

**Laying the foundations for evolving eGovernment:
Why next generation Ethernet technology holds the key**



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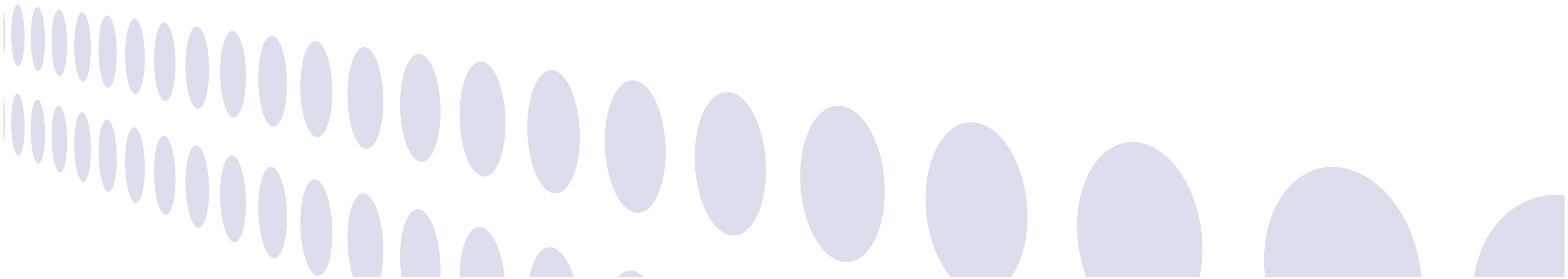
Executive summary

Since 2000, the UK government has committed to transform the public sector by making truly e-enabled delivery of public services a reality. At the heart of this movement is the push for public sector organisations to implement collaborative working practices between their various agencies so that they improve overall service delivery to citizens.

This white paper aims to consider how public sector bodies can effectively and practically respond to this central government drive. In this paper, we:

- consider the key initiatives that are pushing forward reform
- examine common issues faced by public sector agencies as they strive to achieve efficient, joined-up working
- discuss the vital need for a flexible network infrastructure to support and empower these initiatives
- demonstrate with real-life examples of successful projects how next generation Ethernet technology is providing the robust communications infrastructure needed for transformational eGovernment.

The paper concludes that Ethernet network services have a significant role to play in enabling public sector bodies to meet and exceed the dictates of the eGovernment agenda. Those organisations that deploy the technology now will be best positioned to deliver e-enabled services and collaborative working at reduced cost in the future.



1 Introduction

Today, public sector bodies are expected to work both with institutions and the citizens they serve, supplying services which are faster, more cheaply and more efficiently than ever before.

The UK government has introduced a series of initiatives aimed at enabling the rapid movement of information around government departments, agencies and staff to improve citizen interaction. This operating model demands that information should be collected only once and made available to the multiple agencies that require it. Avoiding duplication of effort and increasing accuracy has been shown to generate major efficiency savings and improve productivity.

These central strategies set clear objectives for the provision of more efficient, open and cost-effective services to the public across local government, healthcare and education – and they have been endorsed at the highest level.

In October 2001 the Prime Minister declared: “The key to reform is redesigning the services around the user – the patient, the pupil, the passenger or the victim of crime.”

In November 2005, Cabinet Office Minister John Hutton announced the further extension of the e-enabling programme – what is now termed the ‘transformational Government’ strategy – by stating: “Private companies have been swift to shape their services around people’s needs and lifestyles – now public services need to raise their game and offer people the levels of convenience, choice and efficiency they rightly demand. Through innovative use of technology we can save money and deliver faster and better services for people.”

Central Government is therefore clearly determined to integrate every aspect of public sector work so that the whole system can provide a truly citizen-focused service – at lower cost and with greater efficiency.

A transformation that demands revolutionary technology

Electronic communications provide the means for government bodies to achieve these aims. Modern, robust network infrastructures will enable the high speed delivery of information needed to underpin and deliver joined-up inter-agency working.

Local public agencies must now start to review their Information and Communications Technology (ICT) infrastructures and determine whether what they have in place is fit for the task at hand. If not, they need to decide how best to implement an infrastructure that can meet the demands of eGovernment as the central programme continues to evolve.

2 The Public Sector – an evolving environment

The UK Government’s drive has been described by analysts The Work Foundation as ‘the most significant restructuring of public services for a generation.’¹ Its inception has been linked, in part, to the 2004 spending and efficiency review published by Sir Peter Gershon, former CEO of the Office of Government Commerce.² This review stated that local Governments must save £6.45bn through improved efficiency by 2008 – a mammoth task.

“Ensuring that IT supports the business transformation of Government itself, so that we can provide better, more efficient public services.”

Prime Minister, Tony Blair

Citizen demand and the internet

Reform is also being driven by citizen demand for online services: in a recent report, over 40% of the UK public cited the internet as their preferred channel of communication with the Government.³

Such a trend cannot be ignored and central and local government now see the internet as the key enabler for delivering electronic services that reach large numbers of people at relatively low cost.

Self-service web-based systems are being introduced as an effective way of meeting citizens’ needs. Part of the Government’s ambitious aim was for selected public sector services to be available online, on a priority basis, by the end of 2005. One example of such a service is enabling citizens to complete transactions such as their tax return over the internet. Making it easier for citizens to do business with their local council is set to deliver £1.2bn in efficiency savings against the 2008 targets.

What is eGovernment?

- Provision of all appropriate Government services online
- The movement towards self service
- Better public services

Why eGovernment?

- To maintain and grow the economy
- To use resources more efficiently
- To improve Government services and regulation

These simplified processes will have a major beneficial effect on citizens’ experience of dealing with the public sector. Collaboration across government agencies will result in services organised for the convenience of the citizen, rather than the provider.

Delivering benefit across the public sector

Strategic investment in ICT systems and networks will release resources traditionally used to support cumbersome, manual administrative processes in many areas – not just within local Government, but also across schools and the NHS.

a) ICT-enabled education & learning

The use of ICT in education aims to harness technology to transform teaching, learning and child development. Through initiatives such as the Department for Education & Skills (DfES) targets for bandwidth capacity, all UK schools will have benefited from a high-speed broadband link. This allows them instant access to 21st Century e-learning tools such as digital libraries, online curriculum resources and collaborative research. ICT is also helping to raise teaching standards and enrich students’ learning experiences by providing access to interactive digital resources, including e-mail, chat rooms and video conferencing and making school materials accessible both in the classroom and at home. Such developments are intended to improve the level of social inclusion in education: with countrywide learning grids and high-speed access to educational resources, every child can receive the same quality learning experience – be they rich or poor, gifted or in need of learning support.

As demand for ICT-assisted learning grows, emerging next-generation networks will enable schools and colleges to respond by increasing their bandwidth and building in capacity to meet future growth at minimal cost.

b) Improved healthcare provision

Across the healthcare sector, faster access to information, both regionally and nationally, is already improving the delivery of patient contact services at lower cost. New access technology is also providing a more flexible working environment to support consultants at home and doctors on call. The introduction of electronic care records via the NHS New National Network (N3) will further improve the speed and quality of treatment. Other initiatives, such as ‘Choose and Book’, are also offering more convenient hospital appointments in line with the Government’s agenda for improved customer choice. The advanced communications capability that is powering these services is based on next generation local and wide-area networks. These networks integrate and share information across all the systems used by healthcare providers within the NHS – from GPs at the local surgery to departments spread across large hospital campuses.

c) More flexible governmental working

By combining cross-departmental networks with high speed broadband access into workers' homes, local authorities can introduce greater flexibility into their working practices. Not only are they making major efficiency savings, they are also improving the delivery of services to the public through virtual Contact Centres, and empowering their workforce by providing fast remote access to centrally-managed applications.

The long-term success of these initiatives will be determined by efficient, robust and flexible ICT networks that make it physically and financially practicable to deliver truly e-enabled services.

3 Joined-up Government requires joined-up ICT

ICT can make information available to the right people at the right time – no matter where they work – by enabling public records and internal data to be accessed instantly and securely. This capability is key to providing a better, more efficiently delivered citizen service.

Connecting all council departments together for property searches benefits home buyers with more efficient and faster processing of land information applications and in turn makes the work of local Government easier.

Networked services that provide widespread, secure information access enable citizens to conduct all their business with a Government agency in one visit, rather than being sent from office to office, providing an enhanced citizen experience and simultaneously relieving pressure on government officials.

“We need to make profound changes to the way Government works if we are to make the most of new technology.”

Prime Minister, Tony Blair

Case study: Cambridgeshire County Council

Cambridgeshire County Council was one of the first local authorities to offer enhanced public services through 21st Century communications technology. It launched the Cambridgeshire Community Network (CCN) in 2002 – the UK's most ambitious and inclusive countywide network delivering high-speed internet access and electronic services for the local community.

The network is based on a robust Ethernet Gigabit backbone that links four major council sites at Cambridge, Huntingdon, March and Ely. Additional links are also made to over 300 access points, including offices, schools and libraries, and community access points in pubs and post offices. From these points, local people are able to access the network via high-speed broadband cable connections.

The CCN is also providing a long-term infrastructure for the Council's internal communications.

This will enable more efficient practice within the Council itself and, ultimately, increased productivity through flexible working for employees.

How can ICT deliver efficiency in the public sector?

Historically, ICT has been seen as a support activity. Now, however, technology is expected to play a more front-line role in visibly improving citizen access and staff productivity.

As a result, increasing emphasis is being placed on the need for integrated technology to automate and unite back-office functions and turn them into accessible services, while managing local eGovernment service priorities within a nationally set policy and delivering increased return on IT investments.

These issues have been highlighted by industry analysts Socitm (Society of Information Technology Management), who suggest that 'strategies should move away from just using IT to deliver services electronically, and more towards developing a business transformation initiative enabled to manage information.'

Linking disparate locations

Communicating and sharing data between civil agencies, offices and departments is rarely straightforward. Due to the very nature of their business, public sector organisations tend to be locally and nationally dispersed. Government officers work extensively in interdepartmental and interagency teams, travelling frequently between sites. Most agencies and departments have more than one main site housing data repositories, requiring various offices to communicate with one another to access the information assets they collectively hold.

Linking disparate groups to exchange and disseminate information presents a real challenge to ICT managers. Interdepartmental and inter-site networks need to be able to be affordably scaled up to very high bandwidth in order to support the public sector's need to integrate voice, video and data – with uncompromised performance, efficiency and flexibility.

4 The benefits of deploying Ethernet Virtual Private Networks (VPN)

High-speed Ethernet Virtual Private Networking (VPN) services are emerging as the most viable option for the public sector.

Ethernet VPN technology makes it possible to distribute, exchange and access voice, data and multimedia information at unprecedented speeds. Its rising adoption in the commercial sector has demonstrated its ability to enable significant cost savings, bring substantial operational improvements and enhance service delivery.

An advanced ICT network linking multiple organisations

In brief, Ethernet is an easy-to-implement and extremely cost-effective transport technology.

In fact, 98% of local area network (LAN) connections worldwide today are Ethernet-based.

Ethernet-based networks deliver user applications rapidly, while maintaining data integrity, across multiple locations.

By offering the same access performance and simple connectivity between wide area sites as traditional LANs do on a single, local area site, Ethernet-based VPNs enable employees, applications and information to be quickly and easily accessible wherever they are based. Combining an Ethernet VPN with broadband access to employees' and citizens' homes can extend this reach even further.

Ethernet VPN solutions enable public sector ICT managers to:

- securely deliver networking services wherever they are needed
- expand eGovernment programmes to attract more business
- provide high availability networks to support mission-critical or bandwidth-hungry services
- reduce costs to stay within tightening budget constraints
- enable simple, incremental migration to an IP-based network by integrating with existing networks.

How does Ethernet VPN work?

- It mimics the local network within a building, yet is spread over a metropolitan area
- Ethernet VLANs (Virtual Local Area Networks) can be set up to cater for many separate communities within one physical network
- Each VLAN community can have a unique communications pattern, linking only appropriate sites, at relevant speed and high security

High quality and low cost connectivity

Connecting multiple small sites within the same town via a traditional Wide Area Network (WAN) can be a costly exercise. WANs are typically built using Leased Lines, which become progressively more expensive as the number of branch offices – and the distance between them – increases.

An Ethernet VPN connects local networks or data centres without the limitations or costs of point-to-point topologies. Each site connected to the service can automatically communicate with all others without the need for specific links between them. For the first time, a single platform can serve the entire network, no matter how geographically widespread or application diverse it may be.

Ethernet networks can be seamlessly integrated with existing legacy networks, enabling organisations to slowly incorporate business processes into the next generation platform without throwing away their original IT investment.

An Ethernet solution makes it simple for organisations to build and manage cost-effective, multi-site networks without incurring the overheads of running different technologies and systems. As Ethernet drives down the cost of bandwidth, this technology opens up opportunities to deliver eGovernment objectives within tight budgets.

A further distinct advantage for public sector organisations is the ability of an Ethernet VPN to deliver greater bandwidth flexibility compared with fixed line networks. This level of connectivity enables organisations that regularly run data-intensive or real-time applications between sites to do so at speeds from 10Mbps to 1Gbps. Bandwidth upgrades can be configured easily, remotely and at short notice, to meet evolving business needs on an ad hoc basis.

Additional benefits of Ethernet deployment include significant productivity gains, optimised performance and, according to Ovum⁴, vast cost efficiencies. Ethernet-based networks can be up to 80% less expensive to deploy and manage than traditional wide area networking technologies such as Asynchronous Transfer Mode (ATM) and Leased Lines.

Case study: Glasgow City Council Education Services

Ethernet VPN technology is delivering flexible bandwidth connections to 27 of Glasgow's special needs schools, enhancing ICT-assisted learning and teaching within the wider school community.

Previously, the organisation had in place ISDN lines which were unable to offer the scalable bandwidth necessary to meet local eGovernment objectives. Teachers and pupils needed an unfailingly high speed internet connection to facilitate easier and faster information sharing and storage between special needs sites and the wider school community. Glasgow City Council was also keen to gain the ability in the future to make media-rich and high-volume curricular content available online.

Archie Walker, ICT Manager for Glasgow City Council said, "Being able to easily communicate with our neighbouring schools would enhance the development of teaching methods and sharing of best practice – something that benefits teachers and pupils alike. So our aim was quite clear – we needed to replace our existing ISDN lines with a modern, managed, high-speed data service that could offer reliability, resilience and robustness."

Organisations can also expect a managed Ethernet VPN service to:

- **reduce the cost of network management**
A cost-effective substitute to building your own WAN, an Ethernet VPN is a simpler solution requiring far less resource-intensive administration
- **increase network 'uptime'**
An Ethernet VPN delivers improved network performance, management and visibility. As a less complicated network topology it also minimises the risk of human error impacting performance
- **maximise productivity**
An Ethernet VPN improves staff efficiency by providing better communications between sites and enabling remote and mobile working
- **improve effectiveness**
Extending the corporate network to remote sites and home workers in a straightforward way enables strategic applications to be rolled out quickly and simply
- **increase security**
High quality, secure communication is assured, no matter where agencies and employees are based.

Flexible, joined-up working

An Ethernet VPN enables collaborative working and information-sharing between different groups through its ability to create multiple online communities within a single, integrated infrastructure. For instance, a local authority could have one private community to link all Government bodies, another for its libraries and a third for schools.

Many local authorities are using this virtual connectivity to extend contact centre facilities and provide "always-on" services to citizens. Advanced call handling using an Ethernet VPN solution links contact centre agents, located in a variety of offices or even at home, to create the perception of a single centre that can be reached day or night.

To support this model, it is vital to ensure that latency and jitter levels⁵ will not affect the quality of voice services. Choosing a service provider whose network has low packet loss eliminates disruption to voice traffic, meaning citizen service levels are not compromised.

Supporting the drive for flexible working – without compromising connectivity

Managed Ethernet VPN services can accommodate new ways of working and support innovative business applications. New network technologies based on Ethernet make it easy to form virtual teams, reducing unnecessary travel to meetings and facilitating remote working by giving staff seamless access to information.

Flexible and secure links into centralised head office systems, intranets and business applications and simplify communications with office-based workers. Ethernet connectivity underpins applications such as Voice over IP (VoIP), opening up new channels of communication that enable public sector bodies to provide value-added services to citizens and staff, such as distance learning and online training.

Affordable Ethernet bandwidth facilitates collaborative working by giving each user the same level – and crucially, speed – of access, regardless of where the application or system is hosted. Large data files that would take hours to transfer over traditional lower bandwidth Frame Relay links take just minutes or seconds over an Ethernet link. This enables users at different sites to work together to create and modify documents, financial statements, presentations and other rich content.

Ensuring security measures are in place

Increasing reliance on ICT makes disaster recovery provision vital. Secure storage of business-critical data and assured business continuity are crucial when handling sensitive public information. A managed Ethernet network inherently enables the secure storage of data in diverse sites, removing the burden of housing, accessing and backing up data on every local network and substantially freeing up staff time. In the event of a major outage or catastrophe at one site, staff are still able to access business-critical data and provide citizen services, no matter where they are relocated.

Helping public sector organisations meet future demands

The evolving nature of eGovernment means public sector networks must support the deployment of advanced services in the future.

A provider that can deliver Ethernet networks over a next-generation, fibre-based infrastructure will be able to provide much-needed capacity for future growth. These new infrastructures are capable of running bandwidth-hungry applications and, unlike legacy ATM solutions, they will also be able to support additional users and emerging technologies with ease.

Managed Ethernet VPN technology provides the ideal platform for public sector organisations looking to future-proof their network. The eGovernment agenda will continue to develop as citizen demands increase and expectations evolve. Only networks that can adapt to this continuing revolution will allow the public sector to affordably keep pace with centrally-driven change.

A managed Ethernet network:

- provides a scalable infrastructure that matches resources to a changing environment
- will integrate with traditional networks for a seamless migration path
- delivers quicker response to customer demands
- enables collaboration with workforce, partners, suppliers and customers to improve business objectives
- ensure rapid response to workforce and organisational issues
- supports peaks and troughs in customer interaction.

Case study: North Lanarkshire Council

As part of an ongoing commitment to public safety, North Lanarkshire Council has pioneered the use of closed-circuit television (CCTV) as a way of fighting crime. Some years previously, ntl:Telewest Business had installed an analogue-based CCTV solution to support monitoring operations across four different police stations. However, with no additional capacity for adding new cameras and video tape storage space running out fast, the existing infrastructure was overstretched. To address the need for extra capacity and to improve the efficiency and flexibility of its operations, the Council decided to centralise its CCTV monitoring.

The IP-based CCTV solution implemented by ntl:Telewest Business is the first fully-managed converged solution of its kind in the UK and one of the largest in Europe. At each of the four police stations where activities were previously monitored, analogue camera feeds are now converted into digital signals and transmitted via ntl:Telewest Business' 2GB Metro Ethernet VPN to the Central Management Unit, where the images are monitored by operators.

The Metro Ethernet VPN infrastructure incorporates a self-healing dual fibre ring to ensure that if one part of the network is damaged, data is rerouted without disrupting the transmission of CCTV images. It also allows North Lanarkshire Council to scale capacity incrementally according to its requirements, either adding new cameras or temporarily increasing the number of cameras in a certain area. As it is a converged platform, the Council can also use the Metro Ethernet VPN network to provide an internet telephony solution for the housing department and a data solution for the education department – delivering additional cost and efficiency benefits.

5 Conclusion

The public sector must keep pace with growing citizen demands by delivering efficient e-enabled services that can satisfy enquiries in a single interaction. It needs to turn sprawling, bureaucratic organisations into lean and cost-effective centres. In short, it's about finding ways to do more with less.

eGovernment initiatives aim to ensure public sector organisations focus on improving processes through modernised procurement, rationalising services and improving transaction handling – both between government agencies and with citizens.

This vision of modern joined-up Government is becoming a reality. It will only reach its potential, however, by taking full advantage of network technology that is designed to respond to modern challenges. The infrastructure must empower the secure and seamless sharing of sensitive data and deliver mission-critical applications at high speed to a geographically diverse and increasingly mobile workforce. And such investment must be future-proofed so that costs remain under control, in both the short and long term.

Advantages of managed Ethernet network services:

- anywhere, anytime access
- extended geographic connectivity
- converged network platform
- reduced operational costs versus traditional WAN
- Reduced transit time and transportation costs for remote users
- improved productivity
- simplified network topology
- mobile worker support
- broadband networking compatibility.

Build on what is easily available

A converged Ethernet network is easy to buy and easy to own – removing needless and expensive layers of network management and reducing maintenance and upgrade overheads over its lifetime. Ethernet-based networks dramatically improve overall efficiency and thereby quickly bring about huge savings.

At the heart of eGovernment is the unique aspiration to enable true social inclusion and citizen empowerment. This demands more than just a provider of technology but a meeting of minds. When selecting a technical partner for the provision of managed Ethernet services, public sector bodies need to look beyond the functionality, features and capabilities of the technology alone and source a provider that understands the wider issues and objectives behind the Government's transformational agenda.

The right managed services provider should offer consultative support throughout the process of delivering eGovernment through network technology – from the design and implementation to the daily running of the new network infrastructure. It should provide a next-generation network that affordably accommodates today's eGovernment needs yet is capable of supporting new technologies as they emerge. This provider should also offer a simple, open-ended upgrade path without the need for reinvestment or replacement.

Most crucially, the provider must understand the wider aims of eGovernment's focus on citizen service so that the solutions it recommends and implements have the capacity to make change happen – and deliver real return on investment.

¹ http://www.theworkfoundation.com/pdf/Gershon_response.pdf

² Gershon Review.

³ IT Trends in Local Government 2004/5 – Executive Summary, Society of IT Management.

⁴ Ovum white paper, Ethernet in the WAN – Cause and Effect.

⁵ Latency is the time it takes traffic to travel from one end user site across an intersite network and reach the other side. Jitter is the amount by which latency varies. High latency can significantly impact the performance of VoIP and real-time video applications, whilst excessive jitter can disrupt both voice and video applications.