

## FirstNet should consider application needs while designing network, Mutualink official says

Urgent Communications By Donny Jackson

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Collaboration vendor Mutualink recently released a white paper that encourages [FirstNet](#) officials to consider what application functionality should be included in various parts of the network—particularly as they relate to deployable systems—to enhance efficiency of the fixed-infrastructure system.

“People are putting the pipes first—and understandably so,” Mutualink CTO Joe Boucher said during an interview with [IWCE](#)’s *Urgent Communications*. “What they’re currently focused on is building out the pipes, with the theory being, ‘We’ll build out the pipes, because—without the pipes—we can’t put any applications on it, so it’s worthless thinking about those [applications].”

“One of the things that I wanted people to take away from that white paper is that architecting the pipes does require some thinking about the applications that are going to ride on those pipes. Because the capabilities you would like to enable with applications will influence how the pipes are built out.”

In particular, [LTE](#) architecture requires connectivity to an evolved packet core (EPC) to support application functionality, Boucher said.

“So, if you don’t put a core at the deployable level, you can’t put applications at that level that are using LTE,” he said. “If you only put the cores in the fixed infrastructure, then what you’re saying is that, to get any LTE application-level functionality on scene, I require a certain amount of bandwidth [backhaul](#) to reach my core and my application gateways.”

Currently, the [3GPP](#) standards body that oversees LTE technology specifications is in the process of developing peer-to-peer functionality specifically for public safety to support various applications, including mission-critical voice. However, such functionality means that the ability for applications to work is dependent on the capabilities of the devices being used—and often, the capabilities of the devices are not homogenous, Boucher said.

Having an application server and EPC at an incident scene would change that situation and allow applications to function normally, Boucher said. This is significant as FirstNet officials determine what kind of deployable systems should be used in a given circumstance—cells on wheels (COWs) or more-expensive systems on wheels (SOWs), he said.

“SOWs are fully functional systems,” Boucher said. “They can be dropped from a helicopter in remote areas, provide LTE services—as well as application services—to an entire incident area. COWs, however, require backhaul to do anything. They require connectivity to the packet core, wherever it be located.

“And, if you’re backhaul is something like a satellite, which anticipated for the rural areas—you’re going to be able to do only very limited things over that backhaul. So, if public-safety folks think they’re going to be able to do video sharing from a helicopter ... with a cell on wheels and satellite backhaul, that’s going to be a rude awakening.”

From a big-picture perspective, Boucher said that COWs make sense in dense, urban environments “where you’re almost guaranteed to get connectivity to the core network,” while SOWs are more appropriate in rural environments and in disaster areas, where broadband backhaul connectivity is an issue.

One other option that may prove to be useful and economical is one that leverages the capability of both Wi-Fi and [LTE](#) technology, Boucher said.

“The LTE pipes are great, but you can extend that functionality by putting in an on-scene Wi-Fi bubble system, as well,” he said. “Even if you had a cell on wheels that required [backhaul](#) , at least if you put in a local system with a Wi-Fi bubble for collaboration, all of the users within that bubble could use that [Wi-Fi] bandwidth, and then you could use the LTE to get back to the remote connectivity you needed. That could be a very economical hybrid [approach].”

Although the white paper includes information about Mutualink’s work with early public-safety LTE deployments, such as the one in [Harris](#) County, Texas, the bulk of the document is designed to be “vendor agnostic” and address some of the “inevitable” challenges that

[FirstNet](#)

's technical staff will face when making network-design decisions, Boucher said.

And there will be some very difficult decisions to make as FirstNet tries to build a system that is unprecedented and will try to address a number of factors that are unknown today, Boucher said.

“At the end of the day, there is a huge chicken-and-egg question here,” he said. “Because, until [public-safety] people have the capability and have the network, they’re not quite sure what they’re going to do with it. And, until people are sure what they’re going to do with it, it’s hard to architect the network to do that.

“I wish I could throw some silver bullet out and say, ‘This is the way to implement it,’ but I can’t.”

The Mutualink white paper can be downloaded at <http://www.mutualink.net/FirstNet-Whitepaper.asp>

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