

Smart-telecaster HD View V5 ユーザースガイド

株式会社ソリトンシステムズ

□ 『Smart-telecaster HD View V5』は株式会社ソリトンシステムズの著作物であり、これらにかかる著作権、その他権利は株式会社ソリトンシステムズに帰属します。

※以下 Smart-telecaster を STC と呼称します。

- Windows は Microsoft Corporation の商標です。
- VP8 は Google 社の商標です。
- NDI[®]は NewTek 社の商標です。
- その他記載されている会社名、製品名は各社の登録商標または商標です。
- 本製品には森功氏の AES ライブラリが搭載されています。
- 本製品の一部または全部を複製、複製、改変することは、その形態を問わず禁じます。
- 本製品の内容は製品改良のため予告なく変更することがあります。
- 本書に掲載している接続形態はあくまで参考例であり、すべての組み合わせを保証するものではありません。

株式会社ソリトンシステムズ
〒160-0022 東京都新宿区新宿 2-4-3
TEL: (03)5360-3860

目次

1. STC HD View V5	5
1.1. 受信側必要環境.....	5
1.2. 起動.....	7
1.3. 音声の入出力デバイスについて.....	11
1.4. 設定編集.....	12
1.5. 設定編集(STC Zao-X接続設定時).....	19
1.6. 共通設定.....	21
1.7. 録画再生機能.....	22
2. Transcode 再配信機能	23
2.1. 設定編集.....	23
2.2. Transcodeステータスウインドウ表示設定.....	28
2.3. Transcode再配信ボタン／ローカル録画ボタン.....	29
2.4. Transcode再配信設定例.....	31
2.4.1. YouTube.....	31
2.4.2. Facebook.....	32
3. 仕様	33
4. STC HD Viewで利用しているOSSライセンス	34
4.1. libvpx.....	35
4.2. libvorbis.....	35
4.3. libogg.....	36
4.4. Picojson.....	36
4.5. libavcodec, libavformat, libavutil, libavfilter, libswscale, libswresample.....	37
4.6. spdlog.....	42
4.7. getopt.....	42
4.8. json11.....	43
4.9. httpplib.....	43
4.10. cryptopp.....	44
4.11. pthreads.....	46

4.12. openssl.....	49
4.13. msgpack	51
4.14. opus	51
4.15. libsrt.....	51
4.16. spdlog	52
4.17. fmt.....	53



1. STC HD View V5

受信側の機材は、弊社推奨のインテル系 PC/AT 互換機に外部出力ボードを実装してのご提供となります。



図 1 STC HD VIEW V5 接続(例)

1.1. 受信側必要環境

ネットワーク・インターフェイス

- ◀ 受信側には固定回線とグローバル IP アドレスが必要です。

※ STC Zao は各チャンネルへの着信に UDP ポート 31115 番、31116 番、31117 番、31118 番を使用します。ルータ配下に受信機を設置する場合は、ルータに対し NAT 設定 (UDP 31115~31118 のポートフォワード) が必要です。

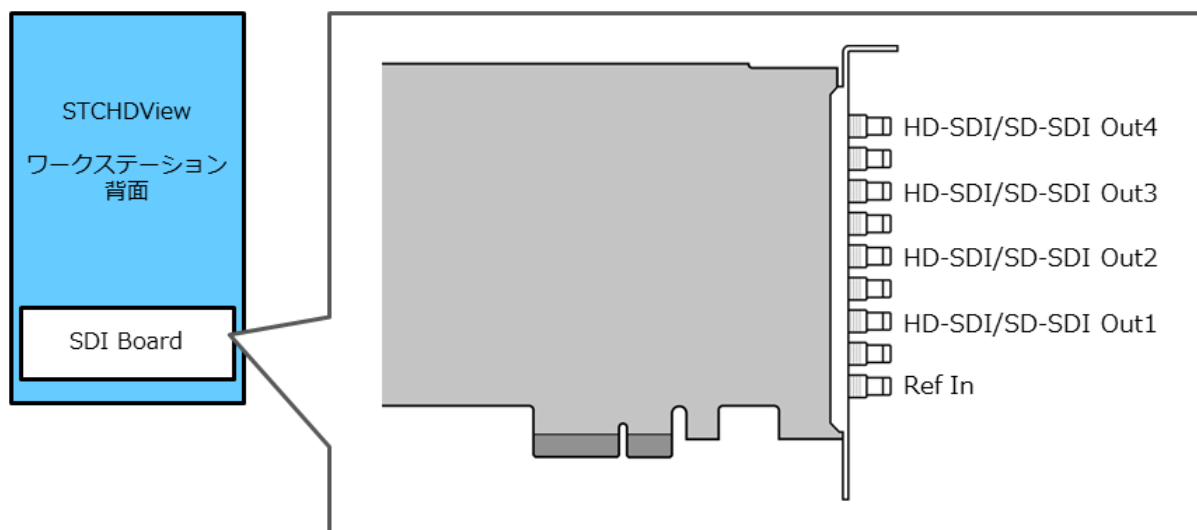
※ STC Zao-X は UDP ポートで各チャンネルへの着信に 42000 番、42001 番、42002 番、42003 番を使用します。ルータ配下に受信機を設置する場合は、ルータに対し NAT 設定 (UDP 42000~42003 のポートフォワード) が必要です。

外部出力 (弊社実装)

Blackmagic Design 社製 Decklink Quad 2

STC HD View の各チャンネルに受信したライブ映像と音声を Decklink Quad に搭載した 4 つのポートから外部出力します。チャンネルとポートの対応は下記の通りです。

- チャンネル 1 → HD-SDI/SD-SDI Out 1
- チャンネル 2 → HD-SDI/SD-SDI Out 2
- チャンネル 3 → HD-SDI/SD-SDI Out 3
- チャンネル 4 → HD-SDI/SD-SDI Out 4



DIN(オス)端子

DIN-BNC変換ケーブルは製品に付属

図 2 外部出力使用ポート



図 3 ワークステーション背面

1.2. 起動

PCの電源を入れると、STC HD View V5 が自動起動します。

STC HD View V5 を手動で起動する場合は、デスクトップ上の「STC HD View V5」アイコン、または プログラムメニューの「Smart-telecaster HD」→「STC HD View V5」から起動します。Smart-telecaster HD View V5 が起動すると以下のメイン画面が表示されます。

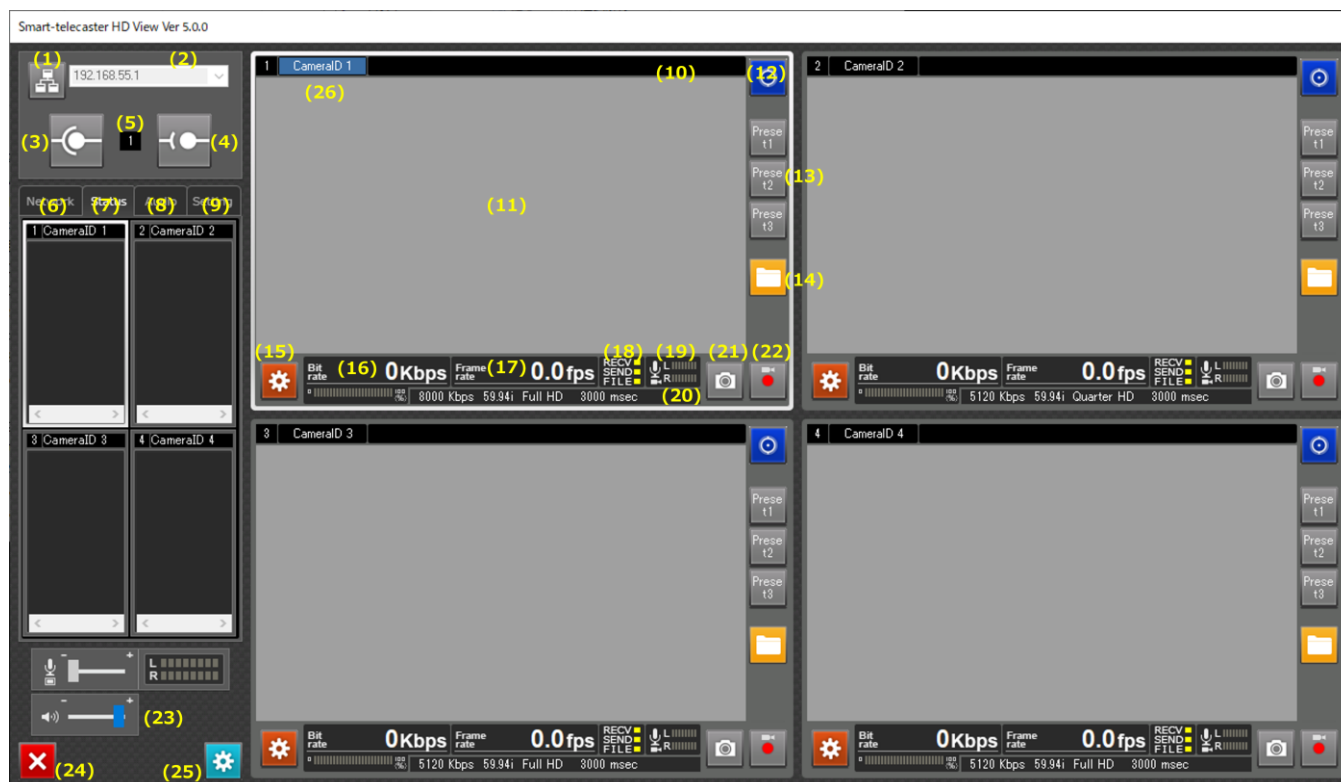


図 4 STC HD VIEW V5 メイン画面



図 5 STC HD VIEW V5 メイン画面(タブ内)

(1) 宛先選択ボタン

宛先選択画面を呼び出します。

注) 本バージョンでこの機能は使用できません。

(2) 宛先表示

宛先の名称や IP アドレスを表示します。

(3) 接続ボタン

注) 本バージョンでこの機能は使用できません。

(4) 切断ボタン

接続先との切断を行います。

注) STC Zao-X との接続時には使用しないで下さい。

(5) チャンネル表示

現在選択されているチャンネル番号を表示します。

(6) 回線状況表示タブ

選択されている送信元との接続に使用している通信回線の接続状況を表示します。

接続中は使用している通信回線の速度が数値とグラフで表示されます。

回線状況は接続中のみ表示されます。

各回線の横に文字入力ができ、モデム名等を記載しておくことができます。

(7) メッセージ表示タブ

STC HD View V5 の動作状況を表すメッセージを表示します。

(8) 音声スイッチタブ

通常、STC HD View V5 の音声は接続中のチャンネル全ての送信元に伝送されます。

音声スイッチを OFF にすると、その音声スイッチに該当するチャンネルの送信元との音声伝送を相互に切断します。


例) チャンネル 1 ～ 4 まで全て受信中で音声スイッチが全て ON の場合、STC HD View V5 の音声は全てのチャンネル向けに伝送されます。


チャンネル 1 の音声スイッチを OFF にした場合、チャンネル 1 との音声は相互に伝送されなくなりますが、チャンネル 2 ～ 4 との音声伝送はそのまま継続します。

(9) 設定値表示タブ

ライブ中継中の解像度、ビットレート、フレームレート、コーデック、ディレイ、オーディオ、自動録画の設定値を表示します。

(10) 暗号化アイコン

宛先と暗号化接続をしている場合は  アイコンを表示します。

録画ファイルを開いている場合は  アイコンを表示します。

(11) プレビュー画面

受信したライブ映像を表示します。

(12) SDI 外部出力ボタン

受信側の機器構成により受信した映像が SDI で外部出力可能な場合はボタンが青くなります。各機器構成による外部出力は下記の通りです。

Blackmagic Design 社製 Decklink Quad2 使用時

全チャンネルが同時に外部出力可能となり、全チャンネルの外部出力ボタンが青くなります。また、このボード使用時は映像と同時に音声も出力します。

Blackmagic Design 社製 Decklink Quad2 以外のボード使用時

4つのチャンネルのうち、外部出力ボタンで選択した1チャンネルが外部出力可能となります。選択したチャンネルはボタンが青くなります。

外部出力ボード未使用時

全チャンネルの外部出力ボタンがグレースアウトし選択できません。

(13) プリセットボタン

STC HD View V5 では、任意の設定状態をプリセットとして登録しておくことができます。

プリセットボタンをクリックすると、登録されている設定値に一括設定することができます。

プリセットが選択されている場合は、選択プリセットのボタンが緑色に点灯します。

(14) 録画ファイルオープンボタン及び再生/一時停止ボタン

STC Zao で録画し、転送されたファイルを開くことができます。

ファイルを開くと  アイコンを表示します。

再生ボタンを押下すると  アイコンを表示します。

(15) 設定ボタン

各チャンネルの設定編集ダイアログを表示します。

(16) ビットレート表示

接続中、実効通信速度を数値で表示します。

同時に、TBR (target bitrate) に対する実効通信速度をレベルで表示します。

(17) フレームレート表示

接続中、フレームレートを表示します。

(18) 通信インジケータ [RECV、SEND、FILE]

通信が発生すると点滅します。

(19) 送信側音声インジケータ [Cam Audio indicator]

音声レベル

送信元からの受信音声レベルを表示します。音声モードがステレオになっている場合は上が左レベルで、下が右レベルです。音声モードがモノラルになっている場合は上下とも同じレベルが表示されます。

(20) 設定表示

ライブ中継中のビットレート、フレームレート、解像度、ディレイの設定値を表示します。

(21) 静止画ボタン

静止画を取得します。

(22) 録画ボタン

録画を開始/停止します。

(23) 受信側音声インジケータ [View Audio indicator]

マイク・アイコン

マイクからの音声入力にエラーが発生した場合、アイコン上に×マークが表示されます。

マイク・ボリューム

音声入力時のマイク・ボリュームを操作します。スライドバーを左に操作すると録音レベルが小さくなり、右に操作すると大きくなります。

スピーカー・アイコン

スピーカーへの音声出力にエラーが発生した場合、アイコン上に×マークが表示されます。

スピーカー・ボリューム

音声再生時のアプリケーション・ボリュームを操作します。スライドバーを左に操作すると音が小さくなり、右に操作すると大きくなります。

音声レベル

STC HD View V5 側の入力音声レベルを表示します。音声モードがステレオになっている場合は上が左レベルで、下が右レベルです。音声モードがモノラルになっている場合は上下とも同じレベルが表示されます。

◀ (24) 終了ボタン

アプリケーションを終了します。

(25) 共通設定ボタン

共通設定編集ダイアログを表示します。

(26) カメラ ID 表示

カメラ ID を表示します。STC Zao-X が接続できる ch では青色になります。

1.3. 音声の入出力デバイスについて

STC HD View V5 は、音声入力／出力に Windows の既定の録音デバイス／再生デバイスを使用します。

音声入力ソースを変更する場合は、使用する録音デバイスを接続し Windows の既定の録音デバイスに設定してから STC HD View V5 を起動して下さい。

また、音声再生を外部出力ボード経由で出力する場合には、本アプリケーションが自動的に外部出力ボードを使用しますので、Windows の既定の再生デバイスを外部出力ボードのオーディオ・デバイス以外に設定して下さい。

注) 弊社からの出荷の際、音声再生を外部出力ボード経由にする場合は、Windows のシステム音を外部出力ボードへ出力しないように設定を行っています。

ご都合により OS の入れ替え等を行った場合には、本アプリケーションが自動的に外部出力ボードを使用しますので、Windows の既定の再生デバイスを外部出力ボードのオーディオ・デバイス以外に設定して下さい。

Windows のシステム音を外部出力ボードへ出力しないようにするには、STC HD View V5 を起動し、タスクトレイの音量ミキサーで「システム音」の音量を 0 に設定して下さい。

この操作は外部出力ボードを既定の再生デバイスに設定した際に一度だけ実施します。設定後、STC HD View V5 の起動中はシステム音が抑止されます。

1.4. 設定編集

送信元と接続する際の映像・音声等の設定を編集します。

設定編集ダイアログは各チャンネルで独立しているため全てのチャンネルで設定する必要があります。

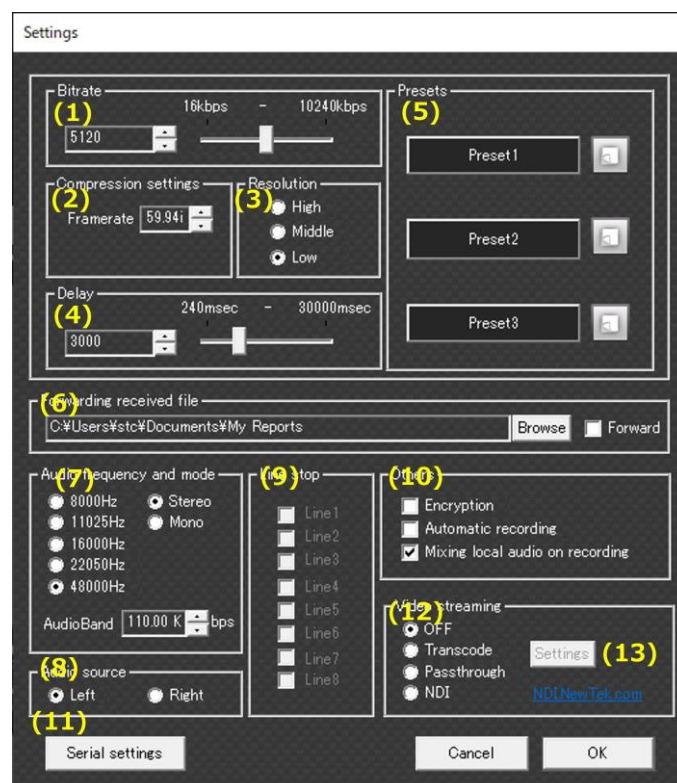


図 6 STC HD VIEW V5 設定編集画面

(1) ビットレート [Bitrate]

通信帯域を指定します。

注) 設定値できる最大値は、接続する送信機によって異なります。

STC Zao : 10Mbps

STC Zao-S : 5Mbps

STC Zao-X : 8Mbps

STC Zao App : 5Mbps

(2) フレームレート [Framerate]

フレームレートを指定します。

(3) 解像度 [Resolution]

ライブ中継の解像度を指定します。各設定による解像度は下記表の通りです。

注) 送信機が Zao/Zao-S (入力：インターレース映像) で Middle 解像度設定の場合、フレームレートの設定値により実効解像度が変わります。(表 1, 表 5, 表 6 参照)

表 1 解像度設定と実行解像度の関係(1080i)

中継端末：STC Zao/Zao-S（入力映像：1080 59.94i/50i）		
解像度設定	フレームレート設定	実効解像度
High	－	1920 x 1080
Middle	59.94i/50i	960 x 1080
	29.97/25	1920 x 540
Low	－	960 x 540

表 2 解像度設定と実行解像度の関係(1080P)

中継端末：STC Zao-S（入力映像：1080 59.94p/50p）		
解像度設定	フレームレート設定	実効解像度
High	－	1920 x 1080
Middle	－	1920 x 540
Low	－	960 x 540

表 3 解像度設定と実行解像度の関係(1080 29.97P/25P)

中継端末：STC Zao/Zao-S（入力映像：1080 29.97p/25p）		
解像度設定	フレームレート設定	実効解像度
High	－	1920 x 1080
Middle	－	1920 x 540
Low	－	960 x 540

表 4 解像度設定と実行解像度の関係(720P)

中継端末：STC Zao/Zao-S（入力映像：720 59.94p/50p）		
解像度設定	フレームレート設定	実効解像度
High	－	1280 x 720
Middle	－	640 x 720
Low	－	640 x 360

表 5 解像度設定と実行解像度の関係(SD)

中継端末：STC Zao/Zao-S（入力映像：480 59.94i）		
解像度設定	フレームレート設定	実効解像度
High	－	720 x 480
Middle	59.94i	360 x 480
	29.97	720 x 240
Low	－	360 x 240

表 6 解像度設定と実行解像度の関係(SD)

中継端末：STC Zao/Zao-S（入力映像：576 50i）		
解像度設定	フレームレート設定	実効解像度
High	－	720 x 576
Middle	50i	360 x 576
	25	720 x 288
Low	－	360 x 288

表 7 解像度設定と実行解像度の関係(ZAO APPS)

中継端末：STC Zao App (Android/iOS)		
解像度設定	フレームレート設定	実効解像度
High	－	1920 x 1080
Middle		1280 x 720
Low		640 x 360

表 8 解像度設定と実行解像度の関係(ML)

中継端末：STC for iOS/Android ML		
解像度設定	フレームレート設定	実効解像度
High	－	960 x 540
Middle		640 x 360
Low		

解像度の設定は、未接続の場合はいずれの設定でも可能ですが、接続中は送信側の映像キャプチャーの種類によりSD設定またはHD設定のどちらかに制限されます。接続中に設定変更した場合は、切断後もその設定が有効になります。

(4) デレイ [Delay]

受信側のバッファリングを指定します。バッファリングは 240msec～30000msec で指定することができます。

受信側のバッファリングの指定により、受信したデータをすぐに再生せずにバッファリング時間分だけ遅延させて再生することでフレーム更新間隔の乱れを抑えます。

※ 送信側で使用する通信回線の種類／組み合わせによる参考値

有線 LAN を使用する場合 240msec 以上

4G 回線のみ構成の場合 720msec 以上

3G 回線が構成に含まれる場合 1200msec 以上

衛星回線（BGAN など）を使用する場合 4000msec 以上

回線を混合する場合は、通信速度の遅い方にあわせて設定して下さい。

尚、この参考値はすべての状況／組み合わせを保証するものではありません。

また、回線の混雑状況や電波状況により、通信速度が安定しない場合があります。
その場合は、移動をやめカメラを固定することやデレイを延ばすことで安定性を増すことができます。

(5) プリセット [Presets]

STC HD View V5 は、任意の設定状態をプリセットとして登録しておくことができます。

① プリセット選択ボタン

プリセット選択ボタンをクリックすると、選択状態（ボタンが緑色点灯）になり、設定編集ダイアログ内の各設定値がプリセットに登録されている値に一括変更されます。

尚、各ボタンには登録時に指定したプリセット名が表示されます。



② プリセット登録ボタン

プリセット登録ボタンをクリックするとプリセット登録ダイアログが表示されます。

プリセット名を指定し Save ボタンをクリックすると、現在の設定値がプリセットとして登録され、かつ選択状態になります。

Cancel ボタンをクリックすると、プリセット登録はキャンセルされます。

尚、プリセット名はメイン画面のプリセットボタンにも反映されます。また、接続中は Cam 側のプリセット表示の名称にも反映されます。プリセットが選択されている場合は、選択プリセットのボタンが緑色に点灯します。プリセットの選択状態は、任意の設定値が変更されると解除されます。

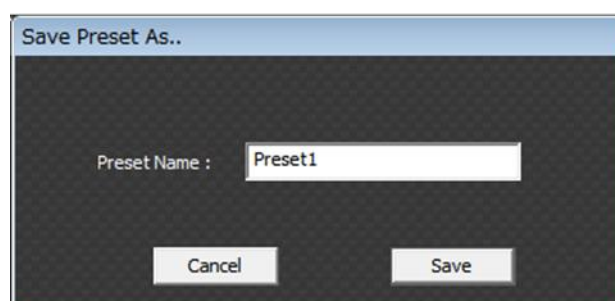


図 7 STC HD VIEW V5 プリセット登録ダイアログ

(6) 受信ファイルの転送 [Forwarding received file]

受信したファイルの保存フォルダを指定します。

(7) 音声周波数およびチャンネル [Audio frequency and mode]

音声のサンプリング・レートおよびステレオ/モノラルと、音声帯域を指定します。

注) 順方向音声と送り返し音声、共通の設定です。

音声周波数 [Audio frequency]

音声送受信に使用するサンプリング・レートを指定します。

注) 送信機が iOS ML の場合、22050Hz 固定となります。

音声チャンネル [mode]

音声入力チャンネルがステレオかモノラルかを指定します。

音声帯域 [AudioBand]

音声送信に使用する帯域量 (Kbps) を指定することができます。

尚、設定可能な帯域幅は音声周波数とチャンネルの組合せにより以下の範囲になります。

表 9 音声周波数とビットレートの関係

音声周波数	ステレオ (Kbps)	モノラル (Kbps)
8000Hz	11.71 ~ 62.50	7.81 ~ 41.01
11025Hz	15.62 ~ 85.93	11.71 ~ 48.82
16000Hz	23.43 ~ 167.96	15.62 ~ 97.65
22050Hz	29.29 ~ 167.96	15.62 ~ 87.89
48000Hz	68.35 ~ 488.28	31.25 ~ 234.37

(8) 音声ソース選択 [Audio source]

音声チャンネルがモノラル時に音声入力を左にするか右にするか指定します。

- ① Left 左チャンネルを使用して音声入力をモノラルとして扱います。
- ② Right 右チャンネルを使用して音声入力をモノラルとして扱います。

(9) 送信側回線の制御 [Line stop]

STC HD View V5 には、接続中に使用している回線を受信側から個別に一時停止／再開させることができるページ機能があります。（複数回線で接続中の場合のみ有効です）

使用中の回線を一時停止させる場合は、停止したい回線にチェックを入れて OK ボタンをクリックします。

一時停止を解除し再び回線を使用する場合は、再開したい回線のチェックを外して OK ボタンをクリックします。

ページ機能はライブ中継を維持したまま操作することができます。本機能を使用することにより、中継位置の移動等で通信速度が低下した回線を一時的に切り離すことや、回線状態を復帰させる為にリダイヤル（切断→再接続）させることができます。

(10) その他 [Others]

暗号化 [Encryption]

通信データを暗号化する場合に指定します。

自動録画 [Automatic recording]

宛先と接続した際に自動的に録画を開始するかどうかを指定します。

注)自動録画機能を使用するためには、LocalRec Mode を ON にする必要があります。

録画時のローカル音声ミキシング [Mixing local audio on recording]

STC HD View 側での録画の際、STC HD View 側のマイク入力を AVI ファイルに収録するかどうかを指定します。

注)録画時の音声ミキシング機能を利用するためには、LocalRec Mode を ON にする必要があります。

(11) シリアルポート設定

シリアル通信設定ウィンドウを表示させます。

- ・Port:シリアル通信可能な COM ポートを選択できます。
- ・Bitrate:ビットレート（ボーレート）を設定できます。
- ・Data bit:データビットを設定できます。
- ・Stop bit:ストップビットを設定できます。
- ・Parity:パリティを設定できます。

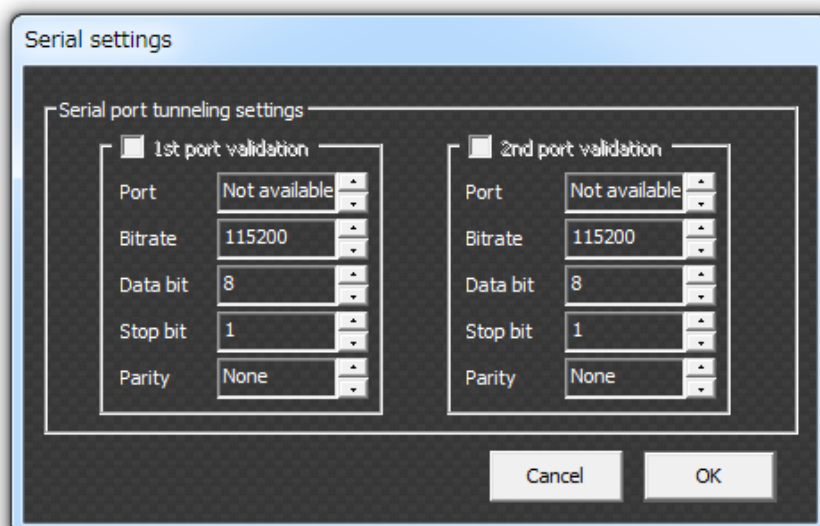


図 8 シリアルポート設定

(12) Video streaming

受信映像を再配信する際の方式を選択することができます。
使用する配信方式を一つ選択して下さい。
複数選択することはできません。

[OFF]

Video streaming 機能を利用しません。

[Transcode]

受信映像を H.264 に変換し RTMP 配信します。
YouTube や Facebook などで配信する場合にご利用下さい。設定方法に関しては後述します。

[Passthrough]

受信映像を変換せず RTSP 配信します。
VLC メディアプレイヤーや milestone Xprotect などへ配信する際にご利用下さい。設定方法に関しては後述します。

[NDI]

NDI 出力機能を利用できます。
チェックボックスを ON にした場合、自動的に NDI 出力されます。
送信機で設定した STC Cam 名称が TriCaster 側に表示されます。

(13) Video streaming 設定

Video streaming の詳細設定を行うことができます。
詳しい設定方法については後掲します。



1.5. 設定編集(STC Zao-X 接続設定時)

STC Zao-X 接続設定時、設定編集メニューは以下のようになります。

注) STC Zao-X はエンコードモード Normal mode で接続して下さい。



図 9 STC HD VIEW V5 設定編集画面(STC ZAO-X 接続設定時)

(1) ビットレート [Bitrate]

通信帯域を指定します。

512-8000kbps の間で設定することができます。

(2) フレームレート [Framerate]

注) 本バージョンでは入力映像フォーマットのフレームレートに固定されます。

(3) 解像度 [Resolution]

注) 本バージョンでは High (入力映像フォーマットの映像サイズ) に固定されます。

(4) デレイ [Delay]

受信側のバッファリングを指定します。バッファリングは 240msec~30000msec で指定することができます。

(5) プリセット [Presets]

STC HD View V5 は、任意の設定状態をプリセットとして登録しておくことができます。

① プリセット選択ボタン

プリセット選択ボタンをクリックすると、選択状態（ボタンが緑色点灯）になり、設定編集ダイアログ内の各設定値がプリセットに登録されている値に一括変更されます。尚、各ボタンには登録時に指定したプリセット名が表示されます。



② プリセット登録ボタン

プリセット登録ボタンをクリックするとプリセット登録ダイアログが表示されます。

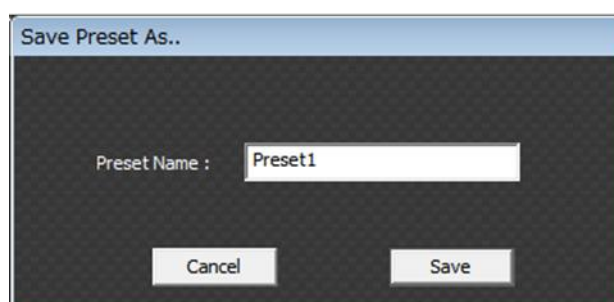


図 10 STC HD VIEW V5 プリセット画面

プリセット名を指定し Save ボタンをクリックすると、現在の設定値がプリセットとして登録され、かつ選択状態になります。Cancel ボタンをクリックすると、プリセット登録はキャンセルされます。尚、プリセット名はメイン画面のプリセットボタンにも反映されます。プリセットが選択されている場合は、選択プリセットのボタンが緑色に点灯します。プリセットの選択状態は、任意の設定値が変更されると解除されます。

(6) 音声周波数およびチャンネル [Audio frequency and mode]

注) 本バージョンでは、音声帯域設定以外設定変更できません。

本設定は「順方向 Embedded 音声の設定」になります。

送り返し音声は「48KHz, Stereo, TBR:128kbps」固定になります。

音声周波数 [Audio frequency]

注) 本バージョンでは 48000Hz に固定されます。

音声チャンネル [mode]

注) 本バージョンでは Stereo に固定されます。

音声帯域 [TBR]

音声送信に使用する帯域量 (Kbps) を 15.62-312.50kbps の間で指定することができます。

(7) 音声ソース選択 [Audio source]

注) 本バージョンでは Stereo 設定に固定されているため、音声ソースの Left/Right は選択できません。

1.6. 共通設定

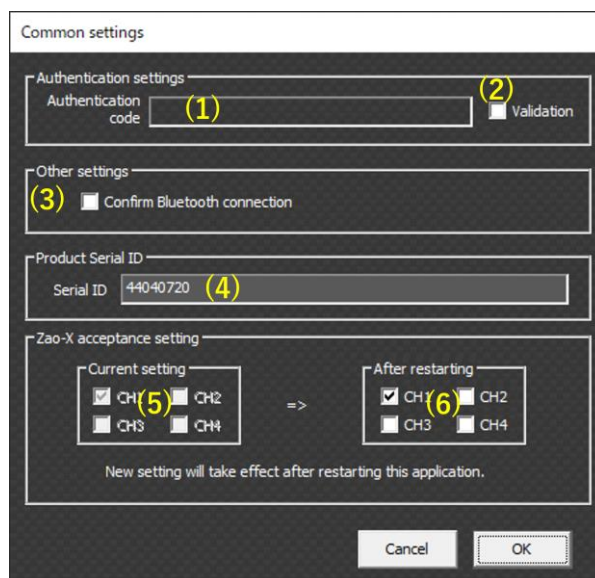


図 11 STC HD VIEW V5 共通設定画面

接続認証設定 [Authentication setting]

(1) 接続認証コード [Authentication code]

送信元との接続認証のためのコードを設定します。

認証コードは、半角英数字で 30 文字まで設定することができます。（入力したコードは * で表示されます）

本機能は、認証有効フラグが ON の場合のみ有効です。

注) 送信機が STC Zao-X の場合、本機能はご利用になれません。

(2) 認証有効フラグ [Validation]

チェック ON 時 : 接続認証コードを有効にします。

チェック OFF 時 : 接続認証コードを無効にします。

注) 接続認証を有効にした場合は、設定した認証コードと同じ認証コードを持つ送信元のみが接続することができます。送信元の認証コードが異なる場合、または無効な場合は、STC HD View V5 と接続することはできません。

その他の設定 [Other settings]

(3) Bluetooth 機器の確認を行う [Confirm Bluetooth connection]

注) 本バージョンでこの機能は使用できません。

ライセンス情報表示 [Product Serial ID]

(4) シリアル ID [Serial ID]

登録されているシリアル ID を表示します。

Zao-X 接続設定 [Zao-X acceptance setting]

(5) Current setting

現在の STC HD View V5 の STC Zao-X の接続設定が表示されます。

✓ が付いている CH に Zao-X を接続することができます。

(6) After restarting

✓ を付けた CH に Zao-X を接続できるように設定することができます。

注) 設定変更後、設定を反映するためには STC HD View V5 の再起動が必要になります。

設定反映後、After restarting の設定が Current setting に反映されます。

1.7. 録画再生機能

Zao の Rec&Go 機能で転送した録画データを HDView で再生することができます。

Zao から転送されてきたファイルは、TAF 形式（Soliton Systems オリジナルフォーマット）で保存されます。

※保存先は、デフォルト設定の場合、ドキュメントの MyReports フォルダ内に保存されます。

録画ファイルの展開と再生

(6) File オープンボタンをクリックすると、ドキュメントの MyReports フォルダが開かれます。

(6) 再生したい録画データを選択します。

※ファイルによっては読み込みに時間がかかる場合があります。

(6) 再生可能状態になると、(1)の File オープンボタンが、再生ボタンに変化します。

再生中は一時停止ボタンに変化し、一時停止が行えます。

(6) ファイル再生を中止したい場合は、右上の×ボタンをクリックすることで中止できます。

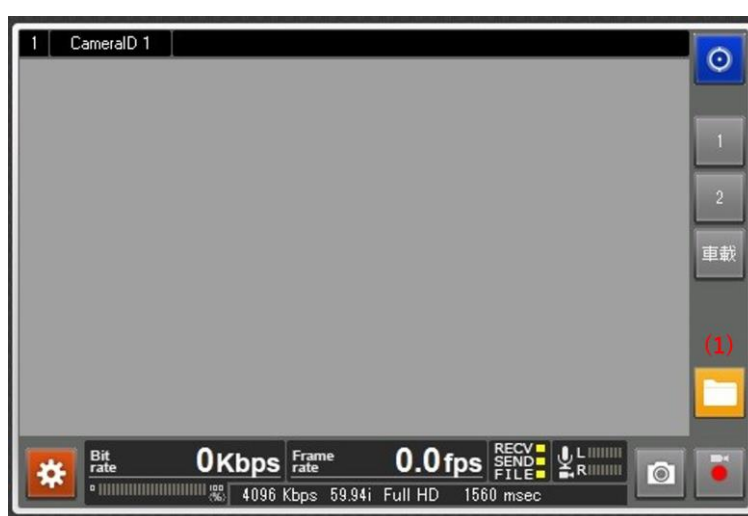


図 12 REC&GO ファイル選択ボタン

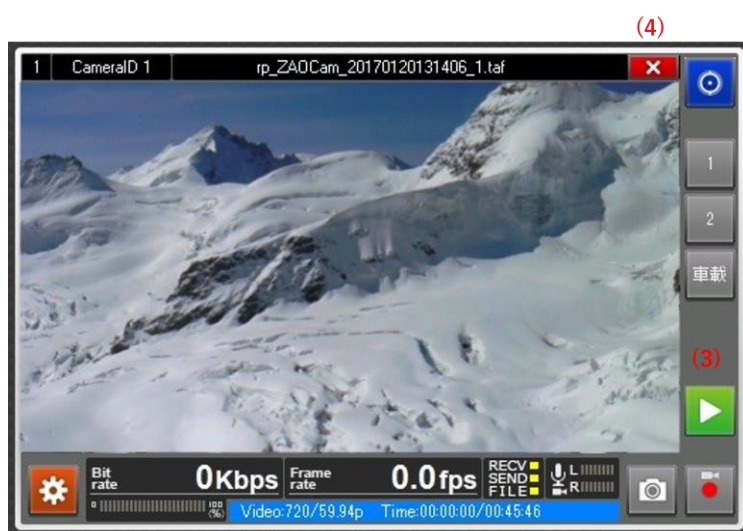


図 13 REC&GO ファイル再生、中止ボタン

2. Transcode 再配信機能

2.1. 設定編集

Transcode 再配信モード、ローカル録画モード、共通の設定ダイアログです。

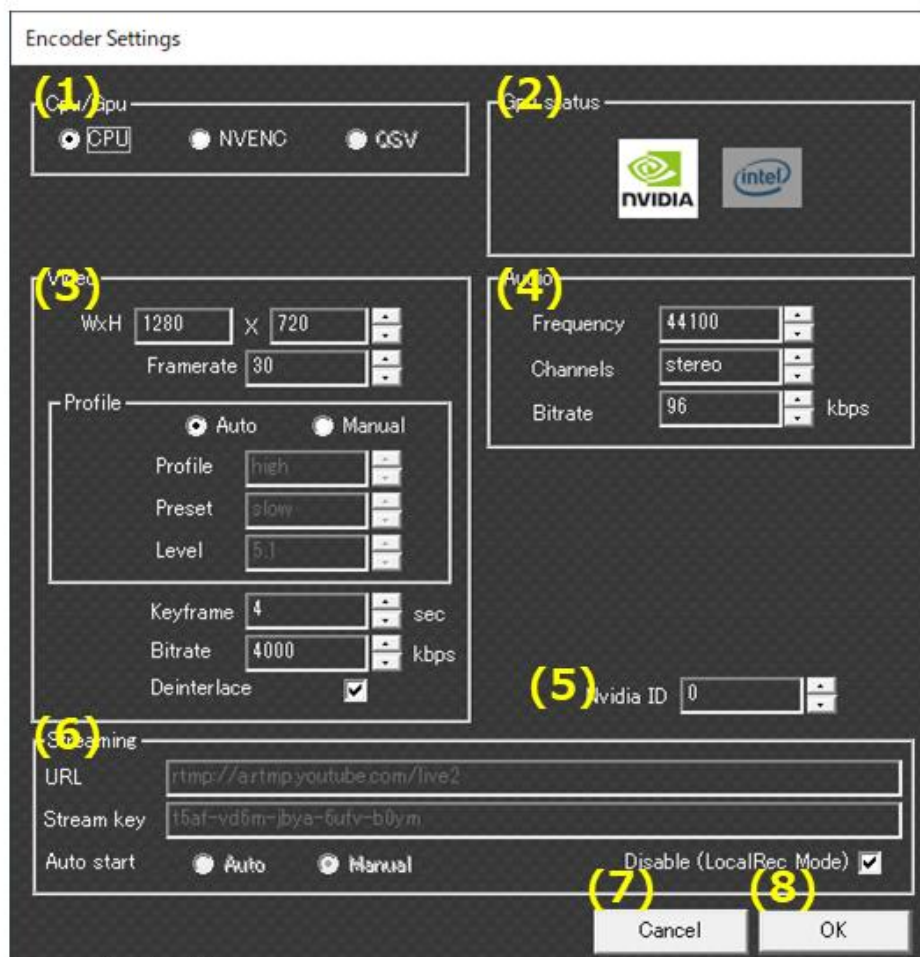


図 14 TRANSCODE 再配信設定編集画面

(1) Cpu/Gpu

サポートしている GPU もしくは CPU を選択して下さい。

(2) Gpu status

STC HD View 起動時に GPU ステータスをチェックしています。



(3) Video

各フォーマットを選択して下さい。

表 10 幅 x 高さ (W x H)

No	width	height	remarks
1	1920	1080	default
2	1280	720	
3	960	540	
4	640	360	
5	320	180	

表 11 FRAMERATE

No	Framerate	Remarks
1	60	* It is effective only when setting 720p/60fps
2	50	* It is effective only when setting 720p/50fps
3	30	default(NTSC)
4	25	default(PAL)
5	15	

Profile グループ

- ・「Auto」の場合 : 「Profile」「Preset」「Level」は自動的に設定されます。
- ・「Manual」の場合 :

表 12 PROFILE

No	Profile	remarks
1	High	default
2	Main	

表 13 PRESET

No	Preset	remarks
1	Slow	default
2	Medium	
3	Fast	

表 14 LEVEL

No	Level	remarks
1	5.1	default
2	5.0	
3	4.2	
4	4.1	
5	4.0	
6	3.2	
7	3.1	

表 15 KEYFRAME

No	Keyframe(sec)	remarks
1	10	
2	9	
3	8	
4	7	
5	6	
6	5	
7	4	default
8	3	
9	2	
10	1	

表 16 BITRATE(VIDEO BITRATE)

No	Bitrate(kbps)	remarks
1	10000	
2	9500	
3	9000	
4	8500	
5	8000	
6	7500	
7	7000	
8	6500	
9	6000	
10	5500	
11	5000	
12	4500	
13	4000	
14	3500	
15	3000	
16	2500	
17	2000	default
18	1000	
19	750	
20	500	
21	250	

表 17 インターレース解除 DEINTERLACE

No	Deinterlace	remarks
1	Checked(ON)	default
2	No checked(OFF)	

(4) Audio

表 18 FREQUENCY

No	Samplerate	remarks
	48000	Local Rec mode
1	44100	default
2	22050	
3	11025	

表 19 CHANNELS

No	Samplerate	remarks
1	Stereo	default
2	Mono	

表 20 BITRATE(AUDIO BITRATE)

No	Bitrate(kbps)	remarks
1	96	default
2	112	
3	160	
4	192	
5	224	

(5) Nvidia ID

2つのGPUがインストールされている場合、nvencに使用するカードを選択できます。

表 21 NVENC

No	NvidiaID	Remarks
1	0	default
2	1	

(6) Streaming

RTMP url

手動で RTMP URL の入力が可能です。

Stream key

手動で Stream key の入力が可能です。

Auto start

•Auto

送信機と受信機の接続が安定すると、自動的にストリーミングを開始します。

•Manual

送信機と受信機の接続が安定し、手動で配信の開始及び停止が出来ます。

Disable (Local Rec Mode)

IP ストリーミング機能を無効化し、ローカル録画を行うことが出来ます。

表 22 LOCAL REC MODE

No	Local Rec Mode	remarks
1	チェックあり(ON)	Default
2	チェックなし(OFF)	



(7) Cancel

設定ウィンドウを閉じます。(設定内容は保存されません)

(8) OK

設定ウィンドウを閉じます。(設定内容は保存されます)

2.2. Transcode ステータスウィンドウ表示設定

デフォルトではライブ中に Transcode ステータスウィンドウはポップアップしません。表示する場合は以下を設定して下さい。

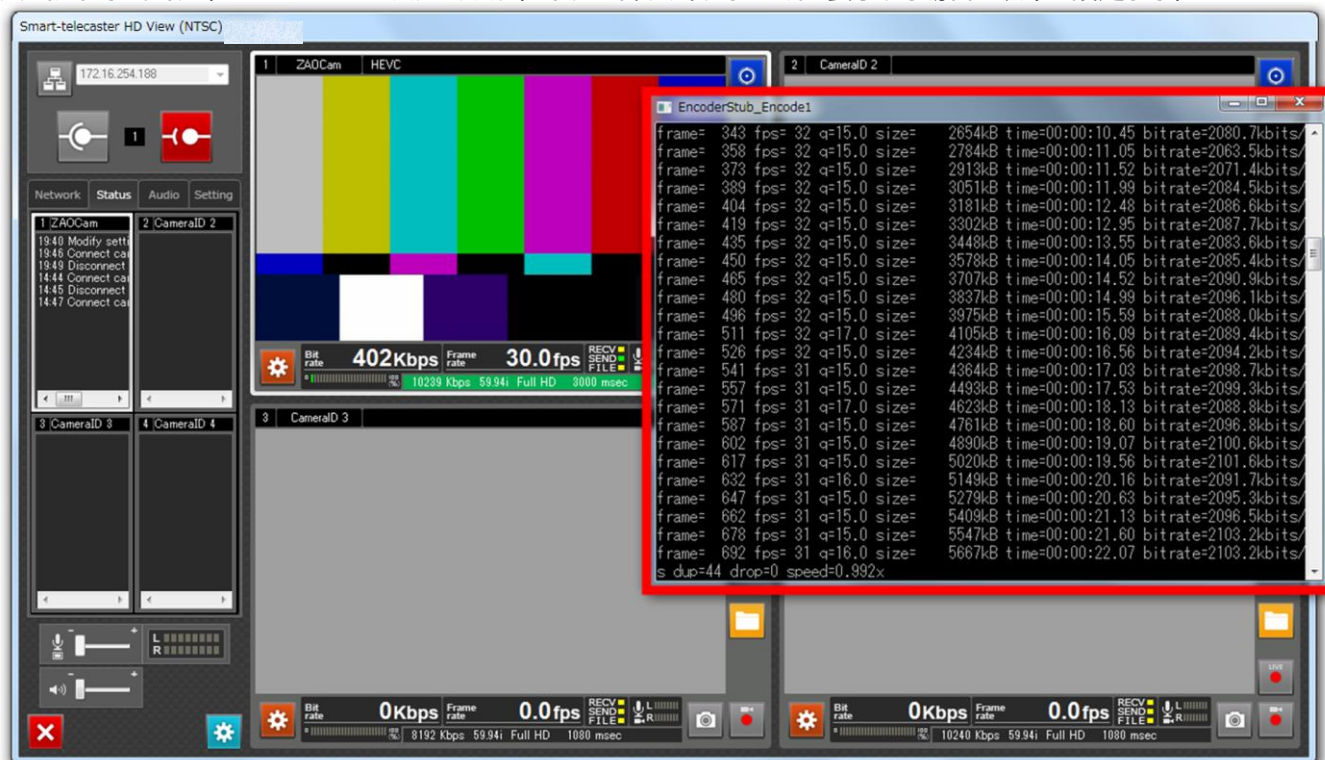


図 15 TRANSCODE ステータスウィンドウ表示

C:\Program Files (x86)\Smart-telecaster HD\STCView (NTSC)\x64\EncoderStub.ini

※EncoderStub.ini はお使いの環境、インストール先によって配置場所が異なる場合がございます。

```

[CONFIG]
check_interval = 100
encstart_waittime = 500
encend_waittime = 500
comm_timeout = 300
program_reg_interval = 15000
encoder_path = "C:\Program Files (x86)\Smart-telecaster
HD\bin\StreamPusher\StreamPusher.exe"
segment_time = 3600
localrec_format = "mp4"
hide_window = 1 ⇒ Please Change to 0 (表示).
  
```

2.3. Transcode 再配信ボタン／ローカル録画ボタン

Transcode 再配信が有効な場合

ローカル録画モード（Local Rec mode）が無効で送信機と接続されている場合は、配信ボタンが表示されます。



図 16 TRANSCODE 再配信モード

ローカル録画モード（Local Rec mode）が有効な場合

Local Rec mode が有効で送信機が接続されている場合にスナップショットボタンと録画ボタンが有効になります。

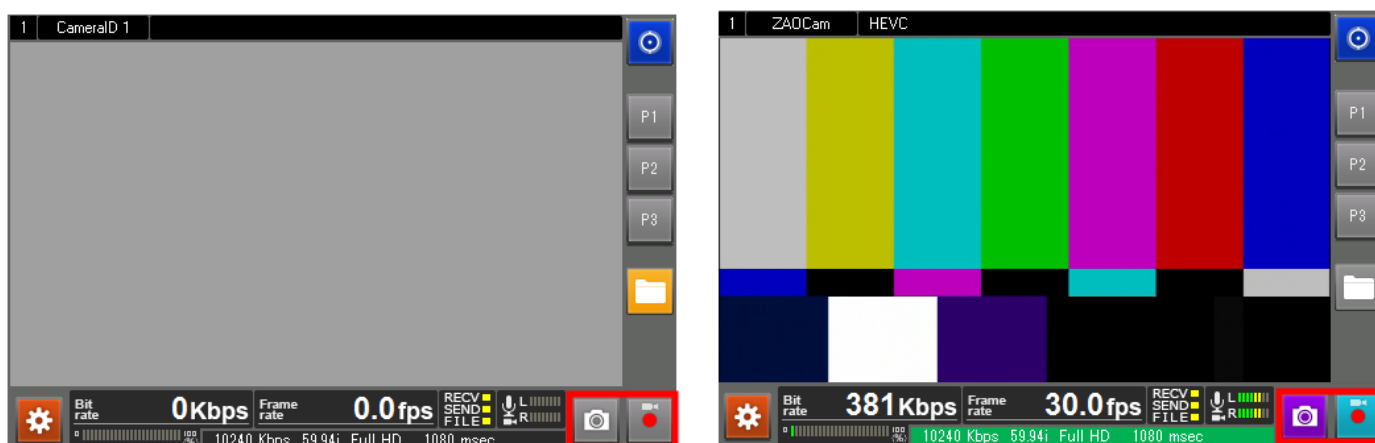


図 17 ローカル録画モード

中継が開始されると録画ボタンが有効になり、押すと録画開始されます。
録画ファイルの保存先は、デフォルトで「ドキュメント/My Reports」となります。



スナップショット、録画ファイルのメディアフォーマットは、それぞれ下記となります。

表 23 FILENAME FORMAT

No	Filename Format	remarks
1	[Transmitter-Name]_yyyyMMddHHmmss_[ch].mp4	mp4
2	[Transmitter-Name]_yyyyMMddHHmmss_[ch].jpg	jpg

2.4 Transcode 再配信設定例

2.4.1. YouTube

YouTube にログインし、[クリエイターツール](#)から、[ライブストリーミング](#)を表示します。

表示される[エンコーダの設定]を、STC HD View の URL と Stream key にコピーします。

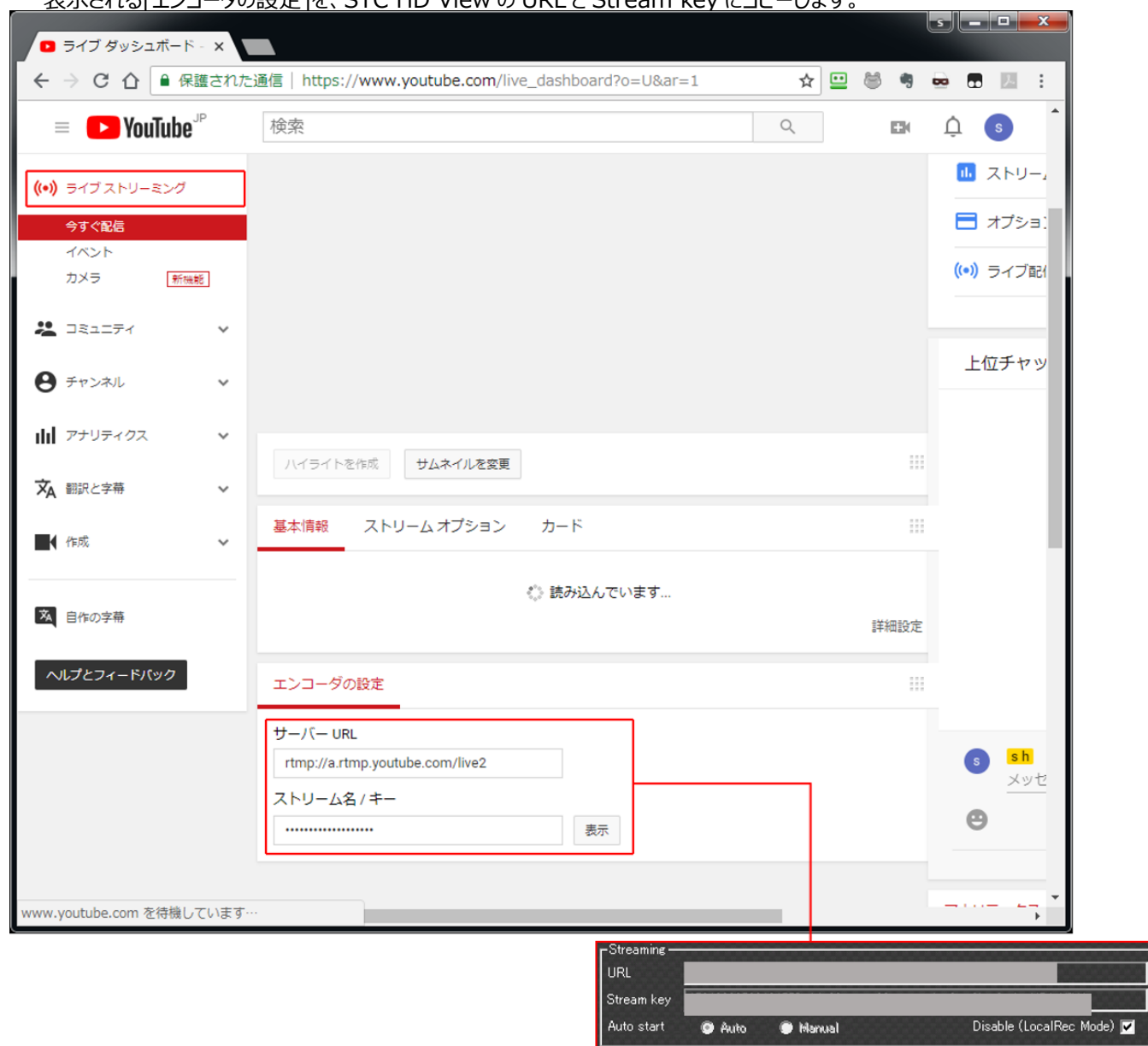


図 18 TRANSCODE 再配信設定例 (YOUTUBE)

2.4.2. Facebook

Facebook にログインし、「ライブ動画」をクリックします。



図 19 FACEBOOK 画面

[接続する]をクリックし、表示される[サーバーURL]と[ストリームキー]を、STC HD View の URL と Stream key にコピーします。

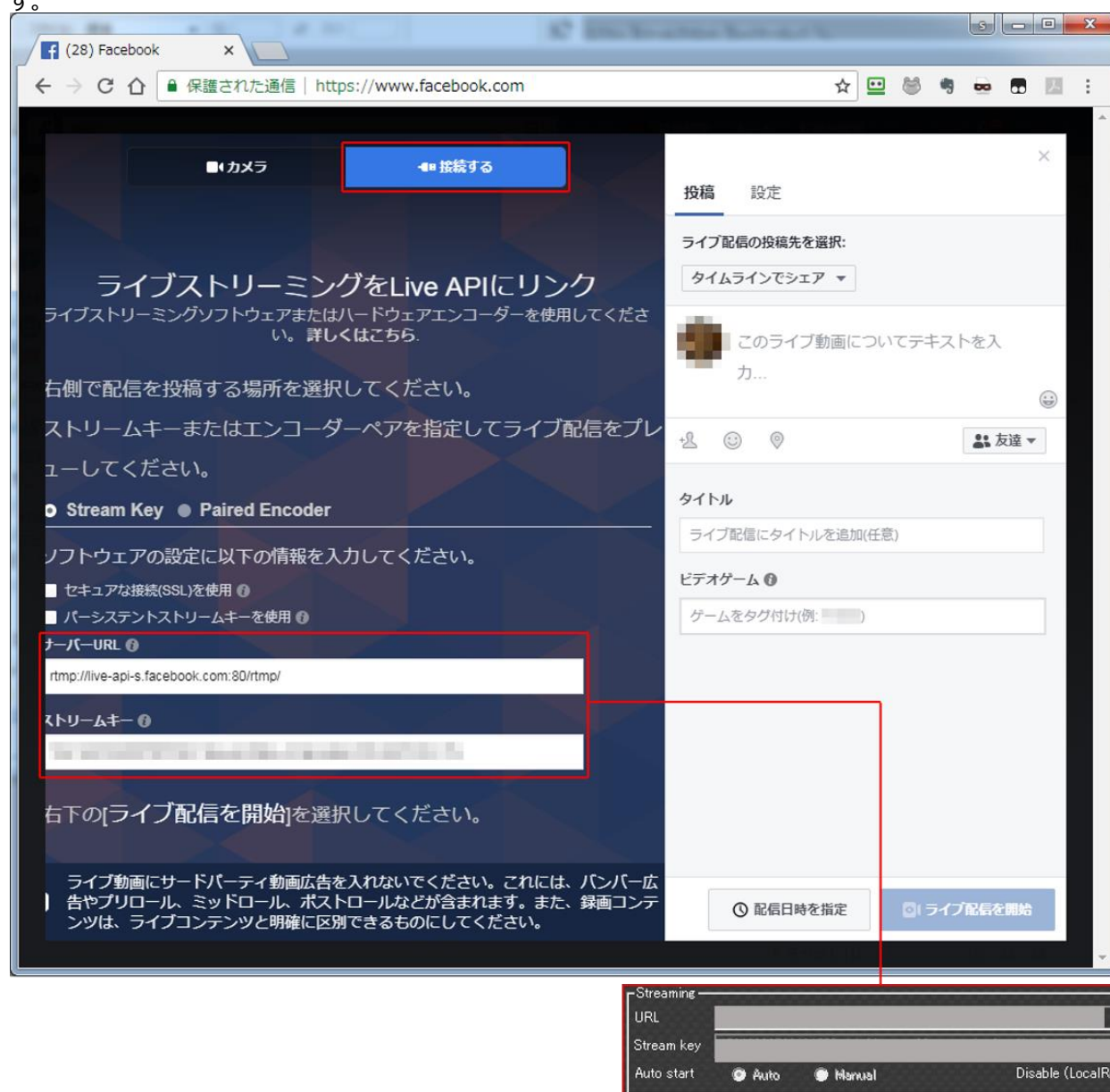


図 20 TRANSCODE 再配信設定例 (FACEBOOK)

3. 仕様

以下に STC HD View V5 の仕様を記載します。

表 10 STC HD VIEW V5 の仕様

主な機能	同時接続数	4
	接続可能製品	STC Zao-X, Zao App 販売終了製品 : STC Zao-S, STC Zao, STC HD Cam, STC for iOS ML, STC for Android ML
	符号化方式	VP8, H.265
	映像ビットレート	512~8000kbps ※STC Zao-X 16~10240kbps ※STC Zao 16~5120kbps ※STC Zao-S,Zao apps
外部出力	映像出力機	BlackmagicDesign Decklink Quad 2 (4ch 同時出力)
	対応信号形式	1080/59.94p,1080/50p,1080/29.97p,1080/25p,1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 480/59.94i, 576/50i
音声	符号化方式	Opus ※STC Zao-X Vorbis ※STC Zao-X 以外
	チャンネル	ステレオ ※STC Zao-X ステレオ/モノラル ※STC Zao-X 以外
	サンプリング	48kHz 固定 ※STC Zao-X 8~48kHz ※STC Zao-X 以外
	入力	PCM
	出力	PCM
	ビットレート	15.62~312.50kbps ※STC Zao-X 7.81~488.28kbps ※STC Zao-X 以外
動作環境	推奨ハードウェア	HP Z440 Workstation 以上
	対応 OS	Windows10 Pro 64bit
	CPU	Intel Xeon
	メモリ	16GB 以上

4. STC HD View で利用している OSS ライセンス

表 11 使用 OSS ライセンス一覧

OSS 名	Copyright	License
libvpx	WebM project	New BSD License
libvorbis	Xiph.Org Foundation	New BSD License
libogg	Xiph.Org Foundation	New BSD License
picojson	Cybozu Labs, Inc., Kazuho Oku	BSD 2-Clause "Simplified" License
libavcodec, libavformat, libavutil, libavfilter, libswscale, libswresample	ffmpeg.org	GNU Lesser General Public License, version 2.1
spdlog	Gabi Melman	MIT License
getopt	NetBSD Foundation	BSD 2-Clause License
json11	Dropbox	MIT License
httplib	Yuji Hirose	MIT License
cryptopp	Wei Dai	Boost Software License 1.0
pthread	Ross P. Johnson	GNU Lesser General Public License, version 2.1
openssl	The OpenSSL Project	the OpenSSL License and the original SSLeay license
msgpack	FURUHASHI Sadayuki	Boost Software License 1.0
opus	Xiph.Org, Skype Limited, Octasic, Jean-Marc Valin, Timothy B. Terriberry, CSIRO, Gregory Maxwell, Mark Borgerding, Erik de Castro Lopo	BSD 3-Clause License
librtsp	Cisco Systems, Inc.	BSD 3-Clause License
spdlog	Gabi Melman.	MIT License
fmt	Victor Zverovich	MIT License

4.1. libvpx

Copyright (c) 2010, Google Inc. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Google nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

4.2. libvorbis

Copyright (c) 2002-2018 Xiph.org Foundation

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the Xiph.org Foundation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS ``AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE FOUNDATION OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

4.3. libogg

Copyright (c) 2002, Xiph.org Foundation

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the Xiph.org Foundation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE FOUNDATION OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

4.4. Picojson

Copyright 2009-2010 Cybozu Labs, Inc.

Copyright 2011-2014 Kazuho Oku

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

4.5. libavcodec, libavformat, libavutil, libavfilter, libswscale, libswresample

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts
as the successor of the GNU Library Public License, version 2, hence
the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

- ◀ To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

◀ If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you

must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy. For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
- b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

4.6. spdlog

The MIT License (MIT)

Copyright (c) 2016 Gabi Melman.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-- NOTE: Third party dependency used by this software --

This software depends on the fmt lib (MIT License), and users must comply to its license:

<https://github.com/fmtlib/fmt/blob/master/LICENSE.rst>

4.7. getopt

Copyright (c) 2000 The NetBSD Foundation, Inc.

All rights reserved.

This code is derived from software contributed to The NetBSD Foundation by Dieter Baron and Thomas Klausner.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
This product includes software developed by the NetBSD Foundation, Inc. and its contributors.
4. Neither the name of The NetBSD Foundation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE NETBSD FOUNDATION, INC. AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE FOUNDATION OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

4.8. json11

Copyright (c) 2013 Dropbox, Inc.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

4.9. httplib

The MIT License (MIT)

Copyright (c) 2017 yhirose

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

◀ THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

4.10. cryptopp

Compilation Copyright (c) 1995-2019 by Wei Dai. All rights reserved.
This copyright applies only to this software distribution package as a compilation, and does not imply a copyright on any particular file in the package.

All individual files in this compilation are placed in the public domain by Wei Dai and other contributors.

I would like to thank the following authors for placing their works into the public domain:

Joan Daemen - 3way.cpp
Leonard Janke - cast.cpp, seal.cpp
Steve Reid - cast.cpp
Phil Karn - des.cpp
Andrew M. Kuchling - md2.cpp, md4.cpp
Colin Plumb - md5.cpp
Seal Woods - rc6.cpp
Chris Morgan - rijndael.cpp
Paulo Baretto - rijndael.cpp, skipjack.cpp, square.cpp
Richard De Moliner - safer.cpp
Matthew Skala - twofish.cpp
Kevin Springle - camellia.cpp, shacal2.cpp, ttmac.cpp, whirlpool.cpp, ripemd.cpp
Ronny Van Keer - sha3.cpp
Aumasson, Neves, Wilcox-O'Hearn and Winnerlein - blake2.cpp, blake2b_simd.cpp, blake2s_simd.cpp
Aaram Yun - aria.cpp, aria_simd.cpp
Han Lulu, Markku-Juhani O. Saarinen - sm4.cpp sm4_simd.cpp
Daniel J. Bernstein, Jack Lloyd - chacha.cpp, chacha_simd.cpp, chacha_avx.cpp
Andrew Moon - ed25519, x25519, donna_32.cpp, donna_64.cpp, donna_sse.cpp

◀ The Crypto++ Library uses portions of Andy Polyakov's CRYPTOGAMS on Linux for 32-bit ARM with files aes_armv4.S, sha1_armv4.S and sha256_armv4.S. CRYPTOGAMS is dual licensed with a permissive BSD-style license. The CRYPTOGAMS license is reproduced below. You can disable Cryptogams code by undefining the relevant macros in config_asm.h.

The Crypto++ Library uses portions of Jack Lloyd's Botan for ChaCha SSE2 and AVX. Botan placed the code in public domain for Crypto++ to use.

The Crypto++ Library (as a compilation) is currently licensed under the Boost Software License 1.0 (<http://www.boost.org/users/license.html>).

Boost Software License - Version 1.0 - August 17th, 2003

Permission is hereby granted, free of charge, to any person or organization obtaining a copy of the software and accompanying documentation covered by this license (the "Software") to use, reproduce, display, distribute, execute, and transmit the Software, and to prepare derivative works of the Software, and to permit third-parties to whom the Software is furnished to do so, all subject to the following:

The copyright notices in the Software and this entire statement, including the above license grant, this restriction and the following disclaimer, must be included in all copies of the Software, in whole or in part, and all derivative works of the Software, unless such copies or derivative works are solely in the form of machine-executable object code generated by a source language processor.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,

FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR ANYONE DISTRIBUTING THE SOFTWARE BE LIABLE FOR ANY DAMAGES OR OTHER LIABILITY, WHETHER IN CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

CRYPTOGAMS License

Copyright (c) 2006-2017, CRYPTOGAMS by <appro@openssl.org>

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain copyright notices, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of the CRYPTOGAMS nor the names of its copyright holder and contributors may be used to endorse or promote products derived from this software without specific prior written permission.

◀

4.11. pthreads

pthreads-win32 - a POSIX threads library for Microsoft Windows

This file is Copyrighted

This file is covered under the following Copyright:

Copyright (C) 2001 Ross P. Johnson
All rights reserved.

Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

Pthreads-win32 is covered by the GNU Lesser General Public License

Pthreads-win32 is open software; you can redistribute it and/or
modify it under the terms of the GNU Lesser General Public License
as published by the Free Software Foundation version 2.1 of the
License.

Pthreads-win32 is several binary link libraries, several modules,
associated interface definition files and scripts used to control
its compilation and installation.

Pthreads-win32 is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
GNU Lesser General Public License for more details.

A copy of the GNU Lesser General Public License is distributed with
pthreads-win32 under the filename:

COPYING.LIB

You should have received a copy of the version 2.1 GNU Lesser General
Public License with pthreads-win32; if not, write to:

Free Software Foundation, Inc.
59 Temple Place
Suite 330
Boston, MA 02111-1307
USA

The contact addresses for pthreads-win32 is as follows:

Web: <http://sources.redhat.com/pthreads-win32>
Email: Ross Johnson <rpj@ise.canberra.edu.au>, or
Ross.Johnson@canberra.edu.au

Pthreads-win32 copyrights and exception files

With the exception of the files listed below, Pthreads-win32
is covered under the following GNU Lesser General Public License
Copyrights:

Pthreads-win32 - POSIX Threads Library for Win32

Copyright(C) 1998 John E. Bossom
Copyright(C) 1999,2002 Pthreads-win32 contributors

The current list of contributors is contained
in the file CONTRIBUTORS included with the source
code distribution. The current list of CONTRIBUTORS
can also be seen at the following WWW location:
<http://sources.redhat.com/threads-win32/contributors.html>

Contact Email: rpj@ise.canberra.edu.au

These files are not covered under one of the Copyrights listed above:

COPYING
COPYING.LIB
tests/rwlock7.c

This file, COPYING, is distributed under the Copyright found at the
top of this file. It is important to note that you may distribute
verbatim copies of this file but you may not modify this file.

The file COPYING.LIB, which contains a copy of the version 2.1
GNU Lesser General Public License, is itself copyrighted by the
Free Software Foundation, Inc. Please note that the Free Software
Foundation, Inc. does NOT have a copyright over Pthreads-win32,
only the COPYING.LIB that is supplied with pthreads-win32.

The file tests/rwlock7.c is derived from code written by
Dave Butenhof for his book 'Programming With POSIX(R) Threads'.
The original code was obtained by free download from his website
<http://home.earthlink.net/~anneart/family/Threads/source.html>
and did not contain a copyright or author notice. It is assumed to
be freely distributable.

In all cases one may use and distribute these exception files freely.
And because one may freely distribute the LGPL covered files, the
entire pthreads-win32 source may be freely used and distributed.

General Copyleft and License info

For general information on Copylefts, see:

<http://www.gnu.org/copyleft/>

For information on GNU Lesser General Public Licenses, see:

<http://www.gnu.org/copyleft/lesser.html>
<http://www.gnu.org/copyleft/lesser.txt>

Why pthreads-win32 did not use the GNU General Public License

The goal of the pthreads-win32 project has been to
provide a quality and complete implementation of the POSIX
threads API for Microsoft Windows within the limits imposed
by virtue of it being a stand-alone library and not
linked directly to other POSIX compliant libraries. For
example, some functions and features, such as those based

on POSIX signals, are missing.

Pthreads-win32 is a library, available in several different versions depending on supported compilers, and may be used as a dynamically linked module or a statically linked set of binary modules. It is not an application on it's own.

It was fully intended that pthreads-win32 be usable with commercial software not covered by either the GPL or the LGPL licenses. Pthreads-win32 has many contributors to it's code base, many of whom have done so because they have used the library in commercial or proprietry software projects.

Releasing pthreads-win32 under the LGPL ensures that the library can be used widely, while at the same time ensures that bug fixes and improvements to the pthreads-win32 code itself is returned to benefit all current and future users of the library.

Although pthreads-win32 makes it possible for applications that use POSIX threads to be ported to Win32 platforms, the broader goal of the project is to encourage the use of open standards, and in particular, to make it just a little easier for developers writing Win32 applications to consider widening the potential market for their products.



4.12. openssl

LICENSE ISSUES

=====

The OpenSSL toolkit stays under a double license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts.

OpenSSL License

```

/* =====
 * Copyright (c) 1998-2019 The OpenSSL Project. All rights reserved.
 *
 * Redistribution and use in source and binary forms, with or without
 * modification, are permitted provided that the following conditions
 * are met:
 *
 * 1. Redistributions of source code must retain the above copyright
 * notice, this list of conditions and the following disclaimer.
 *
 * 2. Redistributions in binary form must reproduce the above copyright
 * notice, this list of conditions and the following disclaimer in
 * the documentation and/or other materials provided with the
 * distribution.
 *
 * 3. All advertising materials mentioning features or use of this
 * software must display the following acknowledgment:
 * "This product includes software developed by the OpenSSL Project
 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
 *
 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
 * endorse or promote products derived from this software without
 * prior written permission. For written permission, please contact
 * openssl-core@openssl.org.
 *
 * 5. Products derived from this software may not be called "OpenSSL"
 * nor may "OpenSSL" appear in their names without prior written
 * permission of the OpenSSL Project.
 *
 * 6. Redistributions of any form whatsoever must retain the following
 * acknowledgment:
 * "This product includes software developed by the OpenSSL Project
 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
 *
 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ``AS IS'' AND ANY
 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
 * OF THE POSSIBILITY OF SUCH DAMAGE.
 * =====
 *
 * This product includes cryptographic software written by Eric Young
 * (eay@cryptsoft.com). This product includes software written by Tim

```

* Hudson (tjh@cryptsoft.com).

*

*/

Original SSLeay License

/* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)

* All rights reserved.

*

* This package is an SSL implementation written

* by Eric Young (eay@cryptsoft.com).

* The implementation was written so as to conform with Netscapes SSL.

*

* This library is free for commercial and non-commercial use as long as

* the following conditions are aheared to. The following conditions

* apply to all code found in this distribution, be it the RC4, RSA,

* lhash, DES, etc., code; not just the SSL code. The SSL documentation

* included with this distribution is covered by the same copyright terms

* except that the holder is Tim Hudson (tjh@cryptsoft.com).

*

* Copyright remains Eric Young's, and as such any Copyright notices in

* the code are not to be removed.

* If this package is used in a product, Eric Young should be given attribution

* as the author of the parts of the library used.

* This can be in the form of a textual message at program startup or

* in documentation (online or textual) provided with the package.

*

* Redistribution and use in source and binary forms, with or without

* modification, are permitted provided that the following conditions

* are met:

* 1. Redistributions of source code must retain the copyright

* notice, this list of conditions and the following disclaimer.

* 2. Redistributions in binary form must reproduce the above copyright

* notice, this list of conditions and the following disclaimer in the

* documentation and/or other materials provided with the distribution.

* 3. All advertising materials mentioning features or use of this software

* must display the following acknowledgement:

* "This product includes cryptographic software written by

* Eric Young (eay@cryptsoft.com)"

* The word 'cryptographic' can be left out if the rouines from the library

* being used are not cryptographic related :-).

* 4. If you include any Windows specific code (or a derivative thereof) from

* the apps directory (application code) you must include an acknowledgement:

* "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

*

* THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND

* ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE

* IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE

* ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE

* FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL

* DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS

* OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)

* HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT

* LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY

* OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF

* SUCH DAMAGE.

*

* The licence and distribution terms for any publically available version or

* derivative of this code cannot be changed. i.e. this code cannot simply be

* copied and put under another distribution licence

* [including the GNU Public Licence.]

*/

4.13. msgpack

Copyright (C) 2008-2015 FURUHASHI Sadayuki

Distributed under the Boost Software License, Version 1.0.

(See accompanying file LICENSE_1_0.txt or copy at

http://www.boost.org/LICENSE_1_0.txt)

4.14. opus

Copyright 2001-2011 Xiph.Org, Skype Limited, Octasic,

Jean-Marc Valin, Timothy B. Terriberry,
CSIRO, Gregory Maxwell, Mark Borgerding,
Erik de Castro Lopo

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of Internet Society, IETF or IETF Trust, nor the names of specific contributors, may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Opus is subject to the royalty-free patent licenses which are specified at:

Xiph.Org Foundation:

<https://datatracker.ietf.org/ipr/1524/>

Microsoft Corporation:

<https://datatracker.ietf.org/ipr/1914/>

Broadcom Corporation:

<https://datatracker.ietf.org/ipr/1526/>

4.15. libsrtplib

/*

*

* Copyright (c) 2001-2017 Cisco Systems, Inc.

* All rights reserved.

```

*
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
*
*  Redistributions of source code must retain the above copyright
*  notice, this list of conditions and the following disclaimer.
*
*  Redistributions in binary form must reproduce the above
*  copyright notice, this list of conditions and the following
*  disclaimer in the documentation and/or other materials provided
*  with the distribution.
*
*  Neither the name of the Cisco Systems, Inc. nor the names of its
*  contributors may be used to endorse or promote products derived
*  from this software without specific prior written permission.
*
* THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS
* "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT
* LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS
* FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE
* COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT,
* INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
* (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
* SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
* HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
* STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
* ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
* OF THE POSSIBILITY OF SUCH DAMAGE.
*
*/

```

4.16. spdlog

The MIT License (MIT)

Copyright (c) 2016 Gabi Melman.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

-- NOTE: Third party dependency used by this software --

This software depends on the fmt lib (MIT License),

and users must comply to its license: <https://github.com/fmtlib/fmt/blob/master/LICENSE.rst>

4.17. fmt

Copyright (c) 2012 - present, Victor Zverovich

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

--- Optional exception to the license ---

As an exception, if, as a result of your compiling your source code, portions of this Software are embedded into a machine-executable object form of such source code, you may redistribute such embedded portions in such object form without including the above copyright and permission notices.

◀