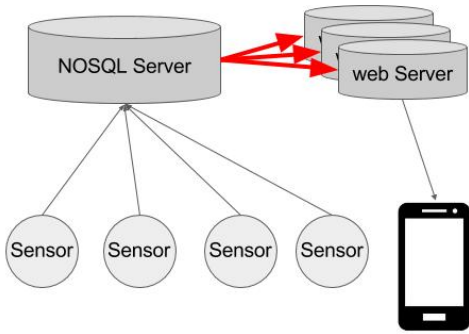


NOSQL Hardware Appliance with Multiple Data Structure

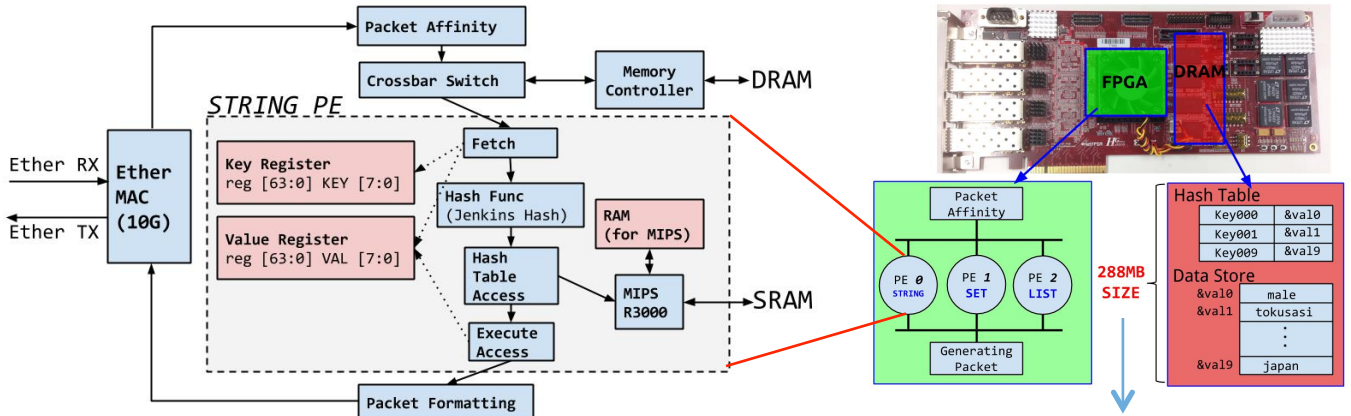
Yuta Tokusashi and Hiroki Matsutani Keio University
 {tokusasi, matutani}@arc.ics.keio.ac.jp

1. NOSQL is emergent data store



Power and performance efficiency and flexibility are required on an embedded data store system due to demand of data handling from IoT and sensor devices. Many works on hardware design for Keyvalue store (KVS) focus on a simple string-type data structure used in memcached. Thus, we propose a hardware design of a KVS appliance that supports various data structures.

2. Heterogeneous Multi-PE Design

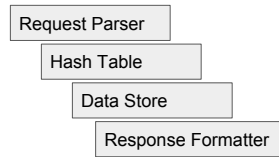


On-board DRAM size (storage size) is small !!
 We will introduce the approach in Next **Hot Interconnect'16**

Supporting Data Structure

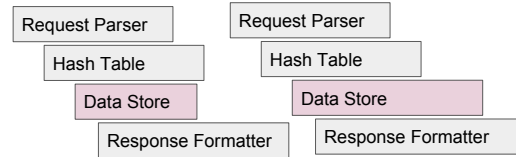
- STRING : General KVS
- LIST : Linked list
- SET : Defining value as SET
- HASH : "Key" and "Field" are hashed and lookup value by the hash.

A simple data structure



Deep pipelining is better to parallelize

Various data structures



Deep pipelining is difficult to support multiple data structures and new operation

➔ **Heterogeneous Multi-PE** : PE per data structure

3. Evaluations

