



# Managing Enterprise Agility

White Paper 2009



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## Overview

Virtualisation is one of the key answers to the industry's IT challenges of spiralling energy costs, demand for space, server sprawl, system complexity and increasing costs. It promises to transform IT infrastructure in terms of its ability to deliver agility, resilience and cost reduction.

It is widely predicted (Gartner, IDC et al) that virtualisation will grow significantly over the next few years. Although today, the focus is server virtualisation, growth will not be limited to that alone but will extend to include high capex applications, network, storage and the desktop.

The vision of a real-time IT infrastructure is compelling and promises to deliver services to the business with the same availability as utilities. Cost reductions will be achieved through virtualisation and consolidation; and autonomic behaviour will be pushed down to all levels of the infrastructure.

This White Paper looks at the business drivers and technology advances that will provide the foundation for high availability, dynamic scalability and manageability of infrastructures across enterprise applications, creating IT agility.



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## 1. The Enterprise Agility Goal

The competitive nature of today's global economy creates an ever-changing environment that demands agility – the ability to react and respond to changes dynamically, in real time. Today's IT cannot react to business changes quickly enough, yet it is critical to achieving real-time business agility. 84% of the UK's organisations regard business agility as vital to future success <sup>Ref 1</sup>.

Striking a balance between achieving real time business agility and maintaining IT cost efficiency requires innovation.

Typically, however, IT objectives focus on cost reduction and quality – and rarely reflect enterprise agility objectives. Current IT trends such as service oriented architecture (SOA), on –demand services, virtualisation and outsourcing should all improve IT agility.

The ineffectual alignment of IT with business strategy and planning hinders IT agility. This is due to an infrastructure-focused rather than business-focused approach which makes it difficult to align business needs with IT service delivery. Most organisations have legacy applications or rigid IT infrastructures that are difficult to configure and expensive to change, and this can be an obstacle to agility. Many IT metrics are driven by cost and risk as opposed to speed, innovation and business responsiveness, hence IT agility is rarely measured



Ref 1 – IDC Virtualisation Report 2006



To achieve the goal of enterprise IT agility it must be possible to provide critical capabilities in the least possible time, at the lowest possible cost, with the highest possible quality and at the lowest achievable level of risk. Time, cost, and quality must all be considered in the enterprise IT agility equation. Therefore businesses need to plan adequately, integrate the business needs with those of IT, and focus on targeting different states of agility for different aspects of its IT provision thereby 'right' sizing its options to reach the agility required, whilst balancing the costs and risks. True business agility can be attained if the four layers of business-strategy, process, applications and infrastructure are fully integrated, to deliver unprecedented levels of reliability, availability, agility and cost sensitivity.



## 2. The Expanded Business Drivers

An agile business is one that can adapt quickly to the changing environment and respond to new opportunities whilst mitigating new threats. IT agility has a major part to play in delivering value to the business. New and emerging technologies, such as wireless, web services, virtualisation and utility computing have introduced more agile solutions. As the pace of change increases, businesses will continue to demand greater IT agility.

Virtualisation as a strategy can enable businesses to boost IT flexibility, improve server utilisation through application consolidation and dramatically reduce IT costs, whilst still improving overall performance at existing service levels. The business drivers have expanded from IT Consolidation alone, to encompass Eco Innovation and Business Continuity as well as faster provisioning and policy-based automation.

Virtualisation has quickly become a leading technology to protect 'business-critical' applications, because it not only encapsulates the applications, but it also decouples the application stack from the underlying hardware. This capability enables the infrastructure to be treated and managed more like a pool of resources with systems from different vendor types managed through a single management console – irrespective of whether they are server, storage or remote client systems.

Through Virtualisation, businesses can consolidate servers to drastically reduce space, power and cooling needs – making the organisation greener and reducing costs. Many businesses now have meaningful and cost effective disaster recovery for the first time and virtualisation has a strong role to play in helping businesses to increase service levels and improve application availability.

The emphasis is now driving toward faster recovery from system failures, improving service levels and increasing agility to improve responsiveness to changing business needs. There is a shift away from a pure focus on lowering capital costs through improved utilisation - to reducing operational costs.

The majority of businesses start their virtualisation projects by focusing on consolidation, but after deployment, the value proposition shifts toward new capabilities such as disaster recovery, reducing planned downtime and rapid deployment. There is tremendous opportunity for agility and efficiency, but without good management tools and associated process changes, there is also possibility of failure. Today, the value proposition for Virtualisation is shifting away from saving money and consolidating toward centralised management and new capabilities.



### 3. Virtualisation across the Enterprise

Virtualisation and System Partitioning have existed for decades aboard mainframe, RISC and Unix-based systems. What is relatively new is the concept of bringing this virtualisation technology to x86-based servers, storage arrays and distributed client environments. Businesses can choose the infrastructure components that best match the performance, functionality, form factor and price requirements for a large part of the IT infrastructure.

Roughly 90% of the server market is composed of x86 architecture servers. Based on the traditional model of one application per server, roughly 80-90% of the x86 computing capacity is unused at any one time. This unused capacity takes up data centre space and requires power and cooling, as well as needing to be managed.

Operational costs are being driven up by the lack of process and service integration across multiple applications and the overhead associated with unused capacity. Instead of viewing IT as a series of discrete silos of infrastructure, businesses want to view IT as a shared pool of resources that can be dynamically manipulated to align with application requirements. This requires the abstraction of applications and services from the physical infrastructure on which they are hosted, enabling the creation of more service-oriented infrastructures.

Virtualisation promises to unlock much of this under-utilised capacity, however, to gain the extended benefits, enterprises should leverage virtualisation not just as a cost saving measure but to gain fast deployments, reduce downtime, improve disaster recovery capabilities, enable variable usage accounting & usage chargeback, provide holistic capacity planning and more.

With the need to innovate becoming increasingly important, attaining IT agility will enable the delivery of new services without impacting adversely on existing service provision. With IT agility, services can be changed more cost-effectively, thereby increasing the value delivered to the business. Increased flexibility in sourcing and resourcing will enable IT services to be reconfigured more easily to meet new demands.

The combination of storage, server and client virtualisation and the ability to dynamically align these virtualised resources represents a foundation for the next generation enterprise data centre and is a key element in the successful implementation of a Service Oriented Architecture.



## 4. Trends in Virtualisation

Server virtualisation holds tremendous potential for consolidation. With advanced features such as automatic fail over, dynamic relocation, load balancing and consolidated back-up pushing many organisations to embrace and use virtualisation technologies. It is becoming a more standard way to deploy new enterprise applications and has moved from the development and test arena, with now over 60% of UK Corporate companies and 50% of all VMware's clients worldwide using virtualised servers to host production applications, including some of the most business-critical applications.

The adoption of virtualisation technologies is expected to grow rapidly, reaching \$3200m by 2011 <sup>ref 2</sup>, fuelled by the decoupling of application services and data services from the physical infrastructure, which enables these services to be provisioned, migrated and scaled more transparently. According to Gartner, Virtualisation will have the highest impact on changing IT infrastructure and operations through 2012 Ref 3 and it will change how infrastructure is purchased, managed and deployed. The advent of embedded hypervisors will undoubtedly grow the market and remove the technical barriers to virtualisation.

Virtualisation technology has moved from early adopters into the mainstream and many high profile infrastructures are virtualised with hundreds of servers. There are more vendors entering the market, and more vendor eco-systems are being formed. As this trend continues, storage virtualisation will become the norm and application virtualisation will become commonplace. Hypervisor architecture is becoming thin and embedded and will eventually disappear as it becomes absorbed into the hardware. Virtualisation technology has impacted on traditional software pricing and licencing models. It has introduced the concept of fractional use of large resources, the ability to quickly change the amount of capacity available to software, the ability to move software from one resource to another easily and the concept of an offline snapshot for recovery purposes.

Virtualisation at all levels of IT resource from storage and networking, to servers, promises to transform the IT infrastructure in terms of agility and cost reduction, but the management of virtualisation is currently fragmented into various point products. As virtualisation matures, emphasis will be placed on the composition and management of the virtual resources.

Ref 2 – Gartner March 2008, Ref 3 – Gartner March 2008



So, if virtualisation is one of the key answers to the industry's IT challenges, why are so few seeing the return on investment expected from Virtualisation? The reason is that there are many aspects of virtualisation for the enterprise, it is not easy and one size does not fit all. Virtualisation is not a commodity technology – it amounts to a re-architecting of the data centre and requires expertise and skills to implement, with training and knowledge to manage effectively.

Reducing the physical server footprint can save on costs but only if the additional layer of complexity doesn't increase the management burden. In a virtual environment the manual procedures for co-ordinating activities don't typically scale. Automated controls are needed to fully exploit technologies in areas such as availability and capacity management.

The rapid growth of server virtualisation and its acceptance for business-critical applications has led to a flood of server virtualisation products on the market. The current landscape is a set of products, each at a different maturity level. More work is required to meet concerns over server virtualisation management, availability, deployment and integration. As prices decline, new pricing models are introduced and improved management tools become available, it will become an optimal time to deploy virtualisation technologies, particularly for the mature markets.

Virtualisation adoption in the data centre offers the benefits of efficient hardware resource utilisation, server portability and high availability. Understanding where virtualisation technology is best suited, as well as using the correct virtualisation architecture for a given situation, is critical in ensuring server virtualisation's success for business-critical applications.



## 5. The Importance of Choice

Different applications have different requirements in terms of isolation, flexibility and performance. Having the right virtualisation tool for the right job is as critical as choosing the right hardware platform and vendor.

Businesses must consider the degree of isolation, the breadth of operating systems they wish to support, the goals of the organisation, the degree of flexibility and mobility, the applications planned to support and the level of performance required.

A strong portfolio of products and services will be required to ensure that business can continue to choose not only the application that best meets their needs but also the virtualisation technology, operating system and storage that will support those needs. It is also important that these technologies can be combined to enhance the capabilities and counteract the challenges.

Today's vendors are building hardware and software platforms that can deliver virtualisation solutions at near native performance. To get the most out of virtualisation technologies it is important to realise that the answer to every consolidation or availability problem may not be a single virtualisation technology, but a combination of complementary solutions.

As virtualisation technologies become more mainstream and pervasive, the ability to provide businesses with a choice in how they virtualise their systems and to provide systems that have high availability, scalability and manageability are the key to success.



## 6. Real Time Infrastructure

Organisations must strive to ensure secure business operations but need to deliver business agility whilst reducing IT complexity, cost and risk. Bridging the gap between IT costs and business agility will create significant business advantage and open up new opportunities.

The Real Time Infrastructure (RTI) has been conceived to support business in near real time. Defined as IT that is shared across the business in all areas, including people, processes and technologies. RTI purports to deliver the ability to react to business changes in real time by providing a utility computing model that can readjust resources to properly serve the business, creating a dynamic autonomic capability to respond to change. It is sometimes described as an on-demand capability that serves up computing resources much like conventional utility companies provide power and water.

RTI has been well adopted across the industry with varying names such as Utility Computing, Adaptive Enterprise (HP), On Demand (IBM), Scalable Enterprise (Dell), Organic IT (Forrester), Dynamic IT (IDC) and RTI ( Gartner, Unisys, Attenda).

The agile business requires an infrastructure that is equally agile – one that will deliver consistent quality of service to the business – one that can adapt quickly to the dynamic business needs, scale both horizontally and vertically, and most importantly maintain a high benefit to cost ratio.

The goal of enterprise agility lies in the ability of the business to drive the IT infrastructure and not the other way around. This requires the management of the infrastructure to be aligned with the management of the business itself – an intelligent infrastructure that provides near real time responses to real time needs – an infrastructure that is intelligent enough to tie business strategies and operations to technology in real time.

The key to successful RTI lies in two primary technology concepts: Virtualisation and Orchestration. Virtualisation being the abstraction of the physical hardware from the underlying software – operating system in a server or database in storage – to allow multiple ‘virtual machines’ to reside on a single physical machine with the 3-fold goal of consolidating servers, storage and networking resources, eliminating waste or excesses and optimising the usage of each physical machine. Orchestration is the capability of intelligently managing the virtualised environment based on monitoring key business events in real time. These events are filtered, processed and pattern matched with pre-defined rules and policies to dictate how the virtualised environment needs to be tweaked to better



respond to present conditions. These rules and policies are directly tied to business requirements and key performance indicators.

Truly effective Orchestration is heavily influenced by the applications in the business application layer above it. Application silos that are tied to their deployment platforms and lack the flexibility to leverage the full potential of such an environment can severely limit the effectiveness of a consolidated, virtualised RTI environment.

RTI is still a vision and it will be five to ten years before it becomes a reality. Large gains have been made in the past three years through virtualisation and DC space and energy issues have helped to drive adoption. There are still significant hype, standardisation and process inhibitors to overcome before it becomes a true reality.



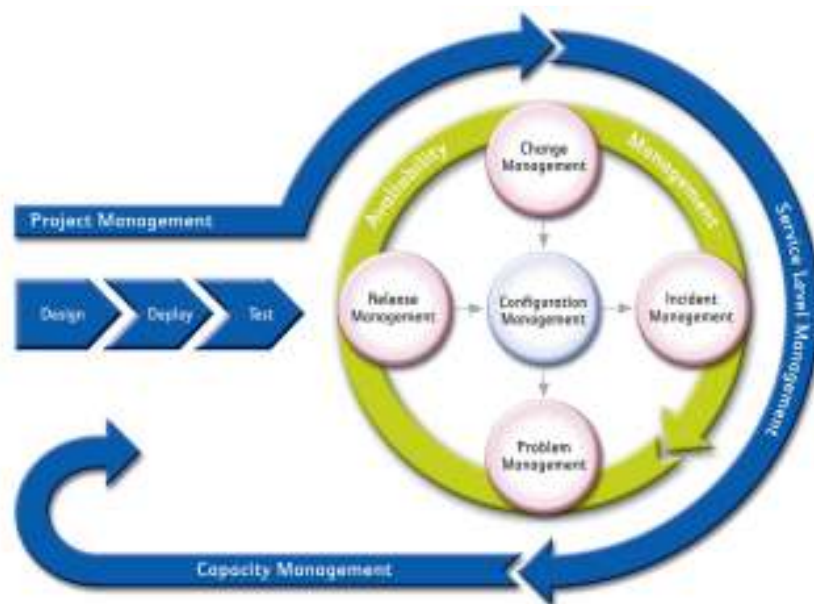


## 7. Infrastructure Management

The enterprise agility goal requires an infrastructure management framework that allows industry- leading solutions to be integrated so that heterogeneous physical resources and virtual resources can be managed as a single infrastructure delivering a guaranteed high level of service to the business.

One of the great weaknesses facing server virtualisation today is the lack of available management and monitoring tools. Server virtualisation challenges many of the traditional tenets of IT infrastructure and this has ramifications on its management. The ability to dynamically move virtual machines makes provisioning easier, but presents a greater challenge in terms of security, management and monitoring.

The most challenging issues affecting server virtualised environments include migration, management, disk performance, network and storage integration, and back up and recovery complexity. Consolidating to Virtual Machines (VMs) running fewer hosts will reduce the number of physical systems but the number of managed systems will remain the same. VM management involves not only system updating and monitoring, but also management between virtual and physical resources. VMs will place an overhead on management in terms of centralised VM monitoring and alerting, and patch and update maintenance.





The consolidation of workloads through virtualisation takes considerable IT resource expertise. Workloads need to be 'right sized' through an understanding of application behaviour and balanced on the same server to avoid a detrimental impact on quality of service. There will continue to be limited availability of skills around virtualisation technologies, particularly for the small and midsize business sector (SMB).

IT agility demands complete integration of people, process and technology – IT operations, service level management, change management, availability and continuity management, performance and capacity management, and security management.

One of the challenges of VM host monitoring is having a proprietary management interface for each virtualisation product, resulting in added training costs and complexity. Additionally, as each interface uses proprietary architecture and terminology it is easy to confuse processes or make assumptions about techniques that are valid for one virtualisation platform but not another.

A single interface end-to-end management tool to centrally manage all major virtualisation applications is not yet commercially available from the virtualisation product & solution vendors. Until the tools and management capabilities associated with virtualisation reach a richer feature level, organisations will remain reluctant to implement it.

The enterprise agility goal can only be achieved with a higher level management environment that directly supports business services independent of specific operating systems or physical resources, with the agility and flexibility that can be achieved on top of a scalable, enterprise class virtualised environment.



## 8. A Managed Approach

### About Attenda

Attenda, the Always On Managed Services company, manages those vital applications that every business relies upon today to function effectively allowing our clients to selectively outsource their IT operations and re-focus on using IT to add strategic value to their business.

Through a commitment to operational excellence, we manage, secure and optimise the performance of business critical applications, irrespective of the physical location of the infrastructure.

With over 8 years' investment into Attenda M.O., Attenda's operations platform, we provide the people, process and technology to deliver exceptionally high service levels, but at a cost that is amortised across Attenda's entire client base - currently 134 of the UK's leading companies.

Attenda is VMware EMEA Hosting Partner of the Year 2008 and 2009, providing VMware virtualised solutions for dedicated Windows or Linux, or heterogeneous operating systems environments, and the Attenda Real Time Infrastructure.

Attenda pro-actively monitors and manages IT infrastructures 24 x 7, identifying problems before they occur. ISO 20000 certification reinforces Attenda's commitment to delivering the very highest service levels in IT Service Management and ISO 27001 certification ensures that these systems are highly secure.

Attenda is a HP SP Signature Partner, a Microsoft Gold Certified Partner, a SAP Adaptive IT Hosting Provider, and a SunTone accredited managed service provider.

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