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Introduction

A successful innovative research-oriented professional with 10+ years of professional experiences in low level software development, system architecture, IoT in both Academia and Industry combined with a very strong educational background in Computer Network, Network Protocols, Distributed system and Data communication, and Future Internet.

The link of my profile: My Linkedin, DBLP, and Researchgate Profile

Employment History

- **Specialist, SoC Software (5G)** Espoo, Finland
  Nokia *July 2019 – Dec 2021*

  Job Responsibilities:

  – Implementing l1low device driver both in user and kernel spaces for 5G
  – Verification of device driver by flashing the images in FPGA board.
  – Release the Software with new features.
    - ***Implementation Language:*** C/C++,
    - *Google Test Framework*
    - Yocto build considering minimal linux for the verification.

- **Master's Thesis worker, Nomadic Lab** Jorvas, Finland
  L M Ericsson AB *October 2011 – July 2012*
  – Investigation and Analysis of Real-time Collaboration on World Wide Web **(RTCWeb)** peer-to-peer data channel connections between Web Browsers
  – The main focus was integrating RTCWeb data channel in the Webkit Network protocol stack
    – ***Open Source*** Userland Stream Transmission Control Protocol stack (userland SCTP), Webkit, Mozilla Firefox, GStreamer framework.
    – ***Key Technologies:*** Objective C, Node JS, Javascript.
  – Worked with the IETF experts of RTCWeb

- **Doctoral candidate, Distributed and Pervasive Systems Group** Espoo, Finland
  Dept. of Computer Science, ***Aalto University*** *2013 – 2018*

  During the period of my doctoral studies:

  —**Disruption tolerant Information Centric Networking**
  – Perform cutting edge research in Information Centric Networking (ICN) for Delay/Disruption Tolerant network (DTN) and Internet of Things (IoT) and publish results
  – Design, implement, and evaluate new proposals towards disruption tolerant ICN and ICN in IoT network

  —**Publish/Subscribe based ICN in IoT (EU funded H2020 ICT project POINT)(Best Demo Award in ACM ICN 2017 [5])**
  – Collaboration with several Industry and Academia
  – Design, implement, and experiment with a system architecture providing IoT network services through ICN network
  – A gateway based approach which connect user endpoint running IP based CoAP protocol via ICN operator network.
    – ***Gateway Implementation Language:*** C.

- Considers CoAP, CoAP observe extension, and CoAP Group communication
- Implemented a minimal version of CoAP implementation to translate CoAP messages to ICN messages and vice versa following RFC 7252 (CoAP), RFC 7641 (CoAP observe), and RFC 7390 (CoAP group communication).
  - ***Implementation Language:*** C++
  - ***Virtualization:*** Mininet
- Build IoT test network which consists of the following:
  - Nucleo boards with ELLi Ethernet NIC
  - ***Operating System:*** RIOT

The project code is released publicly in Github:
https://github.com/point-h2020/point-3.0.0/tree/master/apps/coap

Disruption Tolerant ICN

- Design and implement protocol stack for disruption tolerant ICN and Device-to-Device (D2D) communication utilizing the open source reference implementation of Content Centric Networking and Delay Tolerant Networking.
- Evaluate the above protocol stack using ***ONE Simulator***
  - ***Implementation Language:*** Java
  - Result extraction using ***Python*** script and graph utility ***gnuplot***
  - Implemented *Information Centric DTN routing* in *One Simulator* to evaluate the protocol stack.

Education

- **Aalto University** — Espoo,Finland
  Ph.D., Dept. of Computer Science — *Feb. 2013 – Nov. 2018*
  - Major in the field of Telecommunications Software.
  - **Dissertation:** Information Centric Networking for the Challenged Internet

- **University of Helsinki** — Helsinki,Finland
  Master of Science in Computer Science ***with distinction*** — *Sept. 2010 – Feb 2013*
  - Major in Distributed System and Data Communication.
  - **Thesis:** Analysis of RTCWeb Data Channel Transport Options.

- **Bangladesh University of Engineering Technology** — Dhaka, Bangladesh
  Bachelor of Science in Computer Science and Engg., CGPA:3.62/4 — *Feb. 2003 – Jan. 2008*

Project Experiences

Projects in Doctoral Studies :

- **Andro Task Scheduler, Mobile System Programming Project, Aalto University:**
  Implementation Language: Android, SQLight.
  A calendar application in which an user can store his 'To Do(s)' and can view the tasks in either one of the following three views: day view, week view or month view.
  The project code can be found in Task Manager
- **Publish/Subscribe IoT:** The key responsibility was designing and implementing publish/subscribe based IoT on top of UDP.
  Implementation Language: C.
- **Indoor Positioning using Bluetooth:** The key responsibility was designing and implementing a prototype of indoor positiong system using Bluetooth.
  Key Technologies: Bluetooth Low Energy (BLE).
  Device: BLE enabled mobile device, Arduino, BLE shield.

Projects in M.Sc :

- **Distributed System Project** :
  - **Consistency** implementing vector clock and causal multicast in distributed environment. **Implementation Language** *Java*
  - **Multitier Architecture and the Web** web-based calculator both in server-based version and in a version where some of the functionality is migrated on client side. ***Implementation Language*** JavaScript, PHP
- **BrowserSocket CodeCamp** BrowserSocket is a protocol called WebSockets which was introduced in the IETF and W3C to simplify and optimize bi-directional, long-lived connections between the server and the user's browser. We implemented a tic tac toe game utilizing this protocol.
  Implementation Language: JavaScript

Projects in Bachelor Studies :

- **4-bit microprocessor design and experiment** using *CircuitMaker* and then build up the design containing ALUs, counters, registers, and 1K ROM under the term project of the course of Digital System Design.
- **Implementation of Unix File System** an efficient and flexible file system for UNIX operating system was implemented. In this project all basic data structures of UNIX file system e.g., *inode, super block, boot block etc.* were used. The system was implemented using *programming language C* under the course named Operating System.
- **Implementation of Unix Memory Management System** A Dynamic Memory Manager was implemented by programming Language C for Unix System capable of *allocating and releasing variable size block and splitting and merging of distributed block dynamically.*

Skills

Internet Technologies: Network protocols, system architecture integration
Programming Language: C/C++, Java, Python(basic), Objective C(basic)
Simulation Tools: ONE simulator

Publication

[1] **Hasan M.A. Islam**, Dmitrij Lagutin, Antti Ylä-Jääski and Nikos Fotiou; ***"Transparent CoAP Services to IoT Endpoints through ICN Operator Network"***. Journal of Sensors MDPI 2019. (impact factor 3.576).

[2] **Hasan M.A. Islam**, Dimitris Chatzopoulos, Dmitrij Lagutin, Pan Hui and Ylä-Jääski; ***"Boosting the Performance of Content Centric Networking using Delay Tolerant Networking Mechanisms"***. IEEE Access, 2017 (Impact factor 3.367).

[3] **Hasan Islam**, Dmitrij Lagutin and Nikos Fotiou. ***"Observing IoT resource over ICN"***. IFIP Networking conference and Workshops, IFIP (workshop paper), June, 2017.

[4] **Hasan M.A. Islam**, Dmitrij Lagutin, Andrey Lukyanenko, Andrei Gurtov and Antti Ylä-Jääski; ***"CIDOR: Content Distribution and Retrieval in Disaster Networks for Public Protection"***. The 13th IEEE International Conference on Wireless and Mobile Computing, Networking and Communications, October, 2017.

[5] Nikos Fotiou, George Xylomenos, George C. Polyzos, **Hasan M.A. Islam**, Dmitrij Lagutin, Teemu Hakala and Eero Hakala; ***"ICN enabling CoAP Extensions for IP based IoT devicess"***. 4th ACM Conference on Information-Centric Networking, September 2017 (Demo), (Best Demo Award).

[6] **Hasan M.A. Islam**, Andrey Lukyanenko, Sasu Tarkoma and Antti Ylä-Jääski; ***"Towards Disruption Tolerant ICN"***. The 20th IEEE Symposium on Computers and Communication (ISCC), July, 2015.

[7] Nikos Fotiou, **Hasan Islam**, Dmitrij Lagutin, Teemu Hakala and George C. Polyzos. ***"CoAP over ICN"***. 8th IFIP International Conference on New Technologies, Mobility and Security (NTMS), 2016, pages 1-4.

[8] Afroze, T., Sarkar, S., **Islam, A**, Rahman, A.; ***"More stable Ad hoc On-Demand Distance Vector Routing Protocol"***. 4th IEEE conference on Industrial Electronics and Application,2009. ICIEA 2009. pages 150-155.