Harnessing the Power of Cellular Routers to Revolutionize the Commuter Train and Bus Experience

Commuter trains and buses are crucial in providing mass transit services between cities and suburbs. However, without integrating 4G LTE or 5G routers, transit operators at headquarters cannot update content displays remotely or monitor backup battery voltage levels. This article explores the transformative capabilities of utilizing cellular routers, specifically those with native support for Docker OCI containers, to significantly enhance advertising revenue, power management, automated shutdown processes, and internet connectivity, thereby improving overall customer satisfaction.

Increasing Advertising Revenue and Targeted Content

Cellular routers can automate targeted ads to display on multiple screens in public transportation, opening new possibilities for generating advertising revenue. Leveraging **Perle IRG Cellular Routers** with native support for **Docker OCI containers**, apps can be written to update ads frequently, ensuring dynamic and relevant content. Integration with GPS location data allows operators to tailor the advertising to upcoming stops. With passengers presented with more engaging ads, train and bus operators have an opportunity to boost their revenue streams.

Real-Time Updates and Passenger Information

Beyond advertising, 4G LTE and 5G routers empower operators to deliver real-time announcements to passengers, informing them about upcoming stops, delays, weather conditions, and security updates. Connecting the router's cellular capabilities to the display screens allows vital information to be relayed seamlessly, improving passenger experiences and overall satisfaction.

Efficient Power Management

Commuter trains operate with their own power grid and a backup battery. If the grid goes down, the battery kicks in to keep display screens and other auxiliary equipment running. Bus equipment is entirely reliant on battery power. Integrating cellular routers with dedicated Docker apps enables operators to gather battery voltage level and performance data and wirelessly send updates to the remote headquarters. This knowledge allows operators to take proactive measures by shutting down non-critical equipment when voltage levels drop, ensuring that critical equipment remains powered. It can also initiate the process of replacing aging batteries before they fail. By optimizing power management in this manner, operators can guarantee uninterrupted service and improve both safety and efficiency.

Automated Shutdown Processes

Complementing the ability to monitor voltage levels, cellular routers supporting Docker OCI containers can automate equipment shutdown based on predefined triggers. Docker apps can be programmed to automatically turn off specific devices, such as advertisement screens, when certain battery voltage thresholds are reached. This streamlines power conservation efforts, extending battery life and directing power to essential equipment until a recharge is possible.

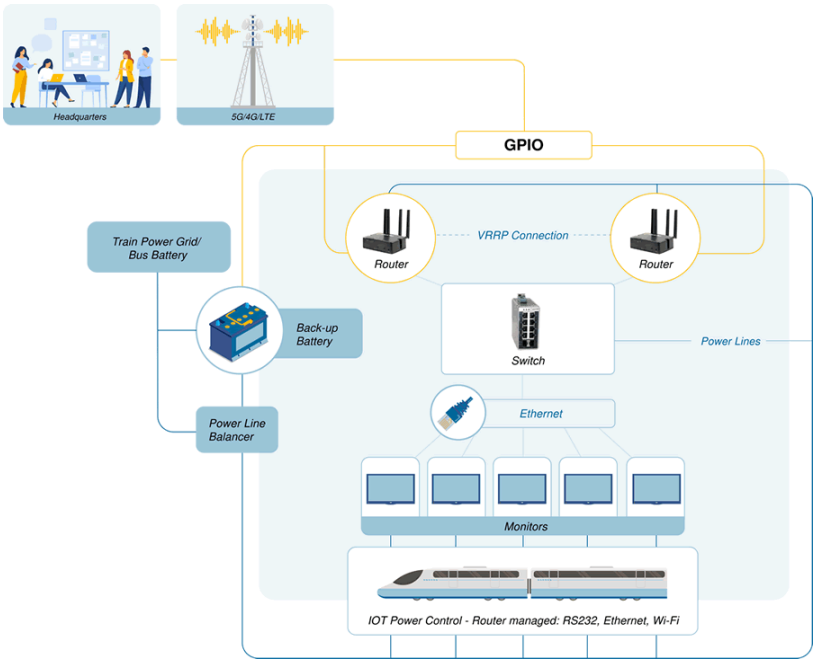
Enhanced Connectivity for Passengers

Cellular routers offer the added advantage of providing passengers with free or chargeable Wi-Fi internet access. Passengers can enjoy uninterrupted internet access, on their personal phones, tablets, and laptops to enhance their commuting experience.

What is the setup?

At the core of this setup is the connection of the backup battery to the cellular router using a GPIO cable for continuous monitoring of battery voltage levels. By leveraging a Docker app tailored for this purpose, the cellular router actively tracks voltage levels and relays this crucial information to remote operators stationed at headquarters. Armed with real-time data, operators gain invaluable insights regarding battery life and current voltage levels to make informed decisions about equipment shutdown or battery replacement in case of power scarcity. An additional Docker app can even automate the shutdown process based on specified trigger levels. For instance, the system can be programmed to turn off every other monitor once the power drops to a particular threshold. More devices can be deactivated as the voltage dips further. This meticulous control ensures prioritization of critical equipment and optimal battery utilization.

The cellular router also serves a pivotal role by functioning as the DHCP (Dynamic Host Configuration Protocol) server for each TV screen connected to the system. This responsibility entails supplying IP addresses and configuration files to the TVs, streamlining network access, and seamless content delivery. The cellular router then establishes a 4G LTE or 5G connection with remote operators at headquarters. The operators use a designated application to dictate each TV's advertisements and real-time announcements. The information is effortlessly transmitted to the respective TVs through the router's cellular connection. The flexibility provided by Docker OCI containers allows operators to select specific TVs, pinpointed by their unique IP addresses, for displaying each advertisement or announcement. A predetermined schedule within the Docker app can also connect the cellular router to the headquarters' network to sync the latest advertising content with the local TV storage. This eliminates the need for continuous manual intervention, ensuring the TV screens remain current with the newest information. When linked with the router's GNSS/GPS capabilities, targeted advertisements tailored to time and location will maximize engagement and effectiveness.



When two Perle IRG Routers are deployed on commuter trains and buses, maximum reliability and uninterrupted connectivity can be assured. These routers work in tandem, leveraging the power of Virtual Router Redundancy Protocol (VRRP) to establish a seamless communication path to guarantee continuous connectivity despite potential network interruptions. VRRP acts as a communication framework between the two cellular routers, allowing them to "talk" to each other and maintain a reliable connection. The second router is constantly vigilant, checking the primary router's communication path status. If, at any point, the secondary router fails to receive a response from the primary router, it automatically assumes control until the communication path of the primary router is restored. This transition occurs seamlessly, with minimum disruption to the overall connectivity and continued operation of the cellular router setup.

The Benefits of Perle Cellular Routers

Perle Cellular routers offer substantial advantages for integrating these transformative capabilities into commuter trains and buses:

1. **Native Support for Docker OCI Containers**: Perle IRG Routers allow the deployment of lightweight applications within Docker containers, optimizing edge computing processing capabilities. This inherent capability eliminates additional fees, ensuring an efficient and accessible solution.
2. No Annual Subscription or License Fees: Perle does not impose additional costs for operation, software updates, or accessing features, making it a cost-effective solution for long-term use.

Perle IRG Cellular Routers with Docker OCI container support are game changers for commuter trains and buses, enabling operators to improve advertisement revenue, offer real-time updates, enhance power management, automate shutdown processes, and provide reliable internet connectivity. These routers enable tailored and engaging content that will increase customer satisfaction and revenue streams. The deployment of Perle Cellular Routers offers an invaluable solution for revolutionizing the commuter experience without additional subscription or licensing fees. By embracing the potential of cellular routers, commuter trains and buses can transform into intelligent, connected vehicles that prioritize passenger comfort and convenience.