



# Information Technology Services

## Annual Report 2013-2014



**Information Technology Services**  
**The University of Hong Kong**

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# Introduction

2013-2014 was another challenging yet rewarding year for Information Technology Services.

The University's IT infrastructure has been expanded significantly in the past several years along with the construction and opening of the Centennial Campus and new student residences, the growth in demand for support from the double cohort of students, and the deployment of IT solutions in enhancing the student learning experience. The campus network's capacity and performance was greatly improved in the year, as was the Internet bandwidth. The IP-based phone system, which was first deployed in the Centennial Campus in 2012, has been extended to the Main Campus along with the refurbishment projects; and a project to replace 1,000 or so analog-based phone lines in the Faculty of Medicine Building was well underway. A new high definition, multi-point video conferencing service was launched in January 2014. On scientific computation, a new High Throughput Computing platform for processing "embarrassingly parallel" problems was launched in March 2014 by utilizing idle PC's in central facilities, such as the Chi Wah Learning Commons, after their closure at night. Information security continues to be a challenge for us. We implemented several measures in the year to strengthen information security protection across the University.

We observed increasing adoption of the Moodle Learning Management System in the year. The percentage of courses in Moodle activated by teachers for student use increased from 56% in 2012/2013 to 70% in 2013/2014. The Panopto Lecture Capture Service was launched on full scale at the start of the 2013/14 academic year. All lecture theatres and half of the classrooms in the Centennial Campus were equipped with ceiling-mounted camcorders for lecture recording. This capability has been and will continue to be added to central teaching spaces in the Main Campus. The Virtual Learning Environment is now integrating the Student Information System, the Moodle Learning Management System and the Panopto Lecture Capture System seamlessly together.

After the opening of the Centennial Campus and The Oval for use in September 2012, project work has continued to improve and enhance formal learning spaces in the Main Campus. A classroom inside The Oval was converted into a 36-seat classroom with computers for students; and four new 120-seat lecture theatres with four open access student study areas (referred to collectively as "The Curve") were opened in the KK Leung Building. Two Teaching and Learning Space Experience Surveys were conducted in February 2014. Based on the survey results, a programme of classroom improvements was put together for implementation over the 2014 summer break.

On supporting administration, we continued to enhance and expand the University's suite of administrative applications. The Student Information System project team kicked off the development of a Degree Audit System for the 4-year curriculum in May 2014 for completion in 2015. A consultancy study was underway to establish a plan for upgrading the Oracle Financials system; and a new project was being put together to upgrade the University's smartcard systems by mid 2016 to read 7-byte cards. Several new mobile applications were launched in the year. A notable new App is "PC Availability", which allows students to check instantaneously, using a smartphone/tablet, the availability of communal PCs in the Chi Wah Learning Commons, The Oval and seven faculty-based computer laboratories.

In order to strengthen the department's management capability, we also made significant progress in our quality journey through deploying international best practices for IT services management and project management; as well as setting and documenting a growing set of technical standards covering the technologies and solutions that we deploy. An internal Quality Management Committee was also formed to provide leadership to this effort.



Danny Tang  
Director of IT Services

# Executive Summary

2013-14 was a year in which ITS built on the progress made in previous years, consolidating its efforts in supporting teaching and learning for students, academic research and innovation, knowledge exchange and the further development and quality control of the University's enabling IT platform.

Following the intake of a double cohort of undergraduate students in 2012-2013, we worked closely with the Estates Office during the year to develop advanced learning environments in four lecture theatres featuring open-access student study areas and another eight large lecture theatres around the University. Our Learning Environment Services team conducted online surveys for both students and staff, gaining a clear idea of how the layouts of and technologies in all teaching and learning environments could be modified to better suit their users. A comprehensive programme of improvements has been launched and will continue through to the end of 2014.

With increased demand for computing power to support research, 2013-14 saw a slight increase in the annual CPU processing time of the GRIDPOINT system. With an eye to the future, in March 2014 ITS launched a high-throughput computing system for selected research projects that makes use of otherwise idle PCs in the Learning Commons. Also in our sights was the design and procurement of a new high performance computing cluster system to replace the aging HPCPOWER system so that HKU researchers will have enhanced access to the latest resources and technologies for computationally intensive research.

In terms of knowledge exchange, following the ITS website receiving a Gold Award from the Web Accessibility Recognition Scheme 2013, ITS hosted a seminar on web accessibility in November 2013 to raise awareness of the important topic. We also worked as part of the Coordination Group for Departmental PC/Network Support, alongside PC support staff from various departments, to organise a series of seminars on PC/network technologies and service support.

A major focus of our work with the business systems of the University's enabling IT platform during the year was the implementation of the 'Student Information System [SIS] Roadmap until December 2016', which began with a crucial degree audit project by the SIS Project Team. The Team also developed a new student performance report, the Academic Attainment Profile, to help students apply for jobs and higher degree studies more effectively than they can with traditional transcripts.

At the same time, the Human Capital Management System Team provided crucial support for that system for a second year, enhancing, redesigning and otherwise improving various elements. ITS also supported the Finance and Enterprises Office in Phase 1 of the Oracle Financials Upgrade Project, which involved conducting a study of the upgraded system and reviewing business processes to determine implementation of the actual upgrade.

Building on our underlying infrastructure improvement efforts in 2012-13, ITS again worked to enhance the campus network's performance and capacity in 2013-14. We supported the Estates Office in renovations to a number of buildings and provided consultants with the requirements for HKU Campus Network services to incorporate into building designs and cost estimates for various projects. New 10G switches installed between the main campus and Starr Hall/Lady Ho Tung Hall realized faster network connections which further enhanced fibre connections between the Lung Wah Street Residential Colleges and the main campus network. To ensure sufficient bandwidth for WiFi connectivity, the links between the central WiFi controllers and campus backbone switches were upgraded, and an additional 120 access points extended the network. ITS also engaged a consultant to perform security assessments for 10 academic and administrative departments and organised numerous information security awareness activities.

A further key element of our infrastructure work was collaboration with the Estates Office during the year to advance the Consequential Movements Project, a multiyear effort to realign the accommodation of faculties, departments, offices and administrative units following the opening of the Centennial Campus.

The two main focal points of our work in unified campus communications were the further extension of the University's IP telephony system during the year and the deployment of the video-based Multi-control Unit, a high definition multi-party video conferencing system. Designed to be used on multiple PC-based and mobile operating systems, and with telephones, the Unit significantly enhanced the University's internal communications.

Service and process improvement during the year continued to focus on the Information Technology Infrastructure Library (ITIL), with refinements being made to the Configuration Management process. Following the development of the Project Management Information System (PMIS), ITS also established a Quality Management System to ensure that all products and services offered reach a high level of quality.

Training further ensured the improvement of our services. To aid students and staff in making the most effective use of the facilities and services we provide, ITS organised computer training courses and workshops throughout the year. We also developed an ITS staff training and education programme to refine our culture of quality and continued with our recognition of staff efforts by presenting Best Project Awards, with the premier award collected by the HKU App, e-Services and Database Administration Team. Indeed, all of our teams are critical to our ability to meet user needs and innovate for the benefit of the entire University.

# 1 Summary of Major Developments

## 1.1 Enhancing the Student Learning Experience

Information Technology Services (ITS) continues to work closely with Estates Office to develop and create high-quality, technology-rich learning environments for teaching and learning. In January 2014, four new 120-seat lecture theatres with four new open-access student study areas opened in the KK Leung Building, followed by the refurbishment and redevelopment of eight large lecture theatres in the Chong Yuet Ming, KK Leung, Library Extension and Chow Yei Ching buildings during the summer break. All eight have been in use since September 2014.

We also continue to assist the University in enhancing student learning by upgrading all PCs in the communal PC Laboratories with the latest versions of commonly used software packages.

## 1.2 Advancing Research and Innovation

As the growth in demand for computing power to support research continues apace, the annual CPU processing time of the GRIDPOINT system has increased slightly despite several periods in 2013-14 during which the system required downtime owing to instability of the cooling system and the asbestos debris removal work in the Haking Wong Building that was carried out in January 2014.

A high-throughput computing (HTC) system that utilises the unused power of Learning Commons PCs for research computing has been established, and has been providing valuable additional computing power to support select research projects since March 2014.

With support from professors and researchers in various faculties and departments, the University has also approved a University Development Fund (UDF) proposal to establish a new high-performance computing (HPC) cluster system. Making use of the latest technology, the HPC system will replace the 11-year-old HPCPOWER system. Good progress has been made in the final design and procurement of the new system, which is anticipated to be ready for service by the end of 2014.



### 1.3 Promoting Knowledge Exchange

During 2013-14, ITS continued to provide technical support to the Communications and Public Affairs Office (CPAO) to maintain the University's website. In April 2014, the ITS website ([www.its.hku.hk](http://www.its.hku.hk)) received a Gold Award in the Website Stream of the Web Accessibility Recognition Scheme 2014 co-organised by the Office of the Government Chief Information Officer (OGCIO) and Equal Opportunities Commission (EOC). ITS also hosted a seminar on web accessibility in November 2013 to raise awareness of this important subject and to refresh departmental web administrators' understanding of best practice in the design of barrier-free accessible websites.

### 1.4 Enabling IT Platform (Business Systems)

The 2013-14 academic year has seen the launch of the three-year plan outlined in the 'Student Information System [SIS] Roadmap until December 2016'. We began with an important degree audit project. After thorough evaluation and careful consideration of the available options, u.achieve of the CollegeSource package was selected, with development beginning in May 2014. Detailed study of all HKU degrees and regulations was crucial to the project's success.

In 2013-14, the ITS Human Capital Management System (HCMS) team took the lead in supporting the HCMS for the second year running. Amongst the team's major tasks during the year was making enhancements to the management reports on financial clearance and staff commitments, redesigning the Assign Delegation function, improving the workforce administration and recruiting functions, setting up the new Base Benefits medical plan, and launching the new Annual Leave Summary report.

A major project this year in support of the Finance and Enterprises Office (FEO) was the Oracle Financials Upgrade Project, which is currently in Phase 1 of its

development, involves conducting a study of the upgraded system and reviewing business processes to determine implementation of the actual upgrade in Phase 2. The upgrade will support new business processes designed to better serve the University's financial service management needs and enhance efficiency.

### 1.5 Enabling IT Platform (Underlying Infrastructure)

Beginning with the establishment of a new computer room on the Centennial Campus in 2012, major system infrastructure expansions have been rolled out across the new campus to improve the overall resilience and capacity of the system infrastructure. With the help of cloud development and underlying virtualisation technologies, we have enabled the failover of critical service between the computer rooms on the main campus and Centennial Campus. The cloud printing solution uPrint replaced the traditional printing system in August 2013, thereby unifying printing solutions for users, with support extended to Mac OS and iOS devices in November 2013. It is anticipated that uPrint coverage will extend to Android devices by the end of 2014.

Several network improvement works were undertaken in 2013-14 to enhance the performance and capacity of the campus network. 10 G switches were installed to set up 10 G links between the main campus and Starr Hall/Lady Ho Tung Hall, which in turn enabled subsequent fibre connections between the Lung Wah Street Residential Colleges and the main campus network. To ensure sufficient bandwidth for WiFi connectivity, the links between the central WiFi controllers and campus backbone switches were upgraded from 1 Gbps to 10 Gbps. In addition, as part of ITS's continued efforts to upgrade and expand HKU WiFi network coverage and performance, an additional 120 WiFi 802.11n access points were installed at various campus locations. Some DC injectors (supporting WiFi access points) were

replaced by Power-over-Ethernet (PoE) switches to improve WiFi availability, as standard DC injectors have a relatively high failure rate. Some building switches were also upgraded from 1-Gbps to 10-Gbps links, and floor switches for the staff network were upgraded in various campus locations to ensure better performance and security and enable IPv6 connectivity. A new initiative to establish a testbed for exploring emerging Software Defined Networking (SDN) technology is in progress.

ITS took several measures in 2013-14 to improve information security across the University, including engaging an independent consultant to perform security assessment services for 10 selected academic and administrative departments, organising information security awareness promotion activities such as seminars and exhibitions, and actively participating in the Joint Universities Computer Centre (JUCC) Information Security Task Force (ISTF). In response to the growing proliferation of security incidents, a server compliance solution was introduced to align the configuration of servers to a good baseline configuration connected to the campus network. System implementation is in progress, and compliance checks are expected to begin with the Windows and Linux operating systems in the first phase of deployment at the end of 2014.

### 1.6 Enabling IT Platform (Consequential Movements Project and Other Developments)

ITS has continued to work with the Estates Office on the Consequential Movements Project since the opening of the Centennial Campus. Our role is the provision of a campus network, WiFi and Internet Protocol (IP) telephony services to newly renovated offices. Over the past 12 months, ITS has supported the Estates Office in timely completion of the renovation of a number of buildings, including Tang Chi Ngong, Pao Siu Loong, Hung Hing Ying, Run Run Shaw and Library Building Old Wing. A new postgraduate students' residence will be opened at

No. 10 Ching Ling Terrace in late 2014 on the site of the old Hong Wah School. ITS worked closely with the relevant vendors for cabling and the installation of network, WiFi and IP phone equipment.

With regard to the University's other major development projects, such as the Chong Yuet Ming Amenities Centre Auditorium and Phase I of the Queen Mary Hospital Redevelopment Project (involving the conversion of senior staff quarters into office space and clinical facilities), ITS has provided consultants with the requirements for HKU Campus Network services for them to incorporate into their building design and cost estimates.

### 1.7 Enabling IT Platform (Unified Communications)

Following the success of the IP telephony system's roll-out on the main campus, the system has been extended to the LKS Faculty of Medicine to replace its ageing PABX system. More than 1,100 IP phones have now been deployed, taking the University's total number of IP phones to 3,800.

We have also deployed a new video-based Multi-control Unit (MCU) to support high-definition multi-party video conferencing. The MCU can support up to seven meeting parties at full high definition (1080 p), 15 at high-definition (720 p 30 fps) or 60 at standard definition (360 p). Users can join a meeting with room-based video-conferencing endpoints, a PC, Mac, iOS or Android device, or ordinary telephone. The system also supports recordings and webcasting to up to 600 viewers simultaneously.

## 1.8 Enabling IT Platform (Service and Process Improvement)

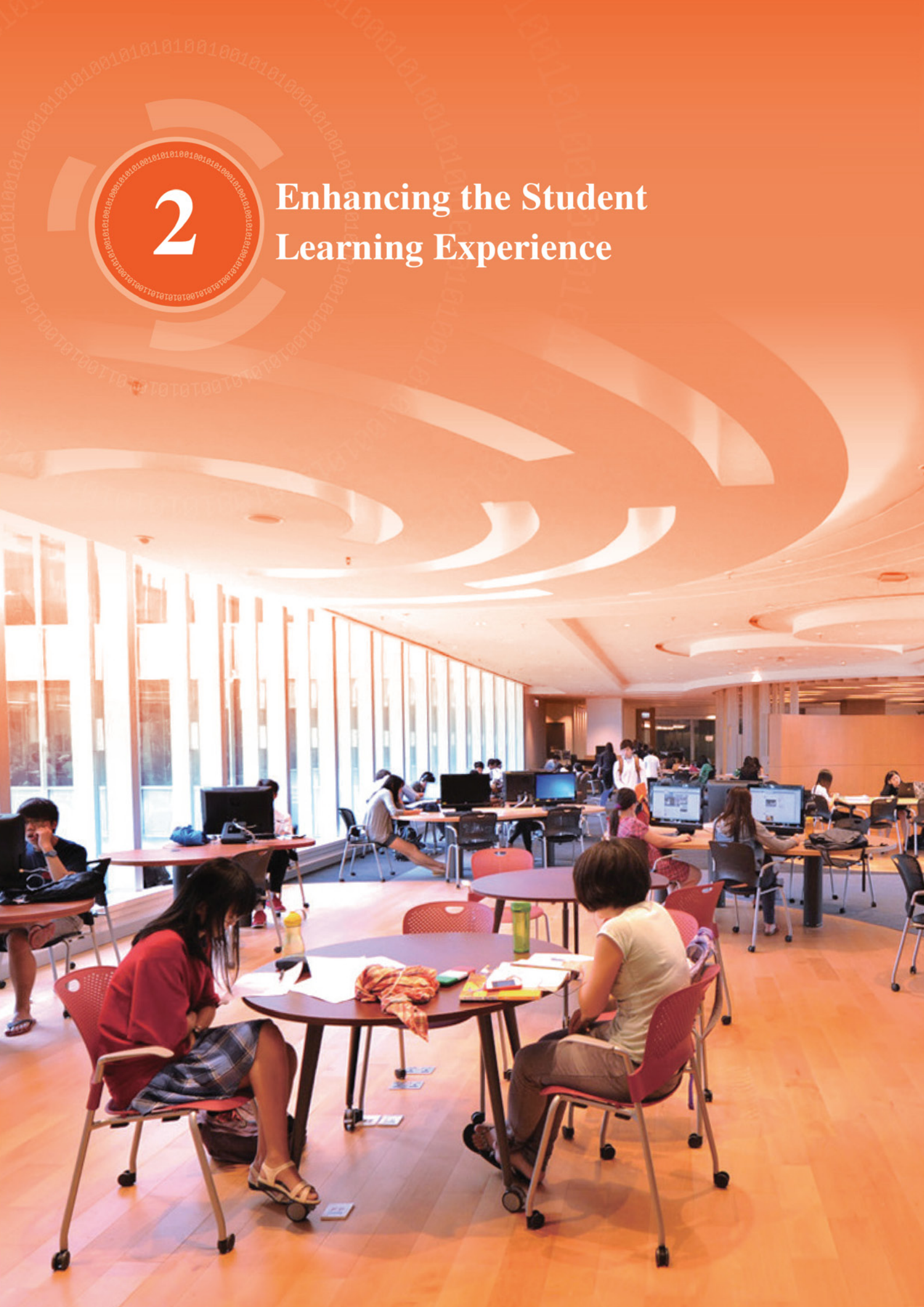
We continue to achieve progress in our service and process improvement, focusing on configuration management and change management based on the Information Technology Infrastructure Library (ITIL), which is an industry best practice IT Services Management (ITSM) framework. During 2012, all configuration items supporting the major services in the ITS service catalogue were confirmed, and their relationship diagrams created. The current focus of the Configuration Management process is to further refine the configuration database and to make greater use of it. By August 2013, all ITS technical teams had joined the Change Management process and are now required to submit technical change requests to the Change Advisory Board (CAB) for review and approval before implementation.

Finally, our Project Management Information System (PMIS), drawing on the ITS Project Management Methodology (PMM), which is in turn based on the PRINCE2 project management methodology, commenced operation in the third quarter of 2014. To achieve continual service/product quality improvement, we also instituted a formal Quality Management System (QMS) based on ISO9000. In addition, a staff training and education programme was developed to nurture a quality culture within ITS. For example, all ITS project managers were encouraged to participate in the PRINCE2 Foundation and Practitioner Training and Certification Programme to gain the expert knowledge needed for better project management.



# 2

## Enhancing the Student Learning Experience





## 2.1 Learning Environment Services

The Learning Environment Services (LES) team provides support to the University's physical learning environment, including teaching rooms (classrooms and lecture theatres), the Learning Commons and PC Laboratories. The team also provides audio-visual and technical support to a wide range of University events.

To enhance our support through technology and training, the LES team focused on two key areas in 2013-14. The first was the continued provision and enhancement of traditional support services to staff and students using both formal and informal learning spaces on both the Main and Centennial campuses. The second was detailed examination of the expectations of staff and students in using

those spaces. Two online surveys were carried out, one for staff, looking specifically at their experiences (good and bad) of using central classroom facilities and technologies, and the other for students, exploring their impressions of the formal and informal spaces they occupy.

LES received a large number of responses to both surveys, thereby gaining a very clear idea of what is and is not working within the teaching and learning environments. In response, we launched a comprehensive summer programme aimed at making improvements to room layouts, classroom technologies, projection facilities and support. Changes and upgrades will continue to be made throughout the autumn semester of 2014, and user feedback will be monitored.



## 2.1.1 Classroom Support

Training and development are unquestionably important components of the provision of support to classrooms and open-access learning spaces, which requires the ongoing development and enhancement of core staff skills. In 2013 the LES team joined InfoComm, the world's largest audio-visual (AV) training provider, to gain access to a range of training materials: from very basic materials for new staff to materials designed for the certified AV designer and integrator qualifications for more experienced staff. These qualifications are widely recognised in the AV industry and will ensure that LES staff are up-to-date with the latest technological developments while being able to provide expert support, advice and assistance to users.

Almost 200,000 hours of classes are scheduled in the University's central classrooms, requiring the AV/IT equipment therein to be fully operational at all times. LES manages two classroom hotlines for staff to facilitate a rapid response in the event of a problem. The majority of calls are answered within a matter of minutes, and problems are usually resolved satisfactorily within 10 minutes. Equipment failure may mean that problems take a little longer to resolve, in which case temporary facilities are provided until equipment can be repaired or replaced.

In 2013-2014, 1,811 and 1,643 hotline calls were received from classrooms on the main and Centennial campuses, respectively, representing an overall reduction of 17% over 2012-13.

Chart 1a: LES Hotline Calls in 2013-14 – Centennial Campus

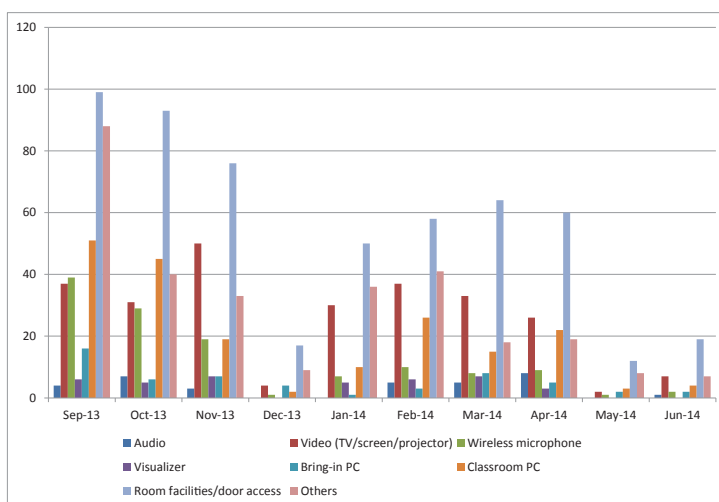
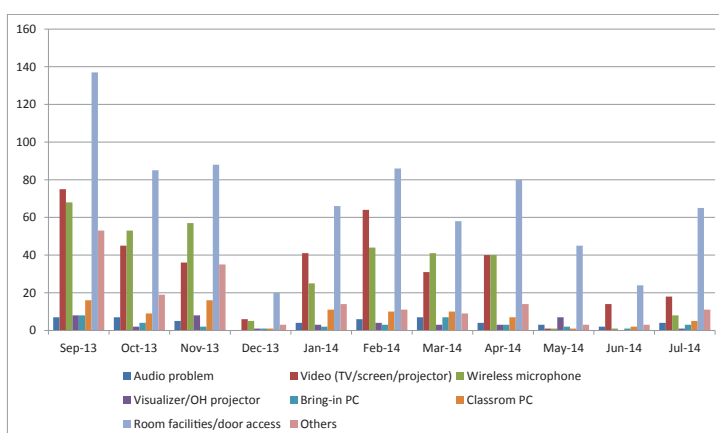


Chart 1b: LES Hotline Calls in 2013-14 – Main Campus



## 2.1.2 Open-access Study Spaces

### 2.1.2.1 LES Service Desks

There are a number of service desks located within the Chi Wah Learning Commons (CWLC) and The Oval that are staffed by LES members to provide technical support to staff and students.

From September 2013 to July 2014, 21,629 enquiries were made at the LES service desks in the CWLC and 3,174 at

those in The Oval, a smaller venue. The busiest months were September, October and November. Many enquiries came from new students, who needed directions to teaching and learning venues and instructions on how to access the wireless network. As both staff and students became more familiar with the facilities on offer as the year progressed, the number of enquiries declined significantly (see Charts 1c and 1d).

Chart 1c: LES Service Desk Enquiries 2013-14 – Chi Wah Learning Commons

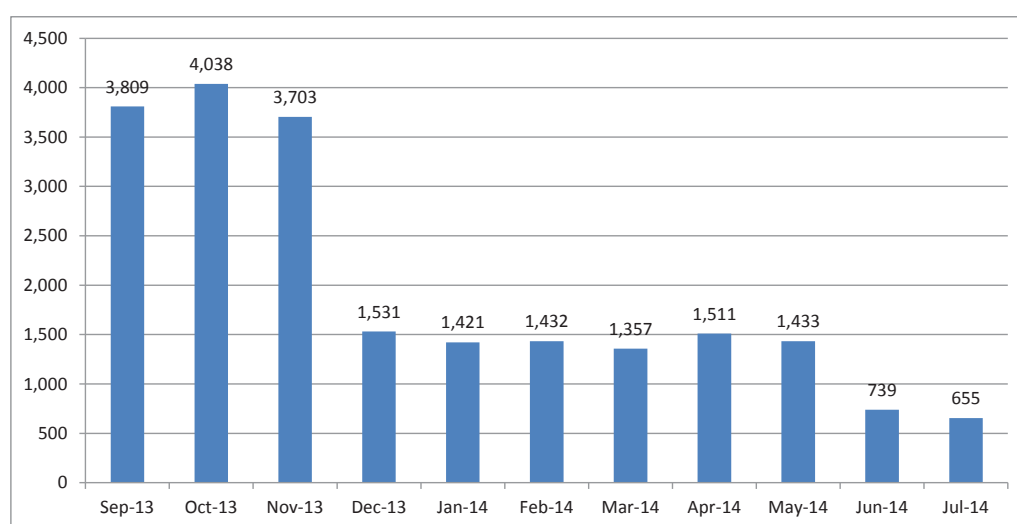
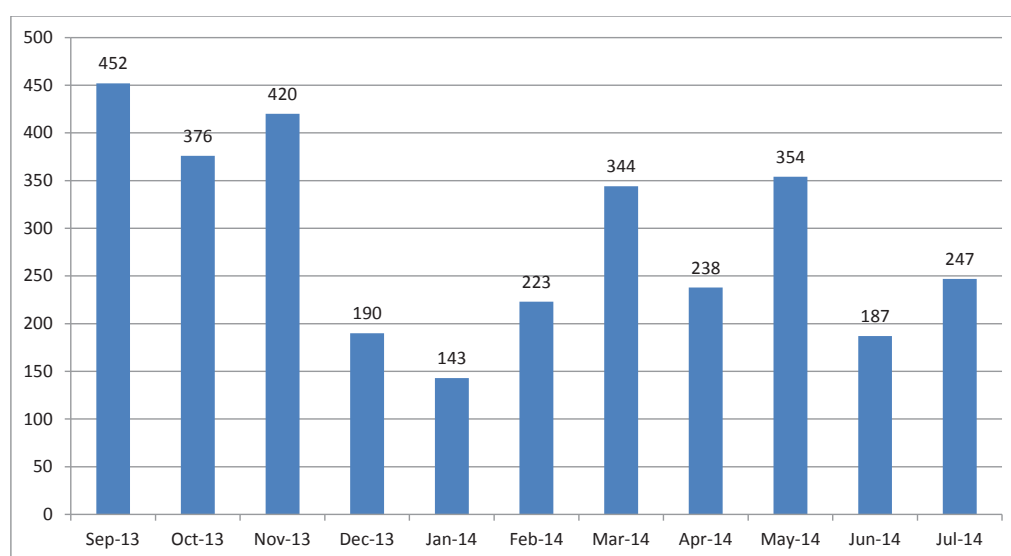


Chart 1d: LES Service Desk Enquiries 2013-14 – The Oval

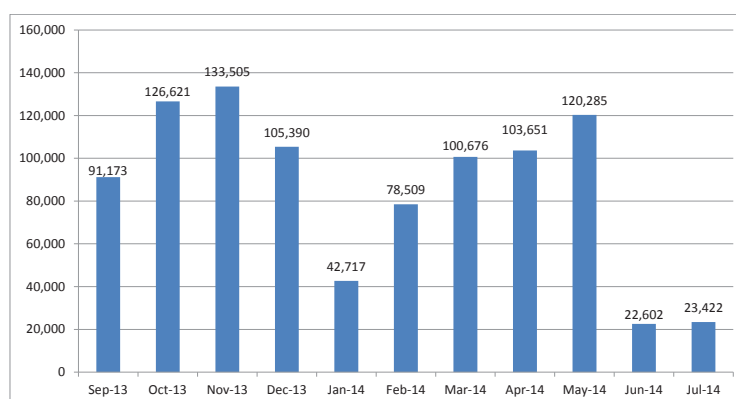




### 2.1.2.2 Usage Figures

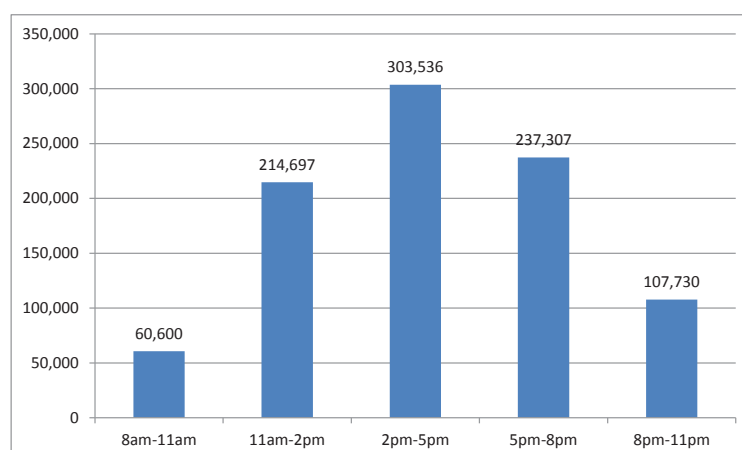
The CWLC continues to be a popular study venue for students. Usage figures taken from the access control system show student numbers to have increased significantly over the past year, with usage almost doubling in November, and January to April (see Chart 1e).

Chart 1e: Daily Occupancy 2013-14 – Chi Wah Learning Commons



Headcounts of students are taken hourly. From October 2013 to June 2014, the number of student hours spent in the CWLC between 8:00 am and 11:00 pm reached 833,956, an increase of more than 55% over the same period of 2012-13, which recorded 525,070. Over the 11-month period shown in Chart 1e, the overall number of student hours reached 948,551. The busiest time, unsurprisingly, was during the examination and revision periods when opening hours were extended, with the CWLC opening at 6:00 am rather than 8:00 am.

Chart 1f: Overall Student Count for Various Periods of the Day in 2013-14 – Chi Wah Learning Commons





### 2.1.2.3 Extended Opening Hours due to Student Feedback

In the last annual report, we noted that the results of a small student survey indicated that students would like the CWLC to have longer opening hours. These results gained support from a recent student survey on their learning space experience, which gave a very clear indication that students not only wanted extended opening hours for study spaces, but viewed 24/7 computing facilities as a necessity. As a result of this student feedback, since 1 September 2014 the CWLC has been open every day (rather than 5.5 days per week), and The Oval, which includes a 36-seat classroom with computers, is open 24 hours per day, seven days per week, with the exception of a few public holidays.

## 2.2 eLearning Services

### 2.2.1 Learning Management System (LMS) – Moodle

In 2013-14, Moodle entered its second year of full implementation as the centrally supported learning management system (LMS). Throughout the year, consistent efforts have been made to ensure Moodle's smooth operation to support campus-wide academic courses through the use of technology. The year has seen the creation of 5,351 Moodle courses, of which 3,725 (70%) have been activated by members of the teaching staff.

Both the number of courses and percentage activated have seen an increase over 2012-13, which saw 4,688 courses created and 2,608 (56%) activated.

The eLearning Team continually works to enhance Moodle's features and functionalities through the adoption of new plugins and system upgrades, improved user experiences, and better integration with the SIS. It has also launched a completely new Moodle Course Archive System and enabled Moodle access via the HKU App.

### 2.2.2 Newly Installed or Updated Moodle Plugins

New Moodle plugins are regularly recommended by teachers from the various faculties. Thanks to the assistance of the eLearning Enhancement Task Force (EETF) in evaluating and testing these recommendations, the following plugins were installed or updated on the Moodle production system and made available for use in 2013-14.

- Turnitin plugin update – a commercial anti-plagiarism checking tool
- Course content block – list of all visible topics/weeks in a Moodle course
- Course menu block – allows resources and activities to be added to the front page
- Portfolio – makes it easy for students to export their work to an external portfolio
- Outcome – specific descriptions of what a student has demonstrated
- Upload file in Wiki – enables file uploading in Wiki
- Theme changes in URL – enables theme changes in URL
- DragMath – equation editor
- PDF submission and feedback – allows a teacher to annotate and return PDF files submitted by students
- Participation map – gives a Technicolor visual representation of interaction threads in a forum
- Attendance block – allows teachers quick access to attendance functionality
- Scheduler – helps teachers to schedule one-on-one appointments with students
- OU wiki – Wiki plugin contributed by Open University, UK
- OU blog – blog plugin contributed by Open University, UK





## 2.2.3 Upgrade to Moodle 2.6.3

Moodle stable version 2.6.3 was released on 12 May 2014 by the official Moodle organisation, and the eLearning Team installed it on a testing platform in May 2014 for internal functionality testing. Based on the positive findings obtained by our team and the EETF, the production system was successfully upgraded to version 2.6.3 on 10 August 2014. The latest version includes a host of new features and improvements, including functional changes, security issues fixes and system enhancements.

## 2.2.4 Other Moodle Enhancements

**Moodle Course Archive System** - Moodle course materials are accumulating year-on-year, and new teaching materials are being added every year. The majority of teaching and learning activities take place on the courses of the current year, and past Moodle course materials are mostly for read-only reference purposes. To increase system performance, it is good practice to offload old course materials to archive servers. We launched our own Moodle Course Archive System on 15 July 2014. Going forward, courses older than two years will be regularly moved to the new system, with current-year and one-year-old courses kept on the production platform. Teachers, students and course administrators can access courses on both the production platform and archive system through the 'My eLearning' tab on the HKU Portal.

**Adding pending course enrolment records to Moodle** - In the past, only approved student course enrolment records were sent from SIS to Moodle. Accordingly, students could not access the corresponding Moodle courses until their course enrolment have been approved. Starting from September 2013, pending enrolment records are also passed automatically from SIS to Moodle to facilitate timely access to Moodle courses by students.

**Email-to-class function in eLearning tab of HKU Portal** - The new 'email-to-class' function, which offers teachers/teaching assistants (TAs)/course administrators

a handy and simple interface for sending emails to their classes through the My eLearning tab on the HKU Portal, was launched on 23 June 2014.

**SIS Class Staff Information (CSI) for Moodle** - This new SIS subsystem was launched on 16 August 2013 to maintain the records of teachers, TAs and Moodle course administrators in a central location. We investigated the new business requirements and refined the system interface programming to enable the smooth exchange of information between Moodle and the CSI system.

## 2.2.5 Lecture Capture Services (LCS) – Panopto system

**Panopto for Students** - Lecture Capture Services (LCS) are powered by a locally installed Panopto lecture capture system. Between the launch of LCS in September 2013 and June 2014, 55 teachers made 368 video recordings (676 hours) in 62 Moodle courses for student viewing. After an initial year of availability only to teachers, we extended the service to students, allowing them to make video recordings, play videos back, and perform video management, editing and sharing with Panopto. Students can apply for Panopto accounts and then begin recording in the study rooms of the Learning Commons. A new course entitled 'Panopto Video Capture Service for Students' has been introduced to complement the launch of the service for students.

**Systems Upgrade - Panopto 4.6.1** - Released on 18 May 2014, the new 4.6.1 version of Panopto brings a range of enhancements and system fixes. For example, teachers can now schedule the publishing of videos, and they can specify a custom-ordered list of videos in a folder. In June 2014, we performed functional tests on the testing server and integration of the Moodle platform, and then invited EETF members to perform user-acceptance tests. After all testing results were deemed successful, the Panopto production system and recorder software on classroom PCs were upgraded to version 4.6.1 on 10 July 2014.

## 2.2.6 User Training and Promotion for LMS and LCS

**User Support and Training** - LMS and LCS usage rates have seen a steady rise, and we handled more than 2,000 user support cases during 2013-14 made through such channels as the telephone hotline, email, helpdesk incident system, and face-to-face personal assistance and on-site support.

An ongoing goal is to further strengthen eLearning user training. We currently offer six regular eLearning hands-on training workshops on Moodle and three on Panopto, and a course on the use of the anti-plagiarism Turnitin plugin was recently updated with GradeMark instructions. In the reporting period, 43 eLearning courses were held, with 237 teaching staff attending.

On-demand short video tutorials are considered to be effective and flexible self-paced learning resources. We create videos to help students and teaching staff learn to use Moodle and Panopto on an ongoing basis. During the year, new videos were created (e.g. Turnitin GradeMark) when new features were introduced, and existing videos were updated to accommodate changes in user interactions for a feature or function.

**Teaching and Learning Showcase Exhibition** - To promote our teaching and learning services to the University, a two-day Teaching and Learning Showcase Exhibition was jointly organised by the eLearning Pedagogical Support Unit (EPSU) and ITS on 11 and 12 February 2014. More than 150 staff members and students visited the booths on both the Centennial and main campuses to gain a better understanding of how teaching and learning can be supported by the use of technologies. During the Exhibition, ITS demonstrated how users can use Moodle and Panopto to facilitate teaching and learning with the aid of laptop and mobile devices, and demonstrated the newly acquired high definition conferencing system, which can be used for remote collaborative teaching and learning.

**Guidelines for Using External Web 2.0 Services** - Staff members and departments have expressed interest in adopting such external web services as Dropbox and Facebook for teaching, research, administration and other

departmental purposes. EPSU and ITS jointly held two staff workshops in January 2014 to discuss the 'Draft Guidelines for Using External Web 2.0 Services'. Twelve academic and 44 non-academic staff members participated in the workshops, and offered valuable feedback. In July 2014, ITS promoted the finalised version of the Guidelines to all department heads and staff. Two of the most practical case study documents in the Guidelines are entitled 'Dropbox repository for the sharing of files amongst a teacher and group of students' and 'Facebook group as a departmental site for the dissemination of information'.

## 2.3 New PC Availability Application (Web and Mobile Versions)

A new PC Availability application was launched in 2013-14 to help staff and students to identify communal PCs available for use in the CWLC, Room 110 of the Knowles Building in The Oval and/or faculty-based PC laboratories that are open for use by all staff and students. The new application is available in both web and mobile versions, rendering it highly convenient for users to locate an available communal PC from their current location.

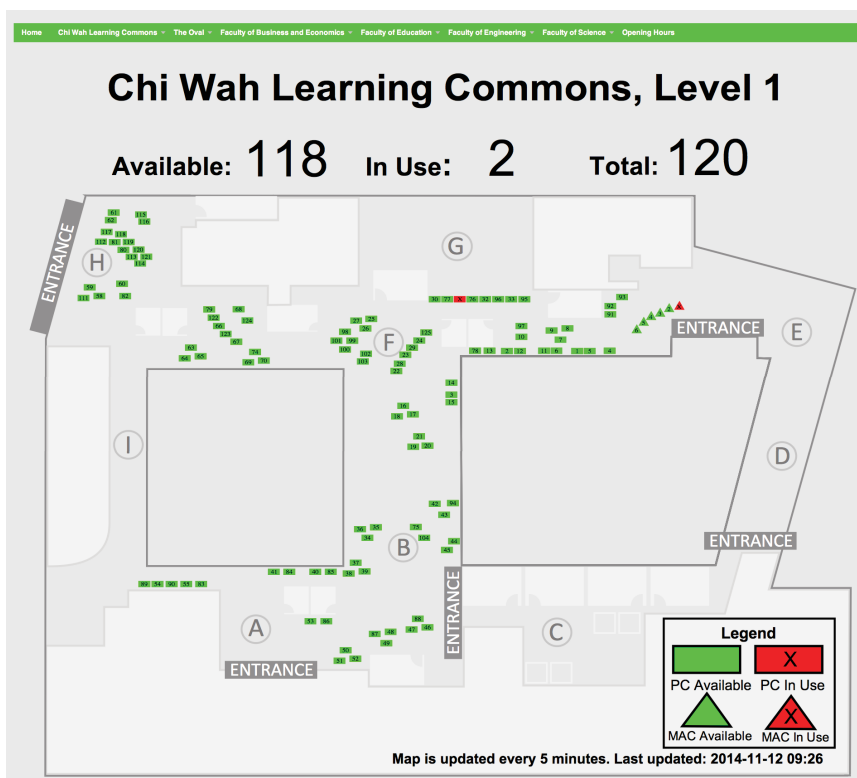
### 2.3.1 Web Version of PC Availability Application

The web version of the PC Availability application is accessible from the ITS website (<http://www.its.hku.hk>) -> Help -> PC Availability.

Home page of PC Availability Mobile App

Home Chi Wah Learning Commons The Oval Faculty of Business and Economics Faculty of Education Faculty of Engineering Faculty of Science Opening Hours			
The following facilities are closed on Sundays, public and University holidays unless otherwise specified.			
Chi Wah Learning Commons			
	Available	In Use	Total
Level 1	118	2	120
Level 2	67	2	70
The Oval			
	Available	In Use	Total
Room KB110, Knowles Building	35	1	36
Faculty-Based PC Laboratories			
Faculty of Business and Economics (K K Leung Building)			
	Available	In Use	Total
Room 610	45	2	47
Room 1009	16	1	17
Room 1104	25	1	26
Faculty of Education (Runme Shaw Building)			
	Available	In Use	Total
Room 301	20	0	20
Room 324	11	1	12
Faculty of Engineering (Composite Building)			
	Available	In Use	Total
LG202	67	1	68
Faculty of Science (Chong Yuet Ming Physics Building)			
	Available	In Use	Total
Room 312	13	0	13
PC Availability is updated every 5 minutes. Last updated: 2014-11-12 09:51.			

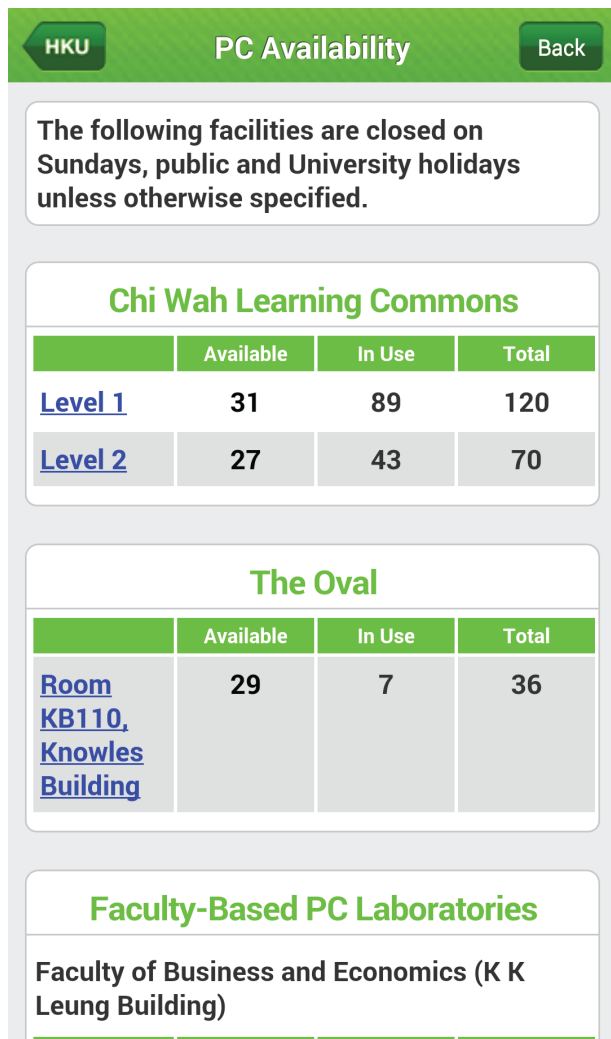
Screen dump of PC Availability Home Page for CWLC, Level 1



### 2.3.2 Mobile Version of PC Availability Application

The mobile version of the PC Availability application is available from HKU App version 1.3 -> Staff corner or Student corner -> Learning Facilities -> PC Availability. The HKU App is available for both Android and Apple iOS devices, and is downloadable from Google Play and the iTunes App Store.

Home page of PC Availability Mobile App



**HKU** **PC Availability** **Back**

The following facilities are closed on Sundays, public and University holidays unless otherwise specified.

**Chi Wah Learning Commons**

	Available	In Use	Total
<a href="#">Level 1</a>	31	89	120
<a href="#">Level 2</a>	27	43	70

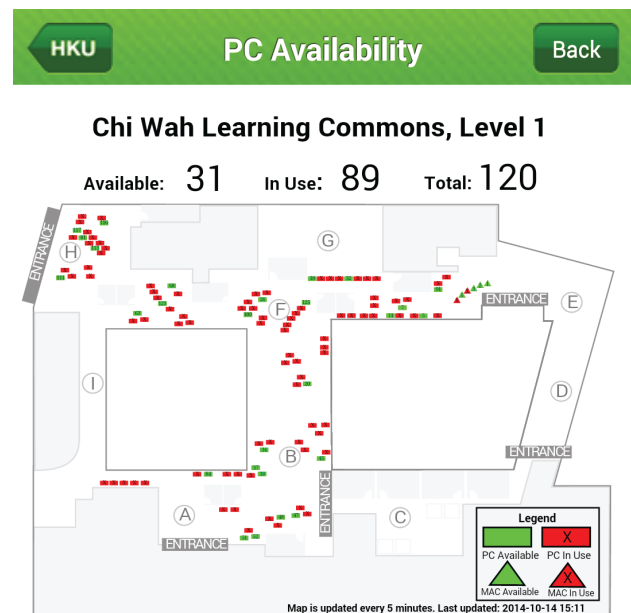
**The Oval**

	Available	In Use	Total
<a href="#">Room KB110, Knowles Building</a>	29	7	36

**Faculty-Based PC Laboratories**

Faculty of Business and Economics (K K Leung Building)

Screen dump of Mobile PC Availability App





3

## Advancing Research and Innovation



### 3.1 High-performance Computing (HPC) and Grid Computing Infrastructure

The 12-TFLOPS GRIDPOINT system was the primary HPC facility supporting the University's multidisciplinary research throughout the year. Annual CPU utilisation of the GRIDPOINT system increased from 63.6% in 2012-13 to 67.2% in 2013-14.

The 2.3-TFLOPS HPCPOWER2 system is the basic HPC facility supporting research studies in Chemistry, Physics, Statistics and Actuarial Science, Engineering, and Medical Sciences. It also serves as a platform for the development of applications/programs before they are run on a large scale on the GRIDPOINT system. Because increasing numbers of computer-intensive research projects have migrated their program to allow them to run on the GRIDPOINT system or newly launched HTC service (discussed in detail in Section 3.2), annual CPU utilisation of the HPCPOWER2 system declined from 79.8% to 56.39% over the course of 2013-14.

Usage of the 11-year-old 32-bit HPCPOWER system remained at a low level (just 10.8%) throughout the year, as most applications/programs now have to be run on 64-bit systems. The system is slated for retirement, and will be replaced by the new HPC cluster system to be installed by end of the year. The new system, which will provide aggregate computing capacity of 30-50 TFLOPS and comprise computer nodes powered by the latest multi-core CPUs, MIC co-processors, GPUs and a huge amount of memory, will give HKU researchers access to the latest HPC resources and technologies to meet their needs in computationally intensive research.





### 3.2 High-Throughput Computing (HTC)

ITS began offering a new HTC service to support research developments in March 2014. The HKU HTC service employs HTCondor, a job-scheduling system developed by the University of Wisconsin that is capable of delivering a research computing workload to computer nodes at distant locations. The HTC service is particularly useful to problems that are embarrassingly parallel, i.e. those that can be easily divided into smaller, independent sub-problems, each of which can be solved within a reasonable timeframe and with limited resources.

The current setup of the HKU HTC service comprises a Linux backend server and 235 Windows-based PCs located in the Learning Commons as computer nodes that run HTC jobs only when the Learning Commons is closed. As of 30 June 2014, roughly 4.9 million jobs accounting for 98,931 hours of CPU processing time had been run since the service's launch.

### 3.3 International Grid Collaboration and eResearch Facilities

HKU has long been a pioneer in grid computing development in support of advanced research and innovation in Hong Kong. ITS plays an active role in coordinating and promoting research collaboration with a range of international grid computing organisations, including the China National Grid (CNGrid), European Grid Infrastructure (EGI), Pacific Rim Application and Grid Middleware Assembly (PRAGMA), Institute of High Energy Physics and Chinese Academy of Sciences (IHEP CAS). In relation to such collaboration, it participated in the EGI Grid, CNGrid and PRAGMA Grid/Cloud consortia in 2013-14.





4

## **Promoting Knowledge Exchange and Demonstrating Leadership in Communities across the Region**

## 4.1 Information on Use of Central IT Services

ITS maintains various channels to inform users of the latest news and developments concerning HKU's central IT services:

- ITS website (<http://www.its.hku.hk>)
- Bimonthly IT Services News (<http://www.itservices.hku.hk/its-news>)
- IT Services Guide targeting new staff and students, which is updated every year to provide a quick overview of our services and contact details (<http://www.its.hku.hk/documentation/handbook/its-guide/2014-2015>).

**INFORMATION TECHNOLOGY SERVICES**  
The University of Hong Kong

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### Information Security Awareness Week

**Exhibition**  
Run Run Shaw Podium  
Nov 24 - 28 (Mon-Fri)

**Seminar**  
T6, Meng Wah Complex  
Nov 25 & 27 (Tue & Thur)  
1430 - 1600

#### What's New

- Seminars on Web Accessibility on November 10 and November 17 (Oct 28, 2014)
- Teaching and Learning Seminar and Showcase Exhibition (Oct 15, 2014)
- New Opening Hours of Chi Wah Learning Commons and The Oval (August 23, 2014)
- Training News

#### Useful Information

- HKU Portal
- Connecting to the HKU Network
- Email Service
- Learning Management System - Moodle
- Learning Environment (classrooms, learning commons)

>> More Information for Students

>> More Information for Staff

#### IT Services News

- Seminars on Web Accessibility on November 10 and November 17
- uPrint Now Supports Android Platform
- Teaching and Learning Seminar and Showcase Exhibition
- Lecture Theatre Refurbishments Summer 2014
- Information Security Awareness Week 2014/15 on November 24-28, 2014
- New WiFi Connectivity at the Centennial Garden of Centennial Campus

#### Maintenance Notice

- 2014/11/11 08:00 (Tuesday) - 2014/11/11 08:15 (Tuesday) - Maintenance of Lecture Capture Service
- 2014/11/09 00:00 (Sunday) - 2014/11/09 01:00 (Sunday) - Scheduled Maintenance of HKU IP Phone System (Phone Numbers 3917-xxxx) on 9 November 2014 (Midnight to 1:00am)

#### Security Alert

- 2014/10/14 (Tuesday) - Microsoft Updates for Multiple Vulnerabilities
- 2014/09/09 (Tuesday) - Microsoft Updates for Multiple Vulnerabilities

#### Spam Email Report

- 2014/11/11 (Tuesday) - Security Alert
- 2014/11/11 (Tuesday) - UK Major Incident Procedure Manual

#### Service Suspension

- 2014/11/11 07:45 (Tuesday) to 2014/11/11 18:00 (Tuesday) - Resumption of Voicemail service for telephone numbers with prefix 2857, 2859, 2241 and 2219

#### Tags

Password Policy Forms Print Utilities Universities WiFi Maintenance Notice Forgot Portal PIN Study Rooms FAQ Chi Wah Learning Commons Email Quota MSSA Opening Hours HKUVPN2 uPrint Service Remote Access HKU Portal for new Staff



## 4.2 ITS Wins Gold Award in Web Accessibility Recognition Scheme 2014

The ITS website ([www.its.hku.hk](http://www.its.hku.hk)) won a Gold Award in the Website Stream of the 2014 Web Accessibility Recognition Scheme co-organised by the HKSAR Government's OGCI and EOC. This was just one of the five Gold Awards received by the University during the reporting year, with the other four awards received by the CPAO.

The aim of this scheme is to show appreciation to organisations that have made their websites and mobile applications accessible, thereby encouraging the community-wide adoption of accessibility designs that facilitate access to online information and services by all segments of the community, including persons with disabilities.



### 4.3 Technical Support for University's Website and Central Web Server

ITS provides ongoing technical support to the CPAO, which maintains the University's website, and also offers advice to departments maintaining their own websites on the ITS Cloud platform. A seminar on web accessibility was held in November 2013 to raise awareness of this important subject and to refresh departmental web administrators' understanding of best practice in the design of barrier-free accessible websites.

### 4.4 Coordination Group for Departmental PC/Network Support

The Coordination Group for Departmental PC/Network Support is a collaborative channel of 171 PC support staff from various departments and ITS through which members share knowledge and experiences of PC and network support at the departmental level. ITS acts as the Group coordinator, and disseminates useful and sometimes urgent information to members concerning security and software updates and alerts of computer virus attacks and security vulnerabilities and associated precautionary actions.

Seminars on PC/network technologies and service support, some delivered by external speakers, are regularly organised throughout the year to inform Group members of best practice in PC/network support and the latest trends in IT technology. A list of the seminars held in 2013-14 is given in Table 1.

Table 1: Seminars Held for Departmental PC/Network Support Coordination Group

Date	Title	Speaker(s)
13 Sep. 2013	Applying A Major Change on WEBMAIL	Mr Charles Y.W. Cheung and Mr Ricky Chung, ITS
13 Sep. 2013	University-wide Data Loss Prevention Solution	Mr John C.C. Lam, ITS
18 Oct. 2013	Promotional Offers on ITS Cloud VM services	Mr Frankie Cheung, ITS
18 Oct. 2013	Introducing New Video Conferencing Infrastructure to HKU	Mr Kenneth KY Yip, ITS
14 Nov. 2013	Microsoft Windows 8.1 and Internet Explorer 11 Microsoft Hong Kong Ltd	Mr Steven Lau,
7 Feb. 2014	HKU Server Compliance Management	Mr Charles Y.W. Cheung and Mr Jacky Pang, ITS
21 Mar. 2014	Microsoft Server 2012 Microsoft Hong Kong LTD	Mr Steven Lau,
25 Apr. 2014	Rolling out Server Compliance Management Agents to Departments ITS	Mr Charles Y.W. Cheung and Mr Justin Law,
20 Jun. 2014	Update on HKU Server Compliance Management	Mr Jacky Pang, ITS
20 Jun. 2014	Bring Your Own Device (BYOD) Microsoft Hong Kong Ltd	Mr Steven Lau,

5

## Enabling IT Platform (Business Systems)





## 5.1 Student Information System (SIS)

The SIS Project Team drew up the 'SIS Roadmap until December 2016' in Spring 2013. The 2013-14 academic year saw the first implementation of this three-year plan, and we are currently progressing on schedule. The most significant and challenging project involved in the plan is the Degree Audit (DA) project. During the year, we evaluated three potential packages used in the higher education sector (one of which is the DA component in the current SIS PeopleSoft Campus Solutions system) to determine which can best fulfil the flexible yet demanding system requirements of HKU's new four-year curriculum. After careful consideration of these packages and the solutions adopted by HKU's sister institutions, we selected u.achieve from the CollegeSource package in early 2014 and then launched the DA project in May 2014.

In parallel with the sourcing of the package for the DA project, the SIS Project team is studying the regulations for more than 50 undergraduate degrees and the requirements for about 200 majors and minors. Finding a structural way to map these regulations and requirements (which are usually in narrative form) for transcription and definition in the DA package is not a straightforward task, but is key to the DA project's success. HKU faculties were invited to confirm their requirements by means of a standard HKU-specific template, which greatly helped to clear up any ambiguities and clarify missing details. We are planning a pilot run of the first batch of DA reports in June/July 2015 when the new cohort of undergraduates (UGs) will have completed their third year of studies.

To help the new UG cohort to apply for jobs and higher-degree studies more effectively, the SIS Project Team is developing a new performance report, the Academic Attainment Profile (AAP). Unlike traditional transcripts, the AAP will show analytical figures on students' performance and relative standing with peer students in the majors and the degree honours, it will also feature data on their advanced standing, credit transfers and exemption credits. We have coordinated with the Registry and faculties to determine the appropriate level of complexity and to finalise details of definitions, handling and report layout.

Since 2010, when SIS was first implemented, different fee calculation modules have been used for UGs and research postgraduates (RPGs). Although both modules run on the PeopleSoft platform, that for UGs can be supported by a vanilla system, whereas the RPG module is a bespoke module developed by external consultants. This heterogeneous approach is not satisfactory. The SIS Project Team thus decided that the new business requirement to levy different fees on RPGs admitted in different academic years constituted a good opportunity to revamp and increase the flexibility of the HKU Fees System to allow it to support both UG and RPG fees. ITS completed the development work in early 2014, and system implementation is targeted for the second semester of the 2014-15 academic year.

The University encourages all UGs to participate in exchange study programmes at overseas universities to broaden their horizons, and allows credit transfers for the exchange studies undertaken. To support student applications to such programmes, the SIS Project Team has created a workflow system comprising all application and approval interfaces for students, teachers and faculty administrators. The design has been worked out in cooperation with the Registry and faculties, and the new system is targeted to begin supporting overseas exchanges in the 2015-2016 academic year.

The screenshot shows the HKU Portal website. The main content area displays a notice from the Estates Office (Project Division) regarding the West Island Line (WIL) Project. The notice is titled 'West Island Line (WIL) Project - Temporary Traffic Management Scheme at Pok Fu Lam Road' and is addressed to 'Dear Colleagues and Students'. The notice informs that the University is in close liaison with the MTRC and is carrying out a Temporary Traffic Management (TTM) Scheme at the Pok Fu Lam Road (near the elevated road next to the Belcher's) for the purpose of MTRC's renovation work for footbridge leading to the HKU Continental Campus. It states that during the road closure, two-way traffic at the Pok Fu Lam Road and vehicle passage at the Elevated Road between the Pok Fu Lam Road next to the Belcher's and the HKU West Gate vehicular entrance will be maintained. The pedestrian walkway adjacent to the MTRC's worksite at Pok Fu Lam Road will also remain open. The MTRC confirmed that the TTM will be implemented on the following stages: Stage 1: 04 Nov 2014 - 05 Nov 2014 (12 am - 5 am), Stage 2: 06 Nov 2014 - 07 Nov 2014 (12 am - 5 am), Stage 3: 08 Nov 2014 - 09 Nov 2014 (12 am - 5 am). For details, please refer to the official notice from MTRC at the link below: [http://www.mtr.com.hk/eng/infocentre/PR/notice\\_TTM\\_PFL%20Road\\_TTMS\\_turbidite%20renov%20work%20Nov%202014.pdf](http://www.mtr.com.hk/eng/infocentre/PR/notice_TTM_PFL%20Road_TTMS_turbidite%20renov%20work%20Nov%202014.pdf). During stage 1 (4 and 5 Nov 2014) of the TTM, temporary passage will be provided to vehicles entering Pok Fu Lam Road from the elevated road. Proper traffic signs and staff will be arranged to assist road users. Please note that it is MTRC's responsibility to inform the public including HKU Community of the captioned arrangement, we hope this note will provide you the necessary information and keep you well informed. For enquiries, please contact MTR Projects Hotline at 2993 3333. Posted on 04 Nov 2014. Comments or enquiries can be sent to: [estates@hkustats.hku.hk](mailto:estates@hkustats.hku.hk).

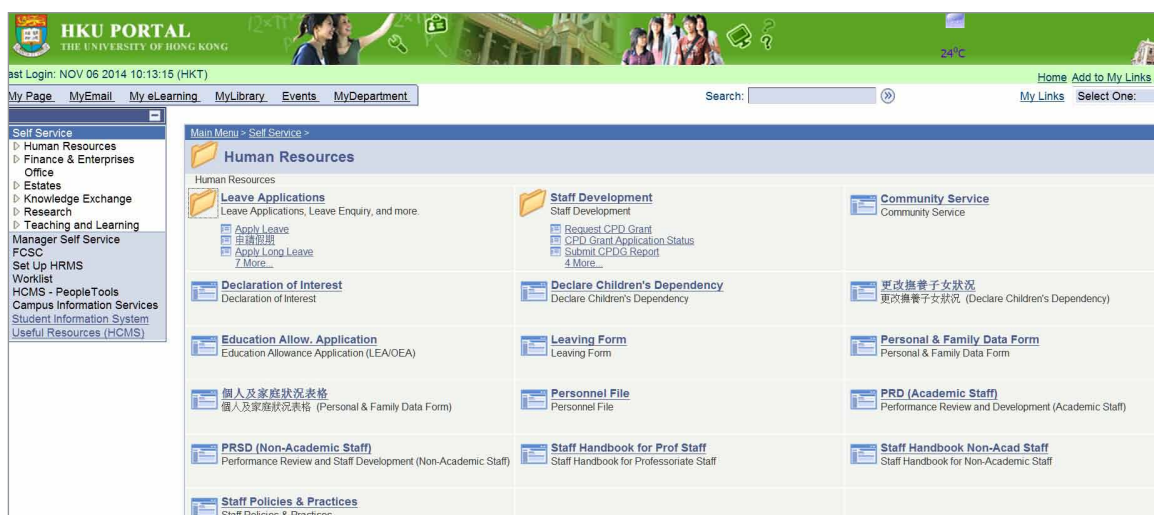
## 5.2 Human Capital Management System (HCMS)

### 5.2.1 PeopleSoft HCMS Services

During the reporting period, a number of enhancements were made to the HCMS to improve its functionalities and user-friendliness, to fix various outstanding issues, and to align it with new business needs. The major enhancements made are as follows.

- Several enhancements were made to facilitate Financial Clearance and Staff Commitment operations. These included a revamp of the Staff Cost Projection Report with on-cost calculations and a downloadable data file to facilitate staff cost analysis by departmental administrators, enhancement of the Funding Body Report to allow FEO enquiries, and enhancement of the General Ledger Interface process to improve performance.
- The Assign Delegation Form used by department heads/deans was redesigned to render it easier to use and more efficient. The new form was released in July 2014.
- The e-Personal and Family Data Form and Acting Appointment and Contract Renewal functions were enhanced to support changes in business requirements and to improve workflow efficiency.
- A new Base Benefits medical plan was established, with various corresponding functions improved as necessary.
- A number of reports were created to help human resources (HR) administrators to reconcile data and to alert them to possible abnormalities. They included reports on Workforce Administration and Base Benefits management.
- A new Annual Leave Summary report was launched to give leave administrators a consolidated view of the leave information of all staff members in their departments. Both this report and the Long Service & Severance Payment report are now facilitating annual accounting preparations.
- Major exercises held during the year included the Cost of Living Adjustment (COLA) exercise for eligible staff members and postgraduate scholarship holders and the annual tax return exercise.
- Several global payroll functions were reviewed, including the retrospective limit for payroll calculation and gratuity provisions, with appropriate enhancements made to improve system performance, accuracy and availability.
- System changes were made to cater for the increased minimum and maximum income levels for Mandatory Provident Fund (MPF) contributions in conformance with the MPF Schemes Ordinance.
- In line with the implementation of a new financial information system by HKU SPACE, a new interface was created within the global payroll module to capture the remuneration information of SPACE employees for taxation purposes.
- Maintenance page features were implemented in all self-service functions to allow information to be promptly shown to end-users during system maintenance periods.

A major project to source an Application Change Management solution for the development of the PeopleSoft HCMS was carried out in 2013. The third-party software package Phire was adopted to support workflows designed for PeopleSoft program migration. The solution was deployed in July 2013, with a number of benefits realised in the intervening months, including better version control, easy program migration under tight security controls, and segregation of duties.



## 5.2.2 HR and Related Services

As in past years, a number of HR systems were improved in 2013-14 in preparation for major exercises. For example, the Performance Review and Staff Development (PRSD) and Performance Review and Development (PRD) systems were enhanced to support the 2013 reward allocation exercises and 2014 review exercises. In addition, various administrative processes were enhanced and system performance improved to ensure a better user experience.

All HR systems developed in-house were originally designed to cater for 5-digit staff numbers, which are now approaching their limit. To allow future expansion, these systems needed to be upgraded to handle 8-digit staff numbers, as the HCMS was equipped to do. Accordingly, all HR systems (i.e. the PRSD, PRD/Academic Portfolios of Achievement [APA], Declaration of Interest, Staff Search, Smartcard Issuance, Tenure/Promotion and Tracking, and Long Leave systems) were so enhanced during the reporting period.





### 5.3 Research Services

Throughout the year, ITS provided a range of professional services to the Research Services Section of the Registry to enhance several core research administration systems. They included the following.

- In support of the 2014 University Grants Committee UGC Research Assessment Exercise (RAE), we developed the HKU Research Assessment Exercise System (HKURAES) to capture the research output data of eligible researchers, with Cost Centre Coordinators (CCC) assisting in recording research grants, esteem measures and research strategy statements. The CCCs and Registry's Research Services Section were also supported through administrator functions and management reports to complete data preparation. The HKURAES ensured that all research output and relevant information was submitted to the UGC on schedule (in December 2013) and in accordance with the UGC-defined format. All research output was made accessible to RAE assessors during the review period, and the JUCC and ITS jointly supported UGC-defined network performance.
- The Research and Conference Grants Administration System (RCGAS) was enhanced to resolve compatibility issues with new versions of browsers under various operating systems such as Mac/Safari and Windows 8/Internet Explorer11, and the RCGAS server was successful relocated from an off-campus data centre to the main campus.
- The Postgraduate Scholarships System (PGS) was enhanced to update all letter and e-notification templates to support the COLA exercise.
- The Research Output System (ROS) was enhanced for greater integrity checking by enabling date of acceptance and deletion prevention, and interface files for the HKU Scholars Hub were upgraded with a new interface file format.
- The Research Assistant Professor and Post-Doctoral Fellow (RAP/PDF) Scheme Management System was enhanced to modify summary of bid reports, unsuccessful letter templates and the format of Principal Investigator (PI) award reports.

### 5.4 Finance Services

#### 5.4.1 Oracle Financials and Related Services

Another major project launched during the year was the Oracle Financials Upgrade project, which is being implemented in two phases. Phase 1, which is due for completion in the last quarter of 2014, involves a study of the upgrades needed to the Oracle Financials system and a review of related business processes. The results will help HKU to make informed decisions concerning upgrade implementation in Phase 2. The Oracle Financials upgrade will support new business processes that better serve the University's financial service management needs and enhance efficiency. The current version of Oracle Financials will be retired, and will be replaced with up-to-date software, technology and hardware in support of the new financial system.

To ensure ongoing service improvements, various enhancements have been made to the FEO's main and associated financial systems, including the Financial Information Enquiry System (FIES) and Financial Functions for Operational Staff (FFOS) system to cater for the enforcement of accounting rules, automation of operational tasks, and streamlining of business operations with other IT systems.



### 5.4.2 Outside Practice Management Services

The University Senate and Council have approved procedural changes in accordance with Independent Commission Against Corruption (ICAC) guidelines. In particular, Outside Practice Management Services have undergone a major overhaul to support a two-level approval mechanism coupled with a delegation function and conflict detection logic. Owing to the complex changes involved, extensive performance testing and tuning of the major system functions has been carried out to ensure a satisfactory user experience.

## 5.5 Estates Services

ITS provides ongoing professional services to the Estates Office, including oversight of the Computer-aided Facilities Management (CAFM) system used to manage the University's facilities and assets. To incorporate the maintenance work performed by outsourced integrated facilities management (IFM) companies with the existing maintenance service provided by the Estates Office, the building operations module of the CAFM system was recently upgraded to support the workflow of both new and existing maintenance work orders. The module now automatically distributes work orders to an IFM company or the Estates

Office based on the assignment of pre-set work orders. In June 2014, the enhanced system was launched in several major campus areas, including the Sassoon Road Campus and Senior Staff Quarters, and its use was extended to the Centennial Campus in August 2014.

Preparatory work and feasibility studies for a major upgrade to the current CAFM software is ongoing. Potential vendors for the new-generation software are currently being explored, and more detailed information on the upgrade path of the current CAFM system is being collected. The tendering process will begin once the project has been approved by University management.

A Space Management Information System (SMIS) is being developed to offer members of the University's senior management team (SMT) a user-friendly graphical user interface allowing them to obtain space information through online enquiries and engage in reporting and scenario planning to rationalise and reallocate space utilisation for better space management across the university. The online enquiry and reporting modules of the SMIS have been implemented, and the scenario planning module is currently undergoing final testing and review.



## 5.6 Centre of Development and Resources for Students (CEDARS)

The annual University Financial Assistance (UFA) exercise has been completed, with changes duly made to accommodate funding requirements arising from family financial circumstances and other special requirements. New enquiry facilities have also been developed to allow easier checking of the main UFA exercise applications and emergency cases.

## 5.7 Knowledge Exchange Services

The Knowledge Exchange Activities System (KEAS) has been revamped to support the capture of additional knowledge exchange (KE) activities in a more structured and detailed way and to allow academic staff to assign proxies to assist them in data input. For the 2014 PRD, a two-way interface was developed between the KEAS and PRD/APA system. This interface enforces a single point of data capture at the KEAS, thereby supporting academic staff with up-to-date KE activities in the PRD/APA system.

In addition, the administrative interface of the Knowledge Exchange Office (KEO) was also enhanced to allow the management of new user roles and KE reserved activities, supported by enriched search criteria and download features. Interface files for the Management Information

Unit (MIU) were upgraded to provide additional information on KE activities to support the MIU in compiling reports for the UGC in common data collection format (CDCF).

## 5.8 Smart Card Project

The 2013 student card issuance exercise was successfully completed in September 2013, following careful planning and a streamlined deployment procedure. In addition to supporting the smartcard issuance offices, ITS also provides support for the classroom smartcard access control systems implemented in the main and Centennial campuses. A new web-based Facilities Access Card membership system has also been developed and launched for the HKU Libraries and Institute of Human Performance, replacing the previous client server mode system.

With the depletion of unique four-byte MIFARE smartcard serial numbers anticipated by the end of 2014, ITS is engaged in forward-planning to replace the current HKU smartcards with seven-byte MIFARE standard numbers in future. We have commenced a preliminary study on seven-byte smartcard technology, and developed a security model for the future system.





## 5.9 HKU Portal

The HKU Portal has become a platform for staff and students to access the large number of information services provided by the SIS, HCMS and other web-based applications in performing their daily tasks. The central authentication service provides a single sign-on (SSO) function that gives users access to a wide range of information services, including the email system, Moodle LMS, HKU Event Management System (HKUEMS), Library services and My Faculty/My Department websites.

The HKU Portal is supported by a set of servers that run on a powerful and reliable virtual machine (VM) cloud, allowing the automatic and rapid recovery of any services affected in instances of failure.

Thanks to the large number of additional services put into production, 2013-14 saw user access to the Portal rise to roughly 1.2 million visits per month, a 1.9% increase over the previous academic year. Table 2a presents statistics on staff and student access to the HKU Portal.

Table 2a: Staff and Student Access to HKU Portal (July 2013-June 2014)

Month	Access by Staff (No.)	Access by Students (No.)
Jul 2013	264,928	475,777
Aug	270,376	750,289
Sep	301,545	1,449,509
Oct	293,892	1,227,459
Nov	282,210	1,183,796
Dec	237,828	766,336
Jan 2014	275,834	976,473
Feb	249,579	906,618
Mar	283,758	1,032,726
Apr	274,346	1,040,853
May	280,028	790,264
Jun	266,510	420,687
Total	3,280,834	11,020,787

In addition to SIS and HCMS applications, ITS has also been developing web applications for various HKU departments, which are also accessible from the HKU Portal. One hundred and twenty-seven such applications were developed in 2013-14, with access instances totalling 442,045. The 10 most popular web applications developed by ITS for various departments accounted for 47.8% of all web applications accessed from the HKU Portal. These applications are summarised in Table 2b.

Table 2b: Ten Most Popular Web Applications Developed by ITS for Other Departments on the HKU Portal (July 2013-June 2014)

Web Applications Developed by ITS	Access (No.)	% of Total
Performance Review and Staff Development (ESS)	47,018	10.6%
Performance Review and Staff Development (MSS)	25,091	5.7%
Performance Review and Development (ESS)	23,435	5.3%
CEDARS Facilities Booking	22,210	5.0%
Student Admin System	19,601	4.4%
Non-JUPAS Admission System	17,028	3.9%
Performance Review and Development (MSS)	15,070	3.4%
TPG Online Applications	14,992	3.4%
HKU RAE System	13,584	3.1%
Research Studies Progress Review	13,482	3.0%
Total	211,511	47.8%

## 5.10 HKU Mobile Applications

The HKU Mobile Application (HKU App) was released in December 2012, with several new versions with new functionalities released since then. For example, version 1.3 was released in February 2014 and version 1.4 in August 2014. The HKU App is a joint effort of CEDARS, the CPAO, the Estates Office, University Libraries and ITS to improve the dissemination of information to University students, staff and visitors. After installing the HKU App on an Android or Apple iOS mobile device (smartphone or tablet), users can readily locate the latest campus information and online services. ITS has built a central authentication service security infrastructure allowing all mobile applications to be accessed with an SSO.

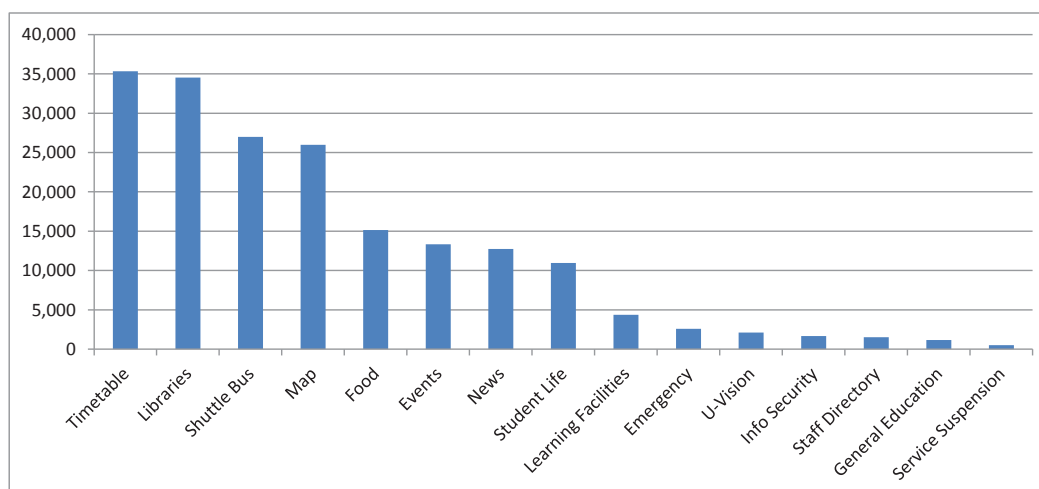
Five modules, namely, General Education, Information Security, Learning Facilities, Service Suspension and Staff Directory, were added to the HKU App in 2013-14, bringing the total number of modules to 15.



Modules	Developed by
Food, Student Life, General Education	CEDARS
News, U-Vision	CPAO
Maps, Emergency Contacts, Shuttle Bus	Estates Office
Library Information	University Libraries
Events, Information Security, Learning Facilities, Service Suspension, Staff Directory, Timetable	ITS

There were 12,634 downloads of the HKU App in 2013-14, 62% to iOS devices and 38% to Android devices, a 17% increase from the 10,804 downloads seen last year. The three most popular modules are Timetable, Library Information and Shuttle Bus.

Chart 2: Access to HKU App by module (July 2013-June 2014)



## 5.11 HKU Event Management System (HKUEMS)

The HKUEMS has continued to see high usage rates by departments and student societies for event announcement and registration purposes. In 2013-14, 108 departments posted 5,145 event announcements on the HKUEMS, 2,912 of which made use of the online registration function and 440 of the online payment function. This year, the HKUEMS processed 90,110 user registrations for events. The departments find the reporting function added to the HKUEMS last year to allow them to report event statistics to the UGC particularly useful.

Table 2c: Usage Statistics for HKUEMS (July 2013-June 2014)

	Count	% increase over 2012-13
Departments Using HKUEMS	108	11.3%
Event Announcements	5,145	11.7%
Events with Online Registration	2,912	16.3%
Events with Online Payment Gateway	440	16.4%
Applicants Using Online Registration	90,110	12.7%

## 5.12 Bulk Email Service

ITS provides a bulk email service allowing departments to send notices and event announcements to all staff and students at once. As an auxiliary service, the bulk email service is also offered to the HKU Students' Union, which regularly send notices and event announcements to students on behalf of various student organisations.

In 2013-14, 167 departments and 134 student organisations made use of the service, with 8,333 bulk email requests and 190 million email messages processed. The number of bulk email messages sent increased by 8.2% compared with 2012-13.

It should be noted that the Development and Alumni Affairs Office has adopted a separate bulk email system to send bulk emails to alumni.

## 5.13 HKU Information Stations

The Estates Office has established six HKU Information Stations on the CWLC to display environmental data, and ITS helped to roll them out in November 2013, along with several new ITS-developed services. The most popular service is PC Availability (see Section 2.3).

Table 2d: Bulk Email Usage by Departments, Student Organisations (July 2013-June 2014)

Requests from departments to send emails to staff and students		Requests from student organisations to send emails to students	
No. of Requests	No. of Messages Sent	No. of Requests	No. of Messages Sent
6,649	162,964,938	1,684	26,807,503

# 6

## Enabling IT Platform (Underlying Infrastructure)





## 6.1 System Infrastructure and Service Development

During the year, ITS maintained 25 major central server systems, the service availability of which was maintained at an impressive level of 99.95% or above. The performance statistics for the individual systems are summarised in the subsections that follow.

The overall annual service availability statistics for the central computer server systems are summarised in Table 3a.

Table 3a: Annual System Service Availability (July 2013-June 2014)

System	Annual Availability	Total Downtime (Hrs)
HKUCC	100%	0
HKUCC1	100%	0
WorkSpace.hku.hk	100%	0
HKUSUC	100%	0
HKUSU1	100%	0
GRADUATE	100%	0
WWW	100%	0
HPCPOWER	100%	0
HPCPOWER2	100%	0
GRIDPOINT	100%	0
SMPSERVE	100%	0
HKUESD	100%	0
LMS (Moodle)	100%	0
HKUPORTAL	100%	0
HKUAP	100%	0
SIS	100%	0
HCMS	100%	0
ePortal System	99.97%	2.45
SWEB	100%	0
HKUAF6/HKUAF7	100%	0
INTRANET/UIS	100%	0
HKUAD	100%	0
HKUAF4/HKUAF5	99.99%	0.38
LIBRARY	100%	0
uPrint	100%	0



### 6.1.1 System and Service Infrastructure

As part of our ongoing efforts to improve data resilience, ITS has expanded the central storage infrastructure with additional capacity to cater for the growth and replication of data. To enhance services, solutions for a personal cloud storage system and document management system (DMS) have been evaluated, with follow-up tendering exercises carried out. Although the implementation plan for the DMS had to be postponed, a DMS solution was acquired in June 2014. The new DMS platform is expected to be ready for roll-out across the departments in 2015 after a pilot run to be completed by the end of 2014. Unfortunately, the 2013 tendering exercise found existing personal cloud storage solutions to be unaffordable and the technology relatively immature. Development was thus suspended until better alignment with the cloud service development direction can be achieved.

To improve the security configuration of network-connected systems within the campus network, implementation of a server compliance system was initiated in January 2014 to enforce the security standards instituted by ITS. This development is crucial for aligning the system configuration of networked servers to a known baseline configuration with reference to industry best practices. Other developments in this area include the migration of the communal printing system to uPrint and system upgrades to the webmail system supporting the legacy Unix mail system, HKUSUC mail system and University Information System (UIS) between September 2013 and May 2014.

#### 6.1.1.1 Capacity Upgrade of Central Storage

ITS started storage virtualisation through an IBM SAN Volume Controller (SVC) in 2008, and in 2012-13 extended it to the new computer room on the Centennial Campus to mirror critical business data across the computer rooms on the main and Centennial campuses. In 2013-14, ITS further strengthened data resilience by acquiring and installing two Hitachi Data Systems (HDS)

HUS VM storage units in the two computer rooms. Each HDS HUS VM unit is equipped with 100 TB nearline data capacity, and that installed on the main campus is equipped with an additional 50 TB online data capacity. Similar to the IBM SVC, HUS VM storage systems are configured with active data replication and automatically switch the data replication direction when site failure is detected. This upgrade is in line with our data resilience strategy, and will also enable us to choose between the two competing options in future storage upgrades.

#### 6.1.1.2 Server Compliance System

In view of two security incidents in 2012-13, ITS initiated a project to improve the baseline configuration of servers connected to the campus network in accordance with industry best practices. A solution was tendered in late 2013, with implementation kicking off in January 2014. Compliance rules for checking against ITS recommended standards were established for the most popular platforms such as Windows 2008 and Redhat/CentOS 6 at this stage, and a software agent will eventually be deployed on all supported networked servers. Once the compliance system is in place, system administrators and department heads will be informed of the compliance level with respect to both pre-defined rules and outdated patches. These developments are part of ongoing efforts to improve the overall security settings of all networked servers within HKU. Complementary measures to improve the system security level are in the planning stage, and will be implemented in the next few years.

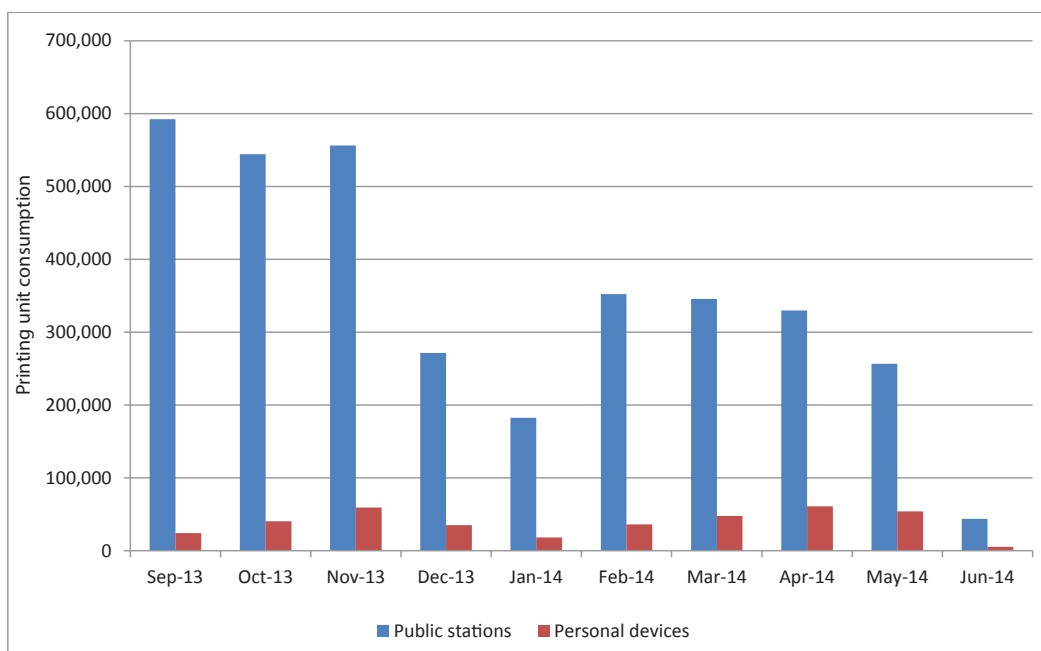
### 6.1.1.3 uPrint (Cloud Printing Service)

The uPrint system, which was introduced in September 2012 and runs on two VM servers, currently supports 15 multi-function devices (MFDs) and five added-value machines to provide printing, photocopying and quota top-up via Octopus services. Following the permanent closure of the central PC laboratories in August 2013, the five MFDs originally deployed therein were relocated to the new learning spaces in the Knowles Building, Sassoon Road Campus and faculty-based laboratories. Overall printing unit consumption decreased by about 10% in 2013-14 compared to 2012-13.



In November 2013, the uPrint service was further extended to support Mac OS (10.5 or above) and iOS devices. Of the printing volume amounting to about 96% of all printing unit consumption this year, about 10% was submitted from personal devices rather than public PC stations. Chart 3 summarises the monthly uPrint printing device distribution from September 2013 to June 2014. Mobility support is expected to be further enhanced for the iOS platform and extended to Android devices by the end of 2014.

Chart 3: uPrint Usage Device Distribution (September 2013-June 2014)



#### 6.1.1.4 Email Facilities

ITS provided email services to a user population of over 99,816 in 2013-14, including 4,320 undergraduate students, 2,803 postgraduate students, 12,620 staff and 80,819 alumni, excluding HKU Connect email users. Some users, postgraduate students and alumni in particular, have more than one identity, and thus the total population does not tally with the sum of all users. The systems that support email services for staff, current students and graduates are the HKUCC and HKUCC1, HKUSUC and HKUSU1, and GRADUATE systems, respectively. In addition, since its introduction in February 2012, 16,197 new graduate and 23,649 student accounts have been provisioned by the outsourced email platform HKU Connect. Of these, 1,123 student accounts were migrated voluntarily from existing in-house email systems. ITS also conducted a pilot test on the outsourcing of the staff email system to the Microsoft Office 365 platform in January 2014.

Similar to the trend in previous years, the percentage of virus-bearing emails remained at a low level of 0.08% in the reporting year, largely because the trend in email attacks has shifted from virus-infected messages to phishing messages. The number of spam messages filtered out in 2013-14 was 3.2 million, which also reflects a declining trend over the previous year.

#### 6.1.1.5 Email Use Statistics

In 2013-14, our central servers processed 132 million# email messages, some 12 million fewer than in 2012-13 as a result of the effectiveness of our anti-spam solution and increasing number of mailboxes hosted on the HKU Connect platform. Tables 3b and 3c present annual statistics on the number of email messages processed by these systems and the number of virus-infected email messages detected by our anti-virus mail gateways, respectively. Table 3d reports anti-spam statistics for the Ironport mail gateway, from which it can be seen that about 59% of incoming mail connections were rejected. Of the remaining 41% processed, more than 6% were quarantined as spam messages and did not reach our central mail servers.

Table 3b: Email Processing (July 2013-June 2014)

	HKUSUC	HKUSU1	HKUCC	HKUCC1	GRADUATE
Total	2,960,896	8,238,193	39,539,200	32,302,294	48,714,282

# In the central servers, a bulk mail delivered to a group of people is counted as one message in the statistics. Hence, the number differs from the number of emails received by users.

Table 3c: Virus-infected Emails (July 2013-June 2014)

Combined Statistics for Central Email Servers			
	Total Emails No. of Messages	Viruses No. of Messages	% of Messages
Total	131,754,865	108,930	0.08%



Table 3d: Incoming Spam at Ironport Mail Gateway (July 2013-June 2014)

	Message Connections	Connections Rejected due to Poor Reputation or Invalid Recipients		Received Messages	Messages Detected as Spam	
	No. of Connections	No. of Connections	% of Connections	No. of Messages	No. of Messages	% of Messages
Total	131,670,368	77,386,366	58.77%	54,284,002	3,279,248	6.04%

#### 6.1.1.6 GRADUATE Email System (x64 Linux VM)

The GRADUATE email system runs on an x64 Linux VM that supports email services for 80,819 University alumni, and processed over 48 million email messages in 2013-14. As new graduate accounts are provisioned by the new HKU Connect platform, the user population of the GRADUATE email system is expected to remain steady. The migration of existing accounts to the Connect platform is in the works, and the GRADUATE system will thus be phased out over the coming years.

### 6.1.2 Systems for Academic Support

#### 6.1.2.1 HKUCC (x64 Linux VM)

The HKUCC system is the primary server supporting legacy email services for University staff members, and has been run on a Linux VM since September 2011. Following the mail server consolidation initiative endorsed by the IT Committee, users of this legacy Unix mail server will be migrated to HKUCC1 in batches, and the system will be retired by the end of 2015. Due to a behavioural change after the upgrade of the anti-virus engine in March 2014, the virus scanning configuration had to be adjusted, which resulted in a nearly 200% increase in processing power over 2012-13.

#### 6.1.2.2 HKUCC1 (Microsoft Exchange 2007 System for Staff)

The HKUCC1 system that will gradually replace the legacy Unix email servers provides users with advanced collaborative features such as calendar sharing, task lists, and email synchronisation with smart phones or mobile devices. The system is based on high-availability architecture with 10 Intel-based blade servers installed in two blade chassis for maximum redundancy and seven mailbox VM servers. With the default disk quota increasing to 5 GB, there were over 11,931 user mailboxes consuming 9,629 GB of disk space as of June 2013, accounting for a 50% increase in disk usage over the previous year. ITS also plans to upgrade the Exchange 2007 system platform to the latest Exchange 2013 platform to keep the system up-to-date with the latest available technology and refresh some of the underlying hardware. The new platform will be put into service in phases until the end of 2014.

#### 6.1.2.3 Workspace.hku.hk – Central SharePoint System (SharePoint 2010 Server for Staff)

The Central SharePoint system was launched in December 2011 as an intuitive collaboration platform for experience sharing within the University community. The system is based on the ITS cloud infrastructure and adopts a multi-tenancy implementation approach to afford full delegated administration rights to departmental administrators. The number of site collections increased from 234 to 259, with a greater than 70% increase in disk storage, in 2013-14.

#### 6.1.2.4 HKUSUC (IBM eServer p5 550 System and Linux VM)

The HKUSUC system is dedicated to supporting student email services, and was migrated from an IBM cluster of two IBM eServer p5550 servers to a Linux VM in December 2013. As of June 2013, about 400 users remained on the system, although the tentative plan is for all remaining users to be migrated to the HKU Connect platform by the end of 2014, after which the system will be retired. This plan aligns with the development direction of all student/alumni email services converging to the HKU Connect platform.

#### 6.1.2.5 HKUSU1 (Microsoft Exchange 2007 System for Students)

The HKUSU1 system is an equivalent Exchange messaging platform for students, with improved collaborative features such as calendars, task lists, and smart phone or mobile device synchronisation support. With availability of the outsourced HKU Connect platform since 2012, new student mail accounts are now provisioned by that platform. Accordingly, the number of HKUSU1 users decreased from 7,500 to 6,822 over the course of 2013-14. Plans are under way to migrate the remaining 6,822 user accounts to HKU Connect, and it is anticipated that the system will be decommissioned by 2015-2016 at the latest.

#### 6.1.2.6 WWW (Linux VMs)

The University's homepage now runs on several Linux VMs with load balancers, and centrally maintained and departmental websites are hosted on other web server clouds. The system remained very stable throughout the year, and IPv6 (the next-generation addressing scheme) was enabled for the University's main website in February 2014.

#### 6.1.2.7 SMPSERVE (Dell R900 System)

The SMPSERVE system was set up to support general purpose computing for teaching, learning, and research activities that are not suitable for the grid or the parallel HPCPower/HPCPower2/Gridpoint infrastructure. With the planned upgrade of HPC facilities, it is anticipated that the system will be eventually replaced by the new system(s) in the coming upgrade exercise.

#### 6.1.2.8 HPCPOWER (IBM xSeries PC-Cluster System)/HPCPOWER2 (IBM BladeCenter HS21 PC-Cluster System)

The primary central research computing support facilities are the 356-core 32-bit HPCPOWER Linux cluster system (since 2003) and 192-core 64-bit HPCPOWER2 Linux cluster system (since 2008). Both systems support computer-intensive research in such departments as Chemistry, Physics, Statistics and Actuarial Science, Engineering, and Medical Sciences.

The annual usage statistics for the HPCPOWER and HPCPOWER2 systems are reported in Table 4a. Both systems were very stable, with high levels of system availability, except for a short period of service downtime in December 2013 because of necessary electrical maintenance in the server room. The average CPU utilisation of the HPCPOWER and HPCPOWER2 systems was 10.8% and 56.4%, respectively, in 2013-2014. The HPCPOWER system is scheduled for retirement, and slated for replacement by a new heterogeneous cluster system by the end of 2014.

#### 6.1.2.9 GRIDPOINT System (Dell M1000e/IBM BladeCenter-H Grid System)

The GRIDPOINT system provides services for advanced research with greater demand for computing resources. As shown in Table 4a, the system was highly stable, with almost 100% service availability, except for a short period of service downtime because of air-conditioner maintenance in July 2013 and the Haking Wong Building asbestos debris removal work in January 2014. The average system utilisation of the GRIDPOINT system increased from 63.6% in 2012-13 to 67.2% in 2013-14. Owing to instability in the cooling system of the laboratory that houses it, the GRIDPOINT system has to be operated at reduced capacity from time to time for cooling system maintenance. Annual total CPU consumption therefore recorded only a slight increase, even though the demand for computing power continued to rise.

Table 4a: HPC Cluster System Annual Utilisation (July 2013-June 2014)

System	Total no. of User jobs	CPU time (days)		System up time (hrs)	
HPCPOWER (356cores)	2,244	13,891.84	10.78%	8,741.00	99.78%
HPCPOWER2 (192cores)	8,407	39,388.55	56.39%	8,735.00	99.71%
GRIDPOINT (1216cores)	29,667	296,563.04	67.19%	8,701.00	99.33%

Chart 4b: Annual Number of User Jobs for Research Computing Facilities

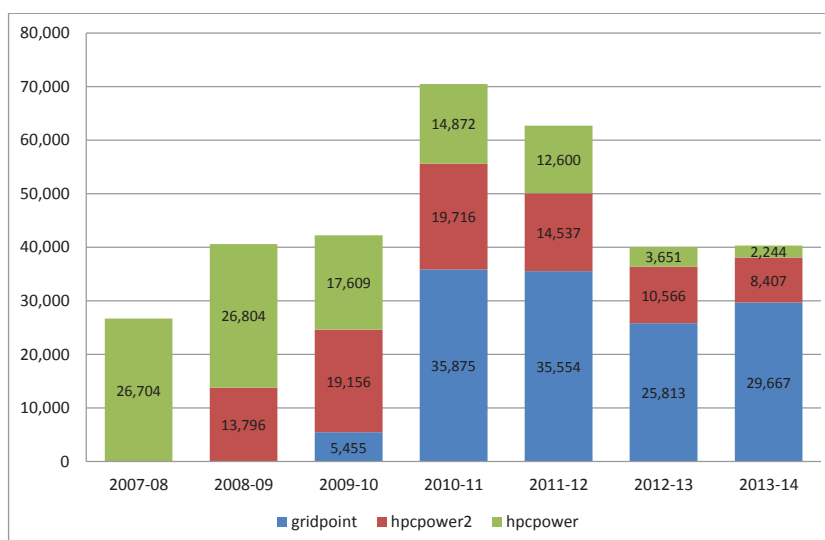
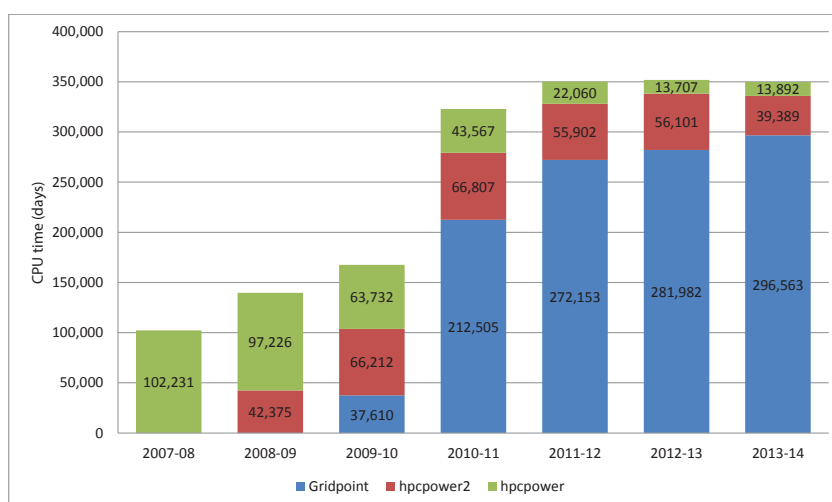


Chart 4c: Annual CPU Time for Research Computing Facilities





#### 6.1.2.10 HKUESD (IBM Power 550 System)

The HKUESD system is supported by a pair of IBM Power 550 servers with a high-availability configuration and serves the University's HKUESD applications. Following introduction of the HCMS in April 2011, some of the system's functions were migrated to the HCMS. However, those not covered by the HCMS, including the PRSD and PRD, remained on the system. The 2013-14 academic year saw a dramatic increase in annual CPU utilisation, a rise of over 150%, compared to 2012-13. As the HKUESD system has been in use for six years, a system upgrade is planned in the coming year to refresh both the hardware and software.

#### 6.1.2.11 Moodle LMS System (Linux VMs)

The Moodle LMS, which is supported by nine Linux VMs, became the University's sole eLearning system in September 2012. With the growing popularity of online courseware and introduction of new features/plugins through the annual software refreshment exercise, aggregate annual CPU utilisation increased by over 180% compared with 2012-13.

#### 6.1.2.12 HKU Portal (Linux VMs) and ePortal (HP rx8640 partitions/IBM x3650 servers, HP BL460c servers)

The HKU Portal, which runs on the ITS cloud, remains the University's only SSO authentication platform for web-based applications. As the system software has been in use since the launch of the first-generation HKU Portal in 2003, software refreshment is planned to improve the SSO authentication capabilities and compatibilities.

The ePortal infrastructure is configured in a three-tier (database, application and web) structure with high-availability components in each tier. Aggregate annual CPU utilisation for 2013-14 increased by more than 90% compared with the previous year.

#### 6.1.2.13 ITS Cloud (Cloud Management System)

The ITS Cloud is the University's private cloud platform, providing HKU departments with an automated server-hosting platform in a virtual environment. HKU departments can subscribe to a self-customisable virtual server through the ITS cloud portal according to their individual needs. Through the cloud portal, departmental staff can subscribe to a VM package on a Linux or Windows Server system with a pre-defined small, medium or large size and acquire additional CPU, RAM, and disk space at additional cost. A new one-month subscription plan with a revised subscription rate was made available on 1 October 2013. Those subscribing to six-month or longer plans enjoyed a promotional 10% discount until 1 April 2014.

The current subscription statistics for ITS Cloud are as follows: 89 VM, 232 vCPU, 471 GB memory and 13.55 TB storage. The number of new (or extended) VM subscription requests more than doubled between 2012-13 and 2013-2014, rising from 43 to 89. It is clear that the service is well received by the HKU community.

### 6.1.3 University Administration Systems

#### 6.1.3.1 HKUAP (IBM p710 PowerVMs) and HCMS (HP rx8640 partitions, HP BL460c servers and HP DL380 server)

The HKUAP system is the main server supporting all University administrative applications not provided by the HCMS, and it also includes a data exchange platform between enterprise resource planning (ERP) and non-ERP applications. Annual CPU utilisation underwent only a slight increase of 13% partly because of database consolidation in the UIS upgrade exercise.

The HCMS, which is configured with a high-availability three-tier server architecture, was launched in April 2011 as the University's main administrative platform. Its aggregate monthly usage statistics for 2013-14 were roughly the same as those in 2012-13.

#### 6.1.3.2 SWEB (p710 PowerVMs and Linux VMs) and SIS (HP rx8640 partitions, HP BL460c servers)

The SWEB system was the primary system supporting student-related web applications before the launch of SIS. Its role has now shifted to that of a supplementary system for SIS, providing functions not implemented in that system. In addition, the SWEB system also hosts the University Extranet website. Annual CPU utilisation declined 70% after the upgrade exercise in April 2013 owing to advancements in processor technology.

SIS has the same high-availability hardware/software infrastructure as the HCMS and ePortal. Supporting student-related activities, the system is equipped with abundant computing resources to ensure smooth operation at peak loads during prime periods. Aggregate annual CPU increased by 19% compared with the previous year, with peaks coinciding with the course enrolment periods in the first and second semesters.

#### 6.1.3.3 University Information System (UIS) (IBM eServer p5 520 Systems; p710 PowerVMs and Linux VMs)

The UIS supports all UIS and Intranet applications, and was upgraded from a high-availability system based on two pairs of IBM p5 520 servers to the ITS cloud infrastructure in February 2014. Annual CPU utilisation declined 15%, with a substantial decrease seen from March 2014 onwards owing to the use of new-generation processors.

#### 6.1.3.4 HKUAF6 and HKUAF7 (IBM eServer p5 550 System)

HKUAF6 and HKUAF7 are the two IBM p5 550 servers supporting the University's financial applications. They handle the general ledger, purchasing and payment, and fixed asset functions using the Oracle Financials package, and the receipt and debit note systems developed by an outside vendor. As these functions and systems have been in service since 2006, an upgrade of the system hardware and Oracle Financials package has been proposed, and a pre-upgrade consultation study is underway.

#### 6.1.3.5 HKUAD (IBM PowerVM on p710)

The HKUAD system is a development and test platform for the University's in-house administrative IT applications. Similar to the HKUAP production platform, its annual CPU utilisation for 2013-14 saw a 54% increase following consolidation of the development platform in the UIS upgrade exercise.

### 6.1.3.6 HKUAF4 and HKUAF5 (IBM eServer p5 550 Systems)

The HKUAF4/5 systems are a pair of IBM eServers p5 550 servers that support the testing and development of the Oracle Financials packages and other financial applications. Annual aggregate CPU utilisation grew by more than 55% thanks to active development works.

## 6.1.4 Other Systems

### 6.1.4.1 LIBRARY (Dell PowerEdge R910)

ITS continued to offer operational management services for the LIBRARY online catalogue system used by the University libraries in 2013-14.

## 6.2 Network Development and Services

### 6.2.1 Upgrade of Campus Network Infrastructure

#### 6.2.1.1 10G Links between Main Campus and Starr Hall/Lady Ho Tung

A project to implement new 10G switches and set up 10-Gbps links between the main campus and Starr Hall/Lady Ho Tung Hall on Pokfulam Road was implemented during the year, increasing the network capacity between them and also freeing up fibre capacity for future connection with the Lung Wah Street Student Residences. The existing hall network is built upon the Gigabit Ethernet network, and hall switches are linked by dual Gigabit connections to core switches located in the data centres in the Run Run Shaw Building and Kadoorie Building. Two new switches with 10G connections (H3C 5800 model) were installed in the Starr and Lady Ho Tung Halls to free up the fibres between the main campus and remote halls and to provide faster connections and enhanced capacity.

#### 6.2.1.2 Upgrade of Building Switches and Laying of Single-mode Fibres to Support 10G Ethernet Connections

This year we continued our efforts to upgrade all building switches (which connect the Gigabit Ethernet floor switches and core network backbone) with 10Gbps uplink connections to provide greater network capacity. In addition, single-mode fibres were laid to replace the old multi-mode fibres and support the 10G Ethernet connection between those switches and network.

The following buildings have already been upgraded:

- Kadoorie Biological Sciences Building
- Knowles Building (except 9/F and 10/F)
- Library Buildings
- Haking Wong Building

Upgrades are planned to the following buildings:

- Chow Yei Ching Building
- Chong Yuet Ming Building
- Runme Shaw Building
- T.T. Tsui Building
- Main Building
- Eliot Hall
- James Hsioung Lee Science Building
- May Halls
- Run Run Shaw Building
- Central Plant Room in Hawking Wong Building

### 6.2.1.3 WiFi Expansion and Enhancement across the University

As part of our continued efforts to enhance WiFi coverage and capacity across the University to cope with the growing popularity of notebooks and mobile devices, better support various teaching and learning activities, and enhance the capacity and coverage of the current network, additional WiFi access points have been added at various HKU locations. In 2013-14, about 120 new WiFi access points supporting the latest 802.11n WiFi standard (H3C WA3628i) were installed at locations of high WiFi usage:

- Faculty of Medicine Building (including the Laboratory Block and William MW Mong Block)
- Haking Wong Building
- Chow Yei Ching Building

More access points supporting the latest 802.11ac WiFi standard are planned for deployment in the following buildings.

- Run Run Shaw Building
- Runme Shaw Building
- Hui Oi Chow Building
- Main Building
- Chow Yei Ching Building
- Haking Wong Building
- Knowles Building
- KKL building
- Chong Yuet Ming Amenities Centre
- Swire Building
- Faculty of Medicine Building Lab Block
- Faculty of Medicine Academic Block
- Kadoorie Biological Sciences Building
- New Clinical Building, Queen Mary Hospital Campus
- Professorial Block, Queen Mary Hospital Campus
- Main Block, Queen Mary Hospital Campus

### 6.2.1.4 WiFi Controller 10G Upgrade to Enhance Performance of WiFi System Support

All WiFi access points in the campus network are centrally managed by WiFi controllers installed in the campus network backbone. The data traffic from these access points switches through the WiFi controllers and, in turn, passes through the campus network backbone switches. As a result, overall WiFi performance is affected by the available bandwidth of the network connections between WiFi controllers and campus network backbone switches.

Previously, the network connections between these controllers and switches were Gigabit Ethernet ports, with a maximum throughput of 4 Gbps per WiFi controller. To further enhance WiFi network performance, the network connections between the WiFi controllers and campus network backbone switches have now been upgraded to fibre 10G Ethernet ports, with a maximum throughput of 10 Gbps per controller. The network throughput of the WiFi controllers has been enhanced to cater for a higher volume of WiFi traffic and more WiFi connections and to support the University's future expansion of WiFi coverage.

### 6.2.1.5 Software Defined Networking (SDN) Testbed

SDN is an emerging networking technology that enables computer networks to be made more programmable and centrally manageable, allowing networks to be tailored to user requirements more effectively. To assess and validate this technology, we launched an SDN testbed in 2013, which served the following objectives.

- To evaluate openflow versions 1.0 and 1.3 with commercial switches (some purchased and some loaned for a short period)
- To verify open-source controller maturity for production use, including OpenDaylight and Floodlight

Areas to be explored in future include proof-of-concept tests on possible uses such as DDoS mitigation, a special network zone for science research data and virtualisation technology.



#### 6.2.1.6 Upgrade of Floor Switches for Staff Network and Installation of Power-over-Ethernet (PoE) Switches to Replace DC Injectors

We began replacing the old network switches on building floors with new switches with greater capacity and enhanced security protection in 2005 to meet staff demands for increased capacity, as most staff PCs run Gigabit network interfaces. In 2013-14, we replaced about 80 floor switch units within the staff network (in which the oldest floor switches have been in use for more than five years) with new floor switches (H3C S5120-28C-EI). This upgrade also affords full support for the IPv6 protocol and multicast applications, such as the efficient delivery of high-resolution video. The following buildings were upgraded this year.

- Chong Yuet Ming Chemistry Building
- Chong Yuet Ming Physics Building
- Chong Yuet Ming Amenities Centre
- Estates Building
- Faculty of Medicine Buildings
- Haking Wong Building
- James Hsioung Lee Science Building
- Kadoorie Biological Sciences Building
- Knowles Building
- Kennedy Town Centre
- Ming Wah Complex
- Run Run Shaw Building
- Queen Mary Hospital Campus

In addition, about 76 PoE switches were installed this year to replace the DC injectors in IT closet rooms with more than seven DC injectors installed for WiFi access points. This operation will reduce equipment failure arising from the overheating of DC injectors.

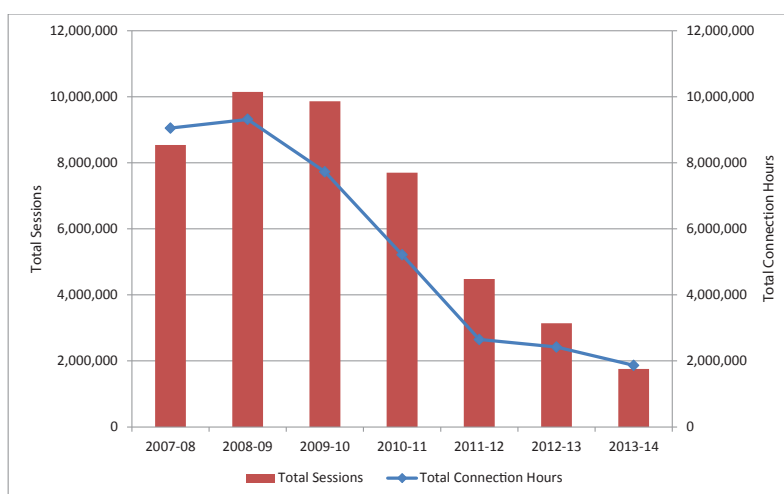
#### 6.2.1.7 WAN Fibre Migration for HKU Residential Colleges

The initial network design of the HKU Residential Colleges on Lung Wah Street launched in 2012 was intended to connect those colleges to the main campus by direct fibres. As it took a long time to lay the fibre cables, we subscribed to a WAN link service (Gigabit Ethernet) from a service provider as an interim solution to provide WiFi and IP phone connectivity to hall residents. That contract has now expired. This year saw completion of the fibre-laying project, with dark fibres laid between the HKU Residential Colleges and Morrison Hall, allowing the colleges' network backbone to connect directly to the network core switches on the main campus.

## 6.2.2 Hallnet (Hall Network)

Hallnet consists of 5,521 network points distributed across 16 student halls of residence, Robert Black College and Graduate House. The statistics for Hallnet usage in 2013-14 are presented in bar chart form in Chart 5. Compared with 2012-13, usage declined by 44% and 23% in terms of connection sessions and connection time, respectively. The declining trend reflects the ongoing trend for users to shift from Hallnet, which is wired, to WiFi, which is wireless. An average of 316 connections were made at each Hallnet point, for a total of 336 connection hours over the year. Translated into daily figures, 0.87 connections were made from each network point per day, for a total of 0.92 hours.

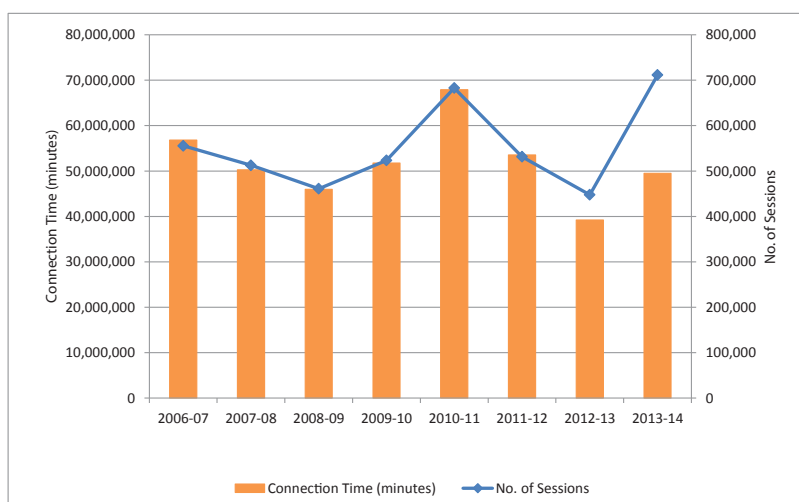
Chart 5: Annual Utilisation of Hall Network



## 6.2.3 VPN (Virtual Private Network)

Use of the HKUVPN facility in 2013-14 is summarised in Chart 6. Compared with 2012-13, there was a 58% increase in the number of VPN sessions and 26% increase in total VPN connection time. Two new VPN servers with enhanced encryption throughput were added to the VPN pool in January, leading to overall HKUVPN performance improvement. Use of a more accurate program for statistical analysis also contributed to the increases.

Chart 6: Annual Utilisation of HKUVPN



## 6.2.4 WiFi Service

HKU's WiFi network consists of 3,994 access points distributed across the main campus, Centennial and Sassoon Road Campuses, remote campuses, and student residential halls. Charts 7a and 7b show that, compared with 2012-13, WiFi usage increased by 12.1% and 37.3% in terms of number of users and user hours, respectively. These increases can be attributed to several factors, including broader on-campus WiFi availability owing to a greater number of WiFi access points, expansion of WiFi signals to newer-model mobile devices and the growing popularity of mobile devices. As of June 2014, the number of WiFi users stood at 41,758, and that of user hours at 50,450,740.

Chart 7a: Number of WiFi Users

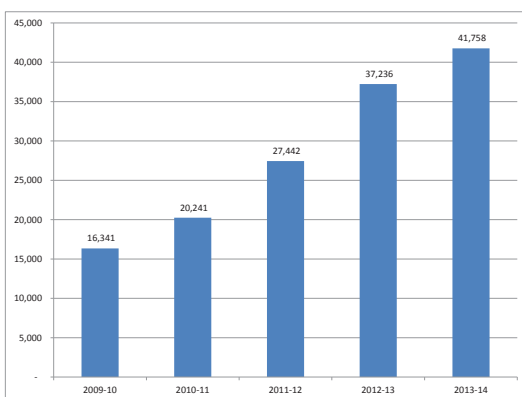
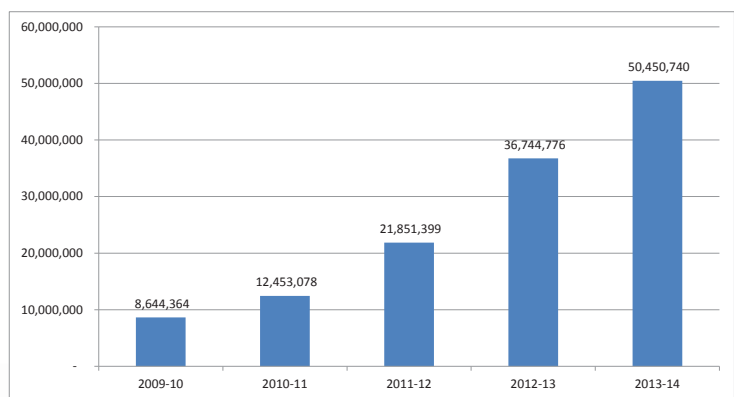


Chart 7b: Number of WiFi User Hours

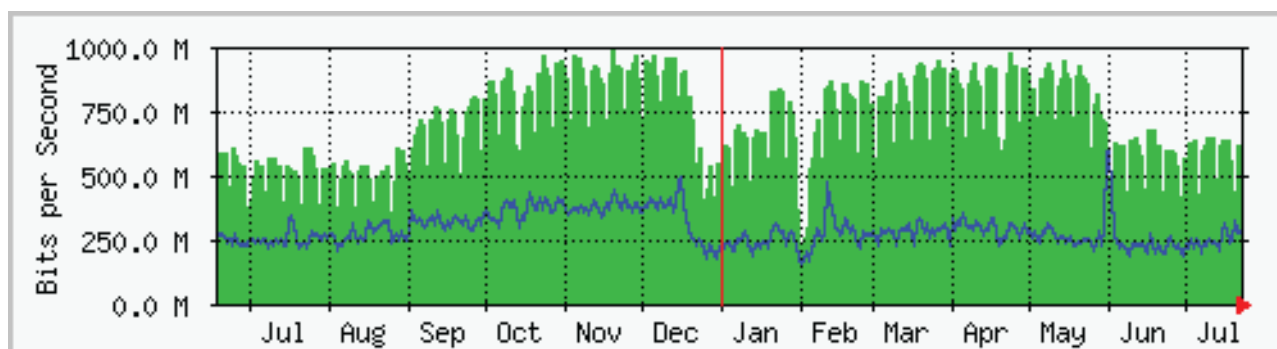


## 6.3 HARNET and Internet Connectivity Development

### 6.3.1 Growth in Internet Traffic

Utilisation of HARNET and the Internet continued to increase steadily in 2013-14. The graph of Internet traffic in Chart 8 was recorded using average values over one-day periods. It shows that incoming traffic grew from a daily average of about 580 Mbps (72.5 Mbytes per second) in July 2013 to over 990 Mbps (123.75 Mbytes per second) in May 2014. In June 2014, the volume of Internet traffic reached 660 Mbps (72.5 Mbytes per second), which was 14% higher than the previous year's peak. Over the year, the data transmission rate during the peak traffic period (between 2.00 and 5.00 pm) rose as high as 1,200 Mbps (150 Mbytes per second).

Chart 8: HKU-Internet/HARNET Traffic (July 2013-June 2014)



- Notes:
- The graph shows the sum of local and international traffic.
  - Incoming traffic is indicated by the green shaded profile.
  - Outgoing traffic is indicated by the blue line.



### 6.3.2 Upgrade of HKU-HARNET-Internet Connections

In September 2013, the HARNET-Internet link was upgraded to 3.5 Gbps to cope with the new academic year. The link was further upgraded to 3.8 Gbps in March 2014 after a tendering exercise for a HARNET service provider. Total bandwidth returned to 2.4 Gbps in July 2014 for the summer holiday, but then increased again to 4.2 Gbps in September 2014 for the new academic year.

A critical exercise took place during the 2013-14 academic year, namely, the RAE 2014 Exercise. The exercise required external reviewers from overseas to access local institutions to download research output for assessment. UGC issued a request (via JUCC) to HARNET institutions for network performance support for the RAE Exercise. In response, a HARNET task force was formed to fine-tune the HARNET backbone configuration to cope with the request. Performance tests were carried out, with the results submitted to the UGC working group for reference. These efforts helped the RAE 2014 Exercise to run smoothly.

## 6.4 Managing Information and Network Security

### 6.4.1 Information Security Assessment for Departments

As an important part of its efforts to maintain an acceptable standard of information security protection and practices across the University, ITS is carrying out an annual security assessment exercise for 10 selected departments/offices with the objective of exposing any network or system vulnerabilities therein, recommending improvements to address any information security weaknesses identified, and suggesting good information security practices to be adopted in relation to data and information management. Ernst and Young Advisory Services Ltd. has been engaged as an independent consultant to conduct this exercise, which started in June 2013 and will be completed by the end of the year.

### 6.4.2 Information Security Awareness Promotion

To raise information security awareness amongst University staff and students, alert them to possible security threats and promote good practices for avoiding potential breaches, ITS organised the following promotional activities throughout the year.

- (i) Information Security Awareness Exhibition 2014 was held in the G/F foyer of the CWLC from 24 to 28 March 2014. Visitors were provided with useful information on how to protect sensitive or confidential information and personal data in the cyber world. They were also invited to participate in an online quiz on information security.
- (ii) A lunchtime seminar on the topic of 'How to Enhance Information Security in the University Environment' was held on 25 March 2014. Guest speakers from Ernst & Young Advisory Services Ltd. were invited to present their professional views.
- (iii) In support of an initiative promoted by the Privacy Commissioner for Personal Data, ITS participated in a University Privacy Campaign in March 2014, which was led by the HKU Data Protection Officer to draw the attention of staff and students to the importance of the statutory requirements governing data privacy and protection.

### 6.4.3 Abuse Case Handling

ITS implemented the following security measures in 2013-14 to address the proliferation of spam and malware (including computer viruses, Trojan horses and spyware programs).

- Alerting the owners of PCs and servers involved in computer abuse activities to eradicate viruses, Trojan horses, spyware and other zombie programs residing in their systems.
- Advising departments through the Coordination Group for Departmental Network/PC Support to take the necessary precautionary measures when new computer vulnerabilities or global computer viruses were reported.
- Fast-tracking and containing the sources of computer abuse cases with the aid of the Abuse Information Enquiry System.
- Controlling person-to-person (P2P) file-sharing activities by blocking P2P connections at the HKUVPN gateway and setting up a dedicated VPN server for legitimate P2P connections.

2013-14 saw a significant rise in the number of computer abuse cases over the previous year, as shown in Charts 9a and 9b. To address the notable increase in the number of 'compromised account' incidents, most of which resulted from cyber-attacks, additional processes have been added for reviewing the network access through HKUVPN gateway to identify suspicious cases soon after they occur. New Intrusion Prevention System (IPS) equipment has also been installed at HKU's Internet gateway to boost protection against Internet attacks.

Chart 9a: Total Number of Computer Abuse Cases

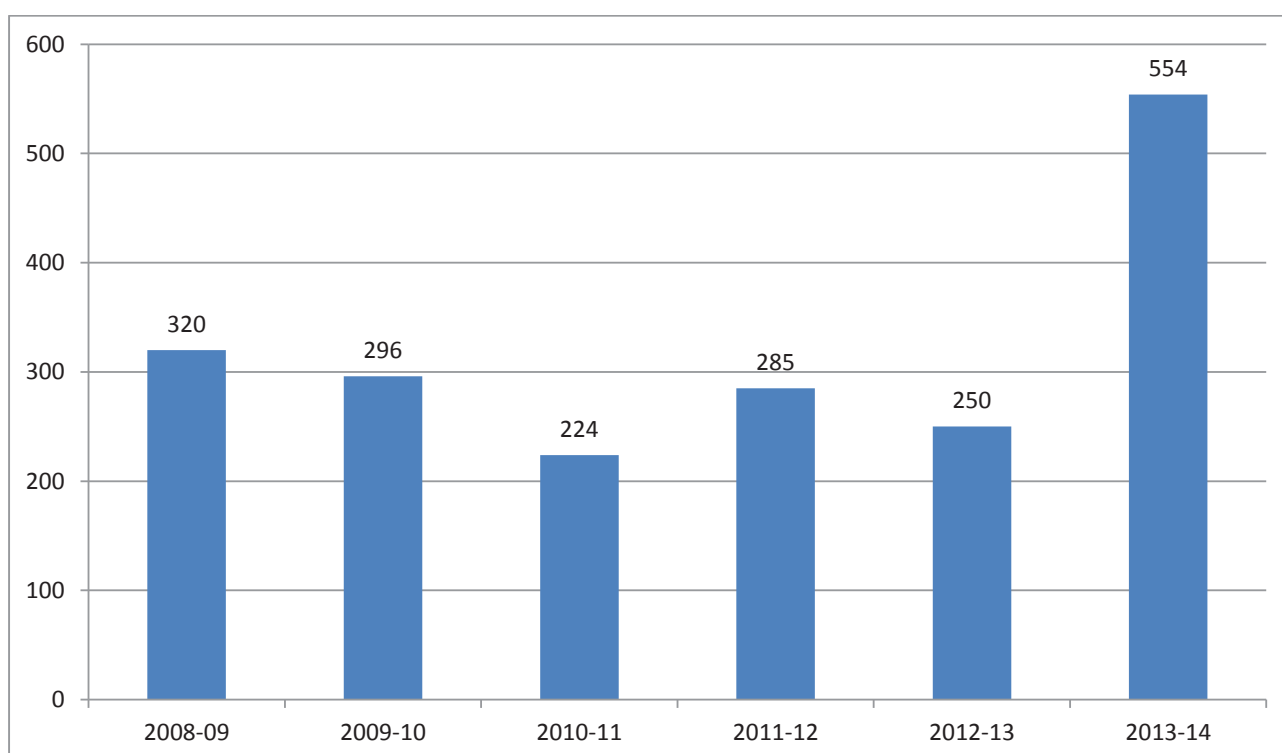
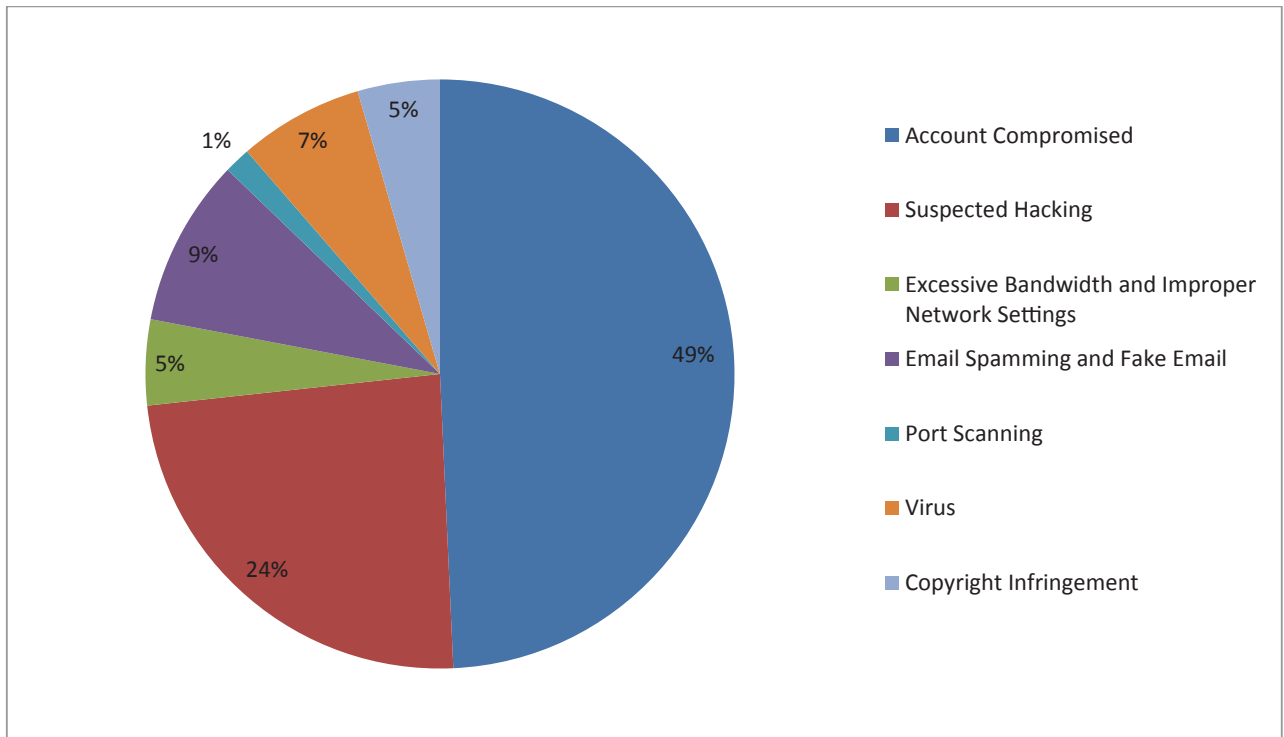


Chart 9b: Computer Abuse Cases by Type (2013-14)



#### 6.4.4 JUCC Collaboration

As a member of the aforementioned JUCC ISTF, ITS actively participates in JUCC ISTF meetings, which are held on a bimonthly basis. These meetings allow JUCC members to share ideas and experiences on institutional information security management practices, technical knowledge and incident handling.

#### 6.4.5 Other

Microsoft ended its support for Windows XP and Office 2003 in 8 April 2014. In January 2014, ITS sought support from the departments in replacing/upgrading any Windows XP PCs before that date. Such forward-planning was designed to mitigate the risks of hackers leveraging Windows XP security vulnerabilities. Almost all Windows XP machines in the campus network had been disabled as of 31 July 2014, although a few departments were offered interim measures to buy them a little more time. We are closely following up with these departments, and they are expected to finish all upgrade tasks within the next few months.

## 6.5 Managing IT Operations

In 2013-14, ITS launched several initiatives designed to enhance IT operations across the University.

### 6.5.1 System Centralisation and Network Monitoring

Close monitoring of the status and performance of servers, network devices and information security equipment is essential to ensure effective service provisioning with a high degree of availability. Nagios has served as the main monitoring tool since mid-2011. ITS has also begun actively monitoring the individual network ports on the backbone network switches, which allows us to detect backup link failures and perform preventive maintenance in timely fashion to ensure a high level of network service availability.

### 6.5.2 Computer Batch Job Automation

The Operations Team handles many computer batch jobs daily. These are routine tasks such as backups, scheduled server reboots and other system housekeeping jobs. At present, most of these jobs are handled manually. However, ITS recently launched an initiative to automate them, both to reduce the risk of human error and improve

the monitoring and management of their execution. A pilot project has commenced, and is anticipated to cover 50 daily jobs by the end of 2014. Further expansion is envisaged in 2014-15 following a review of the pilot results.

### 6.5.3 Data Centre Strategy Study

ITS's main data centre in the Run Run Shaw Building has been in operation for more than 30 years, and is thus ageing and substandard. Accordingly, ITS conducted a study on a long-term strategy and the need for more data centre space and facilities. An external consultant was engaged to assist in the investigation of existing sites and facilities and to explore a range of options, including the expansion of existing sites. A recommendation paper was submitted to the HKU SMT in July 2014 for consideration.

### 6.5.4 Service Suspension Notification

In January 2014, ITS launched a new function for posting notification messages on the ITS homepage and HKU App informing users of suspended services. This function provides an alternate information channel to bulk mail, as in some cases users may be unable to access their mailboxes via their desktops through fixed or WiFi network connections.







# 7

## Enabling IT Platform - Consequential Movements and Other Developments

## 7.1 Consequential Movements Project

The Consequential Movements Project is a multiyear project to realign the accommodation of faculties, departments, offices and administrative units following the opening of the Centennial Campus. During 2013-14, ITS supported the project through IT service provision to the Tang Chi Ngong, Pao Siu Loong, Hung Hing Ying, Run Run Shaw and Library Buildings (Old Wing) and the Chong Yuet Ming Amenities Centre.

## 7.2 Ching Lin Terrace Postgraduate Residence

The old Hon Wah Secondary School in Western District has been converted into a 140-room residence for postgraduate students. ITS worked with the Estates Office and E&M Consultants on the design, provision and installation of data, WiFi and telephony services for the new Ching Lin Terrace Residence, which opened in September 2014.

## 7.3 Chong Yuet Ming Amenities Centre Auditorium Project

ITS has also been working with the Estates Office and E&M Consultants on the design of network, WiFi and telephone services for the above-captioned auditorium project, a complex proposition because a number of fibre cables are routed through the construction perimeter. ITS is working with the main contractor to implement protective measures to minimise potential damage to these fibres, as they serve a number of adjacent buildings.

## 7.4 Queen Mary Hospital Redevelopment

Queen Mary Hospital plans to convert its Senior Staff Quarters into offices and other clinical facilities by 2016, and will need to evacuate three buildings, including the HKU Pathology Building, for Phase I of the redevelopment project. ITS worked with Queen Mary Hospital and the Hospital Authority on the IT infrastructure requirements for provision of the HKU Campus Network to the new office/facilities. These requirements were accepted by the Hospital and included in its submission to the government.



# 8

## Enabling IT Platform - Unified Communications





Unified communications constitute a key development area for ITS. Unified communications refer to the collaboration of different modes of communication in various media formats, such as AV and text messaging in real and non-real time. The Unified Communications Team is responsible for:

- 1) running the HKU voice network;
- 2) acquiring a unified communications platform to gradually replace the old analogue phone system; and
- 3) integrating voice, video and mobile communication, call centre services, and meeting services into a single communication platform for a unified communication experience.

## 8.1 Instant Messaging Service

In February 2011, ITS launched a pilot service based on Microsoft Office Communication Server 2007 R2, which allows users to send instant messages, conduct audio and video conferences, set up virtual meeting rooms, and share one another's desktops from their PCs. The service currently has 250 users, and will be replaced by Lync 2013, which makes use of the Microsoft Office 365 cloud service, by the end of 2014.

## 8.2 Short Messaging Service (SMS)

ITS launched SMS as a subscription service from an external service provider in June 2011 for use by the University's administrative departments. The FEO uses SMS to send notifications to students regarding the payment of tuition fees and other fees, and the Centre for the Enhancement of Teaching and Learning (CETL) uses it to send survey invitations to graduates. SMS messages are also sent to staff and students in case of emergencies. More than 88,000 SMS messages were sent during 2013-14.

2012-2013





### 8.3 Phone System

ITS took over the HKU PABX systems from the Estates Office in September 2011, and is now actively deploying IP phones in all new offices. HKU currently houses 5,300 analogue lines, 260 digital lines and 3,800 IPT lines.

The HKU IP telephony system is powered by a Cisco CUCM IP PBX system that provides a state-of-the-art communication platform to users. Advanced IP phone features such as audio and video conferencing, softphones on PCs and Macs, and simultaneous ringing are provided. The system is built with high-availability and disaster recovery mechanisms in place across two data centres, one located on the Centennial Campus and the other on the main campus, allowing a telephone service to be maintained in case one centre is disabled in a disaster.

IP phones have been deployed in new offices across the University, including those on the Centennial Campus, those created as part of the Consequential Movements Project, the LKS Faculty of Medicine Building, Lung Wah Street Student Residences and Graduate House.

To ensure public telephone network connectivity, the University has subscribed to 24 IDAP lines, 20 on the main campus and four in FMB, from Hutchison Global Communications, meaning that 552 simultaneous conversations with external parties can be supported. In addition, 10,000 telephone numbers, all starting with the prefix '3917', have been assigned to the University, which should allow ITS to standardise all University telephone numbers.

### 8.4 HKU Connect Email Service (email outsourcing)

The HKU Connect Email Service for students and graduates, a service provided by Google, was rolled out in 2011. Since then, all new student and graduate accounts have been created on this outsourced email platform. Current students with email accounts in one of the in-house email systems can also opt in to the Connect service. Upon opt-in, a new HKU Connect account is created for the

student, who is given the option of copying all emails from his or her in-house email mailbox to HKU Connect, but does not have to. Every user is assigned 30 GB of storage space on HKU Connect for the storage of emails and files.

As of June 2014, there were 39,863 accounts using a total of 11.2 TB of storage space on HKU Connect. There were significant increases in the number of HKU Connect user accounts and amount of storage space usage in 2013-14, which grew 65% and 348%, respectively, over the previous year. The growth in disk usage is mainly attributable to the growth in the number of users and stored files. The number of files stored in HKU Connect has grown by more than 925% since last year, rising from 113,701 in June 2013 to 1,165,680 in June 2014.

### 8.5 High-definition multi-party Conferencing and Web Conferencing System

A new high-definition, multi-party video-conferencing system was rolled out in January 2014. The system allows up to seven meetings at full high definition (1080 p), 15 at high definition (720 p, 30 fps) or 60 at standard definition (360 p). Users can join a meeting from room-based video-conferencing end points, PCs, Macs, iOS or Android devices, or ordinary telephone. The system also supports recordings and webcasting to up to 600 viewers simultaneously.

ITS also makes use of the Adobe Connect web-conferencing system to provide a high-capacity web conferencing service as a complementary solution at a lower video resolution. This system supports up to 100 participants in a single meeting, which users can join using a PC, Mac, or iOS or Android device.

Sixteen departments are currently making use of the high-definition, multi-party conferencing system, and 80 of the Adobe Connect system, which in 2013-14 hosted 70 and 210 meetings, respectively.

A circular graphic in the top left corner. It features a large white number '9' in the center. The circle is surrounded by a ring of binary code (0s and 1s). The background of the entire slide is a composite image: the top half is a solid orange color with faint binary code patterns, and the bottom half is a landscape with a green field, a dark road that curves upwards, and a sunset sky with orange and yellow clouds. A large black arrow points upwards from the road towards the top right.

# 9

## Enabling IT Platform - Service and Process Improvement

## 9.1 IT Service Management Tools

ITS continues to run such ITIL processes as Service Desk, Incident Management and Problem Management, primarily in support of Service Operation.

We are also in the process of adopting the Change Management process, which all ITS teams had joined by August 2013. All technical change requests are now put to the Change Advisory Board (CAB) for review and approval before any changes are implemented, which ensures that all necessary procedures are in place for a change to take place smoothly and for unplanned changes to be kept to a minimum except in the case of emergencies and urgent situations.

The ITIL Configuration Management module implemented thus far facilitates change discovery, auditing and dependency tracking. There is still a lot of work ahead to smooth the overall Configuration Management Database (CMDB) management and quality control. Another challenge is to make greater use of the CMDB in the Change Management process. We are currently working with the vendor to identify key information from the CMDB to simplify our Configuration Management process and work with support teams to build more coherent relationships between configuration items (e.g. servers) and key system modules.

## 9.2 Quality Management

In the first quarter of 2014, ITS established a Quality Management System (QMS), which can be expressed as the organisational structure, policies, management practices, standards and resources needed to implement quality management. The primary objective of establishing the QMS was to ensure a high level of quality in all products and services offered by ITS to the user community. More specifically, the QMS provides a basis for:

- (a) the formulation of ITS Policies, rules and guidelines;
- (b) development and adoption of management practices; and
- (c) establishment and enforcement of ITS standards.

The ITS QMS is being enforced by a new Quality Management Committee (QMC) chaired by the ITS Director. The QMC meets once a month with the following terms of reference.

- (a) To guide and oversee implementation of the ITS QMS
- (b) To endorse policies/rules/guidelines, management practices and ITS standards for adoption
- (c) To receive a QMS status report submitted by the Quality Management Team (QMT) leader.

Documentation is central to achieving ITS's quality objectives. Documents concerning policies/rules/guidelines, management practices and standards are collectively referred to as ITS Quality Management Documentation. A growing set of document templates is available to assist staff in the drafting of these documents.

Under the leadership of the Deputy Director, the QMT, which was formerly called the Project Management Office, has taken up wider responsibility for driving the ITS quality journey. Following establishment of the ITS Project Management Methodology (PMM), another major QMT effort in 2013-14 was implementation of the Project Management Information System (PMIS) in the third quarter of 2014.

## 9.3 User Services

ITS continues to run all Service Desk-related services and organise training courses to help staff and students use the University's central IT services.

### 9.3.1 Service Desk

The Service Desk offers professional advice and assistance to staff and students having general problems using the central IT services. In addition to frontline support officers, second-line support teams are also in place to support enquiries requiring follow-up and investigation. Users can obtain assistance by visiting the Service Desk in person on the 1/F of the Chi Wah Learning Commons, by phoning 3917 0123 or by sending an email to [ithelp@hku.hk](mailto:ithelp@hku.hk).

In the reporting year, 11,503 enquires were handled. The distribution of enquires over the year is shown in Chart 10a.

Chart 10a: Service Desk Enquiries by Month (July 2013-June 2014)

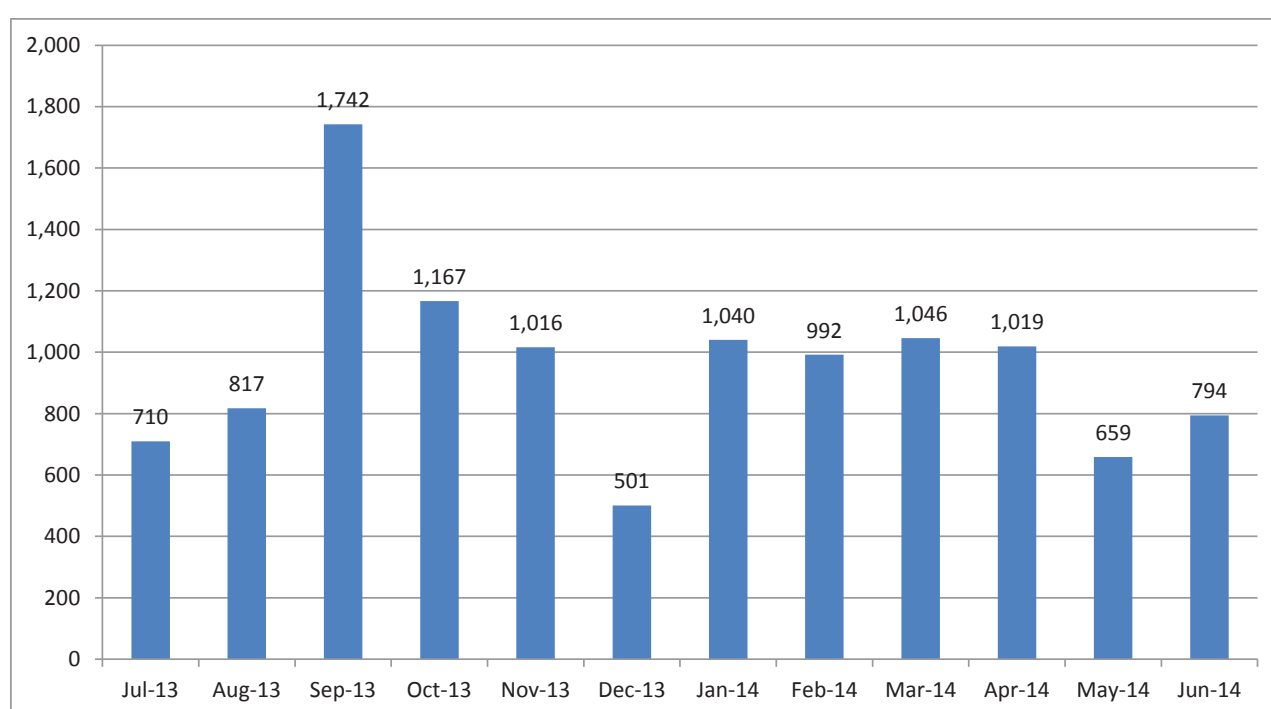


Table 10b: Most Frequent Categories of Service Desk Enquiries (July 2013-June 2014)

Category	Count	% of total
Teaching and Learning (eLearning, classroom services and Learning Commons)	5,156	45%
Communication services (email and bulk mail services)	1,731	15%
Account management services (account management/applications and account passwords)	1,727	15%
Network services (WiFi, VPN and LAN)	1,175	10%
Information systems (HKU Portal, website support, HR, Finance and other administrative systems)	797	7%



The Service Desk strives to offer a responsive service in addressing user enquiries. Performance figures in terms of response time and resolution time taken in handling enquiries in the past two years are tabulated below for reference and comparison. It can be seen that we met performance targets in 2013-14 by resolving enquiries within three working days and reducing the average response and resolution time for handling incidents.

Table10c: Comparison of Resolution Time of Incidents Resolved by ITS in 2012-13 and 2013-14

Resolution Time	July 2012-June 2013 (Total no. of cases: 11,253)	July 2013-June 2014 (Total no. of cases: 11,503)
Within 1 day	99.11%	99.37%
Within 2 days	99.76%	99.83%
Within 3 days	99.86%	99.87%

Table10d: Comparison of Average Response Time and Resolution Time of Incidents Resolved by ITS in 2012-13 and 2013-14

Average Time Spent	July 2012-June 2013	July 2013-June 2014
Average Response Time	20 mins	14 mins
Average Resolution Time	31 mins	21 mins

The enquiries received by the Service Desk are regularly reviewed by the User Services Team, support teams and ITS SMT to identify areas for improvement and formulate action plans to address frequently asked questions. The web pages on frequently asked questions are also regularly updated to give users handy self-help information when they encounter problems using any of our services.

### 9.3.2 User Training

ITS organised regular computer training courses and workshops for students and staff throughout the year on the use of the facilities and services it provides. At the start of the academic year, orientation seminars and workshops were held for new University members to familiarise them with the central IT services. In 2013-14, 122 training courses, workshops and seminars were attended by 1,460 participants.

10

## Other Services



## 10.1 Community Services

### 10.1.1 Joint University Programmes Admissions System (JUPAS) Online Application System

ITS has supported the JUPAS Online Application System on a cost-recovery basis since 2002. The JUPAS system was redesigned with new architecture and functionalities in 2011 in line with the curriculum reform. Since 2011-12, it has been needed only to support Hong Kong Diploma of Secondary Education (HKDSE) applicants. In 2013-14, there were 68,539 HKDSE applicants, and the system supported 5,209 school accounts and 555 institution accounts.

## 10.2 Services for Departmental Users

### 10.2.1 Computer Equipment Maintenance Service

This year, ITS focused on providing a hardware and equipment maintenance service for common network equipment, including that used in the campus buildings and student halls of residence.

### 10.2.2 Technician Service

ITS continues to provide a technician service to all University departments on a cost-recovery basis. Flexible service arrangements ranging from full-time staff secondment to hourly charged support services are available to the departments according to their needs.

### 10.2.3 PC and LAN File Server Support for Departments

ITS continues to manage two LAN file servers running Windows Server 2003 for file sharing by the academic departments on the Main Campus, Medical Campuses and Prince Philip Dental Hospital Campus. In view of the ageing hardware and platform, an upgrade of the LAN file servers is being planned to consolidate the service with our cloud infrastructure.

We are also helping the Registry to maintain a departmental LAN file server running Windows Server 2003 and an email server running Microsoft Exchange Server 2007. During 2013-14, we also provided regular technical assistance to many departments, helping them to resolve PC problems related to hardware and software installation, carrying out system troubleshooting and removing computer viruses on a cost-recovery basis.

11

## Staff Matters





## 11.1 Staff Management

ITS is committed to HKU's strategic direction and to the advancement of IT both locally and globally. Given the important roles played by its High-performance Computing, Security & Quality, IT Infrastructure, Learning & User Services and Administrative Applications Sections, ITS currently employs 184 staff members.

## 11.2 Staff Awards

ITS regularly recognises the efforts of its staff, who are seen as the key drivers of successful developments within the department. Appreciation for the great work done by all ITS teams is shown through the presentation of Best Project Awards. This year, the following Best Project Awards were given.

<b>Best Project Award</b>	HKU App, e-Services and Database Administration Team
<b>1st Runner-Up</b>	PC Availability, User Services & Learning Environment Services Teams
<b>2nd Runner-Up</b>	Application Change Management & Version Control in HCMS, Human Capital Management Systems Team
<b>2nd Runner-Up</b>	Chart of Accounts Change Project, Finance Systems Team

## 11.3 ITS Senior Management

ITS is managed under the collective leadership of the ITS SMT. Chaired by the Director of IT Services, the team comprises the Deputy Director of ITS, Associate IT Director (Administrative Applications), Associate IT Director (Learning and User Services) and Associate IT Director (IT Infrastructure). The SMT holds regular meetings to review issues and to formulate policies and recommendations for IT services across the University.

