DELL

Dell Solutions for the Janet Cloud and Data Centre Framework

Delivering the technology you need, the right advice and better value.

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**Welcome to the Dell Solutions for the
Janet Cloud and Data Centre Framework.**

This guide is designed to help familiarise you with the Dell portfolio of solutions, capabilities and services available through the Janet Cloud and Data Centre Framework. It is also designed to give you easy access to the right advice, products and support from Dell at the best value.

The Janet Cloud and Data Centre Framework assists universities and other UK education establishments to transition from an existing data centre to enhanced or outsourced services, with a common requirement being a hybrid cloud solution to complement existing investment. With the need to maintain the quality of service to users, the ability to scale to cover peaks in demand and to maximise budgets during the transition process, cloud services have never been more important.

While all universities have different needs, Dell services are designed to complement existing in-house facilities and to be responsive, allowing the pace of change to be dictated by the needs of the establishment. Dell transition services include:

- Infrastructure
- Virtual desktop
- Storage
- High performance computing
- Professional services

Expanding in-house capacity is equally important, and Dell servers, storage and network products provide cost effective, high performance solutions to ICT and operational requirements. With the Janet Cloud and Data Centre Framework providing long-term (up to 10 year) support for ICT development and business planning, Dell delivers key, proven, service and product offerings tailored to meet the needs of education institutions.

For more information, please contact your Dell Account Manager or, if you prefer, do not hesitate to contact me via my email at **claire_vyvyan@dell.com.**

Claire Vyvyan
UK Executive Director & General Manager – Large Infrastructure

Cloud.
What makes Dell cloud computing so good?

From IaaS to HPCaaS to Cloud Client Computing – cloud services that meet the needs of education establishments

Dell cloud services for the education environment use industry-standard technologies and are designed to be highly flexible, to complement existing systems, provide the widest possible range of options and ease of transition. Core Dell cloud services include:

- Infrastructure-as-a-service (IaaS)
- High Performance Computing-as-a-service (HPCaaS)
- Cloud Client Computing

Choose from a range of delivery models

Dell cloud computing delivery models are flexible and are designed to be able to match the widest possible range of requirements and provide support for Private, Public, Hybrid and Community models within Education. The choice of service should be based on the needs of the existing estate and the mid-term strategic IT plan of your organisation. Dell can work with you to determine the most appropriate cloud delivery to achieve your strategic objectives or operational outcomes.

Public

The Public cloud model offers high levels of flexibility to your organisation. External data centre resources are dynamically provisioned on a self-service basis over the Internet via web applications. Public Cloud allows for a sharing of resources, with the provision of invoices, usually monthly and at a granular level for easy to manage cost control.

Private

The Private cloud model enables cloud computing on private networks and offers the ability to deliver the benefits of cloud computing while mitigating the challenges associated with data security, corporate governance, and reliability.

Hybrid

The Hybrid cloud model delivers a cloud environment consisting of multiple internal and/or external providers and demonstrates the characteristics of integration between public and private cloud technologies, including for instance, authentication and authorisation and bursting capabilities.

Community

The Community cloud model provides a Private cloud infrastructure shared by a number of like-minded organisations, delivering the security and governance benefits of a private cloud with some scaling and cost sharing benefits across organisations.

For more information visit **dell.co.uk/cloud**

Infrastructure-as-a-Service (IaaS)

The Dell enterprise-class Infrastructure-as-a-Service (IaaS) solution, the Dell vCloud Datacentre Service, is VMware-certified and hosted in a secure Dell data centre. The solution provides self-service access to vCPUs, memory, storage networks, IP addresses, firewalls, catalogue capabilities and additional services. On-demand capacity allows fast response to new organisational and technology opportunities, seasonal or cyclical trends and other fluctuations in compute capacity requirements while the vCloud Connector allows easy management of a hybrid environment from a single, familiar administrator interface. IaaS is not a single solution type, but rather a delivery model that can be deployed in various ways to suit a particular requirement:

- **Hosted –** Dell has a number of hosted IaaS solutions available, ranging from fully flexible, hourly pay-as-you-go Public cloud models that are ideal for variable or project workloads, to reserved and dedicated models for longer term consistent workloads.

- **On-premise –** from optimised, converged hardware bundles in a single rack, to management software and design and deployment services, Dell can help you build an on-premise Private cloud to meet your exact requirements.

- **Hybrid –** as cloud technologies are adopted, many organisations want to move incrementally to new architectures rather than make large 'leap-frog' changes. Hybrid architectures allow for gradual adoption, allowing customers to simply extend the on-premise environments they have already invested in. Dell vCloud is designed specifically with this scenario in mind, providing a fully integrated extension to any existing VMware investments.

The Dell vCloud Datacentre service delivers a range of practical operational features:

- **Secure and Compliant –** common cloud infrastructures lack the inherent security required by enterprises, leaving them vulnerable. Dell vCloud Datacentre Service offers a complete framework with multiple layers of virtual and physical security and a complete framework for securing networks, applications, data, and endpoints in a highly secured Dell data centre. In addition, Dell SecureWorks Active Monitoring delivers information security services powered by proprietary technology for global threat visibility.

- **Open and Interoperable –** built using a common management platform based on open, industry cloud standards, the Dell vCloud Datacentre Service uses the same VMware technology across private and public clouds, creating a compatible 'virtual data centre' and enabling application portability across clouds.

- **Familiar and Compatible –** unlike commodity public cloud services, the Dell vCloud Datacentre Service provides control of all resources through a familiar and compatible user interface, helping to manage, provision, and release IT resources for private, public, or hybrid cloud without having to retrain IT staff.

- **Available and Reliable –** the Dell vCloud Datacentre Service is built to be robust, with the necessary redundancy for optimal availability and reliability. The comprehensive infrastructure management layer monitors the dynamic pools of hardware, software, storage, and network resources, providing automated fail-over and enabling business continuity.

Dell cloud with VMware data centre services

Choose from a range of payment models
Services can be delivered as 'pay as you go' or by contract and are available in three formats, Dell vCloud **PayGo**, Dell vCloud **Reserved** and Dell vCloud **Dedicated**. All include Dell SecureWorks, which provides intrusion detection, prevention and monitoring.

Dell vCloud PayGo	Dell vCloud Reserved	Dell vCloud Dedicated
Compute by the hour	Compute by the month	Compute by the server
Multi-tenant	**Multi-tenant**	**Single-tenant**
No minimum commitment Pay As You Go Consumption based	Savings over pay go model With 1 year commitment Subscription-based	Dedicated physical servers Subscription-based with 1 year commitment
Capacity subject to availability	**Guaranteed Capacity**	

Dell SecureWorks
Intrusion Detection & Prevention Monitoring (included)

Additional components and options

Preloaded Windows and SUSE Linux templates (included)	vShield Security (included)	24/7 ProSupport (included)	VM Image Backup (optional)	TrendMicro encryption (optional)

Dell Cloud with VMware vCloud Datacenter Services

"We saw how simple the Dell cloud is to operate and how we could gain a quick return on our investment. Cloud infrastructures are a great opportunity. We see our future in the cloud – and with Dell."

Peter Kent,
Head of Corporate Infrastructure Services, Janet

High Performance Computing-as-a-Service (HPCaaS)

The explosion of data from multiple next-generation research platforms and the computational challenge of complex modelling and simulation studies is putting increasing strain on IT resources. While many organisations are considering cloud computing as a resource supplement that avoids the need for additional capital investment, cloud technologies also provide an opportunity to acquire high performance computing capacities on demand while avoiding the cost and complexity of building and maintaining a traditional High Performance Compute (HPC) cluster.

Dell cloud architectures are specifically designed to address the challenges of high performance computing in an on-demand model range, from dedicated physical HPC clusters that can be customised and accessed remotely for an agreed period of time to highly flexible virtualised infrastructures that can be optimised for parallel HPC workloads.

- **Virtualised Cloud HPC –** this architecture allows for true capacity-on-demand processing and hourly usage models. Not only can the Dell vCloud environment be used as an ideal platform for running enterprise HPC workloads, Dell can also provide consultancy, advice and proof of concept trials to determine if a specific HPC workload is suitable for a virtualised environment.

  Virtualised Cloud HPC is not appropriate for every HPC workload type, although many Dell customers have found that some HPC applications run very well on a virtualised platform. Virtualised environments provide highly scalable parallel processing and also more agility than hardware-based clusters.

- **Physical Cloud HPC –** some HPC computational scenarios simply need the power, connectivity and performance that can only be provided by a dedicated physical bare-metal cluster. Traditionally this type of compute power has necessitated not only a substantial upfront capital outlay, but also skilled resources to maintain and manage the hardware investment. As an alternative to this traditional approach, Dell Cloud HPC can provide dedicated remote access to a physical HPC cluster:

  - A dedicated (private) physical cluster made available for an agreed period of time (days, weeks or months)
  - Multiple configuration options, including:
    - Specific processor architectures to match your compute needs, including access to latest generation processors
    - Variable memory configurations, including the ability to disable processor cores to give a more favourable core/RAM ratios Various node connectivity options, including Infiniband connectivity
    - Multiple OS and 3rd party application options
  - Optimised remote connectivity to allow simple and fast upload of large workloads
  - Configuration and optimisation for your specific workload
  - Full maintenance and support included, so that skilled HPC resources are not required

Cloud Client Computing

At Dell, we use Cloud Client computing to deliver agile solutions that are designed to be flexible and responsive to the needs of all user types with differing performance requirements, from a remote student or employee to a full-time on-site researcher. Dell delivers Cloud Client solutions through virtual desktop technologies.

As IT environments, devices and desktop support needs grow and become more complex, IT resources and budgets often lag behind. At the same time, the need to support increasingly mobile and remote groups of users has made it ever more difficult for IT departments to support core business aims, let alone focus on strategic IT initiatives or deploy new technologies such as Virtual Desktop Infrastructure (VDI).

In addition, as more and more organisations consider loosening IT controls in order to allow staff to bring their own devices to work, education establishments face the challenge of finding more efficient and scalable solutions that can support the preferred usage and learning models of end-users and students.

At Dell we provide pre-built, pre-tested solutions or we can supply solutions that are tailored to meet exact requirements. Solutions can be deployed within an existing estate or can be managed by Dell through our cloud services, offering:

- **Simplified Management -** easy provision, activation and management of virtual desktops from a central web portal, with a Dell-maintained VDI.
- **Rapid Scalability -** quickly scale virtual desktop support from 50 seats to thousands without investing in virtual desktop infrastructure.
- **Secure Virtual Desktops -** reliable, secure technology transfers virtual desktops and files across the network and provides Active Directory connectivity.
- **Affordable VDI Solution -** lower up-front costs and a predictable, affordable business-aligned monthly subscription model.

Dell DVS Simplified Desktop as a Service (DaaS) provides you with a cloud-based, simplified, customer-managed virtual desktop solution. With Dell DVS Simplified DaaS, barriers to virtual desktop adoption are eliminated by delivering a desktop from the Dell cloud. Scalable and secure, Dell DVS Simplified DaaS provides all the benefits of on-premise VDI without the cost and complexity of deploying and managing virtual desktops. It enables you to rapidly provision desktops to end users anywhere and on any device, without compromising the end user experience.

The Dell-hosted, cloud-based solution enables establishments to reduce energy footprints and lower costs. The solution is also configured to deliver practical advantages:

- Allows desktop virtualisation to be implemented for geographically distributed end-users even when it is not possible to deploy IT resources in every location
- System can be scaled to manage seasonal or project workload fluctuations as required
- Simple set-up and reduced complexity allows rapid, easy deployment
- No upfront infrastructure investment and monthly subscription-based pricing simplifies planning and budgeting
- Desktop costs move from capital to revenue expenditure and overall costs are the same or lower than equivalent non-persistent or shared desktops
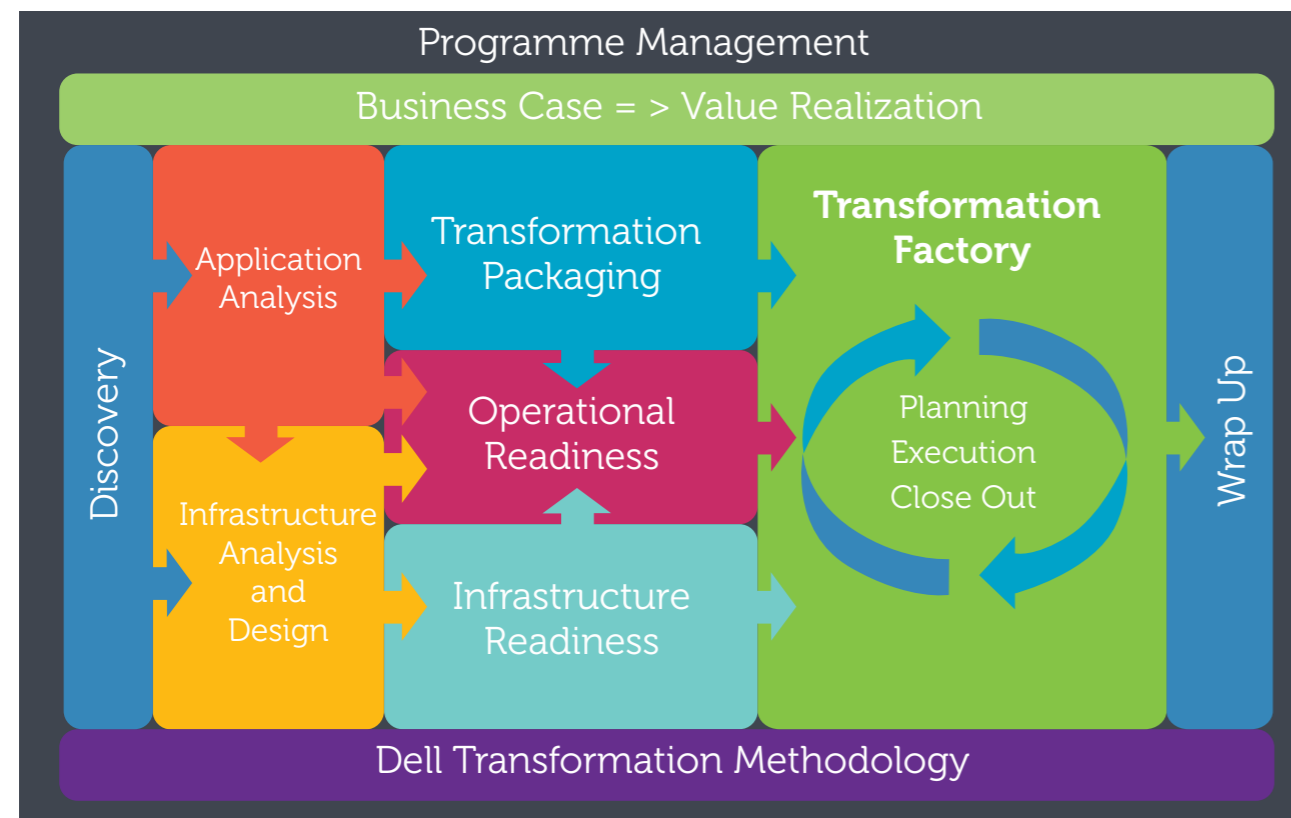
Transformation services.

Data Centre Transformation

At Dell, our approach to transformation services is unique, tailored to help organisations to meet their business financial and IT objectives while ensuring sustainable success. The Dell framework enables the delivery of accelerated change while achieving lower costs, improved quality and increased agility.

Dell Transformation Methodology

The Dell Transformation Methodology has been created for delivery of transformation services to many customers across a wide range of geographies and industries and by the use of consistent industry-recognised best practice aligned with the Project Management Institute (PMI).

Programme Management

Business Case = > Value Realization

Discovery

Application Analysis

Transformation Packaging

Transformation Factory

Infrastructure Analysis and Design

Operational Readiness

Planning Execution Close Out

Infrastructure Readiness

Wrap Up

Dell Transformation Methodology

"At Dell, we understand the importance of security, interoperability and ease of management in on-premise, cloud-based and hybrid environments, and our expertise in the public sector is perfectly positioned to support education and research institutions across EMEA and beyond."

Claire Vyvyan,
Director and General Manager – Public Sector at Dell.

Data Centre Transformation

Outcomes for data transformation and transition
Once the 'what' is determined in terms of transformation destinations, including the cloud, the 'how' of achieving the transformation requires a disciplined exercise in analysis, planning, change management and migration execution. Dell have developed IP for transformation projects that can now be readily applied to the task of ascending to the cloud.

The key elements of any successful transformation are:

- A robust migration methodology
- Control and access to data - a single view of the truth
- Strong programme management, good governance
- Stakeholder engagement and effective communication

Data centre transformation programmes are exercises in change management, not technology roll-out projects, and Dell will use experience, expertise and best practice to assist with your transformation project.

Discovery
At Dell we know that discovery and assessment are the most critical elements in delivering a successful transformation project. The quality of the data captured provides the criteria on which key decisions are made.

Application Analysis
The key activities of Application Analysis are as follows:

- Understand application, data and infrastructure interdependencies and performance and growth considerations
- Categorise application workloads
- Determine application workload consistency groups
- Allow business application mapping
- Clarify and apply standards in order to identify applications requiring remediation
- Propose the transformation method (P2V, BnS, Private or Hybrid cloud, etc.)

Infrastructure Analysis and Design
In the infrastructure analysis and design process, Dell consultants, with the participation of customer IT personnel, conduct analysis, lead design sessions and propose design routes. Depending on existing designs and processes, items covered during infrastructure analysis could include:

- Templates for workload categories
- Current state, initial dispositions and SWOT analysis
- 'To Be' Technical Architecture including draft bill of materials and capacity plan
- Standardised Service Offerings – blueprints for self service
- Software License Impact Analysis and Recommendations
- Number and complexity of workload categories
- Number of unique designs required
- Number of service tiers

The Dell proprietary methodology begins with discovery and analysis, including operational and infrastructure readiness, and consolidates all that information in a 'migration design package'. The migration design package for each application service to be migrated holds an array of information describing the AS-IS state, dependencies, application inter-dependencies and requirements of the TO-BE state. The task of producing a schedule for migration and tracking the execution of migrations is a complex one that can only be achieved through use of a purpose-built supporting tool for migrations, such as the DTM tool developed by Dell.

Transformation Factory
The transformation factory is responsible for the execution of migrations of existing applications to the designated platform. The Transformation factory takes the transformation packages for each application and migrates them to the target environment, ready for testing and cut-over to the production environment.

Servers.
What makes Dell servers No. 1?

From tower to rack to cloud – servers that meet the needs of the education and research environments

The Dell PowerEdge range of servers is comprehensive and industry-proven, ranging from 1-socket, 1U entry-level rack servers to hyperscale-inspired 4 x 2-socket, 2U shared infrastructure servers capable of meeting the demands of the densest data environments in university research departments.

Our PowerEdge server range includes Tower, Rack, Blade and Cloud servers that are purpose-built for reliability, enabling education establishments at all levels to:

- Save time
- Reduce costs
- Improve productivity
- Benefit from easier infrastructure management

Our PowerEdge servers are virtualisation-enabled, giving your organisation the power to process more tasks more quickly and the scalability to grow as work demands increase. And now, our 12th Generation PowerEdge Servers are available, delivering more power, more flexibility and even more productivity.

Servers in support of education and research

- from 1-and-2-socket energy efficiency to big data and high-performance computing - and everything in between.

Tower Servers

Dell PowerEdge™ Tower Servers are designed for flexibility, scalability and outstanding price performance. The range includes 1-and 2-socket servers with a wide choice of performance and functionalities which support file-sharing, centralisation, high availability demands, virtualisation, system management and energy efficiency.

Rack Servers

Dell PowerEdge Rack Servers maximise productivity and deliver performance and efficiency in a rack form factor, from 1-socket, 1U rack servers to 4-socket, 4U rack servers for mission-critical applications in data centres and for workloads needing the highest performance, reliability and I/O scalability.

Blade Servers

Dell PowerEdge Blade Servers offer density without compromise, delivering solutions that are simpler, faster and more power efficient. The unique array of options range from a portfolio of modular servers and networking to a scalable converged blade and storage solution that helps simplify infrastructure deployment and management. The Dell M1000e Blade is winner of the InfoWorld Test Centre Editor's Choice Award.

Cloud Servers

Dell PowerEdge C Servers are designed for organisations that need hyperscale-inspired performance and efficiency, delivering the most compute power in the least amount of space through a shared infrastructure design. Available as a family of rack servers, microservers and a PCI expansion chassis, they are designed for scale-out cloud computing, Web 2.0 services, high-performance computing and big data applications.

Storage.
What makes Dell storage so good?

Making room for more
— Dell storage solutions that can dramatically reduce your TCO

At Dell, we are breaking away from legacy technology that limits growth, wastes capacity, exacerbates system complexity and increases costs. We are building a new breed of data management solutions that are capable of the intelligent management and automatic storage of data in the right place, at the right time and at the right cost.

Our award-winning EqualLogic™, PowerVault™ and Compellent™ storage arrays have delivered storage improvements for thousands of customers around the world, providing new levels of efficiency, flexibility and agility. Dell best-of-breed storage solutions enable you to:

- Maximise the efficient use of existing resources
- Protect and secure critical data
- Simplify operations and administration
- Enable affordable scaling as capacity demands grow
- Leverage virtualisation efficiencies

Awards won include 'Champion' status in the InfoTech report and 'Best Storage Product' for Dell Compellent storage at the UK TechWorld Awards.

Minimise cost and complexity – Dell EqualLogic storage area networks (SANs) have the lowest total cost of ownership (TCO) of common storage array architectures, with a full one-third to half of the total cost of competitors over a five-year period.

Manage data at a more granular level – Dell Compellent Fluid Data technology can help optimise efficiency, agility and resiliency to slash storage costs by up to 80%, scale on a single platform and secure data against downtime and disaster.

Plan for future growth – Dell pay-as-you-grow solutions enable you to plan intelligently so that your storage scales with your business needs.

"After we swapped two existing SANs for two Dell Storage Centre SANs, we more than doubled the storage capacity and improved the performance – and all within the budget."

Dave Thornley,
Head of Network Infrastructure, Sheffield Hallam University

Storage and back-up solutions to rely on
- providing the flexibility and security that enables education and research establishments to deliver results

Networked Storage

Dell Compellent offers self-optimised, intelligent tiered storage that unifies block and file. With advanced storage software, Dell Compellent Storage Centre allows institutions to actively manage data at a highly granular level, using built-in intelligence and automation. Dell EqualLogic is built on an advanced peer-scale platform that automatically scales capacity and performance, while Dell EqualLogic storage arrays are designed to simplify the deployment and administration of consolidated storage.

Direct-Attached Storage

Energy-efficient and affordable DAS arrays allow PowerEdge servers to expand beyond their regular storage capacities and are designed for use with high performance applications such as email, database, web, or file sharing. Dell PowerVault storage arrays help institutions to cost-effectively address the challenges of relentless data growth with versatile solutions that are optimised for smaller-scale storage consolidation, flexible virtualisation projects and high business continuity.

Object Storage

With seamless scalability and long-term retention, the Dell DX Object Storage Platform is redefining cloud and archive storage through intelligent object technology to support your long-term storage vision at a massive scale. You can also increase data value while reducing data costs with the self-healing, self-managing, and metadata-aware DX Object Storage Platform, offering a powerful combination of data and storage management features.

Data Protection

The business-critical nature of information systems means that protecting data and service levels is crucial. While many institutions are updating their data protection strategies, Dell offers a full portfolio of data protection products and services that can help to establish a flexible data protection strategy that balances the cost of protection with the value of the applications being protected.

Buying Guide.
Why working with Dell gives you more.

Next steps

We can help you deliver your research, IT, financial or structural outcome. We have a multi-phased approach to help our clients. Key to success is understanding what the main issues are that need to be resolved.

Step 1

- **Contact Dell, direct or through Janet.** The Dell dedicated education team will understand the outcomes that you want to achieve. We will then arrange for specialists to assist develop your strategy including technology, project and financial teams to build a plan to realise your goals.

- Where necessary we will arrange a detailed workshop to ensure a deep understanding of dependencies and milestones.

Step 2

- **Once the outcomes and strategies to success are understood** Dell will create a proposal, which will have timelines, services to be delivered, plus hardware where necessary. The Janet Cloud and Data Centre Framework allows for data centre infrastructure to be supplied in addition to services for an end to end solution.

- The proposal will be delivered and managed by your Dell account manager who will ensure it meets your requirements.

Step 3

- **Place your order with Dell.** Projects are managed by accredited project managers using standard project methodologies. Dell will manage the hardware, software and services and ensure you are kept informed of progress.

- For "as a service" deliverables, we will set up the service, test that it meets your specifications and then provide the log in details for you to test and deploy throughout your organisation.

"If the disaster recovery infrastructure is in the Dell cloud, we don't have to worry about it anymore – Dell is in charge. As a result, the team saves additional time, which it can spend on other end-user support activities and projects to deliver business improvements."

Peter Kent
Head of Corporate Infrastructure Services, Janet

For more information visit **dell.co.uk/hied**

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