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MulteFire meets the operational needs of the enterprise

**A conversation with Prithu Prakash,
Vice President Business Development, Redline Communications
By Monica Paolini, Senza Fili
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MULTEFIRE®



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With the use of unlicensed bands and equipment that specifically target enterprise needs, MulteFire aims to combine the performance and security benefits of LTE with the simplicity and low cost of Wi-Fi.

In this conversation with Prithu Prakash, Vice President Business Development at Redline, we discussed the operational benefits that MulteFire brings to the enterprise, as demonstrated by use cases for the utilities and mining verticals.

Monica: Prithu, can you give us an introduction on what Redline is about?

Prithu: Redline is a company that's been around for 20 years. We're headquartered in Canada, near Toronto. We support many sectors including oil and gas, military, government, mining, public safety, and utilities. We've deployed in 55 countries. Redline designs, builds, manufactures, deploys and supports our own equipment.

Monica: You already serve many of the verticals that MulteFire addresses using other technologies. How did you get into MulteFire?

Prithu: MulteFire offers several capabilities for us. We're interested in how it progresses, and

how the IEEE and 3GPP support the MulteFire Alliance. A key capability for us is the ability to operate in unlicensed spectrum.

Monica: Why is that important?

Prithu: Today spectrum is a rare resource. The MulteFire Alliance advocates a robust protocol that has been designed to operate in an unlicensed band harmoniously with IEEE 802.11

Monica: Unlicensed spectrum allows the enterprise to deploy a private network without having to work with an operator, and to run its applications within its premises.

Prithu: The model today is that we acquire a license, and then run a wireless protocol over the spectrum that supports our applications. Most of the spectrums are owned by the telcos, and telcos design the networks in a way that it satisfies everyone - like a one size fits all. Some of our customers require a custom-fit and/or a private network which can behave in a way that's suited to their business needs. The ability not to be tied to a public spectrum or telco is advantageous, because they can operate the network alone or with a telco as needed as a private entity. Operating in unlicensed bands and operating a private, dedicated and secure communication network

will help "control" the communication characteristic to their own operations.

Monica: When I talk to the enterprise, the issue of control is really crucial. However, what control means in different environments is different across verticals, and so the requirements differ too.

Prithu: There are a number of points we can make to address the different types of verticals. From the business perspective, if we look at the price of spectrum, deployment, ROI and the risk of churn, then total cost of ownership for MulteFire would be very low compared to a telco.

From the spectrum perspective, enterprises will be able to deploy MulteFire without violating the spectrum regulator laws and rules.

From a deployment perspective, MulteFire will be easier to deploy and coexist with minimal interference from IEEE.

From an ROI perspective, a telco could charge you anything from \$8 to \$100 per device; with MulteFire the ARPU is \$0.

From a technology perspective, MulteFire has the capacity, coverage, latency, mobility, interoperability and security to evolve the

business and operational needs of the enterprise, which vastly benefits operational processes, as they can be customized.

As a base technology, MulteFire can address all of these pillars, making it a positive step forward.

Monica: Can you give us some examples of how that translates in specific applications and verticals?

Prithu: From an individual safety perspective, knowing the locations of your work force and having the ability to get to them is critical for “man down” types of applications.

With M2M, multiple communication sessions can ensure safety levels are maintained, and nothing goes haywire in any way. The layers of edge-based communications could help reduce any chance of a chain reaction at any location.

MulteFire could offer the ability for our customers to define a priority and policy for each operational process.

You can't do this in a commercial network. A commercial network would offer one standard capability for everybody on their network. With MulteFire, we will be able to fine-tune the QoS, and to manage the latency, uplink and downlink for each and every use case as an industrial private network.

This will not only increase security at our customers' locations, but also increase operational capabilities.

Monica: Is there any barrier to entry? Is there anything that an enterprise planning to deploy MulteFire should pay attention to?

Prithu: There are always barriers to entry. Here, the barrier to entry is training. How easy is it to deploy and manage MulteFire? How easy is it to complement the existing infrastructure, and what are MulteFire's operational benefits?

All these factors are not showstoppers. These conversations are needed with a customer to ensure that this technology is well-positioned for their needs.

Monica: What are the applications that MulteFire can support in different verticals?

Prithu: Our verticals are oil and gas, military, government, public safety, utilities, and mining. There are three main basic generic applications across these verticals. These three generic types are related to the safety of individuals, operational needs and IoT, and safety-based applications for man down and/or injured personal. If there was a man down or no movement from their mobile device, another individual close to the area could be contacted to go and find out and help.

Operational-based applications that support heavy equipment could be used to ensure the equipment is adequately serviced. If it hasn't been serviced for a long time, the machine could break down, or fail and cause harm, and take days to fix. Reducing incidents makes operations more reliable and increases operational efficiencies.

IoT based sensors in the field for 6 to 12 months will probably require maintenance and recalibration. It's the ability to communicate back to control with minimal management, minimal maintenance, and minimal support while ensuring accuracy is maintained during the maintenance cycles.

All these types of applications would help our customers to increase their operational processes and reduce the cost of business.

Monica: For IoT and enterprise-specific applications, is the availability of devices a concern?

Prithu: Without devices, a wireless network is useless, but these are the early days. As always, I would love if all the devices were available today. There have been a number of trials to date that have demonstrated certain areas of MulteFire, and the vendors are working on a business case to manufacture the devices.

The more trials we have, the better understanding we will gain from deployment, expectations and requirements.

From an adoption perspective, MulteFire lowers the spectrum barrier, and offers private LTE capabilities while coexisting with IEEE.

But that's not the end of the game, that's only a part of the equation.

The aim is to make MulteFire as simple as Wi-Fi to deploy. It took telcos years to fine-tune their networks, understand traffic patterns and remove congestion. We need to make sure that all of the lessons learned are

inherent in the capabilities before we deploy. Deploying a technology that is quirky would not be a good move for anybody. Advanced capabilities like SON and beam forming would enable MulteFire to better manage the RF layer.

Monica: In which bands will MulteFire work?

Prithu: MulteFire can work in the 400 MHz, 800 MHz and 900 MHz bands. In Japan, trials are happening in 1.9 GHz, 2.4 GHz, 3.5 GHz, and 5 GHz bands. Some of these are regional, others are global.

We plan to build products based upon our customers' needs. We will support both narrowband and broadband communications depending on the customer and their application types.

Monica: Will 3.5 GHz work in the US as well?

Prithu: Technically yes, but not a direct focus for MulteFire 1.0 and 1.1.

Monica: How do MulteFire and CBRS coexist in the US?

Prithu: Redline is a member of CBRS Alliance and working with it. That's moving along very well. We are planning to introduce both MulteFire and CBRS capabilities into our product roadmap for our customers. We see MulteFire and CBRS as complementary.

Monica: An enterprise is likely to have Wi-Fi already or decide to deploy it, and then decide to add MulteFire. How should enterprises decide how and when to add MulteFire to an existing Wi-Fi network?

Prithu: It's safe to say that almost every enterprise has some form of Wi-Fi, and that no real greenfield exists.

MulteFire advocates that it will coexist with Wi-Fi and still keep communication integrity. The customer will need to understand the level of their channel occupancy and free channels on their Wi-Fi deployment before a MulteFire technology is deployed.

Each deployment will require a good understanding of the existing spectrum before MulteFire is introduced. Ample free channels are easier to work with than fully congested channels.

Monica: Wi-Fi and MulteFire must coexist in the 5 GHz band, because everybody has the right to use unlicensed spectrum.

One thing you mentioned before is safety. And there's going to be a potential interest from military users. Can you comment about what security level MulteFire supports?

Prithu: Operating in an unlicensed band does not imply you're open to vulnerability, and the main interest would be distance and predictable latency.

The security elements within the LTE standard, along with the capabilities of listen-before-talk or LBT, while operating a completely private network are some of the benefits which MulteFire can bring.

Monica: LTE is a complex technology, created for mobile operators with a large footprint, supporting full mobility and voice for a large

number of subscribers. How can you make LTE easier so that it meets the different requirements of the enterprise?

Prithu: Telcos go to extreme lengths to support their customers. They operate in very large areas and must ensure that one service profile can satisfy the majority of their subscriber groups. Telcos must monitor a number of parameters, and then continually tweak to ensure the network stays optimal. One main characteristic in the consumer market is downlink stability.

Enterprise customers may require other characteristics such as uplink and latency, but don't have the engineering teams to monitor and tweak their private networks based upon traffic flows and operational needs.

Deploying a private, dedicated, secure network is very different than deploying a telco network. Telco networks have many connected users. However, the telco can only guess, based upon previous trends in usage and density for a particular time and location. For a private network these are better understood, so a more defined network can be deployed.

In addition, private networks will know exactly which applications are being used. A MulteFire network will be able to define the policies and the profiles and ensure that all the end points are adequately serviced before the system goes live.

With these metrics in place, and the pre-engineering work done beforehand, we will ensure that the network is already fully

optimized for the user, while telco networks are usually not.

A telco usually deploys a network based upon best efforts, and tweaks based upon traffic and congestion flows. In a MulteFire private, dedicated and secure network, we will be able to define the user's profile and policy ahead of time.

Monica: Will enterprises – for instance mining companies – install the network themselves? Or will they rely on someone else to do so? And if so, who will install enterprise networks?

Prithu: Obviously, they will hire us to do that! The starting point would be to envision an understanding of the maximum deployment, and then slowly build backwards to the deployment target in phases as required. This way we keep RF conflicts to a minimum by working from a fully deployed RF map.

Monica: You will help the enterprise deploy a MulteFire network, but you don't expect them to deploy it entirely, because that's not their core competence. It's one thing to put an access point here and there. In order to have perfect coverage for services and applications, you need to have a network that can support such services and applications.

Prithu: You can have the perfect capability and perfect technology, but if it's deployed badly, it will be only as good as the weakest deployment link.

The initial step would involve working with the enterprise to understand the needs and then discuss requirements, RF planning, and

deployment metrics. By doing so, they will understand what to expect once they've deployed their network.

Of course, enterprises can do the installation themselves. That's part of the value of owning, running, and deploying your own network. These are the metrics and the merits that MulteFire brings forward. Managing the network would be simpler than running a telco as SON, and other advanced features will help manage the RF layer.

Monica: The planning is crucial because if the network is not planned well, it doesn't really matter what technology is used, it will not perform efficiently.

Let's look at the timeline ahead of us. When is MulteFire going to be commercial?

Prithu: We're waiting for MulteFire 2.0 and we're waiting for what 3GPP and IEEE are planning to do. We're waiting for the user devices to be available. We're planning to build a CPE and a base station so we can manage true end-to-end connections with our platform. We're also looking at IoT in terms of uplink, latency and resilience with MEC.

We're looking at verticals in terms of utility, power generation and power distribution, oil, gas, mining, and SCADA interoperability. We're looking at mission-critical applications for verticals such as healthcare, military, border security, public safety – and generally anything that requires rapid deployments, such as events – as well as our core industries.

Monica: What do you think are the most important 3GPP use cases?

Prithu: The 3GPP Release 16 standard draft document has identified nine different types of use cases. They include rail mass transport, building automation, factories of the future, industry 4.0, smart living with healthcare and all of the IoT devices associated with it, smart city, electricity distribution, centralized power generation, events, and smart agriculture.

We should look at MulteFire as a platform for all these different types of use cases, along with connectivity and resilience.

If we look at it from a platform perspective, the personal grid, the telecom grid, the enterprise grid, the public safety grid, the industrial grid including oil, gas, and mining, a multigrid comes into play.

With such a matrix, we can identify the required differences in communication platforms that are geared for public and private markets. This takes us to private dedicated technologies like MulteFire, where the enterprise can manage and adapt their networks based upon their changing operational needs. The enterprises can operate autonomously from the telco and the spectrum regulators.

Glossary

3GPP	Third Generation Partnership Project
ARPU	Average revenue per user
AP	Access point
CBRS	Citizen Broadband Radio Services

CPE	Customer premises equipment
MEC	Multi-access edge computing
M2M	Machine to machine
IEEE	Institute of Electrical and Electronics Engineers
QoS	Quality of service
RF	Radio frequency

ROI	Return on investment
SON	Self-organizing network
SCADA	Supervisory control and data acquisition

About MulteFire Alliance



The MulteFire Alliance is an independent, diverse, and international member-driven consortium defining and promoting MulteFire – a cellular-based technology for operating in unlicensed and shared spectrum. The MulteFire Alliance purpose is to support the common interests of members, developers and users in the application of LTE and next generation mobile cellular technology – such as 5G New Radio – in configurations that use only unlicensed or shared radio spectrum. As an open organization, the MulteFire Alliance will collaborate with stakeholders that have an interest in shared unlicensed spectrum. Its goal is to develop technology that will be widely adopted in global standards.

About Redline Communications



Redline Communications Group Inc. (TSX: RDL) is a Canadian company incorporated in 1999. The Company develops wireless communications products and solutions for markets that require privately dedicated communications such as Oil and Gas, Mining, Telecom Service Providers, Military Organizations and Governments. Customers in these markets have very demanding requirements and rely heavily on their wireless network to deliver high performance and highly secure communications over extended periods of time. Redline's platforms and products create the communication backbone necessary to support enhanced applications and services for its customers. Redline solutions enable reliable and mission-critical voice, data, video, M2M and IoT applications in very remote or hard to reach regions of the world.

For nearly two decades, Redline has demonstrated that its products are among the most powerful, versatile, reliable and secure in the industry. These products are the result of Redline's engineering strength coupled with its deep understanding of the markets in which it operates and an intimate knowledge of its customers' needs and challenges. As part of designing and delivering mission-critical networks, Redline adds to its advanced technology support for its customers and partners by providing Advanced Services in all phases of the life of the network.

About Prithu Prakash



Prithu Prakash is the Vice President of Business Development and is responsible for Global activities across Redline. He came to Redline from General Dynamics, where he was the Global Director of Business Development and lead the Public Safety portfolio, while there, he was the driver behind the BRIC and SHIELD strategies. Prior to GD-MS, Prithu was an Associate Director of Business Development and took Bell from CDMA to LTE and strategized / executed the national M2M platform at Bell Mobility across Canada. Prithu is a Professional Engineer P.Eng in Ontario, and holds the designation of Chartered Engineer C.Eng, and Chartered Manager C.Mgr, in Europe.

About Senza Fili



Senza Fili provides advisory support on wireless technologies and services. At Senza Fili we have in-depth expertise in financial modeling, market forecasts and research, strategy, business plan support, and due diligence. Our client base is international and spans the entire value chain: clients include wireline, fixed wireless, and mobile operators, enterprises and other vertical players, vendors, system integrators, investors, regulators, and industry associations. We provide a bridge between technologies and services, helping our clients assess established and emerging technologies, use these technologies to support new or existing services, and build solid, profitable business models. Independent advice, a strong quantitative orientation, and an international perspective are the hallmarks of our work. For additional information, visit www.senzafili.com.

About Monica Paolini



Monica Paolini, PhD, founded Senza Fili in 2003. She is an expert in wireless technologies and has helped clients worldwide to understand technology and customer requirements, evaluate business plan opportunities, market their services and products, and estimate the market size and revenue opportunity of new and established wireless technologies. She frequently gives presentations at conferences, and she has written many reports and articles on wireless technologies and services. She has a PhD in cognitive science from the University of California, San Diego (US), an MBA from the University of Oxford (UK), and a BA/MA in philosophy from the University of Bologna (Italy).

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