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Data & Monitoring

Nomad Digital

The Intelligent Journey Powered by Onboard Connectivity

There is an ever-growing demand for connectivity in public transport, both from passengers and operationally, including **passenger information systems** (PIS) and CCTV, creating additional needs for logging and maintenance. This has generated a corresponding demand for ever higher bandwidth, whilst ensuring secure, continuous connectivity.

Nomad Connect – Best of Class Connectivity

Nomad Connect combines multiple links and technologies, so that high-throughput and continuous connectivity can be provided on board. For an optimal level of service or when operating between population areas, the traffic is aggregated and tunnelled over our Customer Data Centre (CDC) for uninterrupted service. For an urban project with good, continuous coverage, a solution without tunnel can suffice, thereby reducing the operational cost.

For the majority of projects, we utilise cellular connectivity. Our new range of Communication Control Units (CCU) provide full 5G and multi-SIM support. Nomad Digital's entry-level router supports two 5G modems and is best suited to provide internet access in areas with good coverage. Nomad high-end routers can support up to 6 modems, multi-gigabit connectivity

and can run a multi-media portal or additional services in parallel.

Cellular connectivity can be combined with other technologies such as mmWave, trackside radio or satellite. This allows a multi-gigabit link over the entire trajectory.

Optimal Use of the Available Bandwidth

Even though Nomad Connect supports very high throughput, demand often still exceeds the available bandwidth. Nomad Connect therefore also ensures that this bandwidth is shared as efficiently as possible.

Nomad Connect supports filtering and prioritisation of traffic or service classes and can implement highly customisable fair-use models. An API is available to allow customers to configure and integrate these

services within any proprietary portal. As an example, Nomad Digital recently introduced a feature named Light User Experience (LUX), which applies dynamic throttling of the heaviest users when the demand exceeds the available bandwidth, resulting in a much fairer distribution of the available bandwidth and an improved **rail connectivity** service for all passengers. On projects where the new feature was deployed, responsiveness and download speeds were significantly improved.

Nomad Connect supports various ways to customise the usage made of the available links. This can be done, for example, based simply on train location, or by using the cascading cost feature. The latter prioritises the use of links or operators with a lower cost, thereby reducing the overall cost whilst minimising the impact on the overall service.

A True End-to-End Solution

Nomad Digital provides a true end-to-end internet on board (IOB) solution, including the on-train network and passenger Wi-Fi, which is fully monitored and managed remotely.

For passenger Wi-Fi, Nomad offers a variety of solutions adapted to customer needs and the operational environment. These range from cost-efficient solutions using daisy-chained access points, to high-end Wi-Fi 6E solutions which can support extremely high throughput. The solution integrates with wireless inter-coach bridges and access points with integrated combiners to limit the need for antennae.

A wide variety of switches is also available, from gigabit solutions up to high-end 10gbps switches with 5 x 10gbps and 23 gigabit PoE ports. This allows the backbone to be used for many other services besides Internet On Board.

The Nomad 4600-3 and 5001C CCU's are extremely powerful units, using Xeon processors whilst supporting 10gbps interfaces and up to 64GB of RAM and 16TB of nVME storage. They can be used to run a wide variety of additional services and applications in parallel to providing connectivity. Examples include

Nomad's Onboard Information Systems (OBIS), and the Nomad **OnBoard Entertainment** Portal (or any customer portal) to offer multimedia infotainment content to passengers offering a positive and enjoyable **passenger experience**.

The 5001C can also host Nomad's Onboard Data Centre (ODC). This virtualisation solution has been fully optimised for mobile operation. It can be used to host and deploy any containerised application provided. This avoids the need to install extra physical servers on the train. The solution can be fully managed by Nomad Digital, but ODC can also be provided to the customer to manage.

Reliable and Easy to Maintain

The entire solution has been designed for optimal reliability, security and maintainability. A central configuration management solution is in place which allows for remote updates of the full on-board system. This allows for greater reactivity and ensures uniform behaviour can be deployed across a whole fleet.

Security is a key consideration for Nomad Digital and its customers with the entire connectivity solution being designed to be as robust as possible. This is further complemented by daily vulnerability scans which allow any potential risks to be identified and addressed quickly before they become an issue.

The solution is fully integrated with Nomad Digital's monitoring tools, Network Management System (NMS) and Fleetview. These are used for fleet monitoring and troubleshooting, as well as supporting detailed historical analysis and reporting.

For more information on the Nomad Digital suite of connectivity solutions, you can the team of experts by contacting **experts@nomad-digital.com**.

Nomad Digital

Scalable Onboard Connectivity in an Ever Connected World

NOMAD CONNECT
Powering The Intelligent Journey

Nomad Digital has over 20 years of experience in providing proven connectivity solutions and continues to innovate to meet that growing demand.

experts@nomad-digital.com |

Nomad Digital
connected transport, intelligent solutions