

Open Broadcaster Software Studio

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Introduction

- OBS is a real-time video streaming and recording solution.
- Provides live capture and encoding from multiple sources.
- Available in compiled packages for Windows, macOS, and Linux.
- Released under GNU GPL 2.0 license.

History

- Initially created by Hugh “Jim” Bailey in 2012
- After 2012 OBS quickly gained multiple contributors.
- In 2014 a full re-write of OBS is started, dubbed “OBS Multiplatform” with the goal of multi-platform support and a more powerful API.
- In 2016 the original OBS software is deprecated as “OBS Classic” and OBS Multiplatform becomes the primary version as “OBS Studio”.

Streaming Platforms

- Youtube and Twitch the most popular public streaming platforms.
- Include features such as live chat and real-time transcoding to different bitrates.
- Most platforms still using the RTMP protocol.
- HLS and DASH protocols starting to gain support.
- RTMP endpoints typically use a unique endpoint ID as their only form of authentication.

Youtube Live Dashboard

The screenshot displays the YouTube Studio Live Dashboard. At the top left, the 'Studio' logo is visible. The main area is divided into several sections:

- Top Left:** A sidebar with icons for audio, camera, and calendar.
- Top Center:** A large area with a loading spinner and the text: "Connect streaming software to go live. Viewers will be able to find your stream once you go live." Below this is a link for "STREAM SETUP HELP".
- Top Right:** Stream metadata including:
 - Title: Manitoba Unix User Group Live Stream (with an EDIT button)
 - Category: Science & Technology
 - Privacy: Public
 - Viewers waiting: 0
 - Likes: 0
- Right Panel:** A "Live chat" section with a welcome message: "Welcome to live chat! Remember to guard your privacy and abide by our community guidelines." and a "LEARN MORE" link.
- Bottom Section:** A tabbed interface with "STREAM SETTINGS", "ANALYTICS", and "STREAM HEALTH". The "STREAM SETTINGS" tab is active and contains:
 - Stream key:** A dropdown menu set to "Default stream key (Variable)". Below it is a text input field for the stream key (paste in encoder) with a "RESET" and "COPY" button.
 - Stream URL:** "rtmp://a.rtmp.youtube.com/live2" with a "COPY" button.
 - Backup server URL:** "rtmp://b.rtmp.youtube.com/live2?backup=" with a "COPY" button.
 - Stream latency:** A radio button selected for "Normal latency".
 - Additional settings:** A list of toggle and dropdown options:
 - Enable DVR:
 - 360° video:
 - Added delay: None (dropdown)
 - Closed captions:
 - Unlist live replay once stream ends:

Twitch Live Dashboard

The image shows a screenshot of the Twitch Live Dashboard interface. At the top, the 'Stream Manager' header is visible, along with a microphone icon. The top status bar displays '0:00:00 Session', '0 Viewers', '2 Views', '0 Followers', and 'Bitrate'. On the right side of the top bar, there are icons for help, a Twitch logo, a mail icon, a chat icon, and a user profile icon.

The main interface is divided into four vertical panels:

- CREATOR DASHBOARD**: A sidebar menu on the left with options: Home, Stream Manager (highlighted), Insights, Community, Content, Settings, Channel, Moderation, Viewer Rewards, Streaming Tools, Extensions, and Creator Camp.
- Activity Feed**: The top section of the middle panel, displaying the message 'It's quiet. Too quiet...' and 'We'll show your new follows, subs, cheers, raids, and host activity here.' Below this is the 'My Chat' section, which shows 'Welcome to the chat room!'.
- Stream Preview**: The right section of the middle panel, showing 'OFFLINE' status.
- Quick Actions**: A sidebar on the right with buttons for 'Edit Stream Info', 'Clip That', 'Raid Channel', and a plus sign for additional actions.

At the bottom of the interface, there is a chat input field with the placeholder text 'Send a message', a 'Chat' button, and a video player control bar with play/pause, volume, and fullscreen icons. An 'OFFLINE' status indicator is also present in the bottom right corner.

Hardware

- Capture cards available with one or more inputs using HDMI or HD-SDI.
- Capture cards typically only support standard broadcast formats.
- Audio interfaces support professional quality microphones using XLR inputs and phantom power.
- Modern mirrorless cameras and camcorders capable of clean output produce excellent image quality at 1080p or greater.
- Custom peripherals such as the Elgato Stream Deck provide custom macro keys for custom functionality.



Cam Link image Copyright Elgato



UR22mkII image Copyright Steinberg



Decklink SDI 4K



Decklink 8K Pro



Decklink 4K Extreme 12G



Decklink Mini Monitor 4K

DeckLink image Copyright Blackmagicdesign

Encoders

- Live H.264 video encoding can be very resource intensive.
- Software encoding performed entirely with the CPU, works on any platform.
- Hardware encoding utilizes dedicated H.264 chipsets and greatly reduces CPU utilization.
- nVidia H.264 hardware encoding available from GTX9xx series onwards.
- Intel QuickSync H.264 hardware encoding available from Sandy Bridge onwards.

Web Conference Integration

- Conference apps such as Jitsi, Zoom, etc, expect to handle encoding and hardware configuration themselves.
- In order to integrate with these apps, OBS developed a “virtual webcam” device which appears to other apps as a standard webcam.
- Audio is separate and directly accessed by conference apps.
- Conference apps use variable resolution and frame rates to achieve ultra low latency. This greatly reduces achievable audio & video quality.

Glossary

- H.264 – Standard codec used for video encoding
- Bitrate – The amount of data per second of an encoded stream. Typically Mb/s
- Encoder – A piece of hardware or software used to encode raw video into a given codec.
- RTMP – Real Time Messaging Protocol
- HLS – HTTP Live Streaming
- DASH – Dynamic Adaptive Streaming over HTTP