Project 1 Report

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Programming language:

We chose Python as our programming language, since both of the group member prefers it over Java.

Communication protocol:

We are using UDP as our communication protocol.

- It does not need to retransmit lost packages and requires no connection setup, so it incurs less delay.
- Wuu-Bernstein Algorithm accounts for site crashes and recoveries, lost messages, and network partitions.
- Compared to TCP, UDP doesn't need to keep track of retransmissions/sending rate for multiple receivers, so it's easier to implement.

Asynchronous Console IO:

We are using an non blocking console IO package called aioconsole while using asyncio from python to handle sending and receiving with UDP.

Stable Storage:

We are storing logs in stable storage and try to recover from stable storage when the application starts. We chose to use Pickle, an object serialization package in Python to help storing the objects directly.
The variables and objects that we store include time counter, matrix clock, logs, and the calendar. They are stored the same directory with filename: stable.pkl

Objects:

We implemented a two objects: Meeting and Log to contain information about meeting schedule and operations.

Meeting

Meeting object includes the name of the scheduled meeting, the date scheduled, the start and end time for the meeting, and participants. We implemented two functions: include(user) and conflict(other_meeting)

- include(user) helps determine whether the a user is included in the scheduled meeting
- conflict(other_meeting) determines whether the current meeting is conflicting with another meeting

Log

The object Log contains information including the operation, time of the operation, node number, and the log.

Question Inserting Schedule:

According to the implementation detail stated in the project document, if a site receives a create meeting event that conflicts with an existing meeting in its calendar, the site must keep the one with a name that is lexicographically first, and cancel the other.

However, if there are multiple events on the current site that all conflict with the one received, then we will compare events by pairs and cancel multiple events, while in some cases we may be able to resolve the conflict by removing less events.