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?
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?
Inspiration!

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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)
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
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
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/creatwebinar/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
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 configuration files 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
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?