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PROPOSED OPERATIONAL PROFILES TO STREAMLINE DIGITAL SATELLITE NEWSGATHERING OPERATIONS

Background:

With the emergence of new RF and video coding standards and the non-withdrawal of the old ones, DSNG communications are complex and are becoming a long and error-prone process.

Scope

This Recommendation defines basic parameters required to establish a DSNG link in a variety of formats that will cover most common

Approach:

Considering that the DSNG communications relies on a set of operation parameters:

- a) RF
- b) Transport
- c) Video & Audio settings
- d) The number of permutation that this process should include, bearing in mind the emergence of DVB-S2, S2 Extension H.264 & HEVC

WBU-ISOG Recommend:

That the parameters of the profiles should be limited to:

- all parameters required for RF signal acquisition and to ensure a full lock at the transport stream level and the support for one video and four pairs of audio

These profiles do exclude:

- all video and audio coding parameters that are normally set by the encoder to the decoder in a master/slave relationship

Definitions:

The desired equipment set-up will be identified by 2 independent identifiers:

- a) The profiles itself, will be named after their occupied bandwidth:
 - ISOG-News3, 3 MHz Bandwidth
 - ISOG-News4, 4.5 MHz Bandwidth
 - ISOG-News6, 6 MHz Bandwidth
 - ISOG-News9, 9 MHz Bandwidth

Their levels that defines the proposed application: Each profile is available at three levels:

- Legacy - This mode is aimed at supporting the use of legacy equipment of DVB-S
 - MPEG-2
 - QPSK based on an a spacing factor of 1.35
 - Standard Definition only
- Mid Range - This level is aimed at power challenged links, where power efficiency is an issue of DVB-S2, based on a spacing factor of 1.20:
 - H.264 video coding, MPEG layer 2 audio coding
 - QPSK
 - HD capable, although not aimed at fast action items
- Efficient - This mode is reserved for applications with better than average link margins, where spectral efficiency is an issue of DVB-S2, based on a spacing factor of 1.20
 - H.264 video coding, MPEG layer 2 audio coding
 - 8PSK
 - HD capable

- Extended- This mode is reserved for applications where DVB extensions are required, in this specific case both Encoder/Modulators & IRD have to be DVB-extensions compliant
 - o DVB-S2x, based on a spacing factor of 1.05
 - o H.264 video coding, MPEG layer 2 audio coding
 - o 16APSK
 - o HD competent

Proposed implementation

As simplifying the operation of DSNG equipment is the primary goal of the proposal, the DSNG equipment manufacturers will be invited to include the proposed set-ups as part of their equipment default values:

Considering:

- a) The number of permutation that all profiles and levels represent is rather large
- b) Speed and stress will always be part of any key news operation including DSNG
- c) The potential for errors of a selection process including the selection of 17 variables defeat the sole purpose of having a standard

WBU-ISOG recommends:

That the selection of profiles & levels be implemented in a 2 tier approach, where the profile is first selected, then the level

Table 1 – Proposed Parameters for News- 3 profile

Level ->>> 1 Legacy 2 Mid-range 3 Efficient 3 Efficient

<i>Profile Name</i>	<i>News3</i>	<i>News3</i>	<i>News3</i>	<i>News3</i>
<i>Level</i>	<i>1 Legacy</i>	<i>2 Mid-range</i>	<i>3 Efficient</i>	<i>3 Efficient</i>
<i>RF Coding</i>	<i>DVB-S</i>	<i>DVB-S2</i>	<i>DVB-S2</i>	<i>DVB-Sx</i>
<i>Order of Modulation</i>	<i>QPSK</i>	<i>QPSK</i>	<i>8PSK</i>	<i>16APSK</i>
<i>FEC</i>	<i>3/4</i>	<i>3/4</i>	<i>5/6</i>	<i>2/3</i>
<i>Symbol Rate (MS/s)</i>	<i>2,220</i>	<i>2,500</i>	<i>2,500</i>	<i>2,857</i>
<i>Pilots Symbol</i>	<i>NA</i>	<i>yes</i>	<i>yes</i>	<i>Yes</i>
<i>Frame Length</i>	<i>NA</i>	<i>Normal</i>	<i>Normal</i>	<i>Normal</i>
<i>Resulting Transport Rate (Mb/s)</i>	<i>3,069</i>	<i>3,630</i>	<i>6,056</i>	<i>7,387</i>
<i>Occupied Bandwidth (MHz)</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>
<i>Roll-off Factor</i>	<i>1,35</i>	<i>1,2</i>	<i>1,2</i>	<i>1,05</i>
<i>Receiver Threshold (Es/No)</i>	<i>6,9</i>	<i>4,03</i>	<i>9,35</i>	<i>8,88</i>
<i>C/N allocated BW</i>	<i>5,60</i>	<i>3,24</i>	<i>8,56</i>	<i>8,68</i>

Table 2 – Proposed Parameters for News- 4 profile

	1 Legacy	2 Mid-range	3 Efficient	3 Efficient
<i>Profile Name</i>	<i>News4</i>	<i>News4</i>	<i>News4</i>	<i>News4</i>
<i>Level</i>	<i>1 Legacy</i>	<i>2 Mid-range</i>	<i>3 Efficient</i>	<i>3 Efficient</i>
<i>RF Coding</i>	<i>DVB-S</i>	<i>DVB-S2</i>	<i>DVB-S2</i>	<i>DVB-Sx</i>
<i>Order of Modulation</i>	<i>QPSK</i>	<i>QPSK</i>	<i>8PSK</i>	<i>16APSK</i>
<i>FEC</i>	<i>3/4</i>	<i>3/4</i>	<i>5/6</i>	<i>2/3</i>
<i>Symbol Rate (MS/s)</i>	<i>2,963</i>	<i>3,333</i>	<i>3,333</i>	<i>3,810</i>
<i>Pilots Symbol</i>	<i>NA</i>	<i>Yes</i>	<i>yes</i>	<i>yes</i>
<i>Frame Length</i>	<i>NA</i>	<i>Normal</i>	<i>Normal</i>	<i>Normal</i>
<i>Resulting Transport Rate (Mb/s)</i>	<i>4,095</i>	<i>4,840</i>	<i>8,073</i>	<i>8.917</i>
<i>Occupied Bandwidth (MHz)</i>	<i>4</i>	<i>4</i>	<i>4</i>	<i>4</i>
<i>Roll-off Factor</i>	<i>1,35</i>	<i>1,2</i>	<i>1,2</i>	<i>1,05</i>
<i>Receiver Threshold (Es/No)</i>	<i>6,9</i>	<i>4,03</i>	<i>9,35</i>	<i>8,88</i>
<i>C/N allocated BW</i>	<i>5,60</i>	<i>3,24</i>	<i>8,56</i>	<i>8,68</i>

Table 3 – Proposed Parameters for News- 6 profile

	1 Legacy	2 Mid-range	3 Efficient	3 Efficient
<i>Profile Name</i>	<i>News6</i>	<i>News6</i>	<i>News6</i>	<i>News6</i>
<i>Level</i>	<i>1 Legacy</i>	<i>2 Mid-range</i>	<i>3 Efficient</i>	<i>3 Efficient</i>
<i>RF Coding</i>	<i>DVB-S</i>	<i>DVB-S2</i>	<i>DVB-S2</i>	<i>DVB-Sx</i>
<i>Order of Modulation</i>	<i>QPSK</i>	<i>QPSK</i>	<i>8PSK</i>	<i>16APSK</i>
<i>FEC</i>	<i>3/4</i>	<i>3/4</i>	<i>5/6</i>	<i>2/3</i>
<i>Symbol Rate (MS/s)</i>	<i>4,444</i>	<i>5,000</i>	<i>5,000</i>	<i>5,714</i>
<i>Pilots Symbol</i>	<i>NA</i>	<i>Yes</i>	<i>Yes</i>	<i>yes</i>
<i>Frame Length</i>	<i>NA</i>	<i>Normal</i>	<i>Normal</i>	<i>Normal</i>
<i>Resulting Transport Rate (Mb/s)</i>	<i>6,143</i>	<i>7,260</i>	<i>12,111</i>	<i>14.774</i>
<i>Occupied Bandwidth (MHz)</i>	<i>6</i>	<i>6</i>	<i>6</i>	<i>6</i>
<i>Roll-off Factor</i>	<i>1,35</i>	<i>1,2</i>	<i>1,2</i>	<i>1,05</i>
<i>Receiver Threshold (Es/No)</i>	<i>6,9</i>	<i>4,03</i>	<i>9,35</i>	<i>8,88</i>
<i>C/N allocated BW</i>	<i>5,60</i>	<i>3,24</i>	<i>8,56</i>	<i>8,68</i>

Table 4 – Proposed Parameters for News- 9 profile:

	1 Legacy	2 Mid-range	3 Efficient	4 High Efficiency	4 High Efficiency
<i>Profile Name</i>	<i>News9</i>	<i>News9</i>	<i>News9</i>	<i>News9</i>	<i>News9</i>
<i>Level</i>	<i>1 Legacy</i>	<i>2 Mid-range</i>	<i>3 Efficient</i>	<i>4 High Efficiency</i>	<i>4 High Efficiency</i>
<i>RF Coding</i>	<i>DVB-S</i>	<i>DVB-S2</i>	<i>DVB-S2</i>	<i>DVB-S2</i>	<i>DVB-Sx</i>
<i>Order of Modulation</i>	<i>QPSK</i>	<i>QPSK</i>	<i>8PSK</i>	<i>16APSK</i>	<i>16APSK-L</i>
<i>FEC</i>	<i>3/4</i>	<i>3/4</i>	<i>5/6</i>	<i>3/4</i>	<i>13/18</i>
<i>Symbol Rate (MS/s)</i>	<i>6,667</i>	<i>7500,000</i>	<i>7500,000</i>	<i>7500,000</i>	<i>8,571</i>
<i>Pilots Symbol</i>	<i>NA</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Frame Length</i>	<i>NA</i>	<i>Normal</i>	<i>Normal</i>	<i>Normal</i>	<i>Normal</i>
<i>Resulting Transport Rate (Mb/s)</i>	<i>9,216</i>	<i>10,891,571</i>	<i>18,167,072</i>	<i>24,163970</i>	<i>23,967</i>
<i>Occupied Bandwidth (MHz)</i>	<i>9</i>	<i>9</i>	<i>9</i>	<i>9</i>	<i>9</i>
<i>Roll-off Factor</i>	<i>1,35</i>	<i>1,2</i>	<i>1,2</i>	<i>1,2</i>	<i>1,05</i>
<i>Receiver Threshold (Es/No)</i>	<i>6,9</i>	<i>4,03</i>	<i>9,35</i>	<i>10,21</i>	<i>9,70</i>
<i>C/N allocated BW</i>	<i>5,60</i>	<i>3,24</i>	<i>8,56</i>	<i>9,42</i>	<i>9,50</i>