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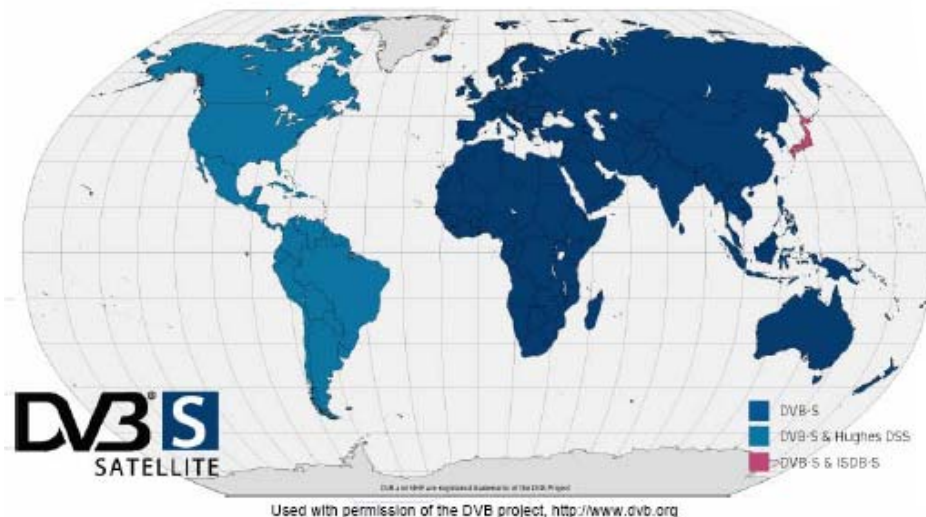
DVB-S2 – What it is, and why you should care...

What it is...

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DVB-S2 is the second implementation of the Digital Video Broadcast via Satellite standard, and was approved by the DVB Project. The DVB project is a worldwide consortium of participants that developed and is implementing a variety of standards for transmission of video. Some of these standards include DVB-T (a terrestrial digital television standard), DVB-H (for handheld devices like cell phones), DVB-C (for cable TV) and others. The purpose of the standards is to allow for the production of interoperable equipment by a variety of manufacturers, spurring increased competition and reducing adoption risk to the benefit of end users.

DVB-S2 follows on the heels of DVB-S, which was originally specified in 1993. While DVB is a modulation standard that specifies the way transmissions are sent, but not the actual content, the original DVB-S standard exclusively uses MPEG-2 compression. It is compatible with both standard definition and high definition formats. DVB-S was adopted initially in Europe and has spread well beyond (see map below). It is currently employed in millions of satellite receivers for transmitting video direct to home as well as tens of thousands of receivers and modulators



for distribution of network feeds to cable and broadcast head ends.



DVB-S2 is more flexible than DVB-S, and is compatible with all forms of video compression. Perhaps even more important, it is more spectrally efficient, and requires 30% less bandwidth than its predecessor for an identical transmission. When this is combined with more efficient compression such as MPEG-4, reductions of over 50% are possible.

Why you should care...

This process of migration represents a significant opportunity for equipment manufacturers and systems integrators that supply and build these networks.

For satellite networks, maximizing use of existing transponder capacity is an imperative. As a result, we expect that in the coming years, satellite networks will migrate to these new standards. This process of migration represents a significant opportunity for equipment manufacturers and systems integrators that supply and build these networks. While initial DVB-S2 equipment is significantly more expensive and harder to find than DVB equipment, the immediate savings on bandwidth is already driving customers with new installations to specify the new standard. Examples of DVB-S2 rollouts include professional installations at PBS, as well as the consumer rollout of DIRECTV's HD channels using its new Spaceway satellites.

From the perspective of a network operator, it is increasingly becoming a financial trade, where we expect adoption to proceed as follows:

Tend to favor DVB-S2	Tend to favor DVB-S
"Greenfield" networks purchasing new equipment	Legacy networks with large installed base of equipment
Bandwidth intensive networks	Thin networks with less traffic
Smaller deployments (i.e. fewer receivers)	Larger deployments

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Some operators will find themselves on both sides, of course. As an illustration of these issues, a recent Radyne COM stream analysis found that for newsgathering applications payback periods for greenfield installations were 1.9 years vs. 3.1 years for overhauling an existing installation. Similarly, they found that for HD premium sports (8 hours/week) video backhaul, green field installations had a payback period of 2.1 years vs. 5.1 years for overhaul and equipment replacement – somewhat less compelling. At the other end of the spectrum, 24 hour video backhaul had payback periods of less than a year for both greenfield and overhaul scenarios.

From the perspective of an equipment provider or systems integrator, as manufacturers move down the production learning curve, we expect that prices will rapidly drop, and these payback intervals will compress. As this occurs, the financial trade will become increasingly lopsided, and



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...it is also going to make satellite applications more competitive than they would otherwise be, which is likely to lead to new demand.

today's relative trickle of DBV-S2 equipment sales will increasingly turn into a flood. We expect this flood to include not only the dominant share of new deployments, but also a one time bump as the installed base of DVB-S equipment is swapped out for the new standard. Because this installed base represents over a decade of DVB-S installations, and is likely to be replaced over a much shorter time frame, this bulge in sales is likely to dominate the industry's economics in the coming years. How the equipment manufacturers split up this opportunity is likely to affect the satellite equipment manufacturing landscape for a long time to come.

From the perspective of a satellite operator, this is all a mixed bag. While the increased efficiency from these technologies is likely to reduce demand for capacity, it is also going to make satellite applications more competitive than they would otherwise be, which is likely to lead to new demand. Given the falling cost per bit for terrestrial applications, keeping satellite costs competitive is probably the best option for these providers.

Finally, from the perspective of investors, the introduction of this new technology offers prospective industry entrants a new lever to gain entry, and a marketing, production and technology race for many industry participants that can produce new winners and losers – and thus profitable investment opportunities.

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