The EuroSys 2020 Online Conference: Experience and lessons learned

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Abstract. The 15th European Conference on Computer Systems (EuroSys20) \cite{1} was organized as a virtual (online) conference on April 27-30, 2020. The main EuroSys20 track took place April 28-30, 2020, preceded by five workshops (EdgeSys20, EuroDW20, EuroSec20, PaPoC20, SPMA20) on April 27, 2020. The decision to hold a virtual (online) conference was taken in early April 2020, after consultations with the EuroSys community and internal discussions about potential options, eventually allowing about three weeks for the organization. This paper describes the choices we made to organize EuroSys’20 as a virtual (online) conference, the challenges we addressed, and the lessons learned.

Keywords: Online conferences · COVID-19.

1 Introduction

The 15th European Conference on Computer Systems (EuroSys20) \cite{1} was planned to be held in Heraklion, Crete, Greece on April 27-30, 2020.

Decision to go virtual: The unfolding of the COVID-19 global outbreak in early 2020 led several private organizations and governments to consider limiting international travel, and as a result it forced conferences including ASPLOS’20 \cite{2} and EDBT/ICDT’20 \cite{3} planned to be organized in the March-April 2020 timeframe to consider alternative plans.

In EuroSys’20, we spent the first week of March 2020 on intense deliberations on how to respond to this urgent situation. Given that we were roughly two months away from the conference dates and there were no firm projections about COVID-19, the decision was not clear. Besides internal deliberations, we decided to also ask for the opinion of the EuroSys community through an online survey on March 10-13. Although several members of the community felt that a physical conference cannot be replaced, the feedback we received on March 13
was pointing towards either canceling the physical event or holding a smaller physical event.

We spent the following three weeks on internal brainstorming about potential options, taking into account the potential impact on organizational costs, logistics, and the general outlook of how the COVID-19 situation was likely to evolve. All these were weighted against what constitutes the best service to the community: a virtual conference, a smaller event during the original dates with remote (online) options, or a (hopefully) typically-sized event at later dates. On April 5, we decided that holding EuroSys’20 as a virtual (online) conference was the most reasonable course of action and we announced this on the conference web page.

**Preparation to go virtual:** While we were aware that this was not going to be an easy task, since none of us had organized a virtual conference before, we also felt that this was an opportunity to explore new ideas.

In EuroSys20, we aimed to provide an interactive conference experience, while also leveraging team collaboration and communication tools for side-channel information exchange. In particular, EuroSys20 combined:

- **Synchronous Zoom** sessions, in webinar mode, i.e. limited rights for attendees, with streamed pre-recorded presentations and live Q&A.
- **Asynchronous chat channels** (Slack, Discord) for discussion among attendees, and also for coordination among organizers.
- **Synchronous virtual meeting rooms** and hosted discussions during breaks, in the form of a hallway track via Discord.

These information channels would allow people to participate in multiple ways, increasing their sense of participation.

**During the conference:** The main program broadcasted on Zoom sessions set the pace of the conference program. Had asynchronous tools been used alone, participants may have been unsure as to where the action happens at any point in time.

Side channels, asynchronous or synchronous, via chat or voice, such as Slack and Discord, allowed information to flow at a higher rate than synchronous sessions alone would allow. A caveat with using several communication channels is that the increased level of information flow may potentially distract participants from the live program (see Section 4, lessons learned); it can also overload organizers, as a large influx of opinions, requests, feedback, etc. about the organization may distract them from attending to higher priority events.

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7 [https://zoom.us](https://zoom.us)
8 [https://slack.com](https://slack.com)
9 [https://discord.com](https://discord.com)
Aftermath: The feeling at the end of the conference and the feedback from the attendees indicate that there was a sense of an online event with live attendance and participation. Pre-recorded talks were of very high quality and were received very well. The increased information flow was not easy to manage. Interactive, voice side-channels are very promising, although they were not used as much during the event. Timezones are difficult to manage. Preparing a virtual conference involves a lot of backstage work before and during the conference.

In the following sections, we describe in more detail the design and implementation choices we made to organize EuroSys’20 as a virtual (online) conference, an analysis of attendee feedback through a survey that we run immediately following the conference, and finally the lessons learned.

2 Design and implementation

In setting out to design and implement EuroSys20, we benefited from an ongoing discussion and report by the ACM Presidential Task Force on What Conferences Can Do to Replace Face-to-Face Meetings [4] and experience with previous online conferences [2,3]. Preliminary experience with the use of Zoom to deliver a synchronous online conference program [3] showed that this can be done effectively. In addition, it pointed out that it can also be enhanced by putting operations staff in place to assist session chairs, by serving rich content throughout the day, and by offering new ways for synchronous and asynchronous interaction between participants.

Pre-recorded talks and live Q&A: Zoom sessions were modelled after the typical sequence of events in a physical conference, except that talks were shorter (EDBT/ICDT [3] also featured shorter talks). We asked authors to provide two versions of each talk: a short (3-5 minute) version to be streamed at the conference, and a longer (10-12 minute) talk to make available in advance so that attendees could watch in preparation of the actual talk. While this put extra burden on authors, it proved an important element of success as it allowed us to experiment with talk duration and adapt in real time, which we eventually did.

Each session included pre-recorded talks and live Q&A. The first session started with short videos (3mins) but after that we switched to longer videos (12min) as the short videos did not seem to provide adequate technical detail. The longer videos worked well until the end of the conference. Most pre-recorded talk were of very high quality and were received very well. The live Q&A session was appreciated but was not used as extensively as we would have hoped by attendees. The feedback suggests that videos 11-14 minutes or longer are preferred.

Minor details, such as a recorded applause at the end of a talk, were especially well received.
Tools and roles for each session: We decided to use Zoom webinars as a way to limit the rights of participants and avoid potential misbehavior. We came up with the following organizational roles for the production and broadcasting of synchronous interactive content over Zoom:

- Content producers and graphics designers, tasked to create videos and other media to play before/after session, during breaks, sponsor slots, etc. This is in addition to the presentations that is streamed (live or pre-recorded during the conference);
- Director, coordinates what content plays and when;
- Zoom host (master), co-hosts (operators) to share screen and operate content flow, start/stop video sequence, Zoom participant registration, change of status (attendee ↔ panelist ↔ co-host);
- A team of Zoom hosts were needed to serve as (a) stand-by hosts, in case of trouble with master host and (b) hosts for parallel workshops.

These roles would interface with the following traditional conference roles:

- Organizers (general chairs, program chairs), participating in sessions as Zoom panelists;
- Session chairs, participating in sessions as Zoom co-hosts (thus also Zoom panelists) so they could unmute participants during Q&A;
- Speakers, attendees that would be set to Zoom panelists for their session (for simplicity, we allowed them to be panelists for the entire day);
- Student volunteers, assisting with Zoom sessions as Zoom hosts, making sure behind the scenes that progression within each session is smooth and reacting to unplanned changes and requests.

Training at large: It was obvious to us that we would need to perform significant training, and embarked upon it early in the (time-constrained) preparation process. Our Zoom master led the training of Zoom co-hosts so that they could serve as his backups, and also as hosts of parallel workshop sessions. The Zoom master also trained Session chairs to be able to operate as co-hosts during sessions. Zoom co-hosts spun off and scheduled training tasks with workshop organizers. The plan was also to invite speakers for dry runs; however, this was not possible within the limited time we had. In retrospect, it seems that it was not necessary either: speakers seemed to find it easy to join as panelists and participate in Zoom sessions for Q&A, so such training may in fact be an optional step in practice.

Instructions and guides: What helped significantly during training was the production of textual user guides for session chairs and presenters:

- [https://www.eurosys2020.org/information-for-the-presenter/](https://www.eurosys2020.org/information-for-the-presenter/)
- [https://www.eurosys2020.org/information-for-the-session-chair/](https://www.eurosys2020.org/information-for-the-session-chair/)
**Side channels:** As we had mapped out what needed to be done with Zoom, we realized that the community demanded also asynchronous teamwork platforms. In particular, we received several requests for Slack early on based on community experience with its use in the ASPLOS20 conference [2] and in the CS Research and Practice Slack [5]. To respond to this need we decided to implement a simple Slack workspace for EuroSys20. In the process, we understood that we could use it also for internal coordination between the several Zoom and conference roles; this coordination proved to be key to the successful implementation of EuroSys20.

A first implementation of the Slack workspace was straightforward, and aided by experience with ASPLOS [2]. We set up regular public communication channels for (a) Sessions (presentation videos, Q&A), (b) General (a lot of general activity, discussions, etc.), and (c) Jobs.

During the conference, we realized that additional public channels would increase people connection with the conference and improve their experience:

- Sponsor channels (sponsor-related content);
- Media (pictures, videos about the original location of the conference);
- Stats (mainly participation figures, published soon after sessions ended); and
- Posters.

Operating this workspace (producing content, responding to questions and requests about organizational matters) required the involvement of several staff members; to ensure responsiveness, we had to assign the following tasks to a number of team members:

- Monitor and respond to organizational questions;
- Regularly emit informational messages on #general, such as sessions starting, etc.;
- Produce statistics about the conference, such as attendance figures; and
- Produce media content (videos) to provide attendees with a visual experience.

**Importance of private channels:** To facilitate coordination and management between members of the organization, we set up private chat channels for easy communication and coordination between

- Session chairs and presenters for each session (#mgmt-sessionX, #mgmt-posters);
- Organizers (general chairs, PC chairs) and session chairs (#mgmt-session-chairs);
- Local organizing team (general chairs & Zoom/Slack/Discord hosts) (#mgmt-local);
- Organizers and sponsors (#mgmt-sponsors); and
- Organizers and sponsor chairs (#mgmt-sponsor-chairs).
These private channels proved important for the smooth operation of the conference. The channels between session chairs and presenters (where organizers also participated) proved to be invaluable in maintaining contact early on and giving session chairs a channel to communicate important information easily. We believe that this coordination mechanism could be useful to some extent in the case of physical conferences as well. The channel between organizers and session chairs made it possible to adjust conference parameters in real time and coordinate such changes seamlessly across the organization. For instance, the organizers decided to change the length of videos from short to long version at the end of session 1; this change was agreed upon and communicated with everyone involved, and applied without disruption in the program.

Facilitating sponsors: While not addressed in detail in this report, this model offered many opportunities for sponsors to interact with attendees (on Zoom and through Slack/Discord channels and Discord meeting rooms). We found that it is important to engage sponsors early on, to communicate opportunities, and to give them enough lead time to assign representatives to participate in activities (Zoom and channels) and to provide the necessary content.

3 Analysis of survey results

To collect feedback from EuroSys20 participants, we circulated a questionnaire after the end of the conference, to which we received 100 responses. The composition of the questionnaire was influenced by previous surveys of online conferences [2,3]. An analysis of the collected responses appears below:

3.1 Current occupation

The largest percentage of respondents were PhD students (35%), followed by professors (25%), industrial researchers (11%), software engineers (9%), post-docs (7%), and researchers (7%) (Figure 1).

3.2 Which continent were you on during the conference?

The majority of respondents were in Europe (70%), followed by Asia (15%) and North America (13%) (Figure 2).

3.3 How many sessions did you attend?

More than half of the respondents (55%) attended more than 3 (out of a total of 10) sessions (Figure 3). The rest (45%) attended 3 or fewer.
3.4 How did the online video presentations compare to conventional conference talks?

About one-third (36%) of the respondents liked online video presentations more than conventional conference presentations, about another third (38%) of the respondents indicated no preference, and a minority (26%) liked them less (Fig-
We believe this is overall a positive vote for the concept of online, pre-recorded presentations.

3.5 What is the ideal length of a research talk for an online conference?

More than half of respondents voted for a duration of 11-14 minutes (54%) with an additional one-quarter (24%) indicating a preference for 15-20 minutes (Figure 5). Overall, an overwhelming majority (78%) indicated a preference for >11 minutes. There is little support for 6-10 minutes talks (22%), and no support at all for talks less than 5 minutes.

3.6 As an attendee, which kind of model(s) do you prefer?

Results (Figure 6) indicate that a majority of votes (62%) went to the model of
– Streamed talks, live Q&A, and having the videos available after the conference.

Fig. 6: Which kind of model(s) do you prefer? Multiple choices possible

This option is similar to the one followed in EuroSys20 since pre-recorded talks were made available at about the time the conference started. Next in preference with an equal amount of votes (39% each) were the models:

– Talk videos available beforehand and live Q&A in discussion sections.
– Live talks, live Q&A, and having recorded talks available after the conference.

Finally, a smaller fraction of the vote (31%) went to the option of

– Talk videos available beforehand and asynchronous Q&A (e.g. over Discord or Slack).

This is an indication that attendees have a clear preference for the synchronous streamed video and live Q&A model. There was no stated preference for having videos available in advance.

3.7 Was the software infrastructure support for EuroSys20 adequate?

A large majority of respondents (77%) agreed that the software infrastructure we put in place was adequate for supporting an online conference (Figure 7).

3.8 Asynchronous interaction platforms (Slack, Discord)

We included four questions on the use of Slack and Discord platforms. A majority of respondents (77%, increasing to 92% when counting neutral opinions) agreed
that Slack was useful in EuroSys20. We believe that this vote indicates a preference for asynchronous interaction platforms in general. Half of the respondents (49%) indicated that they had joined more than 5 Slack channels.

The majority indicated light or no use of Discord (2% spoke in more than 5 discussions and about 2% listened to more than 5 discussions). The organizers noted that Discord discussion sections during the Hallway Track were indeed used and received positive comments by those who did. However, overall use did not match the level of activity in the Slack workspace, which had 579 registered (many of them active) members.

While Slack and Discord share many features and thus we believe that the Discord platform could have been equally popular in EuroSys20 had it been the only asynchronous interaction platform, the fact that a Slack workspace was available and in use several days before Discord (while the latter was under development given very tight time schedules), meant that it was hard to expose attendees to the full range of capabilities of the service developed in Discord.

From the organization point of view, there is strong belief that Discord can significantly improve the level of interaction between conference attendees in an online conference and that it should be further tested in future online conferences to evaluate its full potential.

### 3.9 Did the conference need more social interaction?

Despite the fact that attendees found the software infrastructure used in EuroSys20 adequate and the asynchronous interaction mechanisms useful, a large majority (68%, increasing to 98% when counting neutral opinions) agreed that more social interaction was needed (Figure 8). This is an indication that more research is needed on new ways of social interaction in online conferences (pointing to our conclusion to further investigate new modes of interactions such as prototyped with Discord in EuroSys20). It is also an indication that an online conference may in fact never be able to fully replace the level of social interaction in a physical conference.
3.10 Would you choose to virtually attend a physical conference?

About half of respondents indicated that an online option such as presented at EuroSys20 would be a preferable option to attend a future EuroSys, even when the option of physical attendance existed (Figure 9). A large fraction of the vote (37%) seem to be unsure and would probably decide weighing other factors. We believe that this result indicates that the availability of an online option to a physical conference may have an impact on physical attendance, which should be taken into account by conference organizers.

3.11 Reasons to attend a hybrid conference virtually

Time is the most important reason for virtually attending a hybrid (physical+online) conference for most respondents (70%), followed by cost (57%), and environmental (44%) or family (40%) reasons (Figure 10).
For which reasons would you consider to attend a hybrid conference virtually?

3.12 Would you attend EuroSys 2021 if held virtually only?

A majority of the vote (about 70%) indicate that they would attend EuroSys21 if held virtually only (Figure 11). Only a small minority (7%) indicate a strong negative opinion for the virtual-only option.

3.13 Augmenting future physical EuroSys conferences with online features

The sixteenth question in our survey asked whether attendees would like to augment future physical EuroSys conferences with some online features used in the virtual conference (e.g., Slack or Discord channels, short teaser videos). A large majority of the vote in this question indicate that attendees find asynchronous
communication channels and other online features useful, even for physical conferences (Figure 12).

Fig. 12: Would you like to augment the future physical EuroSys conferences with online features?

3.14 Was virtual EuroSys 2020 better or worse than what you expected a virtual conference to be like?

A large majority of respondents (72%) found virtual EuroSys20 better or much better than what they expected a virtual conference to be like (Figure 13).

Fig. 13: Was virtual EuroSys 2020 better or worse than what you expected a virtual conference to be like?
3.15 Overall satisfaction with the organization of virtual EuroSys’20

Similar to the previous question, a large majority of respondents (about 85%) were satisfied or very satisfied by the organization of virtual EuroSys20 (Figure 14).

![Satisfaction Chart](image)

Fig. 14: How satisfied are you overall with the organization of virtual EuroSys’20?

4 Lessons learned

The following are some of the lessons we learned, and noted by participants:

**Timezone:** Although the organizers made a significant effort to spread sessions in different timezones, US attendees could not make morning sessions in Europe, missing nearly half the conference. Attendees from Asia on the other hand could easily attend morning sessions in Europe.

**Program sessions:** In terms of program density, having to do 43 talks in 2.25 days is challenging, especially when attending remotely.

There was positive feedback for the session format with streamed talks and live Q&A. 11-14 min presentations seems to be the preferred duration. Live Q&A was not used as extensively by attendees as we would have hoped. However, it still gave the tone of a real-time event and was appreciated. Although this is a more general issue beyond virtual conferences, improving such synchronous interaction with live Q&A remains a challenge. The feedback suggests that asynchronous interaction platforms were well received and Slack was used significantly by attendees during the conference.

**Distractions in remote participation:** It is hard for attendees to focus on the conference program and activities around it when still immersed in everyday life (home, office). Two asynchronous interaction platforms (Slack and Discord)
introduced complexity for participants, the large number of channels was at times distracting, and probably unnecessary. While it allowed EuroSys20 to be a live experimentation platform, which was well received by many, we would have preferred to use a single platform. As Discord could implement all asynchronous Slack functionality we wanted, and provide more in the direction of synchronous functionality (hosted virtual meetings, Hallway track), in retrospect we would have chosen Discord as the single platform. A dense program along with multiple interaction and information channels created at times a sense of information overload, also for organizers.

Workshops: Workshops increase the level of difficulty as they require replicating the setup of the main conference track, for each workshop. A question before the conference was how to support workshops: use multiple Zoom hosts (one for each), or a feature of Zoom large-meeting licenses called break-out rooms (all controlled by a single host). Given that it is easier to just replicate the model developed for the main track for workshops, multiple Zoom hosts (one for each workshop) seemed to be the easier way to go.

Registration system and process: Development of a registration system can take significant effort, as well as connecting it with the rest of the conference management processes (how to map them to Zoom invitations for different workshops, sessions, days, etc.; how to communicate all this via email (setup mailing lists, etc.) for multiple communication needs). One has to consider privacy statements, code of conduct agreements, etc. Handling on-site registrations was not straightforward, because it required human intervention to link information across tools, so this ability was not provided in EuroSys20.

The registration system, as in a physical conference, can and should interact with other aspects of the conference. We did not have the luxury to research different registration systems and pick the one that would work best with a virtual conference. In retrospect, being able to publish an attendee list (with people’s consent for that), which is probably more important for a virtual conference, would have probably improved experience, addressing the feedback that having no physical view on the audience made it unclear who else participates.

Zoom master is a key role: The Zoom master is a very important role that may become a bottleneck: Our Zoom master was involved in training other Zoom roles, creating play sequences, developing the registration system, managing registrations, and communicating with participants via mailing lists, before and during the conference. Although he could assign sub-tasks to a team of volunteers, in practice his tasks were not always parallelizable. In retrospect, it would be better to split the Zoom master role to more than one person.

Training: Significant effort and coordination was needed for:

– Training of session chairs and presenters for participating in Zoom sessions.
– Providing content specifications ahead of time for authors/speakers, in case of pre-recorded presentations.

Training will indeed be needed for any new technology that is introduced. Because Zoom and Slack have been used in the workplace a lot, we found that people adapted pretty well to them. Attendees were less familiar with Discord and found it more challenging, which is interesting, as its model is similar to Slack, with only minor (although subtle) differences.

Attendance: Attendance was lower than anticipated based on registrations (offered for free based on sponsor support). While registrations stood at 1100, actual attendance peaked at 240 during opening and ranged between 100-150 after that. This was no surprise: for free, it is easy to sign up and have no qualms about skipping. Nonetheless, it was the right thing to do in this situation. Had we not been able to rely on sponsorships, we could have planned to charge to cover costs. Figuring out an appropriate registration fee remains a challenge.

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