# FAF.PTR16.1 Spring 2023
# Project 2: Message Broker

**Handed out:** Tuesday, April 25, 2023
**Due:** Friday, May 19, 2023

## General Requirements

The goal for this project is to create an actor-based message broker application that would manage the communication between other applications named producers and consumers.

Your project should be tracked in a VCS repository. Every feature you work on should be easily verifiable. Your system should provide logs about starting / stopping actors, connecting / subscribing consumers and other events happening.

## Minimal Features

- The message broker provides the ability to subscribe to publishers (if you are a consumer) and publish messages for subscribed consumers to receive (if you are a publisher);
- The message broker represents a dedicated TCP / UDP server;
- The message broker allows for clients to connect via telnet / netcat;
- The message broker provides the ability to subscribe to multiple topics (if you are a consumer) and publish messages on different topics (if you are a publisher);
- The project has an executable that can run the message broker with a single click / command.

## Main Features

- The message broker provides the ability to unsubscribe to consumers;
- The message broker has a dead letter channel for messages deemed "unsendable";
- The message broker allows for communication via structures / classes, serialized to be sent via network;
- The message broker provides MQTT-style assured delivery;
- The message broker ensures reliable message delivery using Persistent Messages with subscriber acknowledgments and Durable Queues;
- The project provides a Docker container to run the message broker.

## Bonus Features

- The project allows for using the application from Project 1 as a producer;
- The message broker implements a "polyglot" API. The client can choose between UDP / TCP or MQTT / XMPP / AMQP, with protocol negotiation similar to HTTP's content negotiation;
- The project implements Change Data Capture, thus making the publisher the database from Project 1 rather than a dedicated application;
- The project provides a docker-compose file to start all applications at once.

## Reporting

- P2W1 – Architecture of the whole system. List of planned features and desired mark. Message Flow Diagrams and Supervision Trees;
- P2W2 – MVP. Main functionalities implemented;
- P2W3 – Mostly done. Last functionalities need implementation;
- P2W4 – Presentation day. Project demo, report ready.

**Good Luck!**