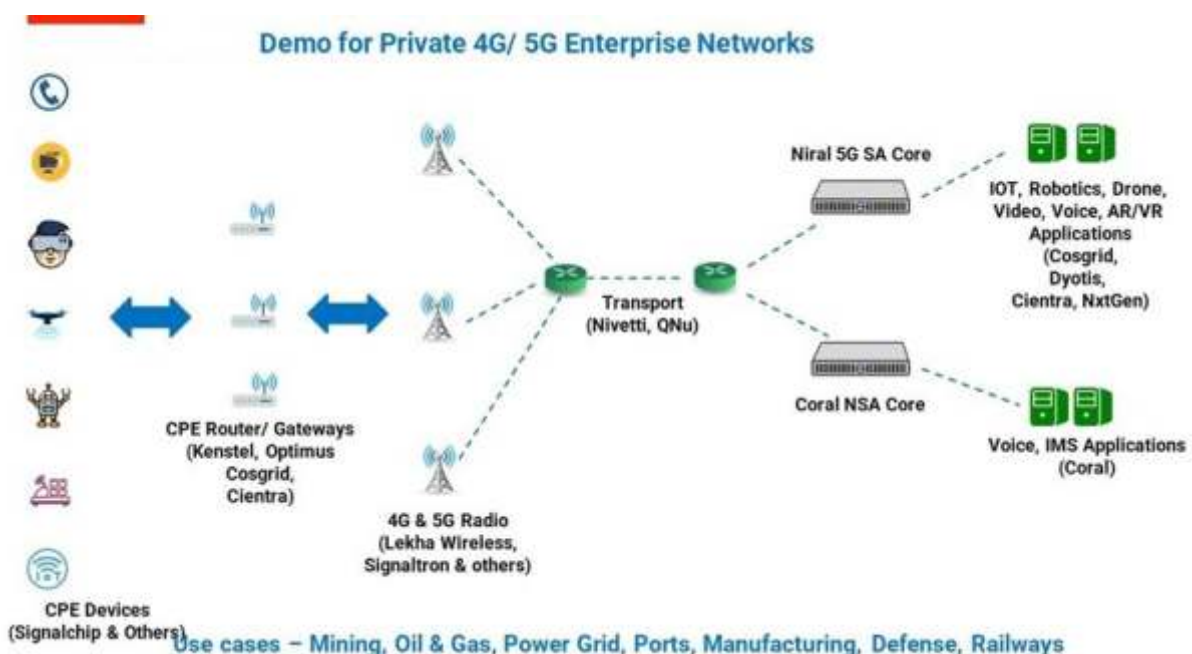
Construction sites & Mining sites in far flung areas with no existing telecom networks could deploy these private networks to cater to immediate communication needs within the private campus. Oil rigs, Oil wells and large construction sites or mining areas could be ideal customer for such applications. They would need high speed low latency 5G networks to use IOT devices for automated / robotic or remote managed applications that are sensitive & mission critical.

In-building Solutions

In-building solution to enhance mobile coverage in the building thereby releasing load on the Macro BTS Network. Local Switching and Intelligence will provide enhanced coverage & additional subscriber density. This would also help effective use of scarce spectrum as each private cell would reuse the same spectrum band.

Rural & Greenfield deployments

Greenfield deployments in Rural areas by providing cost effective & quick deployment methodology that can help local youth to manage and run these networks on commercial basis like the GPAX operators. This will create jobs and entrepreneurs who would ensure upkeep and maintenance at remote locations. These private networks can also be used for temporary deployment in a Games village or for a temporary holiday camp over a few kilometers that can be powered by solar energy.



DOMESTIC TECHNOLOGY PROVIDERS		
Sr. No.	NW Component	Indian OEMs who offer the NW component
1	5G Core and IMS	Resonous, Niral, CEWiT, Coral, Galore, WiSig, Signaltron, Tata (TCS, Tejas, Saankhya), CDOT, Amantya, CEWiT, Reliance Jio
2	4G/5G RAN	Lekha Wireless, Signaltron, Sooktha, Saankhya Labs, VVDN, Galore, Resonous, HFCL, STL, Amantya, CDOT, WiSig, CEWiT, Reliance Jio, TidalWave
3	Chipsets	5G / 4G (Signalchip), SDR (Saankhya Labs),
4	Devices/ CPE	Kenstel, CosGrid, Optimus Rhinu
5	IOT Application	CosGrid, Dyotis, Cienra, CDOT
6	NMS	Coral, Dyotis for M2M, NMS Works, CDOT
7	Transport (Switches, Gateways)	Nivetti, Coral, CDOT, Astrome
8	Encryption	Qnu Labs, CDOT

Content:

- | | |
|---|--|
| 1. Aksentt Tech Services Limited | 19. Infinity Labs Ltd |
| 2. Amantya Technologies Pvt Ltd. | 20. Innogle Technologies Pvt Ltd |
| 3. Astrome Technologies | 21. Kenstel Networks Limited |
| 4. Astromeda | 22. Lekha Wireless Solutions Pvt Ltd |
| 5. BigCat Wireless | 23. Mindarray Systems Pvt. Ltd. (Motadata) |
| 6. Centre for Development of Telematics | 24. Nabstrack Technologies Private Limited |
| 7. Chipspirit | 25. NimbleVision |
| 8. Cienra | 26. Niral Networks |
| 9. Citoto Digital | 27. OptimusLogic Systems India Private Limited |
| 10. Coral Telecom Ltd. | 28. Resonous Technologies Pvt Ltd |
| 11. COSGrid Systems Private Limited | 29. Signalchip |
| 12. DSPWorks | 30. Signaltron |
| 13. Echelon Edge Pvt Ltd | 31. Sooktha |
| 14. Finaara Technologies Pvt Ltd | 32. Samriddhi Automations Pvt. Ltd. (Sparsh) |
| 15. Flex India | 33. TidalWave |
| 16. Galore Networks Private Limited | 34. Ushva Clean Technology Pvt Ltd |
| 17. Gigayasa Wireless Private limited | 35. Vasbeam |
| 18. Indio Networks | 36. Xten Networks |

Akseantt Tech Services Limited is a technology company that delivers industry-specific solutions which include Information & Communication Technology Services, Cyber Security and Technical Resource Outsourcing for large deployments.

Akseantt Tech is a proven leader in technology solutions and provides a wide variety of services ranging from IT strategy, managed services and consulting to system integration, design, application development, implementation, and telecom engineering. The company has its development centre based at Pune which incubates ideas around cybersecurity, data communication and geospatial technologies. Our development center- "**Telecomversity**" in Pune, creates go-to-market solutions and nationwide network rollout solutions.

With the introduction of 5G and cloud-based applications like virtualization, network deployment is becoming more complex. In our journey to become the preferred technology partner of forward-thinking organizations, Akseantt Tech has always been the front runner in adopting the global process improvement models and best practices in the industry. We are re-appraised on CMMI V2.0 at Maturity Level 5 for both Development & Service models along with ISO/IEC 27001:2013 for establishing robust Information Security Management System and ISO 9001:2015 for Quality Management Systems.

NetCaster

All-in-one solution for the edge



Our platform consists of a powerful edge device, content delivery mechanism and Netcaster management interface, which creates a flexible network architecture and enables several "as-a-service" layers, better user experience and new business models for vertical industries, enterprises and IoT applications. Using a decentralized network of mini data centers our platform accelerates the benefits of edge computing without depending on the central cloud.

Third parties can easily integrate their solutions or create new services leveraging our intelligent hardware and powerful software at the extreme edge. It is an open development approach allowing for regular web technologies to be used, combined with our API's and SDK's, to offer innovative solutions.

Deliver Digital experiences to any device without the internet. NetCaster helps to reduce latency and enables high performing local content cloud. Real time content and device management using Intranet, ISP or Cellular network.

Network Rollout Services

With its proven program management and project management framework, Akseantt Tech enables faster time to market for telcos and a quality framework. Through its own field team and partners, we ensure the best of expertise and local knowledge are leveraged. However, from a customer point of view, Akseantt Tech acts as a single point of contact for managing deliverables as per desired service levels.

Fiberlink™ 5G Backhaul Solution

For successful deployment of 5G, mobile network operators (MNOs) need transport technologies that can meet stringent throughput, latency and reliability requirements over increasingly densified networks. Akseantt Tech has developed application on fiber footprint availability based on fiber laid by existing telco's, utility providers and governmental agencies to reach out to the backhaul requirements of mobile network operators on aerial fiber last mile as primary link and Free space optical link as a redundant link.

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ACCELERATING THE PACE OF INNOVATION IN 5G, IOT, AI ML, CLOUD & MEC

Global Presence



Offices in USA, Canada, India (Gurugram, Bangalore, Nagpur)

Amantya at a glance:

- A global organization with proven expertise in next-generation technologies like 5G, IoT, AI ML, edge, and cloud
- Pioneers in 5G innovations with next-gen solutions and services for MNOs, OEMs, and enterprises
- Strong IP & solutions portfolio ranging from Private 5G Network, 5G Network-in-a-box, 5G Core, 5G UPF, 5G RAN, IoT trackers
- Long-lasting client relationships with Tier 1 Mobile Network Operators and other Fortune 500 companies

5G IPs & Solutions

5G SA Core

- 3GPP Rel. 15 compliant (Rel. 16 in roadmap)
- Customisable and scalable
- Deployable on-prem or on cloud
- High-performance user plane and data plane
- Interoperable with mainline 5G RAN vendors



Astra5G (Private 5G Network)

- FR1 Range Radio Access Network
- 5G SA Core – Signaling Plane
- Plane
- High-performance User Plane Function
- Management Interface

5G UPF

- Data plane throughput of 40 Gbps
- Virtualized Network Functions (on COTS)
- Cloud and on-premise deployments



5G Network in a Box

- Pre-integrated 5GC and FR1 RAN
- One-touch start up
- Plug & play
- Interactive GUI based interface
- Ideal for testing & simulation

5G Services



Integration
Stack Porting
Interface Adaptation
Customization



Testing
Network Testing
Device Testing
Application Testing



MEC Apps
V2X
Drone
ROS



5G Lab Setup
Lab Design
Build & Integration
Lab Operations


Amantya Edge

- **Leadership:** Core Leadership with extensive experience in Telecom Industry
- **Team Strength:** Highly-skilled 450+ engineers
- **Global Presence:** Headquartered in USA, with offices in Canada and India (Gurugram, Bangalore, Nagpur)
- **Niche Domains:** Expertise in niche domains including IoT, AI ML, MEC, Cloud and 5G
- **Telecom Expertise:** Frontrunners in 5G innovations with offerings across the 5G ecosystem
- **Global Clientele:** Established business relationships with global clients
- **Strong Partner Ecosystem:** Growing OEM and ODM partner ecosystem to accelerate the pace of innovation
- **Cross Vertical Expertise:** Accomplished multiple big-scale projects across industries ranging from Telecom, Healthcare, Automotive, Retail & Enterprise

Contact

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 **Website:** www.amantyatech.com



building the future
of wireless connectivity through
transformational technologies



IMPACT
COLLECTIVE

urania ventures

Equity Funding

Grants

Pilot Revenue

Clients

Granted

Full-time Employees



Amelia Earhart Fellow
ITU Equals & WEQ Winner
Co-founded SPACE and ECAPS



Springer Link Author
Co-founder of Streamoid
Technologies



TIE Bangalore Board Member
Member FabLess Mission,
Government of India



Imperial College London
Avid Open Source Contributor

Problem

Fiber networks



Are
expensive



Take
longer to
deploy



Have high
downtime

The Need

5G/6G network need,



More Cell
sites to be
deployed



Cell sites to
relate to
wireless
backhaul



Gigabit or
higher
backhaul
speeds
required

E-Band is the wireless backhaul of choice

Business Model



Commercial
Trials/Pilots

With Mobile Network Operators to prove
the product fit for 4G/5G fronthaul,
midhaul, and backhaul applications.



License the
Product

License
product to
OEMs

Revenue Model:

- Fixed Fee (one-time)
- Royalty (recurring)

The current generation of E-Band
radios is only point-to-point and
Mechanically aligned, resulting in High
CapEx and OpEx.



Gigamesh, the next-gen of
E-band Radios, with multi-link
and automatic link alignment.



Single Flat Panel
Integrated Antenna



Integrates Multiple P2P
Radios in a single unit



Electronic beam
alignment



Modular Design to
easily scale capacity
and links

Market

Cumulative Addressable
E-Band Market



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venki@astrome.co



Astromeda develops technology to access the health vitals and stress levels of individuals using e-fabric based health monitoring systems. Astrovest is a simple vest (wearable & washable) which is capable of collecting health data of individuals continuously. All sensors are textile-based sensors.



Astromeda Space Pvt LTD,
2M-162, Second Main, Kasturi Nagar,
Bangalore – 560043.

Astromeda is a MedTech start-up, which designs & develops 5G telehealth systems using E- fabrics technology for Industrial telehealth applications.

The collected data is fed into post process software to estimate and understand the health parameters of users.

Awards / Recognition

- IDEX – DISC IV WINNER - Indian Airforce
- OJAS MEDTECH Winner
- STPI MedTech OC Winner
- DoT DCIS Scheme Grantee

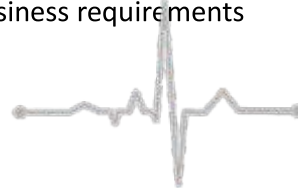
AstroMon sends collected data to cloud based remote monitoring application using 4G/5G tech

AI algorithm post process data to find the triggers / health hazards.



- Our main innovation is to develop “smart textile sensors” to deduct human vitals.
- We developed algorithms to process the health data deducted by our smart fabrics.
- This makes health monitoring simple, flexible and adoptable for different business requirements

- AstroVest can be used for various applications like telehealth and occupational health care.
- This platform is suitable for extending to geriatrics care, pregnancy care and childcare applications



BigCat Wireless

4G / LTE /NIB Solutions

eNB NIB - Macro Cell

eNB NIB - Pico Cell



**5G Wireless Channel Recorder
Test Equipment**

**Private Networks
Communication Network for UAV swarms
NB IoT Support for Smart Cities and V2X**

Centre for Development of Telematics (C-DOT)

C-DOT has made significant contributions towards several flagship missions of the Government viz. “Digital India”, “Make in India”, “Skill India” and “Smart Cities”. C-DOT has been steadfast in its commitment towards building an “Aatmanirbhar Bharat” as envisioned by the Hon’ble Prime Minister. C-DOT has successfully executed various projects of national & strategic importance that have played a pivotal role in achieving self-reliance, reducing dependence upon technology imports, boosting entrepreneurship, augmenting Intellectual Property (IP) assets and creating an ecosystem for indigenous Telecom manufacturing bolstered by a well-coordinated channel of industry stakeholders including System Integrators, Component Manufacturers, TSPs, ISPs, etc. for proliferation of indigenous solutions.

- Indigenously built a 4G/5G Converged core solution providing mobile native VoLTE/VOIP/data services through seamless integration with IMS and legacy mobile services through interworking with 2G/3G networks. C-DOT is working with BSNL for deployment of its indigenously designed 4G/5G converged core in the BSNL network and with Railways to address their requirements of LTE-R for mission critical applications.
- Designed the Early Warning Platform system for Disaster Management based on International Telecommunication Union (ITU) Common Alerting Protocol (CAP). The platform ensures efficient utilization of available infrastructure viz. TV, Radio, Satellite, Railways, NHAI and Coastal Sirens on a common platform for coordinated response during emergencies, natural hazards, pandemics, etc.
- Developed indigenous encryptors and secure phones based on Post-Quantum Cryptography to safeguard our networks from the threats posed by the infinite computational capabilities of Quantum Computers. C-DOT has also built an indigenous Quantum Key Distribution (QKD) based system for secure distribution of crypto keys using the principles of Quantum Physics to negate the probability of eavesdropping in secret and confidential communication.
- Developed various cyber security solutions, and have deployed the solution with strategic agencies for actionable threat detection, assessment and prevention. These technologies are used to monitor the health of critical communications networks.
- Indigenously developed GPON technology has been successfully deployed in BharatNet - National Optical Fiber Network of India for providing high-speed broadband to village Panchayats across the country. It has also designed XGS-PON technology to address the huge bandwidth requirements of end users.
- Built 100G DWDM system to address the demands for high bandwidth. It has also designed Optical Transport Platform (POTP) for transparent, multi-wavelength manageable networks achieving maximum utilization, manageability and wide client signal support for future DWDM networks.
- C-DOT’s Secure Routers (Core) and Switches (Access) have been supplied to SPIC, DRDO. C-DOT’s secure routing platform for value-added security applications has been successfully deployed in CAIR, DRDO for building a test-bed facility.
- C-DOT’s wireless terminals have been installed in rural areas to provide broadband connectivity to the unconnected areas and on various Naval ships and ports for achieving encrypted connectivity between anchorage and approaching vessels.
- C-DOT’s SAMVAD – Secure Chat & Call Platform with advanced security features & encryption capabilities, is a secure alternative for various popular chat platforms that are susceptible to unauthorized data breaches and cyber-threats. The platform is successfully deployed in Govt, defense & strategic agencies including various State Police departments.
- Indigenously developed a secure platform for Videoconferencing that is being extensively used by various Government departments.



Chipsprit Technologies, Bangalore

Chipsprit is an industry leading Startup in VLSI Design, semiconductor design and development.

Chipsprit assists its clients in developing their next generation flagship product lines. This includes developing cutting edge technologies that are key and rare in the industry. Experts in building the most complex SoC's, Chipsprit further differentiates by having one of the strongest FPGA/Board design teams in the industry.

Chipsprit has developed first in the world fully hardware-based encryption Solution with Indian Navy Collaboration. Chipsprit is the winner of [iDEX DISC1 challenge](#) on Secure Hardware Encryption Device.

Chipsprit is one of the 10 Best Bangalore Startups to Work For - •2022 - [Silicon Startup City Magazine](#)

Our Product: ABHED1

Application: High-grade data security transactions and finance (Hardware)[Cybersecurity]

Concept: Abhed1 is fully Hardware based Encryption device which does not need any Operating-system or any software for the encryption and decryption implementation. This is the only one of its kind of device in the world which does USB and Ethernet based encryption/decryption without using any software or any firmware.

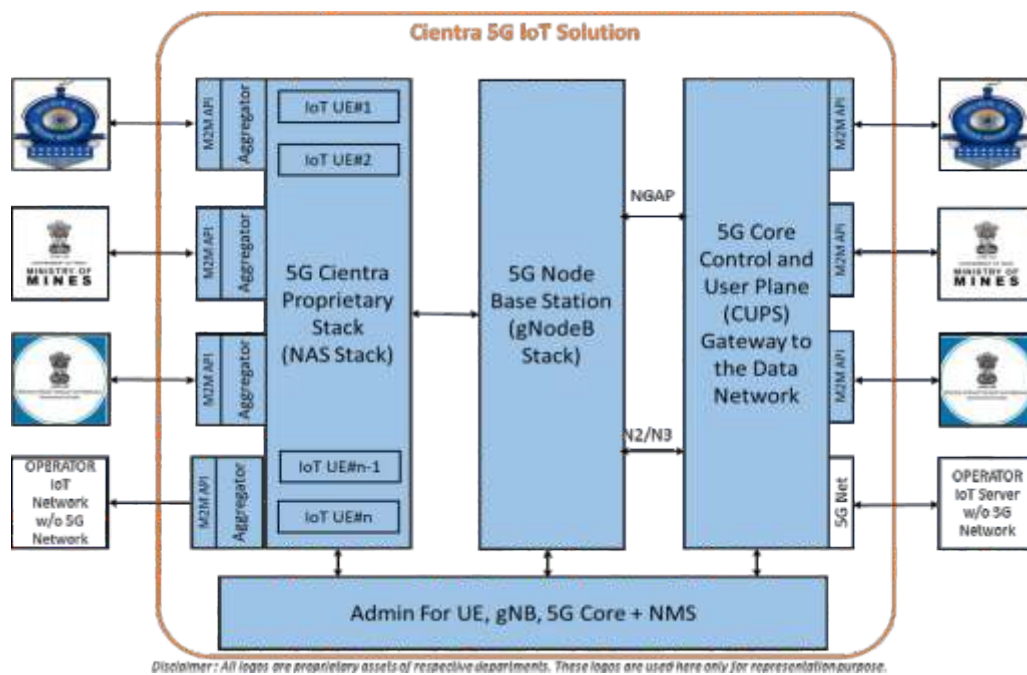
Features:

- ✓ Fully Hardware - USB to USB transfer
- ✓ Bump in the wire model
- ✓ Multi-layer User Authentication
- ✓ Maintenance Mode
- ✓ ETH to ETH transfer over the public N/W
- ✓ Tamper Detect, Tamper Erase
- ✓ High Speed: Hardware Implementation
- ✓ Easy Installation, Robust and Portable device

Product Description Video Link: <https://www.youtube.com/watch?v=kX7YXDaKNTA>



Product Description	Key Features / Benefits
<ol style="list-style-type: none"> Enables non 5G IoT Devices to become 5g UE connectible to 5G Networks. It gets NAS protocol stack based on 23.501/502/503 and 24.501. All IoTs communicate through an inbuilt aggregator, which has OneM2M API protocol gNB (with NGAP protocol), designed as per 3GPP. gNB to communicate with 5G Core with N2 & N3 protocols Contains 5GCore to provide Private 5G IOT network. Also, connects to Public Network directly 5GCore connected to the IOT server, functions as transparent 5G platform cognizant of UEs requirements, able to request 5G Mobile Network (MNO) for suitable QoS 	<ol style="list-style-type: none"> Build and run a IP based complete private 5G IoT Network, without needing 5G spectrum. Upgrades any IoT device to a 5G-IoT, equipped with Virtual SIM. One SIM can be shared with multiple devices at different times, to minimize cost. Provides guaranteed QoS (bandwidth, data rate, latency, etc.) with SMF/UPF/Slice features. Capable to interface with any 5G Core Network, compliant to 3GPP - N2 & N3 Interface IoT Server that is cognizant of IOT/UEs functions, is able to request connection to 5G Mobile Network (MNO) for suitable QoS. Plugs in to existing billing, OSS, BSS, AI/ML system. WebSocket/OneM2M interface between IOT/Clusters and 5GIG and IOT Servers.



IoT Interface WiFi / Wired, Websocket/udp/ip, OneM2M API	5GC Interface NGAP/SCTP/IP with 3GPP N2 Interface	5GU Interface GTP/UDP/IP – N3 Interface	IoT Server Interface OneM2M API
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CITOTO DIGITAL PERSONALITY PRIVATE LIMITED

Registered Office: Bhosale Paradise, B/2 17 5 209 3 Bhosalenagar Rd, Bhosalenagar Pune - 411016,
Maharashtra CIN: U72900PN2020PTC194767

Company Background:

Year of Establishment:	2020 (2016)
Regional Presence:	Pune, Palghar
Backed by:	DST, MIT, MEITY, Atal Innovation, MSME, DCMSME, Startup India

Nature of Business:

Citoto designs Free Space Optical (FSO) Equipment for both terrestrial and Space Applications. Further it provides private wireless channel for server computing to organizations within the city without Internet that includes Defense, Smart City projects and IT industries.

Current Activities:

- Designing Mission critical communication products for ISRO, DRDO, Defense SIGNALS, and other space agencies.
- Building a robust wireless intranet using FSOs and LEO SATs, end mile in EM unlicensed bands, Building Network Clients like Kiosk, IoT mobility & extended smart devices.

Major Products / Services:

- Free Space Optics Manufacturing and Customization
- Creating Intranet for the city viz Routing Protocols
- Network Monitoring and Metering the data throughput
- Customization of products for different terrains and topologies

Company Targets:

To maximize connectivity internally in Geographically Locked Locations, be less transparent to other economies secured connect and create a huge Hyperlocal market segment for digital needs and build strong communication channels at a fraction of the current cost.

Traction:

- **Tata TeleBusiness** has expressed interest in Free Space Optics and have a paid POC with us.
- To sign an MoU with **ISRO** for space communications this September, 2022.
- **Defense SIGNALS** (communications) has proposed to fund our R&D : \$320k
- **ITI-Bangalore** has asked for manufacturing proposal
- Signed an **international partner** for a technology.
- Selected as the only startup in communications in **Smart Cities India** and officially on CiX platform.
- PoCs proposals from **13 Smart Cities and Municipal Corporations**.
- Validated by **DRDO, R&D(E)** and had a panel discussion with NSA agents, Senior scientists, FieldOfficers and Directors. Completely satisfied with the product and have offered assistance even in raising funds from government grants.
- **Vodafone Idea** has expressed interest in Free Space Optics and have a signed a field trial with us.
- In partnership talks with **CtrlS, Webwerks, Telimart**, and two other entities on different domains.

Company Profile

Coral Telecom Limited is a leading design and manufacturing company that provide “enterprise communication solutions” with focus on applications for Railways, Metro, Mines, Défense and other similar private communication networks.

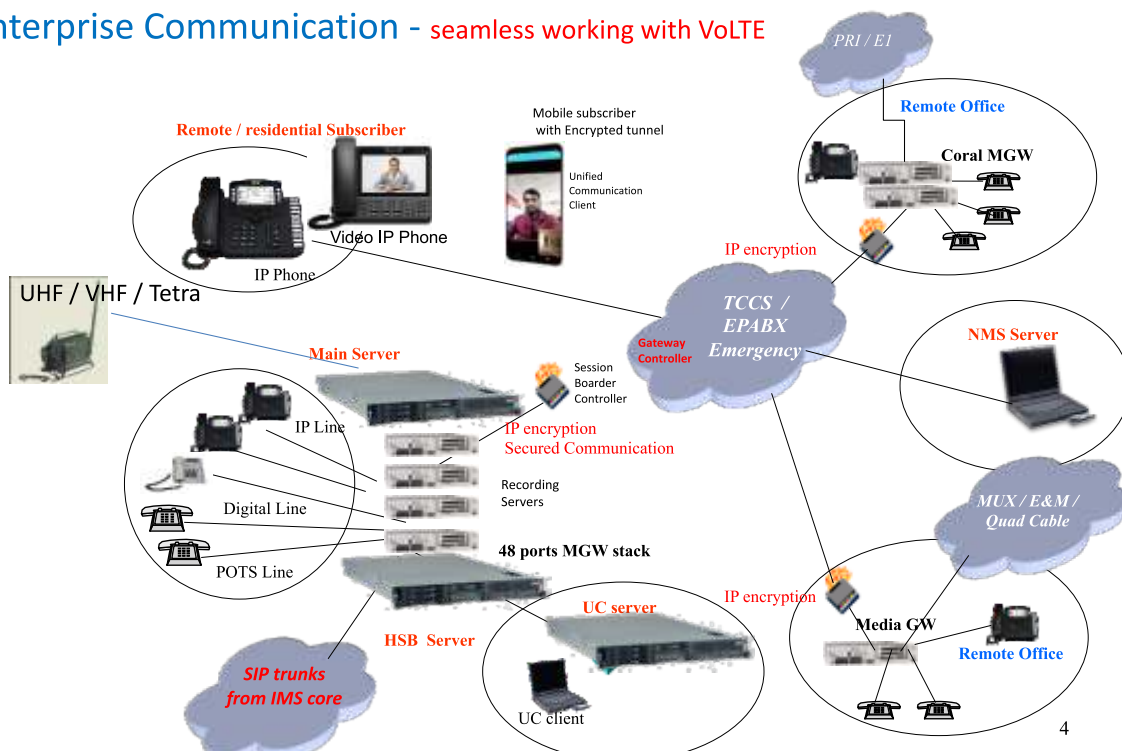
Primarily engaged in design, development & re-engineering of IMS based, Unified Communication solutions that handle voice, video and data requirements of a modern enterprise. Specialized software applications have been designed to provide integrated communication solutions with Paging, Video conferencing and Despatcher applications that find use on Railways, Metro Projects and Smart city applications.

Solutions includes converged 4/5 G core that provides seamless communication with LTE / 5G based radio networks such as to facilitate private enterprise communication across wired as well as wireless devices. We support mission critical and MCX based floor control services to facilitate PTT (push to talk) features for audio and video broadcast, so critical for applications in Utility companies, Police and para military forces. Solution supports Autonomous vehicles, Robotic arms, IOT and M2M applications for Mines, Submarines, Oil rigs and can cater to needs of Industry 4.0 in general.

Common NMS, facilitates simple user-friendly management and configuration of all network elements. Ability of our solution to support plug and play function for Gateways, Wired phones, Mobile phones, Cameras, IOT devices with centralised control and common alerts makes it a preferred choice of users.

Coral has designed and manufactures associated embedded hardware or media gateways to provide seamless inter-operability with legacy protocols like FXS, FXO, PRI, GSM, E&M etc. with emphasis on converged multi-service, multi-protocol access gateways that can work as part of an IP Multimedia subsystem yet capable of standalone existence.

Enterprise Communication - seamless working with VoLTE



COSGrid networks provide software-defined network platforms and solutions for seamless and secure WAN connectivity between branches, clouds, and data centers. COSGrid enables Enterprises to transform their existing WAN infrastructure into a flexible, 'Always ON' connectivity and highly resilient platform suitable for Cloud and IoT world. The benefits include secured network access anywhere, Non-Disrupted Transactions, Superior Customer and User Experience, Easy and Centralised Monitoring, and control, and Rapid Roll of new branch locations.

COSGrid Reflex-WAN at a Glance



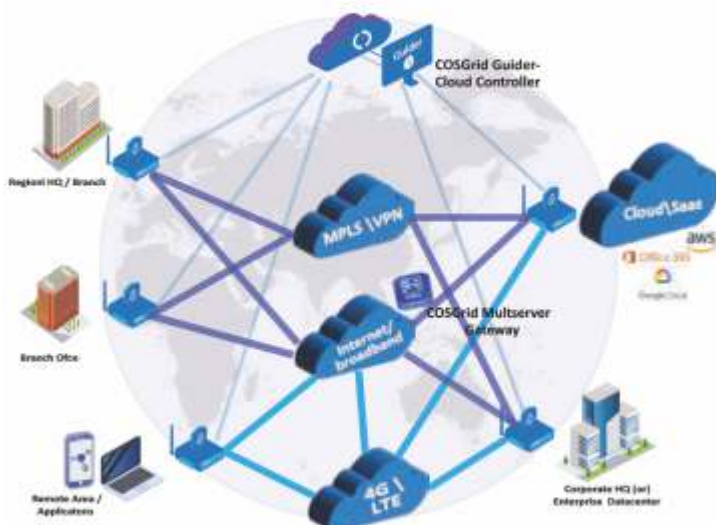
Product Components



COSGrid Use Case



COSGrid Reflex-WAN Architecture



COSGrid Reflex-WAN Models



Website - www.cosgrid.com
Email - info@cosgrid.com
Phone - +91 90227 64534
+91 86101 44212

LOCATIONS:

India - COSGrid Systems Private Limited, No. 24-1, Shanti Street Dr. Seethapathy Nagar Velachery, Chennai - 600042.

USA - COSGrid Networks Inc, 2055 Limestone Rd STE 200-C, Wilmington, DE, New Castle, US, 19808

An indigenous IoT and ESDM company with strengths in LoRa access modules and devices, IEEE 802.15.4g modules and products and applications developed around them. A few of our domain solutions are outlined below

- ✱ AMR for Gas, Water Meters
- ✱ Home Automation in 865MHz and 2.4GHz band, being supplied to leading Tier-1 OEMs,
- ✱ LoRa based Walkie-Talkie
- ✱ LoRa trackers integrated with GPS, BLE for people and asset tags,
- ✱ LoRa based sensors for process industries and industry automation/ Industry 4.0
- ✱ IoT and BLDC Motor Controller with applications on Ceiling Fans, Pumps and now extending to EVs
- ✱ Industrial IoT Multiprotocol Gateways with 5G, LoRaWAN Gateway, BLE and WiFi



Smart Home Suite - Sub-GHz



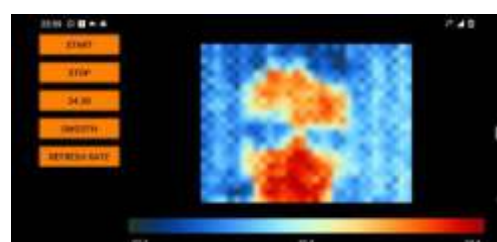
LoRaWAN Gas AMR



DIN Rail Smart Energy Meter



LoRa based Walkie-Talkie



IR Array Thermal Camera

SOLUTION PORTFOLIO

Products designed for digitizing the 5G Era

Percipient NMS is an all-in-one IOT & Network Device Management platform that caters to the Enterprise Management and Centralized Control, Monitoring & Configuration. The solution is FCAPS based along with Helpdesk Ticketing & SLA Management. The solution is highly scalable and robust to cater to ever-growing demands of Heterogeneous Devices and Network in Telecom and Large Enterprise.

Key Features

-  Powerful visualization
-  Scalability
-  Automation
-  Single Pane of Glass View
-  ITSM
-  Flexible configuration
-  Heterogenous NW, Devices, 5G & IOT sensors

Benefits

- ▶ We have a unique solution that supports monitoring and complete management of most of the industry devices and use cases.
- ▶ Single Pane of Glass view that provides centralized access and end-to-end network management.
- ▶ Multi-Tenancy Support & Geo-Location Tagging.
- ▶ Single solution that caters to heterogeneous devices, multiple industries and use cases to provide better agility and time-to-market.
- ▶ The solution will provide in-built ansible integration for automation of network & infrastructure.
- ▶ The solution will support multiple protocols, eg. MQTT, Netconf etc. for 5G & Telecom device integration.

OSS Solution
NMS, EMS, IOT Platform

Teralytx Edge is a scalable, cost-effective, centralized repository, data processing and warehouse solution designed for business agility, regulatory requirements, & provides an integrated source of information.

Key Features

-  AI/ML driven data & insights
-  Enhanced performance with 3 tier architecture
-  Supports integration with multiple data sources
-  Robust and secure platform
-  Highly scalable solution with parallelism
-  Customized reporting and visualization




Benefits

- ▶ Data collection from multiple sources and processing huge data volumes with flexibility.
- ▶ Visualization, production reporting, and consumption by other systems for advanced Analytics and Performance Management.
- ▶ Powerful performance that is several times faster than the legacy system with parallel processing and automatic portioning.

Big Data & Analytics
DWH, BI, AI/ML

Our provisioning system is built for complex telco grade systems. Will also have cloud native BSS offering in SaaS model that enables extremely agile method of delivery, faster time to market and serving multiple enterprise customers from a single instance logical data integrity and protection is maintained in order for avoid one enterprise able to access the data from the other enterprise.

Key Features

-  Ready-to-use business operating system
-  Monetize the business at your pace
-  Automate your monetization with the SaaS model

Benefits

- ▶ Innovate & react faster to market needs.
- ▶ Remove vendor lock-in with a platform built entirely on open-source.
- ▶ Enable flexible growth models, simply operations, & facilitate onboarding & settling with cross-industry partners.
- ▶ Transform with a composable architecture & dynamic microservice scaling.
- ▶ Minimize the total cost of ownership with multi-tenancy architecture.
- ▶ Empower marketing to launch customer journeys quickly.
- ▶ Will have support for latest technologies like 5G, IoT etc.

BSS Solution
Provisioning, Billing, IUC, Mediation

Our Certifications



GET IN TOUCH

-  sales@echelonedge.com | marketing@echelonedge.com
-  www.echelonedge.com



END USER 164 M Msb'S 2.8 M	Revenue by ONE TIME SALE AMC, SLA, SaaS, Custom Development Trans. Commission	Global Patent, Design, Copy right registered products.
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We Invented the "World First Automated Verifiable Cross border Remittance & Money exchange Machine Named as AVRМ" An INNOVATIVE, STANDALONE, COST-EFFECTIVE, AND EASILY ACCESSIBLE INTERNATIONAL AND/OR DOMESTIC REMITTANCE SERVICES.

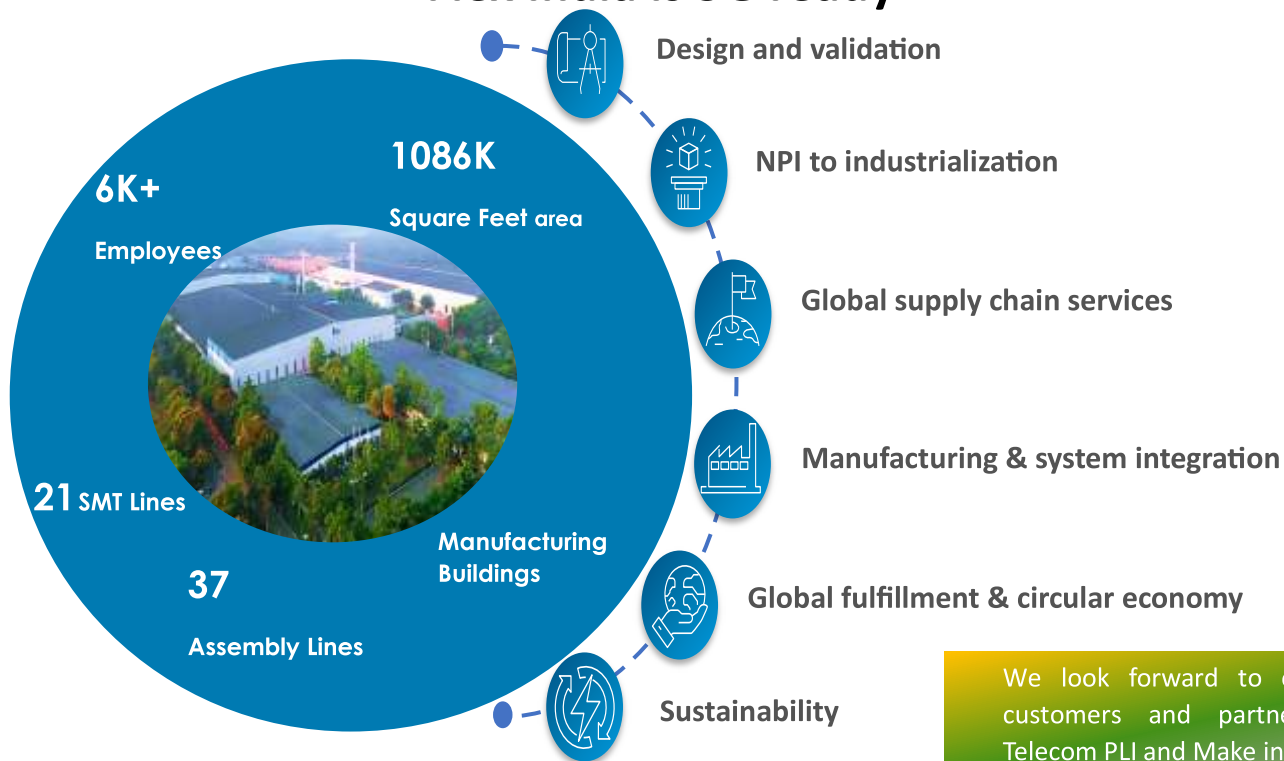
We further, invented a "VAMBХ – Vehicle for Automobile Banking and exchange" Movable Banking Vehicle which will replace a full fledged bank activity with one physical counter with automation and two enhanced ATM (AVRM) which will perform Deposit, withdrawal and remittance.

REDUCE 98% DIGITAL TRANSFORMATION COST, 66% OF BRANCH DIRECT EXPENDITURE FOR BANKS, REMITTANCE & MONEY CHANGERS	480 USD WORTH OF EARNINGS FROM REMITTANCE BY MIGRANT WORKERS (INDIA IS FIRST LARGEST INWARD REMITTANCE COUNTRY)	NUMBER OF GLOBALLY INSTRESTED CUSTOMERS & PARTNERING WITH YES BANK.
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Finaara® focus on the Rural, Remote banking and unattended sector of remittance as global migrant workers don't have bank account or smart phone based access.

World bank says, "there is a sharp decline of 20% in Remittance industry during pandemic". In another statement "South Asia expensive corridor, 10% expense for Every 200\$" India is the 1st inward remittance country but our migrant workers losing 10% and also Remittance senders & receivers Spend 40\$ & half day /remittance transfer as it is Limited access of Remittance.

Flex India is 5G ready



We look forward to on-boarding new customers and partners to leverage Telecom PLI and Make in India



Distributed Antenna Systems (DAS)



Radio PCBA



Baseband / DU / CU



Small Cells



Massive MIMO

Macro Radios

Design Partner

- Accelerate time to market leveraging our engineers with deep design expertise and track record of delivering better cost, performance, and manufacturability
- Smooth transition from design to NPI to volume production.

Domain Expertise

- Decades of accumulated know-how from partnering with market leading customers
- Expert in each end market's unique ecosystem

Manufacturing Partner

- Flexibility of high volume and high-mix products tailored to your requirements.
- Predictability of schedule, supply and logistics.
- Quality with world-class processes and management systems

Supply Chain Management Expertise

- Privileged supply relationships leveraging our scale
- Real time information systems and responsiveness
- **Optimize cost and time-to-market with GSS, Component services, InfineX and Flex Power solutions**



5G Network in Abundance

Company Brief



- ☐ 9 years of focus on indigenous telecom product development.
- ☐ Products include 4G/5G suite of end-to-end offering commercially field deployable solution
- ☐ Target market potential of \$42 Billion by 2027 .
- ☐ Carrier Grade products , LTE-r ,Critical Networks, Private Networks
- ☐ Recognized by DSIR, DOT and Startup India.
- ☐ Strong team presence in India & Australia
- ☐ Leveraging strong clientele Base which includes operators in India & Australia for 5G Revenue
- ☐ 9 Years of Cumulative services revenue of INR 250 Crores



Products

1. 4G/5G Core – NSA/SA
2. 4G/5G Base stations supports NSA/SA

Turn Key Expertise

1. OSS/BSS integration expertise across multiple technologies spread across 3G/4G/5G
2. Deployed more than 100K+ Base station
3. Network Planning,RF Planning expertise

Our Solutions

Product Portfolio

Simulators

- i. 5G Simulator
- ii. 5G advanced simulator
- iii. 6G simulator



Toolkits

- i. Basic communication toolkits
- ii. 5G Toolkits
- iii. 5G advanced toolkits
- iv. 6G Toolkit

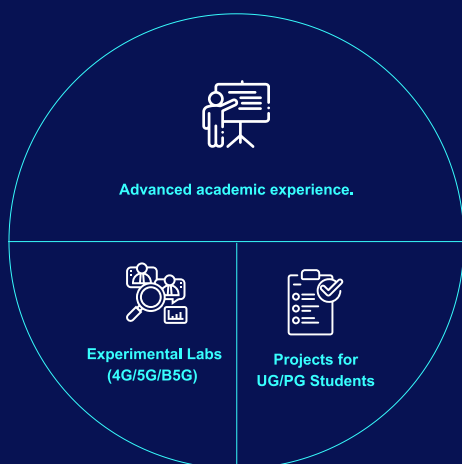


Simulation as a service

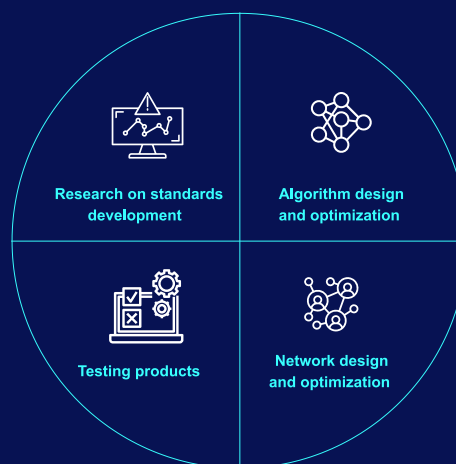
- i. Link level simulation
- ii. Multicell Simulation
- iii. System level simulation



Trusted by **12+** Academic Institutes and **8+** Companies.



Academia



Companies (telecom)

Our Team

Development Team (18)

Wireless Research Engineers (3)

Wireless Communication Engineer (3)

Software Engineer (2)

Sales & HR (2)

Consultant (5)

Interns (3)

Leadership Team (3)



Ravinder Singh

CEO & Founder
(Sales and Marketing)



Vikram Singh

CTO & Founder
(Product Development)



Dr. Radha Krishna Ganti

Mentor

About Company

Name of the Company: Gigayasa Wireless Private Limited

Company Website : www.gigayasa.com

Incorporation Date (MCA): 30.09.2021

Phone No : +91 9363269098

Company Address :

01 FA, First Floor, E-Block, IITM Research Park,
Taramani, Chennai- 600113

Incubator : IIT Madras Incubation Cell

E-mail : info@gigayasa.com



Indio Networks Private Limited, a India based company having its headquarter in Pune (India), and offices in Bangalore (India), Texas (USA) and Sharjah (UAE) building Wi-Fi connectivity products and next-generation connectivity solutions in OpenWiFi, Cellular (4G/5G), LPWAN and Satellite technologies.

Indio Networks has been serving customers around the world since 2005 with a unique blend of products and solutions which deliver the right value at the right price, simplifying connectivity for everyone. Indio's products are deployed in over 45 countries and serve tens of millions of users each day.

Indio Networks has been an active contributor to the TIP OpenWiFi community and has recently launched a TIP powered Wi-Fi Cloud Controller and Management platform called UWIOS for Enterprises, SMB and MDU Markets. Indio's OpenWiFi solution is fully compatible with any Open WiFi enabled Wi-Fi access point thus allowing customers a choice of hardware platforms that fit their specifications and budget.

Indio Product Portfolio – Networking

- Unimax Access Points (WiFi 5/WiFi 6)
- Unibox Network Controller
- PoE Switches
- 4G/5G Routers
- WiOS/UWIOS Cloud Controller

Indio Product Portfolio – IoT

- RMS Gateway
- MX-705N IoT Gateway
- IoT Cloud Platform

Indio Networks Headquarter Address:

Indio Networks Pvt Ltd. C-410, Teerth Technospace IT Park - Baner, Pune – 411045, India

Infinity Labs is a leader in next-generation IT Automation, Software Products, and technology Consulting Services. Our Products and Solutions enable customers globally to automate their IT & Telecommunication Infrastructure utilizing Next Generation software products developed by us. Infinity Labs is having vast experience in understanding customer business need and provide best breed of product platform to empower the business to harness performance and customer satisfaction.

We are one among the few companies who are driven by the novel vision of “Aatmanirbhar Bharat” and strive to make our country self-reliant through latest technologies and automation solution.

We also provide Technology consultancy services to design and automate existing IT Infrastructure of customers to reduce the complexity, modernize IT network and platform to be more responsive to business need. Making new Infra more Scalable, Reliable and Predictable to achieve the operational excellence by reducing the Implementation Costs.

Our Key Products are:

- InfiNxt: Next Generation SD-WAN
- InfiWall: The Next generation Firewall
- InfoWorx: IT Network Operation and Management System
- InfiTip: Threat Intelligence Platform
- Infi5GCN: Infinity Labs 5G Core Network (Under Development)

Our InfiNxt SDWAN is the leading Make in India secure connectivity Solution, which is empowering the reliable and secure communication for many Central and state Government organizations, PSUs etc. Its based-on Software defined networking principles making use of best-in-class technologies like containerization, microservices and Rest API infrastructure. We are the first SDWAN OEM to launch Next Generation features like streaming telemetry, LTE based CPE which can be upgraded top **5G CPE** enabling secure, reliable, and high-speed remote branch communication. Our **InfiWall** is the L7 NG Firewall providing state of the art network security for the enterprise.

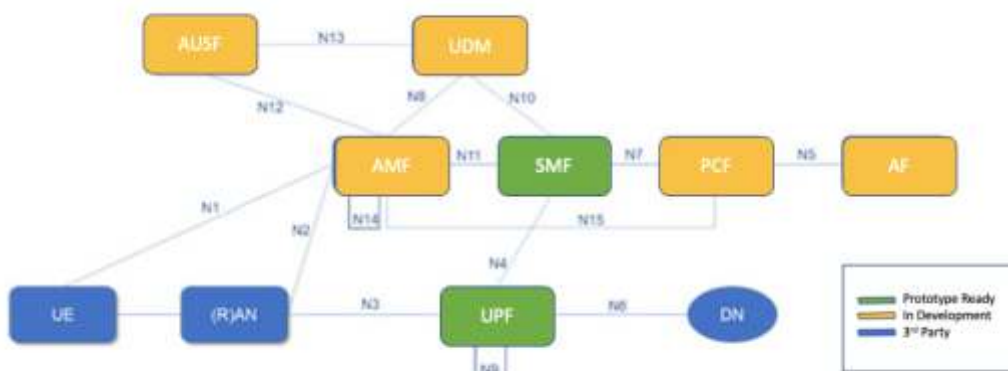


□ InfiNxt SDWAN can provide Software defined faster switching mechanisms, I3 to I7 security, Bandwidth aggregation, Load balancing, QOS, Application aware routing, traffic prioritization, URL filtering, Application visibility, best in class encryption and decryption, client VPN, Hub and Spoke and mesh connectivity. The solution can be used either as a 4G/5G based CPE for inter-office connectivity, as well as a front haul for 5G

deployments for providing secure and reliable connectivity between the 5G core and the remote base stations/small cells.



We are also evolving our own 5G core network stack with compliance to 3GPP release 15/16. We already have the UPF and SMF prototypes ready. The below image depicts our 5G Core readiness





Innogle® A women led company, Received Very First MeiTy Women startup award and Won Number of Government and Non Governmental institution's Awards .

We Focus on Unattended Industry and Lack of Two way Communication Facilities in Mid Sea were we lose 20K Lives per year and Risk of Life, Coastal Security threats and carbon Foot print, reducing ocean fish production, Damaging the Environment

Due to by-catch globally because of "Lack of Technology Advancement".

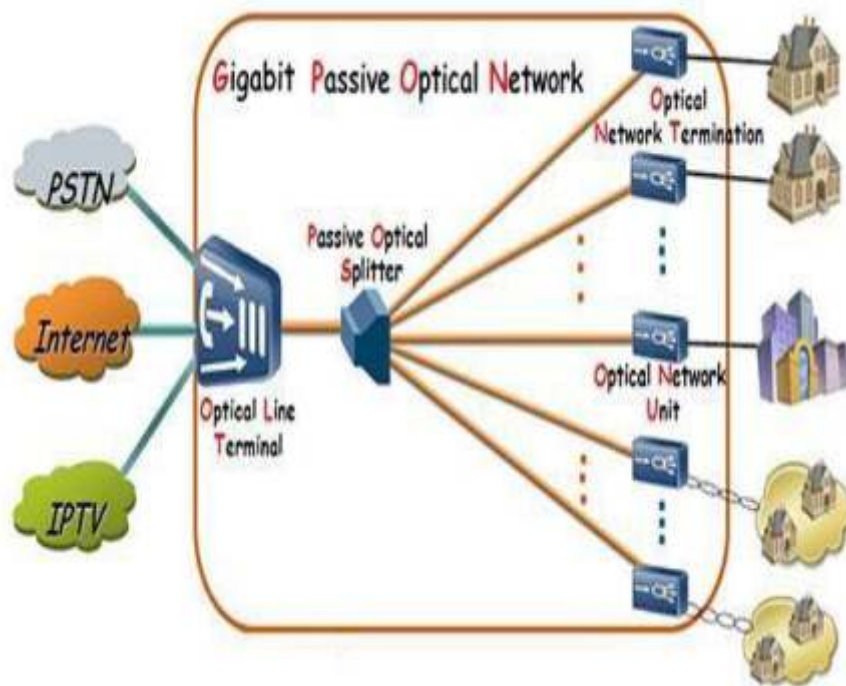
After the 6 years of Research presenting, Our One stop Solution to Create Digital Ocean by focusing Fishing Industry, coast guards and also For Ocean Researchers!

21.4M OCEAN WORKERS WILL BE BENEFITED WITH PROFITABLE FISHING & REAL TIME LIFE SAFETY	COASTAL SECURITY SOLUTION AND OCEAN 3D CARPET DATA MINING – WORTH OF USD 7BN / YEAR	INCREASE 2ND PROFITABLE EXPORT – REDUCE 2.5 LACKS DIESEL COST PER MONTH OF PER VESSEL	OPEN UP NEW MARKET AND EMPLOYMENT OPPORTUNITIES AND IMPROVING THE SOCIETY.
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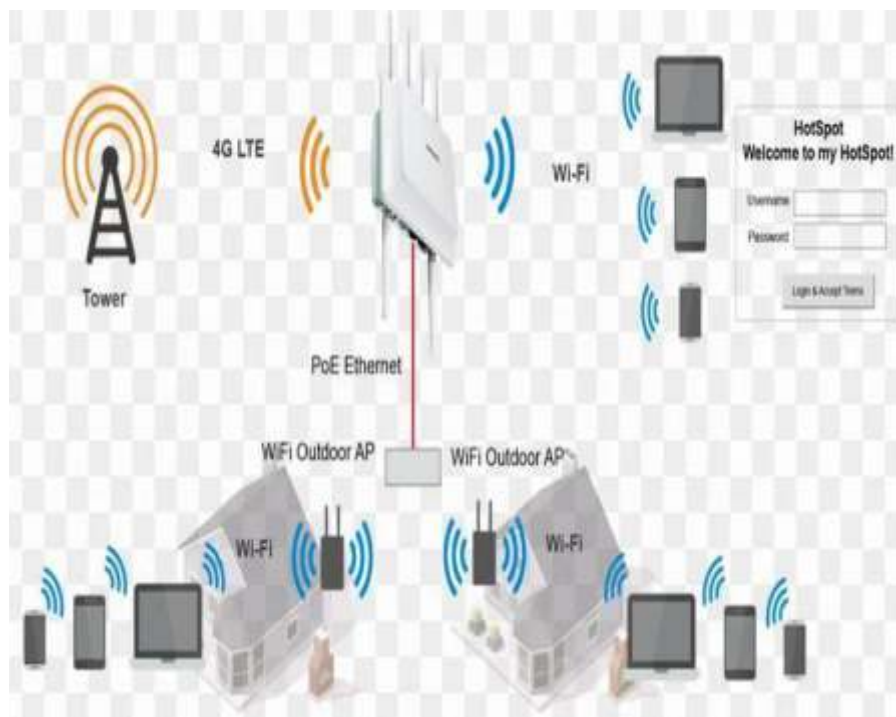
Our comprehensive and Innovative solution named “Kadalcompass, Sarrof, Saagarone” create a 5G enable communication which will provide profitable fishing, Carpet data mining, Real time life safety and Ocean security using an Emerging Technology of Private Network with 5G, AI vision, Deeptech, IoUT, AI and M2M.

Thanking you : Shobana Uthayashankar (Founder & CEO), 9941 909070, Shobana.u@innogle.com, www.innogle.com

Wireless



Wireline



Wireless Access Points & CPE (Indoor/Outdoor) 5G LTE CPE , WiFi Router.

EPON/GPON/XPON Solutions

Email: dhruv@kenstel.com



Lekha Wireless Solutions is a Bengaluru based deep tech company in the area of wireless telecom and defence communication space. Started in year 2010, today we are a team of 200+ Engineers with leadership team comprises of telecom experts with 2 to 3 decades of experience in wireless product development and deployment. We are OEM for Telecom infra products, SDR Products and we also License Software Stacks

Vyapi eNodeB



Products and Solutions

- 5G NR – CU, DU, RU, gNodeB Reference and Protocol Stack for UE.
- 4G LTE – eNB(Release 14), UE reference design, NB-IOT UE stacks
- SDRs for PtoP, PtoMP and MANET.

Patents and IP Disclosures

- Patents: 6 LTE, 10 5G-NR, 6 Industrial IOT
- LTE – 2 US and 5 Indian Patents granted, 1 in first stage review
 - 5G NR – 1 US patent granted, 9 in first stage review
- IP disclosures
- 3 US and 5 Indian Patents granted
 - 5 in second stage review (post drafting)
 - 11 in first stage review (IP registered)

Awards and Recognition

- Winner of Deloitte's Fast 50 Technology India for years 2014, 2015, 2017, 2020
- Winner of iDEX Challenge from MoD in DISC1, DISC3 and DISC5 challenges
- SIDM Award for Best Product Company in Defense
- IESA 2019 Award for Best Design Company in Aerospace and Defense



Business Verticals

- Industrial Communication
- Telecom
- Defense Communication

Address: Lekha Wireless Solutions Pvt Ltd.

#947, 24th Main, JP Nagar II Phase,
Bengaluru 560078

Email : business@lekhawireless.com

Phone : +91 80 2659 0100

URL: www.lekhawireless.com



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Run your IT Operations Proactively

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ServiceOps

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Streamline Service Delivery

Service Desk | Asset Manager | Patch Manager



Every Event Counts

www.motadata.com

DEMOCRATIZE YOUR 5G CONNECTIVITY



Backdrop to Nabstrack

While the above depicted ecosystem of telco, enterprise and cloud providers are coming together, it is giving birth to a newer segment - *The B2B2X*.

Where operators, cloud partners and hyperscalers will enable data abstraction towards private networks, industry verticals and application developers owing to latency and bandwidth inspired by Edge Cloud.

Nabstrack provides the platform to develop, manage & monetize 5G Network APIs on Global Scale

Network Abstraction leads to Nabstrack

Nabstrack is a framework platform that can handle the complexity of integrating with the network elements of operators, cloud partners and hyperscalers to enable a simplified and trusted access towards private networks, industry verticals and application developers through *API*.

Nabstrack is in early product development stage, will seek funds for Team expansion as it is now experiencing market traction.



Vaibhav Mehta



Swapnil Shah



Babu Narayanan

Contact details: Vaibhav Mehta, +91 9820217770, vaibhav@nabstract.io

Product offerings and GTM

Offerings

- ❖ Exposure Function
- ❖ AF Business Enabler
- ❖ Abstraction Platform
- ❖ Marketplace

Go-to-market [GTM]

- ❖ Telecom service providers
- ❖ Enterprises
- ❖ Cloud Providers
- ❖ Vertical Industries

As per trusted global reports, today there are close to *1.5 BN mobility devices* - which are largely managed through mobile broadband and IoT.

The total number of mobility devices are expected to increase at least 4 times over the next as many years - this is due to the advent of 5G use cases, private 5G network induction and related capabilities.

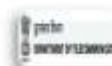
Nabstrack is hence looking at *device addressable market* of over 4 BN leading to over - with this the *TAM of Telecom API* is forecasted to be 400 BN USD - of which *5G Network API market* is expected to be 80 BN USD by 2027.

The *serviceable available market* is expected to grow with standards and network procedures for the related API services growth of *device context, proximity, QoS, slicing* and others.



- ✓ Shortlisted for commercial PoC - Sept '22 with leading Indian Telco Provider
- ✓ DoT DCIS 2022 - 5G grant approved

Prototype Development, Ecosystem and Grant Partners



Nimble Vision Pvt Ltd

Smart Water/Sewage Management using IoT & AI

STARTUP SNAPSHOT

WHAT PROBLEM IS THE STARTUP SOLVING

- India and other developing countries are facing acute water shortage, the main reason behind this is missing awareness about the water usage and wastage in common people
- Missing water status in overhead & underground tanks also in manholes
- Missing water consumption, leakage & quality details in real time
- Missing water quality details like TDS, Ph, ORP, COD, BOD & TSS
- Manual operation and monitoring the systems results in wastage of effort, money, and time
- Missing the clarity of the system's continuous working parameters
- Missing insights on the system efficiency, failure in real time
- Communication gap between vendor & customer

SOLUTION/PRODUCT

- Ni- is an IoT platform developed for providing data analytics on water level, consumption, leakage, and qualities. The additional insights on the system efficiency and energy consumption are bringing additional value addition

BUSINESS MODEL

- B2B, B2C and Smart Cities
- One-time sales and monthly subscription charges

HOW IS IT BENEFIT THE SOCIETY AND ENVIROMENT?

- Reduces the water consumption, wastage, and less usage of ground water, brings the awareness in people to reduce water wastage
- Helps to detect real time water pollution and avoids water contamination
- Helps to keep the cities clean by detecting overflowing manholes in advance
- In summary our platform is addressing below UN SDGs
- SDG -6: Clean Water, SDG -9: Industry Innovation and Infrastructure, SDG-11: Sustainable cities and Communities SDG-12: Sustainable consumption and production

COMPETITIVE ADVANTAGE

- Helps to reduce water consumption by 30% to 50% on daily basis, proportional energy consumption
- Helps to reduce the operational expenses by 50%



Nimble Vision Pvt Ltd

[Simplifying the way of life | Nimble Vision](#)

SECTOR: **Water**

FINANCIAL INFORMATION

Company Stage Scaling

PREVIOUS INVESTMENTS:

Angel investment by Friends: INR 50 Lakhs

Karnataka Govt Grant: INR 25 lakhs

Patents: 2 in progress

MANAGEMENT TEAM

MD: [Vaishali Chinnayya](#)

CEO & CTO : [Chinnayya Math](#)

Awards

Pune Smart City and Niti Aayog
Award for Smart Water

Management Award -2018

Bangalore Chamber of Commerce
and Industry's best IoT Innovation
Award - 2018

Renesas GR Lychee B-Win

Appreciation Award - 2018

ROHM Design Award - 2018

BWSSB Jal Rushi Award -2019

Smart City Expo Award-2021

Qualcomm, ASSOCHAM & Cyient
Award-222



NiralOS

Network Operating System for Private 5G & Edge

- 🏆 Winner of Aegis Graham Bell Award 2022 for 5G Innovation
- 🏆 Recipient of DOT grant under DCIS Scheme for 2021 & 2022
- 🏆 Part of GigaOm global list of Networking OS vendors 2022
- 🏆 Part of LightCounting global list of Networking vendors 2021

Private 5G and Edge is a key enabler for digitization of manufacturing, oil & gas, mining, port, energy sectors



Niral Private 5G & Edge platform will optimize emerging technologies like IoT, Drone, Robotics, AI/ML, AR/VR

1 Niral Private 5G Core

Cloud-Native Private 5G packet core software for Mobility, Authentication, Session and Policy Management within an Enterprise. Contains 5G Network Functions - AMF, SMF, AUSF, NRF, UPF PCF, UDM. Niral 5G core also provides a compact User Plane Function (UPF) for local breakout within Enterprise when integrated with TSP's centralized 5G Core.

2 Niral Edge Cloud

Kubernetes and Virtualized infrastructure to create a Mobile Edge Cloud (MEC) using existing commodity servers and open APIs to host 3rd party applications like AR/VR, Robotics, Drones, AI/ML, Video Analytics for low latency, high bandwidth and privacy.

3 Niral Controller

Centralized management, orchestration, zero touch provisioning and monitoring of multi site Private 5G and Edge Cloud. The controller can be hosted in the public or telco cloud to centrally manage and monitor multiple private 5G networks.

NiralOS Specification

- Release-16 compliant 5G Core for Private 5G Deployment
- 5G Network Functions - UPF, AMF, SMF, AUSF, UDM, NRF, PCF
- Kubernetes based Cloud-Native 5G Network & Edge Functions
- DPDK + VPP based User Plane (UPF) Acceleration that scales per CPU Core
- Compact UPF to provide local breakout when integrated with TSP's centralized 5G Core
- Support of N1, N2, N3, N4 and Service Based Interfaces for 5G SBA
- 5G Core deployed on COTS HW of various form factor and integrated with 5G Radio
- Multi-tenanted and Multi-Site Controller for 5G Core and Edge Cloud Management
- Web based dashboard for Subscriber Provisioning, Configuration and Management

Looking For Digitization Of Your Enterprise?

Contact Us At



+91 98861 79612



info@niralnetworks.com



www.niralnetworks.com

NIVETTI SYSTEMS IS A SECURE NETWORKING AND CYBER SECURITY PRODUCTS & SOLUTIONS COMPANY FOCUSED ON HELPING GOVERNMENT, DEFENCE AND PRIVATE ENTERPRISES BUILD ROBUST AND SECURE DIGITAL INFRASTRUCTURE & PROTECT EXISTING INFRASTRUCTURE FROM CYBER ATTACKS.



Nivetti Systems is a Bangalore based Secure Networking and Cyber Security Indian Company which is redefining the way Network and Cyber Security products are to be built for trusted and secure communication. Nivetti has developed India's first, **fully indigenous and highly secure Network Operating System, Nivetti NiOS™** which powers all its Routing, Switching and Cyber Security product portfolio. Nivetti's Routing, Switching & Cyber products are deployed across Government & Defence, Telco and Private sector.

Nivetti Systems core team is having more than two decades of global experience and expertise in Networking and Cyber Security domain. With deep expertise in Hardware, Systems software, Application software, Network Security and AI/ML, Nivetti team brings in a unique 360° perspective of how future digital infrastructure has to be built for Security, Programmability, Scalability and Performance.

Nivetti delivers a wide portfolio of products powered by its secure/high-assurance Network Operating System – Nivetti NiOS™. NRP Family of Aggregation Routers, powered by NiOS™, are designed as a Convergence Platform to connect various circuit/legacy technologies (e.g. T1/E1, T3/E3, STM1/4/16) and packet technologies (e.g. 1G/10G/40G Ethernet) to a Packet Core Network. With its distributed processing architecture, NRP series routers allow a 'pay as you grow' model. Customer can deploy 1G, 10G and legacy interface speeds today and upgrade to 40G speeds by just replacing the line cards on the same chassis, enabling a migration path from legacy to high-speed interfaces. Nivetti portfolio of Ethernet Switches powers Surveillance, Telco and Critical Infrastructure.

Nivetti HawkSecure™ is a very advanced AI/ML based Network Detection and Response platform that provides Early Threat Detection, Visualisation & Cyber Forensics. Nivetti HawkSecure™. In these days of evolving Cyber Threats across Network, Compute, Application & Device layers, there is a need to ensure every packet on the Network is analyzed. Nivetti HawkSecure is deployed in some very critical and sensitive Networks of India and is protecting more than 100,000 nodes currently.

NMSWorks Software Private Limited

Company Profile

NMSWorks Software delivers network management solutions to some of the largest and most demanding telecom service providers, network equipment vendors and enterprises. NMSWorks has two decades of experience in delivering OSS/BSS solutions for the end-to-end management of carrier grade networks. The products and solutions combine deep domain expertise with current, best of breed software development practices. Moving with the current trend towards customer -centricity, network virtualization and software driven networks, the OSS and BSS functions are seamlessly converged.

Products and Solutions

NMSWorks offers below products and solutions with the brand name CygNet:

1. CygNet OSS product suite including Discovery, Inventory Management, Service Fulfilment, Service Assurance, Network Planning covering Optical Transport, IP/MPLS & CEN, Radio MW, Broadband, GPON, WiMax, LTE technologies
2. CygNet MaSoN (Manager for Softwarized Networks) which is a 5G Management System supporting comprehensive element and network management for 5G Core and NG-RAN and practical machine learning based intelligent analytics use cases considering management data.
3. CygNet BSS product suite including Customer Relationship Management, Billing System, Product Catalog Management, Order Management System, Customer Portal
4. CygNet RFMS, CygNet Submarine Network Management and CygNet Passive Inventory Management

Contact

K V Nair CEO Mob:9871099771 Mail id: kvnair@nmsworks.co.in

A Manickavasagam Senior VP Mob: 9841356366 Mail id: manickavasagam@nmsworks.co.in

Other Details

NMSWorks Software Private Limited is a **development partner** in the **Indigenous 5G Test Bed** project funded by the Department of Telecommunications, Ministry of Communications, Government of India.



1 | sst homegrown glo al mo ile phone

5G

OptimusLogic, India's 1st smartphone startup, is building India's 1st global 5G Mobile, "optimus rhino 1", in association with IIT Hyderabad, supported by TCoE, DoT, Govt. of India under DCIS-2022 scheme.

The "optimus rhino 1" is Made in India, Made for the World, Made for Everyone to create social convergence with 5G.

The "optimus rhino 1", will be followed by Tablets, Laptops and more, built on the new "Mukth" convergence platform co-developed by OptimusLogic & IIT Hyderabad.

OUR PRODUCTS



DORY Ad-hoc Mesh Radio :
ISM 865-867 MHz



SENSEI Sports AI Watch - Cricket,
Badminton



VAMAN (PYGMY) - ARM+eFPGA Dev Kit

the "optimus rhino 1"

- Tough, Rugged, Reliable & Eco-friendly 5.5" inch Smartphone with stock Android 12, with support & upgrades for 3 years
- Industry matching "regular" features for 5G, Calls, CPU, Memory, Camera, Music/Video, Navigation, Messaging, Apps etc.
- Industry first 4G to 5G swappable upgrade support for savings, practicality & optimisation ; upgrade only when necessary
- Inbuilt "Ekalavya" Laptop mode for students & young minds to skill themselves for industry jobs and career opportunities
- Learn, Code & Master skills across Software, Hardware, VLSI, Digital Design, Computer Architecture, Embedded systems, IoT, Cloud & Applications directly on this mobile through self-study and upcoming programs by IIT Hyderabad
- Hardware(FPGA) driven user-programmable security for sensors, location and microphones for 100% privacy & security
- Support for additional 2-way encryption for peer-to-peer communication for industry/government/military captive use
- Programmable Open Hardware Interface with extra USB Type C to directly control outside devices & products
- Unique pan-India Distributed Manufacturing+Test strategy to skill India's young minds and optimize production costs

ABOUT OPTIMUSLOGIC

OptimusLogic Systems, with operations in Bengaluru & Hyderabad in India since 2013, is a revenue-driven growing global Original Device Manufacturer (ODM) and Design House (IDH), for Mobile & Wearable AI systems, Industrial IoT solutions, Signal Intelligence Radars and Ad-hoc Radios.



OPTIMUSLOGIC SYSTEMS INDIA PRIVATE LIMITED

"Brindavan", O, Yashodha agar, Jakkur, Yashodha agar Main Road,
37/4/10/6, Yelahanka, Bengaluru 560064, Karnataka INDIA.

+91-9606706202 | www.optimuslogic.in |

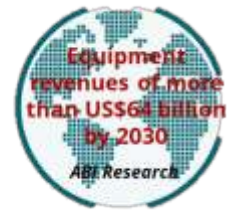
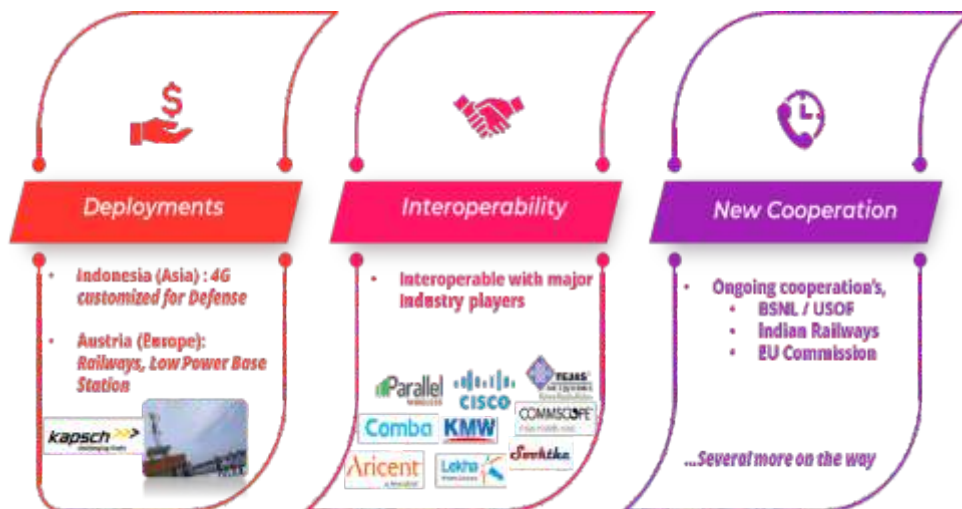
Proud
member of





Indigenous 4G / 5G Wireless Network Solutions

Resonous technologies is a Bangalore based 4G and 5G Wireless Network Solutions Supplier with strong R&D focus for nearly 10 years, delivering cutting edge solutions with secure, reliable, and cost-effective end to end portfolio, we are specialized to serves the industry-tailored needs of Voice, Broadband Data, and IoT. Our main focused domains are Rural Telecom, Defense, and Industry4.0 Communications.



SIGNALCHIP

Signalchip is an exciting fabless semiconductor company established in 2010 with the vision of building an organization of highly motivated people working on cutting edge technologies creating differentiated semiconductor products. They work on extremely innovative chips to enable high speed wireless communication standards like 4G-LTE/3G-WCDMA and 5G-NR. Signalchip's devices provide extreme performance while being optimal owing to its slim baseband and RF architectures that are designed from grounds up with modern-day high-performance systems in mind and carry no baggage of legacy systems.

Complete LTE Base station in one chip

SCBM3412 is a highly optimized device built for residential and enterprise class base stations from scratch with a CPE (Customer Premise Equipment) mindset. A platform that carries no baggage of legacy systems brings together the performance and robustness of enterprise class equipment with the cost sensitivity of mass market equipment. Powerful processing engines for L1/ L2/ L3 layers of LTE Advanced systems, LTE and WCDMA have been built with innovative hardware-software partitioning and optimal analog-digital partitioning of the functionalities. SCBM3412 provides the long-awaited low cost small cell solution with best in class performance.

High performance LTE Baseband

SCBM3404 is a highly optimized device built for enterprise and local area/macro base stations. A platform that carries no baggage of legacy systems brings together the performance and robustness of enterprise class equipment at a competitive price point.

Powerful processing engines for L1/L2/L3 layers of LTE Advanced systems, LTE and WCDMA have been built with innovative hardware-software partitioning to support 4x4 and advanced signal processing functionality.

Multisystem and Multiband RF Transceiver

Signalchip's RF Transceiver chips integrates all the necessary components for 5G-NR/ 4G/ 3G/ 2G, Wi-Fi systems and a wide range of SDR applications. Integrated CPRI/JESD link support enable unique and compact RRU designs.

Part number	Applications	Description
SCRF4502	5G-NR, 4G, 3G, GSM, WiFi and wide range of SDR applications	2x2 MIMO Analog-RF Transceiver with Aux Receiver: 350MHz-6GHz, upto 100MHz RF bandwidth
SCRF3402	4G, 3G, GSM, WiFi and wide range of SDR applications	2x2 MIMO Analog-RF Transceiver with Aux Receiver: 350MHz-6GHz, upto 40MHz RF bandwidth

SIGNALTRON

SIGNALTRON MACRO BASE STATION



- LTE Macro Base Station;
- FDD and TDD;
- 400 Mbps DL and 75 Mbps UL throughput

Upto 4x4 MIMO; Power : Upto 40W
Available in all sub 6GHz bands; Bandwidth (MHz): 1.4, 3, 5, 10, 15, 20

Upgradable to 5G NR

SIGNALTRON OUTDOOR SMALL CELLS



- Outdoor small cell base station;
 - Output Power : 4W ;
 - FDD and TDD;
 - Bandwidth (MHz): 1.4, 3, 5, 10, 15, 20
- 2x2 MIMO
2W per antenna
Available in all sub 6GHz bands

SIGNALTRON COMPACT INDOOR SMALL CELLS



- Suitable for small office, malls and enterprises; Smallest footprint compact base station
 - 2x2 MIMO;
 - 125mW per antenna
 - Available in all sub 6GHz bands;
- Output Power : 250mW
FDD and TDD
Bandwidth (MHz): 1.4, 3, 5, 10, 15, 20 Gigabit Ethernet interface (Optical and Copper)

- ❑ Cellular wireless access software and solutions (**SBS**) – 5G NR, 4G LTE, NB-IoT
- ❑ **Fully Indigenous** solutions – Developed from scratch in-house
- ❑ Collaborator for **5G Test bed** – 5G gNodeB L2/L3 software
- ❑ 4G/NB-IoT **Licenses to Global Customers** (OEMs, Operators, T&M)
- ❑ Catered to **Rural Broadband, Railways and Test & Measurement Segments**
- ❑ Software on **Quasi Standard** platforms



SBS Advantage

Choice of Hardware Platform – CAPEX/OPEX Optimization

Choice of Deployment – Better user experience
Support for multiple verticals – Larger addressable market



Enterprise Femto



Residential Femto



NB-IoT
Network-In-a-Box



Enterprise Pico



INDIA'S 1ST 5G CLOUD CCTV CAMERA



4G CCTV CAMERA

4G Cloud Camera Operating on 4G-LTE networks, an ideal monitoring solution for remote areas with limited or no wi-fi or Wired access.



WI-FI CAMERA

Sparsh Wi-Fi Camera works over existing 2.4 GHz Wi-Fi networks for live streaming. Best Cost effective solution for home and business Security Surveillance.



5G AI CAMERA

5G CCTV Camera works on 5th Generation Wireless Technology. Available even with frequency bands suitable for Private 5G networks. Live Streaming of Audio & Video Signals remotely with less interference and delay transmission. Perfect solution for Cloud storage of CCTV data.

www.sparshsecuritech.com

Sparsh - CCTV Factory for the World, Victory for Make in India

Sparsh is the epitome of **'Made in India'** Electronic security products over the last decade. Sparsh started their journey ~15 years ago with the vision of making India a destination for design and manufacturing of advanced security solutions. Due to its unrelenting focus on innovation and building design/manufacturing capabilities, Sparsh has revolutionized the security market by becoming India's first company to design and manufacture CCTV cameras in the country in 2008. It now counts several renowned brands as its prime customers, including several international and Indian brands. Sparsh has been instrumental in shifting the manufacturing base for several companies from China to India. Sparsh is now a leader in designing and manufacturing CCTV equipment in India with two manufacturing facilities in Haridwar and NOIDA.

The Company truly embodies a vision of **'building India'** and **'building in India'** with ~7% of its annual revenue directed towards R&D. With one of the largest in-house R&D centers for CCTV solutions and state-of-the-art manufacturing units and Testing facilities, building products to global standards, Sparsh has won many accolades and awards including the National MSME Award for Quality. Despite the pandemic, Company has achieved a CAGR of ~80% from 2019 to 2021.

Led by the **'Made in India'** man of the Electronics Security Industry – Sanjeev Sehgal, this success has not been achieved overnight. The Company has faced many challenges in successfully imbedding the **'Make in India'** policy, not just on paper, but in also in practice, while successfully maintaining price competitiveness with much larger Chinese counterparts. Sparsh has achieved more than 80% Domestic Value addition for most of the products as on date and is committed towards achieve same for the complete range

With several government and private projects under its belt, the Company now aims to expand production in India to supply to South-East Asian markets and the West. Sparsh has set a solid benchmark of where India as a nation is headed – establishing economical and financial prominence on the global stage, through the success and scale of its national bred companies. As the Company targets to become the **CCTV factory for the World**, it marks a major victory for **'Make in India'** and a path for other national companies to tread.

#SurakshaSarhadSeGharTak

Tidal Wave Technologies Pvt. Ltd

5G and LTE Product series - SEASHORE NETWORKS

The latest disruptive software technology company - essential in Last mile of Wireless Networks

1. **Seashore Networks** is a proprietary LTE and 5G Software that helps compete with the telecom leaders of the world and bring business due to our unique software advantages and market approach.
2. **Product State** - After the efforts of engineers and PhDs, the product is production grade **ready** and commercially available. It is validated and integrated by large Telecoms and Technology companies like Cisco, Intel, and others



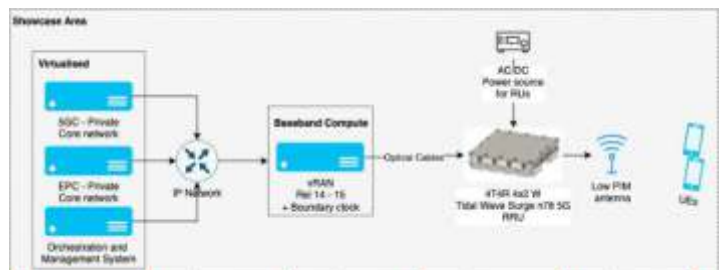
Image below: Mumbai COE, Live 5G



3. The company is growing very fast and has a large Order book. And a (high-conversion probability) pipeline globally as well.

4. **Next Stage** for the company is growth and extending the technical differentiation in prospective customers' mind

5. **Competition:** We are very uniquely positioned due to software-based product and approach to market. Large market, few players are the characteristics of the industry. The next new entrant is many years behind. Huawei, Ericsson, Nokia sell expensive systems which are hardware boxes, which need to be replaced when going from 4G to 5G or next. Seashore software doesn't change the hardware, and



just with software update can make the entire setup upgrade from 4G to 5G or future

6. We are on our way to be a highly valued company. Corroborated with leading valuers (merchant bankers) in the past.
7. We have a very strong IT, Network and Management team, as well as a reputable Advisory Board of luminaries in the business. These are C-level executives and Board members of existing wireless and infrastructure companies.

We welcome discussion with potential investors interested in building a mega future with us in this industry!

Please view this "Teaser". A more in-depth presentation is available for those who wish to understand more of our technology and applications.

CONTACT - palash.patel@tidalwave.tech

Area: Our innovation is a next-generation Industry 4.0 IoT edge device /gateway branded as Flowline and dashboard flowline.io used for remote data control equipped with device management and analytics. The device is Industry and communication agnostic (5G,4G,W iFi,Lora,NbIoT, Satellite) and can work along with all kinds of sensors, meters, devices, etc.

- 2) Globally among top 10 hardware start-ups (Hong Kong Trade Show by start-up Launchpad) (2019)
- 3) Top 9 teams complete Asia Pacific in the Power & Energy Sector (by Schneider Electric) Singapore (2018)
- 4) Awarded by DOT under digital communication innovation square initiative (DCIS 2022)
- 5) Runners up - Smart Communication Module for national smart meter program by Intellismart – EESL – Government of India (2022) and (2022)



1 Executive summary

VASBEAM is an Advance Electronically Steered Antenna Design and Semiconductor Design company offering lowest cost of ownerships products and solutions for Connected World. Our technology is setting the industry standards, positioning us as one of the category leaders worldwide.

VASBEAM research & development (R&D) and market & sales (M&S) efforts will result in a highly integrated and flexible adaptive antenna array (AAS) sub-system for wireless communication, aerospace & defense and satellite communications. Having ownership to the critical semiconductor technology for beamforming and developing an essential semiconductor component of the value chain, VASBEAM expects to guarantee unmatched AAS performance at the lowest cost of ownership for multiple application segments.

Beamforming applications

- 5G beamforming systems under 2.4 GHz wireless communication
- S-band satellite communication
- Satellite to automotive communication in the sub-6 GHz frequency range
- 5G communication in the 3.4 and 5 GHz frequency range for wireless backhaul
- *Radar systems in the C-band, X-band, K and Ku frequency bands*

Likely end user organizations

- 4G/5G Telecom Operators: Airtel, Jio, Vodafone
- Defense: DRDO, Indian Army, Navy, Air force
- Satellite: ISRO, Private satellite operators

Readiness level of the technology

The foundry proven VAS7308 core IC product line is a beam forming ASIC that addresses the market segment of phase array and antenna beam forming for radar and 5G wireless communication and satellite applications. Availability of foundry proven core IC meets the technology readiness requirement (TRL) level of 7 with development of adaptive antenna systems (AAS) using available core IC's.

The critical advantage for VASBEAM to develop Adaptive Antenna Systems is the ownership of the Beamforming ASIC which is already in production

Table 1-1 Table of available products

Product name	Frequency (GHz)	Mode	Channels
VAS7308L	0.5 – 3.2	TX/RX	4
VAS7308C	3 – 6.2	TX/RX	4
VAS7308X	8 – 11	TX/RX	4
VAS7308XT	8 – 11	TX	8
VAS7308K	10.7 – 15	TX/RX	4
VAS7308KU	15 – 17.5	TX/RX	4

Core IC's are already in use by some customers with following applications being developed by end users:

- X-band phase arrays
- Jamming suppression for navigation systems
- Backhaul wireless communications

The company is leveraging the available technology to develop new products in mm-wave for satellite and 5G communication. Two of the main products are proposed by the company leveraging on the experience accumulated during the development of products at lower frequency range.

Product name	Frequency (GHz)	Description	Applications
BF26G	24 – 27.5	3GPP band n258	Communication
BF28G	26.5 – 31	3GPP band n257 Satellite Ka-band	5G communication, military satcom, Satcom uplink

The efforts for these products' development are incremental as

- The platform of Core IC needs to be extended
- IPs are modularly designed and will be reuse / re-engineered
- Manufacturing process is well understood and there is no learning curve

We aim to build Beamforming ICs for all usable frequency band designed and now manufactured in INDIA*

* Our ASIC platform is suitable for Tower Semiconductor's process flow, and we aim to manufacture the new Chips in Indian Fab proposed at Mysore or Low frequency Chips can be manufactured at SCL Complex Mohali



Reduce Cyber-Risk
by operationalized
Threat Intelligence.

Contact

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nitish@xtennetworks.com

xTen Networks is a Cybersecurity, SDN/NFV start-up, **helps** organizations **to stop** cyber threats before they act and **reduces** overall **attack-surface** by 80% with Intelligence enterprise **automation** and threat Intelligence **consumption** and **enforcement** solutions.

Problems

- Increasing **Cyber-attack** surface.
- **No** or **minimum use** of real-time **Threat Intelligence (TI)** on live traffic at network front-line.
- **Strategy** to mitigate emerging, dynamic cyber-attacks with static, silo, post-fact approach.

Solutions

- **Automates:** utilization of Threat Intelligence (TI).
- **Enforce:** early in real-time at scale at wire speed.

Incubation/Awards/Affiliations

- **1st Made in India** in this Segment.
- **Team** that you can depend on: Team has worked for Top 3 MNCs like **Cisco Systems**, Intel Security - **McAfee**, **HCL**.
- Incubated at **IIT Kanpur**.
- Both **Physical** and **Cloud** Solution.
- **Technology Innovation:** low latency, optimized stack to give best user experience.
- **Vision:** MVP's modular architecture eventually will be a **building platform** for **digital communication equipment** like Core **router**, **NGFW**, **SASE** and other 5G/6G Solutions.

Current Stage and Existing Investor/Grant

MVP

Existing Investors: **IIT Kanpur**, **TCOE**, **DoT**, Govt of India.

- Raising: **INR 2.4 Cr** for **5%** equity.
- Purpose: Team expansion for R&D, Marketing & Sales.

Funding Goals



- R&D Capacity (20%)
- Product Development (20%)
- Testing (20%)
- Marketing (40%)

