



UPC++: An Asynchronous RMA/RPC Library for Distributed C++ Applications

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Hello and welcome everyone, my name is Paul Hargrove and I am the Principal Investigator for the Pagoda Project at Lawrence Berkeley National Lab, where we develop and maintain the UPC++ programming model. On behalf of our entire team, I thank you all for joining us today.

This Zoom session is being recorded for the SC archive.

tut113: UPC++: An Asynchronous RMA/RPC Library
for Distributed C++ Applications
Everything you need: <https://go.lbl.gov/sc21>



Before we begin

- Website
- Course Format
- Course Outline
- Final Notes

The tutorial will begin in a few minutes, but first I have some procedural items to share with you to help things go smoothly today.

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Website <https://go.lbl.gov/sc21>

- Slides
- Exercises and Solutions
- Downloads
- Videos

The first, and perhaps most important, info I want to share with you is this URL: go.lbl.gov/sc21. I recommend everyone open a browser tab with that page now. As my slide header says, that site has everything you need. For instance, it includes links to everything found in the handouts package, such as a copy of today's slides and the hands-on exercises with their solutions.

It also has links to the software you will need for the hands-on component. Options in that area include sources you can build or a Docker image pre-populated with compilers, the UPC++ library and the hands-on exercises. If you have not done so in advance, I recommend you start downloading what you will need, because you will need it for the first exercise about 30 minutes from now. If you have an account at NERSC, ALCF or OLCF, you can also find instructions for using UPC++ at those HPC centers.

Additionally, the site includes links to the lecture videos. I will tell you more about those shortly.

Course Format (1 of 3)

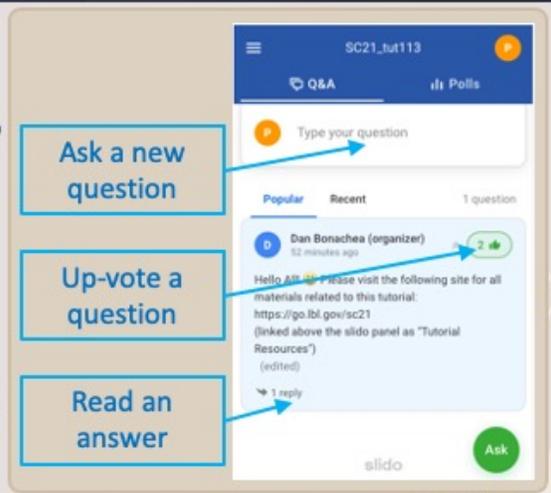
- Zoom will play prerecorded videos
 - Seven segments, roughly 30min each
 - Breaks of varying length between
- Some videos include hands-on exercises
 - To be worked in the break which follows

Today's tutorial will run for 4 hours with a 30 minute break at 3PM central, and consists primarily of seven pre-recorded lectures that will be streamed using Zoom. These segments are each roughly 30 minutes long and between them we will have breaks of various lengths.

These breaks each provide time for live Q&A and some include time for working a hands-on exercise from the preceding lecture.

Course Format (2 of 3)

- Live Q&A in the breaks
- Questions should be submitted using Slido
- Answers to be given in Slido and the breaks



As I just mentioned, we will be conducting live Q&A. However, the Zoom platform and use of pre-recorded material complicates this slightly.

We ask that participants remain muted in Zoom and ask all questions using the Slido interface on SC21 HUBB and linked from our website.

This image calls out the three main interface features you should be aware of in Slido.

We will answer questions in writing as quickly as practical while the pre-recorded sessions are playing, as well as answering verbally in the breaks.

We also have Zoom breakout rooms, which are not recorded, and can be used for any in-depth discussions that need to be taken offline.

Course Format (3 of 3)

- Zoom “Live Transcript” feature
 - Automated captioning of the Zoom stream
- Alternative Videos
 - YouTube links available on the website
 - High-quality manual captions
 - Variable playback rate

We have enabled Zoom's "Live Transcription" feature, which should allow you to optionally view automated captioning of everything occurring in Zoom today. Recent Zoom clients should have a "CC" or "Live Transcript" button in the controls.

Since the accuracy of automated captions is limited, we have also shared the lecture videos with high-quality manual captions on YouTube.

If you have a need for those captions, we recommend that you view the videos linked from the website instead of this Zoom session.

Even if you fall out-of-sync with the rest of the group, you are still welcome to ask questions using Slido as I described previously.

I will also note that those videos are a good option if you miss a portion of the main presentation. In particular, YouTube allows playback at an accelerated rate to catch up if desired.

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Course Outline

1. Introduction (hands-on 1)
2. Programming Part 1
3. Programming Part 2 (hands-on 2)
4. Programming Part 3 (hands-on 3)
5. 30-minute Break (no content)
6. Advanced Topics
7. Applications Part 1
8. Applications Part 2

Next, I want to quickly share with you this outline of today's activities. The website includes a version of this with times.

In the first portion of this tutorial we will introduce PGAS and UPC++ and then cover three lessons on programming in UPC++.

These four segments include three hands-on activities.

After a half-hour break, we will resume with an overview of several advanced topics that we cannot cover in depth today.

The last two pre-recorded segments will describe some of the applications written in UPC++.

Each of these segments is interspersed with a live Q&A period on Zoom, and the day's activities will end with a final live Q&A.

Final Notes

- Please complete the evaluation form
 - Appears in upper-right corner of HUBB page
 - Also linked from the webpage
- Reminder to start UPC++ downloads
 - Among the information at go.lbl.gov/sc21
 - First hands-on will occur in about 30 minutes

I have just two more items.

First, I'd like to encourage you to complete the evaluation form at the end of the tutorial. It can be found in the upper-right corner of this tutorial's HUBB page, among the links above Slido.

Your positive feedback helps us to return again next year, and constructive criticism helps us to improve.

Second, I will repeat my suggestions to open a browser tab now with go.lbl.gov/sc21 which contains links to everything you need.

In particular you should begin any downloads you may need for the first hands-on. So, we'll pause here for just a few seconds before we begin the first video segment.