

# RCRWireless

INTELLIGENCE ON ALL THINGS WIRELESS

BONUS  
SUPPLIER  
GUIDE

**Diameter to be tested by data, VoLTE demand; evolve in a NFV, SDN, cloud world**

By Dan Meyer

Report Sponsors:



Supplier Guide Sponsors:





Mobile telecom networks are constantly seeing their capabilities pressured by ever-increasing demand from consumers to remain connected at all times. This has forced telecom operators to throw billions of dollars at spectrum resources, network technologies and marketing tactics in order to gain control over their operations.

One network element increasingly coming under the microscope is Diameter signaling, which is the traffic cop tasked with identifying and routing network traffic across IP-based LTE networks to ensure everything runs smoothly. When Diameter platforms struggle, we have seen networks nearly brought to their knees. But, when they are up to the task, they disappear into the complicated morass that is the modern telecom network.

The Diameter protocol is responsible for authentication, authorization, accounting, policy and charging, and mobility management in LTE networks, expanding its 3G role in policy and charging – meaning that issues with Diameter not only have the potential for slow networks or dropped connections, but lost billing information.

In this latest update on the Diameter space, we will look at how the market has evolved over the past 12 months; where we stand today in terms of Diameter development and deployment; challenges facing the Diameter market; the impact new services like voice over LTE and increased consumer demand for mobile video are having on Diameter; what impact virtualization technologies using software-defined networking, network functions virtualization and cloud are having on

Diameter; and what can be expected from the market over the next 12 months.

### Diameter market by the numbers

Infonetics Research recently noted the global Diameter signaling controller market increased 81% in 2014, hitting \$381 million. The market was boosted by growing LTE network deployments and customer usage, with Infonetics predicting the Diameter signaling control market to grow threefold between 2014 and 2018, hitting \$1.8 billion.

Infonetics also found that in 2014, top use cases for Diameter were based on centralized routing and roaming via Diameter edge agents. North America was singled out as the largest market for Diameter signaling controller revenue, accounting for more than one-third of the market, followed by Europe, the Middle East and Africa and Asia Pacific.

“Growth in the regions is predominantly tied to rising LTE subscribers, however in

EMEA, where there are many more operators, the need for signaling controllers for roaming is having an impact,” the firm noted.

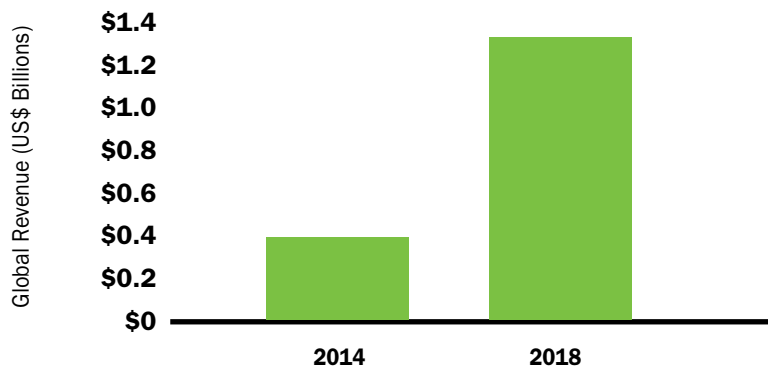
Infonetics noted a number of top vendors in the space, including Huawei, F5, Oracle, Ericsson, Alcatel-Lucent, Sonus and Mavenir, with expectations of continued consolidation possible.

Oracle, as part of an extensive report, said it expects traffic across Diameter signaling platforms to surge from 30 million messages per second in 2014, to 395 million messages per second in 2019, which it attributes to increased penetration of LTE services. (See sidebar for more details from Oracle.)

### Diameter in a growing data world

Obviously, the numbers show the market for Diameter is expected to post robust growth over the next several years. But, that doesn't mean the market has not seen growth and evolution over the past 12 months. This surge

## The global Diameter signaling control market is expected to triple in size between now and 2018



© Infonetics Research, *Diameter Signaling Control: Annual Market Size and Forecasts: January 2015*

Telecom operators have been busy in recent years throwing out diverse rate plans in order to entice increasingly fickle consumers and outmaneuver their rivals. These moves have put tremendous stress on LTE Diameter signaling traffic, which is expected to explode over the next five years.

According to a new report, "Oracle Communications LTE Diameter Signaling Index, Fourth Edition," LTE Diameter signaling traffic is predicted to grow at a 68% compound annual growth rate through 2019, with total Diameter traffic surging from 30 million messages per second in 2014 to 395 million MPS by 2019. Oracle notes that growth will push Diameter signaling traffic past total global IP traffic over that time frame, and put a substantial burden on wireless carriers to bolster their Diameter signaling platforms.

"As CSPs continue implementing LTE networks, they must effectively manage the resulting Diameter signaling traffic in capacity planning. Ignore it, and CSPs risk network outages or overprovisioning," said Greg Collins, founder and principal analyst at Exact Ventures, in a statement tied to the Oracle study. "With the massive growth that Oracle is forecasting ... CSPs should focus on implementing a Diameter signaling infrastructure that is scalable and reliable to cost-effectively control and route signaling traffic."

The Oracle report cites a handful of application areas expected to generate healthy increases in Diameter signaling traffic, including:

- LTE Broadcast, which Oracle states is the fastest-growing generator of Diameter signaling traffic on track to rack up 49.5 million MPS by 2019. "The technology is just emerging, and continued growth is expected as CSPs trial LTE Broadcast for everything from digital signage to live video

feeds at sporting events," Oracle notes.

- Policy, which is the main driver of Diameter signaling traffic and expected to create 277 million MPS by 2019. "With more sophisticated policy use cases, the number of Diameter transactions between policy enforcement points and charging has increased," Oracle said.
- Voice over LTE, which is expected to post a 49% CAGR by 2019, generating 43.1 million MPS.

Breaking down predicted Diameter signaling growth by region, Oracle predicts developed markets will be the biggest overall drivers of traffic, though developing markets will see the most dramatic increases in overall traffic generated.

Asia-Pacific is expected to post the most Diameter signaling traffic by 2019, with the region generating 188 million MPS by 2019, at a 78% CAGR. Oracle also notes the region will lead in VoLTE signaling, generating 19.9 million MPS by 2019, at a 55% CAGR.

North America was cited by Oracle as "beginning to mature in Diameter signaling traffic," predicted to generate 82.9 million MPS by 2019, though with growth slowing to a 42% CAGR. Europe is expected to be a close No. 3, generating 78.7 million MPS within the next four years.

Of the regions expected to post the most dynamic growth, Oracle noted Latin America and the Caribbean will see a 118% CAGR by 2019, with overall Diameter traffic hitting 15.4 million MPS. The Middle East and Africa is expected to post slightly lower growth with a 103% CAGR, through overall traffic is forecast to hit 29.8 million MPS by 2019.

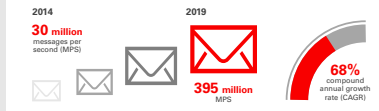
# Global Diameter Signaling Will Surpass Total Global IP Traffic by 2019

Changing subscriber behavior is driving rapid LTE Diameter signaling growth across the globe. As the number and variety of devices and applications continues to grow, understanding the impact on signaling becomes more important.

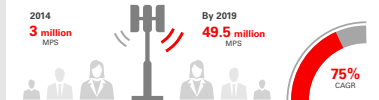
The Oracle Communications LTE Diameter Signaling Index 4<sup>th</sup> Edition, October 2015, provides insight into how Diameter signaling is impacted by applications, and forecasts global Diameter growth by region through 2019.

## HUGE GROWTH OVER THE NEXT FIVE YEARS

With LTE penetration on the rise, global Diameter signaling continues to demonstrate strong growth



## LTE Broadcast has the largest impact on Diameter signaling



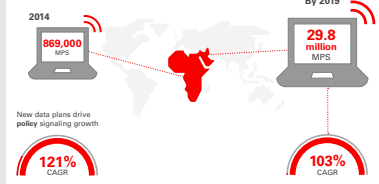
## ASIA-PACIFIC

The largest generator of Diameter signaling by 2019



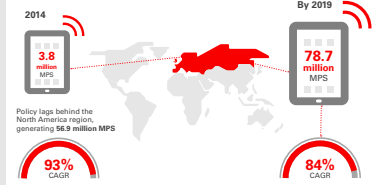
## MIDDLE EAST & AFRICA

Second-fastest growing region for Diameter signaling



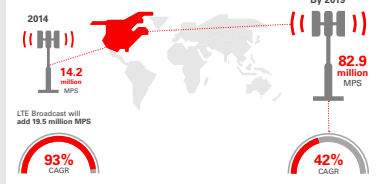
## EUROPE

Europe will contribute 78.7 million MPS to global Diameter signaling



## NORTH AMERICA

Growth is slowing as the market matures



## LATIN AMERICA AND THE CARIBBEAN

Latin America represents the highest growth of all the regions



## YOUR GUIDE TO THE FUTURE OF LTE DIAMETER SIGNALING

The Oracle Communications LTE Diameter Signaling Index forecasts global and regional LTE Diameter signaling traffic trends—so you can plan the most effective strategy for managing and monetizing it. Get your copy of the full report for more in-depth analysis of the current global and regional trends, and emerging opportunities to come.

Get the full report

Join our communities



has been boosted by the continued rollout of IP-based LTE networks that rely on the Diameter standard to handle network signaling; the continued adoption of mobile data services by consumers, most notably bandwidth-hungry mobile video services; and telecom operators continuing to bolster their LTE core with IP multimedia subsystem deployments.

“Diameter has been growing really strong over the past few years,” noted Greg Collins, founder of technology analyst firm Exact Ventures. “LTE and IMS are driving a lot of the growth, though there are a number of different elements that ‘speak’ Diameter, including policy and billing,

with that number expanding as network traffic grows in the packet core and IMS.”

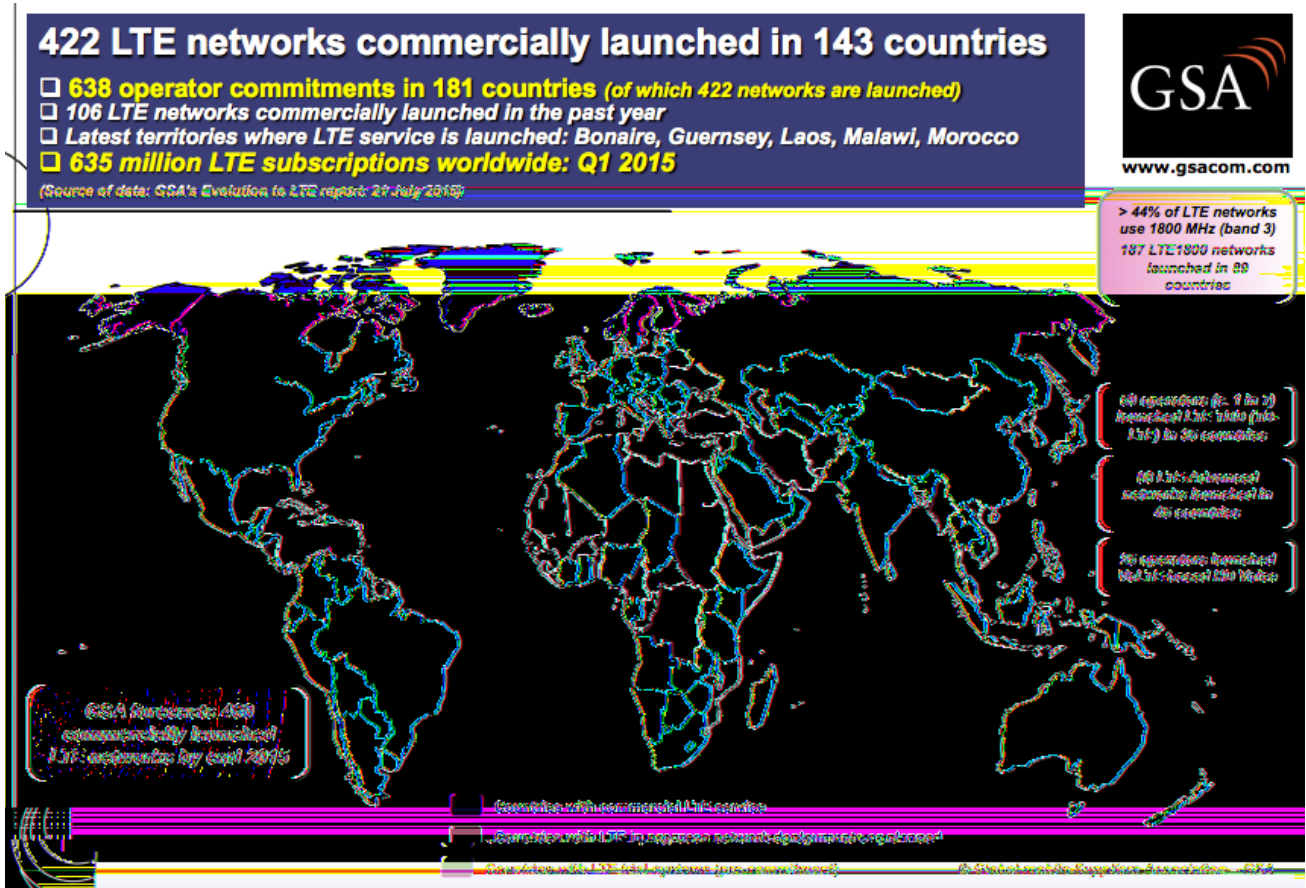
According to recent figures from the Global mobile Suppliers Association, at mid-year 422 operators had launched commercial LTE systems in 143 countries, with expectations of 460 commercial LTE networks by the end of 2015. Those networks were supporting 755 million mobile connections, with more than half of those added over the past 12 months. The GSA said it expects total LTE-based connections to hit 1 billion by the end of the year.

This growth has come from both the launch of new networks garnering early adopters as

well as increased competition in developed markets supporting multiple LTE carriers.

“We are past the point of Diameter being a novel thing with the number of LTE deployments out there,” said Bill Welch, senior product manager of Diameter signaling controllers at Sonus.

Vendors noted carriers in those developed markets have rapidly moved beyond the phase of just having an LTE network in order to be competitive to over the past year figuring out that they needed to tap into the full capabilities of those networks in order to remain competitive and gain





greater operating efficiency.

“This year we have seen the market move beyond just offers of plain data,” explained Kevin Summers, senior director mobile strategy at Mitel. “The rollout of LTE seems to be inevitable. What I am seeing is that when I spoke with customers last year they said LTE was wonderful and couldn’t we keep it just like that. The answer for most developed markets is no. Voice and video need to be supported and it has impacted all vendors. On the signaling front it means that this year we have had to start working hard to support voice over these networks and interfaces. That evolution is just going to grow.”

In support of that evolution, telecom carriers appear to be recognizing the need to ensure their LTE networks are able to handle growing demand. Early trials and tribulations showed that underestimating the need of robust Diameter support for LTE deployments will cause network pains, which some noted carriers have taken to heart.

“We as an industry have done a good job in letting carriers know that they need to understand,” said Peter Nas, senior solutions architect at F5. “Network traffic growth problems require operators to put serious thought into their diameter deployments and I think they have realized the importance of really thinking through those deployments. The technology and those deployments are more mature now and operators know it’s not just a sales pitch anymore. It’s how they need to design it and they are more realistic in those designs. They know they need to put in diameter to protect their networks.”

### **SS7 remains in play**

With growth in LTE deployments and customer adoption driving increased Diameter traffic, some vendors noted that over the past year they have also seen telecom operators needing to bolster their legacy SS7 platforms serving their 2G and 3G networks. Joerg Ewert, technical product manager for Ericsson’s BU Cloud and IP division, explained that in some cases LTE networks still lack the outright reach of legacy networks, but that hasn’t stopped consumers from increasing their data demands.

“Over the past 12 months there has been momentum to combine Diameter and SS7 traffic,” Ewert said. “SS7 is not growing as much, but its still being supported and a lot of the legacy SS7 equipment is older and carriers are finding it needs to be updated.”

Summers said that with 90% of mobile customers worldwide still on 2G or 3G connections, SS7 will remain a significant part of telecom networks for years to come.

“Big operators I have talked to have said it will be at least 10 years before they expect to see any reduction in SS7 traffic,” Summers said. “It’s maybe not growing, but it’s not shrinking or going away. There are certain end-of-life situations occurring that means there are vendors being asked to upgrade. But, for now you can’t just turn off SS7 support and if your platform is not able to handle any increase in traffic load, then you are likely looking at some sort of upgrade.

Policy and charging platforms are also in need of updating as mobile operators become more aggressive in marketing services. That

aggressiveness has seen carriers roll out new rate plans for both traditional mobile customers as well as more creative offerings tied to enterprise customers and growing insertion of cellular connectivity tied to the “Internet of Things.” What were initial deployments designed to handle basic rules and functions have become platforms tasked with making sense of marketing and billing creativity.

“[Policy and charging rule functions] was deployed as part of Diameter because it was part of the specification or was thrown in because it was part of the packet core, but carriers did not pay attention to the details. For many that deployment let them check that box,” explained Steffen Paulus, director of product marketing for policy, charging and network analytics at Alcatel-Lucent. “But, as mobile data surged and policy became more central to operations, those PCRFs were not made for that. Similar to the Diameter signaling controller market in that a lot of the tools can do the job, but are not really made to handle the changing and growing market.”

### **VoLTE pushing diameter demand**

VoLTE, while still in its infancy, is also said to be placing considerable strain on Diameter platforms. Vendors noted just setting up a single VoLTE call results in up to a dozen Diameter signals, which considering operators are looking towards VoLTE to at some point support all voice traffic, is setting up to be a significant signaling generator.

Domestically, three of the nation’s four largest mobile operators have launched VoLTE services, providing high-definition voice and



video capabilities to some customers. However, limitations remain in terms of device compatibility and so far there is no support for cross-carrier conversations, though work is progressing on both of those fronts. Those issues have also kept carrier somewhat subdued in terms of promoting those efforts, thus keeping VoLTE-related signaling traffic modest.

Analysts are also somewhat mixed on their views VoLTE to impact signaling platforms.

“VoLTE could create its own signaling storm, although we don’t see it being nearly as problematic as previous signaling storms,” noted Michael Thelander, CEO and founder of Signals Research Group, in a recent report looking at VoLTE deployments. “We do believe that an increase in signaling traffic isn’t necessarily a bad thing. In the case of diameter signaling, it could merely be an artifact of new sources of revenue that did not previously exist. This situation is much different than what transpired with the 3G signaling storm, which was generally caused by rogue applications which generated a disproportionate and frankly unnecessary amount of signaling traffic relative to the actual data payload. Then again, operators in many regions of the world do not have any specific plans to monetize VoLTE. Instead, they are including it as a ‘free service’ that gets billed no differently than what they offer today with their subscription packages that typically involve unlimited voice and a limited monthly data package. ... Further, the industry is better prepared to deal with a signaling storm. Vendors have supposedly taken into consideration high signaling loads when designing their platforms



Source: Verizon Wireless

VoLTE requires up to a dozen Diameter signals to initiate a single call.

and operators claim to have architected their network accordingly. If anything, the anticipated increase in diameter signaling traffic does add credence to the need for some sort of diameter signaling controller/agent to aggregate, route and control the signaling traffic that does exist.”

Exact Ventures’ Collins echoed Thelander’s comments, stating he thinks there should not be any signaling issues related to broader VoLTE deployments in the near term, though it was still too early to tell what could happen down the road.

“VoLTE has not yet taken a lot of traffic yet,” Collins said. “A lot of work has been done to handle potential signaling storms, but so far it’s hard to say if there is enough capacity to handle the load. I think there is not enough capacity there today to handle loads that will be there in three years. ... Operators have been

slower to deploy VoLTE and hopefully they can work on getting the support in place.”

Despite the slower than expected roll out of VoLTE, carriers know they must move forward with deployments if they want to stay above the “dumb pipe” analogy in the minds of consumers. Over-the-top players have already established a beachhead in the minds of consumers for providing video calling and advanced messaging services, with FaceTime, Skype and Facebook quickly becoming the “Kleenex” of the space.

Vendors have noticed that pressure and are working with carriers on battling the OTT threat.

“VoLTE is tricky from so many angles,” Summers explained. “Operators took the approach that ‘I can’t make money on this. I can’t sale voice as an extra service.’ Now we know that’s not true. Operators were asleep on

*Robin Kent, director of European operations, Adax*

The number of devices with access to LTE networks is constantly rising across the globe. ABI Research predicts the total number of LTE subscribers will hit almost 1.37 billion by the end of the year, rising to 3.5 billion by 2020, as the technology continues to thrive in a range of markets. It's clear that the demand from end users to be connected to a "smarter world" is ever increasing, driven by the much publicized "Internet of Things," the rise in data and application use, and voice and video calls over LTE, which operators are now beginning to offer end users.

However, this surge in traffic across the network will have a detrimental impact on operators that are ill prepared for the future. While investment in LTE infrastructure is expected to grow nearly 10% year-on-year, it's paramount for operators to know exactly how to prepare efficiently.

Network operators that are unprepared will be faced with a potentially severe "bottleneck" in their network. There are basic issues with Diameter signaling, the protocol that enables communication among network elements, that threaten to cause mass disruption to the network, which could lead to a diminished quality of experience for network subscribers and ultimately operator revenue loss.

#### **Problems with the underlying transport protocol**

The problem is not with Diameter itself, but rather its underlying transport protocol. Many operators are still using the outdated transmission control protocol, or indeed user datagram protocol for radius as a transport, which are simply not up to the task of handling tens of thousands of active co-current connections.

TCP is largely insufficient and cannot cope with the specific signaling needs that the LTE network requires, let alone the demands that IoT traffic and increased voice over LTE will place on the network. A single VoLTE call alone can require more than nine Diameter transactions, which places a large amount of pressure on the networks.

Greater volumes of data transfer and consumption mean that the strain is being felt at various levels, and critical, evolved signaling and transport solutions are needed to match the demands.

A creaking TCP infrastructure is also having a huge impact on operators' ability to analyze data. A reliable and robust transport layer, which can cope with thousands of signaling messages, is a fundamental part of the analytics process for operators. It is one of the primary steps in the data analytics sequence. Data has to be delivered to operators on time, accurately and reliably. Unstable signaling will have a negative effect on network behavior and distort this analytic data.

The transport layer is not only important in the data analysis process. It also plays a significant part in the control of data consumption and the volume of

transactions. This has become especially important following the vast uptake in data-centric applications. Instant messaging and voice over Internet Protocol, along with video content downloads and sharing, are all particularly bandwidth sapping, meaning the transport layer is a vital component for operators.

#### **How to keep up with the evolving end user habits**

In light of these issues, stream control transmission protocol is the transport solution that operators should be, and indeed more are, beginning to turn to due to the limitations of TCP. Embedded Linux SCTP may seem like the more convenient and economical solution but it cannot keep up with the multitude of connections and constant user activity that is the very essence of the new LTE network. This requires a large number of signaling connections and concentration for efficient routing, which is only going to increase as more devices join the network. The challenge for operators is pre-empting this problem by employing signaling solutions that can support more intelligent signaling and traffic patterns.

While there are deficiencies in the standard SCTP protocol, the problem is far greater than simply signaling transport technology. Operators are running the risk of failing to keep up with their network subscribers' needs and demands. This isn't a case of replacing the entire transport protocol; operators should be implementing upgraded solutions that recognize the changing data consumption landscape. Unlike previous networks, operators are experiencing an unparalleled volume of simultaneous connections on the LTE network. The number of Diameter transactions is on a sharp increase and the performance of its underlying transport layer – SCTP – is critical to maintaining a high level of customer experience on the network.

The solution Adax has developed, SCTP/T, provides Diameter with thousands of robust and reliable associations; ensuring Diameter's instant readiness and ability to carry the traffic required by the host application to any and all of its possible destinations.

#### **Policy management, maximizing revenue and effective billing**

If the transport protocol cannot cope, then it poses a problematic challenge for operators who are trying to manage the signaling messages that are coming through from the network. Again, the issue here is forward planning as operators will be unable to identify popular items of data and subsequently manage or alter policy accordingly.

It's clear that LTE has opened up a number of alternative revenue channels for operators, but due to the signaling deficiencies in the network there is a high risk that service providers won't bill users accordingly. The ability to control communications is seriously affected with inadequate transport protocols,

but the power to control billing policy will also suffer because operators are effectively operating wearing a blindfold. Information is not being transported correctly, and personalizing their service plans will be near impossible.

#### **Overcoming challenges and securing the next generation network**

To overcome the challenges of an ageing signaling infrastructure, operators must look at a solution that performs vigilant in-service quality monitoring along with precise detection capabilities. But it's not just a case of improving the reliability of signaling transport solutions.

It's also crucial that operators look at investing in transport technology that provides the necessary security for the network and its subscribers. The rapid development of IoT has worried some. Not all IoT traffic will go over LTE, some will run over 3G or could potentially be broken down to a more granular protocol level, with GTP for example. Some answered questions also remain as to whether IoT devices that require network connectivity have the necessary security protection that is required of traditional devices accessing the network.

If there is a fault in the transport protocol, operators are either receiving mixed or incorrect messages that can compromise network security. Faulty signaling, on any level, is an invite to harmful content or unverified users to enter the network, which the operator has a depleted level of control over.

However, it's not all about the future and the LTE network. TDM networks are not going away, and in some cases expanding, so it's important for operators to have solutions in place that meet the demands from a plain old telephone service through 2G and 3G to 4G and beyond. Operators should be interworking Diameter to SS7 and ensuring they address the need for highly reliable SIGTRAN communications and SS7-SIGTRAN interworking, especially with the rise in value-added service applications.

The LTE network is maturing quickly, but there are still fundamental problems with the basic infrastructure. With the developments in IoT technology, the rise in voice and video over LTE offerings, and data and application use on the increase, not to mention "5G" on the horizon, the problems with inadequate network signaling capabilities in the core network have to be eradicated now otherwise the infrastructure will be unsustainable. As new technologies that require network connectivity develop, it becomes incrementally important that basic network requirements, such as reliable signaling processes, are prepared and fully functional by the time the connecting technology is ready to be connected. LTE needs reliable, high-performance, high-capacity signaling capabilities now.



# High performance for high expectations.

## How do you deliver new services that will delight customers?

F5 virtualization solutions enable scalable network services with dynamic security at every layer, giving you the flexibility to offer new services that keep customers coming back for more.

Learn what F5 solutions can do for you at [f5.com/solutions/service-provider](https://www.f5.com/solutions/service-provider).



Solutions for an application world.



OTT apps like FaceTime are threatening the position of carriers.

messaging and have lost that market to OTT and now voice could be next in line. Operators are doing a great job with their networks and the OTT guys are going to take advantage of that.”

Summers added that while VoLTE can be a significant challenge for VoLTE in terms of initial call set up, the application itself does not require a lot of bandwidth, and thus should not be much of a burden once a connection is established. More troubling for carriers are VoLTE’s low latency requirements and coverage.

**Diameter in a virtualized world**

When looking towards advancements in Diameter platforms, many pointed towards virtualization. The telecom virtualization space has witnessed significant moves towards the use of SDN, NFV and cloud in order to help mobile operators gain further network efficiency and increase network agility, and the software-centric nature of Diameter lends

itself to such deployment models.

Infonetics recently said it expects Diameter signaling controllers to be implemented as virtual network functions beginning this year, with North American operators and a few European mobile operators leading the charge.

Oracle’s latest Diameter market index pre-

dicts Diameter signaling will become more common in virtualized network deployments, as “the ability to virtualize various components provides CSPs with more flexibility in their implementations. Adding more components means adding to the Diameter signaling MPS.”

“LTE innovation is still in the early stages, but it is gaining momentum,” said Doug Suriano, SVP and GM at Oracle. “And we’re looking beyond today’s LTE – NFV is developing, creating a very attractive cloud-based LTE opportunity. The time for CSPs to plan for Diameter signaling growth is now.”

Analysts also see the opportunity virtualization can provide for Diameter plans, noting the scalability and agility expected from virtualized deployments are a good fit for carrier Diameter plans.

Larger telecom operators appear to be heeding that advice, with vendors noting a growing interest from their customers in platforms with virtualization as part of their roadmap.



Virtualization using NFV and SDN are expected to be part of Diameter plans moving forward.



“We have some major tier-one operators in Europe sending out RFPs and RFIs for full blown automated NFV architectures,” explained Sonus’ Welch, who added he has been a bit surprised at the advanced nature of these efforts.

“I did not expect to have these discussions on bringing NFV to market until 2016, so it’s sort of six months ahead of schedule,” Welch said, adding that while advanced in terms of discussion timing, telecom operators are still a bit perplexed on just how they plan on virtualizing their Diameter operations.

“Most of the talks are looking at [capital expense] and [operating expense] savings,” Welch said. “Some are looking at the mobile core first then coming back to Diameter later, but then they come back with RFPs asking about moving first with Diameter. This mostly seems attached to their risk tolerance. If they are starting from scratch and have not had any type of acquisition for a cloud player then they are still scratching their head. But, if they have picked up cloud players or software players they are thinking more about it a move.”

Despite the seeming match between Diameter and virtualization, there remain concerns over the reliability of NFV and SDN deployments, especially in terms of handling something as important to network integrity as Diameter signaling.

“Signaling is really critical and operators are still a bit averse to move from the platforms they know and love to virtualized environment,” Collins said. “A lot of Diameter platforms now are software based and run on third-party hardware so there’s really

not much of a stretch to move towards virtualization, but valid concerns remain.”

Welch admitted that those questions are indeed still out there and will likely result in telecom operators dabbling first with virtualizing less mission critical platforms before making the jump to virtualizing their Diameter efforts.

“Probably the first thing we will see will be just in support of Diameter instead of a full blown scalable model,” Welch said.

#### **IoT uncertainty**

Looking further down the road, Diameter signaling platforms are also expected to see an influx of work tied to the growing IoT space. Vendors have been very vocal in predicting tens of billions of “things” will soon be clamoring for access to the Internet, with many of those striving for a mobile connection.

While models are still being worked out, what has been seen so far in the connected car space is enough to concern Diameter platform deployments. Gartner predicts there will be a quarter-billion connected vehicles on the road by 2020, with new vehicles dramatically increasing the proportions of connected cars. Those vehicles will require networks to handle a multitude of potential chores through a single LTE connection, some of which will require near-zero latency.

Broader IoT models will likely not require as much signaling per device as a connected vehicle, but are expected to make up some of that difference in the sheer mass of those connections.

“IoT will expand the number of devices and

will increase the number of transactions, but it will depend on what the devices are that are attaching to the network,” Collins said. “Meters, for instance, won’t generate a lot of traffic, but the connected car will.”

Ericsson’s Ewert concurred, noting these IoT connections are set to fuel the market. Ericsson recently announced a partnership with AT&T and chipmaker Altair to showcase battery technology designed to power an IoT device for up to 10 years, highlighting the long tail nature of the IoT market.

“IoT definitely needs to be factored into the conversation in terms of Diameter signaling,” said Robin Kent, director of European operations at Adax. “Will it be a device that just connects to the network once per day, or is it live and constantly being polled. The impact of the application will have a huge impact on how carriers manage their Diameter platforms.”

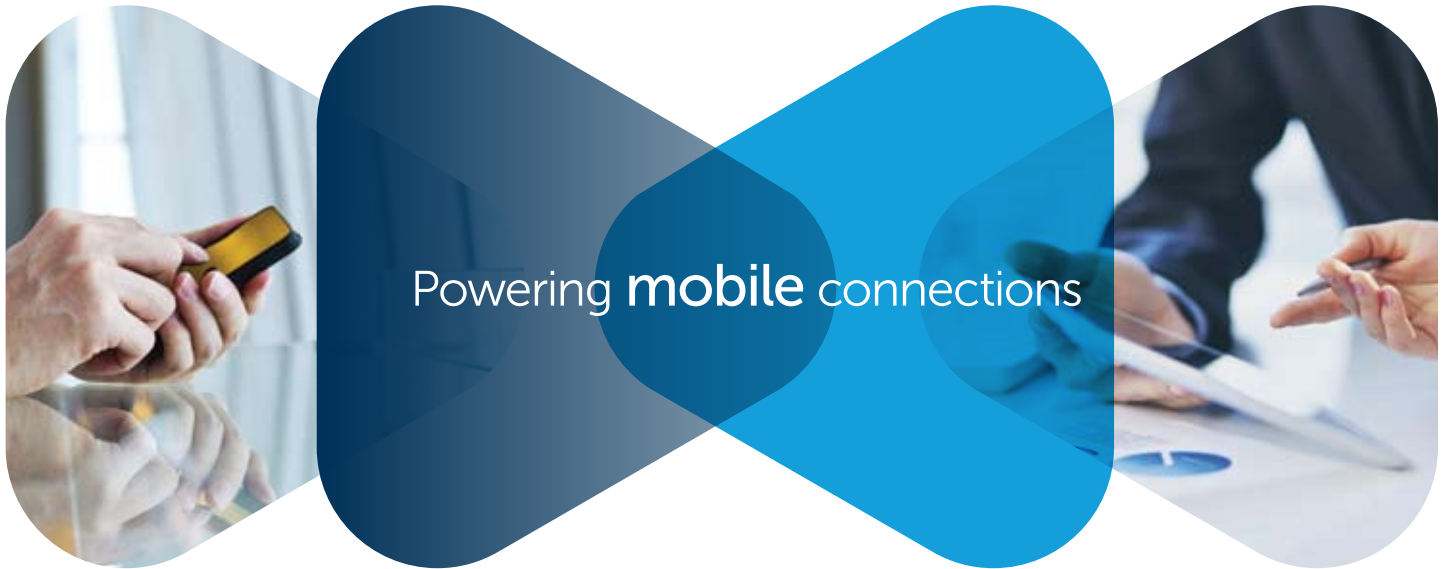
These questions are significant in the vacuum of just M2M and IoT models, but when discussed in the bigger picture they become even more significant.

“Is this segment does become a bigger signal driver, carriers are not going to want those services to override their need to support VoLTE signaling, which is an immediate consumer-facing service,” noted F5’s Nas. “Carriers want to be able to be ahead of these issues and manage the potential risk.”

Indeed, it appears that a number of technology advances and service trends are set to have an impact on the Diameter market moving forward. Then again, if the market is to hit forecasts, that impact is to be expected. ((••))

# Mavenir is now Mitel

Mobilizing your enterprise



A global market leader powering more than 2 billion business connections and 2 billion mobile subscribers every day, Mitel helps businesses and mobile operators connect, collaborate and take care of their customers. Our innovation and communications experts serve more than 60 million business users in more than 100 countries, and 130 service providers including 15 of the top 20 mobile carriers in the world. Learn more at [mitel.com](https://mitel.com).



Powering connections

[mitel.com](https://mitel.com)

Nasdaq:MITL | TSX:MNW

Featured Companies

---

---

---



# 2015 Telecom Software Supplier Guide

---



**Telecom Software**

7signal is The Wi-Fi Performance Company. Use 7signal's Sapphire solution to measure, optimize and proactively assure peak Wi-Fi performance in hospitals, universities and business-critical enterprises.

**Telecom Software**

Accanto Systems is the leading provider of intelligent Customer Service Assurance solutions for communications services providers globally. With its unique probe-based technology, Accanto Systems seamlessly delivers in-depth monitoring, analysis and troubleshooting intelligence to operators, enabling them to overcome the challenges associated with migrating to converged, next-generation telecom architectures.

**Telecom Software**

Accedian Networks is the leader in Performance Assured Networking for mobile backhaul, business services and cloud connectivity. Our solutions provide service providers and network operators with visibility into their networks and this differentiating ability empowers them to optimize, improve and manage the performance of their network, thereby delivering the best possible experience to their subscribers.

**Telecom Software**

Accelera creates wireless network virtualization technology, which unifies heterogeneous network resources to create seamless high-speed carrier-grade connectivity.

**Telecom Software**

Accruent's Siterra software is the industry standard for managing wireless network projects for Wireless Tower Companies, Infrastructure Service Providers, Wireless Carriers and Mobile Network Operators. Accruent's solutions are used by all five of the top five U.S. carriers.

**Telecom Software**

Accuver provides comprehensive 4G air interface test solutions for field and lab measurement. Our XCAL product line offers tools for drive testing, network optimization, in-building testing, mobile testing, and network benchmarking; as well as throughput, VoLTE MOS, video, and capacity testing.

**Telecom Software**

Affinegy is a proven global provider of service enablement and network management software solutions for the home.

**Telecom Software**

Agilis International is a leading innovator of Customer and Operational Analytics used by Communications Service Providers for Subscriber Life Cycle Management, Customer Risk Management, Margin Management, Cost and Revenue Assurance, Data Warehousing and Reporting/Dashboarding. The team at Agilis International has considerable experience in developing solutions for both emerging as well as Tier-I telecommunications service providers throughout the world.

**Telecom Software**

AirHop is a privately held startup that develops advanced RAN intelligence software critical to the next wave of the mobile Internet. AirHop's eSON products are the first to completely address the installation, operation, performance, and multi-vendor support challenges of multi-layer, small cell and HetNet deployments.

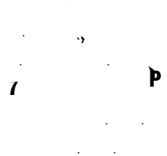
**Telecom Software**

Aktavara is a market innovator providing COTS software for Communications Service Providers.

**Telecom Software**

Alcatel-Lucent is the leader in global communications products and innovation, providing as well as multi-layer, small cell and HetNet deployments.

## Telecom Software



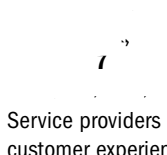
Allot Communications is a leading global provider of intelligent broadband solutions that put mobile, fixed and enterprise networks at the center of the digital lifestyle. Allot's DPI-based solutions identify and leverage the business intelligence in data networks, empowering operators to shape digital lifestyle experiences and to capitalize on the network traffic they generate.

## Telecom Software



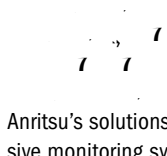
Service Delivery Automation - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS)

## Telecom Software



Service providers rely on Amdocs to simplify the customer experience, harness the data explosion, stay ahead with new services and improve operational efficiency. Amdocs combines a market-leading BSS, OSS and network control and optimization portfolio, with professional services and managed services operations.

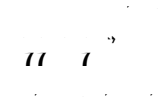
## Telecom Software



Anritsu's solutions are a probe-based non-intrusive monitoring system designed to provide the business critical performance measurements needed for management reports and network operations. MasterClaw is the leading service and network monitoring system for traditional fixed, SS7, GSM, GPRS, UMTS and VoIP/IMS

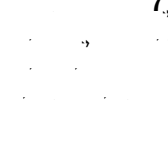
networks that fulfills the needs for both real time reporting and long term trend analysis with highly flexible customized KPIs and reports. MasterClaw is a high-performing open platform, and it presents a true state-of-the-art fully distributed architecture.

## Telecom Software



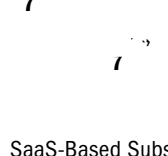
The Ixia Anue Net Tool Optimizer® (NTO) helps to optimize and secure rapidly evolving, dynamic data center networks. The Anue NTO intelligently connects your network with monitoring tools to aggregate, filter, load balance, and de-duplicate network traffic.

## Telecom Software



Aptilo is the leading provider of carrier Wi-Fi service management and offloading solutions. Aptilo maximizes functionality and fast-tracks deployments while minimizing impact on existing systems.

## Telecom Software



SaaS-Based Subscription Billing - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS)

## Telecom Software



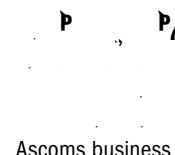
Aricent is the world's premier engineering software and services company.

## Telecom Software



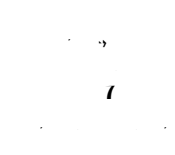
Location-Aware Resource Management & Planning. Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS)

## Telecom Software



Ascoms business unit Systems & Solutions located in Aachen and Frankfurt, Germany as well as Solothurn and Wallisellen, Switzerland, plans and implements large scale software applications in the area of business and operations supporting solutions for the telco industry as well as selected other market segments. Our service offering ranges from analysis and consulting, over system design and integration, project management, engineering and implementation to maintenance and support. We deliver customised solutions and services in the fields of IT and Business Service Management - Interconnect Business Solutions - Enterprise Asset Management - Mobile Applications - Fraud Management - Carrier Business Solutions.

## Telecom Software



Astellia is a leading provider of network and subscriber intelligence enabling mobile operators to drive business performance. Astellia's vendor-independent real-time monitoring and troubleshooting solution covers end-to-end 2G, 3G and 4G from radio access to core network. Astellia's scalable products and expert services address the needs of operators full value chain.

## Telecom Software

Aster Telecom Services, It's a dependable services

## Telecom Software

Atos is an international information technology services company with annual 2011 pro forma revenue of EUR 8.5 billion and 74,000 employees in 48 countries. Serving a global client base, it delivers hi-tech transactional services, consulting and technology services, systems integration and managed services. With its deep technology expertise and industry knowledge, it works with clients across the following market sectors: Manufacturing, Retail, Services; Public, Health & Transports; Financial Services; Telecoms, Media & Technology; Energy & Utilities

## Telecom Software

At the core of Avvasi solutions is a unique technology that allows for a highly scalable, real-time measurement of video-based Quality of Experience (QoE). Much like MOS scores, this perceptual measurement accurately reflects subscribers perceived experiences with video content. Avvasi is able to break down video traffic by device, source, content, media format, media duration, and network topology.

## Telecom Software

Azimuth 's Analytics uses device-network interaction KPIs to provide a holistic view of performance for benchmarking, regression, optimization.

## Telecom Software

BatteryCorp provides software and site-based services for telecommunications companies, providing insight and analytics that facilitate proactive decisions about site maintenance, planning and budgets to support network availability.

## Telecom Software

Berkshire Search Partners provides Talent Acquisition & Talent Management solutions for small-to-medium-sized companies involved in Technology & Telecommunications industries/markets throughout USA.

## Telecom Software

BroadSoft is the leading, worldwide innovator of Voice over IP (VoIP) applications that is transforming how people connect, communicate and collaborate.

## Telecom Software

CA Technologies' portfolio of software and services helps our customers speed time to value, ensure critical application performance and simplify security and operations so they can drive innovation and quality for their customers.

## Telecom Software

Established in 1989, Casewise provides Business Process Analysis, Business Process Management, Business Architecture software and consulting solutions to over 3,000 major global organizations. These solutions enable organizations to visualize, audit, report, improve and continually maximize complex operating processes and technology infrastructures.

## Telecom Software

Give your business the leading edge to excel in a fast-paced and competitive world. With Celcom First, we understand that every SME is unique in its own way, which is why our unrivalled advantages are specially suited for your SME business to experience control, convenience and priority in your hands.

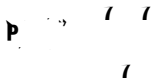
## Telecom Software

CellVision provide a suite of productized software solutions that help mobile operators market their mobile broadband offering more accurately, run their operations more efficiently and provide a better customer care experience to their subscribers.

## Telecom Software

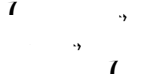
CelPlan Technologies is a leading provider of radio frequency (RF) planning; optimization tools, and value added consulting, engineering and training services to the wireless industry.

## Telecom Software



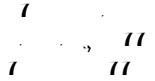
Centina Systems provides Service Assurance and Service Quality Management solutions for communications service providers globally. The company is focused on helping operators enhance the customer experience, while at the same time improving their operations through increased agility and faster time to market of new services.

## Telecom Software



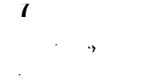
CENTRI is a leading provider of mobile data optimization and bandwidth management solutions. Mobile Data Intelligence - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS)

## Telecom Software



At CHR Solutions we help you grow revenue, reduce cost, improve operations, manage risk, and align technology. We deliver comprehensive technology solutions and business operations services to Communications Service Providers around the world. Our goal is to provide all required solutions and services to help you plan, build and operate your business.

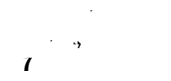
## Telecom Software



Cisco Prime products deliver next-generation management by supporting an intuitive

workflow-oriented user experience and integrated lifecycle operations across Cisco architectures, technologies, and networks. Cisco Prime helps IT organizations.

## Telecom Software

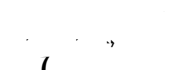


Clarabridge is the industry-leading intelligent Customer Experience Management (CEM) solution selected by more Global 1000 companies than any other solution. We provide the CEM hub that bridges the gap between listening to the Voice of the Customer (VOC) and proactively acting on it.

## Telecom Software



## Telecom Software



Since 1993, Comarch's Telecommunications Business Unit has been specializing in designing, implementing and integrating solutions and services for telecommunication operators. Our mission is to enable you to increase revenues and build strong relations with your clients and business partners.

## Telecom Software



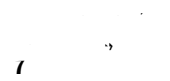
Comptel's mission is Making Data Beautiful. Comptel aims to become a leading provider of customer interaction automation systems.

## Telecom Software



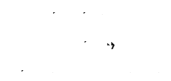
Bridging IT applications to the wireless network. Experts in BSS software and systems integration, on-site professional services, and Value Added Services.

## Telecom Software



Comverse is the world's leading provider of software and systems for business enablement through converged billing and active customer management, mobile Internet, value-added and managed services. Comverse's extensive customer base spans more than 125 countries and covers over 450 communication service providers serving more than two billion subscribers. Comverse is ranked number 55 in PwC's Global 100 Software Leaders based on research by Pierre Audoin Consultants.

## Telecom Software



ClickSoftware is the leading provider of mobile workforce management and service optimisation solutions, supporting almost half million field resources globally, across several industries. For the communications industry, it offers a single solution to manage their workforce as one, leading to higher productivity, improved response to emergency work and most importantly, better customer service.

## Telecom Software

ConceptWave is a leading provider of customer, product, and order lifecycle management solutions that enable communications service providers to rapidly introduce new market offers and to empower superior customer experience. Our unique offer is to provide an end-to-end catalog-driven suite of order fulfillment automation software with ConceptWave Order Care and Rapid CRM.

## Telecom Software

ConteXtream is a privately held software company delivering the industry's first cloud-based network virtualization framework for carriers, cloud service providers, and private cloud operators. Leveraging the power of proven virtualization and grid technologies, ConteXtream's market-ready products help extract more value and profitability from networks through higher performance, greater scalability, and lower operating and capital expenditures.

## Telecom Software

CSG's wireless solutions help hundreds of service providers worldwide automate processes, consolidate multiple systems, enhance revenue, and realize operational efficiency. Many leading wireless operators rely on our solutions to deploy innovative subscriber tariff structures, convergent prepay/postpay propositions, and enhanced revenue assurance processes. Our integrated mediation and billing solutions offer real-time charging, dynamic account selection options, and blended service propositions. This approach lets operators define differentiation based on value not just price, and target and reward their most profitable customers.

## Telecom Software

cVidya Networks is a global leader of Revenue Intelligence solutions for telecom, media and entertainment service providers. Innovative cVidya solutions serve to maximize margins, improve customer experience and optimize ecosystem relationships by encompassing Revenue Assurance, Fraud Management, Operational Risk Management & Compliance, Sales Performance Management and Pricing Analytics.

## Telecom Software

Cycle30 provides a hosted order-to-cash billing platform for cable, wireless, telecommunications, utilities and machine-to-machine services. We empower service providers to focus on their customers, while Cycle30 handles the billing operation. The Cycle30 platform includes customer management, service fulfillment, billing and revenue management, service assurance, integrations, and business intelligence. Cycle30 is a U.S. company, headquartered in Seattle, Washington, with data center facilities across North America and beyond

## Telecom Software

Diametriq, offering LTE control signaling solutions to meet the needs of LTE network operators, was built on the assets of IntelliNet Technologies, a wireless solutions company founded in 1992. The company's application enabled Diameter Solution Suite addresses traffic management, interoperability and service migration issues.

## Telecom Software

DigitalRoute's mediation solution delivers a new approach to managing data. Our platform, MediationZone, empowers organizations to liberate the value hidden in their usage information via a unique approach that supports multiple mission-critical aspects of their business. DigitalRoute customers benefit from fewer integration points, reduced costs and flexible data management. Over 250 leading companies from around the globe are today actively using DigitalRoute technology to help meet their data management needs. DigitalRoute is headquartered in Stockholm, Sweden with regional offices in Gothenburg, Atlanta, and Kuala Lumpur. DigitalRoute is a venture-backed, privately held company.

## Telecom Software

DSET's operational support system tools allow service providers to tackle a variety of challenges associated with the provisioning, activation and configuration of telecom services, as well as the electronic exchange of provisioning information with other telecommunications providers.

## Telecom Software

EDX's SignalPro family of products helps engineers plan, deploy and optimize virtually any wireless network from Public Safety, Transportation, Cellular and Broadband to Smart Grid and beyond.

## Telecom Software

Founded in 1999, Elitecore Technologies is a Carlyle Group investee global IT product company providing BSS alongside packet core with flexibility of modular as well as pre-integrated offerings. Its Wi-Fi Service Management Platform (SMP) helps operators leverage Wi-Fi as an integral part of their heterogeneous networks strategy to deliver better subscriber experience, reach, availability and service offerings. Elitecore offerings are compatible to large vendor ecosystem addressing CSP requirement of faster time to market and better TCO. Being a traditional IP solutions player, Elitecore products are highly responsive to next-generation services, fulfilling operator monetization needs across all access networks.

## Telecom Software

Empirix is the recognized leader in delivering end-to-end network performance visibility, empowering our clients to improve business performance through solutions that enable you to proactively preempt problems by predicting the customer communication experience. We enable organizations worldwide to accelerate the development, deployment and profitable operations of new, fluid, and complex communications by validating the quality of user experience and overall performance of networks and applications.

## Telecom Software

Founded in 1998, Ensim is a leading provider of solutions to automate on-boarding, orchestration, provisioning, and management, of users and organizations with business applications, services, and infrastructure in private, public, and hybrid clouds. Ensim has over 5,000,000 seats deployed worldwide and is used by over 20,000 small, medium, and large sized organizations and

government agencies through service providers, system integrators, msp's, and resellers.. OSS/BSS for Cloud-based offerings - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS)

## Telecom Software

Equinix Information Systems provides cost-effective and flexible software solutions to optimize and protect revenue for the telecom industry for over a quarter century.

## Telecom Software

Our experience-centric managed services model aligns service delivery with the operator's strategic and business objectives, securing a customer experience-centric operation that proactively drives business innovation. Our sharing models, such as the wholesale network sharing model, are focused on structural efficiency and enabling new business models, giving operators maximum flexibility.

## Telecom Software

ETA International - Founded in 1978, Electronics Technicians Association, International is a not-for-profit professional association fostering excellence in electronics through certification. The associations initiatives are to provide a prominent certification program of competency criteria and testing benchmarks that steer international electronic standards and renowned professional electronics credentials.

## Telecom Software

EXFO is among the leading providers of next-generation test and service assurance solutions for wireless and wireline network operators and equipment manufacturers in the telecommunications industry.

## Telecom Software

F5 helps organizations and service providers seamlessly scale cloud, core network and SDN/NFV deployments to successfully deliver services to anyone, anywhere at any time. F5 enables service providers to secure, optimize and monetize their networks by leveraging contextual subscriber and application information to provide the ultimate customer experience, maximize network efficiency, and deliver services quickly and more cost-effectively.

## Telecom Software

Famigo creates a safer, fun mobile environment for your kids.

## Telecom Software

Fiberlink's in-depth expertise and focus on delivering enterprise mobile computing solutions for over two decades translates to best practices that accelerate deployment, eliminate risk and reduce costs. We continuously innovate to serve the needs of our customers by delivering mobile solutions that help them gain competitive advantage, increase employee productivity, and implement proper security measures.

## Telecom Software

More than ever before field reports and closeouts are critical to business success and remotely collected information must be sent, with full accuracy, back to headquarters, for field crew reporting and closeout docs. Field Dailies automates the transmission and receiving of all field reports and closeout documents.

## Telecom Software

Flash Networks is a global provider of intelligent mobile Internet solutions that enable operators to improve quality of experience, reduce network operational expenses and manage and monetize the mobile Internet.

## Telecom Software

Tower and Obstruction Lighting Systems and Monitoring

## Telecom Software

FNT provides a software titled Command. Command is an IT management software that can perform DCIM functions as well as many different IT tasks such as server application management, WAN, LAN and Telecommunications management. Command also has a series of pre set integration packages for coordination with other IT tools. This allows Command to tie the many silo's of information throughout the IT environment into one single picture for better management and control.

## Telecom Software

Forsk is an independent company providing radio planning and optimisation software solutions to the wireless industry since 1987.

## Telecom Software

FTS is a global provider of billing, charging, customer care and policy control solutions that have greater flexibility and provide greater independence for communications and content service providers, resulting in a dramatically lower total cost of ownership (TCO).

## Telecom Software

Our expertise spans the entire process of creating digital security solutions for our clients and their customers. We develop secure software and operating systems which we embed in billions of trusted devices of many kinds, like UICC cards, banking cards, tokens, electronic passports or ID cards. We personalize these devices, and deploy the software and services for managing them and the sensitive data they hold throughout their life-cycle.

## Telecom Software

GENBAND is a global leader in smart networking solutions for service providers and enterprises in more than 80 countries. From the Core to the Edge to the Experience™, the company's technology seamlessly evolves IP networks to new levels in scalability, security, profitability and efficiency. GENBAND's market-leading technology facilitates multimedia voice, data and video sessions and "anywhere" and "any device" services that scale on public and private networks. GENBAND is headquartered in Frisco, Texas, and has R&D, sales and support resources in more than 50 countries.

## Telecom Software

GL Communications Inc. specializes in both test and measurement hardware and software products for telecommunications industry all over the world. We offer consulting services for T1/E1/T3 testing and analysis, and system design of wireless, satellite, fiber optic, and microwave networks. Please visit <http://www.gl.com> for any additional information.

## Telecom Software

Globys is a big data analytics company with more than 15 years of experience delivering out-of-the-box solutions that transform massive amounts of customer data into valuable insights and action. Our contextual marketing solutions help some of the world's largest mobile operators deliver highly personalized and contextual customer experiences that maximize ARPU and reduce churn.

## Telecom Software

GoS Networks takes policy to smart connected devices and across the RAN via a unique software solution, GoS 360°. By extending policy to the user's device, GoS 360° allows operators to monetize their existing network investment, reduce CAPEX and OPEX, and enhance the User's Experience. CSP Policy Control and Enforcement - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS).

## Telecom Software

The Guavus tool is unique in its ability to take data from different reporting sources and merge this data into a comprehensive view of our subscribers' end-to-end experience. The Guavus approach is reducing the data gathering and the analysis lifecycle by 50%, enabling us to make quicker decisions and spend more time focused on solving our business challenges.

## Telecom Software

Hetnet Software consolidates and automates end-to-end management of today's 3G/4G/LTE networks, including solutions for fault, performance, service levels, configuration, network management, CEM and SON.

## Telecom Software

HP Customer Engagement Management Services – Transformation to help you deliver great customer experiences across every channel to enhance competitive advantage. With this service, HP assesses quality and effectiveness, and provides opportunities for improvement within and across your contact centers and operations.

## Telecom Software

As one of the largest software vendors in China, Huawei is ready to work closely with operators and OSS/BSS manufacturers worldwide, to provide state-of-the-art and open operation support solutions and serve the global telecom industry on a constant basis. Huawei's TopEng series provides solutions and products in all fields across OSS and BSS, including integrated customer service (Call Centre), customer relationship management (CRM), Billing, Customer Care, Settlement and Integrated Network Management. Huawei is also dedicated to product integration and outsourcing services, to offer operators integrated solutions in the fields of OSS and BSS.

## Telecom Software

H&P is a global leader in the design and manufacturing of obstruction lighting technology. Offering a complete line of low, medium and high intensity lighting technology solutions for radio, television, and communication towers; wind turbines; buildings; smokestacks; bridges; and other obstructions to aerial navigation.

## Telecom Software

Turn challenges into opportunities - The communications industry is rapidly evolving with escalating infrastructure costs, declining customer acquisition rates due to market saturation, high customer churn rates, declining ARPU and competition making it difficult to monetize new applications and generate new sources of revenue. IBM's business analytics solutions help communications service providers address challenges in two key areas: Improve network and services to reduce customer churn and transform operations and optimize your call center.

## Telecom Software

Our leading software enables 500+ clients in over 80 countries to automate the design, deployment and operations of wireless in-building networks to ensure optimal connectivity.

## Telecom Software

Incognito Software is a global provider of broadband software provisioning and activation solutions that help monetize IP based subscriber and commercial services. Service providers and large enterprises worldwide use our products to quickly and cost-effectively deploy data, voice, and video services across a multitude of networks.

## Telecom Software

Infobright develops and markets a high performance, self-tuning analytic database designed for applications and data marts that analyze large volumes of "machine-generated data" such as web data, network logs, telecom records, stock tick data and sensor data.

## Telecom Software

Infonova, founded in 1989, specializes in providing technology and business-oriented solutions and services to telecommunications, media, utility and convergent industries. Infonova's R6, a proven Multi-Industry Business Support System, has been implemented for fixed line incumbents, tier 2 aggregators / attackers, cable TV, mobile "MVNO" bureau, utilities and content players supporting both Telco 1.0 and Industry 2.0 business models. Built in Java EE, R6 is a revenue sharing and allocation platform, that supports real multi-tenant concept-to-cash operations for fully convergent and complex business models and delivers pre- & post-paid convergence at a fraction the cost and time of traditional integration scenarios.

## Telecom Software

InfoVista is the leading provider of IP and RF planning, assurance and optimization software solutions and services that enable efficient network and IT transformations. InfoVista's performance management solutions ensure that QoE goals are achieved by measuring end-to-end delivery effectiveness from the end user viewpoint.

## Telecom Software

Interop Technologies is the next-generation, leading-edge provider of core solutions for mobile network operators worldwide. Our high-performance, highly scalable solutions power services delivered to millions of wireless customers every day.

## Telecom Software

Intrado Inc. supports public safety agencies and telecommunication services providers with emergency communication services and technology via the Intrado Mobility products and services suite.

## Telecom Software

JDSU serves markets that are at the heart of what's important, making virtually every network in the world faster and more reliable. From development and planning, through deployment and turn-up testing, to optimization and assurance, JDSU test instruments, software, and expertise ensure that all network's DSL, fiber, cable, and wireless are always working at their best.

## Telecom Software

JDSU serves markets that are at the heart of what's important, making virtually every network in the world faster and more reliable. JDSU leads the fastest-growing segments of the optical-networking market: tunable XFPs, transport blades, and reconfigurable optical add/drop multiplexers (ROADMs). From development and planning, through deployment and turn-up testing, to optimization and assurance, JDSU test instruments, software, and expertise ensure that all networks, DSL, fiber, cable, and wireless are always working at their best.

## Telecom Software

Global provider of Mobile VAS infrastructure, Mobile Advertising and Diameter Signalling solutions.

## Telecom Software

Kansys, Inc is an IT Solutions Firm founded in 1997. Our adaptive approach allows us to Collaborate, Develop and Manage solutions that increase revenue and maximize operational efficiency. The use of Metadata driven software allows us to be nimble and quickly build solutions.

## KPMG CE1M Telecom Software

KPMG's team of telecoms experts work with some largest fixed, mobile and satellite companies all over the world to address their current challenges and better align their capabilities with today's consumer. Whether this means acting as a central ecosystems manager, or providing network, software and device capabilities, our global team can help define strategies to adjust to today's rapidly changing market.

## Telecom Software

Toll-free call center services, inventory, billing, performance reporting and disaster recovery solutions. Telecom products and services.

## Telecom Software

We respect data, and we help analytic people, like you, understand it and manipulate it at the most detailed level possible. Someone once said we were like an "MRI for data," and we all thought that description was bang on. We build analytic software that enables a new, agile way for business analysts to analyze, optimize and control data so they can build analytics that allow them to take fact-based action.

## Telecom Software

Level70 provides value-added services to regional mobile carriers. We leverage a proven business model (music bundled with a rate plan) to drive subscriber growth, enhance brand loyalty, and create subscriber stickiness. We make carriers stronger.

## Telecom Software

Link's suite of Advanced Analytical technology-based solutions, designed for the Communications industry, can be integrated into your organization to optimize media and marketing spend, discover competitive opportunities, and understand the customer experience.

## Telecom Software

MATRIX Software enables NOW. We give Communications Service Providers instant visibility, intelligence and control of services across your network. Our patented, smart charging technology enables a seamless, intuitive service experience that empowers your subscribers - in the moment, every moment. Delivering up to a 100 times increase in efficiency and scalability, we equip you with the most advanced solution designed specifically for the data generation. Charging. Policy. Insight. Value. NOW.

## Telecom Software

Mavenir is a leading provider of software-based networking solutions that enable mobile service providers to deliver high-quality internet protocol (IP)-based voice, video, rich communications and enhanced messaging services to their subscribers globally.

## Telecom Software

MDS provides managed revenue and customer management solutions for communications service providers that are flexible and assured to enable operators to grow their business and effectively serve their most complex customer bases.

## Telecom Software

Metaswitch is powering the transition of communication networks into a cloud-based, software-centric future. With a reputation earned by solving tough technical problems, Metaswitch develops openly programmable solutions that run on standard hardware or in virtualized environments and act as the key control points in elastic voice, video and data networks.

## Telecom Software

Microsoft, in concert with its Partners, delivers flexible B/OSS solutions that span billing and real time charging, service fulfillment, service assurance, service delivery platforms, and network management and scale to meet the requirements of Service Providers of all sizes.

## Telecom Software

MobileComm Professionals is a key industry player in the wireless services arena. We utilize our expertise in wireless services to provide quality centric, cost effective solutions to all major Wireless Mobile Operators, Engineering firms, Infrastructure providers and Original Equipment Manufacturers (OEMs).

## Telecom Software

Mobixell provides intelligent mobile video optimization and web acceleration technologies that optimize Operator's data network and maximize data profitability. Mobixell solutions enable operators to provide superior broadband and Internet services to their subscribers, with excellent rich media user experience and enhanced value

added services. Our solutions include mobile data and video optimization technologies, Web acceleration, overall traffic management, and advanced revenue generating services.

## Telecom Software

Mobilize CacheFront is Endpoint Web Optimization software that provides content delivery optimization at the point of greatest impact: the endpoint device.

## Telecom Software

Mocana unlocks the extended mobile enterprise and simplifies wide-scale deployments by securing apps automatically, in seconds. The company's Mobile Application Protection (MAP™) app-shielding solution - distributed globally by SAP - mitigates the complexities of mobile management, while freeing developers from tedious and expensive security coding projects.. Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS).

## Telecom Software

Monolith Software provides a next generation, service assurance solution that unifies fault, performance, topology, and service level management in a single scalable platform.

## Telecom Software

Mosaik Solutions builds world-class applications backed by comprehensive wireless network intelligence. Make better decisions and attract more customers with accurate datasets and tailored marketing solutions.

## Telecom Software

MYCOM is a leading independent provider of carrier-grade Network and Services Performance Management solutions and Advance Engineering Services to the world's largest Communications Service Providers (CSPs). Its products, services and 700 staff are focused on delivering advanced network performance intelligence that enables CSPs to optimize networks, govern suppliers, rapidly launch new technology and services, and deliver high quality customer experiences.

## Telecom Software

Nakina Systems provides Network Integrity Management solutions to the telecommunications industry worldwide. Our solutions enable service providers to introduce new services and grow networks more rapidly and with fewer outages by automating the discovery of network equipment, reconciling with inventory systems, auditing software in the network, and centralizing management of network security. Nakina's solutions power integrity in the world's largest networks, and they are provided in partnership with the world's largest and most advanced equipment manufacturers.

## Telecom Software

Napatech is the world leader in accelerating network management and security applications. As data volume and complexity grow, the performance of these applications needs to stay ahead of the speed of networks in order to do their jobs. We make this possible, for even the most demanding financial, telecom, corporate and government networks. Now and in the future, we enable our customers' applications to run faster than the networks they need to manage and protect. Intelligent Real-Time Network Analysis - Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS).

## Telecom Software

NetCracker Technology is the proven partner for communications service providers and cable operators offering comprehensive, end-to-end solutions and delivery capabilities to optimize their enterprise. With its global reach, leading-edge technology, and unbroken track record of successful implementations, NetCracker helps eliminate operational and business silos and delivers real-time experience in an on-demand world.

## Telecom Software

Netformx is the leader in collaborative requirements-to-order software solutions for enterprise technology.

## Telecom Software

NetNumber delivers a common NFV infrastructure for all signaling control, policy enforcement and subscriber database services in the network.

## Telecom Software

NetScout Systems, Inc. is the market leader in Unified Service Delivery Management enabling comprehensive end-to-end network and application assurance. For over 25 years, NetScout has delivered breakthrough packet-flow technology that provides trusted and comprehensive real-time network and application performance intelligence for the network, applications and users.

## Telecom Software

Neustar, Inc. (NYSE: NSR) is a trusted, neutral provider of real-time information and analysis to the communications services, financial services, retail, media and advertising sectors. Neustar applies its advanced, secure technologies to help its clients promote and protect their businesses.

## Telecom Software

Newfield Wireless is a pioneer in next-generation mobile geoanalytics. Our TrueCall platform unlocks rich user experience and location data enabling mobile operators to optimize their networks, maximize service assurance, launch new services and monetize subscriber data. Operators can view their entire networks one subscriber experience at a time.

## Telecom Software

NexGen Utility Solutions is a provider of device installation solutions and technical resources to leading energy utilities, communications companies and OEM device manufacturers throughout the United States. Our company implements, builds and supports America's infrastructure: the smart grid, wireless communications systems, wireline telecommunications.

## Telecom Software

Network and Business Intelligence data-driven solutions to assure a quality service experience, drive operational efficiencies and uncover business opportunities. Nexius believes that there is a treasure trove of opportunities in Big Data from networks, devices, and social media to improve a service provider's business. Through our deep experience with structured and unstructured data, business and operational support systems (B/OSS), and leading data analytics platforms, we can develop, integrate and optimize a solution to unlock the value in your data.

## Telecom Software

Nokia Solutions and Networks (NSN) provides the world's most efficient mobile networks, the intelligence to maximize network value and the services to make it all work seamlessly.

## Telecom Software

Ontology Systems is revolutionising how companies use their application data. Using semantic search technology, Ontology applies the power, simplicity and speed of search to business applications across the enterprise. Search and centralise applications, databases, files, spreadsheets - anywhere, without the cost and risk of integration.

## Telecom Software

Openet software enables the world's largest network operators to innovate service offerings in an increasingly mobile, data-driven society. Our technology extends from the network core to the mobile device and our products represent an integrated suite of industry leading charging, policy, data management, and interaction capabilities. Together, these represent a powerful platform for service innovation in a dynamic, connected world.

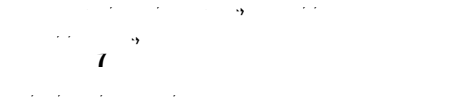
## Telecom Software

Our EIM products enable businesses to grow faster, lower operational costs, and reduce information governance and security risks by improving business insight, impact and process speed. OpenText strives to enrich the way people use information, foster innovation, be trusted in our relationships, be committed to excellence in all that we do, work with our stakeholders and demonstrating honesty and passion towards common goals.

## Telecom Software

Openwave Messaging is the leading global provider of innovative messaging software solutions. The company's Universal Messaging Suite™ provides a powerful, open and flexible, complete messaging environment optimized for today's most complex messaging requirements, including millions of mailboxes, security controls, identity management, and ease of integration with both internal systems and external partners.

## Telecom Software



Openwave Mobility empowers operators to manage and monetize mobile data. Openwave Mobility's data service solutions are used by over half a billion subscribers worldwide. Frost and Sullivan 2013 "Ten to Watch" list of operational support systems companies (OSS)/business support systems (BSS).

## Telecom Software

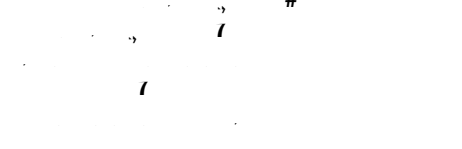


Oracle's software and systems span the communications industry technology landscape – from carrier-grade servers, storage and IT infrastructure, to mission-critical business and operational support systems and service delivery platforms; from business intelligence applications and retail point-of-sale solutions to the Java platform running on more than two billion mobile and handheld devices.

## Telecom Software

Orga Systems is a leading software vendor for real-time charging and billing solutions, with an international customer base in the telecommunications, utilities and automotive markets.

## Telecom Software



PCTEL RF Solutions specializes in the design, optimization and testing of today's wireless communication networks. We develop and build innovative scanning receivers, drive test software, and interference management solutions that help wireless cellular operators get the most out of their wireless spectrum.

## Telecom Software



Leading supplier of software for LTE EPC. Includes S1AP, GTPu, GTPv2C, Diameter, PMIPv6.

## Telecom Software

Procera Networks delivers Internet Intelligence solutions designed for carriers, service providers and enterprises worldwide. Procera's Packet-Logic solutions provide actionable intelligence and policy enforcement to ensure a high quality experience for any Internet connected devices. Network operators deploy Procera's technology to enable real-time visibility, superior performance and scalability, and deliver personalized services for millions of enterprises and consumers. Enterprises utilize Procera's embedded NAVL solutions to ensure that they can deliver on BYOD and Cloud services to their employees.

## Telecom Software

One way forward is the New Generation Operations Systems and Software (NGOSS) frameworks created by the TM Forum, and Progress has the only solution for the TM Forum's information framework (the SID). Progress OSS/BSS Integration, powered by Progress® DataXtend® Semantic Integrator (SI) will reduce operational cost, integration complexity and the risks associated with OSS/BSS integration,

giving you a faster time to market and an enhanced experience for your customers. With the OSS/BSS Integration solution, business analysts, architects and developers can create, maintain and govern common-model-based data services in your service-oriented architecture (SOA). These services reduce the complexity and cost of your SOA implementations while improving agility.

## Telecom Software

As a global supplier of advanced network solutions, PT offers Diameter and SS7 Signaling Systems delivering advanced routing/applications to SS7, 4G/LTE and IMS telecom networks.

## Telecom Software



Pulse Electronics is a leading global supplier of LTE, WLAN, 3G/4G, DAS and M2M fixed and mobile antenna solutions.

## Telecom Software



Radcom provides innovative service assurance and customer experience management solutions for leading telecom operators and communications service providers. RADCOM specializes in solutions for next-generation mobile and fixed networks, including LTE, VoLTE, IMS, VoIP, UMTS/GSM and mobile broadband.

## Telecom Software

Radisys is a leading provider of embedded wireless infrastructure solutions for telecom, aerospace, defense, and public safety applications. Radisys' market-leading MRF (Media Resource Function) and T-Series Virtualized Platforms coupled with Trillium software, services and market expertise enable customers to bring their products to market faster with lower investment and risk.

## Telecom Software

In a revolutionary new development that leverages 10 years of working exclusively with leading global communications providers, analyzing massive volumes of data, delivering cloud based analytics to CFO organizations at AT&T, Verizon, Comcast, T-Mobile, Tata, Telus, Facebook and numerous others, Razorsight has married a team of the industry's best Data Scientists with its industry leading cloud analytics software to create a new Predictive Analytics solution.

## Telecom Software

Red Bend Software is the leader in Mobile Software Management (MSM). Over 1.75 Billion Red Bend-Enabled™ devices use our software and services for firmware over-the-air (FOTA) updating, application management, device management, device analytics and mobile virtualization. More than 80 leading manufacturers, mobile operators, semiconductor vendors and automotive companies worldwide trust Red Bend to make their mobile devices and services continuously better in a rapidly changing world.

## Telecom Software

Redknee, a leading provider of real-time monetization software, delivers innovative converged billing, charging, policy management, and customer care solutions to some of the world's largest CSPs.

## Telecom Software

RedSky provides 9-1-1 location management for Enterprise telephone users to help them meet State statutes. RedSky also provides NG9-1-1

infrastructure functional elements. Software/service based.

## Telecom Software

ResponseTek is a customer experience management (CEM) software company focused on the requirements of Global 2000 organizations with diverse product lines. The ResponseTek Listening Platform™ analyzes valuable customer sentiment in real-time and scales to meet the demands of big data, eliminating silos of customer information captured across multiple channels including websites, call centers, retail or branch locations and social platforms.

## Telecom Software

ipoque provides network intelligence and policy control solutions helping fixed and mobile broadband operators to better understand traffic patterns, monetize new data services and improve the quality of experience for their subscribers. Our application classification and analysis engine enables bandwidth and congestion control, prioritized quality of service delivery and detailed network visibility. ipoque was founded in 2005 in Leipzig, Germany, and has become a Rohde & Schwarz company in 2011.

## Telecom Software

RooX Solutions is a rapidly growing Russian software company focusing at innovative next-gen Customer Experience Management (CEM) solutions for the Telco 2.0 environment.

## Telecom Software

## Telecom Software

Sandvine provides a single platform to introduce unified, standards-compliant network policy control into any fixed, mobile or converged access network, at any scale. An unmatched commitment to research and development delivers the industry-first, exclusive and standards-compliant solutions that let our customers out-manuever their competition.

## Telecom Software

Headquartered in Walldorf, Germany, with locations in more than 130 countries, SAP SE is the world leader in enterprise software and software-related services.

## Telecom Software

Unwire your employees, customers, and partners with proven, highly-rated mobile solutions from a company you can trust. SAP is the only vendor that can provide you with complete, end-to-end software solutions that mobilize your entire organization. Use a single, unified mobile platform for all your employee, consumer, and partner app needs.

## Telecom Software

ServiceFrame is the leading independent governance platform, addressing Performance, Risk and Compliance in Telco Managed Services. ServiceFrame brings smart relationship intelligence, the expertise of the organization, and rich visualization together to initiate and enable the Governance process. ServiceFrame is Software delivered as a service ensuring rapid deployment, easy integration and configuration, and anywhere on any device availability. The worlds smartest managed services rely on ServiceFrame.

## Telecom Software

SEVEN Networks develops innovative software solutions that help wireless carriers manage and optimize mobile traffic before it impacts the network. SEVEN's flagship Open Channel products reduce operator costs, increase efficiency in the use of wireless infrastructure, and enhance end-user experience. Extending the management of data traffic from the network to the mobile client brings immediate capacity relief to overloaded networks. Operators gain actionable intelligence on their networks, application activity is optimized, and unnecessary signaling activity is significantly reduced. SEVEN products are in production in 20 languages across five continents.

## Telecom Software

SevOne provides the world's fastest, most scalable IT management and reporting platform, delivered as all-in-one appliances, to help you detect and avoid performance events before they impact your business.

## Telecom Software

Sigma Systems helps telco and cable service providers around the world deliver more than 150 million advanced communication and enhanced entertainment services every day. Our proven, award-winning portfolio of OSS products and solutions for service order management, provisioning and activation; device provisioning; and advanced mediation support integrated, bundled IP service offerings for residential and business subscribers including VoIP, ultra-fast broadband, advanced digital and IP video, IPTV, wireless and more.

## Telecom Software

Smith Micro Software, Inc. provides software and services that simplify, secure, and enhance the mobile experience. The Company's portfolio of wireless solutions includes a wide range of client and server applications that manage voice, data, video, and connectivity over mobile broadband networks. Our primary customers are the world's leading mobile network operators, mobile device manufacturers, and enterprise businesses. In addition to our wireless and mobility software, Smith Micro offers personal productivity and graphics products distributed through a variety of consumer channels worldwide.

## Telecom Software

Since our founding in 1999, SolarWinds' (NYSE: SWI) mission has been to provide purpose-built products that are designed to make IT professionals' jobs easier. We offer value-driven products and tools that solve a broad range of IT management challenges – whether those challenges are related to networks, servers, applications, storage or virtualization.

## Telecom Software

Solutelia has demonstrated itself as a leading industry resource for establishing and improving wireless coverage for over a decade. Solutelia provides RF engineering and DAS services and solutions. Solutelia has recently introduced the WINDa,™ software platform that addresses some of the wireless industry's™ most pressing concerns by providing real-time reporting, testing and analysis of network performance by using the latest commercially available Android smartphones. WINDa,™ supports mobile voice and data technologies, including GSM, UMTS, CDMA, EVDO, LTE, VoLTE, LTE-A and WiFi. Cloud-based control and analysis tools allow access to real-time results, from anywhere.

## Telecom Software

Sonus secures real-time communications so that the world's leading service providers and enterprises can embrace SIP-based applications through secure, reliable and scalable IP networks. With service provider and Fortune 500 customers in more than 50 countries and 17 years of experience enabling VoIP, video and Unified Communications, Sonus offers a complete portfolio of hardware-based and virtualized Session Border Controllers (SBCs), policy/routing servers and Diameter and SS7 Signaling Systems.

## Telecom Software

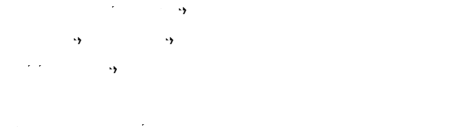
Spirent TestCenter Live leverages hardware probes and client software applets to provide an end-to-end view of the network and application performance—one that starts in the RAN and is segmented to include the backhaul, core and cloud environments

## Telecom Software



StepLeader develops, builds and sells mobile apps, and helps customers monetize the advertising on those apps.

## Telecom Software

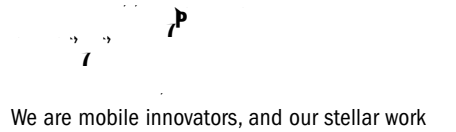


Subex Limited is a leading global provider of Business Support Systems (BSS) that empowers communications service providers (CSPs) to achieve competitive advantage through Business Optimisation - thereby enabling them to improve their operational efficiency to deliver enhanced service experiences to subscribers.

## Telecom Software

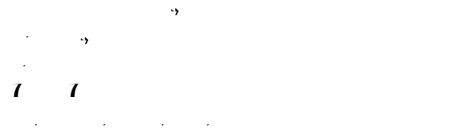
Synchronoss is the mobile innovation leader that provides personal cloud solutions and software-based activation for connected devices across the globe. Founded in December 2000, the company completed a successful IPO in June 2006. Stock Exchange: Nasdaq - Symbol: SNCRO. Our solutions help customers acquire, retain and service subscribers quickly, reliably and cost-effectively by simplifying the processes associated with managing the customer experience for activating and synchronizing connected devices and services. Synchronoss' industry-leading customers include tier 1 service providers such as AT&T Inc., Verizon Wireless and Vodafone, tier 1 cable operators/MSOs such as Cablevision, Charter Communications, Comcast, and Time Warner Cable and large OEMs such as Apple, Dell, Panasonic and Nokia. These customers utilize our platforms, technology and services to service both consumer and business customers, including over 300 of the Fortune 500 companies.

## Telecom Software



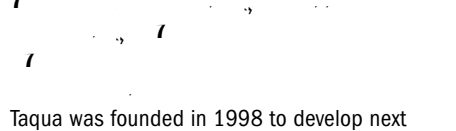
We are mobile innovators, and our stellar work is recognized by both the global industry and local communities. Syniverse connects more than 4 billion mobile subscribers through voice, data, SMS, MMS, mobile video communications and more.

## Telecom Software



Tango Telecom is a leading provider of Policy and Charging Control Solutions for evolving mobile networks. Through an evolutionary approach to infrastructure replacement and seamless integration capabilities, our solutions drive service innovation, monetizing the growing demand for mobile data while optimizing network resources.

## Telecom Software



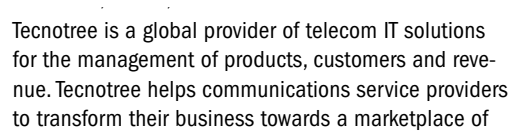
Taqua was founded in 1998 to develop next generation telecommunications systems and applications. The company has evolved into a leading supplier of products and services that enable a seamless user experience as the carrier transitions into VoIP, IMS, WiFi and 4G/LTE. Today, hundreds of carriers utilize Taqua to cost effectively provide a full array of revenue generating, broadband and mobile applications to all types of communication devices.

## Telecom Software



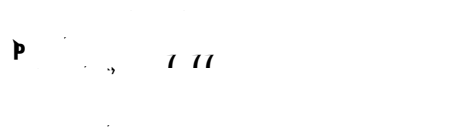
Tarana Wireless' universal wireless transport delivers deterministic performance at full capacity across True NLoS, nLoS, and LoS operation enabling backhaul anywhere small cells are located.

## Telecom Software



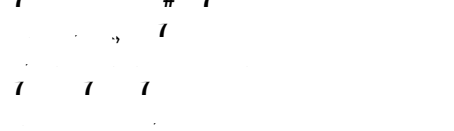
Tecnotree is a global provider of telecom IT solutions for the management of products, customers and revenue. Tecnotree helps communications service providers to transform their business towards a marketplace of digital services. Tecnotree empowers service providers to monetise service bundles, provide personalised user experiences and augment value throughout the customer lifecycle. With over 1100 telecom experts, Tecnotree serves more than 100 service providers in over 70 countries. Tecnotree is listed on the main list of NASDAQ OMX Helsinki with the trading code TEM1V.

## Telecom Software



Whenever you view a web site, click a mouse, make a cell phone call, or turn on a TV you touch our work. As a world leader in test, measurement and monitoring technology, we enable our customers to do more than they ever have. Technical innovators of all kinds benefit from our products and expertise.

## Telecom Software



Towers, Shelters, Cabinets, Coax, Generators, and Fiber

## Telecom Software

When it comes to mission-critical wireless communications, TeleCommunication Systems, Inc. (TCS) (NASDAQ: TSYS) solves some of the toughest technical challenges. We produce solutions for communications that demand proven high levels of reliability, security, and availability

9600 Escarpment Blvd Ste 745

TeleStax provides Open Source Communications software and services that facilitate the shift from legacy SS7 based IN networks to IP based LTE and IMS networks hosted on private (on-premise), hybrid or public clouds. TeleStax products include Restcomm, JSLEE, SMSC Gateway, USSD Gateway, SS7 Resource Adaptors, SIP Servlets, Rich Multimedia Services, Presence Services/RCS, Diameter/AAA Services, XMPP Services, WebRTC services and others.

## Telecom Software

Tellabs Insight Analytics<sup>SM</sup> Service offers a powerful set of network analytic tools to identify and address performance and capacity issues in mobile backhaul networks before they become user-affecting problems.

## Telecom Software

Teoco is a leading provider of assurance and analytics solutions to communications service providers worldwide. By taming the glut of telecom network, operational and business data, TEOCO leverages its expertise in 'big data' and 'real-time' capabilities to analyze and optimize network and business performance.

## Telecom Software

TIBCO Software (NASDAQ: TIBX) provides companies the two-second advantage<sup>TM</sup>, the ability to capture the right information at the right time. Distinguished by its speed to insight and adaptability to business challenges, Spotfire reveals unseen threats and opportunities, creating significant value. TIBCO Spotfire is the company's in-memory analytics software for next generation business intelligence. More than 4,000 customers worldwide rely on TIBCO to manage information, decisions, processes and applications in real time.

## Telecom Software

A single connection to TNS provides connectivity to carriers around the globe and access to a suite of advanced signaling & transport, intelligent database and next generation services. Whether launching new subscriber services, upgrading infrastructure, or migrating to IP, TNS delivers mission-critical services in a managed services model that helps minimize complexity, reduce risk and speed time to market.

## Telecom Software

Field service software gets mobile employees to the right place, on time. Predictive analytics optimize field work - driving efficiencies, empowering employees, improving customer relationships.

## Telecom Software

OSS & Billing, Mediation, Roamer Billing, Conversion Services, Fraud Management, Analytics & Reporting

## Telecom Software

Ulticom's signaling solutions have a proven track record of providing measurable value to the world's leading telecom equipment manufacturers and service providers. We take a collaborative, holistic approach to addressing your signaling challenges by listening and leveraging all of our corporate resources. We begin with an adaptive business model that is designed to deliver flexible business-to-business practices which seamlessly fit into your business model. Our Solutions Engineers then combine deep signaling expertise with practical industry knowledge and creative thinking in order to solve complex signaling and network challenges. You can collaboratively work with the industry's top signaling experts to fully explore how our leading signaling products can be adapted to give you a competitive advantage in today's converging communications markets.

## Telecom Software

SIMPLuS IP/MPLS OSS/BSS solutions offer Core/Access/BackHaul/Edge Networks Management with Planning Optimisation/Load Balancing/Provisioning/Inventory at (Logical+Physical )/Fault/Config/Performance/Audit/SLA Management/VPN/VPLS Management solutions for Services Assurance & better SLA's

## Telecom Software

Velocent Systems is pioneering Customer Experience Assurance (CEA) for Mobile Data and Voice over LTE (VoLTE). Customer Experience Assurance (CEA) represents an evolution of Service Assurance and Service Quality Management (SQM) by providing real-time, synchronized, end-to-end analysis of the subscribers' perceived experience, the network's performance and the delivered service quality.

## Telecom Software

Ventraq provides large-scale data integration, business analytics and personalization solutions for communication service providers (CSPs). These solutions enable CSPs to integrate all their data sources, analyze the data to enhance their operational performance, make the data available for multiple users and systems across the enterprise and offer subscriber web-based self-care solutions for traditional and next generation communications.

## Telecom Software

Verax OSS/BSS Suite is a complete, application-based "OSS/BSS-in-a-box" solution allowing Service Providers to quickly define, provision, monitor and bill services in convergent, multi-play environments, enabling them to start generating revenues in a short time with no integration hassles.

## Telecom Software

Vibe Wireless provides reverse logistics services including device returns, refurbishing, recycling and repair.

## Telecom Software

Victory Info Services, a subsidiary of MDF Holdings, LLC, provides mobile services and applications for wireless carriers and their customers. Victory is on the cutting edge of technology that broadens, yet simplifies mobile applications, for the user.

## Telecom Software

VSS Monitoring is a world leader in network packet brokers (NPB), providing a unique systems approach to enable network-wide and link-layer visibility, access and offload for a broad ecosystem of network monitoring and security tools. Deployed globally by 80% of the world's tier 1 service providers, F500 corporations and major government agencies, VSS Monitoring packet brokers improve tool usage and efficiency, simplify IT operations, and greatly enhance tool ROI.

## Telecom Software

WeDo Technologies is a worldwide leader in revenue and business assurance, providing software and expert consultancy, to intelligently analyse large quantities of data from across an organisation – helping to negate or minimise operational or business inefficiencies and allowing businesses to achieve significant return on investment via revenue protection and cost savings.

## Telecom Software

Westell Technologies is a global leader of intelligent site and outside plant solutions focused on the critical edge and access networks.

## Telecom Software

Operations and business support systems (OSS/BSS) have been the driving forces allowing service providers to deliver a multitude of products and services to customers in an efficient way. OSS/BSS transformation can now be the catalyst for increasing revenues – supplementing and supporting traditional sales and marketing routes.

## Telecom Software

ZTEsoft is a subsidiary held by ZTE Corporation which is the largest public listed telecom equipment manufacturer in China. As a leading provider of telecom software, solution and service, ZTEsoft specializes in providing comprehensive BSS/OSS solutions to global operators of wireless, wireline and broadband cable services, enabling agile operation to deliver innovative services quickly to address market challenges.

## Consultant

Our "high performance business" strategy is to use our expertise in consulting, technology and outsourcing to help clients achieve performance at higher levels so they can create sustainable value for their customers and stakeholders. We use our industry and business-process knowledge, our service offering expertise and our insight into, and understanding of, emerging technologies and new business and technology trends to formulate and implement solutions with and for our clients.

## Consultant

Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. Present in 44 countries with more than 130,000 employees, the Capgemini Group helps its clients transform in order to improve their performance and competitive positioning.

## Consultant

International mobile telecoms consulting services.

## Consultant

The Deloitte Telecommunications group is part of our U.S. organization's Technology, Media & Telecommunications (TMT) practice. We have more than 1,400 Technology, Media & Entertainment, and Telecommunications clients in the U.S. alone, including the vast majority of market category leaders across all sector segments.

## Consultant

## Consultant

PwC's global communications industry group is dedicated to delivering effective solutions to the complex business challenges facing communications companies. We can help you with capex, customer excellence, partnerships, network life-cycle management, regulation, and investor confidence, compliance, and risk. We work with clients from telecom, cable, satellite, and Internet companies from all developed and emerging markets around the world.

## Consultant

TCS' solutions and service offerings address the entire landscape of telecom equipment vendors and telecom service providers including R&D, consulting, operations and Enterprise IT. Our solutions help you identify and address the challenges and opportunities created by convergence of applications, networks or content. Our labs (IPTV, OSS / BSS, VAS & SDP, Nozomi - next-generation Wireless Innovation, etc.) build competency, develop innovative models and conduct experiments in wireless networks.

## Consultant

NTSS solutions enable the infrastructure to interact with internal and external information technology systems such as Operations Support System (OSS) and Business Support System (BSS) to provide full lifecycle management solutions to Communication Service Providers (CSPs). NTSS services span across the entire network ecosystem for telecom companies and enterprises ranging from network build, operate and maintain in an optimized and cost effective way. It also facilitates integration with Value Added Service platforms thereby achieving business efficiency and excellent customer experience.

## Consultant

TMNG Global's approach to Customer Experience Management is a disciplined methodology to comprehensively manage a customer's cross-channel exposure, interaction and transaction with a company, product, brand or service. Our Customer Experience Management practice is built upon two decades of success in CRM planning and implementation; network and operational service assurance; and self care and contact center assessment and optimization experience.

## Consultant

Jill Van Nostran specializes in PR and digital marketing for wireless / mobile, telecom and B2B tech companies. Her mantra: more value, less hassle!

## Consultant

Wipro have established practices in the areas of Billing & Customer Care, Service Delivery Platform, Service Provisioning, Service Assurance, Order Management, Inventory Management and Revenue Assurance. They have the widest range of offerings throughout the telecom ecosystem starting from R&D to IT and Consulting Services and which helps them to provide end to end solutions to their customers globally.

## Analyst

Our ability to understand the complex workings of TMT industries and draw practical conclusions, based on the specialist knowledge of our people, is what sets our consulting and research services apart.

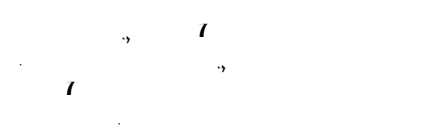
## Analyst

Current Analysis is a leading provider of timely, practical market intelligence and advice that helps global IT and telecom professionals compete, innovate and improve performance.

## Analyst

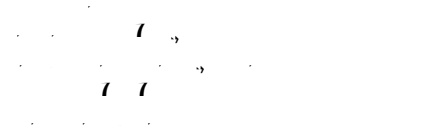
Heavy Reading is an independent research organization offering deep analysis of emerging telecom trends to network operators, technology suppliers, and investors. Its product portfolio includes in-depth reports that address critical next-generation technology and service issues, market trackers that focus on the telecom industry's most critical technology sectors, and exclusive worldwide surveys of network operator decision-makers that identify future purchasing and deployment plans.

## Analyst



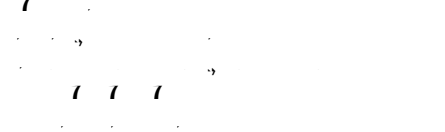
International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets.

## Analyst



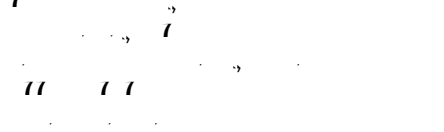
Informa Telecoms & Media actively foster and empower the communities we serve, assisting them in debating and sharing best practice, solving problems and stimulating innovation. From our magazines to online information portals, from our large exhibitions to intimate networking lunches at focused conferences, we bring the industry together to enable change

## Analyst



With access to Ovum's research and support from best-in-class analyst and consulting teams, companies can turn analysis and insight into action. Our aim is to make our clients' planning more effective, and to help them identify and assess relevant business opportunities.

## Analyst



Stratecast's product line includes: Monthly Analysis Services [Communications Infrastructure & Convergence (CIC), OSS/BSS Global Competitive Strategies (OSSCS), Consumer Communication Services (CCS), and Business Communication Services (BCS)]; Weekly Analysis Service [Stratecast Perspectives & Insights for Executives (SPIE)]; Standalone Research; and Business Strategy Consulting.

## Analyst



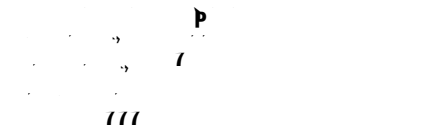
Strategy Analytics works with Mobile Service Providers and Infrastructure Vendors to balance investment choices with market timing through in-depth reports, custom white papers and strategic analysis.

## Analyst



TBR specializes in providing in-depth and timely insights within the computer, software, telecom, mobility, and professional services industries. These critical insights can provide value to all levels of your organization: executive, sales, marketing, product and business development, finance, procurement, and others.

## Analyst



TM Forum is a global trade association trusted by the world's largest enterprises, service providers and suppliers to help them continuously transform to succeed in the digital economy. We help our members reduce costs and risks, improve business agility and grow their business through a wealth of knowledge, tools, standards, training and practice advice.

## Analyst



Yankee Group's research efforts are focused exclusively on the mobility revolution and its impact on business decisions and strategies. Our goal is to answer the important questions about the mobile economy every day, giving our clients the critical data, insight and advice they need to profit in today's mobile world.

## Need guaranteed leads? Thought leadership? Incremental content marketing opportunities?

Sponsor an RCR Wireless News' multi-platform, editorial program and receive the following benefits:

**Editorial Webinar** – sponsorship includes 250 guaranteed leads, participation as sponsored guest and recognition as sponsor in all promotional materials. Sponsors will receive webinar registration and attendee list, responses to pre and post surveys and polling responses gathered during webinar.

**Editorial Feature Report** – in addition to recognition as sponsor in program promotion, sponsorship includes 250 guaranteed leads, distinct from webinar leads, 2-page ad spread or advertorial in feature report, and responses to lead capture survey questions.

For information contact  
sales@rcrwireless.com

**25% discount**  
When you sponsor 2 or more programs

### Fast facts about RCR Wireless News digital network (October 2015)

- ▶ 372,863 monthly page views
- ▶ 262,599 unique monthly visitors to websites
- ▶ 76,000+ opt in newsletter subscribers
- ▶ 269,957 monthly video minutes viewed on RCR Wireless News Youtube channel
- ▶ 68,522 monthly videos viewed on RCR Wireless News Youtube channel
- ▶ Industry leading demand generation programs and results



<http://www.rcrwireless.com/category/free-reports>

### UPCOMING 2015 AND 2016 EDITORIAL PROGRAMS INCLUDE:

#### NOVEMBER 2015

*Analyst Angle Series:*  
RAN Optimization

#### DECEMBER 2015

2016 Predictions: VoLTE, 5G, Connected Cars IoT, Wearables and more

#### JANUARY 2016

*IoT Innovation Series:*  
IoT: Opportunities for Carriers

#### FEBRUARY 2016

*Analyst Angle Series:*  
Managing Mobile Traffic to Maximize QoE and Performance

*Test & Measurement Series:*  
Small Cell Testing: Getting Small Cell Networks Right

#### MARCH 2016

*Telecom Software Series:*  
NFV, SDN and Cloud: How Deep and Where?

#### APRIL 2016

*HetNet Series:*  
The Future of Wi-Fi

#### MAY 2016

*HetNet Series:*  
Case Studies: Outdoor DAS and Small Cells

*Analyst Angle Series:*  
VoLTE, VoWiFi: Voice Comes to the Fore, Again

#### JUNE 2016

*HetNet Series:*  
Scalability, ROI and the Business Case for Small Cells

Each program is limited to three (3) sponsors