

LiveView / FlightView: Network Socket Commands and Formats

Date: August 19, 2022

Overview:

A TCP/IP server exists within LiveView which can be used to command LiveView to save data to a file. The command for saving includes arguments for the number of frames, filename, and any averaging per frame desired. Two status commands may be used to query the progress of the file saving, which may be useful in both judging when LiveView will complete the saving, and if the command sent has been enacted upon. The STATUS_EXTENDED command has been added recently, and this command includes the filename being used.

Example code lives under the “utils” folder within the repository, and includes both python and c++ demonstration programs.

Network:

LiveView listens on all interfaces on port 65000. LiveView has only been tested on IPv4.

Format of data in commands:

Numbers are written in Big Endian, 16 bit unsigned.

Strings are unicode-like (UTF-16), termination is not used or required but may be included if desired. It is recommended to stick with the normal ascii filename-friendly characters (please). The maximum supported string length is 4096 characters.

Commands:

Overview of command types:

Name	Type Enumeration Value	Arguments Required	Arguments Returned	Description
SAVE	0x0002	N Frames, Filename, N Averages	N/A	Begin saving data
STATUS	0x0003	None	Frames Complete, FPS, N Averages	Check status of saving data
STATUS_EXTENDED	0x0004	None	Frames Complete, FPS, N Averages, Filename	Check status of saving data and filename

Command: SAVE

A typical save command looks as follows:

LABEL:	SIZE	TYPE	NFRAMES	STR START	STR LEN	"/"	"A"	"B"	"C"	"D"	"E"	"F"	"G"	NAVGS
INDEX:	"[00][01]"	[02][03]	[04][05]	[06][07]	[08][09]	[10][11]	[12][13]	[14][15]	[16][17]	[18][19]	[20][21]	[22][23]	[24][25]	[26][27]"
DATA:	"[00][1a]"	[00][02]	[00][64]	[00][00]	[00][10]	[00][2f]	[00][41]	[00][42]	[00][43]	[00][44]	[00][45]	[00][46]	[00][47]	[02][00]"

Index 00 and 01 contain the total message size in bytes, minus two (for example, a message of size 28 is written as size 26).

Index 02 and 03 contain the message type, which must be set to 0x0002.

Index 04 and 05 contain the number of frames to save, up to a maximum of 60000 (0xea60) frames. In this example case, 0x0064 = 100 frames

Index 06 begins the string containing the filename. The string is sent as follows:

beginning: 0x00 0x00 (always)

String Length: 0x00 0x10 (16 bytes long indicated, data is uint16)

Note: The length is in bytes. With two bytes per character, this is effectively the string's character length times two. Filenames over 4096 (length encoded as 0x2000) characters will be rejected with an error in the log file.

The text is written with two bytes per character. Please, limit the text to standard filename-friendly ascii characters.

The example filename is "/ABCDEFGF"

[00][41][00][42][00][43][00][44][00][45][00][46][00][47]

There is no null termination required, the string length informs the reading side how far to read. Include two additional bytes in the string size if you wish to supply 0x00 0x00 at the end for your own convenience of termination. Again, termination is not required. Note that liveview will override an existing file without complaint. Liveview will only honor the first of overlapping save requests; any request received during an on-going data save will be ignored (an error will be indicated in liveview's log file).

A note on file extensions: Liveview will add ".raw" to any filename without an extension. Liveview will replace any text after the first "." with "raw" if it does not match. Filenames with more than one dot in the filename are permitted provided the user has ended the filename with ".raw" For example, "file.doc.exe" will get renamed to "file.raw". "file.doc.raw" will be unchanged. And, "file" will be changed to "file.raw" Additionally, a "header file" will always be created with the ".raw" part of the filename replaced with ".hdr". This is a plaintext file that can be used to help open the raw files. The recommended strategy is to always end the requested filename with ".raw".

A note on file paths: Absolute paths beginning with "/" are *strongly* recommended. If a relative path is used, the current working directory of the liveview executable will be the reference point.

The last two bytes contain the number of frames to average into each saved frame. Averaging may be disabled by setting this to 0x00 0x01. In this example, the averaging is set to 512 frames, which is seen here as 0x0200

Command: STATUS

A status request command looks as follows:

```
LABEL :      SIZE      TYPE
INDEX:  "[00][01]  [02][03]"
DATA:   "[00][02]  [00][03]"
```

The size is the total message size minus two, which is fixed for this message at exactly 0x0002

The TYPE of command is 0x0003

Return of STATUS command:

The status request command returns the frames left to be recorded (zero if not recording), the frame rate in frames per second (as a unsigned 16-bit int), and the number of frames to be averaged into each saved frame (1 if not averaging).

Example of returned data:

```
LABEL :      SIZE      FRAME      FPS      NAVGS
INDEX:  "[00][01] [02][03] [04][05] [06][07]"
DATA:   "[00][06] [01][04] [00][64] [00][01]"
```

The size is the size of the message minus two. The example message is 8 bytes long, and the size value written is 0x0006.

The FRAME number is the number of frames remaining to be saved. This value will go to zero when saving is complete. In this example, 0x0104 = 260 frames remaining

The FPS number is the frames per second, rounded to unsigned 16-bit integer. In this example, 0x0064 = 100 FPS

NAVGS indicates the number of frames to be averaged together into a single saved frame. The values 0x0001 and 0x0000 indicate that averaging is not taking place.

Command: STATUS_EXTENDED

An extended status request command looks as follows:

```
LABEL :      SIZE      TYPE
INDEX:  "[00][01]  [02][03]"
```

DATA: "[00][02] [00][04]"

The size is the total message size minus two, which is fixed for this message at exactly 0x0002

The TYPE of command is 0x0004

Return of STATUS_EXTENDED command:

Example of returned data from a STATUS_EXTENDED command:

LABEL:	SIZE	FRAME	FPS	NAVGs
INDEX:	"[00][01]	[02][03]	[04][05]	[06][07]
DATA:	"[00][32]	[03][e6]	[00][31]	[00][01]

LABEL:	STR_START	STR_SIZE	"/"	"t"	"m"	"p"	"/"	"1"	"0"
INDEX:	[08][09]	[10][11]	[12][13]	[14][15]	[16][17]	[18][19]	[20][21]	[22][23]	[24][25]
DATA:	[00][00]	[00][28]	[00][2f]	[00][74]	[00][6d]	[00][70]	[00][2f]	[00][31]	[00][30]

LABEL:	" "	"2"	" "	"s"	"o"	"c"	"k"	"e"	"t"	","	"r"	"a"	"w"
INDEX:	[26][27]	[28][29]	[30][31]	[32][33]	[34][35]	[36][37]	[38][39]	[40][41]	[42][43]	[44][45]	[46][47]	[48][49]	[50][51]
DATA:	[00][5f]	[00][32]	[00][5f]	[00][73]	[00][6f]	[00][63]	[00][6b]	[00][65]	[00][74]	[00][2e]	[00][72]	[00][61]	[00][77]"

string is "/tmp/10_2_socket.raw"

The return is the same as the not-extended STATUS command return, except that the filename is included at the end of the return, using the format described above for sending filenames. Again, there is no termination on the string expected, although if termination was supplied with the initial request it will be returned with termination (ie, 0x0000 at the end).

If saving has completed, the filename indicated is the last filename used. If saving has not happened in the current instance of LiveView, an empty string is returned (size is 0x0000).