Application for TCL-HKUST Communication and Information Technology Research and Education Grants

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Name of program	:	MSc in Information Technology (IT)
Name of project supervisor	:	Prof. Xin LI, CSE

Please consult the supervisor (and program director) for advice and guidance to complete the form, and keep the completed form in 2-3 pages only.

Title of the project:

Build Your Own Cloud (BYOC)

Brief description of the project:

Motivation:
Everyone has multiple devices nowadays, and many start to use cloud services to keep their photos, documents, notes, and contacts synchronized on whatever device they are using. It is a trend that cloud storage nowadays is becoming a necessity. We are offered with many choices, such as Dropbox, iCloud and Google Drive, which are available out there to help backup and access our important data. When cloud service providers advocate 'Dropbox brings your photos, docs, and videos anywhere and never lose a file again', and when you enjoy 'iCloud does it all automatically', have you ever consider the security risks behind this?

With cloud service, your data is physically stored in a device owned by others. It can be trustable names as Apple, Google who claim to take data security and the privacy of your personal information very seriously. There're news about hacked databases, compromised passwords and secret service data probing. Still quite some debates on security issues of public cloud are undergoing.

Objective:
The project aims to provide a solution to setup personal cloud service. Build you own cloud that lives on your own device wherever you are, yet with ultimate privacy and security. This means that the storage capacity of your cloud can be as big as you want. With BYOC your digital life is synced wirelessly and simultaneously across your entire ecosystem of devices regardless of the network connection, operating system or brand of device. The idea is applicable to both individual and business users, who concerns data privacy.

Case Study:
TCL offers a TCL Tcloud which is a big progress in building a private cloud. Overcoming many disadvantages, it provides sufficient privacy and high surfing speed which gives us a lot

of convenience. Nevertheless, it is still not perfect from my point of view. The key point of Tcloud is "push", which means you can push your multimedia files from your cellphone or computer to TV, or from cellphone to computer. This function has coped with the problem of "share", but there is still no solution for space utilization and file management.

Scope and workload (3 credits from Sept to Dec or 6 credits from Sept to Apr/May):

The initial prototype should start from a 2015 Fall semester 3-credit project. It can be further extended to 2016 Spring for another 3 credits on further improvement and implementation.

For the initial prototype stage, I plan to
• Conduct background survey on existing public cloud services, and personal cloud products (Sep 2015)
• Design the functionalities supported by personal cloud (Oct 2015)
• Implement the prototype of personal cloud, and (Nov to Dec 2015)
• Test on both the client and server side (Dec 2015)

For further extension of the project in Spring 2016 (if applicable), I would extend the project to support
• Android devices
• Multiple file types, e.g. documents, videos
• User-friendly interface based on feedback in prototype

Methodology and related information:

Tools and development platform:
Operating System: Windows
Web Framework: Tornado
Language: Python + HTML + Java Script

Personal Background:
The tasks listed above need knowledge and background on networking, security, App development and software engineering. I graduated from Sun Yat-sen University with Bachelor in Software Engineering, which provides me with solid background in Computer Science related subjects. I also have hand-on experience on software development and project management from various projects.

Project:	Data Operation & Maintenance on Computing System Cluster	Dec 2013
	Master of Chinese Character (game development)	Sept 2013
	PayNovo (mobile payment APP)	Sept 2013
	Relationship Optimization of Baidu Baike	Sept 2013
Employment:	Center of Excellence (CoE), SAP (China), Shenzhen	July 2014
Practice:	Intern in Microsoft Office Division, Beijing	July 2014
Contest:	**Top Prize** in Guangzhou, Microsoft Imagine Cup 2014	May 2014
	Successful Participant in **MCM/ICM**	May 2014

Format of output (e.g. A final report, a presentation, and/or demonstration):		
Upon the end of Fall 2015, the tangible deliverables would include: • A survey report of different existing types of cloud services and products • A prototype of personal cloud, including an iOS App for iPhones and iPads as client side, and a cloud server for Windows PC. The prototype would initially support images only. • Video demo of the prototype • A final report with emphasis of system design of personal cloud, difficulties encountered and solutions, and testing results and findings		
Detailed financial budget (maximum budget is around HK$20,000):		
	Details	HK$
Equipment	a. Mac b. IPhone c. IPad d.	For the prototyping stage, no need to purchase these items
Chemical	a. b. c. d.	Please fill out
Consumables	a. b. c. d.	Please fill out
Miscellaneous	a. b. c. d.	Please fill out
Travelling / Transportation	a. b. c. d.	Please fill out
Total budget :		