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Diametriq: BEHIND THE 4G NETWORK

Anjan Ghosal, President & CEO

Diametriq: 4G BEHIND THE NETWORK

By Anamika Sahu

“I held a moment in my hand, brilliant as a star, fragile as a flower, a tiny sliver of one hour. I dripped it carelessly, Ah! I didn’t know, I held opportunity”, Hazel Lee.

Anjan Ghosal does not like letting a good opportunity slip away. After selling his Wi-Fi Data Offload business in 2011 in a very successful exit to Ruckus Wireless, he had the option to take some time off. “It was a great feeling! After many years of grinding effort, it was fun to prove a lot of skeptics wrong!” smiles Ghosal.

The explosive growth of mobile data has led to a number of challenge

Anjan Ghosal,
President & CEO

for mobile operators. Wi-Fi Offload addresses data traffic congestion in LTE networks – one of these key challenges. But there is a bigger challenge in managing signaling traffic – cryptic data messages that flow between the various network elements to keep them running. Signaling is the “central nervous system” of all telecom networks. If the signaling network fails, it will bring the entire wireless network to a grinding halt.

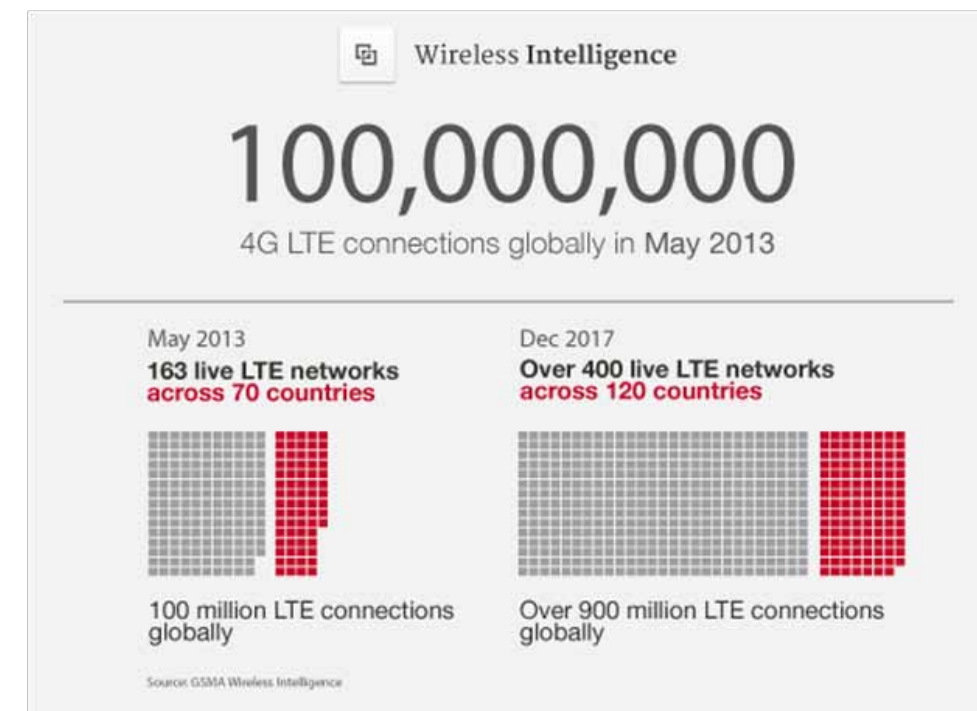
“In past lives we helped network operators manage their data traffic in 4G networks. The focus at Diametriq™ is to extend smart routing and management to their signaling networks.”

As operators and standards bodies came together to address this issue by proposing specialized “signaling routers,” Ghosal saw that as a golden opportunity. With a couple of employees, Ghosal started Diametriq to build intelligent routers to manage signaling routing in LTE networks.

of selling into a consolidating customer. So we knew we have to do something radically different to make our mark”.

In 2008, IntelliNet made that move and acquired Azaire Networks, a pioneer in Wi-Fi Offload. “It was a great company with a great idea, just a bit ahead of their time. We outmaneuvered some much larger buyers by our sheer speed of execution. The deal was closed in four weeks before others had the time to react! We had an 18 wheeler parked in their lot to make a point that we were serious about doing this deal!” laughs Ghosal.

The heavy lifting started right after the acquisition. We realized that we would have to make some technology changes to make this more adoptable to the operators who had just started warming up to the idea of overlaying their LTE networks with Wi-Fi. We integrated our Femtocell Gateway platform with Wi-Fi Offload to build the world’s first true “Small Cell



The Launching of Diametriq, Building on Experience

Anjan started IntelliNet almost 20 years ago and gradually built up a versatile team and product portfolio. “The face of telecom has changed dramatically over the last twenty years. Startup activity has been dwindling due to a hostile funding environment and the complexity

Gateway.” Selina Lo, CEO of Ruckus Wireless and a visionary in this space, quickly realized the synergy between the Ruckus carrier-grade access points and data offload technology. By October 2011, Ruckus Wireless had acquired this division in a cash and stock deal.

“Retirement was a terrifying proposition for me



The U.S. Team

even though Florida did present some attractive options”, quips Ghosal. “But more importantly I saw an interesting opportunity in LTE signaling which I could not pass up!”

Diametriq was formally launched in May 2012 though the team had already started forming from late 2011. IntelliNet already had a number of Diameter deployments having launched the Accelero™ Diameter product in 2006. The challenge at hand was to leverage these assets to build a world class Diameter routing product, referred to in the industry as the Diameter Signaling Controller or DSC.

“I had the technology for a new company, but I didn’t have a team to execute the strategy. Almost all employees had been absorbed by Ruckus”, explained Anjan. “So I took the couple of people that did not go to Ruckus and recruited some former employees and people I knew in the industry and started building a new team.”

Diametriq then had a strong core team in the U.S. and has augmented

that by building a development team in Bangalore which continues to expand. Kumar Ramalingam, VP-Engineering, is responsible for

“The challenge at hand was to leverage these assets to build a world class Diameter routing product, called DSC”

building this team. Having worked extensively with offshore teams in past lives with Lucent and other telecom organizations, he brings years of

valuable expertise in making remote development teams effective. He says, “Regular communication and regular visits in both directions are the key.”

A primary challenge of any startup is funding. Fortunately, Diametriq had an income stream from IntelliNet’s support contracts as well as additional sales of Diameter and other signaling products. “I learned the hard way that telecom infrastructure is not a favorite of the investment community. They want to see a finished product and a backlog”, adds Anjan. “Like IntelliNet, Diametriq continues to be self-funded.”

So What is a DSC?

Unlike the hierarchical network of earlier wireless technologies, the LTE architecture of Evolved Packet Core (EPC) draws inspiration from the IP world – which is a build around a flat architecture. While flat architectures may be very efficient in terms of resource usage and latency, it is much harder to manage and control since most of the intelligence is “extremely” distributed. In telecom networks

Diametriq DSC Solutions

Diameter Routing Engine™

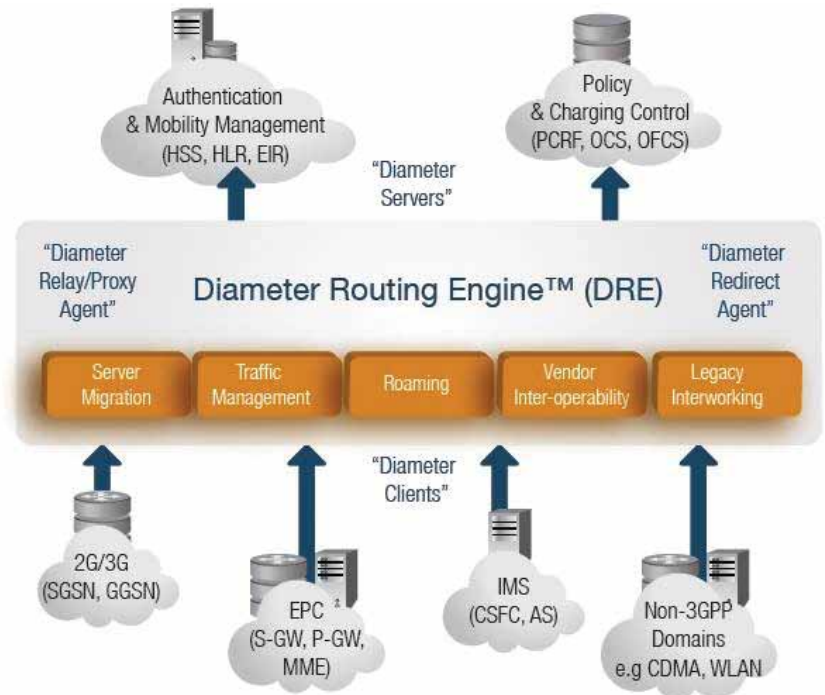
This product includes a Diameter Routing Agent, Diameter Edge Agent, a Subscription Locator Function and a Diameter Interworking Function. These functions can be configured to meet specific network requirements as well as serve as a host for critical applications that utilize the information contained in Diameter messages. Some of the main features of this product are geographic redundancy across multiple sites for disaster recovery, capacity of up to 100K messages/sec per server/blade, and scalable to 1M messages/sec per cluster.

Diameter Edge Appliance™

Larger Mobile Network Operators that have multiple instances of EPC network elements will need a Diameter Routing Agent (DRA) to efficiently route signaling traffic and perform load balancing, relay, proxy and redirect functions. For smaller operators a DRA may not be necessary. However, they will need a Diameter Edge Agent for LTE roaming to enable a secure connection to an IPX or directly to another Wireless Network Operator.

Accelero™ Diameter Platform

Accelero Diameter has been used by tier one mobile equipment vendors and deployed in tier one operator network since 2006. Accelero Diameter includes support for the most popular Diameter interfaces used by EPC, IMS and MMD. Also included is an ABNF compiler and extensible XML-based data dictionary that allows changes to existing and new Diameter interfaces in just a few days.



which promote “5-9’s” reliability and network resilience that can be a major obstacle. Early LTE adopters like Verizon Wireless, O2 and Telenor found it out the hard way when their networks experienced extended outages traced back to signaling congestion.

To that end, the IETF reached a compromise by proposing a hierarchical structure for the signaling network while keeping the data flow flat and offloading that at the nearest point. At the core of this hierarchical network is a smart message router called the Diameter Signaling Controller (DSC). The DSC performs multiple tasks in the network. While its basic function is to manage signaling traffic by effective load balancing, it is increasingly performing additional tasks like conversion between different ‘dialects’ of Diameter as well as interworking between earlier 3G networks and today’s 4G networks. This could not have come at a better time. An avalanche of smart

phones and tablets using features and applications not available on conventional devices has created a surge of signaling traffic – a signaling storm.

Diametriq’s DSC, trade named the Diameter Routing Engine™, combines a Diameter Routing Agent, with a Diameter Interworking Function to connect to the control layer of 4G and older technologies and a Diameter Edge Agent to provide security for LTE roaming. The product is hosted on a fully redundant carrier-grade yet commercial off-the-shelf hardware platform. Differentiating features include the ability to host applications that have access to the vital information carried the in control plane. An example is Roamer Visibility, the geographic representation of where an operator’s subscribers are located outside of their home network.

Diametriq and its predecessor IntelliNet have always had “underdog” status in a playing field



India Team

“Diametriq extends its reach by partnering with companies that provide complimentary solutions to wireless network operators”

with larger companies with superior resources and Ghosal seems to cherish that. When Diametriq was launched the Diameter Signaling Controller market was in its infancy, but major competition soon emerged. The early mover in that space - Traffix Systems, an Israeli company, had just been acquired by F5 networks. Tekelec and Acme Packet soon had products of their own. Despite the strong competition, Diametriq is carving a niche for itself as the smaller, but more nimble, competitor with unique product features. Diametriq extends it

reach by partnering with companies that provide complimentary solutions to wireless network operators. This enables Diametriq to compete effectively with some of its larger competitors.

Diametriq has secured a number of relationships that will lead directly and indirectly to customer sales. These partners include world's leading network equipment suppliers, software developers, and hosted services providers. Diametriq works closely with them to understand their requirements and anticipate how its products and services can best meet their needs. It combines wide-range software experience, peerless understanding of industry dynamics and meticulously detailed software processes to deliver market-leading solutions.

“In the process of working with partners and operators we are uncovering a number of adjacent needs that we can solve for our customers”, adds Anjan. “This is where our flexibility and nimbleness will help us grow the business beyond the initial products and markets.”

Vision Ahead

LTE continues to grow rapidly around the globe. “The DSC is the proverbial tip of the iceberg! These are the early

days of all-IP networks and it has the same level of excitement as the early days of mobile networking. There will be tremendous opportunities of players who has the depth of experience and the ability to productize their knowledge”, explains Anjan.

The real value in being in the signaling network is our ability to better understand customer behavior. Signaling networks carry key information on subscriber behavior like their surfing habits, devices being used as well as sites and applications where subscribers spend their time. “In the emerging world of big data, this is a gold mine! While routing the data packets is the beginning, the future value will be in the information that travels in the control plane. We see this as a key area of growth for us”, says Dan Wonak, Director -Marketing.

Excited about the opportunity, Anjan see enormous prospects even competing against giants. “Our strategy is to get a foothold by establishing a set of reference customers among Tier II and Tier III operators which will fill the revenue stream early in the game and become valuable reference accounts. But to achieve our goals, we need to land some Tier I customers at some point in time”, envisions Anjan.

Ghosal may be on to something. Recent reports show that the Diameter Signaling Controller market is expected to grow at more than 100 percent a year and seems to be a hot area for M&A. In 2012, F5 acquired Traffix Systems at very rich multiple of revenue. More recently Oracle spent over \$3 billion to acquire the top two players in the market – Acme Packets and Tekelec.

Headquartered in Florida with its Development Center in Bangalore, the company currently has over 55 employees globally and plans to expand both in terms of reach and number. 