Fog Computing (Summer Term 2023)

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Reading Assignment

For the reading assignment, you will answer the question that has been assigned to you from the question catalogue below. For this, you will have to write a short paper (2-3 pages, IEEE conference template, 10pt) that will be subject to peer-review.

In detail, do the following tasks:

I. Read your paper carefully.

II. Write a short essay-style paper in which you answer your assigned question and introduce the paper's key concepts. You should also name other related work.

III. Upload your paper without your name or student number to ISIS until **June 27, 2023**; we will assign two papers for double-blind peer-review to each student on **June 28, 2023**.

IV. Upload your peer-reviews (approximately 1/2 a page each) to ISIS until **July 11, 2023**.

V. Upload the camera-ready version of your paper to ISIS until **July 18, 2023**.

Questions

1. How would you use a system such as described in "The Chubby lock service for loosely-coupled distributed systems" in a fog environment? How and where would you deploy it, for what purposes would you use it, would you make any major changes?

   Students: S M Mahmudul Haque, Leon Moll, Amina Iqbal, Hassan Bassiouny

2. Is Bifrost ("Bifrost – Supporting Continuous Deployment with Automated Enactment of Multi-Phase Live Testing Strategies") capable of handling rollouts in Fog Computing environments? How should it be deployed and/or what changes are necessary? Which adaptations would you propose?

   Students: Christopher Hansen, Ali Aziri, Yong Hyun Song, Martin Doleschal, Leon Schäffer, Rafael Dobler

3. Can the approach described in “Enhancing Edge Computing with Database Replication” be used in large-scale fog deployments? What might be problems, what might work well, what would you use it for?

   Students: Alexander Guttenberger, Felix Bieleit-Medicus, Josseph Medina Revilla, Tim Michaelis, Valentin Carl, Lucius Kruse

4. How would you classify and compare the paper “FogStore: A Geo-Distributed Key-Value Store Guaranteeing Low Latency for Strongly Consistent Access” to the case studies from the fog storage block? In which dimensions is it better suited, in which dimensions is it worse, what are inherent assumptions in FogStore?

   Students: Mert Ertekin, Dimitrios Peppas, Veronika Dimitrova, Michael Kora S

5. Considering the information from “Orbital Edge Computing: Nanosatellite Constellations as a New Class of Computer System”, what are key differences between the Orbital Edge Computing vs. the In-Network LEO Edge you learned about in the lecture? How does this affect programming models/platforms?

   Students: Leo Lierse, Henrik Nickel, Jan Beckschewe, Florian Vogel

6. How could the approach in “Cloudburst: Stateful Functions-as-a-Service” be applied to Edge FaaS Systems? What additional challenges arise from the Fog Environment and how could they be solved?

   Students: Niklas Fomin, Jan Golebiowski, Marvin Steinke, Danila Ferents, Alyssa Könnecke, Maxim Popov

7. How does the approach in “Towards a Serverless Platform for Edge Computing” address challenges in implementing a FaaS platform for the Edge? Compare with the case studies from the FaaS block of the lecture. For which kinds of systems is this approach better suited?

   Students: Mohamed Ouassim Ghouil, Filip Robert Rejmus, Sebastian Koch, Yakup Ensar Evli, Le Quoc Anh Tran, Ettore Marangon

Further Notes

- For the peer-review, first summarize the paper’s contents and then discuss how well the question was answered.
- Please, do not use the discussion points listed in your question as headings – write the paper as if you had chosen the topic of “Applicability of X to fog/Using X in fog”.
- Don’t plagiarize.

- We will send out an unedited version of your first submission to other students for double-blind peer review. Please make sure that your file contains no identifying information.