who we are

**IT Services at Trinity** is responsible for the delivery and maintenance of the University’s main data centres, running the University’s network, supporting Trinity’s Business Systems, provisioning web infrastructure, managing Office365 and Google email and calendaring services, providing Research IT and Teaching and Learning IT services. Trinity staff and students are supported by the IT Service Desk and our provision of quality website information and our skills development programmes, delivered through both face-to-face and online training sessions. IT Services also operates an IT Projects Office to help us to plan and successfully deliver change initiatives and our technology portfolio and catalogue of services has continuously expanded as we change and adapt to meet the contemporary needs of a Digital Trinity.

Our innovative approach, expertise in current and emerging technology, service excellence, IT training, procurement, security, business analysis, consultancy and project management expertise contribute to a Digital Trinity every day.

digital transformation

IT Services have been working over the past year to transform the digital landscape at Trinity to ensure effective academic and business operations across the University are supported, that data and information is available to guide better decision-making and that we provision technology to further enhance the Trinity community’s culture of collaboration and innovation.

It has been our goal in 2017/2018, and will remain so going forward, to provide an increasingly cohesive digital ecosystem to ensure the advancement of the University’s strategy and priorities.

the way we work, our core values

- University Experience - we are committed to adding to the overall University experience of staff and students.
- Customer First - understanding our customers and their differing needs. Deliver our services in a way that exceeds their expectations.
- One IT - working with colleagues across IT towards common goals in a collaborative environment.
- Enabling Others - enabling colleagues across the University. Working in partnership with them to ensure they can guarantee delivery of their services.
- Environment - understanding our role and responsibility to promote sustainable development in all our activities.
our year in numbers

150,000,000
emails delivered to staff and students

99.95%
availability of Trinity Authentication Services

5,889,933
visitors to www.tcd.ie

134.8 TB
provisioned in Cloud storage

99.93%
availability of the Internet connection

99.91%
availability of the Core network at Trinity

132,066,168
pages viewed on www.tcd.ie
the past 3 years
Delivering excellent customer services is central to our service and support ethos. We know that digital transformation is constantly informed by the experiences of everyone who is using the technology we develop and deliver, so engagement with the Trinity community and measuring improvements in service and support will remain a cornerstone of transformation.

For staff and students today the relationship with Trinity begins online and demand continues to grow each Academic Year for more IT support as, whether working or studying at the University, everyone needs to be confident using technology. We are always seeking to improve the way we offer IT services and we work hard to ensure that Trinity community can continue to rely on the IT Service Desk to provide quality information in response to their queries and that we offer IT skills development, through both face-to-face and online training opportunities.

highlights this year

- IT Service Desk connected 1444 new Desktops and Laptops to the Trinity Network for Staff and Research Postgraduates
- Almost 1 in very 5 queries to the IT Service Desk are for help to resolve a problem with staff and student usernames and passwords
- Over 900,000 views of the IT Services website
- Introduced support for new Operating Systems, Windows 10 v1709 & macOS High Sierra (10.13), rigorously testing to ensure full compatibility with central IT services in Trinity.
- Upgraded the IT Service Desk (SID) and the popularity of the Web Portal (http://ask.tcd.ie) saw the number of web submissions of IT enquiries increase by 68% over the year
- IT Services manage critical components of Trinity’s IT security infrastructure for Desktops and Laptops by delivering anti-virus protection, using McAfee ePolicy Orchestrator, and Windows security updates, using SCCM. In 2017/18 both of these vital services were successfully upgraded and rolled out via ‘silent’ installations to over 5000 PCs at Trinity. McAfee Endpoint Security replaced VirusScan on PCs and has improved our threat-detection and allows us to run a more intelligent scanning service with minimal impact on each PC. The SCCM system underwent a major upgrade to SCCM 2016 which entailed a full rebuild on new servers and databases. The SCCM product is used to automate and manage the security patching of the Windows Server and Desktop environments and allows us to “push out” major version updates of Windows 10, among other improvements, to Windows PCs across the University.
- Engaged with over 12 Trinity Schools and Administrative areas to define the Service Level Agreements they specifically require to be delivered by IT Services to help them meet their strategic goals.
- Monthly Service Level Achievements Matrix (SLAM) Reports were collated and published to detail performance across the 10 service areas of the IT Services Corporate Service Level Agreement for the Academic Year 2017/2018. (Annual SLAM can be found on page 46.)

new student orientation 2017

A range of additional activities ran alongside, and in support of, the IT Service Desk activity for the start of the new Academic Year 2017-2018. In addition to our normal service levels we provided an extra 95 person days of IT Support in the form of Orientation Presentations, where we met with 5510 new students, TCDConnect Clinics to help students to connect to the Trinity Network and by running the Quick Information Desk to help Fresher’s to get started with all their IT queries.

IT Service Desk handled 22% of the overall annual call volume in the first 6 weeks of the new semester 2017/2018 and over this period 14,584 students connected 25,457 devices to the Trinity WiFi network.
supporting Digital Literacy with IT Skills Development

- 1436 Trinity staff and Postgraduate students improved their digital literacy by attending one of our 117 IT courses and rated their satisfaction at 97.52%

- IT Services provided 28% of all our scheduled IT courses at St James Trinity Centre to ensure inclusion for School of Medicine and School of Nursing & Midwifery colleagues based at the hospital

- Lynda.com online learning now “bookends” all IT training sessions, with prep courses to be completed prior to attending a training session and further Lynda.com learning recommendations for those who want to further their digital.

- A new Maintaining Trinity Websites Course was developed to support Trinity Webauthors using new Web Templates

- Online support & learning material was developed for Trinity staff who want to podcast with Panopto.

- We ran specialist IT Security Week events and Phishing Awareness & Education Campaigns

- Google analytics was added to all webpages on the IT Services site and provided us with statistics on website access and usage. Over 2017/18 we have continued to re-organise and enhance the information on our website introducing a more structured layout on the pages, with information being much easier to find and navigate to in less clicks, improving readability and ensuring images have accessibility tags to assist visually impaired visitors using screen reading technologies.

- The IT Services Webpages were visited over 900,000 times and the Home page was visited 105,500 times over the Academic Year.

- The most popular service pages on our website were Staff Email (Office 365), Student Software & MyTrinityApps, TCDconnect - How to get connected and IT Accounts

- IT Services also produced videos, for our website, to specifically inform our staff and students. Our most popular video “IT security basics for 2017” went viral with over 40,400 views.

97.5% was the satisfaction rating for our IT Training courses

44,437 Lynda.com videos viewed

2/3 of all IT queries were resolved on first contact with the IT Service Desk
listening to the Trinity Community

Over 3100 members of the Trinity Community, the highest number ever, responded to our 5th annual IT Services Satisfaction Survey which we ran in January 2018. The response provided us with rich quantitative and qualitative feedback and demonstrated the value of IT services to the Trinity community. We remain as keen as ever to ensure we understand how our service provision is performing and that it delivering and meeting the needs of everyone.

Overall the levels of satisfaction show we were performing well in many areas and helped us to identify the areas we need to work on. We were pleased that the Trinity community placed a high level of importance on IT and are very satisfied with our IT Service Desk, the Trinity Network, Office 365, Email & Calendar Services and IT Security, to name a few.

We have taken time to reflect on the survey results and the themes that arose from it. We are committed to following through on the feedback and we published an "IT Services 2018 Satisfaction Survey - Next Steps" report in Summer 2018. This report shows the "quick wins" we identified that would have an immediate impact and could be addressed prior to the start of the new Academic Year. We have also identified the key issues that we need to improve on in the medium-to-longer term and we will be working to deliver more changes over the coming new Academic Year 2018/2019.

95% of the Trinity community agree that Trinity IT systems & services are important to their work and study

86% of Trinity staff & students were satisfied with IT Services - a 13% increase in student satisfaction & a 7% increase in staff satisfaction since 2016.

88% of Trinity staff & students were satisfied with the service provisioned by the IT Service Desk
IT Services have been developing the capability of our products to offer Trinity staff & students Teaching and Learning IT tools that are more user-centric, collaborative and innovative in powering greater levels of engagement throughout the University.

Over the course of the last year our Teaching & Learning IT team have developed and released a range of new and enhanced services.

**Highlights this year**

"Build for the future" - the Virtual Learning Environment (VLE) had additional functionality, integrations and process improvements released that will not only scale to meet the University’s strategic and operational needs to 2021 but also enable the University to realise the delivery of academic led operational targets and strategic initiatives. The final delivery of the VLE project in 2017/2018 was Grades Journey, which delivered functionality that allows staff to transfer assessment marks and grades directly from the VLE (Blackboard) into Student Administration System (SITS). Grades Journey not only reduces the time taken by staff by cutting out duplication for the entry of marks and grades but also has the advantage of eliminating the potential for data entry error.

Audio-visual Teaching Equipment was fully upgraded in 9 Room across Trinity in locations from Foster Place, Arts Building, Goldsmith Hall and to the Museum Building, where new laser projectors, document cameras, video conferencing terminals, large display screens and audio playback systems were installed.

Teaching & Learning IT also provided Audio Visual service consultancy to the capital projects which are planning the delivery of new teaching facilities for Trinity over the coming years including the Trinity Business School & the E3 Learning Foundry.

60 New Teaching & Learning PCs were installed in the Trinity Computer Rooms in College Green, Dartry, Gas Building (D’Olier Street) and for the Trinity Access Programme.

Huddle Spaces were launched to provide high-tech spaces that small groups of students can use to boost collaboration and easily share images, videos and presentations. In co-operation with the Arts Building Refurbishment Project the new Student Huddle Spaces were relocated in late 2018 to the Arts Building Upper Concourse.

iCal was developed in response to the demand from the students to be able to sync their timetable to their MyZone Calendar and to have timetable notifications via their mobile phones.

MyTrinityApps service continued to be further enhanced to provide improved access to a range of academic software from a portal website, available from the Internet on and off Campus, for staff and students.

Lecture Capture Service (Panopto) has a new dedicated microsite, with enriched online support materials for those new to recording, sharing and streaming video & audio. The Teaching & Learning IT team facilitated a Panopto event in March 2018 and included a keynote address showcasing Lecture Capture Technology to a range of Irish Third Level institutions.

Teaching & Learning IT delivered a range of visual and audio productions for Trinity in 2017/2018:

- New photographic images were commissioned of works in the College Art Collections
- Portrait and Group Photography was undertaken for Schools and Departments across Trinity
- Recorded, edited and produced video content with:
  - School of Social Work and Social policy on “Supporting People with Intellectual Disabilities”
  - Irish School of Ecumenics “Europe on the Edge” series to support their Virtual Exchange Program
  - School of Nursing and Midwifery Horizon 2020 project ProACT
  - Trinity Centre for Literary Translation promotional videos
  - School of Natural Sciences summer school in association with Climate-KIC

60 New Teaching & Learning PCs were installed in the Trinity Computer Rooms in College Green, Dartry, Gas Building (D’Olier Street) and for the Trinity Access Programme.
Teaching & Learning IT organised and ran Student Focus Groups in 2017/2018 to specifically listen and learn more about what students need in regard to group study and collaborative. The team are keen to ensure that they have a clear understanding of how students want to work going forward and can tailor the future approach to design of the new collaborative teaching and learning facilities to fit these requirements.

The three Trinity Faculties have requested that IT Services integrate the Turningpoint Audience response system with Blackboard and Edugate (user authentication service) to deliver a fully integrated service where lecturers can create audience response questions (multiple choice questions or survey opinion type questions) which students can answer during lectures via clickers or mobile devices.

This is an innovative way to deliver a more interactive experience, a method of engaging students, testing their understanding & knowledge and retaining their attention. This project is expected to be delivered in late 2018.

Produced Audio recordings and Digital Archiving for Schools including School of English, School of Languages, School of Nursing and Midwifery, Social Work & Social Policy and for the Manuscripts section of the Library

**Looking Ahead**

- **€143K** of Teaching & Learning Software in our portfolio
- **8151** new downloads of the MyDay App with over **2,000,000 sessions**

**Blackboard VLE this year ...**

- **6519** active courses & **16,285** active users
- **277,679** views on the busiest day
supporting research

Our services to researchers range from the delivery & support of high performance computing services through to administrative systems that support the research lifecycle.

Over Academic Year 2017/2018 Research IT continued to develop the research computing services and expertise available to the University to ensure the provision of quality research support that benefited large numbers of Trinity staff and students.

highlights this year

• High Performance Computing (HPC) clusters and storage infrastructure saw improvements delivered to the node provisioning systems and a successful migration of the shared HPC storage to a new SAN environment, all with minimal downtime and little inconvenience to the user community.

• The High Performance Computing software environment was enhanced to allow users to run containers on clusters and new tools were introduced that allow for rapid deployment of software suites, while reducing dependencies on software and library versions.

• Research IT Virtual Machine and Storage platform was upgraded to the last versions of Ceph and OpenNebula.

• An automated certificate deployment system was implemented to provide a simple workflow for research web services.

• Graphics Processing was expanded to offer better facilities for Machine Learning and Artificial Intelligence research.

• Research Support System (RSS) extended its functionality into new areas such as Senior Academic Promotions. This development was short-listed for the Chartered Institute of Personnel and Development (CIPD) Ireland Award 2018 for ‘Use of Technology in HR & People Management’.

engagement with the research community at home & abroad

• Research IT provided a number of, fully subscribed, training courses on technical topics ranging from introductory courses on Linux use through to advanced topics on GPU programming with CUDA, Parallel Profiling and Optimization, and hosted monthly workshops to provide a forum for staff and students to discuss their IT requirements with the team.

• Research IT were also involved in Postgraduate teaching on Masters courses across three Schools: MSc in High Performance Computing, MSc in Finance and MSc in Interactive Digital Media.

Research IT presented work at conferences in Ireland and abroad, sharing best practice with other similar organisations and participated in events during 2017/18 across the globe in Montana & Denver USA,
The team were also included in the successful consortium for the Common Culture project, which will start in early 2019, that joins DRI to other national digital repositories across Europe in aggregating content to the Europeana platform.

Principal Investigators were supported in 2017/2018

136 jobs for Trinity Researchers

Completed 151,449 jobs for Trinity Researchers

using 28,716,652 processor core hours equivalent to a standard laptop working for 1600 years

The academic year 2017/18 saw a substantial change in focus in Research IT, brought on by two external factors – the European Commission led drive towards open research data and the introduction of the General Data Protection Regulation. These two separate, and yet related, events required a review of a large number of systems and workflows supported by Research IT to ensure Trinity’s compliance with this new era of both protecting and sharing data at the same time.

In the medical areas, Research IT have undertaken reviews of a number of systems used to collect potentially sensitive data for research purposes including the Motor Neurone Disease register, the Prostate Cancer Biobank, the MRI archive for the Neuroscience Institute, and a study of women’s health in pregnancy. Following these reviews, changes were made to ensure the security of this valuable research data and as part of a project funded by the Health Research Board, Research IT have developed the skills and expertise to further advise Trinity researchers on how best to meet their requirements to share their data in a FAIR (Findable, Accessible, Interoperable and Reusable) manner.

gdpr & open research data

In 2017/2018 Research IT commenced a new project with the INSIGHT Centre for Data Analytics that builds tools for semantically enriching digital collections in DRI, as well as extending the International Image Interoperability Framework (IIIF) to support linked data searching across image resources held in multiple repositories.

digital repository of ireland

Research IT continues to operate the technical infrastructure of the Digital Repository of Ireland (DRI), the national repository of humanities, cultural and social sciences data. Major new functionality was added to the DRI repository application to leverage cloud technologies for the upload, and subsequent ingest of, data to the repository and delivered improvements that included supporting additional co-ordinate systems for the display of objects on map views.

In 2017/2018 Research IT commenced a new project with the INSIGHT Centre for Data Analytics that builds tools for semantically enriching digital collections in DRI, as well as extending the International Image Interoperability Framework (IIIF) to support linked data searching across image resources held in multiple repositories.

France, Sweden, UK and Ireland, covering areas of expertise in Open Repositories, High Performance Computing and Simulation and SuperComputing.

On the basis of continued involvement in High Performance Computing and Simulation over a number of years, Dublin has been selected as the host city for this conference in 2019 and Research IT will be heavily involved in the planning and delivery of this important event in the next academic year.
supporting business at Trinity

IT Services works in partnership with service and support units across Trinity’s Central, Academic and Financial Services Divisions to develop and support Trinity’s business systems. We ensure effective academic and business operations across the University are supported and that data and information is available to guide better decision-making.

highlights this year

IT Services were focused in 2017/2018 on working in close collaboration with the Academic Registry, Human Resources, Estates and Facilities and Financial Services and also particularly on supporting the business process needs of the Trinity Education Project (TEP). To achieve success across this diverse range of capital projects IT Services teams actively participated in the implementation of new infrastructure, application design & development, system integrations and the delivery of business intelligence reporting.

IT Services worked closely with project managers and system users throughout the development lifecycle of the projects and ensured that requirements were delivered as expected, on time and by conducting extensive testing and liaising closely with the stakeholders we assured the quality of all the IT activity that was carried out for these projects.

trinity education project

New functionality in SITS (Student Information System) and business intelligence reports were created across the following areas to support TEP’s delivery of new programme architecture and the new Academic Year structure.

- Health Screening and Clearance Checks – to allow Schools to proactively monitor the status of health checks and manage pre-registration processes for students
- Mentor & Tutor Allocation Reports - ensured the allocation of mentors & tutors was completed in time for the new Academic Year
- Pre Applicant Transfer & Pre Registration – new automations and reports were created to ensure the smooth processing of students through these stages of the registration process
- IT Account Creation for new students - this enhancement delivered a reduction in the provisioning time for new student IT accounts to less than 48 hours
- Transcript Production - simplification of the Transcript generation process ensuring alignment to TEP
- Joint Honours Application Report - Enabling monitoring of the applications for joint honours courses with a particular emphasis on the selection of the language option.
- Student Levies and Charges - provides information for the distribution of the Student Levies & Charges.
- Bursary Analysis - provides information on bursaries issued
- Secondary Course Report - indicates where a student may be entitled to receive a bursary.
- Fee Certainty – assists with calculating the estimated revenue impact of Fee Certainty.
- Course Applications - provides predictive analysis on course registrations against course fees paid

As part of SITS continuous improvement programme enhancements were also delivered to the First Destinations Returns Survey for the Careers Advisory Service and to the Research Management System.

Business Intelligence implemented a Near To Real Time analytical reporting capability and delivered data models to support:

- Course Analytics - which is a Course/Programme data cube, with dimensions to enable drill down into further detail of Courses, Modules and Students.
- Assessment and Progression Analytics Includes information on Modules, Assessment Components, Marking Schemes, Exam Scheduling, Invigilators and Exam locations.
- Student Finance Analytics improves understanding of SITS Finance related activity and delivered information to allow data trends to be analysed over time.

core HR service upgrade

Over 2017/2018 IT Services worked in partnership with Human Resources on the Capital Project that has successfully upgraded the CoreHR Service to a new and secure cloud-based solution, with fundamental developments on how HR data is managed and optimally shared across Trinity’s IT systems. IT Services have been involved from the evaluation of the cloud hosting environment, through the data analysis & mapping.
the planning, design, build and testing of interfaces to Trinity IT systems such as the Finance system for
bank reconciliation, to setting up new services to integrate CoreHR in the cloud with Azure Active Direc-
tory and Office 365 for single sign-on. A site-to-site VPN service was also designed and commissioned
which facilitates seamless and secure communications between the cloud hosted service and on-premis-es
hosted business applications. This upgrade has optimised HR Technology and will enable HR to deliver
on strategic business goals over the coming years.

integrated workplace management

IT Services worked with Estates and Facilities on the capital project to implement Planon Universe, an
innovative Integrated Workplace Management (IWMS) platform that will allow Trinity to optimally
manage University space. In August 2018 Planon went live with phase one incorporating the property,
space and assets modules. During the project IT Services have provided system analysis, design and
testing and have setup Federated Access to Planon so allowing users to access the service using their
Trinity username and password.

web asset management

As part of the FIS Transition capital project IT Services have provided expert analysis and documentation
of acceptance criteria, reporting, audit and testing to deliver on the enhancement of the current Web
Asset Register. The application will be enriched to incorporate additional accounting requirements for
asset register financial and insurance management and will also include the integration of FIS and space
related data from the IWMS system for asset custody and control purposes. The main deliverables
are the development of a data import facility which will provide access to enable users to evaluate and
maintain the asset records.

25 bespoke data integration solutions for the University
were delivered for 28 of Trinity’s business systems

Business Application Support answered 7017 calls from
Trinity applicants, students & staff
keeping
Trinity IT safe

IT Security works both to protect Trinity from attack and to ensure that our community has the knowledge and awareness to play their part in keeping Trinity secure.

managing cyber security threats to Trinity

In 2017/18 the University continued to experience risk to University data and computing equipment from the global cyber security threats posed by malware (viruses and ransomware) and phishing attacks. IT Services monitor the Trinity data network for evidence of malware infections and provide a managed anti-virus service using McAfee ePolicy Orchestrator & McAfee Endpoint Security. In 2017/18 this service successfully detected and removed thousands of malware threats.

IT Services also provides a managed service which ensures that all Windows computers receive important security updates. These updates protect the windows computers from known software bugs which may allow malware to be installed on computers.

Trinity staff and student email accounts continued to be significant targets for Phishing attacks in 2017/18. Phishing is the fraudulent practice of sending emails purporting to be from reputable companies in order to induce individuals to reveal personal information, such as passwords and credit card numbers.

Trinity staff and students were targeted by phishing scams attempting to gain access to their Trinity username and password and Office365 accounts as well as other University services and their personal data. In 2017/18 IT Services continued to run our Phishing Awareness and Education Campaign to reduce risk and inform staff. This involved IT Services sending “phishing” messages to all staff. Any staff member who provided their credentials in response to the phishing email was provided with real-time online training on how to avoid future phishing scams. The four Phishing Campaigns in total sent 22,982 Phishing messages, 717 Trinity staff fell victim and opened the fraudulent websites or files and if these had been real cyber-attacks 292 people would have put Trinity College and their own personal information at risk.

Looking ahead

In 2018/2019 as part of the Unified Communications II project IT Services will be rolling out two-step sign-in for all staff to protect the important administrative, teaching and research data stored in their Office365 and email accounts.

securing new university information systems

Ensuring the security of University administrative, teaching and research data is critical to the ongoing success of the University. Throughout 2017/18 the Information Security Manager in IT Services worked with IT Services staff, and with project managers across the University, to ensure that all newly procured Information systems whether hosted on campus or in the cloud adhered to the highest possible security standards.

IT security week and data protection day

IT Services held its annual IT Security week (22-26 January 2018) to raise awareness of IT Security issues affecting staff and students in the University.

This 2018 IT Security week addressed the issues of how to protect University data and computing devices from threats including spam, malware and phishing and provided guidance on how to ensure compliance with the new data protection legislation, the GDPR, which came into effect in May 2018.

During IT Security Week many interesting news items that offered tips and guidance on the latest IT Security developments were posted daily to the IT Services website.

To mark International Data Protection Day on the 25th January 2017 IT Services collaborated with our colleagues in Information Compliance and the Science Gallery to run a number of interesting and successful events. These included a drop-in data protection clinic, which offered staff and students advice on a wide range of data protection and IT security issues ranging from protecting personal data in day to day lives to advice for researchers who collect and analyse personal and sensitive data in their professional work.
In the evening a thought-provoking panel discussion entitled The value of personal data took place in the Trinity Long room hub. The discussion focused on the value of data and how individuals can strike a balance between encouraging data driven innovation and protection of their privacy.

**IT security website gdpr refresh**

In May 2018 a new IT Security website was successfully launched. The new website aims to provide all University staff and students with useful information on IT Security in Trinity including information on IT Security Policy, awareness and education programmes as well as information on recent events and useful resources.

The new website also includes a section to provide IT advice on the General Data Protection Regulation (GDPR) which came into effect in May 2018. The GDPR gives individuals greater control over their personal data by setting out additional and more clearly defined rights for individuals whose personal data is collected and processed by organisations. The GDPR also imposes corresponding and greatly increased obligations on organisations that collect this data.

This section of the new website aims to help staff ensure that they are GDPR compliant in their day-to-day handling of electronic personal data in the University by providing useful information and checklists.

- **67,924** malware & viruses blocked
- **32%** of all of Trinity’s incoming email was detected as SPAM
- **1,060** Security queries at the IT Service Desk
Digital infrastructure is all the hardware, software, network resources, telephony and data centres that are the foundation of the IT services offered across Trinity. IT Services operate and manage an enterprise IT environment that is delivering secure, resilient and reliable service 24/7.

New “Next-Generation” Firewalls - Firewalls are the most critical IT security infrastructure component and form the security boundary between Trinity’s network and the internet. Following a procurement process with the Office of Government Procurement (OGP), and an investment of almost €300K over the next 5 years, new Firewalls were purchased and went into service in January 2018.

The new Firewalls protect all of our IT assets and business systems from cyber-attacks and unauthorised access. The Firewall tightly manage the security controls around Trinity’s website and have also introduced a raft of new security capability to combat continually evolving cyber threats - including real-time Intrusion Protection capability, Malware detection and the ability to inspect, at the application level, our network traffic.

Storage upgrade and backup replacement – Trinity’s Storage and Backup infrastructure supports 120 of the University’s key IT business systems and applications including SITS, FIS and CoreHR. The current infrastructure was end of life and a project, with a budget of €0.8m, was approved to commission a replacement environment. The project ran throughout 2017/18 and comprised the installation and commissioning of the new storage and backup equipment, and a phased migration of all business system and research data. The project successfully delivered the following:

- Continuity of services by purchasing technology with the necessary performance, capacity and licensed functionality that meets current requirements out to 2022 and that can be scaled out to meet projected growth
- Replaced the existing primary and secondary storage appliances hosted in the Green Data Centre and the Lloyd Data Centre, that hold the transactions and records of 120 IT systems along with Departmental and Research data, with two new appliances
- Replaced two backup appliances hosted in the External Data Centre that hold offsite copies of the University’s data with a single new appliance
- Minimised downtime on all IT systems, departmental & research storage and backup services as the upgrade took place
- Avoided the need to pay for extended maintenance and support on the existing storage and backup infrastructure from November 2017
- Delivered a better service using less electrical power

491 TB of storage provisioned on the new SANs
2,789,012 phone calls made and received
Trinity Web Service was improved with the introduction of a new Solr web search engine and the deployment of Apache Caching to speed up the load and response times for some of the busiest Trinity web pages, including the main homepage www.tcd.ie. Load time for webpages was reduced from 3 seconds to less than 10 milliseconds. A new News and Events website was integrated into the Trinity home page in collaboration with the Digital Office.

Edugate Federated Access was setup for a range of new services including Lynda.com, Talis, Panopto, Planon, Seats, Sketch Engine, APPEL and Aluminati.

Telephony - IT Services, in collaboration with our external support partner, continued to enhance the Mitel IP Telephony service at Trinity and a two-year programme commenced to phase out and replace Cisco IP handsets with Mitel IP handsets. Over 2017/2018 230 new Mitel IP Handsets and 168 new mobile handsets were purchased for use across Trinity.

Trinity network

Mobility - IT Services is resolute that the mobile experience is optimal and a foundational starting point for creating a Digital Transformation at Trinity. To enhance mobility in 2017/2018 we have:

- Leveraged the investment made over the last 3 years on the Trinity WiFi infrastructure and developed a new Internet Connect service for staff that allows for quick self-service Wi-Fi connection of personal mobile devices
- Made it easier than ever before for students to connect, safely and securely, to Trinity WiFi using TCDconnect

running the network infrastructure

IT Services manage 160 Comms Rooms across the Trinity campuses and these are the spaces where we host the Network Infrastructure that provisions the Trinity Wired and WiFi network services. Working with Estates & Facilities 10 of the Comms Rooms were refurbished over 2017/18.

IT Services also invested in new equipment for network cable testing & for WiFi design that will help us support and eliminate network coverage “black spots” on the Trinity Campus today and improve the design of WiFi networks for new buildings in the future.

IT Services provided extensive consultancy and service delivery to support Trinity’s Estates & Building programme of projects. IT Services worked on both new buildings and refurbishments to ensure the buildings comply with University cabling policy and meet the appropriate quality standards in relation to all aspects of networking. Once the network is commissioned in these projects IT Services then work to integrate the buildings to the core network, commissioned networking switching equipment, configured access points, patched points and tested to ensure the highest possible standard of networking was available for the users. IT Services worked on a number of Capital building projects including:

- Extensive consultancy was provided by IT Services to support the Capital Estates Projects by engaging with Estates and Facilities on new building projects and refurbishments including E3, New Business School and Printing House Square.
- Global Brain Health Institute
- MV Project
- Arts Block Refurbishment
- South Leinster Street (Computer Science)
- Trailhead (Arts & Regent House)
delivering change & improvement

IT Services staff contribute their considerable expertise to a wide range of projects and programmes across the University, in addition to those that are sponsored and managed within IT Services. The program of projects for 2017-2018 has delivered service development and enhancement to support the University’s Strategic goals:

From engagement in Proposals & Business Cases to Approved and In progress projects IT Service Project Office managed a portfolio of 39 active projects over 2017/18 for both IT Services and Non-IT Services Capital & Non-Capital Projects for 12 different Academic and Business areas of Trinity.

Nine projects were completed in 2017/18 across our Project Portfolio including the IT Services initiated large, capital technology projects to deliver new Storage, Backup and Network Firewall infrastructure; the VLE Enhancement project and the programme of Audio Visual upgrades for Teaching & Learning IT, the Radiation Therapy planning system was delivered and now allows for Undergraduate and Postgraduate students to learn and practice advanced treatment planning activities; and the upgrades of the University Student Administration System SITS, the ESD call management service to the Student Information Desk (SID) and the CMIS Timetabling service.

highlights this year

In addition to the projects included in our earlier sections IT Services commenced, and are continuing, work on a large portfolio of projects over 2017/2018

• Building on the success of the Unified Communications Phase I project IT Services received approval to commence the planning of the next phase of this project. The Unified Communications Phase II project will be a critical enabler of a digital campus for Trinity in the 21st century (We have a spotlight on this project on page 40).

• IT Services assisted the Library with a capital project to upgrade and enhance the resilience of the Library Management system. IT Services commissioned the new hardware infrastructure which is hosted in Trinity’s Green Data Centre and the secondary Lloyd Data Centre, completed the network configuration and data migration for the successful upgrading of the library management and catalogue applications (Sierra and Encore). This project will ensure continued availability of the Library IT system which supports key operational tasks for the Library and the discovery of Library resources.

• IT Services continued to enhance Trinity’s IT Infrastructure with an upgrade to our Active Directory Service to deliver a resilient, robust and up-to-date directory & authentication services.

• IT Services has worked with the Project Management Office to deliver a Trinity portfolio management
Enterprise Architecture is an Innovation Enabler for IT Services and it drives technological innovation to maximise return value from Trinity’s IT investments. This function advises on how to exploit Innovative IT to achieve strategic goals.

Over 2017/18 Enterprise Architecture has engaged with numerous projects from delivering proof of concepts, such as for automated testing of the SITS Reporting Suite, designing integration architecture methodology to enable easier management of interfaces and faster time to deployment practices, to templating common IT requirements to streamline the tendering process for cloud and on-premises IT applications procurements.

enterprise architecture

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(PPM) tool. This project is due to go live in late 2018 and will allow the PMO to create and maintain a single, central register of all projects for Trinity College and will provide portfolio reporting, prioritisation and workflow functionality for Trinity projects.

- IT Services continues to provide consultancy and IT delivery support to the Commercial Revenue’s programme of projects. In 2017/18 this has included input to a project that will provide an online booking engine that integrates with Ticket Kiosks on campus to streamline the planning and capacity management for accommodating visitors to the Book of Kells.

- The Procurement Office are seeking to implement a new Contract Management System (CMS) which will provide an accurate record of supply agreements and facilitate compliance reporting in line with Comptroller and Auditor General (C&AG). IT Services have assisted the Procurement Office with the tender technical specifications and evaluation to ensure we have a system to provide a central repository of all tender contract management documentation and enable procurement planning.

- IT Services have worked with the School of Nursing and Midwifery to upgrade their Student Time and Attendance System. IT Services have delivered technical services for this project including architectural design, data integration (for staff and student data), server and database implementation, provision of network points and authentication services.

- IT Services worked in partnership with Human Resources to build a hub of web forms, using SharePoint technology, to support their process improvement programme. The project identified a number of forms for development in relation to staff requisitions, promotions and probations. The creation of the HR Forms Hub has improved the user experience by automating and streamlining HR approval workflows.

- IT Services have been working with Trinity Sport on a project to upgrade their current Sports System and implement a new online booking system to allow customers to book and pay for classes online, as well as receive notifications of any timetable changes, vacant booking slots for courts, halls, pitches and new classes or special offers. To date, the new infrastructure has been commissioned, the current system has been upgraded and the new modules installed. There has been extensive customisation and configuration to prepare the new modules ready for go live, including a new Mobile app which members can use to book classes and facilities and keep up-to-date with the latest Trinity Sports news.

- Achieving AACSB & EQUIS accreditations and entering the Financial Times (FT) rankings are fundamental to the success of the Trinity Business School’s strategy. The new Business Accreditation system will enable the Trinity Business School to attain accreditations and access to improved reporting for the School. IT Services have commissioned the new architecture required and are working on integrating this new system with existing Trinity IT systems. The project is planned to be delivered in 2019.
project spotlight

unified communications II

IT Services have commenced an ambitious programme of work to transform the day-to-day IT working environment for all Trinity staff by integrating elements of our existing Office365 service, and other technologies, to provide a standardised approach to collaboration and storage. The project will provide immediate benefits across the University as the role of communications is central to Trinity’s goal of creating a better-informed and more engaged community of people who are fully committed to the University’s success.

The Unified Communications II project was approved by CRG in February 2018 and the project will be a critical enabler of a digital campus for Trinity in the 21st century. It will also facilitate delivery of other planned, or in-train initiatives, including the CoreHR upgrade by providing two-step secure sign-in for off-campus access to Trinity IT systems.

project objectives

In phase I of the Unified Communications, which completed in 2017, IT Services upgraded the underlying infrastructure of the University fixed line telephone system to modern digital telephone switching equipment.

Phase II of the Unified Communications project will consolidate and secure existing productivity services and combine these with new communications and collaboration services like Microsoft SharePoint and Teams in Office365, building on the services successfully delivered in Unified Communications phase 1 and the Staff Email Upgrade project.

The Unified Communications II project is a program of work with two broad complementary aims:

- to transform the day-to-day IT working environment for all Trinity staff by providing a standardised approach to collaboration and storage which will provide immediate benefits across the University. Adoption of a suite of GDPR compliant cloud services as illustrated below will allow the University to present a coherent and professional image in its management of medium and high impact business data as well as facilitating global collaboration with external partners/researchers.

- encrypted 7,000 computers at Trinity

- ensured security with Two Step Sign In for 6,000 people who use our Office 365

- delivered SharePoint with unlimited & secure storage for collaboration and sharing
sustainability

playing our part in ensuring a green university

Trinity College began its journey towards sustainability as far back as 2001 with the establishment of the first environmental committee and since then environmental awareness has grown among staff and students. Over the last year Trinity has established the Provost’s Advisory Committee on Sustainability and Low Carbon Living to drive sustainability initiatives and IT Services knows that we will have our part to play. Every day we are working to be more energy efficient while meeting the technology needs of over 25,000 staff and students.

sustainability by objective

In 2017/2018 IT Services undertook a new Data Storage & Backup project. This project was conceived with not only the need to be able to provide continuity of service but also keep sustainability & greener IT firmly in mind. The project set the goal of a 50% reduction in energy usage in the Data Storage Area Network (SAN) and this goal was surpassed.

We achieved a 55% energy saving by upgrading the SAN in both Trinity’s Green Data Centre and secondary Data Centre, which is equivalent to a 14,682kg CO₂ (Carbon Dioxide) reduction per annum. In our remote Data Centre, a 50% energy saving, equivalent to a 2,072kg CO₂ reduction per annum was achieved, as we replaced associated data storage equipment. Additional energy savings arise on an ongoing basis as the Data Centres will now require less cooling power as a result of less energy being consumed.

There are a myriad of ways for everyone to get involved in sustainability and every little makes a difference so IT Services have been engaged in promoting the following within Trinity:

- Encouraging migration to electronic document usage rather than paper printing within each area
- Offering support on how to default a personal computer settings to double sided, black & white printing as default.
- Showing staff and students how to better manage their power usage so that computers go on standby after a certain number of minutes, to save on energy and reminding everyone to shut their devices down overnight and at the weekends.
- Encouraging the migration away from multiple small printers in individual offices to a centralised large multi-function device (MFD) within a School or Business Area for printing, copying and scanning.

14,682 kg CO₂ reduction, equivalent to 29 households switching to biking or walking to work for a year

14,682 kg CO₂ reduction, equivalent to 29 households switching to biking or walking to work for a year
**financial elements**

The following table shows pay and non-pay expenditure from 2008 / 2009 to 2017 / 2018.

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Pay</th>
<th>Pay</th>
<th>Non-Pay</th>
<th>Pay</th>
<th>Change since 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 / 2009</td>
<td>€5,755,717</td>
<td>€5,483,674</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>2009 / 2010</td>
<td>€4,539,002</td>
<td>€5,434,391</td>
<td>-21%</td>
<td>-1%</td>
<td></td>
</tr>
<tr>
<td>2010 / 2011</td>
<td>€3,450,101</td>
<td>€5,102,482</td>
<td>-40%</td>
<td>-7%</td>
<td></td>
</tr>
<tr>
<td>2011 / 2012</td>
<td>€5,223,885</td>
<td>€5,092,622</td>
<td>-9%</td>
<td>-7%</td>
<td></td>
</tr>
<tr>
<td>2012 / 2013</td>
<td>€3,996,606</td>
<td>€4,926,710</td>
<td>-31%</td>
<td>-10%</td>
<td></td>
</tr>
<tr>
<td>2013 / 2014</td>
<td>€4,757,762</td>
<td>€6,076,614</td>
<td>-17%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>2014 / 2015</td>
<td>€2,639,635</td>
<td>€6,767,462</td>
<td>-54%</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>2015 / 2016</td>
<td>€3,242,439</td>
<td>€6,477,348</td>
<td>-44%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>2016 / 2017</td>
<td>€3,750,386</td>
<td>€6,419,099</td>
<td>-35%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>2017 / 2018</td>
<td>€4,360,947</td>
<td>€6,624,427</td>
<td>-24%</td>
<td>21%</td>
<td></td>
</tr>
</tbody>
</table>

The following table shows IT Services, FTE 2008 / 2018.
The production of the IT Services Annual Report 2017/2018 required the knowledge, skill and expertise of a range of colleagues and their contributions generated a report that reflects the work performed by the teams across IT Services at Trinity.

The contributions and cooperation of the following are gratefully acknowledged in the preparation of this report (presented in alphabetical order by surname):

- Stephen Barrett, IT Service Desk
- Paul Duggan, Programming & Integration
- Sheila Dunphy, Application Design & Development
- Nicola Cooke, IT Service Delivery
- James Dawson, Business Intelligence
- Dermot Frost, Research IT
- David Hamill, Training & User Communications
- Paul Jones, Infrastructure & Operations
- Sara McAneney, IT Security
- Colin McCabe, Teaching & Learning IT
- Katrina McCall, IT Project Office
- Sean McGrath, Research IT
- Cathal O’Donnell, ICT Facilities
- Brian O’Hara, IT Project Office
- Tricia Patterson, Vendor Management
- Lisa Quinn, Training & User Communications
- Sinead Sheils, IT Service Desk
- Ian Stevenson, Business Applications Support
- Andrew Watson, Enterprise Architecture