



Houlihan Lokey

Connectivity Software

MARKET UPDATE | WINTER 2023





Houlihan
Lokey

01	KEY UPDATES	3
02	SPECIAL FEATURE AI IN TELECOM	9
03	SPECIAL FEATURE MAKING CONNECTIVITY PROGRAMMABLE	21
04	TRANSACTION CASE STUDIES	31
05	NOTABLE NEWS STORIES	48
06	PUBLIC COMPARABLES	56
07	ABOUT HOULIHAN LOKEY	59

The background is a dark blue space filled with glowing digital elements. A central globe is formed by a dense cloud of light blue particles. Overlaid on this are numerous thin, intersecting lines in shades of blue and green, some straight and some curved, creating a sense of a global network or data flow. Faint, semi-transparent numbers and symbols are scattered throughout the scene, adding to the high-tech, data-driven aesthetic.

01

KEY UPDATES

Key Trends in the Connectivity Software Market

- 1 > Macro trends continue to expand the market opportunity for telecom software companies.
 - Notable trends include layoffs in the carrier market (including those at Bell, BT, Vodafone, and Verizon) and broad—oftentimes related—AI initiatives (including those announced by AT&T, BT, Comcast, T-Mobile, and Verizon).
- 2 > Companies have been reluctant to test the valuation environment despite continued—but generally slowing—revenue growth.
 - YTD transaction volumes are down more than 50% year-over-year.
- 3 > Strategic M&A has been more resilient than financial sponsor-related M&A.
 - YTD financial sponsor transaction volumes are down nearly 60% from last year.
 - YTD strategic M&A volumes are down by only 20% from last year.
- 4 > M&A processes have become increasingly targeted.
 - Sellers are now engaging in discreet processes with tight bidder groups rather than broader auction processes.
 - These types of processes allow sellers to test the waters without cannibalizing a broader process at a later time.
- 5 > Investors have also become increasingly targeted.
 - In addition to being more diligent, resulting in longer processes with lower likelihoods of closing, investors have also been more focused on specific sub-verticals where they've developed real theses.
 - Last year, the top three verticals from a volume standpoint—connectivity-as-a-service, deployment management, and network management and analytics—represented a third of overall volumes; this year, they represent more than half.
- 6 > While capital markets activity has been quiet and inside rounds have remained in favor, a few companies have completed “regular-way” growth equity raises.
 - Notably, Edge Q, Accelercomm, and IP Fabric completed raises of this nature.

Note: YTD as of September 30, 2023.



Notable AI Announcements

SK Telecom and Deutsche Telekom Develop LLMs for Telcos

"SK Telecom and Deutsche Telekom plan to collaborate with AI companies to develop a multilingual LLM tailored to the needs of telcos. The LLM will have a higher understanding of the telecom service-related areas, making it suitable for customer services such as AI contact centers. AI shows impressive potential and to maximize its use, especially in customer service, we need to adapt existing large language models and train them with our unique data." says Claudia Nemat, Member of the Board of Management for Deutsche Telekom.



AT&T Taps OpenAI to Streamline Internal Operations

AT&T has begun deploying an OpenAI-based tool that assists its technology workers in tasks ranging from coding and customer support to language translation. The system, Ask AT&T, aims to enable workers to use natural language to find data stored in various HR and support documents and to help the company optimize its network and upgrade legacy code. AT&T chief data officer Andy Markus said he is particularly excited about the use of generative AI for writing computer code, where little added work is needed, and productivity gains have been averaging between 25% and 50%.



How T-Mobile Plans to Use AI to Improve One of Its Most Important Business Metrics

T-Mobile sees an opportunity in artificial intelligence to analyze why customers leave the company, attempting to retain more of them and improve in an area where it's already doing better than others in the wireless industry. Mike Sievert, T-Mobile's CEO, said he sees in AI an opportunity to gain a much deeper understanding of customer motivations, moving further from the analog world in which companies treated every customer the same. Sievert cited the opportunity to use AI to better understand and improve churn. Every churned customer left a trail of data before they finally threw their hands up and gave up on T-Mobile. Something was going wrong, something in the network, something in the customer interaction. AI can be used to help understand the underlying customer experiences by working across disparate data sets.



Verizon's Debika Bhattacharya on the Endless Possibilities for Generative AI

Debika Bhattacharya, Chief Product Officer for Verizon Business, explains how the company is using "applied or specialized AI" to make improvements in network performance, tracking data trends, customer experience, and more. She also discusses Verizon's approach to edge computing, the rise of cloud elasticity and fixed wireless access (FWA), and computer vision use cases.



Notable Carrier Layoffs



BT to Cut Nearly Half of Workforce by End of Decade

- BT Group, one of the largest telecom companies in the world, said it is laying off up to 55,000 people or 42% of its workforce by the end of the decade—due in large part to AI and automation.
- Up to a fifth of cuts will come in customer services as staff are replaced by technologies, including artificial intelligence.
- Generative AI tools are giving the company confidence that they can go further, implementing chatbots and other technologies without degrading network or customer service.



Bell Deepens News Industry Gloom With 1.3k Job Cuts

- Canadian media and telecom firm Bell is cutting 1,300 jobs, shuttering six radio stations, and selling another three as revenues dry up at its legacy phone and news business. The layoffs will mostly affect management and follow thousands of cuts in the media industry, which has been wrestling with dwindling ad dollars, high levels of inflation, and the ongoing shift from cable TV to streaming.
- The company expects Bell Canada's legacy phone revenue to decline by \$250 million each year while the news operation posts annual operating losses of \$40 million
- The Canadian telecom industry has come under pressure from the government to bring down phone bills in a concentrated market.



T-Mobile to Cut 5,000 Jobs

- T-Mobile is slashing 5,000 jobs on the heels of the telecom company's management touting the carrier's success.
- In the wake of the Sprint acquisition, T-Mobile is working to cut redundant or misaligned roles as well as centralizing functions for efficiency and cost-saving.
- They plan to add 11,000 more roles by 2024, with the goal of reducing reliance on external resources.



Verizon Warns 6,000+ Customer Service Employees of Layoffs

- Verizon notified more than 6,000 customer service employees of upcoming "restructuring" and "streamlining" measures that are all but certain to result in significant layoffs.
- While the customer service division was the primary target of Verizon layoffs, there is a likelihood that more employees may be impacted by the decision. Other roles expected to be impacted by this round of Verizon layoffs include customer experience, loyalty, and technology positions.
- The warning comes just a month after Verizon posted Q1 '23 earnings, which fell short of Wall Street estimates as its subscriber base continued to shrink. The company lost 127,000 postpaid subscribers in the quarter.



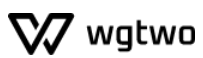
Vodafone to Cut One Tenth of Workforce

- Vodafone will axe 11,000 jobs over the next three years as new CEO Margherita Della Valle sets out to "simplify" the telecoms giant.
- The job cuts are the biggest in the history of Vodafone, which employs 90,000 people directly across Europe and Africa.
- Vodafone's broadband service in the U.K. was the second-most complained about of any major provider in the three months to December.
- Della Valle previously targeted efficiencies in Vodafone's central and European operations when she took the helm at the start of the year, with 500 job cuts in central operations, 1,300 in Germany, and 1,000 in Italy.

Sources: BBC, AWS, LightReading, FCC, TelecomTV, SDX Central.



Notable Transactions in Q3

Date	Target	Acquirer/Investor	Transaction (mm)	Target Description
Oct-23		Undisclosed investors +  TEXAS CAPITAL BANK	\$61.0	Alianza is a provider of cloud communications software for service providers designed to supercharge growth, reduce costs, and transform telcos into modern techcos.
Sep-23		Greenfield Partners and 83 North	\$47.0	FloLIVE is a global innovator in advanced 5G network solutions and IoT connectivity, offering both private and cloud-based services through its proprietary platform.
Sep-23			Undisclosed	Depotnet is a software platform specializing in efficient and compliant management and maintenance of linear asset networks.
Sep-23			\$325.0	Commify is a provider of business messaging products and services to SMEs and corporate customers
Aug-23			Undisclosed	Codilime is an IT consulting and software engineering firm offering comprehensive support for cloud-native applications, network automation, and system maintenance.
Aug-23			\$150.0	Working Group Two is a telecommunication platform bridging internet ecosystem dynamics with the telecom industry through its cloud-based infrastructure
Aug-23			Undisclosed	Webbing is a premier provider of global connectivity and IoT services, delivering mission-critical functions for IoT public safety and business.
Aug-23		March Capital and Sanabil Investments	\$175.0	Nile provides secure, uninterrupted connectivity through service-centric wired and wireless solutions, revolutionizing network deployment, security, and maintenance.
Jul-23			\$60.0	Airalo is an eSIM technology provider, offering an array of cost-effective mobile data packages for international travelers.
Jul-23			Undisclosed	Patchmanager provides cable and asset management software intended to streamline network connectivity management.
Jul-23			Undisclosed	Tigerpaw develops project management software for the construction and infrastructure sectors.
Jul-23			Undisclosed	Vitruvi Software is a leading provider of cutting-edge utility construction software solutions.
Jul-23			Undisclosed	Oasis Smart Sim provides SIM card products for end-to-end and customized services for the deployment of global USIM technology, connectivity, and management.

Sources: PitchBook, company press releases, and other publicly available information.

 HL Advised Transaction

Notable Transactions in Q2

Date	Target	Acquirer/Investor	Transaction (mm)	Target Description
Jun-23	 Service Assurance Unit		\$90.0	TEOCO's Service Assurance unit provides service providers with an end-to-end service orchestration offering, assuring the quality of service and enabling the monetization of next-generation dynamic customer experiences.
Jun-23			~\$100.0	Kaleyra is a global omnichannel-integrated communication services provider with a set of proprietary platforms, offering targeted personalization through messaging, video, push notifications, e-mail and voice-based services, and chatbots.
Jun-23		  	\$25.0	IP Fabric is an automated network assurance platform that discovers, verifies, visualizes, and documents large-scale networks holistically, reducing costs and resources while improving security and efficiency.
Jun-23			Undisclosed	SamKnows is a U.K.-based developer of an internet performance monitoring platform designed to identify and provide solutions for network problems.
Jun-23			Undisclosed	Accedian provides mobile, enterprise, and carrier networks with network performance monitoring technology and assurance services.
Jun-23	 A TWILIO COMPANY		\$42.0	ValueFirst is an Indian provider of CPaaS services that enable enterprises to connect with their customers globally across multiple communication channels.
May-23		 	€20.0	Ringover is a SaaS software company developing integrated VoIP, video, chat, and SMS communication solutions for professional teams at European SMEs.
May-23			Undisclosed	Riverbed's telemetry data spans from network to app to end user and illuminates every interaction so organizations can deliver a seamless digital experience.
May-23			Undisclosed	Lifesize is a global provider of video conferencing and omnichannel contact center solutions.
May-23			Undisclosed	LastMileXchange (LMX) provides Communication Service Providers across the globe with cloud-based access pricing solutions, enabling them to automate, accelerate, and streamline the quote-to-order sales process.
May-23	 SUPERCHARGED WIRELESS	IQ Capital, Bloc Ventures, and IP Group	\$21.5	AccelerComm optimizes the performance of 5G radio access networks and solves challenges that limit throughput, latency, and spectral efficiency.
May-23		Syndicate of Angel Investors	\$3.0	Sitenna is a SaaS platform that helps telcos accelerate 5G deployments by connecting them with landlords willing to host telecom equipment.

Sources: PitchBook, company press releases, and other publicly available information.

 HL Advised Transaction

02

SPECIAL FEATURE | AI IN TELECOM



Top Use Cases for AI in Telecom—According to ChatGPT



What are the top 10 use cases for AI in telecom?



As of my last knowledge update in, here are the top 10 use cases for AI in the telecom industry. Keep in mind that developments might have occurred since then, but these use cases should still provide you with a good overview of AI's applications in the telecom sector:



1. **Predictive Maintenance:** AI can analyze vast amounts of data from network equipment and sensors to predict potential faults and proactively schedule maintenance activities, reducing downtime and improving network reliability
2. **Network Optimization:** AI algorithms can optimize network traffic, predict congestion, and dynamically allocate network resources based on real-time demands, ensuring efficient network performance and quality service
3. **Fraud Detection:** AI-powered fraud detection systems can analyze patterns and anomalies in call records, transactions, and user behavior to identify fraudulent activities such as SIM card cloning, subscription fraud, and identify theft, preventing financial losses
4. **Virtual Assistants and Chatbots:** AI based virtual assistants and chatbots can handle customer inquiries, provide personalized recommendations, and assist with common service requests, improving customer service efficiency and responsiveness
5. **Customer Experience Enhancement:** AI can analyze customer data, including call records, browsing behavior, and social media interactions, to personalize offerings, predict customer preferences and deliver targeted marketing campaigns, resulting in an enhanced customer experience
6. **Network Security:** AI algorithms can detect and respond to security threats in real-time by analyzing network traffic patterns, identifying anomalies and initiating proactive security measures, safeguarding against cyberattacks and data breaches
7. **Intelligent Network Planning:** AI can analyze geographical data, population densities, and historical usage patterns to optimize network planning, identify ideal tower locations, and plan network expansions, ensuring optimal coverage and capacity
8. **Revenue Assurance:** AI can analyze billing data, detect revenue leakage, identify billing errors, and reconcile usage records, enabling telecom operators to optimize revenue collection and billing accuracy
9. **Network Fault Diagnosis:** AI-powered fault diagnosis systems can analyze network alarms, performance metrics, and historical data to identify the root causes of network failures, helping network operators troubleshoot resolve issues faster
10. **Call Analytics:** AI can analyze call recordings, transcriptions, and sentiment data to gain insights into customer interactions, identify emerging trends, and improve call center performance leading to better customer service and training

Send a message



Enablers of AI in Telecom

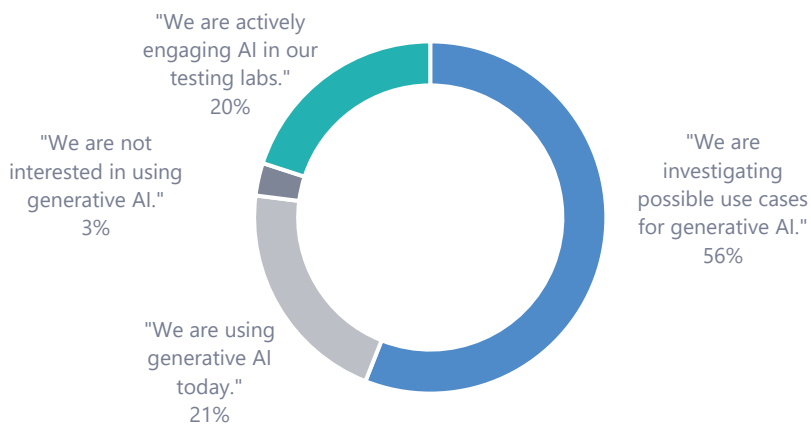
Notable Software Vendors



Notable Use Cases

Company	Use Case
cerillion	Cerillion's pre-integrated BSS/OSS suite transforms the product lifecycle for CSPs using generative AI (GenAI) to rapidly build new products and packages that will enhance customer experience and business productivity.
MATRIXX SOFTWARE	MATRIXX is developing a platform to provide customers with a spending forecast, offering them a greater amount of transparency into what their targeted monthly bill will be based on their usage and spending history while making recommendations to optimize costs.
SPECTRUM EFFECT	Spectrum Effect is leveraging AI to help mobile operators drive RF interference mitigation, improve network performance, and maximize spectrum value.
wavelo	Wavelo is layering AI with billing to help telecoms improve customer experience, drive down average handle time for customer support, and make more informed business decisions.

The Majority of CSPs Are Exploring AI⁽¹⁾



Source: Omdia survey of CSP professionals, June 2023.



Justin Reilly

CEO, Wavelo

Toronto, Ontario

Wavelo is a developer of telecommunications software designed to build modern alternative support for operations support systems and business support systems. The company's platform specializes in minimizing technical barriers and offers a suite of flexible software to enable mobile and internet access, provisioning, billing, subscriptions, and more, thereby helping communications services providers improve internet access and focus on providing a superior customer experience.

What do you view as the biggest challenges to delivering connectivity today?

Operators are feeling it from all angles. Customer expectations continue to evolve—wanting more for less, and as macroeconomic conditions impact affordability, switching will pick up in 2H23 and into the new year. The competitive landscape is evolving as infrastructure investment, both private and public, continues to pick up steam. And finally, operators are faced with network and software decisions that impact the next 10–20 years of their business, such as moving critical pieces to the cloud. I've never felt more certain that the decisions over the next 24 months will dictate winners and losers over the next 24 years.

How do you see AI influencing the delivery of connectivity?

In the places closest to the customer, LLMs and AI-native systems will evolve the conversations between brands, employees, and customers. The ability to carry forward context in a conversation, a huge challenge in 2015 chatbots, is all but solved in the latest models. Paving the way for automation in CX that hadn't been previously possible. I'd posit, though, that the bigger impact on business value is in augmentation, not automation. Automating a job end to end is pretty hard and often doesn't return the ROI you thought it might. Rather, augmenting human tasks can deliver sustained efficiency. We see this most potently in back-office functions in large telecoms.

In the places closest to the network, anomaly detection, self-healing, and network automation will continue to improve as

the underlying ML models reach the next maturity curve. In particular, those operators that have invested in cloud-native solutions will see the biggest upside in cost reduction and network intelligence.

How do you see this evolving over the next 5–10 years?

We'll see the first end-to-end use cases of AI in telecom. A customer having a conversation with a brand about their relationship (billing, service, upgrade, etc.) that contemplates all the variables in that thread through to the network. It will take a tremendous amount of effort to transform legacy telecom to realize this vision, but in some ways, it's inevitable. And again, this is the core pillar in deciding one's relevancy to the customer.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

Our build and partner decisions are mostly driven by LLMs and ML technology that can build on our cloud-native, event-driven foundation for augmenting and automating the most complex parts of the telecom stack. We think there is a tremendous upside in abstracting away the unnecessary complexity of OSS/BSS. And we think it's a necessary service to provide to telecom customers across the globe.



Ned Taleb

Founder and CEO, B-Yond

San Francisco, California

B-Yond is a developer of network automation software designed to help communications service providers (CSPs) automate, optimize, and monetize their network infrastructure and business processes. The company designs and develops AI-powered network intelligence and automation technology using machine learning that ingests and analyzes complex network data and accelerates the time-to-market of new services and products to communication service providers.

What do you view as the biggest challenges to delivering connectivity today?

Testing complexity (5G stand-alone, etc.), affecting time to market, deployment costs, deployment delays, densification, capacity, and low latency demands.

How do you see AI influencing the delivery of connectivity?

Network testing automation: *This includes automated delivery of lab environments, automated building of virtualized network functions (VNFs), and using AI algorithms for automated test delivery.*

Continuous assurance: *The increased requirements on service monitoring demand more robust algorithms for continuous, real-time monitoring of services. Our AI-based technology allows for accurate application detection and quality of service enforcement, while our advanced anomaly detection algorithms enable near-real-time service monitoring.*

Automated remediation: *A combination of different AI techniques allows for automated root cause determination of detected anomalies and a hyper-automation platform allows to close the loop and automatically fix the underlying issues.*

AI-powered network optimization: *AI can be used to optimize network traffic and improve performance. This can help to reduce congestion and improve the overall quality of service.*

How do you see this evolving over the next 5–10 years?

Few operators have enabled the production of 5G stand-alone networks, and few devices still support it. The current economic climate has also somewhat slowed down the speed of network investments. Legacy network still consumes most of the OPEX, yet 60–80% of labor cost can be replaced with AI. Telcos may gravitate towards the most pressing/cost savings, such as NOC automation (things like customer-focused alarm prioritization, performance-based alerting, and ticket automation) and migration of customer support systems towards LLM-based AI systems. We choose to continue to invest in the journey towards fully automated, AI-powered, self-aware, and self-healing networks.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

Generative AI, self-supervised, synthetic data, model compression, and knowledge graph.

B-Yond is heavily investing in leveraging its capabilities to optimize network performance, predict and prevent outages, analyze user behavior, and manage traffic intelligently.



Nicolas Girard

Founder and CEO, OXIO

New York, New York

Oxio is the operator of an internet service provider intended to offer internet services. The company offers customized internet packages that include free installation, provides stable speed, a modem, and a router without any contracts, enabling users to get internet services at an affordable range.

What do you view as the biggest challenges to delivering connectivity today?

The biggest challenges to delivering connectivity today are all symptoms of outdated systems, black box networks, and processes that constrain innovation and progress. Companies that want to deploy connectivity are finding themselves stalled by the industry's lack of access. Some of the biggest obstacles we see are the absence of a unified global API with a clear wholesale rate card, slow and costly time-to-market from carriers, and a lack of flexibility to meet the varied connectivity needs of enterprises, businesses, and machines.

How do you see AI influencing the delivery of connectivity?

For networks, AI can improve resource allocation and traffic management to mix and match network providers and radio access technologies. For consumers, AI can make recommendations on plans and services by understanding patterns and treating each subscriber as a unique individual. And finally, for businesses, AI will improve the monetization of connectivity. The biggest opportunity for AI in telecom is to drive key subscriber insights to help companies connect with their customers.

How do you see this evolving over the next 5–10 years?

Today, MNOs are running their businesses with more human capital than is necessary. AI will replace functions that can be automated in revenue assurance and network planning so that human intelligence can be reallocated to the roles where it's needed most. We will see AI being used to optimize the

assembly of technologies to deliver better connectivity. Over the next 10 years, as connectivity becomes a commodity, the business intelligence derived from that commodity will become the true value in the industry.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

OXIO was built to support an automated future for telecom, so we are investing in tooling to support the demand for telecom-as-a-service. Legacy networks were not designed for collecting information, and this will be a struggle for them. Every network will need to be paired up with data functions and AI. We are focusing our investments on data pools and platforms to improve data streaming and pipelining. Our goal is to make it easy so that there is a simpler, API-driven path to the future of connectivity and monetization.



Sam Gadodia

Co-Founder and CEO, LotusFlare
Palo Alto, California

LotusFlare is a developer of a growth platform designed to make mobile internet affordable and available. The company's platform allows telcos and OTT players to create data packs, promos, and services without needing to disrupt the core network and also to rate mobile data to reduce the friction of accessing content for users, enabling people in rural areas to access high-speed data and clients to expand their business through mobile applications.

What do you view as the biggest challenges to delivering connectivity today?

LotusFlare sees two main challenges. First, is customer experience associated with connectivity. If an offering is simple and easy to use, there's a much better chance that it will be adopted by the market, consumers, and businesses alike. We're seeing this today with eSIM—the easier we make it to use, the more it's being used and purchased. It's a whole new way of providing connectivity, but only when the experience is simplified and reliable does adoption occur.

Second, LotusFlare thinks that there is still a mentality of trying to deliver the "big" outcome when, in actuality, delivering an initial MVP project would be the better, lower-risk choice. LotusFlare has seen big efforts to create all-encompassing marketplaces stall quickly because CSPs understand, once they get into a project, that it is a massive change to their business and the underlying systems. LotusFlare is a firm believer in delivering a specific outcome that is very well defined and not so large as to become unobtainable due to too wide a scope.

How do you see AI influencing the delivery of connectivity?

AI has been within the industry in various forms for a while, so it has already helped deliver connectivity, especially in the OSS realm (e.g., self-healing networks and service assurance). In our realm (on the BSS side), AI comes into play in how data that is produced by our offering is used to engage customers. The data that LotusFlare DNO Cloud produces should be used by AI-enabled components, among other things, to better define offerings to optimize the likelihood of sale, anticipate churn among specific groups of customers, and

improve post-sales support to drive the cost of supporting customers.

In addition, AI should also serve to help us improve the way we develop and advance LotusFlare DNO Cloud. We are already using AI internally to create developer knowledge bases, so onboarding new developers is faster, and finding answers about capabilities and functions is more readily available. LotusFlare is looking to use AI to help our developers improve LotusFlare DNO Cloud.

How do you see this evolving over the next 5–10 years?

AI is going to have a dramatic impact on everything we do. Marketing/content creation will be highly automated, if not completely. Software engineers will spend less time writing code but more time supervising AI, and the output per engineer will increase exponentially. L1 support will be largely taken over by AI-powered chatbots and tools. The world will move at a faster pace. Connectivity will become an even more critical part of our everyday lives. This means privacy, security, and reliability are paramount to connectivity providers.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

We are investing in AI-assisted coding to help improve our engineering efficiency. We are investing in AI-assisted testing to lower our costs. We are already using AI to help generate marketing content for SEO. Longer term, we are exploring using AI to increase automation and improve operational efficiency. How do we get rid of repetitive tasks from the daily operations and make sure humans are working on creating, not execution of routine tasks?



Leopold Kojeder

Founder and CEO, Compax

Vienna, Austria

Compax is a developer of customized CRM and business support solutions intended to simplify daily business processes. The company provides cloud-based solutions that are customized for every company that feature business workflow automation, product catalog, promotion and campaign management, and document management, enabling companies to operate enterprise functionalities in less time.

What do you view as the biggest challenges to delivering connectivity today?

Mobile: The clear direction is transitioning to 5G networks; however, legacy networks such as 3G and even 2G still exist, posing significant challenges for the network-facing systems. Further, new mobile connectivity options such as eSIM and bootstrap profiles provide significant challenges to the customer experience.

FTTH: The massive shift from copper-based connections to fiber-optic infrastructure for last-mile connections will pose significant infrastructure challenges.

IoT: There are doubts surrounding the capacity of existing mobile networks to handle increased data flows from expanding IoT deployments. Likewise, the ability of existing devices and infrastructure to support new mobile connectivity options will pose new challenges.

OTT: The trend of over-the-top (OTT) applications that began with applications such as WhatsApp and FaceTime is poised to revolutionize mobile operators/ OTT services relying on strong connectivity may also present opportunities for operators to generate additional revenue if they can adapt and become part of the service delivery value chain.

Mobile devices: The rapidly evolving connectivity landscape, characterized by the introduction of satellite connectivity alongside existing Wi-Fi and Bluetooth technologies, poses a challenge to traditional mobile operators. Thus, there is a burgeoning opportunity for over-the-top (OTT) services that can facilitate cross-support between different technologies and providers.

How do you see AI influencing the delivery of connectivity?

The AI industry is expected to revolutionize customer service, potentially reducing the need for human roles in call centers and introducing AI tools to assist customers. While current efforts are focused on integrating AI into operations support systems (OSS), the future likely lies in developing AI tools that directly assist customers, therefore drawing a potentially larger and willing user base. Much like OpenAI's subscription model, which enjoys a significant user base due to its direct assistance to customers.

How do you see this evolving over the next 5–10 years?

The rise of devices with multiple connectivity options underscores the growing importance of satellite operators in providing connectivity. An integrated approach to connectivity is evident in the ongoing mergers between mobile operators and cable/FTTH providers. As operators transition to stand-alone 5G, adjustments in BSS/OSS systems will be necessary for evolving use cases.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

We'd like to make the user experience across channels a focal point. The boundaries between BSS CRM and multi-channel interfaces are fading; we need a unified system that seamlessly integrates various platforms without excessive costs. Emerging low-code/no-code platforms are facilitating the integration of BSS CRM and multi-channel experiences seamlessly and cost-effectively.



Sam Pratt

CEO, Render Networks

Melbourne, Australia

Render Networks is an operator of a cloud hosting platform intended to improve the developer experience. The company's platform builds and runs all applications and websites with free SSL, a global CDN, and auto-deploy from Git, enabling companies to reduce complexity and cost.

What do you view as the biggest challenges to delivering connectivity today?

The cost of capital has risen significantly; primary capital and matching funds required by operators to support government grant programs are, therefore, more expensive, and higher hurdle rates are making it harder to get new projects off the ground. This, coupled with a tight labor market and skills shortages that are driving up costs to build, are the main challenges operators are facing.

How do you see AI influencing the delivery of connectivity?

Delivery of connectivity relies on world-class networks being deployed quickly and efficiently, and AI is only as powerful as the quality and consistency of the data available to feed ML algorithms and learning models.

At Render, our digital construction approach harnesses the power of GIS to enable world-class network deployment and connectivity outcomes. In doing so, standardized and consistent construction and geospatial deployment data is collected and analyzed in real time by Render Insights, our in-platform data analytics engine. This capability is an industry first in the network deployment context. The data infrastructure and real-time insights Render customers now have access to enable operators and builders to do more with less and utilize AI and ML to deliver connectivity faster.

How do you see this evolving over the next 5–10 years?

We see best-of-breed, open API-enabled solutions that support automated design, AI/ML-enabled construction, and efficient active and passive network operations, driving the most value for network operators over the next decade. Consistent GIS data and records are the key to improving connectivity, efficiently delivering world-class customer experiences, and cutting time-to-repair and ongoing opex for network operators.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

Render's investment in API integration infrastructure and real-time data analytics capabilities are foundational to Render offering industry-leading AI capabilities and outcomes for years to come.



Petri Hautakangas

CEO, Tupl

Bellevue, Washington

Tupl is a developer of network operation automation software designed to optimize network and customer care operations for businesses. The company's software uses an AI engine, machine learning, and several other utilities to enable fast innovation cycles for network and customer care operations, enabling operators to increase efficiency and reduce costs.

What do you view as the biggest challenges to delivering connectivity today?

The innovation cycle has slowed in telecom while accelerating in many other industries. Winning operators are disrupting the status quo, but too many are set in their traditional ways. Good initiatives do exist, but far too seldomly reach the operational environment for a variety of reasons.

How do you see AI influencing the delivery of connectivity?

The use of AI is creeping into every aspect of operators' businesses (but could be faster—see earlier response). ML algorithms are in the radio, core, transport architecture, and control plane—functioning as a “co-pilot” to engineering and operations teams.

Operators demand that operational AI/ML be a “white box” rather than black box – in other words, engineers ultimately need to be responsible for their decisions—AI/ML systems need to be 100% transparent and explainable in order to be operational. Operators also want to reserve the right for their own development on top of AI/ML frameworks.

Ultimately, AI is taking connectivity to zero-touch operations:

- +1,000x faster reaction times on customer-impacting issues
- Optimized delivery of connectivity
- Issue prediction and resolution
- Reduced energy costs
- Marketing segmentation

How do you see this evolving over the next 5–10 years?

Key to self-driving networks are:

- Ubiquitous coverage of AI, helping every aspect of connectivity
- Transformative AI technology (originally from LLM, such as ChatGPT)
- Interactive capabilities, enabling complex verbal/text-based interactions and supporting operational tasks

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

In light of the widespread use of AI and transformer technologies in connectivity, our primary investment focus is on advanced, interactive AI systems. These systems are crucial for developing autonomous networks with human oversight, capable of complex verbal and text interactions.

Views From the Front Lines | VETRO



Will Mitchell
CEO, VETRO

Portland, Maine

Vetro is an operator of a fiber management platform intended to meet the needs of competitive ISPs, design engineers, and community fiber networks.



What do you view as the biggest challenges to delivering connectivity today?

To deliver at pace and at scale, the methods have to be digital and integrated—old methods are a drag.

How do you see AI influencing the delivery of connectivity?

At the physical layer, it is a stretch to see influence. But at the service layer, there is no doubt there will be innovation backed by AI.

How do you see this evolving over the next 5–10 years?

There is a rolling force of standardization and efficiency that needs to play out. Getting data right in fewer systems that can talk to one another will be the evolution ahead.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

Integration and automation—enabling technologies at the engine level as a system of record platform. These will enable Vetro to become the digital home of the physical internet.

Views from the Front Lines | MATRIXX



Marc Price
CTO, MATRIXX

Washington, D.C.

MATRIXX is a developer of a digital commerce platform designed to provide modern, converged, and cloud-native digital commerce services.



What do you view as the biggest challenges to delivering connectivity today?

CSPs have to provide seamless connectivity amidst the proliferation of device types and explosion of devices across an ever-evolving landscape of network technologies. This is a serious challenge considering the heterogeneous environment of emerging networks, both public and private, a wide variety of available cloud and edge infrastructure solutions, and the need for devices to roam across both emerging networks and legacy architectures that simply weren't designed for the rapid technological advances we've made.

How do you see AI influencing the delivery of connectivity?

Telcos are moving to a real-time monetization model, in which they provide customers with the right service at just the right time with fully transparent pricing. AI can assist in

the automation process, providing customers with hyper-personalized offers and consequently bringing revenue to CSPs.

How do you see this evolving over the next 5–10 years?

With the speed of AI advancements, the crystal ball is understandably cloudy for next year, let alone the next 5–10. However, we're engaged in a study with 3GPP on the impact of AI/ML on charging and look forward to sharing the results.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

At MATRIXX, we continue to invest in our cloud-native, services-based architecture that offers the kind of linear scaling needed to accommodate peak demand periods as well as opening up new revenue streams.



Views From the Front Lines | Cubro



Christian Ferenz

CEO, Cubro

Vienna, Austria



Cubro offers an array of monitoring tools to oversee the production network and provide network visibility.

What do you view as the biggest challenges to delivering connectivity today?

Today, the biggest issue in networking is the complexity—there are so many layers that have to work together. The second biggest issue is the lack of knowledge inside the organization. In many organizations, IT is only a side tool, and companies tend to invest more in marketing than in IT.

Another major challenge is the limited time dedicated to planning and defining use cases.

Lastly, the biggest issue of all is the lack of investment in maintenance. The notion of preventative maintenance in IT is uncommon. Maintaining infrastructure also needs well-trained people!

How do you see AI influencing the delivery of connectivity?

Some ML concepts have been around for many years—expert systems and neuronal networks, for example. Now, it seems that every company has the AI pitch. The market feels immature and a “ChatGPT for networking” is far in the future, from my perspective.

How do you see this evolving over the next 5–10 years?

ML and AI can help, but first, we must collect the data in a useful way. Secondly, we need automatization to close the loop.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

Data lakes and tools to model use cases and train ML models.

Views From the Front Lines | 1nce



Ivo Rook

COO, 1NCE

Miami, Florida



1nce is a developer of network carrier products designed to offer fast, secure, and reliable connectivity services.

What do you view as the biggest challenges to delivering connectivity today?

Operators closing down markets for international IoT SIM cards (restricting domestic roaming). It's causing confusion in a market that needs longevity and stability to be able to connect devices for a lifetime. Any unplanned truck roll kills a connected products business case.

How do you see AI influencing the delivery of connectivity?

Little. Some AI will be used in backbone resource planning. I do also see the value of AI in shielding networks from malicious attacks and spotting malfunctioning devices.

How do you see this evolving over the next 5–10 years?

I see there being more self-healing networks with well-protected, stable

devices. I believe IoT networks that connect low-value assets (trackers, monitoring, etc.) will be able to be very well protected as an individual hack of a sensor provides little return other than “hostage cases.” Therefore, I believe hackers will focus on high-value connections such as phones, banking apps, and enterprise networks.

I also see AI developing to balance connectivity and edge processing.

These advances enable flat fees, lifetime connectivity, and networks as simple as electricity.

Which key technologies are you investing in (or looking to buy) in light of these changing conditions?

AI, SIM switching technology, device management software, virtual core, and cloud-to-device interconnect.



03

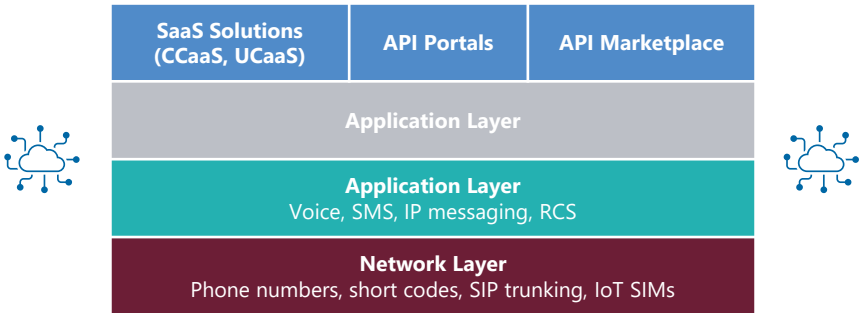
**SPECIAL FEATURE | MAKING CONNECTIVITY
PROGRAMMABLE**

CPaaS Is Becoming the Dominant Model for Business Communications

Key Points

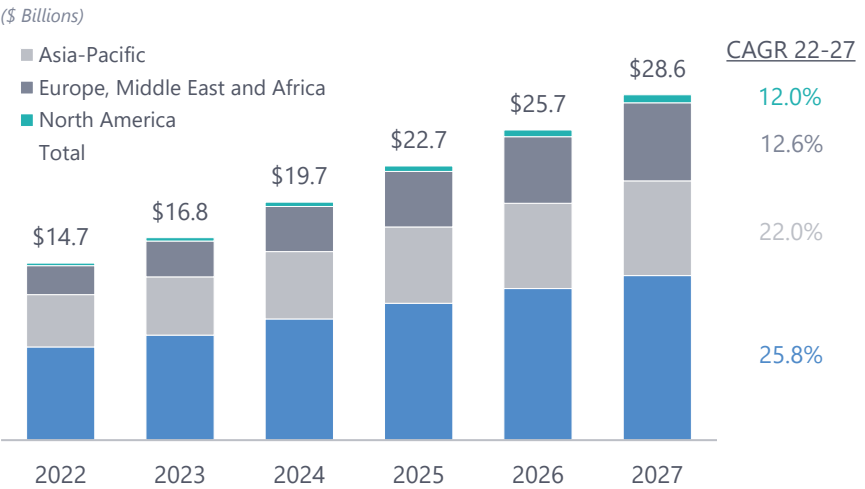
- Communications platform as a service (CPaaS) and mobile messaging platforms are enabling enterprises to engage in real-time, programmable P2P and A2P communications to enhance customer and employee engagement.
- These platforms sit on top of telecom networks, essentially as middleware, and enable developers to embed real-time communications into workflows and applications.
- Vendors provide APIs, SDKs, and libraries for developers to integrate real-time voice, video, chat, and messaging communications into their web and mobile applications and enable digital experiences such as push notifications, voice and video click-to-call capabilities, and secure 2FA.
- A large market opportunity exists at the intersection of CPaaS and traditional business communications segments such as contact center and unified communications.
- Today, ~40% of organizations provide embedded messaging, voice, or video in customer and employee apps; another 40% plan to offer it.

CPaaS Technology Stack



Source: 451 Research.

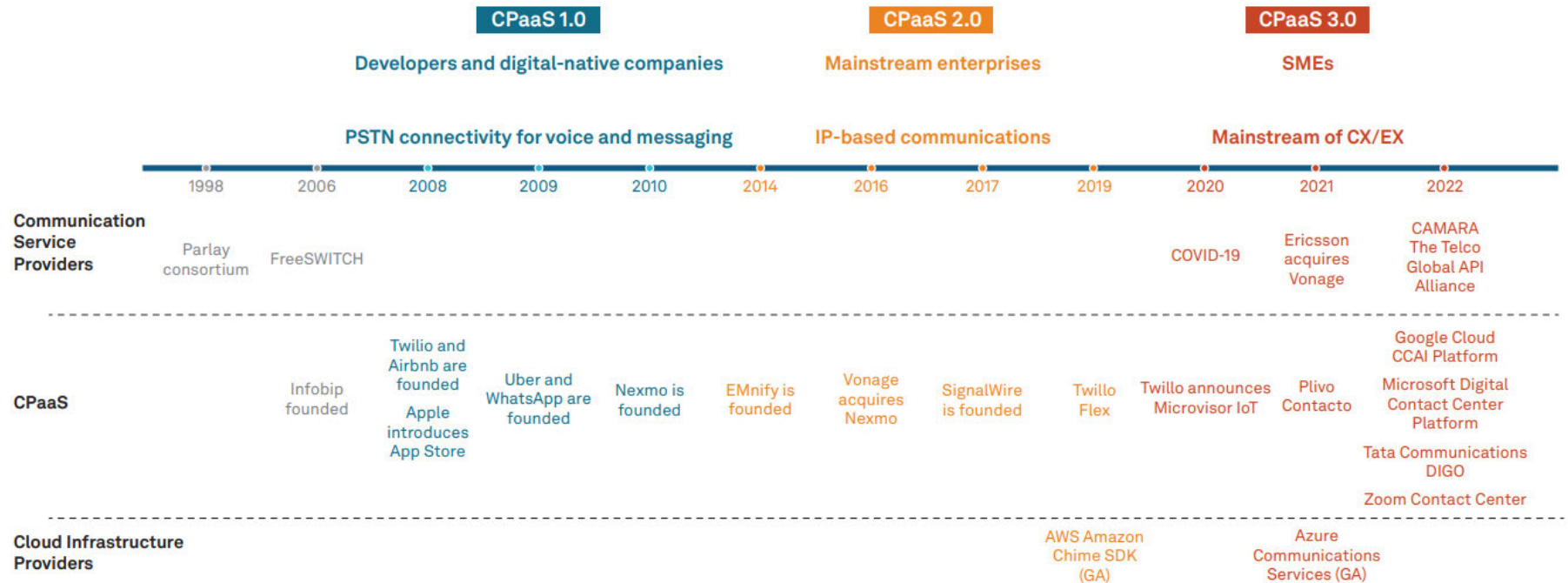
Global CPaaS Forecast



CPaaS Competitive Landscape

Criteria	Categories	Representative Vendors
Connectivity	PSTN	Bandwidth, Tata Communications, TeleSign
	IP-based services	BlackBerry BBM Enterprise SDK
Geographic Coverage	Global	TeleSign, Infobip, Plivo, MessageBird, Twilio
	Regional	Yellow.ai, Route Mobile
Go to Market	Developers	Twilio
	Enterprises	Soprano Design, IntelPeer
	CPaaS enablement	Kandy, Mavenir, Infobip
API Portfolio	Horizontal	Twilio, Vonage, Infobip
	Vertical	EMnify, PubNub

The Evolution of Programmable Communications



Key Points

CPaaS 1.0

- ✓ Platforms grew out of an access layer to the PSTN and were used by early adopters such as startups, developers, and digital-native companies.
- ✓ Emergence of developer-focused, cloud-based providers of telecom APIs, including Infobip, Nexmo (now Vonage), and Twilio—which pioneered the segment now known as CPaaS.
- ✓ The emergence of platform model was a significant development for business communications—evident from the central role of CPaaS in industry disruptors such as Airbnb, eBay, Lyft, Netflix, Uber, and WhatsApp.

CPaaS 2.0

- ✓ Vendors expand beyond early adopters — developers, startups, and digital-native companies—and into the mainstream enterprise segment

CPaaS 3.0

- ✓ Third iteration defined by the mainstreaming of digital transformation, which accelerated as a result of COVID-19, with global CPaaS revenue growing approximately 50% in 2020 and 2021.

Key Market Segments

The landscape is highly fragmented, with vendors across different categories increasingly overlapping with each other.

Standalone CPaaS	– Horizontal vendors with strategies that center on providing a broad range of APIs, SDKs, and libraries enabling developers to integrate real-time voice, video, chat, and messaging into their web and mobile applications.
Specialized CPaaS	– Vendors that provide a specialized set of communication APIs targeting a specific set of requirements, such as connectivity for IoT or video CPaaS.
Cloud Infra Providers	– Cloud infrastructure providers have launched formal CPaaS offerings, placing them in direct competition with stand-alone CPaaS providers.
CPaaS Enablement	– CPaaS technology vendors with go-to-market strategies centered on partnering with CSPs, enabling them to deliver programmable, real-time P2P and A2P communication services.
Communications Services Providers	– Carriers are leveraging national IP networks, enhanced with a CPaaS software layer, to deliver voice, messaging, phone numbers, and specialized services such as Enhanced 911 with enterprise-grade quality, reliability, and scalability.
Customer Engagement	– Platform providers enabling businesses to build and scale personalized omnichannel campaigns based on real-time customer interactions.
Enterprise Communications	– Providers of cloud-based programmable communications capabilities that aim to address enterprise requirements for customer and employee engagement.

Source: 451 Research.

Market Consolidation Is Now Underway

Key factors driving this include:

1 > Offering Expansion

- AI, chatbots, and IoT capabilities are driving M&A roadmaps for many strategic acquirers.
- A large share of 2022 deals were driven by vendors looking to accelerate their product roadmap with conversational AI, in particular.

2 > Geographic Expansion

- Mobile-first regions such as Asia-Pacific and the Middle East have been hotbeds of recent CPaaS M&A activity.

3 > Vertical Expansion

- CPaaS providers have been focused on expanding into verticals with active digital transformation initiatives (e.g., banking, financial services, retail, e-commerce).

4 > Competitive Pressures From Adjacent Sectors

- Carriers and hyperscalers are looking to monetize their infrastructure with programmable, API-based communication services and are competing directly with CPaaS vendors in many cases.
- Vendors in adjacent segments—including CRM, UCaaS, team collaboration, CCaaS, and marketing communications—have also incorporated programmability and digital engagement capabilities into their product roadmaps.

5 > Pent-Up Demand Within the SMB Segment

- Startups and digital natives were first adopters of CPaaS. These adopters were followed by large enterprises, particularly big tech (Uber, Airbnb, etc.). Then, SMB adoption accelerated starting in 2020 as COVID-19 forced everyone into digital communication channels.
- Given their extensive footprints and existing customer relationships, telcos are uniquely positioned to address SMB requirements for customer experience improvement and task automation with API-based connectivity.

6 > Scale and Synergies

- With scale, CPaaS players stand to benefit from improved economics, sourcing costs, and customer acquisition costs—important in a market in which mobile ARPUs are barely holding ground.

Source: 451 Research.



Public CPaaS Trading Comparables

EV/Revenue

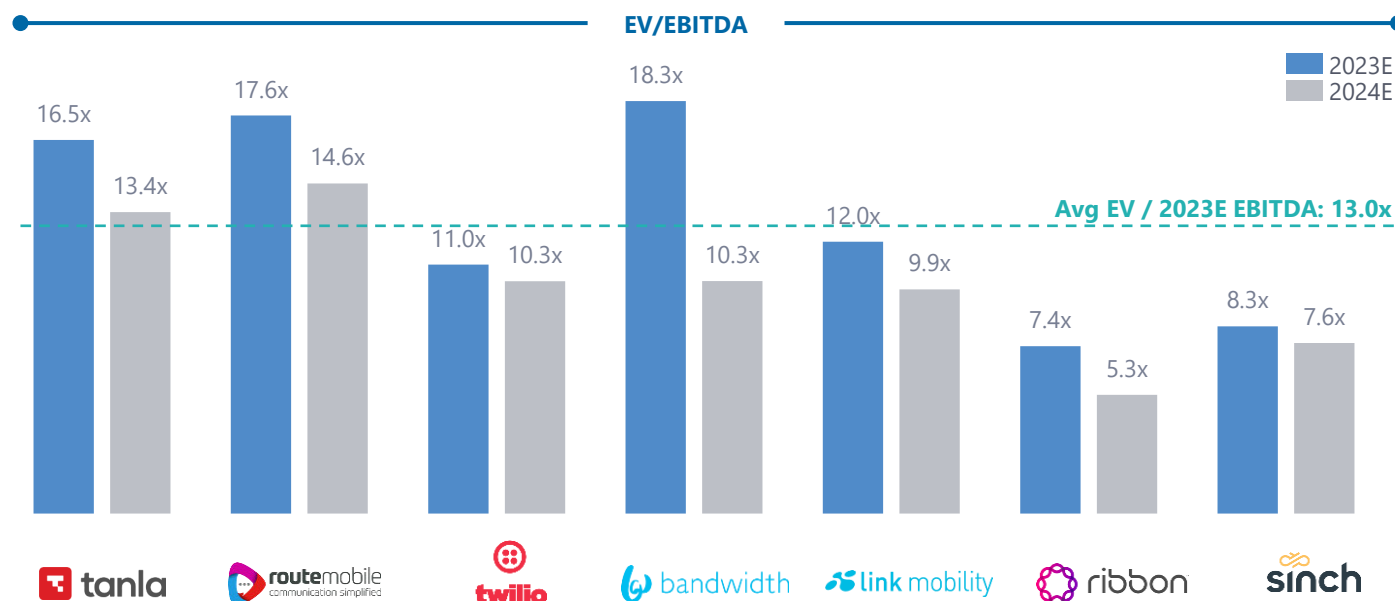
FY23E Median: 1.4x

FY24E Median: 1.2x

EV/EBITDA

FY23E Median: 12.0x

FY24E Median: 10.3x



Headquarters							
EV	1,445.6	1,113.6	8,480.2	813.1	716.9	677.6	2,834.3
EV/23E Revenue	3.1x	2.2x	2.1x	1.4x	1.3x	0.8x	1.0x
EV/23E EBITDA	16.5x	17.6x	11.0x	18.3x	12.0x	7.4x	8.3x
Revenue Growth	23.4%	19.0%	8.2%	14.2%	9.7%	6.1%	7.7%
Gross Margin (23E)	20.8%	16.2%	52.7%	47.2%	28.2%	52.7%	33.2%

Notable CPaaS/A2P SMS Transactions

Date	Country	Target	Bidder Company	EV (£M)	EV/Revenue	EV/Gross Profit	EV/EBITDA	Category
Oct-23		iNet	nuso	n/a	n/a	n/a	n/a	CPaaS
Sep-23		Commify	eci	n/a	n/a	n/a	n/a	CPaaS
Jul-23		routemobile (1)	proximus	874	2.2x (2)	10.7x (2)	17.9x (2)	CPaaS
Jun-23		kaleyra	TATA COMMUNICATIONS	195	0.7x (3)	2.9x (3)	10.8x (3)	CPaaS
Jun-23		ValueFirst A TWILIO COMPANY	tanla	33	n/a	n/a	n/a	CPaaS
May-23		lifesize	Enghouse Systems	16	n/a	n/a	n/a	CCaaS
Apr-23		HelloTech	soprano	n/a	n/a	n/a	n/a	A2P SMS
Jul-22		VONAGE	ERICSSON	4,590	4.4x	8.8x	31.5x	CPaaS
May-22		VOOOOO	Commify	6	0.9x	n/a	n/a	A2P SMS
Apr-22		CDYNE Success as a Service	Commify	23	2.3x	n/a	n/a	CPaaS
Feb-22		Mr. Messaging	routemobile	32	1.4x	n/a	n/a	A2P SMS
Oct-21		Masiv	routemobile	37	n/a	n/a	n/a	CPaaS
Sep-21		PATHWIRE	sinch	1,406	14.4x	18.3x	34.5x	Marketing
Sep-21		MESSAGE BROADCAST	sinch	41	9.4x	10.7x	nm	CPaaS
Sep-21		MESSAGE MEDIA	Message Media	n/a	n/a	n/a	n/a	A2P SMS
Aug-21		Spryng	Commify	11	1.0x	n/a	n/a	A2P SMS
Jun-21		MESSAGE BROADCAST	link mobility	186	6.6x	7.6x	10.8x	CPaaS
Jun-21		tone	attentive	n/a	n/a	n/a	n/a	A2P SMS
Jun-21		Message Media	sinch	922	8.6x	13.8x	25.4x	A2P SMS
Jun-21		Privy	attentive	n/a	n/a	n/a	n/a	Marketing
May-21		soprano (4)	link mobility	305	4.8x	9.0x	19.7x	CPaaS
May-21		zipwhip	twilio	601	7.1x	n/a	n/a	CPaaS
Apr-21		qmm	link mobility	15	1.1x	7.3x	8.2x	A2P SMS
Apr-21		marketingplatform	link mobility	13	1.0x	n/a	n/a	Marketing
Feb-21		mGage	kaleyra	154	1.3x	4.0x	7.0x	A2P SMS
Feb-21		tismil	link mobility	18	n/a	n/a	n/a	CPaaS

Medium sized transactions (£100m-£500m)

Large sized transactions (>£500m)

CPaaS Portfolio by Vendor

Vendor	Messaging		Call																	AI Workflow Automation	Payments
	SMS	2FA	Voice	Video	WebRTC	Chat	VoIP	IoT	E911	SIP Trunking	Call Recording	Number Masking	Number Lookup	Email	Conversation API	Calendar	Contact				
2600Hz	●	●	●	●	●		●	●	●	●	●	●	●								
8x8	●	●	●	●	●	●	●	●		●	●	●	●		●		●		●		
Agora				●																	
Alcatel Lucent Enterprise (ALE)	●		●	●	●	●		●	●											●	
Amazon Web Services			●		●																
AT&T			●																		
AudioCodes			●																		
Avaya	●		●	●			●		●	●	●										
Bandwidth	●	●	●	●	●		●	●	●	●	●	●	●								
BICS (TeleSign)	●	●	●																		
BlackBerry					●		●	●													
Brightlink	●		●		●		●		●	●	●										
Castr				●																	
Cequens	●	●				●							●	●	●						
Cisco (IMImobile)	●	●	●	●		●					●		●	●	●		●	●	●		●
Clickatell	●	●				●									●						●
Cloudinary				●																	
CM.com	●	●	●		●	●	●		●	●	●		●	●	●	●	●	●	●		●
Commio	●		●																		
Dacast					●																

Source: 451 Research.

CPaaS Portfolio by Vendor (cont.)

Vendor	Messaging		Call		WebRTC	Chat	VoIP	IoT	E911	SIP Trunking	Call Recording	Number Masking	Number Lookup	Email	Conversation API	Calendar	Contact	AI Workflow Automation	Payments
	SMS	2FA	Voice	Video															
Dolby (Voxeet)					•														
Dubber											•								
Eltropy				•		•	•									•			•
EMnify								•											
Enabl	•		•	•															
EnableX (vCloudx)	•		•		•														
Enghouse Systems (Vidyo)				•															
Freespee	•	•	•															•	
Glance Networks	•																		
Gupshup	•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•
Heymarket	•																		
iBasis			•																
Infinite Convergence	•	•		•			•	•					•	•					
Infobip	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	
IntelPeer	•	•	•			•	•		•	•	•		•			•	•	•	•
Intrado Flowroute (flica West Corporation)	•		•																
lotum						•													
Kaleyra	•	•	•	•	•	•	•				•							•	
Kandy	•	•	•	•	•	•	•		•	•	•		•					•	•
KonaTel (Apeiron)	•		•																

Source: 451 Research.

CPaaS Portfolio by Vendor (cont.)

	Messaging		Call																		
Vendor	SMS	2FA	Voice	Video	WebRTC	Chat	VoIP	IoT	E911	SIP Trunking	Call Recording	Number Masking	Number Lookup	Email	Conversation API	Calendar	Contact	AI Workflow Automation	Payments		
KPN			●																		
LiveSwitch Inc.					●																
LiveVox	●		●																		
Mavenir (Telestax)	●	●	●	●	●	●	●			●	●							●			
Message Bird	●	●	●			●												●			
Microsoft Azure Communication Services	●		●	●	●	●	●		●		●										
Mitel	●	●	●	●	●	●	●														
Mitto	●	●	●		●	●	●			●	●	●	●	●	●	●	●	●	●		
Mux				●																	
Nylas	●					●		●						●		●	●	●			
OnSIP	●		●																		
Oracle	●																				
Pexip				●																	
Plivo	●	●	●		●		●			●	●	●	●		●						
Plum Voice	●		●																		
Proximus	●	●	●																		
PubNub				●																	
Radisys Engage Digital Platform (EDP)			●	●																	
RingCentral	●		●																		

Source: 451 Research.

04

TRANSACTION CASE STUDIES



Cisco Acquires Accedian

Overview

Acquisition of

ACCEDIAN

by



June 2023

- In June, Cisco announced its intent to acquire Accedian for an undisclosed sum.
- The acquisition will round out Cisco's existing assurance platform with Accedian's sophisticated network performance and user experience monitoring capabilities.
 - Cisco can now offer end-to-end network assurance solutions linked to cloud services.

Headquarters



Montreal, Canada

~400

Employees

Undisclosed

Transaction Value

Transaction Notes

- The acquisition will help Cisco address the needs of communications service providers (CSPs) and web-scalers—who face increasing subscriber expectations and stringent performance requirements—by providing real-time data analytics and actionable insights to ensure their networks perform as expected.
- Cisco and Accedian already partner through the Cisco SolutionsPlus program, a joint automation and assurance solution for service provider customers.
- Accedian's portfolio of microsecond-level sensors and its Skylight Analytics platform will enable Cisco to link data to its ThousandEyes cloud, bringing transformational solutions to clients.
- The Accedian team of approximately 400 employees will join the Cisco organization within the Data Center and Provider Connectivity unit.

Target Description

- Provider of network performance monitoring and assurance services intended for businesses. The company's software and technology are used by the mobile, enterprise, and carrier networks to monitor, test, and ultimately ensure the real-time quality of service and quality of experience for operators.
- **The company operates through four main business segments:**
 - **Cloud visibility:** Cloud migration and hybrid/public cloud monitoring, SDN, and virtualization.
 - **Application performance:** End-user experience monitoring, end-to-end application delivery, SaaS visibility.
 - **Network performance optimization:** Intent-based assurance, edge monitoring, network evolution, and performance troubleshooting.
 - **Security:** Network detection and response, cyber resiliency services.
- Accedian also provides a virtualized performance assurance platform (Skylight) and various other cybersecurity services, including incident response and penetration detection.

“Accedian was born in the heart of the world's largest and most complex networks... In 2017 we transformed the company, accelerated its growth, and evolved to a SaaS-first service assurance platform. We look forward to bringing our critical capabilities to a wider set of solutions within Cisco's networking portfolio and taking the next step in the partnership we have built with Cisco and our joint customers over the last years.

Dion Joannou
CEO, Accedian

”

Sources: Cisco, Accedian, PitchBook.

Cisco Acquires SamKnows

Overview

Acquisition of

SamKnows

by



June 2023

- In June, Cisco announced its acquisition of broadband network monitoring company SamKnows for an undisclosed sum.
- The transaction will allow Cisco to utilize SamKnows' technology and platform to strengthen its ThousandEyes cloud-based network intelligence software.

Headquarters



London, U.K.

~50

Employees

Undisclosed

Transaction Value

Transaction Notes

- The acquisition will allow Cisco to integrate SamKnows' millions of internet measurement vantage points into the last mile, adding increased visibility for customers regarding performance metrics across their infrastructure.
- This transaction, announced a week after Cisco's purchase of Accedian, marks the company's sixth acquisition of 2023.
 - The introduction of the SamKnows portfolio will likely complement the newly acquired Accedian platform in supplementing Cisco's network assurance and monitoring services.
- The SamKnows team will join the Cisco organization in its Network Assurance business.
- The transaction is closed in September 2023.

Target Description

- SamKnows is a London-based developer of an internet measurement platform designed to identify and provide solutions for network problems.
- The company uses a global network of software agents located in everything from home systems to mobile devices and service provider networks to get a real-time measurement of internet performance and customer experience.
- SamKnows offers applications and services like speed measurement, application monitoring, network monitoring, and network visualization through various case-specific platforms.
- Customers include service providers, government regulators, broadband customers, and enterprises.

“

Cisco's acquisition of SamKnows will expand ThousandEyes' visibility of broadband networks and last-mile performance through SamKnows' fleet of millions of vantage points on home routers and mobile devices connected to internet service providers around the globe. It will also bring ThousandEyes' end-to-end network assurance to more broadband service providers, enabling them to isolate and troubleshoot issues faster to assure a differentiated customer experience that reduces churn, attracts users, and enables them to better compete in today's market.

Mohit Lad
CEO, Cisco ThousandEyes

”

Sources: Network World, SamKnows, Cisco, PitchBook.

Cisco Acquires Working Group Two

Overview

Acquisition of



by



August 2023

- In August, Cisco announced its intent to acquire Working Group Two for \$150 million.
- The acquisition will strengthen Cisco's portfolio for current service provider customers by enabling faster monetization of its 5G investments and broadening the availability of its mobility services platform.

Headquarters



Oslo, Norway

90+

Employees

\$150M

Total Purchase Price

Transaction Notes

- The acquisition enhances Cisco's Mobility Services platform, leveraging Working Group Two's API-centric approach and its technological framework. This acquisition accelerates Cisco's shift to more distributed systems, fills gaps in its Mobile Services platform, and brings in much-needed expertise in cloud-native systems.
- Working Group Two taps into the 5G, edge, and cloud ecosystem to provide an as-a-service option for service providers to help them construct and manage new IoT networks and services.
- Cisco is buying out Telenor's 44.6% remaining stake in Working Group Two at a \$150 million valuation, granting Cisco full ownership.
- Over 90 employees from Working Group Two will join Cisco in the Provider Mobility business unit.

Target Description

- Working Group Two is a cloud-native mobile service platform provider offering cloud solutions for mobile operators and cloud-based platforms for launching new services.
- The company has two main products:
 - **Developer portal:** Allows third-party developers/operators to build products leveraging core network events and media streams. Provides access to telco APIs, including authentication, events, data, subscription profiles, messaging, and voice.
 - **Storefront:** Allows developers to market their application across Working Group Two's customer base.
- Working Group Two provides core network services built as a platform and delivered as a service to enable a rich ecosystem of telecom products
- The company provides APIs that allow for provisioning and configuring adaptable mobile subscriptions, enabling telecom operators to configure subscriptions and add products as necessary.

“ The goal? To enable our communication service provider customers to cover ground faster as we work together to monetize their 5G investments. The consumption model is simple and comprehensive, supporting all stakeholders. The end result is a mobility services platform that can dramatically simplify mobile network deployments, provide enhanced edge experiences, enable new and advanced use cases, as well as support simple application development.

Masum Mir
SVP, Cisco

”

Sources: Cisco, Working Group Two, PitchBook, Sdx Central.

Vector Capital Acquires Riverbed Technology

Overview

Acquisition of

riverbed

by



VECTOR CAPITAL

May 2023

- Vector Capital announced its acquisition of Riverbed Technology for an undisclosed sum.
- Riverbed's portfolio of products in the networking and IT observability sectors fit into Vector Capital's investment mandate to acquire established technology businesses.

Headquarters



San Francisco, CA

~2,000

Employees

Undisclosed

Transaction Value

Transaction Notes

- Riverbed's existing lenders, including Apollo Global Management, will continue to support the company by providing it with a new credit facility at closing.
- The deal is the fourth lender-backed investment made by Vector Capital in recent years, following a trend of purchases for companies who have previously converted debt to equity through reorganizations.
- As of transaction close in July 2023, a former Executive VP at Oracle and HP, Dave Donatelli, who most recently served as a Director at a portfolio company of Vector Capital, has replaced previous Riverbed CEO Dan Smoot; former CFO John Theler has returned to the company as well.

Target Description

- Riverbed Technology is an IT solutions provider that develops network and application performance software tools.
- The company's platform offers to visualize, optimize, remediate, and accelerate the performance of any network for various applications.
- Since its inception in 2002, Riverbed has served a wide variety of customers, including 95% of the Fortune 100, across the government, oil and gas, financial services, and retail industries, among others.
- **The company operates two main business segments:**
 - **Alluvio Unified Observability:** Portfolio of tools that allow for data monitoring and analysis across a company's digital service delivery chain to provide actionable insights and intelligent automation.
 - **Riverbed Acceleration:** Solutions that accelerate applications and services across the digital enterprise, helping companies overcome network performance inhibitors like latency and congestion.

“

Riverbed is a terrific business with a strong foundation for success. Its industry-leading portfolios, Alluvio by Riverbed for Unified Observability and Riverbed Acceleration, are market leaders with blue-chip customer bases. Bolstered by a significantly improved capital structure, I look forward to working with Riverbed's team and Vector Capital to enhance our product offerings through innovation and strategic growth investments.

Dave Donatelli
CEO, Riverbed Technology

”

Sources: Riverbed Technology, BusinessWire, PitchBook.

Siris Injects Another \$100 Million in Mavenir

Overview

\$100M Raise

MAVENIR

led by

 **SIRIS**

May 2023

- In May, Mavenir announced its newest round of funding led by its majority owner, Siris, for \$100 million.
- The financing supports Mavenir's innovation-focused strategy, enabling the digitization of telco networks with cloud-native applications.

Headquarters



Richardson, TX

5,000+

Employees

\$1.6B

Total Capital Raised

Transaction Notes

- Networking chip giants, Intel and Qualcomm are the "strategic ecosystem partners" that participated in the latest funding round.
 - The strategic investment will help Mavenir further open a market that is currently closed to independent semiconductors due to proprietary OEM systems.
- Mavenir serves more than 250 communications service providers in more than 120 countries, which serve more than 50% of the world's subscribers.
- Mavenir is building the future of networks and pioneering advanced technology, focusing on the vision of a single, software-based automated network that runs on any cloud.

Company Description

- Mavenir is an end-to-end, cloud-native network software provider servicing CSPs.
- Mavenir is building the future of networks and pioneering advanced technology, focusing on the vision of a single, software-based automated network that runs on any cloud.
- **Mavenir's portfolio includes six main product offerings:**
 -  **MAVcore:** Cloud-native IMS, SMS/RCS, converged packet core, voice services
 -  **MAVair:** Radio/access, multi-access edge computing
 -  **MAVedge:** CBRS/OnGo private networks, private networks, intelligent video analytics (IVA), intelligent IoT platform (IIoP)
 -  **MAVapps:** Digital enablement platform (BSS), fraud and security suite
 -  **MAVbiz:** Communication platform-as-a-service (CPaaS)
 -  **MAVscale:** AI and analytics, next-generation operations, support systems (ngOSS), messaging as a platform (MaaS), webscale platform

“ This investment enables Mavenir to further scale its business and maintain its leadership in Open RAN and 5G transformation...We firmly believe in the automated networks of the future that are cloud-native, AI-native, and green-native, and we are confident that Mavenir's innovations are essential in driving that evolution.

Hubert de Pesquidoux
Siris Executive Partner, Executive Chairman of Mavenir

”

Sources: TelecomTV, Mavenir press releases.

Tata Communications Acquires Kaleyra

Overview

Acquisition of:



by



June 2023

- Tata Communications, a global digital ecosystem enabler, announced it has entered into a definitive agreement through Tata Communications Ltd. to acquire Kaleyra, Inc. (NYSE:KLR).
- With this transaction, Tata Communications will gain an industry-proven platform with strong capabilities and scale.

Headquarters

Atlanta, GA

~700+
Employees

~\$100M
Transaction Value

Transaction Notes

- Under the terms of the agreement, Tata Communications has agreed to acquire Kaleyra, Inc. in a cash-only transaction, at a price per share of \$7.25 for a total consideration to Kaleyra shareholders of approximately \$100 million and the assumption of all outstanding debt.
- This transaction has been unanimously approved by the boards of directors of both Tata Communications and Kaleyra.
- Upon closing of the transaction, expected in six to nine months, Kaleyra Inc. will become a subsidiary of Tata Communications Ltd.
- For the full year ended December 31, 2022, Kaleyra reported revenue of \$339.2 million (\$353.3 million in constant currency), an increase of 26.7% compared to the full year 2021 (32.0% increase in constant currency).

Target Description

- Kaleyra is a global omnichannel integrated communication services provider with a set of proprietary platforms, offering targeted personalization through messaging, video, push notifications, e-mail and voice-based services, and chatbots.
- **Kaleyra’s product offerings:**
 - **SMS:** Transactional messages, OTPs, promotions: all delivered timely and safely to your customers’ mobile phones.
 - **Voice:** IVR, click-to-call, call forwarding, call recording, and call masking features for any app, platform, or website.
 - **WhatsApp:** Converse with your customers on the most widely-used instant messaging app and send media attachments.
 - **Chatbots:** Automate your customer engagement flows with AI-based chatbots for scalable customer interactions.

“With this investment in Kaleyra, we will accelerate our push into the customer interactions platform market and fortify our global commtech position. We are excited about Kaleyra's remarkable talent and their demonstrated capabilities in next-gen technologies. With this acquisition, we will further build intelligent, intuitive, and innovative multi-channel communication solutions to unlock new growth opportunities for our customers.

A.S. Lakshminarayanan
MD & CEO, Tata Communications

”

Sources: Kaleyra press releases, PR Newswire, TelecomTV, PitchBook, LinkedIn.

Amdocs Acquires TEOCO's Services Assurance Unit for \$90 Million

Overview

\$90M Divestiture



(Services Assurance Unit)

to



amdocs

May 2023

- In May, Amdocs announced its acquisition of the service assurance business of TEOCO for approximately \$90 million.
- The acquisition rounds out Amdocs' quality engineering services offering with a suite of tailored solutions for communication service providers (CSPs).

Headquarters



Fairfax, VA

~\$25M

Revenue

~\$90M

Transaction Value

Target Description

- The Services Assurance division of TEOCO provides assurance and analytics software services to CSPs.
- The company's Service Assurance suite is an intelligent and integrated solution for managing fault, performance, and service quality, with a focus on customer-centricity and advanced automation.
- **TEOCO's Service Assurance business includes two main products:**
 - **FAAST (Fault-Analytics-as-a-Service):** ML-driven insight reports and actionable recommendations for network outages.
 - **Network and Service Operations Center (NOC/SOC) Services:** network surveillance, fault management, performance monitoring, and incidence management.

Transaction Notes

- The acquisition will be made with a cash consideration of approximately \$90 million.
- Additional consideration may be paid later based on the achievement of certain performance metrics.
- Revenue from TEOCO is expected to be immaterial to Amdocs in FY2023 and add approximately 0.5% to total revenue in FY2024.
 - The impact on Amdocs' GAAP diluted EPS will be determined after completion of purchase price allocation.
 - Impact on Amdocs' non-GAAP diluted EPS expected to be neutral in FY2023 and FY2024.

“

The move will enhance Amdocs' offering by bringing key assurance expertise and capabilities in-house, enabling us to offer truly end-to-end service orchestration. In today's dynamic and complex 5G era, such a holistic, end-to-end approach is key to delivering on the promise of amazing experiences our customers' end users expect.

Amdocs and TEOCO already partner in some opportunities within the service assurance domain, and this acquisition and the new seamlessly integrated offering will enable us to better serve existing and new customers.

Shuky Sheffer
President and CEO, Amdocs

”

Sources: PitchBook, Amdocs, TEOCO.

EdgeQ Raises \$75 Million Series B

Overview

\$75M Series B



led by

5G VENTURES_

April 2023

Headquarters



Santa Clara, CA

~145

Employees

~\$143M

Total Capital Raised

- EdgeQ, a provider of 5G wireless infrastructure, announced a \$75 million Series B.
- Participating investors include Phaistos Investment Fund, Strategic Development Fund (SDF), Tawazun Council, Singapore-based global investor EDBI, IRONGREY, ST Engineering, Yaletown, and ClearSky.

Transaction Notes

- The funding will be used to ramp production of its 5G+AI “base-station-on-a-chip” to meet customer demand and to develop its next-generation chip.
- With this transaction, EdgeQ has appointed CEO & President of Lattice Semiconductor, Jim Anderson, to the company’s board of directors.
- EdgeQ’s converged 4G+5G+AI chip is available now, with customer deployments expected sometime this year.
- EdgeQ’s converged 4G+5G+AI platform enables operators and enterprises to deploy systems at scale, implement wholesale upgrades without ripping and replacing their current network configuration, and frees the market from vendor lock-in

Company Description

- EdgeQ’s revolutionary approach to wireless infrastructure unifies both 4G and 5G onto a single chip that can elastically scale in performance and features via software upgrades.
- EdgeQ is the only company offering multi-mode 4G+5G convergence along with a production-grade 4G+5G PHY layer for O-RAN distributed unit (DU) and small cells.
- **EdgeQ product offerings:**
 - **Small cell:** EdgeQ’s small cell nodes have enabled campus network, industrial, fixed wireless, and telco outdoor deployments.
 - **Open RAN macro cell:** EdgeQ’s macro cells offer towers chips for 5G and LTE MaMIMO deployment.
 - **Satellite communication:** EdgeQ supports 5G non-terrestrial networks for mobile broadband.

“EdgeQ is built on strong fundamentals that appeal to investors, technologists, and customers. Particularly in the 5G wireless space, EdgeQ possesses the rare blend of ability and aptitude to execute on a compelling vision that will profoundly reshape how the industry conceives and consumes 5G.”

Jim Anderson

CEO, President, Lattice Semiconductor

Airalo Raises \$60 Million Series B

Overview

\$60M Series B



led by



July 2023

- Airalo, an eSIM marketplace for global connectivity, announced a \$60 million Series B raise.
- Participating investors include Antler, E& Capital, GO Ventures, I2BF Global Ventures, KPN Ventures, LG Technology Ventures, Liberty Global, Orange, Peak XV Partners, Rakuten Capital, T.Capital, and others.

Headquarters



Singapore

~200
Employees

~\$67M
Total Capital Raised

Transaction Notes

- The capital injection will drive the following growth goals for Airalo:
 - Expansion of vibrant user base.
 - Expansion of its global team to foster a robust operational framework.
 - Launch of Airalo Partners, a connectivity solution for global businesses and organizations, opening up the B2B space.
- Investors believe Airalo has the potential to become a travel essential and are excited to support its journey towards becoming the definitive gateway to instant connectivity worldwide.

Target Description

- Airalo is the world's first eSIM store, offering digital SIM cards (eSIMs) for 200 countries/regions to combat high roaming charges for travelers.
- The company's application supports 22 languages and boasts a 4.7 average star rating on the App Store and 4.6 stars on the Google Play Store.
- Users can download and install data packs via Airalo, enabling seamless connectivity without the need to switch or carry multiple physical SIM cards.
- Airalo provides seamless connectivity to mobile networks in hundreds of destinations across the globe to more than 5 million travelers.
- By combining cutting-edge technology and a user-centric approach, Airalo empowers travelers with seamless mobile network access, enhancing their global journey experiences.

Over the past years, Airalo has alleviated the pain points and improved the experience of millions of travelers by providing very affordable and accessible connectivity all around the world. This new consortium of investors will further enable us on our quest to build the gateway to instant connectivity worldwide.

Abraham Burak and Bahadir Ozdemir
Co-founders, Airalo

Sources: Airalo, PitchBook.

FloLIVE Raises \$47 Million Series C

Overview

\$47M Series C



led by



GREENFIELD



Sep 2023

- FloLIVE announced a \$47 million Series B funding round led by Greenfield Partners and 83 North with participation from Dell Technologies, Hazelnut Partners, Qualcomm Ventures, and Saban Ventures

Headquarters



London, U.K.

~130
Employees

~\$88M
Total Capital Raised

Transaction Notes

- FloLIVE intends to use the funds to increase the company's global footprint by partnering with additional MNOs and expanding its unique multi-IMSI over eSIM technology.
- FloLIVE provides enterprises with a single-point solution for managing cellular connectivity, bypassing traditional carrier roaming agreements which constitute 98% of connections.
- The company's technology enables seamless IoT and cellular data services provisioning across 220 countries, regardless of endpoint location or network type.
- Qualcomm, an investor, is collaborating with FloLIVE to enhance its IoT platform. Qualcomm is looking to address the significant fragmentation in global cellular services coverage by leveraging FloLIVE's extensive connectivity solutions.

Sources: FloLIVE, TechCrunch.

Company Description

- FloLIVE operates a hyperlocal global network that spans across all continents and offers localized connectivity in a streamlined manner. This globally distributed and API-driven cellular data network serves as the underlying infrastructure for enterprises, OEMs, IoT service providers, and MNOs.
- FloLIVE offers a full suite of connectivity solutions:
 - FloNET:** Global IoT connectivity-as-a-service.
 - FloCONTROL:** IoT connectivity management platform.
 - Cloud-managed mobile private network:** LTE/5G mobile private network with seamless integration into an enterprise's IT infrastructure and adherence to security and corporate policies.
 - Global network-as-a-service:** Global network of local user-plane packet gateways
 - Business support system suite:** Billing and rating, invoicing, taxation, and customer management.
 - Network Resiliency Service:** Back-up cellular IoT connectivity solution, fully managed by the MNO, and ready to kick in according to custom-built rules and business logic at SIM-level.

“After tracking the company and space for some time, FloLIVE's rapid growth adds to our conviction that the company has developed a unique solution that elegantly solves for the full matrix of pain points traditionally plaguing the IoT connectivity market. This solution lays the foundation for new and innovative services that will dramatically change the IoT space as we know it; we are delighted to join FloLIVE's promising journey.

Avery Schwartz
Partner, Greenfield Partners

”

IP Fabric Raises \$25 Million Series B

Overview

\$25M Series B

 IP FABRIC

led by

 ONE PEAK PARTNERS

May 2023

- IP Fabric, a provider of automated network assurance, announced a \$25 million Series B funding round led by One Peak with the participation of Senovo and Presto Ventures.
- The funding will fuel IP Fabric's mission of making network assurance ubiquitous so that users can operate without the risk of network failures or outages.

Headquarters



Czech Republic

~100

Employees

~\$31M

Total Capital Raised

Transaction Notes

- IP Fabric intends to use the funds to expand its operations and business reach.
- This is intended to advance IP Fabric's mission of making network assurance ubiquitous so that people, businesses, and governments can operate without the exponential risk of network failures or outages.
- Network assurance is becoming critical for managing private network infrastructure, which, combined globally, is vastly larger than the internet and forms the backbone of the modern economy. This infrastructure is now the foundation for every part of modern life, from airports and factories to public utilities and financial systems.

Company Description

- IP Fabric presents itself as a leader in the growing network assurance space, helping organizations overcome the complexity of their sprawling internal networking infrastructure, improve security, and ensure that automation proceeds without a hitch.
- IP Fabric product offerings:
 - **The IP Fabric automated network assurance platform:** Empowers enterprise network and security teams to discover, model, verify, and visualize large-scale networks within minutes.
 - **Network security assurance:** A proactive approach to network security for enterprise customers.
 - **Network automation:** Powerful automation that eliminates weeks of manual work.
 - **Multi-cloud networking:** IP Fabric introduces a consistent single view for the network in a multi-cloud world.
 - **Trouble resolution:** IP Fabric automatically discovers and centrally highlights single points of failure, policy, or functional inconsistencies that can cause costly errors or outages.

“

We've seen how network outages can cause businesses and critical infrastructure to grind to a halt, but amidst rising complexity and the need to ensure control in the face of rising cyber threats while adhering to regulatory compliance, enterprises lack the means to assure operations for their entire network end to end. IP Fabric delivers the network assurance needed to operate without the exponential risk of network failure or outages while enabling innovation through standardized access to network control data.

Pavel Bykov
CEO, IP Fabric

”

Sources: Silicon Angle, IP Fabric, PR Newswire.

Ringover Raises €20 Million Series B

Overview

€20M Series B



led by





June 2023

- In June, Ringover announced its series B round of funding from Orange Ventures, Bpifrance's Large Venture, and participation from existing investor, Expedition Growth Capital.
- This round of funding will help Ringover to solidify its leadership position both nationally and internationally.

Headquarters



Paris, France

~300

Employees

~\$40M

Total Capital Raised

Transaction Notes

- This funding will serve to intensify the company's R&D investment, particularly in AI, to revolutionize the way business is conducted and enhance its revenue generating capabilities.
- The deal was structured as a pure equity investment and aims to enable Ringover to extend its technological DNA worldwide with a demanding and transparent product roadmap.
- In conjunction with the funding, David Olsson, Principal of Expedition, will join the board of directors.
- In recent months, the company launched Cadence, a sales prospecting tool, and Empower, an AI-based conversational analysis solution.
- Over the past three years, Ringover has experienced exponential growth, with revenue multiplying eightfold.

Company Description

- Ringover is a powerful, 100% cloud communication solution integrating telephony, video conferencing, SMS, and group messaging.
- **Ringover's product offering includes:**
 - **Business phone system:** Ringover's business phone system provides a secure IP telephony solution with a simple and clear interface, usable without any technical knowledge.
 - **Productivity:** Ringover improves productivity with thoughtful apps, including click-to-call, unlimited call plans, SMS for business, voicemail drop software, and call tags.
 - **Supervision and training:** Ringover offers enterprise customers statistics and reporting, call monitoring, call whisper, call logs, and call recording software for all supervisory and training needs.

Knowing sales performance and customer relations are undergoing major transformations, our priority is to remain attuned to our customers' expectations. With this round of funding, we're accelerating development while remaining true to our fundamental goal—to offer a powerful suite of customer relations tools focused on team performance and enhanced by AI.

Renaud Charvet
CEO, Ringover

Sources: Ringover PR Releases, Finsmes, LinkedIn, PitchBook.

Sitenna Raises \$3 Million Seed Round

Overview

\$3M Seed Round



led by

Syndicate of
Angel Investors

May 2023

- In May, Sitenna announced its newest seed round of funding from a syndicate of angel investors for \$3 million.
- Sitenna will use the funds to accelerate the rollout of its SaaS platform across the target markets of the U.K., Ireland, and North America.

Headquarters



Birmingham, U.K.

~10
Employees

~\$6M
Total Capital Raised

Transaction Notes

- As North America rolls out a 5G and EV charging eco-system, Sitenna seeks to accelerate the deployment of critical infrastructure required to underpin industry 4.0 and the energy transition,
- An advisory board has been established with notable figures in the digital infrastructure space to support Sitenna’s next stage of growth.
- Sitenna's proven software and platform, which drastically minimizes deployment time, have garnered strong investor confidence and optimism.

Company Description

- Sitenna is a B2B SaaS platform for modern infrastructure to deploy and manage sites
- Sitenna is on a mission to digitize the lifecycle of trillions of dollars in infrastructure so that the technologies of tomorrow can be deployed today.
- **Sitenna’s main customer segments:**
 - **Carriers and verticals:** Sitenna enables site acquisition and estate management at scale.
 - **Infrastructure providers and utilities:** Sitenna helps infrastructure providers and utilities scale acquisition, management, and monetization of their assets throughout their lifecycle, reducing capex, opex, and time to revenue.
 - **Real estate and local government:** Sitenna supports local governments in marketing their assets across multiple industries, including wireless telecoms, EV charging, smart cities, IoT, and in-building connectivity.

As we become a key player in North America’s 5G and EV-charging ecosystem we are excited to bring our platform to the North American market to help accelerate the deployment of critical infrastructure required to underpin industry 4.0 and the energy transition.

Daniel Campion
CEO, Co-Founder, Sitenna

Sources: Y-Combinator, Silicon Republic, LinkedIn, SamsungNext.

Tanla Platforms Acquires ValueFirst From Twilio

Overview

Acquisition of:



by



June 2023

- In June, Tanla Platforms announced its acquisition of ValueFirst Digital Media from Twilio for \$42 million, and in a separate deal, ValueFirst Middle East for \$2.4 million.
- The acquisitions will bolster Tanla’s market footprint in India and strengthen its position in the APAC CPaaS space.

Headquarters



Hyderabad, India

1,000+

Customers

~\$45M

Transaction Value

Transaction Notes

- Tanla is purchasing ValueFirst Digital Media from Twilio for \$42 million in cash, subject to upward closing adjustments in the range of \$2.5 million to \$3.5 million.
- In a separate deal, Tanla is purchasing ValueFirst Middle East for a cumulative consideration of \$2.4 million via a combination of primary investment and a secondary investment from existing shareholders.
- With approximately 40% of the target's revenue coming from customers that are net new to Tanla, the acquisition of ValueFirst Digital Media will allow Tanla to significantly expand its market share in India.
- Tanla hopes to create value through the acquisition by accelerating revenue growth in international markets, realizing cost synergies due to consolidation, and offering a more comprehensive suite of communications solutions for customers.

Target Description

- ValueFirst Digital Media is one of India’s largest enterprise messaging aggregators and CPaaS providers. Its product portfolio includes various customer engagement offerings across the communications stack, as well as conversational AI.
- **ValueFirst offers three primary platform solutions:**
 - **Carrier routing:** Its flagship offering, NotifyHub, enables enterprises to intelligently route SMS-based transactions to multiple carriers.
 - **Conversational AI:** ValueFirst’s Surbo enables solutions to enhance customer, employee, search, and contact center agent experiences.
 - **Omnichannel Marketing:** Infinito allows teams to build conversational journeys on Chatbot, Email, SMS, etc.
- ValueFirst services customers across the automobile, banking, retail, and logistics industries, among others.

“

The acquisition of ValueFirst will further strengthen our undisputed market leadership in India. We only believe in purposeful acquisitions and have had an incredible track record with the Karix acquisition, which has seen 20x EBITDA growth over the last 5 years. I am confident we will embark on a similar journey with ValueFirst to unlock massive value.

Uday Reddy
Founder Chairman and CEO, Tanla Platforms

”

Sources: Tanla Platforms, ValueFirst, 451 Research, PitchBook.

Soprano Design Acquires Hello Technology

Overview

Acquisition of:

HelloTech

by

 **soprano**

April 2023

- In April, Soprano Design announced its purchase of Hello Technology for an undisclosed amount.
- The acquisition solidifies Soprano's position in the CPaaS space and enhances Soprano's operational resources, product capabilities, quality of service, and footprint.

Headquarters



Singapore

~40

Employees

Undisclosed

Transaction Value

Transaction Notes

- Hello Technology has established strong relationships with its customers who have needs that align well with Soprano's capabilities and mission.
- The acquisition adds Hello Technology's 600 million interactive mobile messages to Soprano, setting them on a path to exceed 15 billion mobile messages per year in 2023, with more than 7,400 enterprise and government customers globally using Soprano's technology.
- Hello Technology's strengths in A2P messaging services and enterprise and carrier-grade SMS connectivity will augment Soprano's strengths in enterprise messaging platform, administration tools, and advanced messaging applications
- The transaction enables Soprano to offer a more complete CPaaS solution stack, further differentiating it from competitors.

Target Description

- Hello Technology is a software developer that specializes in providing robust, scalable mass communications solutions; the company services customers across the financial services, government, retail, education, and logistics industries.
- **Hello Technology offers four major products:**
 - **Hello Gateway:** Superhighway message delivery platform that enables businesses to message across multiple channels.
 - **Hello MDynamics:** Multi-channel marketing platform that provides an online messaging system to send out bulk SMS broadcasts.
 - **Hello Firecast:** Two-way incident and emergency communication system that provides instant, real-time interactive communications with large groups during critical events.
 - **Tok-Tok! Communicator:** Mobile application for online messaging and social networking, specifically catered for education and enterprise purposes.

“

With the addition of Hello Technology, Soprano is now even better positioned to meet the increasing demand for innovative enterprise and government communication solutions and technology. This positive momentum is crucial at a time when meaningful engagement and trusted mobile interactions have become an even more important form of currency for businesses around the world.

Richard Favero
Founder and CEO, Soprano

”

Sources: Soprano Design, Equiteq, iTWire, Hello Technology, PitchBook.

Connectbase Acquires LastMileXchange

Overview

Acquisition of:



by



May 2023

- In May, Connectbase announced its acquisition of LastMileXchange (LMX) for an undisclosed amount.
- By acquiring LastMileXchange, Connectbase has opened international growth opportunities while offering current clients more exposure to the EMEA and APAC regions.

Headquarters



London, U.K.

~10

Employees

Undisclosed

Transaction Value

Transaction Notes

- With this acquisition, Connectbase will deepen its presence in the EMEA and APAC regions, furthering its journey to be a “connected global platform.”
- LMX is Connectbase’s first acquisition and the latest in a series of the company’s investments in growing its platform capabilities and expanding services.
- The acquisition will add incredible value to both company’s customers, enriching Connectbase’s product offering.

Target Description

- LMX provides communication service providers across the globe with cloud-based access pricing solutions to automate, accelerate, and streamline the quote-to-order sales process.
- The LMX reach enables platform customers to connect 450+ access vendors worldwide and processes more than 15 million quotes per year. Its main product offerings are:
 - **LMX Buyer:** Provides customers with their own dedicated version of the system into which they can add network products, global POPs, and negotiated supplier rates.
 - **LMX Supplier:** Provides customers with automated quotes via an API to their pricing environments, ensures that the latest rates are in use, and provides visibility of services being quoted.
 - **LMX Enterprise:** Maps-based interface that displays existing fiber paths at street level to show the diversity of each location and highlight any single points of failure.
 - **LMX Marketplace:** A multi-tenanted pricing system that provides local access suppliers with a platform to publish rates and solutions to buyers around the world.

“The Connectbase vision has always been global. Bringing the LMX reach, offerings, customer base, and team into the Connectbase fold follows through on our longer-term strategic vision and brings incredible additional value to the existing customer base of both companies. With this acquisition, we are deepening our presence across EMEA and APAC and furthering our journey as a truly connected global platform.

Ben Edmond
CEO, Connectbase

”



05

NOTABLE NEWS STORIES

Sector News: AT&T and HAAS Alert to Advance Vehicle Innovation and Safety



The Background

- HAAS Alert's Safety Cloud is a cellular V2X solution in deployment, connecting emergency vehicles, roadway infrastructure, and other transportation assets together in a consolidated platform for real-time communication with motorists and consumer vehicles.
- AT&T's cellular connectivity, combined with HAAS Alert's V2X software capabilities, will clear the road ahead for automakers that are ready to harness the power of this technology to permanently improve transportation safety nationwide.

Key Benefits

- ✓ Offers first-ever bundling of connectivity and cellular vehicle-to-everything (V2X) software for automakers, marking a new era in connected vehicles.
- ✓ Bundled solution could drive OEM adoption.
- ✓ Full network functionality voice and data communications, including push-to-talk, emergency messaging, and VoIP.

The Outcome

- AT&T and HAAS Alert have entered into a letter of intent to bundle digital alerts from HAAS Alert's Safety Cloud cellular vehicle-to-everything (V2X) service with AT&T-connected vehicle solutions for automakers—delivering lifesaving hazard and roadway alerts to drivers behind the wheel.
- For automakers, this relationship removes barriers to cellular V2X capabilities by offering direct integration and activation of a connected software solution and helping to minimize data costs for sending and receiving digital alerts.
- With the total addressable market for connected vehicles anticipated to triple in the next five years, the need for reliable hyper-connectivity and innovative safety solutions will be greater than ever. As more applications continue to migrate to the cloud, AT&T and HAAS Alert are equipped to support growth in the connected vehicle space and connect more vehicles to the robust Safety Cloud platform.

“

Safety is important to us and has been the hallmark of our business for decades—ensuring we keep our customers and businesses connected through any scenario they may face...Our relationship with HAAS Alert further extends our commitment to public safety and our confidence in connected transportation as a key growth driver in the years ahead.

Cameron Coursey, VP of Connected Solutions, AT&T

”

Sector News: Telus Gains New Lease on Telecom Software Life



The Background

- Like many telecom operators, Canada's Telus was for years stuck in a telecom software rut, weighed down with IT silos and running fast to stand still at enormous cost.
- Change of direction and the adoption of a uniform approach to reusable, application-programmable interface (API)-driven software modules developed by industry body TM Forum have delivered a host of benefits, according to the operator's chief information officer Hesham Fahmy—but it hasn't happened overnight.

Key Benefits

- ✓ Quicker time to market for new value-added offerings for customers.
- ✓ Cost and time efficiencies accomplished through a simplification of systems and operations.
- ✓ Interoperability of new internal APIs makes for a "build once, reuse everywhere" model.

The Outcome

- Telus achieved significant cost savings and delivered valuable new features to customers in a more efficient manner, often reducing costs and timelines by half or even a third compared to previous practices.
- Due to the transformative changes, numerous significant partnerships have been unveiled, among which the most notable is its collaboration with Google.
- These changes are intended to simplify Telus' IT operations across its wireless and wireline network domains.

“

If we wanted to build a new feature, a new value proposition for our customers, we were having to do it four or five different times because we were repeating the same implementation on multiple stacks, using either internal systems we had [developed] or vendor systems. This is when we realized we needed to hit pause because it was hurting our efficiency in terms of agility and time to market, and it was very expensive to add new value to our customers.

Hesham Fahmy, CIO at Telus

”

Sector News: DISH 5G Rollout Reaches 70% of U.S. Population



The Background

- DISH's effort to create a 5G cloud-native open radio access network (RAN), labeled Project Genesis, was announced in 2020.
- DISH expanded into the wireless network carrier space in 2019 during the T-Mobile/Sprint merger.
 - As part of an agreement with the FCC over antitrust concerns, DISH acquired Boost Mobile and 5G wireless spectrum from Sprint and secured rights to use part of T-Mobile's 5G network.
- The company's strategy focused on assembling an open RAN network by utilizing third parties to meet its digital infrastructure needs for both hardware and software.
 - DISH has partnerships with Zayo, Crown Castle, Dell, Samsung, AWS, Fujitsu, Mavenir, AltioStar, VMWare, Nokia, and others.

Key Milestones

- ✓ Completed the nation's first virtualized, O-RAN 5G broadband network, servicing more than 70% of the U.S. population.
- ✓ Rolled out the first 5G voice over new radio (VoNR) offering by a major wireless service provider, covering over 70 million people in the U.S.
- ✓ Launched more than 15,000 5G sites in accordance with FCC commitments.

The Outcome

- On June 14, 2023, DISH announced the completion of its nationwide 5G broadband network, offering service to over 240 million Americans, more than 70% of the U.S. population.
- DISH's project is the first 5G cloud-native open RAN network of its kind, set to provide a competitive 5G alternative to the big three carriers: Verizon, AT&T, and T-Mobile.
- DISH is the first wireless service provider to launch a 5G voice service, voice over new radio (VoNR).
 - VoNR is a method that handles voice calls over a 5G network.
 - DISH's VoNR service currently covers more than 70 million people across the U.S.; rollout will continue through further network optimization.
- 5G offerings are provided through Boost Mobile and Boost Infinite subscriptions, currently available in more than 50 markets nationwide and set to expand through the rest of 2023.

“

As a leader in open RAN technology, DISH is playing a major role in the transformation of America's wireless infrastructure and the way the world communicates. We have made significant progress on our network buildout and can now focus on monetizing the network through retail and enterprise growth. With more markets across the country offering the DISH 5G network for voice, text, and data services, our business can start realizing the benefits of owner economics.

John Swieringa, President and COO of DISH Wireless

”

Sources: DISH Networks, Dgtl Infra, CNET, Boost Mobile, Boost Infinite.



Sector News: Nokia Introduces On-Demand Network Slicing



The Background

- On June 15, 2023, Nokia announced that it had successfully trialed a new solution that allows Android smartphone users to purchase and activate on-demand network slices from their operator.
- Trials took place at Nokia's network-slicing development center in Tampere, Finland.
- The solution utilizes Nokia's IMPACT entitlement server and its UE route selection policy (URSP) technology in order to verify network slice availability and activate selected slices for users.

Nokia's Network Slicing Track Record

- ✓ Highly regarded in 4G and 5G network slicing.
- ✓ First to implement 5G network slicing across device-RAN-transport-core-applications with management and assurance.
- ✓ Successfully ran multiple network slicing trials on its live network in the past, testing solutions for 5G VPN slicing, fixed wireless access slicing, edge slicing, and more.

Potential Use Cases and Benefits

- Nokia's solution enhances efficiency by allowing network slices to be tailored to support specific use cases and different kinds of applications based on qualities like performance, latency, and security.
- Network slicing benefits both end users and operators:
 - **End users:** Customers can personalize their network services to fit their individual needs and use cases; for example, a gamer could activate a gaming-specific slice with enhanced network performance and low latency.
 - **Operators:** Solution creates an opportunity for monetization; for example, an operator can offer premium network slices that can be purchased in certain areas based on customer demand.
- Trials also provided testing for slice interworking functionality between 4G and 5G and dynamic radio resource allocation for different slices.

This trial of the on-demand slicing solution for Android smartphone users is yet another step in our desire to support new monetization opportunities for our operator partners. For mobile operators, slicing unlocks new 5G business opportunities with an opportunity to provide premium services and enhanced customer experience.

Ari Kynäslähti, Head of Strategy and Technology at Nokia Mobile Networks



Sector News: Apple Adds Support for Private 5G Networks



The Background

- Apple has updated its latest iOS 17 and iPadOS 17 systems to support private, data-specific cellular networks, employing technologies such as LTE and 5G non-standalone (NSA) and standalone (SA).
- To connect an Apple device to a private network requires a provisioned eSIM or physical SIM card configured specifically for that network; private networks need to be compatible with supported mobile country code (MCC) and mobile network code (MNC).
- Latest iOS and iPadOS versions support the ITU-standard MCC 999 and all MNCs for MCC 99 private networks; all iPhone models from 12 to 14, as well as the latest generations of iPad Pro, Air, mini, and standard iPad are compatible with MCC 999.
- For organizations, private 5G and LTE network settings can be managed using a mobile device management (MDM) solution or a configuration profile containing a private cellular network payload.
 - Enables features such as 5G stand-alone activation, cellular over Wi-Fi prioritization, and geofence activation.
- iOS 17 and iPadOS 17 have introduced a new feature that allows organizations to assign specific network slices to managed apps on their carrier’s 5G stand-alone network.

The Outcome

- This announcement marks the first time Apple has provided iPhone/iPad support for stand-alone 5G, giving users access to increased functionality and compatibility with various licensing regimes.
- The changes will accelerate the adoption of private 5G networks by eliminating barriers to entry for enterprises, particularly with regard to what devices they can use with those networks.
- Apple’s decision may enable its devices to be more competitive with the existing Android products that currently see high usage with private 5G networks in several harder-nosed industry 4.0 markets.
- The move will potentially have large impacts on the wider private 5G market, as the influence of a large company like Apple supporting private networks could encourage other device manufacturers to do so as well.

Key Benefits

- ✓ iPhone models 13 and up and new iPad models can now be used as work devices in private network setups.
- ✓ Fixes to mobile device management extends various private network features, such as cellular/Wi-Fi prioritization, to Apple products.
- ✓ New support will allow workers using the relevant devices to work across both public and private networks simultaneously.



Additional News Stories

Operators Eager to Monetize 5G



- Network API (application programming interface) exposure is a top-five priority for 73% of communication service providers (CSPs), who are turning to open APIs and SDK (software development kits) to enable software developers to create programs that offer 5G services to customers.
- The market for services enabled by telecom APIs is forecast to grow from \$12 billion in 2022 to \$34 billion by 2026, according to estimates from Nokia.

Paradise Prepares a 5G Platform for Developers



- Paradise Mobile is close to finishing its 5G network buildout and is ready to kick off the next step in its broad strategy: opening its operations to developers.
- Paradise Mobile is building a 5G network across Bermuda. The network spans Bermuda's roughly 20 square miles with a handful of transmission sites – but it runs mainly in the Amazon Web Services (AWS) cloud using software and hardware from Mavenir.
- Paradise Mobile hopes to offer its network as a public test bed that others in the 5G ecosystem can use to prove out new technologies and business models that can subsequently be exported to bigger markets.

Wallaroo.AI and VMware Partner on the Deployment of 5G Edge



- Wallaroo.AI announced a strategic agreement to provide the first unified edge ML/artificial intelligence (AI) deployment and operations platform specifically tailored for the unique needs of global communications service providers (CSPs).
- With 5G, CSPs have new ways of monetizing their networks through industrial IoT and private networks.
- The VMware/Wallaroo.AI solution will mitigate these challenges and help CSPs drive more value from their AI projects.
- It will enable easy deployment, efficient inferencing, and continuous optimization of ML models to 5G edge locations and distributed networks.

Keysight Makes U.K.'s First 100Gbps 6G Sub-THz Connection



- Keysight Technologies, in collaboration with the National Physical Laboratory (NPL) and the University of Surrey, has made the first 6G connection at speeds greater than 100 gigabits per second (Gbps) over sub-terahertz (THz) frequencies in the U.K.
- Future 6G use cases, such as augmented reality and autonomous vehicles, will require data throughput speeds from 100 Gbps to 1 terabit per second (Tbps).
- Located at NPL, this new 6G test bed achieved the U.K.'s first high-speed sub-THz data link. The demonstration was made at a frequency of 300 GHz using both 32- and 64-quadrature amplitude modulation (QAM).



Additional News Stories

Deutsche Telekom Shows Off 5G Network Slicing, RIC Proof-of-Concept Work



- Deutsche Telekom announced progress in disaggregated 5G networks, emphasizing developments in network slicing and the RAN intelligent controller (RIC) through multi-vendor trials.
- 5G network slicing is pivotal for providing tailored services with specific quality assurances to enterprise sectors, though its adoption faces technical hurdles and slower-than-expected market growth.
- The RIC proof of concept underscores the potential for operational cost reductions through automation and energy savings, enables superior customer experiences by optimizing network performance, and fosters new revenue opportunities by facilitating innovative, tailored services in a multi-vendor 5G landscape.

Nokia Offers Network APIs to Nurture Operator 5G Fiscal Success



- Nokia launches a network-as-code platform with tools for developers, aiming to help CSPs monetize their 5G networks, with Dish Network as an early adopter.
- The platform acts as a bridge between developers and operators, supporting multiple vendor interactions and planning a global aggregation role through a revenue-sharing model.
- Nokia's initiative opens telco networks to developers and extends to private wireless deployment. This strategy is pivotal for unlocking new commercial potential in 5G.

Ericsson Executes on Strategy to Build Platform Business With Strategic Partnership to Provide Access to Network APIs



- Ericsson and Deutsche Telekom (DT) have partnered on a platform offering network APIs to developers and enterprises, enhancing 5G capabilities like quality-on-demand and network monetization.
- STL Partners predicts a \$20 billion revenue opportunity from mobile network APIs by 2028, with Ericsson foreseeing even greater operator revenues through new API-based use cases.
- Deutsche Telekom introduces MagentaBusiness API, granting access to Vonage communications APIs and new network APIs, and marking a pioneering step in network API commercialization with a direct link to their mobile network.

How Verizon's Network Cloud Journey Is Paying Off

- Verizon leverages cloud-based network architecture for faster updates and service deployment, using its virtual cloud platform (VCP) and Kubernetes-based OpenShift for greater agility and scalability.
- Verizon uses its Virtual Cloud Platform (VCP) and the Kubernetes-based OpenShift platform to efficiently manage network functions, leading to less downtime and swifter deployment of services like their fixed-wireless access (FWA).
- Despite the move to cloud-native architectures, Verizon insists on retaining control over its network assets, with the potential for multi-cloud environments tied to enterprise needs, while acknowledging the efficiency and cost-effectiveness of this digital transformation.





06

PUBLIC COMPARABLES

Q3 2023 Public Comparables

Company	Stock Price	% of 52-Week High	Equity Value (\$M)	Enterprise Value (\$M)	FY 2023 Leverage	EV/ Revenue			EV/ EBITDA			
						CY 2022A	CY 2023E	CY 2024E	CY 2022A	CY 2023E	CY 2024E	
Allot	\$1.36	32%	50.6	33.6	NA	0.3x	0.4x	0.5x	NA	NA	NA	
Amdocs	\$83.56	84%	9,945.8	10,053.8	0.8x	2.2x	2.1x	1.9x	9.6x	9.1x	8.5x	
CSG Systems	\$51.27	74%	1,456.2	1,922.4	2.0x	1.8x	1.7x	1.6x	7.7x	7.3x	6.9x	
Cerillion	\$16.16	85%	477.0	450.0	0.2x	13.8x	11.0x	9.1x	26.6x	20.4x	18.9x	
Calix	\$37.84	49%	2,492.4	2,254.8	0.1x	2.8x	2.2x	1.8x	17.3x	14.1x	11.8x	
Enea AB	\$4.90	46%	103.7	122.0	3.0x	1.2x	1.2x	1.3x	4.3x	6.1x	4.8x	
Hansen Technologies	\$3.41	86%	692.2	702.1	0.7x	3.6x	3.4x	3.2x	10.6x	11.2x	9.9x	
Optiva	\$3.14	20%	19.4	98.6	17.5x	1.5x	1.6x	1.9x	7.3x	19.8x	7.8x	
Tecnotree	\$0.35	48%	111.5	116.4	0.2x	1.8x	1.7x	1.5x	6.8x	4.5x	3.9x	
IQGeo	\$3.01	73%	185.2	178.8	0.3x	8.9x	4.5x	2.9x	66.4x	19.5x	12.5x	
					Mean	2.8x	3.8x	3.0x	2.6x	17.4x	12.4x	9.5x
					Median	0.7x	2.0x	1.9x	1.9x	9.6x	11.2x	8.5x

Connectivity Software Index vs. S&P 500—EV/Revenue



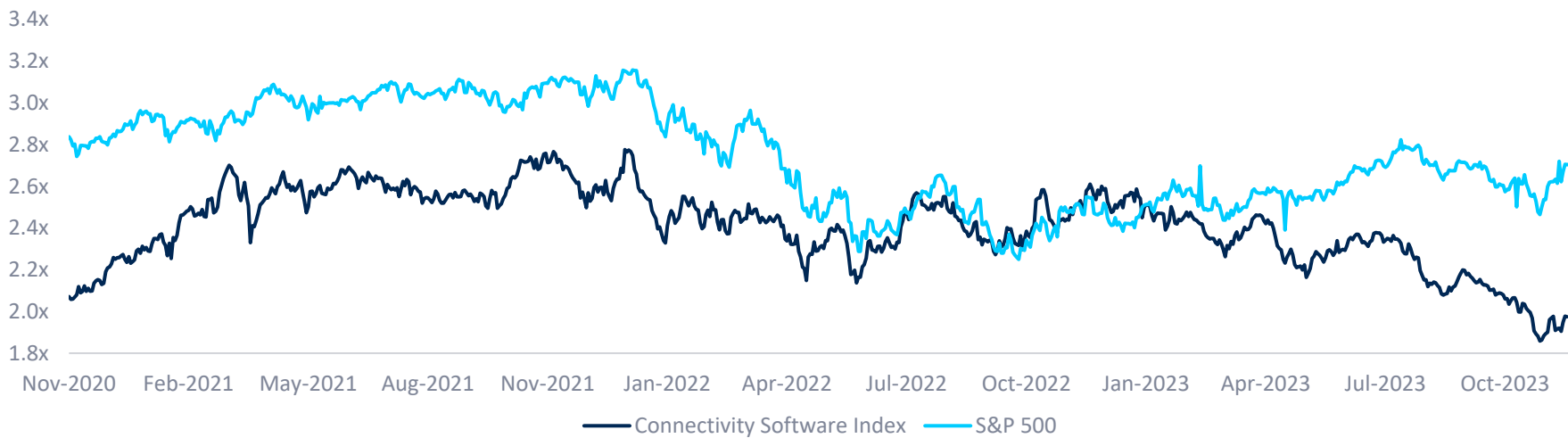
Notes: Stock price last updated on November 16, 2023.

NA means information is not available or not applicable.

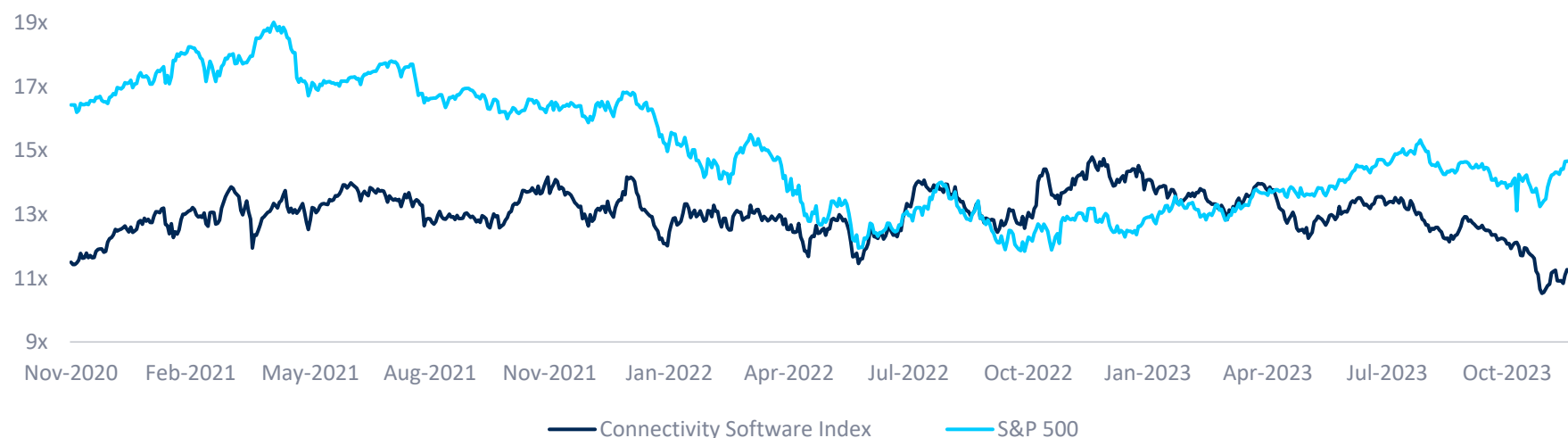
Source: Data from S&P Capital IQ.

Q3 2023 Public Comparables (cont.)

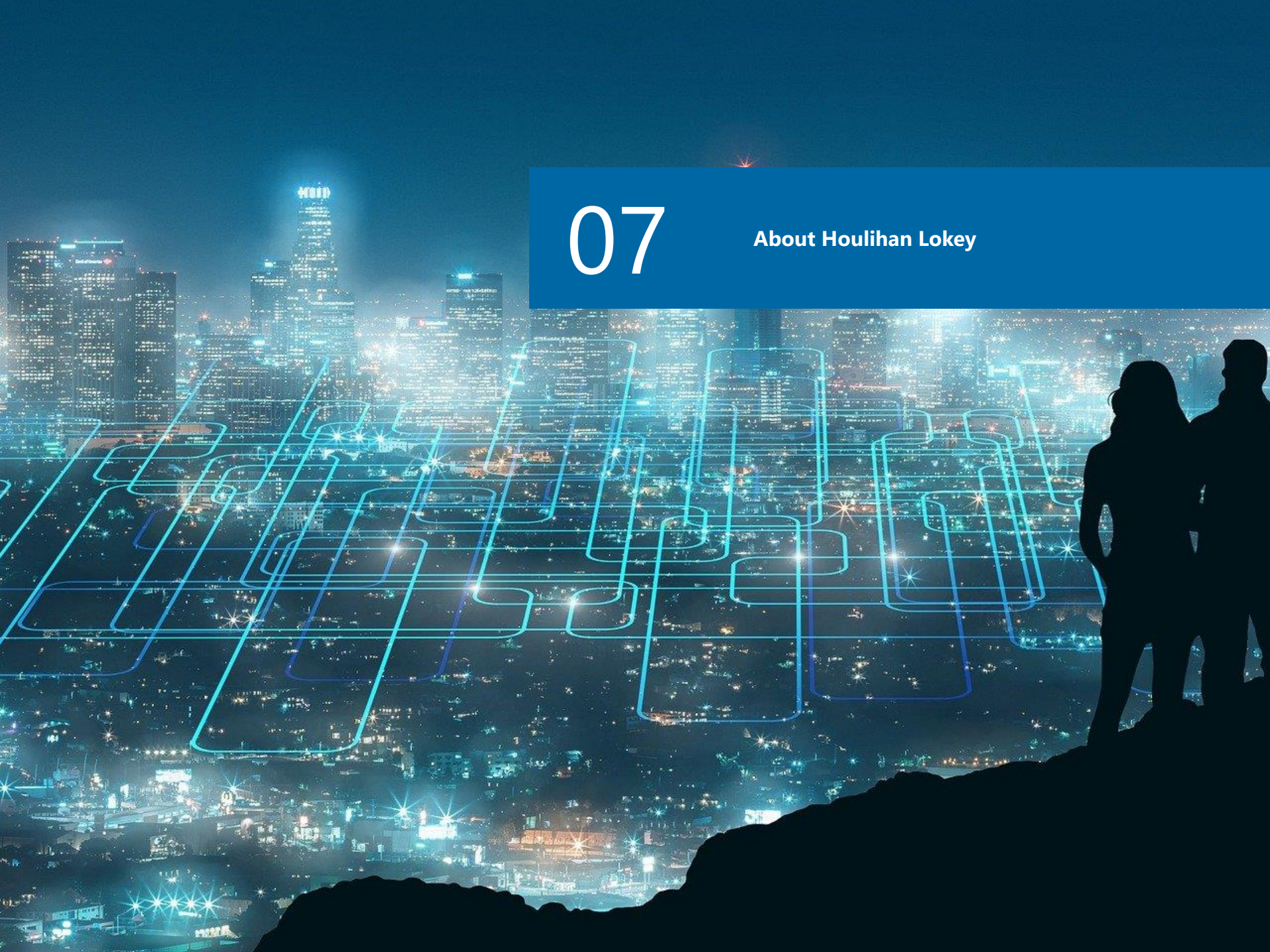
Connectivity Software Index vs. S&P 500—EV/Revenue



Connectivity Software Index vs. S&P 500 – EV/EBITDA



Notes: Info last updated on November 16, 2023.
Source: Data from S&P Capital IQ.

The background of the slide is a vibrant night cityscape, likely New York City, with numerous skyscrapers and lights. Overlaid on this is a complex, glowing blue circuit or network pattern that spans across the middle of the image. In the bottom right corner, the silhouettes of a man and a woman are visible, looking out over the city. The overall color palette is dominated by deep blues and bright, glowing lights.

07

About Houlihan Lokey

Leading Independent, Global Advisory Firm



Houlihan Lokey

Houlihan Lokey Is the Trusted Advisor to More Top Decision-Makers Than Any Other Independent Global Investment Bank

2,680+
Employees

37
Locations

>\$7.5B⁽¹⁾
Market Cap



\$1.8B⁽²⁾
Annual Revenue

~25%
Employee-Owned

No
Debt

Corporate Finance

- No. 1 Global M&A Advisor
- Leading Capital Markets Advisor Raising ~\$25 Billion in Past Two Years

2022 M&A Advisory Rankings Global Transactions Under \$1 Billion

Rank	Advisor	Deals
1	Houlihan Lokey	381
2	Rothschild	369
3	JP Morgan	217

Source: Refinitiv.
Excludes accounting firms and brokers.

Financial Restructuring

- No. 1 Global Restructuring Advisor
- \$3.0 Trillion of Aggregate Transaction Value Completed

2022 Global Distressed Debt and Bankruptcy Restructuring Rankings

Rank	Advisor	Deals
1	Houlihan Lokey	58
2	PJT Partners	30
3	Lazard	29

Source: Refinitiv.

Financial and Valuation Advisory

- No. 1 Global M&A Fairness Opinion Advisory Over the Past 25 Years
- 1,000+ Annual Valuation Engagements

1998 to 2022 Global M&A Fairness Advisory Rankings

Rank	Advisor	Deals
1	Houlihan Lokey	1,232
2	JP Morgan	1,030
3	Duff & Phelps, A Kroll Business	938

Source: Refinitiv.
Announced or completed transactions.

Financial Sponsors Coverage

- No. 1 Global Advisor to Private Equity Firms
- 1,000+ Sponsors Covered Globally

2021 Most Active Global Investment Banks to Private Equity Firms

Rank	Advisor	Deals
1	Houlihan Lokey	323
2	Deloitte	218
3	William Blair	183

Source: PitchBook.

Houlihan Lokey + **Oakley Advisory**

Houlihan Lokey acquired Oakley Advisory, an independent advisory firm that provides a range of services to clients across the digital infrastructure, communications services, and cloud landscape.

With the addition of Oakley, Houlihan Lokey covers the full spectrum of digital infrastructure and connectivity in the U.S and Europe

- Broadband and Connectivity
- Towers and Shared Infrastructure
- Data Centers and Managed Services
- Wireless and Spectrum
- Telecom Services
- Telecom Software

(1) As of November 30, 2023. (2) LTM ended September 30, 2023.



Overview of Technology

Broadband	Business Management Software	Cloud Solutions	Communication Tech Solutions	Cybersecurity	Data and Analytics
Data Centers and Managed Services	Digital Media	EdTech	EHSS	Entertainment	FinTech
Gaming (Gambling)	GovTech/Public Sector Software	GRC and Safety	Human Capital Management	Healthcare Software	Industrial Software
Infrastructure Software	Legal	MarTech	Natural Resources, Energy, and Commodities	Nonprofit/Associations	Other Vertical Software
PropTech	Retail	Satellites	Semiconductor Technology	Tech Services	Telecom Services
Telecom Software	Towers and Wireless Infrastructure	Transportation, Logistics, and Mobility	Travel and Hospitality	TV, Film, and Entertainment	Wireless Services

Global Coverage



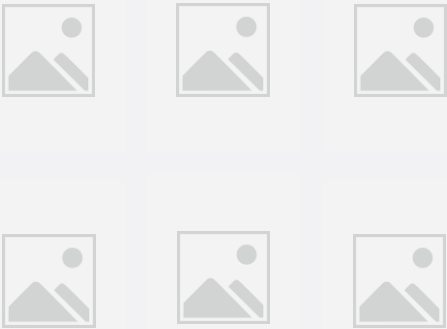
Global No.1 Technology Team

2022 M&A Advisory Rankings
All Global Technology Transactions

	Advisor	Deals
1	Houlihan Lokey	116
2	Goldman Sachs & Co	106
3	Morgan Stanley	79
4	Rothschild & Co	76
5	JP Morgan	75

Source: Refinitiv. Excludes accounting firms and brokers.

Recent Transactions



*Selected transactions were executed by Houlihan Lokey professionals while at other firms acquired by Houlihan Lokey or by professionals from a Houlihan Lokey joint venture company.

Global Connectivity Software Team

U.S. Team



Vik Pandit
Managing Director
New York
VPandit@HL.com



Wayne Harrington
Vice President
Boston
WHarrington@HL.com



Thomas Grigglesstone
Financial Analyst
Boston
Thomas.Grigglesstone@HL.com



Ewan Jones
Financial Analyst
New York
Ewan.Jones@HL.com



Sanford Miller
Financial Analyst
New York
Sanford.Miller@HL.com

U.K. Team



Greg Widroe
Managing Director
London
GWidroe@HL.com



Chris Godsmark
Managing Director
London
Chris.Godsmark@HL.com



Christian Maher
Managing Director
London
Christian.Maher@HL.com



Ed Wirgman
Managing Director
London
Ed.Wirgman@HL.com



Leticia Plaza Marin
Vice President
London
LPlazamarin@HL.com

Global Reach



Raymond Fröjd
Managing Director
Stockholm
Raymond.Froj@HL.com



Sameer Jindal
Managing Director
Mumbai
Sameer.Jindal@HL.com



Sara Napolitano
Managing Director
Paris
Sara.Napolitano@HL.com



Hisashi Yoshimura
Managing Director
Tokyo
Hisashi.Yoshimura@HL.com



Ido Zakai
Managing Director
Tel Aviv
Ido.Zakai@HL.com

Senior Leadership



Jason Hill
Managing Director
Global Head Digital Infrastructure;
Co-Head U.S. Technology
Boston
JDHill@HL.com



Rob Louv
Chairman of U.S.
Technology
San Francisco
RLouv@HL.com



Sascha Pfeiffer
Managing Director
Head European Technology;
Global Head Software
Frankfurt
Sascha.Pfeiffer@HL.com



Sean Fitzgerald
Managing Director
New York
SFitzgerald@HL.com



Chris Hebble
Managing Director
Los Angeles
CHebble@HL.com

Financial Sponsors



20+

Senior Financial
Professionals
Covering



1,000+

Relationships



End-to-End Coverage of Connectivity Software

Houlihan Lokey is tracking more than 1,000 companies in the space

Houlihan Lokey

Application Layer

Sales and Marketing

- Channel Management
- Marketing Automation

amdocs

CSG INTERNATIONAL

ERICSSON

NOKIA

Netcracker

advertising

alepo

cerillion

CloudSense

compaxDigital

Connectbase

LOTUSFLARE

maplewave

SPOTIQ

Product Management

- Data and Product Management
- Product Cataloging

amdocs

COMARCH

CSG INTERNATIONAL

ERICSSON

HANSEN TECHNOLOGIES

Netcracker

CloudSense

compaxDigital

ETIYA

evergent

KEYEDIN

LOTUSFLARE

onebill

qvintel

TIERONE

Customer Experience

- Customer and Subscriber Management
- Contact Center Software

amdocs

COMARCH

CSG INTERNATIONAL

Microsoft

Netcracker

NOKIA

ERICSSON

syniverse

ASAPP

CloudSense

compaxDigital

ETIYA

evergent

Innovative Systems

INVOCAP

lovox

LOTUSFLARE

moflix

Revenue Management

- Rating and Charging
- Billing and invoicing

amdocs

COMARCH

CSG INTERNATIONAL

ERICSSON

HANSEN TECHNOLOGIES

Netcracker

ARIA

BLULOGIX

cerillion

compaxDigital

DigitalRoute

ETIYA

IZI Systems

Innovative Systems

LOGIBEST

MIND

MATRIX

onebill

qvintel

revio

sonar

Technoe

TimeIQBill

wavelo

Cloud Communications

- VOIP, UCaaS, CPaaS

cisco

dialpad

ERICSSON

LogMeIn

Microsoft

ORACLE

RingCentral

twilio

2600Hz

8x8

ALIANZA

AVOXI

bandwidth

plivo

ribbon

TELNYX

Expense Management

- Enterprise Telecom, Mobility and Software Expense Management

brightfin

Calero

Sakon

tangoe

ASIGNET

CALVI

GAC

ISI Telemanagement Solutions

ISI

TEMIS

VALICOM

veroxos

ZYLO

Deployment Management

- Mapping, Planning and Design
- Project and Asset Management

amdocs

Beniley

COMARCH

ERICSSON

Fujitsu

HEAVYAI

Netcracker

servicenow

smartsheet

Connectbase

itd

IQgeo

NEXSYS-ONE

OneVizion

Render

SITENNA

SITETRACKER

TEOCO

VERSANT

VETRO

vitruvi

Partner Management

- Supplier Management
- Carrier Interconnect

amdocs

ERICSSON

CSG INTERNATIONAL

syniverse

Beyond Now

OneVizion

compaxDigital

mobileum

NEXSYS-ONE

TOMIR

TEOCO

wgtwo

Network Provisioning

- Network Planning and Orchestration
- Customer Order Fulfillment

amdocs

blueplanet

hp

CISCO

ERICSSON

NOKIA

ACCEDIAN

Druid

eti

gluware

Innovative Systems

ivalua

MAVENIR

OCEUS

PACKET-FABRIC

TEOCO

wavelo

wgtwo

Network Management and Analytics

- Network Data and Analytics
- Network Observability, AI and ML

amdocs

Calix

COMARCH

ERICSSON

Fujitsu

IBM

KEYSIGHT TECHNOLOGIES

NOKIA

B-YOND

mobileum

TOMIR

elisa

mycomosi

gluware

OCEUS

Pill

Spectrum

kentik

TEOCO

wgtwo

RAN/Spectrum Management

- Open RAN
- Spectral Efficiency

Airspan

amdocs

ciena

infovista

KEYSIGHT

MAVENIR

Rakuten

Ospirent

Qualcomm

ACCELERCOM

A(tellera)an

airhop

amarisoft

cohere

DEEPSIG

EFFNET

e-wireless

Phluido

Pill

SPECTRUM EFFECT

TEOCO

Connectivity-as-a-Service

- Cellular IoT
- Telecom-as-a-Service

guavus

KORE

JT

SIERRA WIRELESS

syniverse

TRUPHONE

aeris

bics

blues wireless

cubic telecom

EII

esense

Hologram

kajeet

Kigen

NAVOCO

monogato

OXIC

PARTICLE

TEAL

TELNA

velos

wgtwo

Private Networks

- Private Connectivity (LTE, 5G, WiFi)

MAVENIR

ALEF

ASOCS

LATHONET

celona

Druid

fw

OCEUS

Pente

TEAL

Decentralized Networks

- Wireless Networks
- Broadband Networks

helium

Airwaive

althea

extendify

HEXAGON WIRELESS

KARRIERONE

Next Level

WORLD MOBILE

Mobile Core

- Performance Management and Automation

hp

amdocs

Microsoft

NOKIA

ERICSSON

ORACLE

amarisoft

ARIMA NETWORKS

alepo

casa systems

Cumucore

EII

MAVENIR

monogato

ngvoice

OCEUS

OXIC

Quortus

Symplicity

wgtwo

Network Layer

How Houlihan Lokey Can Help

Our firm is extremely well-equipped to help our clients navigate uncertain times. We respond quickly to challenging situations and are constantly helping clients to analyze, structure, negotiate, and execute the best possible solutions from both a strategic and a financial perspective.

What We Offer

1  Corporate Finance	Mergers and Acquisitions Capital Markets Private Funds Advisory Board Advisory Services	We are widely recognized as a leading M&A advisor to the mid-cap market and have long-standing relationships with capital providers, including commercial banks and other senior credit providers, insurance funds, asset managers, and mezzanine fund investors. Few other investment banks maintain the breadth of relationships and capital markets intelligence that we do.
2  Financial Restructuring	Company Advisory Special Situations Distressed M&A Liability Management Creditor Advisory	We have the largest restructuring practice of any global investment bank. Since 1988, we have advised on more than 1,500 restructuring transactions (with aggregate debt claims in excess of \$3.0 trillion). We served as an advisor in 12 of the largest 15 bankruptcies from 2000 to 2022.
3  Financial and Valuation Advisory	Portfolio Valuation and Fund Advisory Transaction Opinions Corporate Valuation Advisory Services Transaction Advisory Services Real Estate Valuation and Advisory Dispute Resolution Consulting	Over the past five decades, we have established ourselves as one of the largest financial and valuation advisory firms. Our transaction expertise and leadership in the field of valuation help inspire confidence in the financial executives, boards of directors, special committees, investors, and business owners we serve.

Why We're Different

 No. 1 for Global Under \$1B and Tech M&A*	 Significant Experience With Financing Markets	 Senior-Level Commitment and Dedication	 Deep, Industry-Specific Expertise	 Superior Work Product/Technical Abilities	 Creativity, Imagination, Tenacity, and Positivity
---	---	--	---	---	---

*Source: Refinitiv. Excludes accounting firms and brokers (2022).

Disclaimer

© 2023 Houlihan Lokey. All rights reserved. This material may not be reproduced in any format by any means or redistributed without the prior written consent of Houlihan Lokey.

Houlihan Lokey is a trade name for Houlihan Lokey, Inc., and its subsidiaries and affiliates, which include the following licensed (or, in the case of Singapore, exempt) entities: in (i) the United States: Houlihan Lokey Capital, Inc., and Houlihan Lokey Advisors, LLC, each an SEC-registered broker-dealer and member of FINRA (www.finra.org) and SIPC (www.sipc.org) (investment banking services); (ii) Europe: Houlihan Lokey Advisory Limited, Houlihan Lokey EMEA, LLP, Houlihan Lokey (Corporate Finance) Limited, and Houlihan Lokey UK Limited, authorized and regulated by the U.K. Financial Conduct Authority; Houlihan Lokey (Europe) GmbH, authorized and regulated by the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht); (iii) the United Arab Emirates, Dubai International Financial Centre (Dubai): Houlihan Lokey (MEA Financial Advisory) Limited, regulated by the Dubai Financial Services Authority for the provision of advising on financial products, arranging deals in investments, and arranging credit and advising on credit to professional clients only; (iv) Singapore: Houlihan Lokey (Singapore) Private Limited and Houlihan Lokey Advisers Singapore Private Limited, each an “exempt corporate finance adviser” able to provide exempt corporate finance advisory services to accredited investors only; (v) Hong Kong SAR: Houlihan Lokey (China) Limited, licensed in Hong Kong by the Securities and Futures Commission to conduct Type 1, 4, and 6 regulated activities to professional investors only; (vi) India: Houlihan Lokey Advisory (India) Private Limited, registered as an investment adviser with the Securities and Exchange Board of India (registration number INA000001217); and (vii) Australia: Houlihan Lokey (Australia) Pty Limited (ABN 74 601 825 227), a company incorporated in Australia and licensed by the Australian Securities and Investments Commission (AFSL number 474953) in respect of financial services provided to wholesale clients only. In the United Kingdom, European Economic Area (EEA), Dubai, Singapore, Hong Kong, India, and Australia, this communication is directed to intended recipients, including actual or potential professional clients (UK, EEA, and Dubai), accredited investors (Singapore), professional investors (Hong Kong), and wholesale clients (Australia), respectively. No entity affiliated with Houlihan Lokey, Inc., provides banking or securities brokerage services and is not subject to FINMA supervision in Switzerland or similar regulatory authorities in other jurisdictions. Other persons, such as retail clients, are NOT the intended recipients of our communications or services and should not act upon this communication.

Houlihan Lokey gathers its data from sources it considers reliable; however, it does not guarantee the accuracy or completeness of the information provided within this presentation. The material presented reflects information known to the authors at the time this presentation was written, and this information is subject to change. Any forward-looking information and statements contained herein are subject to various risks and uncertainties, many of which are difficult to predict, that could cause actual results and developments to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. In addition, past performance should not be taken as an indication or guarantee of future performance and information contained herein may be subject to variation as a result of currency fluctuations. Houlihan Lokey makes no representations or warranties, expressed or implied, regarding the accuracy of this material. The views expressed in this material accurately reflect the personal views of the authors regarding the subject securities and issuers and do not necessarily coincide with those of Houlihan Lokey. Officers, directors, and partners in the Houlihan Lokey group of companies may have positions in the securities of the companies discussed. This presentation does not constitute advice or a recommendation, offer, or solicitation with respect to the securities of any company discussed herein, is not intended to provide information upon which to base an investment decision, and should not be construed as such. Houlihan Lokey or its affiliates may from time to time provide financial or related services to these companies. Like all Houlihan Lokey employees, the authors of this presentation receive compensation that is affected by overall firm profitability.





Houlihan
Lokey

CORPORATE FINANCE
FINANCIAL RESTRUCTURING
FINANCIAL AND VALUATION ADVISORY

HL.com