

Topic: Whiteboarding protocols

Online collaborative whiteboard applications, such as Miro, InVision Freehand, and IPEVO Annotator, have been widely used for teamwork, especially during the pandemic. The existing whiteboard applications often use proprietary protocols, except a few using standard messaging protocols like XMPP (extensible messaging and presence protocol).

Requirements: Design your own protocols for a real-time interactive whiteboard app. For evaluation, you need to implement a prototype of the whiteboard app using the protocols and test its performance.

The whiteboard application should:

- allow any user to create a new session and invite others to join the session. Optionally, one of the users can be designated as a host that has more power, e.g. in accepting or declining other users for the same session.
- allow for freehand **drawing** and support the **Erase and Undo** functions.
- allow multiple users (more than 2 users) to draw on the same board at the same time.
- provide a consistent (shared) view for all the users in the same session.
- allow users to add, edit, or remove **sticky notes**.
- allow users to upload images and to comment on the images. Comments can be texts attached to the images or drawings on the images.
- allow users to save the whiteboard as a JPEG or PNG file before ending the session

References:

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- [2] Lutz Gericke, Christoph Meinel. Evaluating an instant messaging protocol for digital whiteboard applications. International Conference on Internet Computing. 2011. https://hpi.de/fileadmin/user_upload/fachgebiete/meinel/papers/Design_Thinking/2011_Gericke_ICOMP.pdf
- [3] XEP-0113: Simple Whiteboarding. <https://xmpp.org/extensions/xep-0113.html#sect-idm45133283222496>
- [4] NetMeeting Whiteboard Protocol. https://docs.microsoft.com/en-us/openspecs/windows_protocols/ms-mnpr/0d384d5e-6d4a-4a55-ba67-6f7de6909a24
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