Infrastructure Group

ucisa

Infrastructure Survey 2018

Survey Report

Introduction

The first IG survey was carried out in 2018. The survey attracted 66 responses from a wide range of institutions, ranging from small Further Education Colleges through to large research intensive universities.

Clearly with such a diverse range of respondents, it is sometimes nonsensical to attempt to compare across all institutions. In order to group universities and colleges to allow comparison, we have used a complexity rating to group responding institutions and so identify trends or traits. This system of measuring institutional complexity was initially developed by CAUDIT, our Australasian equivalent organisation and enhanced by members of the Coalition of Higher Education IT Associations (CHEITA). The measure determines institutional complexity through three measures – number of full time equivalent staff, number of full time equivalent students and total research income.

Three groupings have been used:

- Large: typically large metropolitan universities with high student numbers and/or significant research income (17 institutions);
- Medium: typically smaller research intensive institutions, provincial universities (31 institutions)
- Small: typically small specialist universities and colleges (18 institutions)

However, the size of the institution has little bearing on the technology or software used. There appears to be a great deal of commonality across the sector, as detailed in the report.

Results

Management of IT

IT was both centrally located and managed in nearly 60 % of responding institutions. One fifth of respondents reported that their institution's IT was centrally managed with a significant level of staff placed locally in departments/schools but managed centrally. Management was further devolved in 16 % of institutions with there being both a central service and a significant local presence managed by the hosting departments.

In the larger institutions, the split between centrally located and managed, a central service with a significant centrally managed local presence and a central service supplemented by devolved, locally managed teams was even (7:5:5). In the medium institutions, central management was more dominant with just over half having wholly centrally located and managed IT departments and the majority of the remainder having a central service supplemented by local but centrally managed staff. Smaller institutions were exclusively centrally managed with all bar two centrally located.

The size of the core IT department varied. For the most part the number of staff in the IT department in the large institutions was in the hundreds – most were around 150 staff with a number of outliers in excess of three hundred staff. The responses here may not wholly reflect the true numbers of IT support staff since it is not clear that all respondents interpreted the question in the same way. Some appear to have included the locally hosted (but centrally managed) staff whereas some have omitted these staff from their headcount. The number of IT staff in the medium group of institutions ranges from 50 – 150 although the same reasoning for the variation may apply. The IT departments in the smaller institutions were commonly around 30 – 40 headcount for higher education institutions (with one outlier at 80 staff) and were under ten staff for the further education colleges that responded.

Data centre provision

Only a few very small institutions have a single primary data centre located on premise. The remainder all have multiple data centres (two or more) and whilst institutions may be accommodating all their data centres within their estate, the majority and utilising a blend of on premise and commercial or cloud provision. In addition some applications (for example, the Virtual Learning Environment or the Finance system) are externally hosted in many institutions. The rationale for these applications to be externally hosted will vary but may include improved resilience, ease of maintenance/upgrade or to address skills shortages. Nearly 77 % of respondents maintained a separate location for backup or replication.

Student email is now predominantly (90 %) delivered through hosted services such as Office365 or Gmail. Staff email lags behind with just over 63 % of institutions having migrated their staff email services to a hosted service.

Storage and backup

There were three dominant suppliers of storage arrays to the sector. Dell EMC has a presence in over 46 % of institutions with both Netapp and HPE having a presence in around 25 % of institutions. Most institutions opted for a single supplier although multiple suppliers were deployed in 25 % of cases. Over four fifths of respondents have a dedicated data centre storage network.

Fibre channel (FC) is used by the majority (53 %) of respondents as the transport for block storage with nearly 40 % utilising the iSCSI protocol.

There is a broader approach taken to the delivery of user filestore. Two thirds of institutions utilise servers backed by storage area networks with a further 23 % making use of appliances. The remainder are using servers backed up by directly attached storage. The approach taken is not

dependent on the size of the institution with similar breakdowns for the large, medium and small institutions.

A broad range of vendors are used for backup with no dominant supplier. VEEAM have the largest market share with a presence in nearly 30 % of institutions with over 20 % of institutions deploying Comvault solutions. Around 12 % of institutions deploy multiple backup solutions these being largely VEEAM with one or more others. Commodity disc is the preferred target for backup for over 40 % of respondents with a further 35 % preferring a deduplication appliance. However, that is unlikely to be the case in the future with over 62 % considering public cloud solutions as a target for backup.

Infrastructure

There appears to be a move towards hyper-converged infrastructure. Over 25 % of respondents already have hyper-converged infrastructures in place with a further 12 % having firm plans to migrate. A further 16 % are actively considering. It will be interesting to revisit this question in a few years' time to see if this trend is maintained. Again the adoption of hyper-converged infrastructures does not seem dependent on the institution's size or complexity.

The server environment is highly virtualised with nearly two thirds of respondents reporting that over 90 % of their sever estate is virtualised and a further 22 % advising that 75-90 % of their servers are provided through virtual machines. All respondents have a single corporate virtualisation solution; VMWare is the dominant solution with 83 % of the market. Hyper-V is utilised as the corporate solution by 14 % of respondents. Many institutions deploy multiple solutions with Hyper-V being present in over 50 % of institutions. Not surprisingly the number of physical virtualisation hosts and virtual machines varies although there is no apparent correlation between the size/complexity of the institution and the number of hosts/machines. Similarly the amount of storage varies considerably.

DellEMC are the dominant supplier for server equipment with nearly 50 % of the market with HPE preferred by nearly 24 % of respondents. There is a wide spread of alternative suppliers in the remaining 29 %. Perhaps not surprisingly Windows is the dominant preferred platform (nearly 75 %) although all respondents reported that they use a blend of operating systems across their IT estate, depending on the application requirements.

Given the dominance of Windows as the preferred operating system, it is perhaps not surprising to note that all respondents utilised SQL Server in their institutions. Oracle and MySQL were also used by over two thirds of respondents with PostgreSQL being used by over 30 % of institutions. SQL server was the preferred platform for corporate applications in over 60 % of institutions with Oracle the preferred solution in 31 % of cases. However, almost all institutions used multiple database platforms. Active Directory is used as the primary directory service in over 80 % of cases.

Firewalls are a key component of an organisation's cyber security defence. A variety of vendors are employed as the primary firewall vendor – Palo Alto is used in nearly 40 % of institutions with 20 % using Cisco technology, 15 % using Fortinet and 11 % using Checkpoint. However, the market is competitive with a further six suppliers being utilised as the primary firewall vendor.

Desktop and remote

It comes as little surprise that almost all respondents reported that they provides a standard managed Windows desktop client service to both staff and students. Most have migrated or are in the process of migrating those services to Windows 10 although Windows 7 retains a strong presence. A wide variety of tools are used for the deployment and configuration of the Windows desktop service and for application deployment.

There continues to be a MAC presence in many institutions with over 54 % of respondents reporting that their institutions provide a standard, centrally managed Mac OSX client service.

Nearly 70 % of respondents offer a staff VPN service but the reverse is the case for students with only 30 % of respondents offering a student VPN service. Most institutions use multiple single sign on solutions with Shibboleth and ADFS both being used in over 75 % of institutions. Nearly 60 % of institutions are using both Shibboleth and ADFS.

Print
There continues to be a move towards managed print. However there is no dominant technology with a wider range of vendors supplying the market. PaperCut is used in two fifths of institutions as the print accounting solution with Pcounter being used in one fifth. The remaining two fifths use Pharos or SafeCom with some institutions using multiple solutions. Almost all (92 %) of respondents use a *follow me* printing service for both staff and students.

Networking
Cisco are the dominant provider of networking technology being the primary vendor for institutions' core network infrastructure, edge infrastructure and wireless. In each instance, Cisco was the preferred supplier for over 50 % of respondents. HPE also had a strong presence being the preferred supplier for over 16 % of institutions for the core network infrastructure, nearly 25 % for edge infrastructure and nearly 20 % for wireless. Brocade/Extreme were the preferred supplier for over 17 % of institutions for core network infrastructure and 11 % for edge infrastructure with a lower penetration in the sector for wireless technology. Other network technology suppliers included Huawei, Juniper and Aruba.

Looking to the future – hot issues
The survey concluded by inviting respondents to identity up to three *hot issues* that would be taking up respondents' time in the coming year. These could include projects or major challenges the institution was facing in maintaining or delivering a quality infrastructure to support institutional mission or strategy.

Three main areas dominated: data centres and services; storage infrastructure; and identify management and authentication.

With regards to data centres, the emphasis is on the review of existing provision (whether on premise or commercially provided) and assessing what the balance should be between local and cloud provision. The biggest issue with storage is the ongoing growth in demand, although some institutions are struggling with migration from legacy technology to modern solutions. Many access and identity management solutions deployed in institutions are now coming to end of life with the result that institutions are looking at potential commercial solutions that can work well in a complex environment.