

Trouble at Sea

How Paradise Modems Helped in a Shipping Application



The Problem to Be Solved

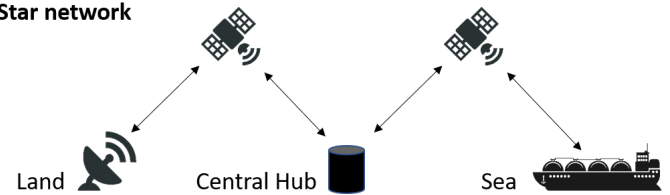
A customer contacted us last year wanting help with an interesting business problem. They are involved with maritime shipping, including oil and commercial cargo. They needed communication between vessels, and also between vessels and land-based facilities. This included information about their location, details about their manifests, schedules for loading and offloading, as well as crew communications with families, internet access and the like.

Typically vessels of these kinds are highly valued targets, and frequently pass through dangerous shipping routes where piracy and attacks are common. The fleet is relatively small, but links need to be low latency, resilient, secure and reliable. However, the customer also needed to keep costs as low as possible for both the initial capital outlay and ongoing operational expenditures.

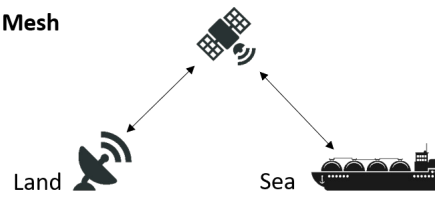
A Solution that Just Meshes

Communications across a geographically dispersed and mobile fleet makes satellite communication the obvious answer. The need for the lowest possible latency pointed towards a mesh network rather than the more traditional topology of a star network for an application like this. Rather than data travelling to and from a central hub and therefore requiring two passes through the satellite with twice the delay for a star network, a mesh allows each location to access every other location in a single hop.

a) Star network



b) Mesh



Having decided upon the best network topology, the next step was sorting through the different approaches to satellite communications, each with their pros and cons.

Time Division Multiple Access (TDMA) is a commonly used technology for satcom links because it is bandwidth efficient with many transmitters sharing the same satellite bandwidth. However, TDMA has several drawbacks in a situation like this. One is that it requires a central hub, even if the hub is supervising a mesh network rather than taking in and directing traffic in a more traditional star network. Hubs are expensive, which works well where their overhead cost is spread across hundreds of locations but becomes prohibitive for small networks like this. They are also complex to set up and manage. Another characteristic of TDMA networks is that if multiple transmitters need connections at the same time and traffic is high, the system will deprioritize some packets, meaning they will be either delayed or sacrificed – not an acceptable situation in this critical application.

The solution that we proposed was based upon SCPC (Single Channel Per Carrier), a common alternative to TDMA satellite networks. In SCPC systems, each transmitter has its own dedicated chunk of satellite bandwidth, ensuring that packets transmitted will never be deprioritized, delayed or lost. This addressed the customer need for reliability. Paradise modems have a feature allowing two to operate as a redundant system with the second taking over from the first should failure occur, further enhancing the reliability aspect. SCPC is well known for providing the most secure connections, satisfying the concern about data security in possibly hostile geographies.

The key reason that the customer decided to trial a solution from Paradise Datacom, was this ability to provide a mesh network based upon SCPC. This met most of the customer's needs, with the remaining one being cost. By being hubless, and by using some unique capabilities Paradise provides for optimizing bandwidth use on satellites, the solution also met the customer's need for low CapEx and OpEx.

Being inherently cautious, the customer initially trialed the Paradise solution with half a dozen modems deployed on marine and land locations, then quickly upgraded to the full 17 nodes that are supported by a single modem. As of writing, this has been so successful that we are now working with them on extending their network to more vessels and more locations.

For more information about Paradise Datacom's hubless secure mesh networking capabilities, contact us using the details overleaf, or check out our website at:

www.teledynedefenseelectronics.com/paradisedatacom/

About Paradise Datacom Modems

Paradise modems are used wherever secure satellite links are essential. In addition to the capabilities described here, we provide encrypted and WGS modems trusted by the most demanding security and military customers worldwide. Our solutions include point-to-point, point-to-multipoint and mesh modems, and we provide solutions for rack-mount and small form-factor mobile/airborne applications.



Global Sales Offices

U.S., Canada, Latin America

Teledyne Paradise Datacom
11361 Sunrise Park Drive
Rancho Cordova, CA 95742
Tel: +1 (916) 638-3344
sales@paradisedata.com

Eastern Regional Sales Office (Eastern U.S. & Latin America)

RF Inquiries: John O'Grady, (732) 280-1688
Modem Inquiries: Mike Towner, (470) 509-9941
sales@paradisedata.com

Western Regional Sales Office (Western U.S. & Canada)

Bruce Grieser:
Cell: +1 (480) 444-9676
sales@paradisedata.com

U.K. Office Covering the UK & Europe

Teledyne Paradise Datacom
106 Waterhouse Lane,
Chelmsford, Essex, England, CM1 2QU
Tel: +44(0)1245 847520
Fax: +44(0)1376 515636
sales@paradisedata.com

Asia Pacific

Tavechai Mektavepong,
Teledyne Paradise Datacom Thailand Office
333, 20 C1 Fl., Lao Peng Nguan Tower 1,
Vibhavadi-Rangsit Rd.,
Chomphol, Chatuchak,
Bangkok 10900
Thailand

Tel: +66 2-272-2996
Fax: +66 2-272-2997
sales@paradisedata.com

Beijing, China

Teledyne Paradise Datacom Representative Office,
Room 204, No. 1 Building,
No.9 Jiuxianqiao East Road,
Chaoyang District,
Beijing, China 100016

Tel: +86 13601251528
sales@paradisedata.com