

Enterprise-class cloud services for Europe

A joint white paper from Colt Technology Services and VMware

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1. Introduction

// Changing technologies is often only moderately difficult. Changing mindsets, though, is an enormous challenge. //

Lydia Leong of Gartner

According to Lydia Leong of Gartner: “Most of the people [she spoke to about cloud computing] strongly held one of two utterly opposing beliefs: that cloud computing was going to be the Thing of the Future and the way they and their companies would consume IT in the future, and that cloud computing would be something that companies could never embrace.” (http://blogs.gartner.com/lydia_leong/)

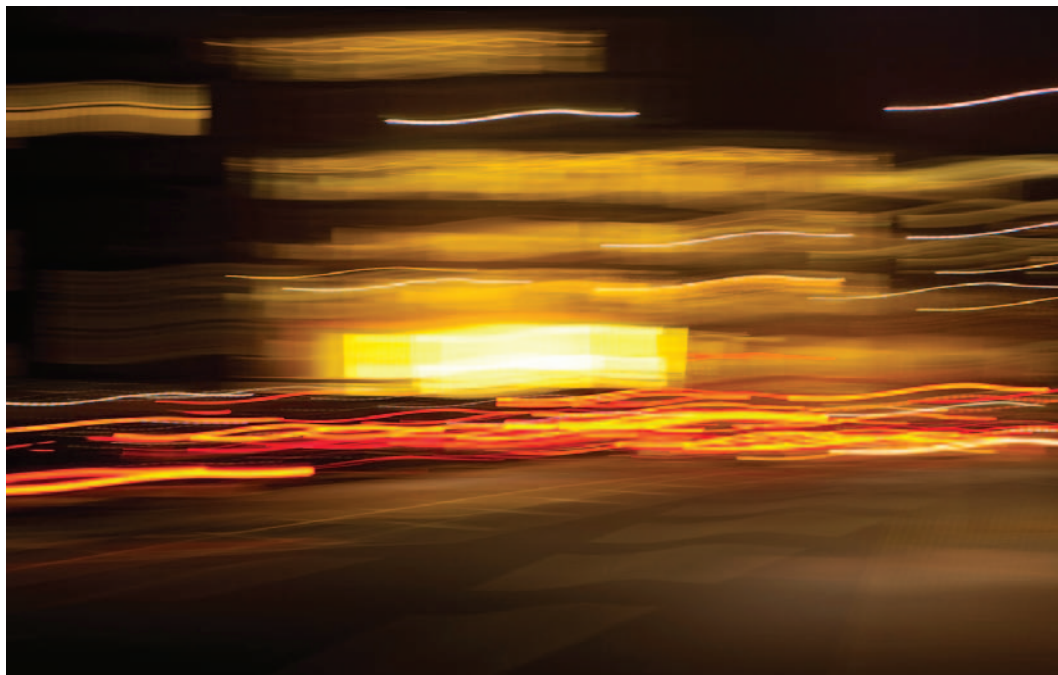
The polarisation of such opinions is never healthy and most IT transformations are never cut and dried – so what is driving this polarisation? Are simplistic arguments on cloud computing causing organisations to come to too-simple conclusions?

The aim of this paper is to highlight the possibilities of cloud computing. To show how organisations can innovate in new ways. To recognise cloud computing as an enabler to free IT from the chores of ‘keeping the lights on’. All the while, being aware of the real-world barriers and challenges that lie ahead.

Recognising that the regulation and governance structures in Europe still have to catch up with the advances in technology doesn’t mean you can’t derive benefits right now. By taking considered risks to develop wider experience, you can acknowledge the wider picture is evolving and still deliver immediate business value to your organisation.

In this paper we’ll discuss:

- The EU backdrop to the emergence of cloud computing
- Types of “cloud services” – their difference and relevance
- Why the network is so critical to cloud computing
- The need for enterprise-class cloud computing for European IT
- Colt and VMware® and why service provider partnerships are so important



2. What makes European clouds different?

In September 2010, a New York Times article was headed “Cloud computing hits snag in Europe” (<http://www.nytimes.com/2010/09/20/technology/20cloud.html>) highlighting the privacy and regulatory environment as a barrier to a ubiquitous global cloud service. But, there is an element of “so-what” – Europe is different from the USA. The question is what type of cloud computing is best suited to European implementation, who is best placed to provide it, and what technology best supports it?

2.1 National regulatory frameworks

The world has moved on since the EU privacy “Data Protection Directive 95/46” was published in 1995. According to Peter Fleisher, Privacy Counsel at Google: “We need to come up with global privacy standards in this space, else we’ll spend forever debating jurisdiction, applicable law, contorting ourselves in attempts to comply with these divergences as best or as poorly as can be done”. Theoretically sound: practically, very difficult to achieve.

ENISA, the European Network and Information Security Agency are doing sterling work to highlight risk assessment best practice and to recommend areas to be addressed by a new Data Protection Directive. However, to create a “digital single market” connected to a cloud, the laws on data protection would have to be the same in each of the 27 EU countries.

Currently, every member state has its own version of privacy protection and data-retention. The period a company is allowed to store users’

data ranges from six months in some EU nations to two years in others. Some countries, including Germany and France, forbid sensitive data from leaving the country at all. The 70-member Association for the Development of a Digital Economy in France has petitioned its government to keep the legislative status quo, subscribing to the concept of cloud computing, but at a national - not EU - level. The EU Commission is in the process of reviewing and refining its Data Protection stance, but this appears to be now targeted at the mid-to-late 2011 timeframe.

In Colt’s European CIO survey (www.colt.net/cio-research), 86 per cent of European CIOs believe cloud services will be the predominant operating method within the next three years.

What do we do in the meantime?

Plenty of activity is underway already; services are reaching the market that allows companies to employ cloud computing while remaining compliant with country-specific requirements.





// Up until now the cloud story has been dominated by examples like Animoto and UK Channel4 - variable, huge scale stories. In some ways these successes have confused the enterprise - plain old IT guys hear these examples and think "I don't need that, my applications don't scale, so I don't need to scale. //

Pat Kerplan, CTO of CohesiveFT

2.2 National cultures

Our CIO research highlights national and cultural differences in the approach to cloud computing. In 2010, over two-thirds of CIOs and their peers admit that they are now familiar with cloud services, compared with just 44 percent in 2009. Spain has the lowest percentage (58 percent) of CIOs and peers familiar with cloud services. Awareness is highest in the UK, at 77 percent, followed by Germany (72 percent), France (71 percent) and Italy (66 percent).

Even perceived barriers to adoption are different across the EU. Transparency of costs is the biggest concern to companies in Italy (62 percent) and France (60 percent). CIOs and their peers in France are relatively less concerned by regulatory and compliance issues (49 percent), but view performance/reliability (76 percent) of cloud services as their biggest concern.

2.3 Waiting for 'PoA' (plain old applications)

Traditionally, Europe has not been as strong in software developments and software start-ups. For example, only 12 of the Top 100 software companies are European.

Enterprise IT lives out its life one business topology at a time. Helping enterprises embark on the long, slow migration of these systems (where the topologies regularly consist of 5 to 20 servers), to an agile infrastructure is the payoff. Statistically this is where all the money is - and this is where the market will begin to focus, at the staging and production environments rather than pure development.

In effect, the European market has been looking for cloud solutions beyond the public cloud.

3. Many clouds – why?



Cloud computing isn't just about technology and it isn't just about virtualising servers and virtual data centres. As an operating model, it cannot ignore or wish-away regulatory and national business environments. This leads to the "many clouds" concept – already the National Institute of Standards and Technology's (NIST) cloud definition in the US defined four deployment models for cloud computing: Private, Public, Hybrid and Community. According to others, there are even more. These will be governed by two major factors: the IT environment and the external environment (Social, Economic, Political and Technical).

3.1 IT environment

The public cloud space is where a large part of the cloud hype has been more recently centred and includes Infrastructure-as-a-Service (IaaS), that include services such as Amazon Web Services and Software-as-a-Service (SaaS), from organisations such as Salesforce.com. The private cloud is the domain of the typical enterprise software and hardware vendors, such as HP, IBM, Microsoft, and Oracle, who are predominantly focused on selling tools for enterprises to build their own clouds. The third area is hybrid cloud, a cloud model that is not confined to your own data centre but not publically accessible via the internet either. This is what Colt defines as the enterprise cloud service space, where we provide enterprise class services and where enlightened software vendors such as VMware with vCloud™ Datacentre services are providing the bridge to link private and hybrid cloud.

3.2 The Network is Critical

One critical component of cloud computing which is seldom mentioned, and goes a long way to addressing concerns over the performance/reliability issues, is the role of the network.

Indeed, it's all about the network. More and more applications require low latency as users manipulate larger files and graphical objects, and need those at their fingertips. With the availability of cloud servers and storage, the speed of the network is really becoming the deciding factor. And unlike Moore's law for servers, with networking we tend to have the laws of Physics to contend with.

As networks are usually operated and managed by third parties (that's the first thing most CIO's have outsourced), companies mostly look at this as a given. With cloud computing, this is no longer the right way to consider networking. How – and how quickly – you get to your applications and data is important.

As service level agreements move from an availability basis (99.9 percent or thereabouts) to a KPI basis (response time/concurrent users/elapse time), the ability to dynamically flex network bandwidth in addition to processing and storage is crucial.

If network performance is important to the performance and delivery of your application, how can a service provider give you an end-to-end SLA if they don't own/control the network?

We are faced with an IT environment that has to span from infrastructure to software to business process; from tools to services; from legacy architectures to cloud architectures; from old software design methodologies to new – while still "keeping the lights on." Local when latency is important and lowest cost when it is not. And that's just the IT set of issues – now let's look at the bigger picture.

3.3 The enterprise cloud service

Balancing the constraints of the markets and regulatory environment with the demands of the organisation has always been the dilemma of the CIO. To take advantage of the massive opportunities of cloud computing, there needs to be a pragmatic approach to undertaking this journey.

A cloud service is enterprise class when it provides multi-tier security including physical, infrastructure and user levels, compatible management and security models to enable application portability to and from internal datacentres, and fast self service provisioning of resources.

But most of all an enterprise cloud service must allow organisations to fully take advantage of the new cloud operating model whatever the regulatory or business environment.

Here are some of the requirements for an enterprise-class cloud service:

Business agility

- Procure new, ready-to-use IT infrastructure on demand.
- Scale up and down according to business need and allow self-service provisioning for end users.
- Application portability.
- No rewriting of applications when moving from initial development to full production whether inside the organisations datacentre or in a service provider data centre.

Auditable security

- Built to predefined specifications and based on industry-proven technology. Virtualisation-aware firewall capabilities, Layer 2 isolation, role-based access control and the ability to integrate with Active Directory.

Flexible service levels

- No “one size fits all” approach. Enterprise cloud services allow for multiple service levels and models, including “pay-as-you-go,” to rapidly scale up and down cloud usage, “committed” for guaranteed resources pools, and “dedicated” for complete isolation of all resources.

Control

- No delegation/abdication of all security and control measures to external parties, Enterprise cloud services offer the ability to stay in complete control while enabling a self-service provisioning model for end users.

4. Why vCloud Datacentre Service is important to European IT

VMware announced vCloud™ Datacentre in August, 2010, with Colt as the first European-based service provider to offer the service. vCloud Datacentre Services extend the logical boundaries of datacentres, allowing organisations to leverage cloud computing services while preserving the security and control of their VMware environment. Designed to raise the bar and define a whole new class of enterprise-class cloud computing infrastructure services, it sets a benchmark for cloud computing for enterprises.

vCloud Datacentre is an enterprise cloud solution for enabling organisations to rapidly extend to cloud services with enterprise level security, industry and corporate compliance and predictable performance. Through a common platform built on VMware vSphere™ and vCloud Director, with common management and security models, enterprise customers can connect and integrate cloud computing as part of their own IT architecture.

vCloud Datacentre service is cobranded between Colt and VMware, offering cloud services that enable organisations to extend and migrate their own virtualised environment to a Colt data centre, with Colt providing a VMware-certified architecture.

The service is designed to make it as easy as possible for enterprises to move their workloads to vCloud Datacentre services. Any existing VMware virtual machine (VM) or Virtual Application (vApp) can be run with little or no modification on a vCloud Datacentre service, and compatibility with existing enterprise VMware deployments is a key design objective. There is no requirement for an enterprise to deploy a private cloud – any VMware virtualised infrastructure is compatible.

To ensure consistency for the base service offerings, vCloud Datacentre is based on a set of blueprints. This set of blueprints, and the intellectual properties they represent, provide the transparency needed for enterprises to trust and verify the methodologies and processes of cloud service providers. For example, Colt, with its vCloud Datacentre service, is required to adhere to the service definition and architecture to ensure consistency across the services.

As we have already seen, there are challenges for enterprises in adopting cloud computing. Broadly speaking, we can identify these challenges enterprises face into two categories:

Trust/Security

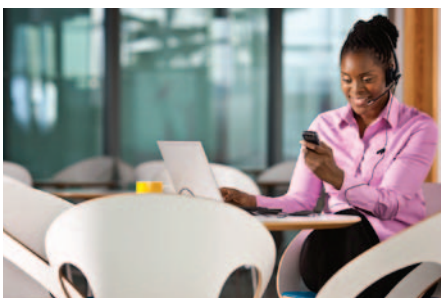
- Alignment with existing processes and tools
- Regulatory and standards compliance
- Secure connectivity
- Data location

Control and Management

- Consistent identity and access management
- Simplified resource management
- Compatible platforms and API.
- Predictable performance

vCloud Datacentre services are built on vSphere, a secure virtualisation platform with ELA4+ and FISMA certifications, and VMware vCloud Director, a cloud delivery platform offering secure multi-tenancy and organisation isolation. With the vCloud Datacentre service, enterprises can exercise the defense-in-depth security best practice as the platform offers both per-organisation firewalls and per-virtualised application firewalls and a multi-layered network that offers another level of protection from unwelcome intruders.

Access and authentication can be performed against the enterprise's own Active Directory (AD), which means that the enterprise can manage its own user base and provide role-based access according to its own policies. In addition, vCloud Datacentre services will provide customers relevant audit logs and compliance reports for their cloud environments to ensure enterprises can meet their own internal audit requirements.



4.1 Compliance

When considering security and compliance, most regulations and mandates in the industry, including SOX, PCI, HIPAA, COBIT, and ISO, all have two areas of requirements: transparency/visibility and control.

- Transparency is an absolute must, as enterprises need to know who's accessed what data, when and where, and potentially why based on documented evidence. The Payment Card Industry requirement #10 is an good example of the need for visibility and transparency.
- Control is also a vital component of compliance. For example, enterprises need to be able to control who can access, configure and modify the cloud environment, what firewall ports are open, when to apply patches and where the data resides.

Enterprise customers can outsource responsibility, but can't outsource accountability. At the end of the day, the enterprise is still accountable for compliance. vCloud Datacentre is designed to tackle this problem, and, does so in three areas:

- Ensure compliance through ISO27001 certification based on a standard set of controls.
- Provide compliance logging and reports to the customers so they have full visibility into their public cloud environments.
- Architect the service so customers can control the access to their cloud environments.

In order to ensure that enterprise customers feel secure and safe and that they have the necessary

information and visibility into the service to meet their own internal audit requirements, Colt's vCloud Datacentre service is ISO27001 certified. This proves that security management processes are in place, and have a relevant subset of the ISO27002 controls in place.

These compliance controls are published to enterprise customers so they understand that the vCloud Datacentre is not only compliant, but to ensure customers have full visibility into what controls the services were audited against.

4.2 Control

Log management is built into many of the compliance frameworks such as ISO, HIPAA, PCI and COBIT. It is needed to meet the requirements of these audit standards. Enterprise customers not only need visibility into their private clouds; they need the same levels of visibility into the service provider's portion of their cloud environment: logs and reports around user activities, access control, firewall connections and others.

To meet the requirements of being compliant with the controls that are implemented, Colt will provide visibility and transparency into the vCloud Datacentre service. To accomplish this, the relevant logs will be available that covers the following areas:

- Identity and access management
- User activities monitoring
- Change and configuration management
- Security and threat management
- Business continuity and availability management

vCloud Datacentre is based on a set of software products that have been battle tested in many secure environments, and VMware vCloud Director and vShield generate a set of logs that gives customers visibility into all the user activities and firewall connections.

4.3 Application mobility

As part of our offerings, Colt will deliver services within a named data centre, within a named hosting country, based on availability and the regulatory requirements around the customer solution. But how would an enterprise customer map its virtualised applications to the Colt enterprise cloud service and what do we mean by "map" anyway?

As a provider of vCloud Datacentre Services, Colt is supporting a standard interface based on the vCloud API, which, in turn, has been submitted to the Distributed Management Task Force (DMTF) for cloud standardisation. So, essentially, enterprises can extend their local datacentres into our enterprise class cloud service, safe in the knowledge there is no lock in – the customer freely move applications into and out of our service. Or deploy in another Colt data centre and country if that becomes important.

5. Why Colt and VMware?

VMware and Colt are uniquely positioned to help enterprises develop secure, scalable, clouds based upon customer proven virtualisation and management technology. The ability to quickly and seamlessly move computing workloads from internal virtualised infrastructure out to the enterprise cloud service is undoubtedly attractive to enterprises. Through vCloud Datacentre customers gain the benefit of:

- Business agility in responding to the needs of end users.
- Application portability through standardised VMware based technology stack across internal data centres.
- Private cloud and enterprise cloud services which leads to a flexible cloud strategy able to deal with real customer concerns and regulatory requirements.

To gain real end to end performance and quality from your cloud service, you can't separate cloud services from the network over which it is provided. Colt is uniquely placed to roll-out solutions that comprise network, infrastructure, applications, security and IT consultancy. This enables us to give customers control over three critical elements:

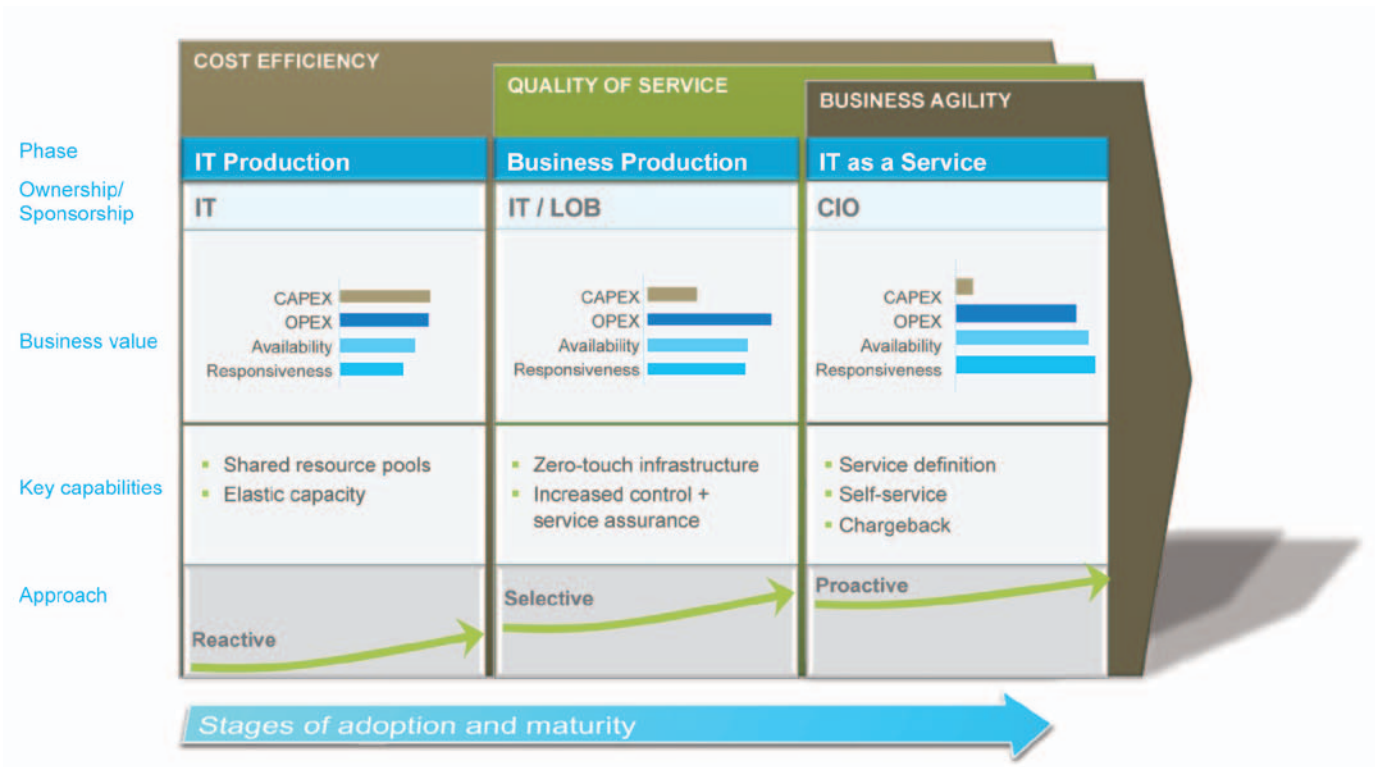
- Pioneering European Ethernet and IP networks.
- Extensive IT infrastructure and services.
- Extensive expertise in networking, IT managed services and communications.

Colt's philosophy of partnership (with customers and in developing a full range of cloud services), together with a pragmatic mix-and-match approach, ensures that the customer gets the right solution for today, and one that can adapt to meet the needs of tomorrow.

Ownership of network and data centres makes Colt uniquely able to improve system performance, provide end-to-end quality of service, and meet European compliance needs.

Colt's long track record of delivering enterprise networking and IT services sets it apart from public cloud service providers with services rooted in less demanding consumer needs; Colt Managed Services are enterprise-ready.

Colt's wide portfolio of managed infrastructure, application and security solutions makes it one of the few service providers to offer solutions across the entire IT 'stack'. We focus on enterprise business drivers, not technology - positioning technology as the best way to achieve business objectives - a support for the business, not an end in itself.



6. What can customers do now?

Every enterprise should be formulating a cloud strategy. Colt are helping many customers across Europe decide which applications are best suited to cloud deployments, what should stay inside the corporate data centre and what should be considered for cloud implementation, and what data centre strategy makes most sense in this changed world of IT.

vCloud Datacentre service gives that opportunity to move from rationalising IT production - using tools such as virtualisation - to providing IT as a service.

The first stage is to find the decision point for cloud services. For example: Is ownership of infrastructure critical? Is there anything unique about your infrastructure or architecture that is critical? Is your IT run to 'best practice' standards? Are your IT resources best used running infrastructure, or could you get better value from our people?

6.1 Plan for the cloud transformation journey

The three means of managing and procuring IT allow for differing ways to manage your business processes. In each case, the balance between capex and opex is altered as the ownership and responsibility starts to move from internal to external. The availability and responsiveness of IT to meet business needs increases as the internal resources become more targeted on areas where most value can be obtained.

IT production (or internal IT management) is a strong contender to target for business efficiencies for enterprises whose needs are not exceptional - for example excessive regulatory or legal pressures, extreme performance requirements, or the need to use highly specialised equipment and applications. Even in this case, Colt is working with customers to apply cloud models to specialised areas such as grid and high performance computing.

Business production caters for customers that are in the majority - their needs are able to be met by a service provider or managed services specialist, where the efficiency gains (quality and sometimes monetary) are able to be realised through the targeted outsourcing of a number of areas of the delivery of applications. Common areas are security, infrastructure management, patching, and storage & backup that can be readily operationalised or industrialised without increasing the risk to the business.

The end-state architecture is that of a cloud operating model, bridging to an enterprise cloud services, that is best described as "IT as a Service".

6.2 Accelerate the transformation journey

Although these three phases (from IT to business production ending in IT-as-a-Service), are consistent across customers, the path through these stages is dependent on the current state of IT, business objectives and priorities, and risk management. Thus, there is no one-size-fits-all approach. Colt works with its customers to assess, evaluate, and determine the most appropriate path, that accelerates the transformation while mitigating risk, and producing the highest business value to the organisation. Each journey has to be tailored to a particular customer's situation. Especially in the case of European IT, one size does not fit all.

6.3 Address European cloud issues

According to James Staten of Forrester, there are actions enterprises can take to stay on top of risk and regulatory issues while still getting the most out of the cloud operating model.

- Maintain the security posture of your application and data
- Use the location that makes sense for your business
- Stay on top of changes in regulation and legal requirements
- Know the locations of your cloud provider's data centres

This advice becomes much easier to implement given the partnership between VMware and Colt to bring a European vCloud datacentre service to market.

7. Conclusion

European clouds require a European approach. Enterprises can and should start now. vCloud Datacentre is important and will become increasingly more important to European IT as companies adopt and benefit from the enterprise-class cloud.

The bottom line for European IT is that cloud services are becoming extensions of enterprises, and therefore require planning, architecture, integration, security, accountability, and governance - the same, or even more than go into managing on-premise applications and systems.

Enterprises shouldn't think that cloud services offer cheap alternatives to on-premise IT. There is a lot more to enterprise IT than simply accessing on-demand servers and storage.

The enterprise cloud model raises the bar and defines a whole new class of cloud computing services. The model sets a benchmark for cloud computing for enterprises and is the blueprint for European enterprises to now be taking their first steps to a cloud based future. It is going to be a better, more strategic, more agile architecture, but it's also potentially going to be more complex, at least at the outset.

Commodity cloud models demand that enterprises reinvent existing infrastructure to leverage newer architectural patterns in the cloud. Added to this is the change management involved in retraining staff and re-aligning the business. In contrast, vCloud Datacentre allows enterprises to retain and reuse their existing infrastructure and resources, extending their datacentre with cloud computing services that maintain security and compliance.

Ultimately, you get to a much better, higher value strategic architecture which is going to add more value to the business. It's going to be a journey to get there, not measured in unit cost per server hour but in business terms of security management and audit, change management, migration and planning. But without doubt, it is a journey worth taking.

About VMware

VMware is the global leader in virtualisation and cloud infrastructure, delivering customer-proven solutions that significantly reduce IT complexity and enable more flexible, agile service delivery. VMware accelerates an organisation's transition to cloud computing, while preserving existing IT investments and enabling more efficient, agile service delivery without compromising control. With more than 190,000 customers and 25,000 partners, VMware helps organisations of all sizes lower costs, preserve freedom of choice and energise business through IT while saving energy - financial, human and the Earth's.

For more information about VMware please visit www.vmware.com

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About Colt

Colt is Europe's information delivery platform, enabling its customers to share, process and store their vital business information. Colt provides major organisations, midsize businesses and wholesale customers with a powerful resource that combines network and IT infrastructure with expertise in IT managed services, networking and communication solutions. Colt operates a 13-country, 25,000km network that includes metropolitan area networks in 34 major European cities with direct fibre connections into 17,000 buildings and 19 Colt data centres.

For more information about Colt's IT Managed Services please visit www.colt.net/managedservices or email ITManagedServices@colt.net