Pressing the BigBlueButton
Webconferencing in the Age of Coronavirus

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The Story

At Work

Oh look we are in a pandemic! Everybody stay home! But continue to hold meetings!

Do we need to use Zoom? Can we trust it?

What about meeting length limits?

At KWLUG

Oh look we are in a pandemic! No more in-person meetings for us!

Do we need to give up on meetings?

Do we need to rely on some proprietary SaaS application?

Inspiration!

Remember August 2011? Raul Suarez
demonstrated a webconferencing
system called BigBlueButton.

It was slick! FLOSS! Self-hosted!

Maybe we could set it up?

How hard could it be?

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What is a BigBlueButton?

Project Goals

Online classroom software.

Designed for ease-of-use: "As easy to use as pressing a Big Blue Button."

Some History

Started in 2007 as a Carleton University (!) distance learning project.

Open-sourced in 2009 under LGPL. (Business model: support and hosting.)

Old-school grassroots open-source project (not "community core")

Adoption

Offers an API for integration into other systems: Moodle, Canvas LMS, D2L, Drupal, Wordpress...

Under the Hood

- Audio: FreeSWITCH
- Webcams/Screensharing: Kurento (and Red5?)
- HTML client: Meteor.js
- Presentation uploads: LibreOffice
- Shared notes: Etherpad
- Backend: Java?
- Registrations (Greenlight): Ruby on Rails

Setup

Try Before You Buy

https://test.bigbluebutton.org

(or ask me for a demo)

Hardware

BBB really wants bare-metal install (esp for audio).

Hardware is easy for desktops, expensive/tough for the cloud:

- 8GB RAM, 4 CPU cores
- 250Mbit internet, symmetrical

Install

Manual install:
`https://docs.bigbluebutton.org/2.2/install.html` (but be prepared for pain)

Use `bbb-install.sh` : APT repos, Let's Encrypt Cert, Greenlight..

Upgrades

```
apt upgrade

bbb-conf --restart
```

(but be careful...)

The Good

Features!

- No meeting time limits!
- Audio (with indications of who is talking!)
- Shared presentations, video links (cheap!)
- Webcams, screen sharing (expensive!)
- Chat, shared notes
- Whiteboard (multi-user if desired)
- Record/play back meetings
- Breakout rooms
- Phone bridge capability

Moderation!

- Passcodes on rooms (changeable mid-presentation)
- Single presenter (controls presentation/screensharing)
- Moderator vs user
- Lock user functionality (no webcams, no chat...)
- Waiting rooms (less useful...)

Flexibility!

- Online classrooms/seminars (highly structured)
- Ad-hoc meetings (relatively open)
- Replacement for phone conferences (names on screen help a lot)
- Group video chat replacement
- Remote help application (but no remote control...)
- Socially-distant movie parties

User Experience!

- No client app! Use your browser! (Preferably Firefox/Chromium)
- HTML5 client with (mostly) good user interface
- Works well on desktop and mobile
- Audio test (don't dismiss this!)

Graceful degradation!

Users can participate even with limited resources.

- No microphone? Listen in!
- No audio? Phone in!
- Slow computer? Bad internet? Turn off video/screensharing on client side!

The client seems more lightweight than Jitsi/Zoom/Teams/etc

Community!

- Thorough documentation
- Reasonably-friendly (although overwhelmed) developers
- Okay support channels (Google Groups)
- Committed to old-school FLOSS philosophy

The Bad

Code Mishmash

- Configuration files are scattered and not marked properly. You lose customizations on upgrade.
- Package dependencies (specifically `bbb-demo` have problems.
- A lot of different languages are used ad-hoc
- Some things depend on Docker
- Testing methodology is unclear/uneven

Security

- Based on Ubuntu 16.04 . Next version will be based on 18.04.
- Difficult to secure Greenlight frontend.
- NOT end to end encrypted.
- By default meetings are secretly recorded even if the record light is not on!

Other security issues have come to light recently.

Irritations

- Access codes are always random 6 digit strings.
- Recording playback is weird (use `bbb-download` plugin for this: `https://github.com/createwebinar/bbb-download/` .
- HTML5 interface is pretty good but is still confusing in some ways (logging out, uploading presentations).
- URLs are ugly (fix with nginx aliases).

Missing Features

- No desktop remote control.
- Not easy to stream to Icecast, Youtube, etc. Workaround: OBS.

Scalability

- Maximum 100ish concurrent participants.
- Some processes (FreeSWITCH?) use lots of CPU but appear to be single-threaded.
- Video scales quadratically with number of participants in a room (but audio is mixed and scales linearly).
- Server really wants fat Internet pipe.

The Ugly

NAT

BBB really wants to be directly on the Internet, not behind a router. Consequences:

- Need to hack `bbb-install.sh` to get BBB installed.
- Need to modify several conffiles with actual IP address to get external access working.
- Difficult to get BBB working both internally and externally.

Audio connection problems

- When server is behind NAT, some clients behind NAT cannot get audio.
- Causes: "symmetric" NAT, port randomization.
- Example: pfSense with "Automatic Outbound NAT" (the default) turned on.
- Can often fix on client side, but this is not reasonable.
- Possible to use "TURN" server, but then all client traffic gets relayed (expensive! slow!)

Troubleshooting

Helpful commands

- Firefox: `about:webrtc`, web developer console
- FreeSWITCH: `/opt/freeswitch/logs/freeswitch.log`
- FreeSWITCH: `/opt/freeswitch/bin/fs_cli`
- `bbb-conf --debug`
- `bbb-conf --check`

Helpful Resources

- https://docs.bigbluebutton.org
- "BigBlueButton-Setup" Google Group
- https://github.com/bigbluebutton/bigbluebutton/issues
- https://github.com/pnijjar/bbb-saltconf

Misadventures

At Work

A flop.

Webcam bandwidth and audio problems were big barriers.

Still used by IT department, not much else.

Work purchased a Zoom licence.

User Groups

Used by KWLUG, Drupal, UUG,
https://flattenthecurve.tech

DataCity offers it for videoconferencing.

Not much adoption otherwise.

Alternatives

- Jitsi: `https://jitsi.org`
- OpenMeetings:
  `https://openmeetings.apache.org`
- Wire: `https://wire.org`
- P2P Chat: `https://p2p.chat`

Conclusions

BBB works pretty well if you have the right resources.

It is good there is an alternative to Zoom/Jitsi.

Thank you!

For your attention and interest.

Comments? Questions?