

# Optimizing Cache Efficiency for Object Storage and Key-value Systems



## Dr Feng Chen

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Date : 25 July 2017 (Tuesday)

Time : 10:30 a.m. – 11:30 a.m.

Venue : Room PQ703, 7/Floor, PQ Core, Mong Man Wai Building,  
The Hong Kong Polytechnic University

### ► Abstract

Storage technologies have experienced a rapid advancement in the past few years. Two representative technologies that are being widely used today are cloud-based object storage and key-value cache systems. For both systems, cache efficiency is the key component that determines the system performance and user experience. In this talk, we will present our recent work on optimizing cache efficiency for both systems. We will first introduce a parallelized cache framework, called Pacaca, for cloud-based object storage systems. Pacaca is designed to leverage the correlation among objects to cluster objects into semantic groups, based on which objects can be fetched in a highly parallelized way, and a cost-aware caching algorithm is developed to enhance the client-side cache management. Then we will briefly discuss another recent effort on integrating on-line compression into flash-based key-value cache systems, called SlimCache. SlimCache is able to effectively compress cache data and virtually enlarge usable cache space at a low overhead. Our early experimental results show these solutions can significantly improve system performance and enhance user experience.

### ► About the Speaker

Dr Feng Chen is an Assistant Professor of Computer Science at Louisiana State University. Before joining LSU, Dr Chen was a research scientist at Intel Labs, Oregon. He received his Ph.D. degree in Computer Science and Engineering from Ohio State University in 2010. His research interests are in computer systems with a focus on operating systems, memory and storage systems, and data management in cloud and large-scale distributed storage systems. In addition to publications in major venues, his work has also been adopted by open-source communities and influenced industrial products, such as CLOCK-Pro and Hystor. Dr Chen is a recipient of the Best Paper Award at the 25th ACM International Conference on Supercomputing in 2011. He is also a recipient of the NSF Faculty Early Career Development Award (CAREER) in 2015.

**All are welcome!**

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