Co-innovation from industry leaders

The IBM-SAP partnership provides many advantages to enterprises looking to lower costs and increase agility

Highlights

- Transition to the newest SAP version more easily by deploying IBM® Spectrum Storage™ software-defined solutions

- Accelerate business-critical SAP applications with all-flash IBM FlashSystem® and cost-efficient IBM Storwize® storage systems

- Increase business agility and simplify data management with IBM Spectrum Virtualize™

- Gain market-leading data protection and SAP system availability with IBM Spectrum Protect™

- Deploy IBM Spectrum™ Copy Data Management and IBM Cloud Object Storage to build more efficient copy management and data retention solutions

SAP is a market leader in enterprise application software. As one of the largest independent software companies in the world, SAP helps streamline enterprise resource planning (ERP) processes and data analytics for millions of users at tens of thousands of installations worldwide.[1]

In 2016, IBM and SAP announced a partnership[2] to help customers accelerate toward digital transformation. The two industry giants have been working together to produce cognitive extensions, enhanced user experiences and industry-specific functionality, all enabled for the next generation of SAP solutions.[3]

At the heart of this "co-innovation" initiative lies IBM software-defined storage (SDS) technologies and IBM FlashSystem and Storwize all-flash storage arrays. IBM Spectrum Storage is the number-one family of SDS solutions on the planet.[4] This broad and ever-expanding portfolio of SDS products and capabilities, when matched with award-winning IBM FlashSystem and Storwize systems, offers solutions to almost any SAP storage-related infrastructure requirement and business use case.

SAP means business

The SAP Business Suite is an integrated portfolio of applications for large and midsized businesses that includes SAP Enterprise Resource Planning as a foundation, plus customer relationship management (CRM), supplier relationship management (SRM), product lifecycle management (PLM) and supply chain management (SCM) modules. SAP now gives its

customers the option of running the SAP Business Suite on SAP HANA, the company's in-memory database platform, on-premises or in the cloud. SAP S/4HANA is the in-memory version of the Business Suite platform. S/4HANA is designed to run only on SAP HANA. It is intended to be easier to use and administer while helping to solve more complex problems and handle vastly larger amounts of data than its predecessors.[5]

SAP HANA gives enterprises access to robust analytics and rapid decision support, based on large-scale, diverse data sets. As a result, and with optimized infrastructure, businesses can pursue improvements such as replacing fraud detection with fraud *prevention*, or making informed purchase suggestions while a customer transaction is underway, rather than a week later by email. As companies adopt SAP HANA and S/4HANA, they encounter tremendous opportunity for their line-of-business organizations to devise new strategies based on real-time business.

But many businesses are finding that their existing systems and approaches to data processing are inadequate to meet the new set of business requirements embodied by SAP HANA and S/4HANA. A new approach is required, based on quick, easy and flexible handling of data to satisfy rapidly changing needs.

Co-innovation from industry leaders

An important aspect of the joint value proposition for digital transformation offered by IBM and SAP stems from the unique and long-standing relationship between the two companies. This factor alone positions IBM well, compared to most competitors, as a technology provider supporting SAP solutions. But IBM brings additional advantages:

• Full-stack support and service offerings cover the full range of IBM, SAP and Linux components of the SAP HANA solution.[6]

• IBM is the only organization in the world that participates at every one of SAP's partnership levels, from technology, to cloud, to services, to software.[6]
• IBM is among SAP's top vendor customers; running a large-scale SAP implementation makes IBM a peer with other SAP customers.[6]
• IBM has more code-development projects underway with SAP than all other partners combined, including system integrators, OEMs and software vendors.[6]

Recently SAP selected IBM for the prestigious "SAP Global Partner of the Year—Infrastructure" award, which recognizes a SAP partner "who has demonstrated a commitment to deliver innovative solutions that meet a multitude of customer deployment scenarios, including on-premises, cloud and hybrid, as well as virtualized architectures." IBM was selected on the basis of successful customer digital transformation, alignment and affinity with SAP's vision and platform road map, ability to address and expand markets, and the company's success and relevance within the SAP ecosystem.[7]

As SAP users plan for the transition to SAP HANA and S/4HANA, they must assess whether their current infrastructure can support this inevitable migration. Can their existing systems support the demands of tomorrow's SAP workloads? Can they meet growing performance and capacity requirements? Can they provide the level of security required? Can existing infrastructure support the demands of real-time analytics, DevOps or the Internet of Things (IoT)? IBM and SAP are working closely together to develop and refine the best possible solutions to each of these SAP infrastructure challenges, and many more, through the SDS capabilities of IBM Spectrum Storage coupled with the performance, reliability and efficiency of IBM FlashSystem and Storwize storage systems.

Spectrum of software-defined solutions

IBM was essentially offering SDS products and solutions long before anyone coined the name, and IBM has continued to invest in SDS development and innovation. A significant portion of this effort and investment has gone into consolidating many of the previous standalone SDS-related solutions into one product family, and then continuing to innovate and extend new and better functionality and features to each and all. This new SDS product family—IBM Spectrum Storage—offers a wide range of SDS functionality and capabilities, including the foundational benefits we expect from market-leading SDS solutions, such as:

- **Increased flexibility**—Organizations can use a variety of heterogeneous storage systems to meet changing demands.
- **Automated management**—Policy-driven control helps put data in the right place at the right time at the right cost, automatically.
- **Cost efficiency**—With many storage system options available, organizations can tailor solutions that lower both acquisition costs and total cost of ownership.
- **Virtually limitless scalability**—The storage infrastructure can be scaled out and still managed as a single enterprise-class system with high performance and reliability.
- **Enhanced agility**—Storage infrastructures can be updated rapidly to keep pace with business demands.

High-performance, cost-efficient storage systems

IBM Spectrum Storage functionality and technologies are deeply integrated with the leading-edge engineering found in IBM FlashSystem and Storwize systems to provide storage solutions for SAP environments that offer the full range of flash performance and efficiency.

IBM FlashSystem

IBM FlashSystem is the number one family of all-flash array in the marketplace.[8] Powered by IBM FlashCore® technology, IBM FlashSystem storage arrays deliver the extreme performance, enterprise reliability and operational efficiency required to accelerate business-critical SAP applications. IBM FlashCore innovations include a Non-Volatile Memory architecture and advanced flash management features such as IBM Variable Stripe RAID™ technology, IBM-engineered error correction codes and proprietary garbage collection algorithms that not only increase flash endurance, but also accelerate performance while reducing latency.

IBM FlashSystem solutions leverage the advantages of IBM FlashCore-enhanced 3D triple-level cell (TLC) storage media to provide exceptional storage density and cost-efficiency. The systems utilize powerful inline, hardware-accelerated data compression technology that provides consistent, high-performance data reduction across the full range of workloads and supports FIPS 140-2 Level 1 encryption with IBM Security Key Lifecycle Manager centralized key management and full hot-swap capabilities. When integrated with IBM Spectrum Virtualize or IBM Spectrum Accelerate™ technologies, IBM FlashSystem arrays offer a comprehensive storage solution for all active data sets.

IBM Storwize

Not only can application workloads vary dramatically from one business to the next, but they can also vary across divisions within a single company. The IBM Storwize family is designed specifically to meet the unique data storage requirements of business groups or organizations with entry to midsized application workloads and limited IT budgets that still need all of the features and capabilities demanded in business-critical environments.

The Storwize family offers all-flash, virtualized, enterprise-class storage systems designed to deliver the high performance needed to derive real-time insights from SAP business data combined with advanced management capabilities. Storwize solutions focus on providing enterprise-grade functionality, performance and reliability at very affordable pricing.

Solution architecture

The IBM and SAP partnership has resulted in an overall solution architecture based on market-leading IBM storage technologies to address the evolving data management and storage needs of SAP HANA and S/4HANA applications and environments. Figures 1 and 2 illustrate the basic IBM solution architecture within the SAP application framework.
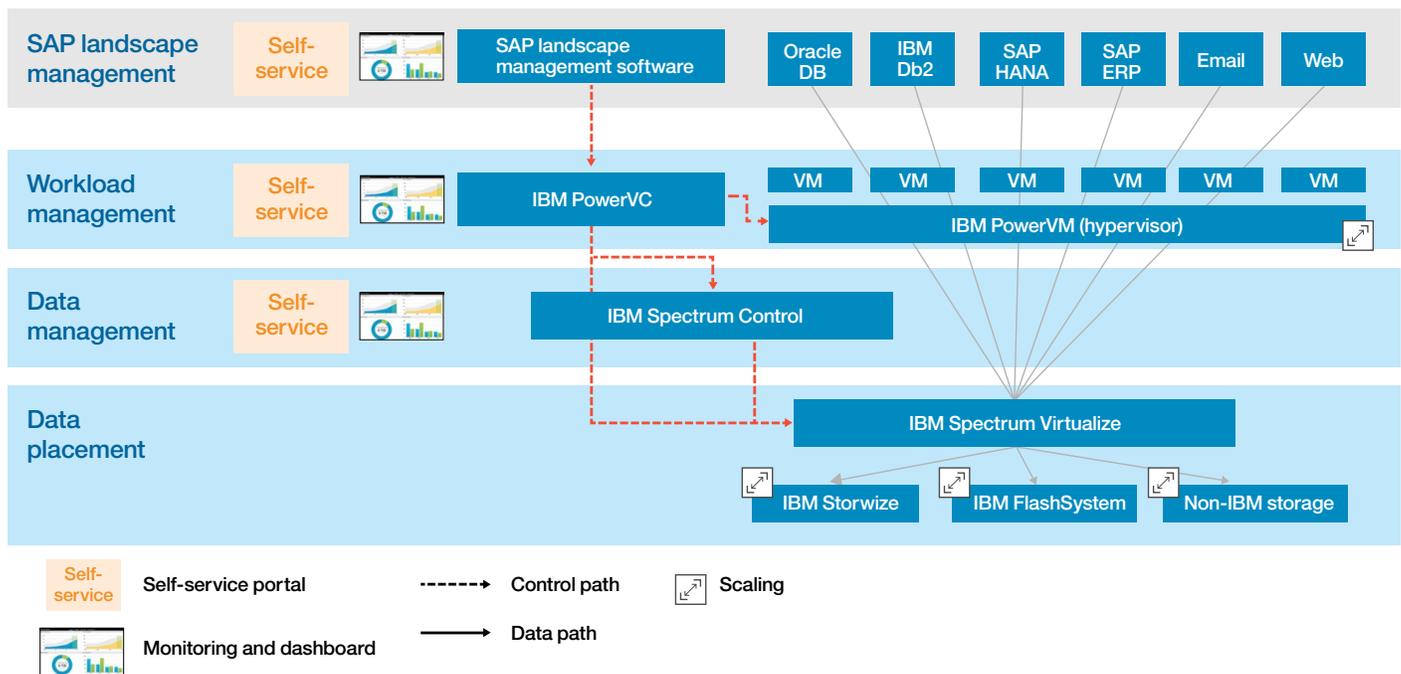
Figure 1. IBM solution architecture for SAP environments

The solution approach is based on four overarching requirement domains:

1. Data placement and management
2. Data protection and disaster recovery
3. Data retention and compliance
4. SAP landscape management

SAP landscape management

This requirement domain is foundational to all other domains. It addresses workload management, data management and data placement requirements.

The SAP landscape can include IBM Db2®, Oracle and SAP HANA and Business Suite applications, as well as email and web applications. SAP Landscape Management provides a framework to perform automated, end-to-end system clone, copy, rename and refresh of the SAP NetWeaver technology platform and systems running SAP HANA or SAP ECC with IBM Db2 or Oracle databases. Using SAP Landscape Management for automated operations, you can:

- *Clone*: duplicate an existing system with identical ID and network isolation
- *Copy*: duplicate an existing system with a different host name and unique ID
- *Refresh*: refresh business data in a non-production system by completely rebuilding it

SAP Landscape Management, formerly known as SAP Landscape Virtualization Management (SAP LVM), provides an excellent example of how the partnership between IBM and SAP benefits customers. SAP Landscape Management is the comprehensive administration solution from SAP that helps businesses reduce their cost of operations and increase their business agility through automation of repetitive,

time-consuming system administration tasks and acceleration of fundamental business application lifecycle operations such as SAP system provisioning, system refresh and system cloning. IBM Spectrum Virtualize and other members of the IBM Spectrum Storage family are fully integrated with SAP Landscape Management, providing a single access point to manage the entire SAP stack, from specific SAP applications through the server hypervisor, down to the storage virtualization layer.

Workload management with IBM PowerVC Virtualization Center

Workload management in SAP environments coordinates directly with the overlying SAP Landscape Management domain and involves management of the data requests from the individual SAP application virtual machines (VMs). IBM PowerVC is recommended to fulfill these requirements.

PowerVC is an advanced virtualization and cloud management offering built on OpenStack that provides simplified virtualization management and cloud deployments for IBM AIX®, IBM i and Linux VMs running on IBM Power Systems™. It is designed to improve administrator productivity and simplify the cloud management of VMs, and to provide the foundation for Power Systems scalable cloud management, including integration to higher-level cloud orchestrators based on OpenStack technology.

Data management with IBM Spectrum Control

IBM Spectrum Control™ provides the self-service functionality and storage analytics needed to address data management requirements. IBM Spectrum Control is the member of the IBM Spectrum Storage family devoted entirely to improving and enhancing the management of data and storage. It helps reduce the complexity of storage environments by enabling

SAP users to centralize, simplify and automate routine tasks associated with data, storage systems, networks and replication services. IBM Spectrum Control:

- Provides comprehensive storage system monitoring, automation and analytics
- Helps automate common storage tasks, such as allocating or provisioning resources and coordinating and integrating storage assets
- Provides efficient storage infrastructure management for traditional, virtualized, cloud and SDS environments

IBM Spectrum Control helps reduce the costs of overall storage management with capabilities that save IT staff time and improve productivity, including:

- Simplified inventory control, asset management and reporting
- A single, integrated web-based administrative console designed to simplify the management of multiple storage devices
- Tools that enable IT staff to perform routine administrative tasks such as aggregation, grouping of devices and policy-based actions from a single location.

Data placement with IBM Spectrum Virtualize

IBM Spectrum Virtualize provides the storage tiering and virtualization functionality needed to address data-placement requirements. It provides an ideal way to manage and protect the huge volumes of data organizations use for big data analytics and new cognitive workloads. IBM Spectrum Virtualize has been available for years in IBM SAN Volume Controller (SVC), the IBM Storwize family and IBM FlashSystem storage systems, and VersaStack converged infrastructure solutions from IBM and Cisco.

IBM Spectrum Virtualize can bring more than 440 different IBM and non-IBM storage systems under a single management regime, creating one easily managed storage resource. It offers a rich and ever-expanding set of data management features that can be extended across all virtualized systems. For example, data can now be encrypted, high-performance data reduction utilized and storage tiering implemented, along with many other services, no matter whether existing systems natively offer these features or not. IBM Spectrum Virtualize provides support for Docker and Kubernetes container environments, and now cognitive-based customer support services are available, designed to provide faster resolution of issues, an enhanced user experience, higher system availability and even greater confidence. And thanks to the IBM and SAP partnership, IBM Spectrum Virtualize is proven compatible with SAP Business Suite, SAP HANA and S/4HANA environments.

Just as important, IBM Spectrum Virtualize offers multiple ways to implement and manage multi-cloud architectures. For example, IBM Spectrum Virtualize for Public Cloud enables near-real-time disaster recovery and data replication and migration between on-premises storage and public cloud resources. Implementing this service is straightforward: Customers purchase public cloud server and storage resources from IBM Cloud™, then license IBM Spectrum Virtualize for Public Cloud to extend its rich set of storage services and features across the acquired cloud resources. An advantageous utility-based licensing model is available to complement IBM Cloud pricing for servers and storage.

Data retention and compliance with IBM Content Management suite

Data retention and compliance in SAP environments requires much more than just archiving or long-term backups. This requirement domain involves solutions that address compliance challenges such as the new General Data Protection Regulation (GDPR) of the European Union (EU), or similar regulations in the US such as the Health Insurance Portability and Accountability Act (HIPAA). These regulations define how data must be managed for security and privacy, how long it must be stored, how and by whom it can be accessed, and what data owners must do to ensure that sensitive data cannot be changed or altered in certain unacceptable ways.
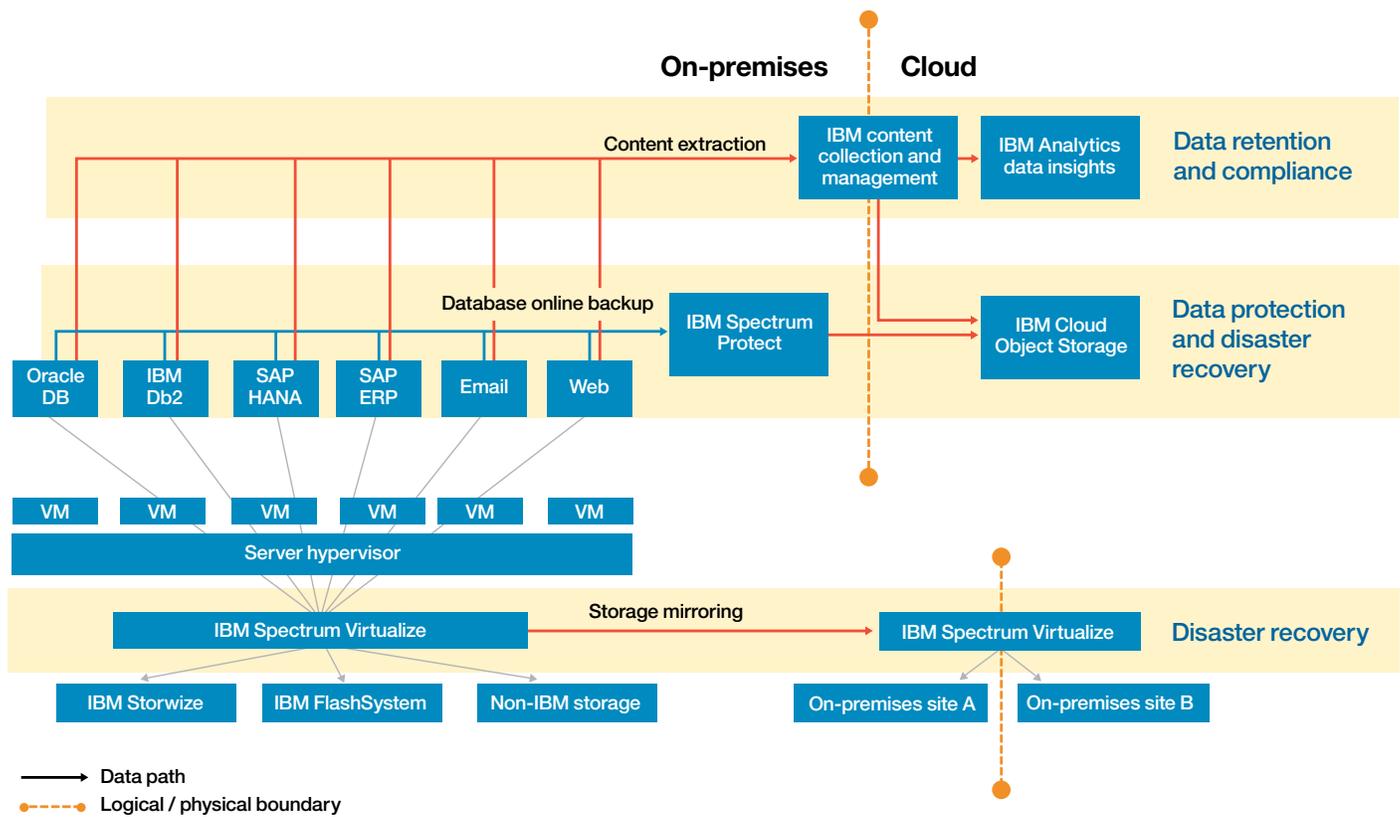
Figure 2. IBM data protection and retention solutions for SAP environments

Data retention and compliance

IBM Content Collector is a family of products designed to collect, enhance and manage email, file systems and SAP data and documents. It is the IBM solution recommended to address SAP application data retention and compliance requirements. Members of the IBM Content Collector family identify and archive content based on business value to help ensure that critical content is properly protected and retained. IBM Content Collector for SAP provides flexible archiving, content management and governance for SAP data and related content. It extends value-based archiving capabilities from IBM across SAP applications and archive stores, including IBM enterprise content management (ECM) repositories and IBM Spectrum Protect. IBM Content Collector for SAP helps reduce total cost of ownership by circumventing costs associated with limited, siloed SAP offerings and by deploying full SAP business solutions that offer expansive capabilities in one unified product.

The IBM Content Manager OnDemand Enterprise Archive solution automatically captures and stores high volumes of documents, including XML data sets, outbound statements and internal production reports. It offers powerful search and fast retrieval options with a web client solution for multiple browsers, mobile devices and desktop environments. It creates a 360-degree view of each customer and delivers that view to the right person, in the right place, at the right time. It automates and optimizes storage management and serves as a platform for implementing electronic bill presentation and payment solutions to help improve customer service and retention. IBM Content Manager OnDemand offers active-active high availability, encryption of content in storage and expanded storage options, with support for IBM Cloud Object Storage and Amazon S3.

Data insight

In order to effectively address data retention and compliance requirements, SAP users must monitor and analyze their data to ensure proper placement and handling. IBM offers a range of cloud-based solutions for this requirement:

- *IBM Datacap* streamlines the capture, recognition and classification of business documents for use by business users and in applications.
- *IBM Case Manager* empowers case workers with persistent access to critical information, workflow tasks and key analytics, in the lab or out in the field.
- *IBM StoredIQ* for Legal helps SAP users streamline legal processes and respond more efficiently to litigation and internal audits by minimizing the time, cost and risk involved in the governance of enterprise information.
- *IBM Content Foundation* delivers full content-lifecycle and document-management capabilities to promote enterprise-wide content management adoption.

IBM Cloud Object Storage

IBM ECM solutions can lower costs and increase the management efficiency of active data, but what about long-term retention of less-active data, especially the proliferating unstructured data from documents, email, social systems of engagement, images and video, and product telemetry?

IBM Cloud Object Storage is the member of the IBM Spectrum Storage family that provides SAP users with the flexibility, scalability and simplicity required to store, manage and access today's rapidly growing unstructured data sets. Relied upon by some of the world's largest data repositories, IBM Cloud Object Storage solutions transform storage challenges into business advantage by reducing storage costs while reliably supporting both traditional and emerging cloud-born SAP workloads.

IBM Cloud Object Storage offers great flexibility of deployment—on-premises, or in hybrid cloud, dedicated cloud or public cloud environments. It delivers the capabilities required to provide continuous availability, protection and access to data assets, while enabling you to leverage your S/4HANA data when and where needed to improve business processes, decision making and compliance with regulatory or other legal demands.

Rather than making copies, IBM Cloud Object Storage leverages geo-dispersed erasure coding to protect data with as much or more data durability and availability as traditional systems. This method eliminates the high overhead associated with RAID-based storage and the complexity of managing mirrors, replication and disaster recovery required in a traditional data center. Many other members of the IBM Spectrum Storage family, such as IBM Spectrum Copy Data Management, integrate deeply with IBM Cloud Object Storage to create comprehensive data efficiency and retention solutions that lower costs and increase agility while helping you meet your compliance mandates.

Data protection and disaster recovery with IBM Spectrum Protect

S/4HANA is not just about real-time analytics, though moving all the Business Suite modules to the SAP HANA platform can help create powerful new synergies between corporate data sets and SAP analytics engines. The ERP, CRM and other Business Suite modules are themselves business-critical to the organization, and they often contain sensitive customer, supplier and employee information. These systems and the data sets they rely upon must be effectively protected and remain available.

The IBM Spectrum Storage portfolio provides the foundation for a variety of data protection, recovery and availability solutions across file, block and object storage that can easily be implemented as parts of a cost-effective, agile and

high-performance infrastructure supporting S/4HANA implementations. The IBM Spectrum Protect family is the portfolio member that provides market-leading data protection and disaster-recovery solutions.

IBM Spectrum Protect offers a wide range of backup, snapshot, archive, recovery, space management, bare metal system recovery, disaster recovery and data reuse capabilities. It can help protect data on systems of all sizes—from a single point of control. IBM Spectrum Protect enables advanced data protection for current and next generation environments, including cloud, virtualized and software-defined environments. The comprehensive data protection solution helps recover individual items, complex systems and entire data centers. IBM Spectrum Protect has provided market-leading data protection solutions for decades. It was named a Leader in Gartner's *Magic Quadrant for Data Center Backup and Recovery Solutions* report for 2017. This was the seventh consecutive year that IBM Spectrum Protect earned this honor.[9]

Backups can be managed by IBM Spectrum Protect Operations Center or VMware vSphere Client. IBM Spectrum Protect Operations Center delivers breakthrough visibility, control, automation and ease of use for backup administrators, reducing the level of expertise required. It provides prescriptive blueprints and configuration scripts designed to help reduce deployment time and guesswork by automating deployment steps and integrating best practices for small, midsized and large environments.

Backup to the cloud is simple, secure and cost-effective with IBM Spectrum Protect implemented as part of the S/4HANA data protection solution. IBM Spectrum Protect container storage pools enable SAP users to leverage object storage without additional hardware or gateways on popular cloud environments such as IBM Cloud, Amazon S3 and Microsoft Azure. These container storage pools include inline deduplication and compression for efficient use of space and bandwidth as well as encryption to ensure that data is secure. IBM Spectrum Protect also provides Representational State Transfer (REST) application programming interfaces (APIs).

IBM Spectrum Protect high-performance deduplication, compression and incremental forever capabilities work together to reduce backup storage requirements and expenses. The solution's efficiency capabilities are enabled entirely in software. Additional hardware-based appliances aren't needed for deduplication, encryption, network acceleration or cloud access. For maximum cost flexibility, IBM Spectrum Protect enables a broad choice of storage options for backup data, including flash, disk, tape and object storage.

IBM Spectrum Protect Plus

IBM Spectrum Protect Plus is the next wave in the IBM data protection and recovery portfolio—modern technology that is fast, low-cost, and easy to deploy and use. This new member of the IBM Spectrum Storage family is focused on VM protection for both VMware and Microsoft Hyper-V environments. Unlike many traditional data protection solutions, you don't have to be a backup expert to use IBM Spectrum Protect Plus. The software is simple to deploy and can be ready to use in minutes by installing a prebuilt virtual appliance. You can use it as a standalone solution for agile and easy VM and file protection or integrate it as part of your overall IBM Spectrum Protect environment for a complete solution to all data protection needs.

The primary use case will be data protection for VMs, but IBM Spectrum Protect Plus also supports disaster-recovery and data-copy use cases, such as provisioning SAP application development/test environments and supporting analytics and reporting. The solution offers potentially faster time to value because it can be up and running in less than an hour, compared to some alternatives that may take weeks to deploy and require costly professional services.

The solution consists of two components—the IBM Spectrum Protect Server and the VMware vSnap repository. Built-in deduplication and compression are both included in the vSnap repository and, when combined with the block-level incremental forever backup strategy inherent in IBM Spectrum Protect Plus, can substantially reduce storage requirements. Backups are stored as native VM images and mounted for recovery to provide near-instant access to protected data.
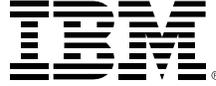
The advantages of co-innovation

If you haven't already, you may soon be transitioning to the next SAP version, called S/4HANA, that combines SAP Business Suite and SAP HANA into one comprehensive platform. In order to gain the most value from S/4HANA, your underlying IT infrastructure must provide increased performance, agility and efficiency. Thanks to the long-standing partnership between SAP and IBM, the IBM Spectrum Storage family of software-defined infrastructure solutions, along with IBM FlashSystem and Storwize storage arrays, provides a full

range of easily deployed storage and data management solutions that you can rely on to integrate well and work effectively in your business-critical SAP application environments. Cutting-edge technology from industry leaders, proven effective in thousands of deployments around the globe—this is the confidence you gain from choosing SAP and IBM Spectrum Storage.

For more information

To learn more about the IBM Spectrum Storage solution portfolio, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/storage

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: **ibm.com**/financing

[2] "IBM and SAP Announce Plans for Major Investments to Drive Clients'
Digital Transformations," *SAP SE*, April 6, 2016. https://news.sap.com/
ibm-and-sap-announce-plans-for-major-investments-to-drive-clients-digital-
transformations/

[3] "SAP: IBM and SAP Combine Efforts to Accelerate SAP S/4HANA
Implementations," *SAP SE*, January 2018. https://news.sap.com/
ibm-and-sap-combine-efforts-to-accelerate-sap-s-4hana-implementations/

[4] "IBM Ranked # 1 in Worldwide Software-Defined Storage Software
Market," *IBM Corporation*, April 2017. http://www-03.ibm.com/press/us/
en/pressrelease/52189.wss

[5] "Definition: SAP S-4HANA," *TechTarget*, October 2015.
http://searchsap.techtarget.com/definition/SAP-S-4HANA

[6] "Harnessing the Potential of SAP HANA with IBM Power Systems,"
IBM Corporation and SAP SE. https://www-01.ibm.com/common/ssi/
cgi-bin/ssialias?htmlfid=POM03015USEN

[7] "SAP Partners: SAP Pinnacle Awards 2018: Winners and Finalists,"
SAP SE, 2018. https://www.sap.com/partner/find.awardwinning.html

[8] "Enabling the future of your business," *IBM Corporation*, December
2016. https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=
TSW03518USEN

[9] Devon Helms, "Continuing leadership in enterprise and cloud data
protection," *IBM IT Infrastructure Blog*, August 17, 2017.
https://www.ibm.com/blogs/systems/continuing-leadership-enterprise-
cloud-data-protection/

[1] "Higher performance business in a flash," *IBM Corporation*, October 2016.
https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=
TSS03208USEN

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