

The future of rail connectivity

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No longer a luxury, internet connectivity is essential to the railways. Rail Business Daily talks to systems architect Nomad Digital about its growing capabilities and what we can expect in the future.

A crucial ingredient for modern rail services is rolling stock that has strong internet connectivity. This connectivity is at the heart of everything: from entertainment to selling food, maintenance, CCTV and even training.

With this modern-day digital landscape in mind, it is clear that getting good internet into trains is no longer a 'nice-to-have'.

This is where Nomad comes in. Nomad is a systems architect that brings modern connectivity solutions to trains.

Mike Butler is Head of Innovation at Nomad, which means he is responsible for keeping the business at the cutting edge of new technology whilst also having one eye trained on the future.

He said Nomad was already pushing the boundary of what was possible by making the most of **rail connectivity** infrastructure. Many customers might even feel like the future is here already: "The benefit to

our customers is that we utilise all available bandwidth being delivered to the train.

“Our connectivity solution is extremely robust. We utilise multiple mobile operator networks at the same time, rather than just one – which is incredibly important for creating a strong and seamless **passenger experience** for travellers as the train moves across the country.”

“To achieve this, our systems are constantly testing the network to determine the best route for data at that particular point in time, greatly minimising any effect on the upload and download speeds used by all aboard.”

The implications for those on the go are not to be underestimated. Not only does great connectivity keep film fans watching the latest movies or social media users browsing the latest updates while travelling, but it also keeps productivity up for those working from their laptops.

“Customer satisfaction is crucial,” Mike said, explaining that this technology is not just relied upon by passengers. “Better Wi-Fi and **rail connectivity** means happier customers and happier operators, it can also support payment applications so tickets and food etc can be securely purchased onboard”.

A powerhouse behind the scenes

There is a side to this passengers do not see. For instance, Nomad’s connectivity solution and Onboard Data Centre can also support Docker Containers and Virtual Machines that allow engineers to undertake data processing onboard vehicles to support applications such as Condition Based Monitoring, and Video Analytics. It can also provide onboard entertainment (movies and films) for passengers.

The systems on the train can crunch masses of performance data and report any issues supporting **rail maintenance**. Without good connectivity, operators have to wait until all the data can be offloaded via an eventual “good spot” in the network, and then they have to filter this information in the control centre.

With good internet, information about journeys can also be fed back and compiled to help train the drivers of tomorrow, and CCTV information about an incident can be efficiently provided to the authorities.

What comes next?

Mike is the first to admit that, no matter what you do right now onboard a train, there are some limits. He said: “The UK Rail Network does not have the best connectivity in the world. That said, I am confident that will change.

“In the future, we’re going to see more increased bandwidth being made available thanks to private comms networks – which also provides data connectivity to trains as they drive into hard-to-reach places like cuttings or tunnels.

“And we’re also going to see more satcom solutions – vast Low Orbit satellites ‘mesh networks’ that will send a signal to trains almost anywhere in the world.

“New infrastructure, meanwhile, will also bring with it sophisticated internet technology. One great example of this is what is being done on HS2. Better internet coverage is being built as part of the project.

“Of course, you need a go-to partner to help access these new forms of connectivity, which is what our team at Nomad does very well.

“At Nomad, we are already preparing our solutions to make sure they can take advantage of new systems as they are installed on the infrastructure to replace the old ways of working,” Mike said. “Ultimately, connectivity is one of the biggest enablers of exciting possibilities on the railway. As such, trains, their operators and the passengers they serve will be able to do a lot more, better and faster than before.”