

# Lamont-Doherty Earth Observatory



## Overview

The Lamont-Doherty Earth Observatory (LDEO) is a leading research institution that is part of the University of Columbia, where more than 200 research scientists seek fundamental knowledge about the origin, evolution and future of the natural world. The work contributed greatly to the IPCC report that jointly won with Al Gore the 2007 Nobel Prize for Science.

The Observatory's operations include research on the changing patterns of ocean waters and its Exploration Vessel, "The Ewing" in particular circulates in the cold remote Alaskan Waters. The work is intended in great part to assist humanity mitigate the effects of our changing climate.

The ship was to be undergoing a total refurbishment. Boarding 55 staff all of whom needed to keep in contact with each other and with shore this was seen as an opportunity to modernise their communications and find a system that could be used in one of the most remote and least hospital parts of the earth.

## Challenge

When the Observatory began looking for a new telephony solution they had three critical issues:

First, being as far away from base they had to have a system that was not only simple to maintain but in the event of severe hardware failure could be built from scratch by the ship's engineer without any communication to shore for assistance. Second, as the ship moved about from port to port they needed to be able easily set-up trunks with new service providers; and finally they needed a broader feature set including the ability to deal with which users could use which trunk as the ship passed through satellite coverage areas offering varying cost / quality options.

Proprietary Systems were often able to offer complicated redundancy but would require proprietary parts that were not commonly found far off the Alaskan Coast. These systems also depended heavily upon dedicated resellers to service them which again were unlikely to be available if needed.

The setting up of trunks has traditionally required considerable experience. Each trunk provider has slightly different requirements that have to be met perfectly for the trunk to function. Depending upon bandwidth requirements there are also a wide variety of Codec options. The ship would need to vary these according to port and satellite conditions on a regular basis without the assistance of a reseller but relying on its own engineers.

Voicemails, IVRs, Conferences were all expected as standard inclusive features. The ship knew however that the systems administrator would need a detailed control of privileges each user should have. According to these settings privileges different users would or not be able to select from a variety of trunks with varying bandwidth, quality and cost factors that changed as the ship passed in and out of different port-based or satellite trunk providers' coverage areas.



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## **Solution**

Even by contacting other traditional competitors \$30,000 and \$40,000 for a key-hybrid system was a typical expectation. None of these systems were an option due to the servicing limitations. Nor did they prove to have the flexibility to manage the Trunk Settings complications.

Richard Oliver-Goodwin at Lamont-Doherty was aware of native Asterisk and some interface options available. Having scoured the competition came to Bicom Systems. Bicom Systems offered what he considered the most complete turnkey solution from a commercially orientated business that was able to give him the time to understand the University's exacting requirements.

Bicom Systems solutions all work with HFC standard hardware. University of Columbia had an existing purchase relationship with DELL for which they have favourable terms and so chose to benefit from this. This also meant that in the event of hardware failure repairs could be effected from part of the ships normal inventory.

## **Implementation**

In March 2006 Richard first downloaded PBXware. Although PBXware set up quickly and easily the number trunks to be tested took time. Rollout began in September of 2006.

In March 2006 Richard downloaded PBXware CD. It took Richard several months of testing and familiarising with the solution. Many questions were asked and provided. In particular Lamont Doherty needed a reliable way of sending and receiving the faxes while at sea.

After some consultation, Senad Jordanovic came up with a solution for fax over IP (FoIP). In the Fall 2006 Richard and several colleagues were invited to a proof of concept and training day. This made sure that the actual deployment was easy and with no major issues encountered. Shortly afterwards the production system was installed onto the ship.

Subsequently the system has been maximised to deal with the restrictive bandwidth and the ship is supplied with two external VoIP lines and two DIDs on a monthly unlimited plan.

## **Results**

The ship is now fully furnished with Aastra phones, trained engineers and ready for 55 users. Internal functionality is an incomparable improvement to the traditional key system that PBXware replaced each user with voicemail and many other enhanced services. The ship's engineers have complete confidence in their ability to use the system, repair hardware if necessary, set up trunks as the ship docks in new ports where clearly third-party engineers would not be an option and of course saving thousands of dollars saved in the process.

The ship is currently pier side served by 1 Mbit down and 350 Kbit up and no issues. The satellite's 96 Kbit up and variable down is tested and the anchor is ready to be raised.

