Content Virtualization Backgrounder

Few trends in the history of IT have been as all-dominant as virtualization. From its quiet beginnings as a mainframe technology that enabled better CPU utilization, virtualization has quickly progressed over the past decade in two major waves – migrating from servers and storage, to applications and desktop architectures. The core technology came at a perfect time, when IT shops were being asked to do more with less. Virtualization technologies have radically transformed the IT data center, and in so doing, have saved organizations millions of dollars through hardware resource optimization, greater IT manageability and increased organizational agility.

The Perfect Data Storm

As it turns out, virtualization has introduced an unexpected new layer of complexity into organizations. In the past, physical server and storage limitations served to put a cap on the growth of data. Virtualization breaks the physical and logical link in a new way, spreading the entire computing process across a wide range of physical devices, whether it's processing, end user devices, storage or networking. Once server and storage resources became mainstream virtualization targets, data sprawl quickly followed, contributing to accelerated duplication, disintermediation and confusion of data.

Virtualization has contributed to the accelerated mobility of information while spurring the growth of cloud computing, which adds yet another layer of complexity to the mix by pushing valuable corporate information beyond the firewall into public and private clouds. And mobile devices make it increasingly difficult to manage and secure information, further amplifying the problems of splintered data and different data views.

As a result, today's enterprises have never been more fragmented, with information scattered across hundreds of application silos and file stores, thousands of email attachments and an explosion of cloud apps. And it's only getting worse as data volumes continue to double each year. According to industry analyst group IDC, "there's been a ten-fold increase in data stored by enterprises over the last five years (2006-2011)."

The Virtualization Divide

While data center virtualization has lowered costs and made IT management simpler, end users have experienced more complexity in managing content across devices and locations. The past two waves of virtualization have created a plethora of file and data locations across the enterprise, putting pressure on end users through the multiplication of physical resources.

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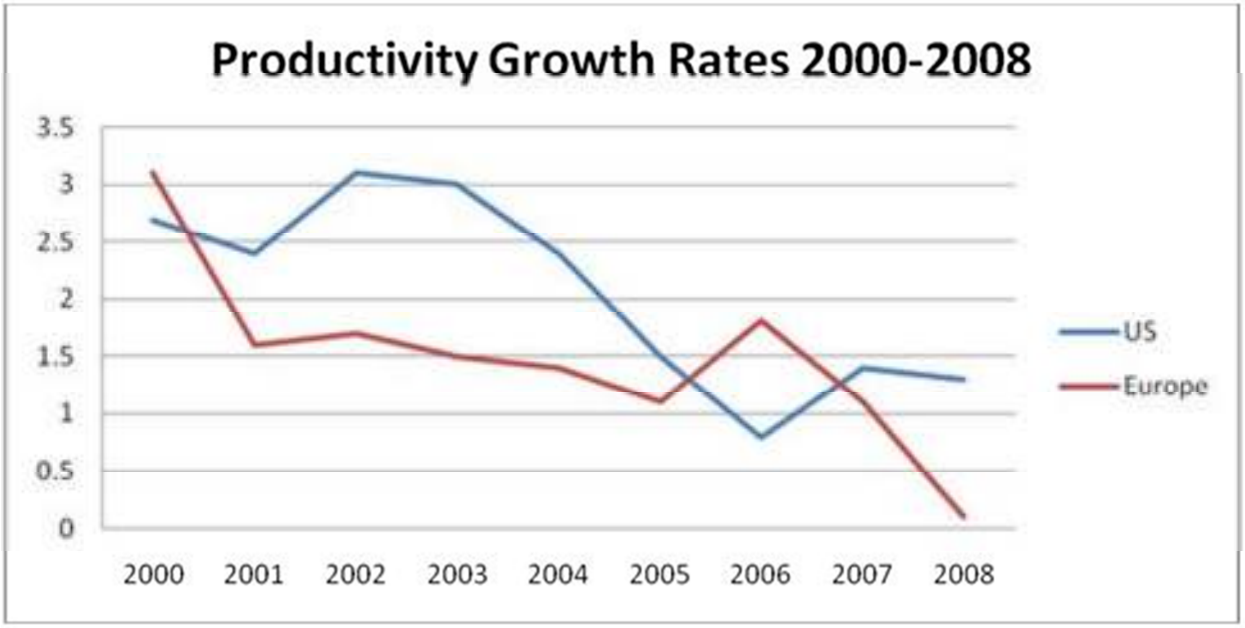
The issue is no longer about simply finding a piece of information when it's needed. The issue is now about finding the right information across a multitude of copies housed in myriad locations – including virtual servers, off-boarded storage, attached to emails hosted in the cloud, or sitting in virtual and physical desktops.

The Cost of Data Sprawl

For decades, advances in information technology have significantly boosted worker productivity with everything from email to new ERP and CRM applications; and global productivity grew steadily throughout the 1990s. Since the millennium, however, we seem to have reached a point of diminishing returns and are simply not getting the same rate of return with each new IT investment. Data sprawl is simply choking the system. As a result, the actual productivity rate of information workers has slowed dramatically.



Source: OECD productivity growth rates 2000-2009 www.oecd.org

Today's enterprises of all sizes are paying the high cost of data sprawl in multiple ways:

- Poorly informed decisions because the most timely, relevant content is not being used.
- Slower decision-making with time wasted looking for the right content.
- Productivity loss, with knowledge workers spending more time looking for content instead of adding value.
- Slower return on technology investments, with data locked inside application silos.
- Massive IT burden, as resources are wasted trying to control, secure and manage data.

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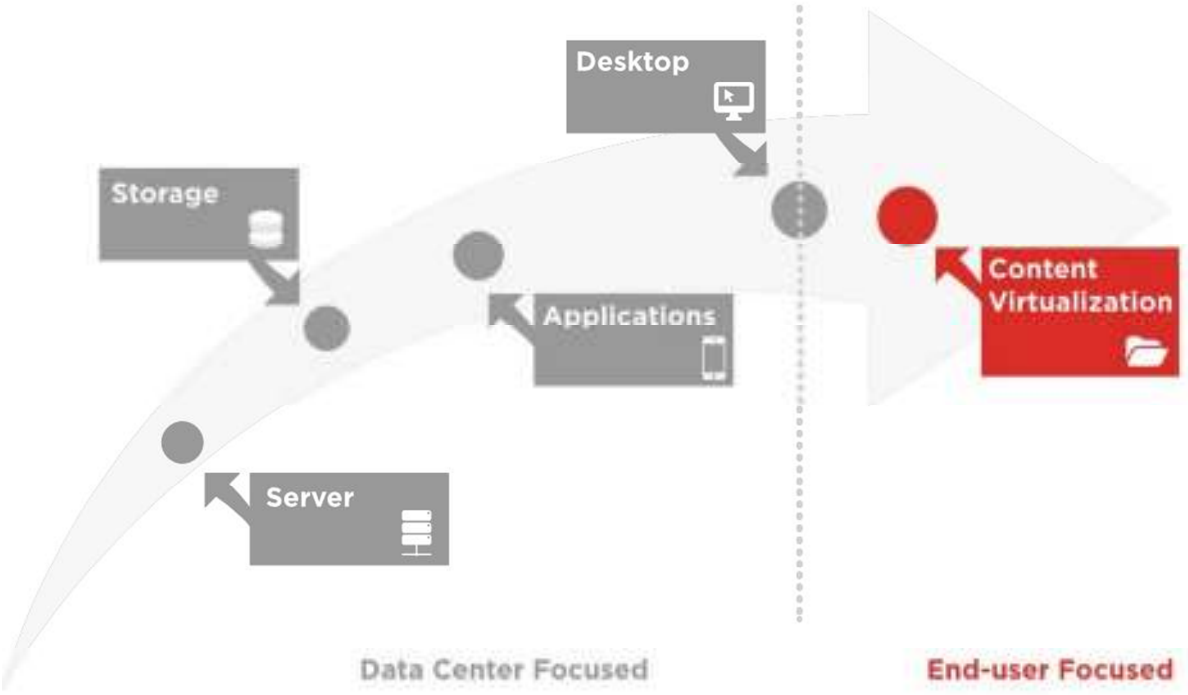
The Third Wave in Virtualization

The enterprise is ripe for a new information paradigm where everyone can find every piece of information they need, when they need it, with a light and agile interface that actually super-charges productivity instead of creating a drain on it.

The virtualization concept has now advanced to embrace the content that lies at the heart of every organization, promising to liberate it from the storage recesses and application silos that have curtailed its use and value. It now stands ready to transform the very core of the enterprise itself through content virtualization.



As its name implies, content virtualization is based on the ideas that have made other virtualization technologies so popular: resources on demand, distributed architectures and agile infrastructures. Content virtualization is the next logical extension of the virtualization movement – and the first to focus squarely on delivering benefits to end users. In an era governed by data sprawl, content virtualization is a breakthrough technology on par, or exceeding, other virtualization applications in the productivity benefits it produces.

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What is Content Virtualization?

Content virtualization breaks down the walls between application silos to ease data sprawl and deliver a more productive end-user experience. It does this by separating and abstracting content from the underlying physical data silos, capturing the metadata in a secure common index for improved access, availability and security. It then federates the results and gives users immediate access to their business-critical information regardless of its location.

By creating a virtualized representation of content from across the entire organization, content virtualization allows end users to see all their content as logical objects, while masking all the intricacies of the underlying physical IT infrastructure. It makes all fragmented applications, and their related data silos, work together as one cohesive content system, enabling users to draw upon the collective intelligence and information of the entire organization.

How it Works

Content virtualization works by:

1. **Finding all information.** Content virtualization discovers data wherever it lives – across applications, servers, intranet sites, email and file stores hosted in the cloud or on premise in the data center.
2. **Indexing everything.** Content virtualization identifies and maps all data in the enterprise, making it easy to index everything in a central or virtualized cluster of indices.
3. **Securing access.** Content virtualization uses existing security schema to associate each piece of content with its access privileges, so only authorized users can see it.
4. **Leveraging knowledge.** Content virtualization makes all content available to authorized users, on-demand, without leaving their application or device.

Defining Characteristics

Content virtualization leverages a deep understanding of applications and stored metadata to render an image of all enterprise content across diverse applications and devices, network and cloud architectures, data storage systems and formats. The defining technical attributes of content virtualization platforms include:

- **Common index.** The most critical component of a content virtualization platform is the core index itself, as it acts as a unifier for all enterprise information. Content virtualization platforms must organize and index data using a common index structure and make the data accessible to any authorized application or user device, regardless of format or structure.

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- **Non-disruptive.** Unlike complex systems that try to impose structure on unstructured data or new processes on users, content virtualization platforms leave data where it lives while making it available to everyone who needs it and is authorized to see it. The system must not interfere with the functioning of applications nor the structure and integrity of data in performing its role. Rather, it must sit on top of other platforms and existing security systems in a lightweight model in order to build the common index dynamically and continuously.
- **Any application.** Content virtualization platforms possess the ability to understand the metadata of the various applications in use by an organization and provide the means for their interrogation. The system must find and index the data inside any application, database or file store without having to hard-wire integrations for each and every application. That means the platform must understand a huge range of file formats and data types, as well as context and meaning.
- **Any location.** Content virtualization platforms must embrace data wherever it lives: behind the firewall, out in the cloud or anywhere in-between. Location, whether physical or virtual, must not be an impediment to the system. Content virtualization spans all types of local, SAN and NAS storage; server configuration, whether local or remote; and cloud service, whether public or private.
- **Any device.** Content virtualization must federate disparate content into a single view regardless of end-point and support all client device models: physical, virtual, distributed and mobile.

How it's Different

Previous attempts at solving data sprawl involved putting controls and structure around unstructured data either by forcing users to behave according to a set of rules or managing data across the entire enterprise. Such measures are simple for databases, but impossible for emails, documents and almost any other type of unstructured data.

The results so far have been over-engineered systems that are expensive to buy, expensive to maintain, create a huge drain on performance and are very likely to be ignored or worked around by the end user, including:

- **Data warehouses.** Massive, centralized data stores that were meant to replace the hundreds of silos.
- **Document management systems.** Extensive (and expensive) knowledge management stores with pre-structured data schema and intensive metadata rules.
- **Data governance initiatives.** New rules, policies and processes designed to enforce better data hygiene practices.
- **Traditional enterprise search.** Too centralized, too hierarchical and too insecure for the way data lives.

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Content virtualization is a lightweight, non-disruptive approach to dealing with the heavy problem of data sprawl that requires no heavy lifting, custom integration or changes in how end users or organizations work.

Business Advantages

Virtualization has already transformed enterprise IT. Now content virtualization is set to transform the end-user experience. By leveraging the power of content virtualization, organizations of all sizes, from SMBs to global enterprises, can solve a critical pain point for frustrated workers trying to find the information they need in a timely manner across a variety of applications, locations and devices. Content virtualization allows companies to unleash the power and value of information, no matter where it resides within the organization.

End-User Benefits:

- Make faster, more informed decisions by making the right information available at the right time.
- Boost productivity by eliminating wasted time searching for or recreating existing data.
- Simplify the user experience by providing a single view of all data (and data relationships) regardless of the app it is created or stored in.

IT Benefits:

- Lighten the data management burden by leaving data where it lives, but discovering and indexing it for use.
- Unite all content stores whether in the cloud, the data center or any server or storage system in-between.
- Secure all content, so users see only what they are authorized to see, since all content is housed within the security authentication framework for secure access control. Virtualized content can be easily reviewed and audited to reveal usage patterns and identify potential abuse.

About VirtualWorks

The VirtualWorks™ approach to content virtualization is based on the company's new Virtual Index Architecture™ (VIA) that leverages a deep understanding of applications and stored metadata to render an image of all enterprise content across diverse applications, network and cloud architectures, data storage systems and formats.

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VirtualWorks is pioneering a new software category called content virtualization that breaks down the walls between application silos to ease data sprawl and deliver a more productive end-user computing experience. Headquartered in Boca Raton, FL, with offices in Norway, the company is led by Edward Iacobucci, a prominent high-tech entrepreneur and co-founder of Citrix Systems. The company's technology is currently used by more 300 private and public sector organizations in Norway, Sweden and the United States to unleash the power of information no matter where it resides within the organization. For more information, please visit www.virtualworks.com.

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