



## Press Release

Guildford, 11<sup>th</sup> September 2008

### **UK-DMC satellite first to transfer sensor data from space using 'bundle' protocol**

The first use of the 'bundle' protocol in space has been demonstrated with the UK-DMC satellite built by Surrey Satellite Technology Ltd (SSTL). Sensor data was successfully delivered from the satellite using this disruption- and delay-tolerant networking protocol designed for the Interplanetary Internet.

Wireless ad-hoc communication networks and networks operating in extreme environments suffer frequent outages and disruption and require careful engineering to meet their needs. Spacecraft and probes operating beyond Earth orbit have intermittent communication contact limited by orbital dynamics. These space communication links create worst-case scenarios for disruption and long communication outages. Delay-Tolerant Networking techniques address these issues for systems that lack continuous network connectivity. The 'bundle' protocol has been developed in a co-operative research effort to support continuous communications across disrupted links.

The UK-DMC satellite has delivered delay-tolerant networking 'bundles' carrying remote-sensing image data to NASA Glenn Research Center in Cleveland, Ohio, via SSTL's Guildford, England, Mission Control Centre. The first complete image, of South Africa's Cape of Good Hope, was downloaded in fragments across two separate satellite passes to a 'bundle agent' in SSTL's ground station. The fragments were then sent across the Internet to NASA Glenn's agent, and reassembled into the image file. That file was then delivered back to SSTL for post-processing and orthorectification.

Proactive bundle fragmentation protects against the disruption and link outage that occurs between the two separate satellite passes over the ground station. SSTL's high-performance *Saratoga* protocol enabled the bundles to be transferred quickly and effectively to the ground.

The UK-DMC satellite is a member of the Disaster Monitoring Constellation (DMC), used for observing the Earth for major disasters and commercial land monitoring. Currently there are four DMC satellites in daily use in orbit that rely on standard Internet Protocol (IP) networking to send mission-critical imagery to ground stations and to interact with terrestrial networks. The DMC effectively extends the Internet to orbit, and its farsighted adoption of IP has made it possible to take the backbone of the Internet even further into space. Networking technologies new to the space environment, such as the bundle protocol and the Cisco Systems Internet router onboard the UK-DMC satellite, can be experimented with and evaluated for further use.

Working together and using Internet technology to prototype the future Interplanetary Internet, NASA Glenn Research Center, SSTL and Cisco Systems are the first to evaluate the delay-tolerant networking bundle protocol in space.

This work will be publicly presented on 30 September at the 59th International Astronautical Congress 2008 in Glasgow, where SSTL will also be exhibiting. Copies of the conference paper and presentation slides are available from:

<http://tinyurl.com/bundle-saratoga>

## **About SSTL**

Surrey Satellite Technology Ltd (SSTL) develops innovative technologies to change the economics of space, delivering cost effective satellite missions within rapid timescales. The Company is a world leader in the design, manufacture and operation of high performance small satellites with experience gained over more than 25 years and 32 satellites launched.

SSTL employs 300 staff working on LEO, GEO and interplanetary missions, turnkey satellite platforms and space-proven satellite subsystems and optical systems. The Company also provides know-how transfer and training programmes and consultancy services, and performs studies for ESA, NASA and commercial customers related to platform design, mission analysis and planning.

Based in Guildford, UK, SSTL is currently owned by the University of Surrey (85%), SSTL staff (5%), and SpaceX of the USA (10%).

[www.sstl.co.uk](http://www.sstl.co.uk)

### **Notes to editor:**

This press release and photo can be downloaded from the SSTL online press room:  
<http://www.ballard.co.uk/sstl>

### **SSTL Contact:**

Audrey Nice, Surrey Satellite Technology Limited  
Tel: +44 (0)1483 804200 Email: [a.nice@sstl.co.uk](mailto:a.nice@sstl.co.uk)

### **Press Contact:**

Robin Wolstenholme, Ballard Communications Management (BCM)  
Tel: +44 (0)1306 882288 Email: [r.wolstenholme@ballard.co.uk](mailto:r.wolstenholme@ballard.co.uk)