



Press Release No. 6/2015

Highly Available Broadband Wireless Internet Connections in Trains

Bingen am Rhein, Germany, June 2, 2015. Building on successful deployments with train operators in Italy and in France, Viprinet is looking to further develop its rail business across Europe. Viprinet is fully aware of the strong market demand for enhanced passenger Wi-Fi experience and believes that its best of breed solution will deliver this. Target markets include the UK, Germany, the Netherlands, and Denmark.

Background

These days, mobile internet is an important part of most peoples' lives. Smartphones and tablets are our constant companions in both our professional and private lives. Many passengers on long train journeys choose this mode of transport because it presents the opportunity to get work done, send email, or watch online videos and films during their trip. As a result, WLAN (wireless LAN) connections on trains are an important factor in the competition between train operators, as well as between trains and other transportation options. However, major technical challenges relating to coverage and service availability make it difficult to offer highly available broadband access on trains.

Technical Challenges

Trains themselves are not the problem, but the data transfer rates between the train and cell towers along its route pose several technical challenges:

- Provider coverage varies greatly (dead zones)
- Trains pass cell towers at high speeds, frequently moving from cell to cell
- High rates of packet loss
- Transfer rates between the train and the tower vary from a few to 200 milliseconds

The result is that service quality suffers. Frequent disconnections caused by long transmission times, the retransmission of lost packets, going through dead zones, and switching from cell to cell lead to a bad user experience.

Solutions

(1) If one network provider does not provide sufficient coverage, better results can only be obtained by combining services from multiple providers. Viprinet's patented WAN bonding technology, proven in high-speed trains, makes it possible to aggregate connections from several providers, for example Vodafone, O2 and Three, into one virtual link. Bonded broadband is highly available and stable because one unreliable, unavailable or error-prone link will not cause the connection to go down. The advantages of a Viprinet solution are far fewer dead zones, more usable bandwidth, and no disconnections, despite the high speed of travel and

the rapid call handovers between cell towers required.

(2) Uniquely, Viprinet bonding technology uses our patented forward error correction. This makes it possible to reconstruct lost packets sent over mobile networks rather than resending them. The advantages of this solution over competitive offerings are consistently low transmission times, no disconnections, and no bottlenecks due to retransmissions.

(3) Viprinet routers use adaptive data compression which means that 30% more bandwidth is available to data being transmitted from the train. The amount of bandwidth available on wireless networks varies based on the number of users connected to them so this improved bandwidth availability has a real direct and positive impact on user experience.

In terms of bandwidth, transmission times, coverage, and stability, Viprinet delivers the best quality solution for WLAN on trains. Train operators in Italy and in France currently use Viprinet's bonding technology.

As a result of our technology being superior to alternative competitive solutions Viprinet is in talks with operators in the UK, Germany, the Netherlands, and Denmark.

Notes for Editor:

UK Mobile Network Coverage

According to the Mobile Operators Association (www.mobilemastinfo.com) 99.7% of UK premises (homes and offices) had outdoor 2G mobile coverage from at least one operator in June 2014. Levels of coverage are influenced by population densities and by topography. As a result, 99.9% of England's premises were covered by 2G mobile from at least one operator, with 99.0% in Wales, 99.5% in Scotland and 98.9% in Northern Ireland.

The comparable figures for 3G coverage were slightly lower: 99.5% of UK premises; 99.8% in England, 97.3% in Scotland, 98.3% in Wales and 99.0% in Northern Ireland.

4G coverage has already reached 73.0% of UK premises with 76.3% for England, 56.8% for Scotland, 44.9% for Wales and 79.2% for Northern Ireland.

Customer Numbers

Mobile telecommunications have been available in the UK since the mid 1980s, they are now ubiquitous: there are now 83.1 million mobile handsets and data connections in the UK.

The Mobile Operators Association (www.mobilemastinfo.com) report mobile phone take up in the UK is 93%, smartphone take up is 61% and tablet take up in the UK is 44%.

About Viprinet Europe GmbH

Viprinet has been manufacturing innovative network components since 2006; their patented technology makes it possible to aggregate the bandwidths of a variety of WAN connections at the same time (xDSL, cable, mobile, or satellite). Today, about 50 employees develop, produce, and sell Viprinet products worldwide from Bingen am Rhein in Germany. An additional sales office opened in Sunnyvale, California, in early 2015. All Viprinet products are made in Germany and fulfill the highest standards of security and confidentiality.

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