The Evolution of
SCPC and TDMA
for Data Services

TECHNOLOGY

Single-carrier and burst multiplexing solutions for satellite used to be distinct technologies that were matched to differing needs, from high throughput to efficient bandwidth allocation among multiple terminals. Technology advances, however, are creating far more options for network designs, which teleport operators are putting to use to win business and deliver most cost-effective solutions.

December 17, 2015

US$1,650, free for WTA members

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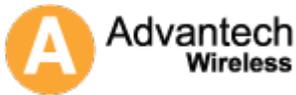
Introduction

Two technologies have dominated satellite data networks for many years. SCPC (single carrier per channel) is highly efficient when there is sufficient traffic to fill the circuit and terminals are inexpensive and reliable. But for large, highly interactive networks, SCPC comes with too high a cost: an all-SCPC network with 1,000 remotes will fill a transponder just with communications overhead, before any data is transmitted. For such networks, TDMA (time division multiple access) and its variants have become the industry standard, with its ability to share a pool of bandwidth among multiple remotes. The tradeoffs of using TDMA, however, include bandwidth limitations for each remote, higher management complexity and more costly terminals.

Recent technology innovations are bridging the gap between the benefits of the two technologies, and offering the promise of preserving TDMA's efficiency for data networks while boosting its throughput and bursting capability.
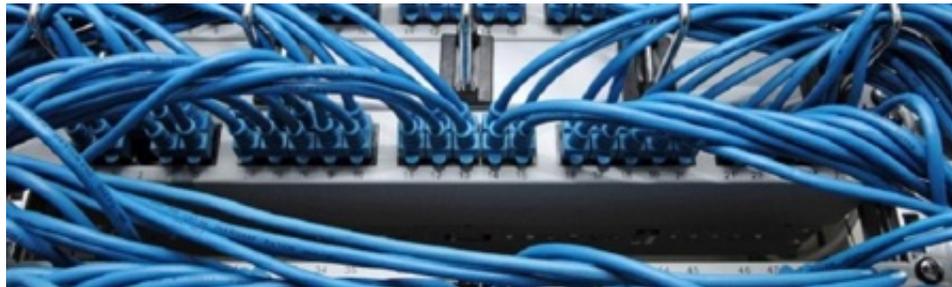
Methodology

The Evolution of SCPC and TDMA for Data Services is based on confidential interviews conducted with technology, teleport and satellite executives, which explored:

- The fundamentals of SCPC and TDMA technologies as they are applied in satellite networks, and their benefits and tradeoffs

- Recent technology advances changing the capabilities of TDMA, how they work and the benefits provided

- The experience of teleport and satellite operators implementing the technologies, including advantages, disadvantages and challenges

- The likely path of future evolution of the technologies

Acknowledgments

WTA thanks the following individuals for contributing their time and expertise to the project: