

1 HW 3: eBPF Case Studies (enhancing and improvements)

This homework departs from the prior homeworks in two distinct ways: first, while prior homeworks focus on familiarizing you with the broader microservices ecosystem and highlights challenges managing microservices, this project focuses on a specific technology, i.e., eBPF. Second, while the other homeworks focused on KubeCON, this homework focuses on eBPFSummit-2022 and LPC-eBPF Track. This project aims to help familiarize you with the evolving eBPF ecosystem and illustrate challenges faced in this constantly growing space.

1.1 Homework Requirements

For this homework, you must explore three case studies, and the three must come from **both** conferences, e.g., two from eBPF summit and one from LPC or vice versa. It would be best if you searched these conferences for talks that focus on identifying and improving a limitation in the eBPF ecosystem by extending the ecosystem in one or more ways. In selecting the talks, try to select talks that are related to each other to make it easier to have a strong and cohesive discussion section. **You must complete this in two pages or less, not including references.**

In analyzing these case studies, your goals are to understand the following:

- What is the key limitation of eBPF that is being addressed in this talk?
- How does this limitation either: (a) restrict applications of eBPF, (b) impact performance/correctness/scalability of eBPF, (c) impacts eBPF use cases differently?
- What is the key principles/technique/idea that is used to address this limitation?
- Looking across use cases, what are the common themes? What are the differences? Why do the similarities or differences exist?

As with the prior homeworks, you should include: (1) Abstract, Introduction, Case-studies, and Discussion, (2) unlike the other homeworks; you do not need to introduce a new technique; however, in your discussion, you should identify themes while comparing and contrasting your use cases. Additionally, it would help if you reused the same templates from prior assignments.

1.2 Bonus Points

This week is KubeCON, and there is an additional eBPF workshop, Cloud Native eBPF Day – analyzing two additional use cases from this conference additional points will result in extra credit. You may use an additional page for this extra credit.

1.3 Submission Guidelines

- Please label your PDF: *FirstName.LastName.HW#.pdf*
- Please submit your homework using this Google Form