

Board:	Date(s):
Information Systems Sub Committee	25 th March 2014
Subject:	Public
CTO Overview of Technical Change Projects	
Report of:	For Information
Chamberlain	

Summary

This report provides Members with an overview of two of the key infrastructure projects, Wide Area Network (WAN) and Remote Access, and sets these in the context of the overall IS Strategy and Vision.

The Wide Area Network project was approved by Finance Committee in 2013 and sees the City's WAN upgraded from a BT based hub and spoke network to a modern, faster and more effective network, provisioned largely from Virgin Media.

This new network will support faster and more reliable access to systems and information, which will particularly benefit staff in remote offices, allowing them to obtain a similar level of service to those in the Guildhall. In conjunction with Remote Access and the Agilisys Service the new network also improves resilience by removing the current dependence on the Guildhall complex as the hub for IS service provision and increasing access capability at all remote sites. This greatly enhances business continuity and ability for services to continue in the event of a major incident (disaster recovery).

The City's remote access project combines a number of different technologies to improve the ability of staff to work flexibly and access systems and information outside of the Corporation's offices. Staff with corporate laptops will be able to work at home, or any other place with an internet connection, as if they were in the office. Improved access will also be provided for staff to use web based email from non-corporate devices.

Taken together, these projects provide an excellent foundation upon which the IS Strategy is based, providing the ability to work flexibly and 'access everything everywhere'. This will facilitate the implementation of improved working practices, more efficient use of our accommodation and enables the potential savings from those initiatives.

The report also provides a high level vision of joint working with City Police and details some of the work in progress to deliver this vision. It highlights some of the common areas of IS infrastructure such as; Local Area Network (LAN), WiFi, and telecommunications, which are in need of major upgrade or improvement within both organisations, as well as common service areas where there appears to be overlapping requirements and resource.

There are many facets to joint working and these are covered in more detail in the City Police Corporate Service Director's verbal report on CoLP Force IT Modernisation programme.

This report should be read in conjunction with the IS Programme Update which details the latest status for key IS projects including those covered within this report.

Recommendation

That the report be received.

Main Report

1. This report provides Members with an overview of two of the key infrastructure projects, Wide Area Network (WAN) and Remote Access, and aims to set these in the context of how they support delivery of the overall IS strategy and vision.
2. The report details also the work being undertaken by the City IS team with City Police to assist with the Force's IT modernisation programme, to align vision and strategy and to deliver where possible, taking into consideration operational and security requirements, a consolidated, effective and efficient IS service.

Background

3. **Wide Area Network** - The City's Wide Area Network (WAN) has for some years been based on a hub and spoke design, sourced largely on services provisioned from BT. There were a number of issues with this approach including unreliability of some lines, poor performance due in part to running services over the public internet and a lack of resilience to support business continuity and disaster recovery.
4. With Committee approval a project was initiated in 2012 to review business requirements with a view to upgrading the WAN to ensure it is fit for purpose and that the known weaknesses were engineered out as far as possible given financial constraint.
5. A contract was awarded to Virgin Media in April 2013 to complete the design and rollout a WAN based on MPLS¹ technology. MPLS provides several benefits including dedicated, uncontended bandwidth, greater monitoring and reliability and geographic independence through use of the Virgin Media business cloud infrastructure. This latter point means that rather than remaining a hub and spoke topology, each site is capable of direct communication with all other sites. In combination with other projects such as the move to Agilisys Infrastructure-as-a-Service (IaaS) platform this ability fundamentally changes and improves the City's business continuity and disaster recovery capability.

¹ MultiProtocol Label Switching -

6. The WAN upgrade is due for completion in March/April 2014 and the significant improvements it delivers underpin 'Better Working Practice' and 'Building an Effective Corporation', two of the IS strategies key themes.
7. **Remote Access** - The City's remote access has for many years been largely based on Citrix, which provides the City's current remote desktop access to the majority of corporate applications. This service is supplemented by Blackberry and Good which provide limited predominately email and calendar access from corporate and non-corporate mobile devices.
8. Citrix has for many years been a useful solution as it requires relatively little bandwidth to work effectively, a significant consideration to date. However, given the increasing availability of high bandwidth home and mobile services and the layer of complexity Citrix remote desktop adds to the average user, alternative solutions were sought to support the increasing move to flexible/mobile working.
9. The selected solution is a mixed suite of services delivered through common infrastructure. These include;
 - Virtual Private Network (VPN) – This enables corporate laptops to securely connect to the corporate network over public networks. I.e: from home, hotels, remote locations, over 3g, 4g and Wifi.
 - Outlook Web Access (OWA) – secure browser based access from corporate and non-corporate devices to corporate email service.
 - Outlook Anywhere – client based email access using the Microsoft Outlook or similar client software. As data is held locally on the device this is likely suited to corporate devices only.
 - Office Communicator / Lync – Access to corporate presence, instant messaging and video service and the future introduction of softphones.
10. This combination of services, supplemented by Blackberry and Good, greatly increases capability for mobile and flexible working and supports the ability of staff to work independent of location. It also supports enhanced business continuity and disaster recovery capability.²
11. **Joint Working** - Members may be aware that the developing City Police IT Modernisation programme contains three key areas;
 - Development of a strategy and approach in partnership with the City Corporation.
 - A portfolio of projects with an initial focus on getting the basics right in collaboration with the Corporation

² Some restrictions may apply. Data classified as IL3 may be excluded from direct external access. Some countries may be considered to pose a security risk and therefore access may be restricted to UK/Europe only. As traffic is encrypted from the laptop to the City's infrastructure it is anticipated that use of public Wifi will not pose a security issue.

- A new operating model.
12. Whilst at a relatively early stage, to align with CoLP IT modernisation work is underway to define and agree a joint governance model to ensure projects and procurement are actioned collaboratively, thereby ensuring opportunities for rationalisation, joint working and improved efficiency are identified and progressed.
 13. This joint working has already identified common requirements for replacement or upgrades to a number of core areas of infrastructure including;
 - Local Area Network – Both CoL and CoLP networks are due for replacement.
 - WiFi – The existing CoL WiFi service is due for replacement and CoLP have identified a need for greatly enhanced WiFi provision to support mobile and flexible working as part of their accommodation strategy and mobile working project.
 - Telecommunications inc Unified Communications – CoL are looking to implement use of Unified Communications including softphones and CoLP have similar requirements although additional urgency to progress in preparation for accommodation moves.
 - PSN – Whilst CoL are currently compliant all new services will be provisioned with PSN requirements in mind. CoLP will connect to PSN by October 2014 and therefore will need to meet the same minimum, and probably a higher, level of compliance.
 14. In addition, joint working on the Force operating model review, IT strategy and accommodation projects feeds into and enforces the vision for efficiencies through common infrastructure, contracts and support function.

Overview of Wide Area Network upgrade

15. The City's Wide Area Network was until recently largely of a 'hub and spoke'. This means that the City's remote offices and home workers connected back to Guildhall using single connections and relied upon Guildhall to be available in order to access IS services. See figure 1

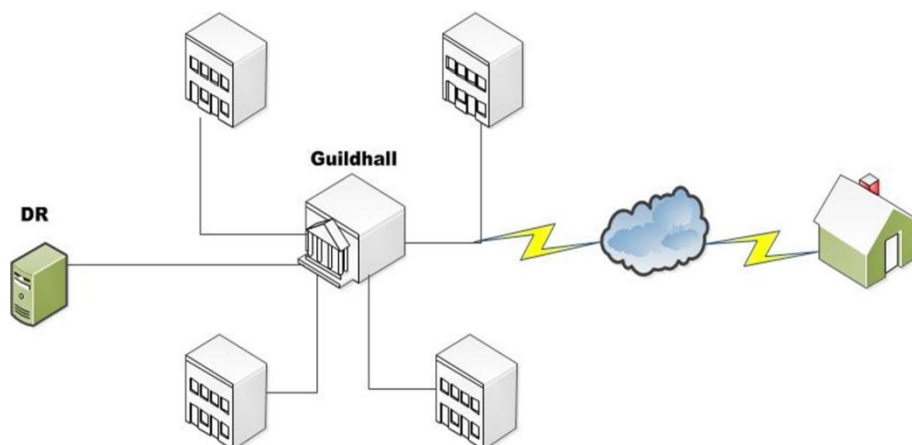


Figure 1

16. Figure 2 is a more detailed representation of figure 1 and shows how the previous WAN infrastructure had several weaknesses.

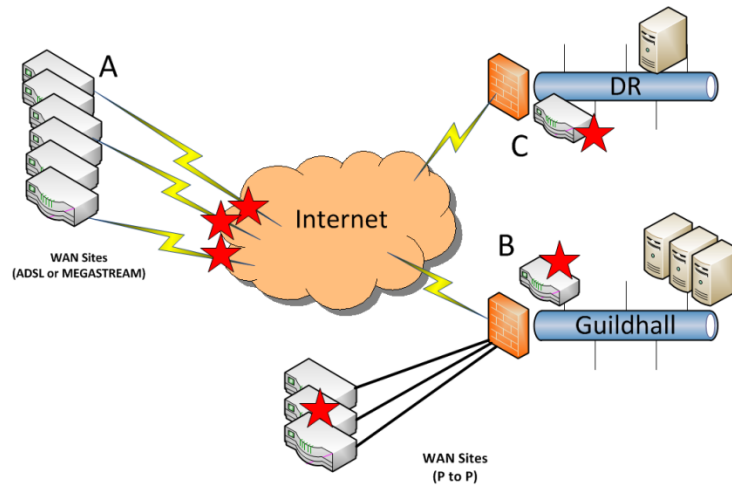


Figure 2

17. Smaller sites “A” used ADSL lines to connect to Guildhall via the internet. These suffered from low capacity, contention and latency meaning that too often users did not receive the quality of service they would reasonably expect.
18. In addition to connecting via the internet, smaller sites connected to equipment “B” & “C”, whilst this provided a level of resilience the equipment was old and no longer serviceable.
19. Larger sites connected directly to Guildhall, whilst these lines were far more reliable and of acceptable capacity they lacked resilience meaning that in the event of a disaster there was no direct connection to the City’s disaster recovery service.
20. Figure 3 shows a high level view of the WAN as is currently being deployed. The City’s many sites large and small connect with each other in a network mesh. This allows all sites to connect directly with each other and with the City’s existing and planned hosted data centres.

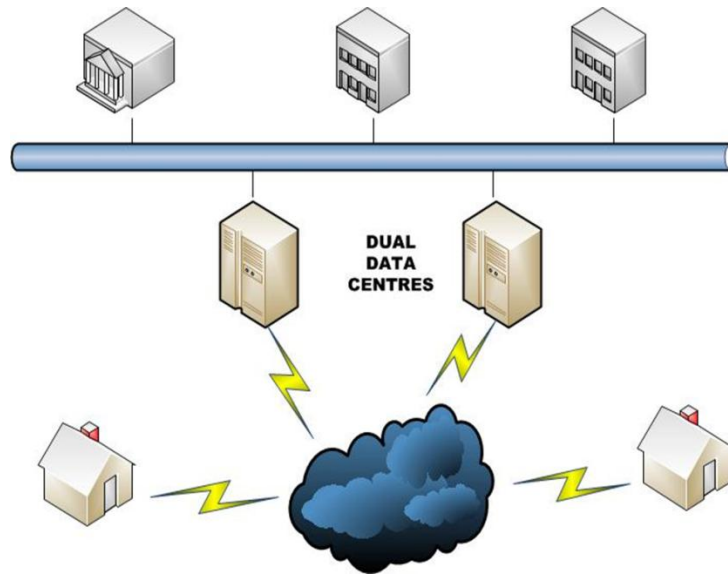


Figure 3

21. Providing a more detailed view, figure 4 shows how the weaknesses in the previous design have been removed. Sites now have communications circuits and services commensurate with their size (concurrent users) and/or operational requirements. Whilst most sites have a single connection the Guildhall complex and data centres have dual links for resilience, these links being sourced from different telecommunications providers. The resilience deployed is designed to meet business requirements.

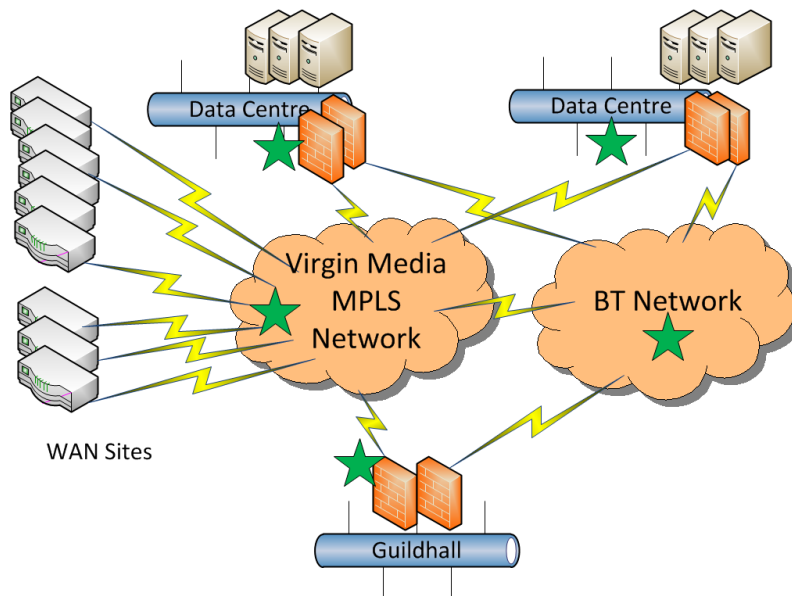


Figure 4

22. To date 62 sites have been migrated with the remaining 23 planned for completion in March/April 2014.
23. Although not covered in detail in this report, figure 4 shows the physical and geographical separation of data centre facilities and office space. This is being

achieved through the Agilisys Infrastructure-as-a-Service (IaaS) project which sees IS services relocated to offsite data centres. As well as the greater efficiency afforded by using a large-scale, purpose built, highly resilient data centre in combination with the WAN upgrade and increased remote access capability this significantly improves the City's business continuity and disaster recovery capability.

Remote Access

24. For many years the City has used Citrix to support home, mobile and 3rd party workers who require remote access to IS services including applications. This has been supplemented by use of Blackberry and Good for those who required mobile access to email. Citrix has some benefits, notably where low bandwidth is an issue, where the endpoint is unmanaged or where the applications and access need to be tightly controlled as is the case for 3rd party access.
25. For many City staff however Citrix adds a layer of complexity which, given the increasing availability of higher bandwidth services, is best avoided. Figure 5 shows how the City's remote access capability is increasing as a result of the remote access project.

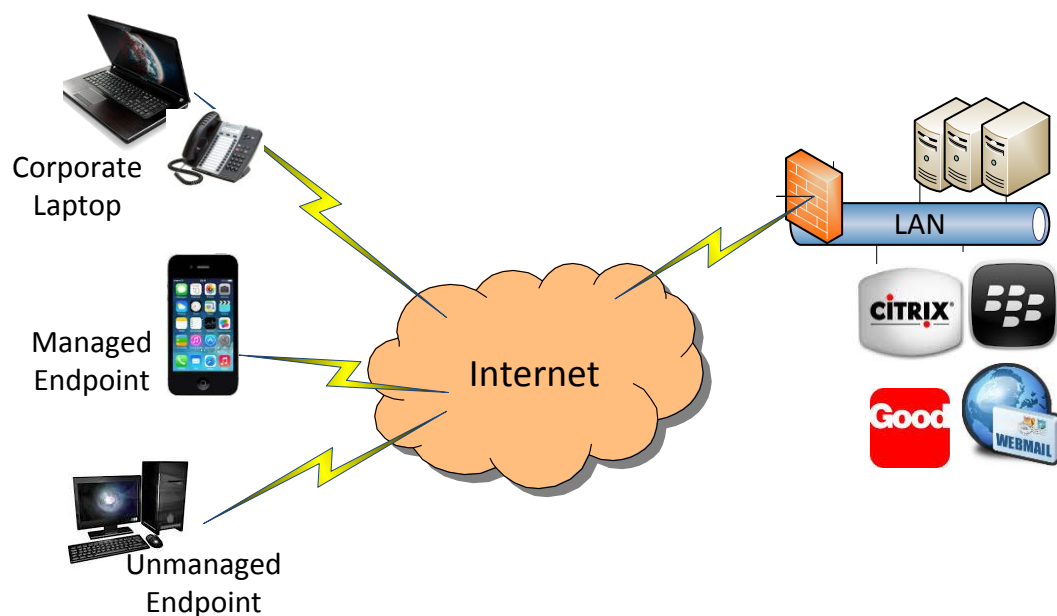


Figure 5

26. For those provided with a corporate laptop, which should become increasing common as flexible working is adopted, the City's virtual private network (VPN) solution will be the de facto remote access solution. The VPN allows staff to connect to the corporate network whilst outside of the organisation thereby gaining access to all data and applications regardless of location³. In situations where internet access is intermittent or unavailable the laptop will continue to provide limited functionality until such time as a connection is re-established.

³ Some restrictions may apply. Data classified as IL3 may be excluded from direct external access. Some countries may be considered to pose a security risk and therefore access may be restricted to UK/Europe only. As traffic is encrypted from the laptop to the City's infrastructure it is anticipated that use of public Wifi will not pose a security issue.

27. In addition to the VPN the City will enable access to corporate email through Webmail. Most people will be familiar with this type of email service as it is commonly used to access Google mail, Hotmail and most other internet based mail services. Access will likely be available from any supported browser.
28. Good and Blackberry will continue to provide email services to mobile devices and Citrix, or another virtual desktop service, will be used to support 3rd parties and access to applications from non-managed devices.

Business Continuity and Disaster Recovery

29. In combination the improvements to the City wide area network and remote access services have a significant impact on the City's BC&DR capability. There is increased ability for staff to work from multiple locations and increased capacity for flexible workers, enabling the City to better accommodate disrupters such as adverse travel and weather conditions. The result is less reliance on London Metropolitan Archives as the City's main DR recovery suite although it, or other buildings as needs dictate, will still provide a command and control / operations response centre function.
30. As covered in paragraph 24, the combination of WAN, remote access and IaaS results in a significant improvement to resilience.

Joint Working with City Police

31. As part of the City Police IT modernisation programme work is underway to identify and progress opportunities for collaboration and shared services between City Police and City Corporation. It is still relatively early days and whilst there is a high-level vision of what a shared service might look like much work is required to understand the technical, security and governance implications.

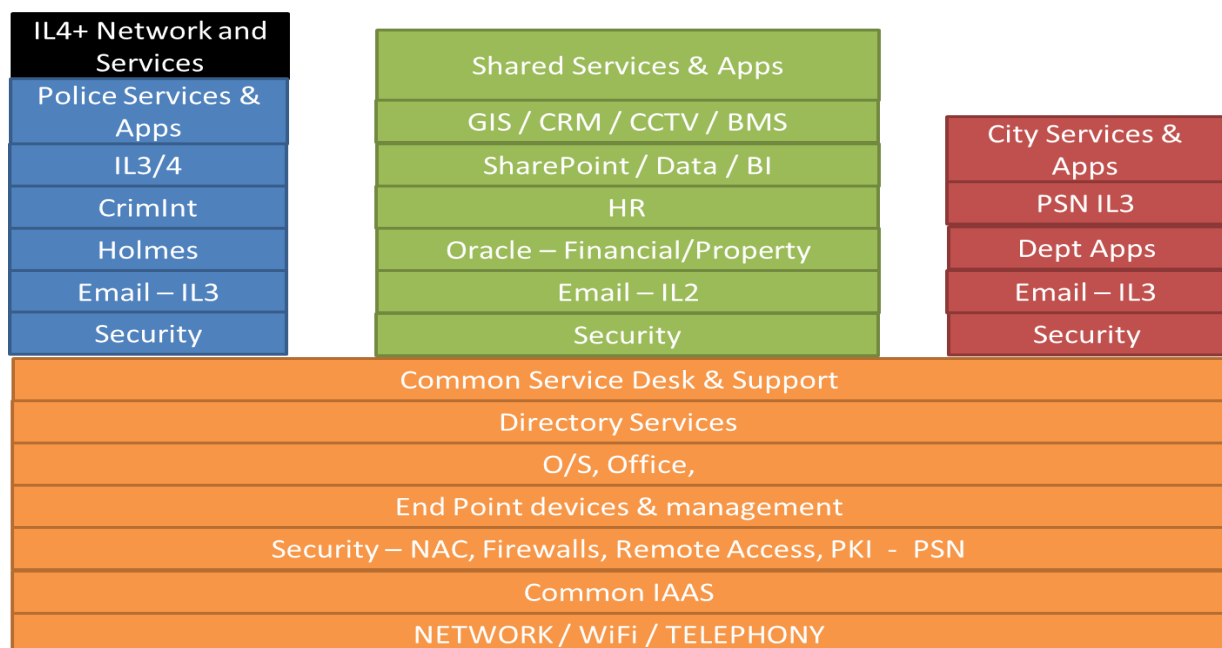


Figure 6

32. Figure 6 aims to visualise the shared service, with three towers of applications/services (City Police specific -left, City Corporation specific – right and shared services - centre) built upon a foundation of common network, telecommunications, infrastructure and support services.
33. Security of systems and data and assurance of the operational requirements of the City Police will be key factors in determining the extent to which common services can be implemented.
34. The timing of this opportunity is highly significant as it aligns work required by both parts of the organisation to;
 - replace and upgrade a number of key areas of core infrastructure; LAN, WAN, WiFi, Telecommunications
 - Implement CoLP accommodation strategy
 - Develop and adopt mobile, flexible working practices
 - Drive greater efficiency in both the adoption and delivery of IT and the business transformation efficiencies which are reliant upon it.
35. Gateway 2 reports have been approved by Project Sub-Committee for LAN and WiFi upgrades and these will proceed as joint projects with the aim of submitting consolidated gateway 3-5 reports.
36. The option to increase the current scope of these projects to include the adoption of Unified Communications and to consolidate all upgrades into a single project is being reviewed, the intention being that this would give Members a clearer, consolidated view of improvements to the City and City Police infrastructure improvements.

Contact:

Chris Anderson

Chris.anderson@cityoflondon.gov.uk