

IBM® Storage

# **IBM and CMTG Cyber Resiliency: Building an Automated, VMware Aware Safeguarded Copy Solution to Provide Data Resilience**

The IBM logo, consisting of the letters 'IBM' in a bold, black, sans-serif font. Each letter is composed of horizontal bars of varying lengths, creating a striped effect.

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# About this document

This IBM® Blueprint outlines how CMTG and IBM have partnered to provide cyber resilient services to their clients. CMTG is one of Australia's leading private cloud providers based in Perth, Western Australia.

## Executive summary

Data is the lifeblood that pumps through the beating heart of all modern digital organizations. Data is also the most sought after prize by cyber criminals who are seeking to profit from disrupting data access or destroy businesses by deleting their data.

Correspondingly, the need to defend, detect and rapidly recover from cyber-attacks has become one of the most critical business requirements of the decade. This is the essence of *cyber resilience*. Cyber security focuses on defense. Cyber resilience, however, focuses on an overall data resilience strategy to detect, respond and rapidly recover in near real-time. Essentially, it is about the ability to recover your 'minimum viable business' to a pre-attack state within hours or minutes.

The fastest growing type of cyber-attack is ransomware. In its 2022 study<sup>1</sup>, Interpol identified ransomware as the number two threat; this includes all types of crime, not just cybercrime, which highlights the severity of the issue.

Increasing an organizations level of maturity, in terms of cyber resilience, requires not only adopting modern data protection mechanisms but also requires an ability to integrate business automation processes that reduce overhead, ensure consistency, and remove errors from all phases of the cyber security and cyber resilience processes.

This paper outlines how CMTG and IBM have partnered to provide cyber resilient services to their clients. CMTG is one of Australia's leading private cloud providers based in Perth, Western Australia.

## IBM Storage FlashSystem

The IBM FlashSystem® family of data storage solutions is designed to meet all aspects of your enterprise storage needs while reducing cost and complexity. The IBM FlashSystem family combines the performance of flash, which includes the award-winning innovations of the NVMe attached IBM FlashCore® modules, with the rich feature set, data security and high availability capabilities of IBM Storage Virtualize software.

The IBM FlashSystem platform has evolved and adapted to the changing requirements over the last few decades: from hardware-driven data reduction and encryption, policy based management of immutable (cyber secure) snapshots and data replication, disaster recovery and high availability to new hybrid cloud capabilities. Connectivity is provided via Fibre Channel or Ethernet and with SCSI and NVMe based protocols. But two key characteristics have always been maintained:

1. ultra-low storage latency with the highest levels of sustainable performance
2. ultra-reliable system designs with in-built redundancy and fault-tolerance.

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<sup>1</sup> <https://www.interpol.int/en/News-and-Events/News/2022/Financial-and-cybercrimes-top-global-police-concerns-says-new-INTERPOL-report>

Figure 1 shows the IBM Storage Virtualize feature highlights.





 Volume Management	 Replication & High Availability	 Snapshots (Point in time copies)	 System Management / Security
<p><b>Distributed RAID</b> with dynamic Expansion (1,6)</p> <p>Thin Provisioning with Zero Detect &amp; Reclaim</p> <p><b>Data Reduction Pools</b> with Compression &amp; Deduplication</p> <p><b>Storage Pools</b> with <b>child pool</b> logical separation</p> <p>Data at rest <b>Encryption</b>, drive or externally virtualised.</p> <p><b>Non-disruptive</b> volume and controller <b>migration</b></p> <p>Volume Mirroring (Thick to Thin, Comp/Dedupe &amp; Encrypted)</p> <p><b>IBM EasyTier</b></p> <p>Scale out <b>Clustering</b> for capacity and performance and Scale up <b>Expansions</b> for capacity</p> <p>External <b>Storage Virtualization</b></p> <p><b>VMware Integration</b> VASA, vROPS, VAAI etc</p>	<p><b>Policy-based Replication</b> with Adaptive async journaling/cycling mode operation.</p> <p>IBM <b>HyperSwap</b> intra-cluster HA w/ IP Quorum - up to 300km</p> <p>IBM <b>MetroMirror</b> Sync Replication (300km)</p> <p>IBM <b>GlobalMirror</b> Async Replication (250ms r/trip)</p> <p>IBM GlobalMirror w/Change Volumes Async Replication (5min - 24 hr)</p> <p>Co-ordinated <b>3 Site Replication</b> (Sync+Async) Star or Cascade / (HA Hyperswap+Async)</p> <p>Native IPsec Replication</p> <p>IBM (SVC) <b>Enhanced Stretched Cluster</b> w/ site awareness - 100km live data mobility - 300km HA</p> <p>Consistency Protection recovery</p> <p><b>Volume Mobility</b></p>	<p>IBM <b>FlashCopy &amp; Volume Group Snapshots</b> with clones and thin-clones</p> <p><b>IBM Safeguarded Copy</b> immutable logical air-gapped for Cyber Resiliency</p> <p><b>Internal scheduling</b> of Volume Group Snapshots - integration with <b>external scheduling</b> tools.</p> <p>256 copies of source</p> <p>Consistency groups / Volume Groups</p> <p>Incremental copies</p> <p>Cascaded copies</p> <p>Thin Provisioned, Compressed, Encrypted Copies in different pools</p> <p>Simple instant 'Reverse' Operation - FlashCopy</p> <p><b>Transparent Cloud Tiering</b> Snapshots to S3(&amp; immutable) / Azure CSP</p>	<p>Integrated encrypted GUI/CLI interfaces</p> <p>REST-API</p> <p>Ansible modules/playbooks</p> <p><b>Inline Data Corruption Detection</b> and alerting</p> <p>Object-based access control (multi-tenancy)</p> <p>Role-based access control</p> <p>Cyber resilience separation of duties for logical air gap</p> <p><b>MFA</b> - Multi-factor Authentication</p> <p><b>SSO</b> - Single sign-on integration</p> <p><b>TPI</b> - Two Person Integrity</p> <p>Storage Insights and Spectrum Control integration</p> <p>Volume delete protection</p>

Figure 1 IBM Storage Virtualize - Feature highlights

The IBM FlashSystem family currently consists of models designed to address the full range of application workload and cost requirements. Every solution comes with the intelligence and capabilities that can make deployment and management of hybrid cloud architectures easier for any enterprise:

**IBM FlashSystem 5000** solutions offer entry-level cost efficiency within the traditional two rack unit family architecture.

**IBM FlashSystem 5200** offers an efficient end-to-end NVMe or hybrid flash 1U option with all the performance and functionality of larger arrays. The 5200 is the entry point allowing customers to benefit from up to 12 IBM FlashCore modules.

**IBM FlashSystem 7300** provides the combination of performance, features, and cost-efficiency that makes it a favorite for midrange workloads with support of up to 24 IBM FlashCore modules per 2U system.

**IBM FlashSystem 9500** is engineered to tackle the most demanding business and research environments with the capability to sustain millions of I/O per second workloads while maintaining microsecond latencies. The 9500 can support up to 48 IBM FlashCore modules per 4U system.

## IBM Safeguarded Copy

IBM introduced Safeguarded Copy (SGC) technology in 2018 with the IBM DS8000® storage family. This technology has aided some of the world's largest organizations who primarily use the IBM Z® system mainframe storage for their most critical applications. These clients quickly adopted SGC and with the current trends in cybercrime, IBM introduced the same SGC technology on the IBM FlashSystem NVMe product family in 2021.

Safeguarded Copy offers the functionality to regularly and automatically create immutable snapshots of volume groups. The snapshots can be scheduled either internally by the

FlashSystem or by external orchestration software, such as IBM Copy Data Management or IBM Copy Services Manager. Additionally, the triggering of new SGC snapshots can be controlled through an SSH or secure REST API interface. See Figure 2.

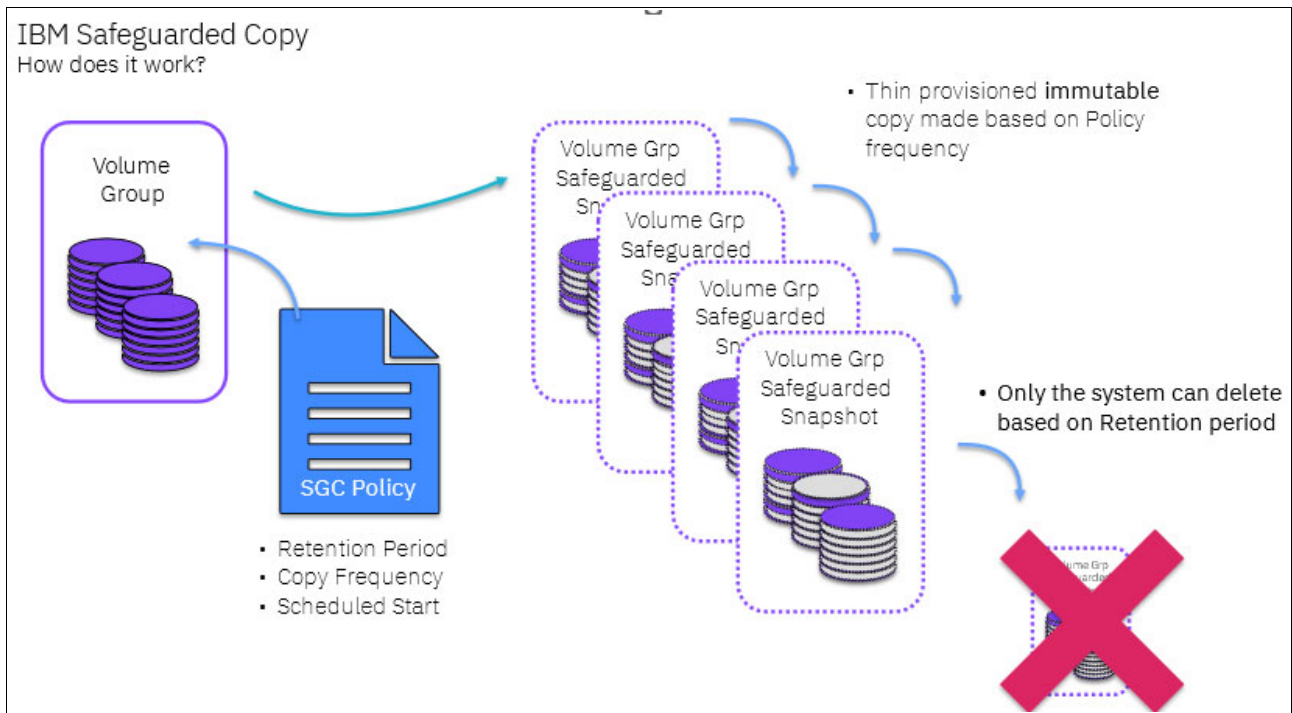


Figure 2 IBM Safeguarded Copy workflow

After they are created, the volume copies within an SGC volume group cannot be modified. Not only are they immutable from a data access point of view but also from a logical configuration point of view. That is, the SGC volumes cannot be mapped to, and therefore their data contents cannot be changed by, host servers, and the logical SGC objects themselves cannot be deleted by a bad actor.

SGC is implemented using a policy-based management scheme where the policy defines a frequency at which copies will be created (think hours to tens of hours), and a retention period for each copy (think days to weeks). After a policy is created, the same policy can be “attached” to one or more volume groups. All production volumes contained within that volume group, and any new volumes created in that volume group, are then protected based on the details contained within that policy. See Figure 3 on page 5.



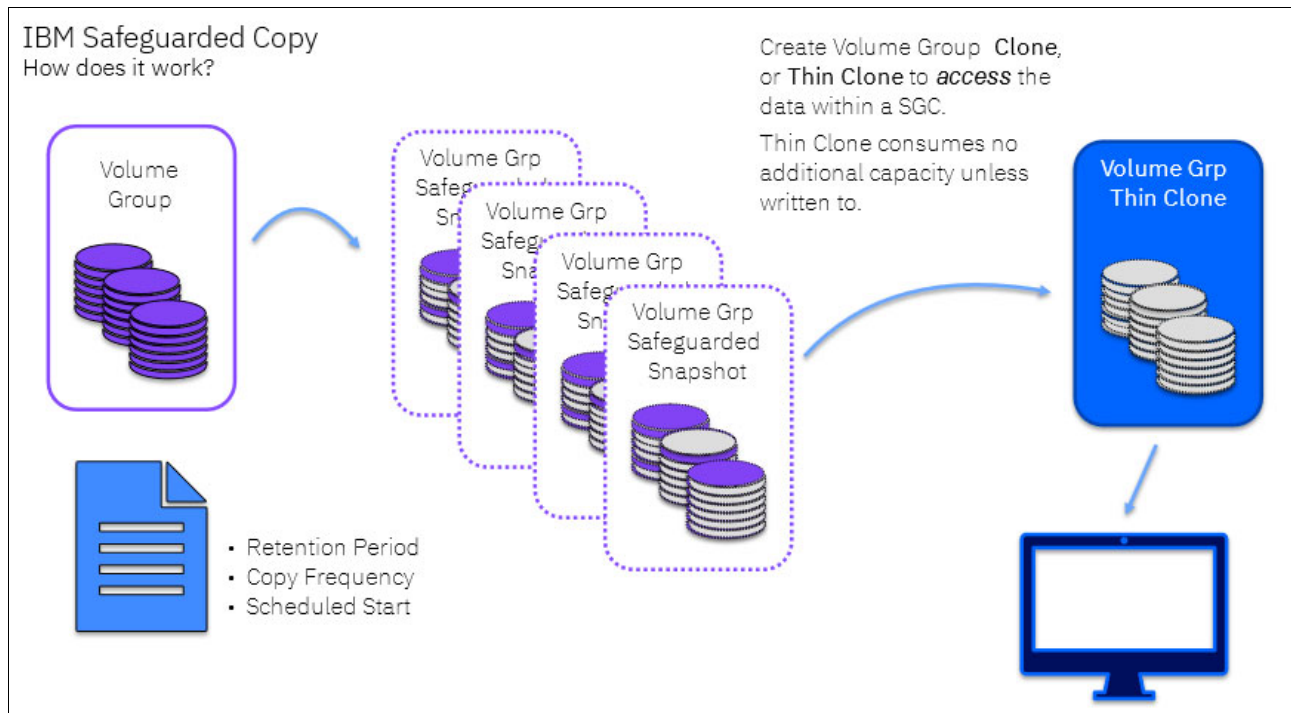


Figure 3 How does IBM Safeguarded Copy - Validating copied data

## Importance of Safeguarded Copy

If you consider the issues outlined in the introduction, one of the biggest inhibitors to business continuity when it comes to cyber-attacks is the speed at which data can be recovered.

In the unlikely event that your traditional backup environment has not also been attacked, you can invoke backup recovery processes. However, consider the time it can take to recover your 'minimum viable business' from backups. The time it takes to recover data for the entire organization can be even greater.

Safeguarded Copy provides snapshots on the same media as your production data. These can be used to immediately restore or recover data onto your production systems without the need for that data to be streamed from your backup systems, or over network links. By restoring your data from the same media, the time needed to recover the data can be reduced to minutes or hours instead of days or weeks.

## Additional Business Automation utilizing SGC data

To protect, and maintain immutability of your SGC volume group snapshots, data access can be achieved by making a *clone* or *thin clone* of an SGC volume group. From this clone, data can be read, and any updates made are only stored on the clone, thus leaving the immutability of the SGC volume group intact.

Business processes can be added to daily running tasks to validate the data contained within a chosen SGC volume group snapshot to proactively determine that the security of the data has not been compromised. In addition, IBM is working on new workflows and data corruption techniques that could be run against these clones. For example, IBM Sentinel, and the new IBM Defender framework can make use of these clones to build a Cyber Vault architecture

and provide solutions to not only recovery (SGC) but detection and validation phases of your cyber resiliency solution.

## IBM Storage Copy Data Management

IBM Storage Copy Data Management (SCDM) makes copies available to data consumers as they need them, without creating unnecessary copies or leaving unused copies on valuable storage. SCDM provides mechanisms to automatically orchestrate application-aware snapshot and replication management for storage environments. Automated copy processes and work-flows ensure consistency and reduce complexity.

Whether the goal is operational automation, data copy validation or data protection, a common challenge is how to get access to copies of *usable* data.

Access, whether the data is on storage arrays or copies of systems such as virtual machines, typically requires multiple steps. These steps include business processes and controls and then actually snapshotting or replicating the data.

Usable data might seem like a simple requirement. However, data consistency is critical. Each layer in a modern application stack can have a different 'consistent point in time'. Therefore, creating a storage snapshot requires integration of checkpoints to ensure the required level of consistency. Consistency is critical to enable a simple and smooth recovery, which is the primary goal of making the copies in the first place.

IBM Storage Copy Data Management, delivered as a virtual appliance, addresses these problems. SCDM provides self-service automation and APIs to leverage existing IT infrastructures data copy services, including storage array snapshots. SCDM provides replication and clone engines and integrates into application and operating system consistency and check-pointing capabilities. The orchestration and automation of multiple tasks enables complex work-flows that include application, operating system, and storage tasks to be more easily configured, tested, and executed using a template-based point-and-click interface.

## CMTG

Established in 1998 in Perth, Western Australia, CMTG<sup>2</sup>  CMTG is an IT infrastructure and managed service provider with extensive technical expertise across a variety of disciplines.

CMTG takes a holistic approach to IT services, taking responsibility for all aspects of the customer IT environment, from infrastructure servers, storage, backup, cyber and network security to end user support. Technical staff are extensively trained and certified, with many years of experience in key technologies resulting in levels of certification and accreditation that deliver quality best practice solutions to protect their client's data.

Specializing in high performance data storage and application hosting, CMTG offers private cloud systems in their enterprise-grade Data Centre coupled with ongoing support to give their customers consistent *Peace of Mind*.

Maintaining long standing relationships with key technology providers, such as IBM, CMTG is regularly briefed on new developments and industry adoptions. This allows opportunities to

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<sup>2</sup> <https://cmtg.com.au/>

present consistent improvements to customer IT environments that increase availability, security, performance and productivity.

For over a decade, CMTG has underpinned the business and their key core private cloud offerings on IBM storage, software, and infrastructure, by using the exceptional enterprise availability, security, and consistent performance features offered throughout their platform.

## **CMTG Cyber Resilient Solution requirements**

In this age of cyber security, CMTG recognizes threat actors are becoming more and more calculating, pervasive, and persistent in attempts to penetrate customer systems. These bad actors are using changing technologies, which challenge the skill level and technological investment that is required by many organizations to safeguard their data.

*Peace of Mind* is CMTG's core tenet. It is the undercurrent for all offerings, to provide performance and security for their managed customers environments.

CMTG identified a customer requirement to deliver exceptionally secure storage, with the core initiative being to offer a service that would snapshot a customer's data at regular intervals. These snapshots would need to be stored securely, as immutable data, such that nothing could alter, modify or delete the content in any way. This would mean that CMTG could provide an offering that allowed the complete restoration of a clean, tested, and assured customer environment in minutes instead of hours or days.

One key additional requirement of this solution was the need for operating system level consistency, with the potential to include application consistency, such that when a snapshot is taken by the storage system, checks and balances would need to be in place to ensure the operating system or application was in a quiesced state.

That is, the point in time that the immutable storage snapshot is taken must be coordinated with the operating system or application to ensure all data written up to that point in time is safely stored on disk in a manner that the data set can be represented into production in a known good state.

The complexity of the exercise is in the orchestration required to communicate with the host OS and for core applications to halt or quiesce I/O on the host for just the moment required to take the safeguarded copy, immutable snapshot. After the snapshot is taken, then the host must return to full operation with no interruption of service.

By realizing these requirements, CMTG saw this as the key to the timely representation of clean customer data, offering significant enhancements in service flexibility as well as substantial customer comfort.

## **The CMTG and IBM Storage Solution**

CMTG had been consistently briefed on IBM's FlashSystem technology, with its exceptional Flash core module resilience and performance. However, one key component remained to be identified. They needed a mechanism to automate and orchestrate the consistency of CMTG's customer environment snapshots to be application aware, enabling the timely representation of clean customer data.

After a thorough consultation process with IBM Systems Storage, IBM Storage Copy Data Manager (SCDM) was identified as the key missing piece, completely fulfilling CMTG's core

requirement for their customers and offering the orchestration required to address the complexity of the operation.

The solution included SCDM, coupled with an IBM FlashSystem 7300 that uses Flash Core module technology, and Safeguarded Copy. By using this solution, CMTG can create immutable snapshots for their customer's entire private cloud hosted environment at regular intervals with application-level consistency. See Figure 4.

For more information, see [IBM Spectrum Copy Data Management](#).

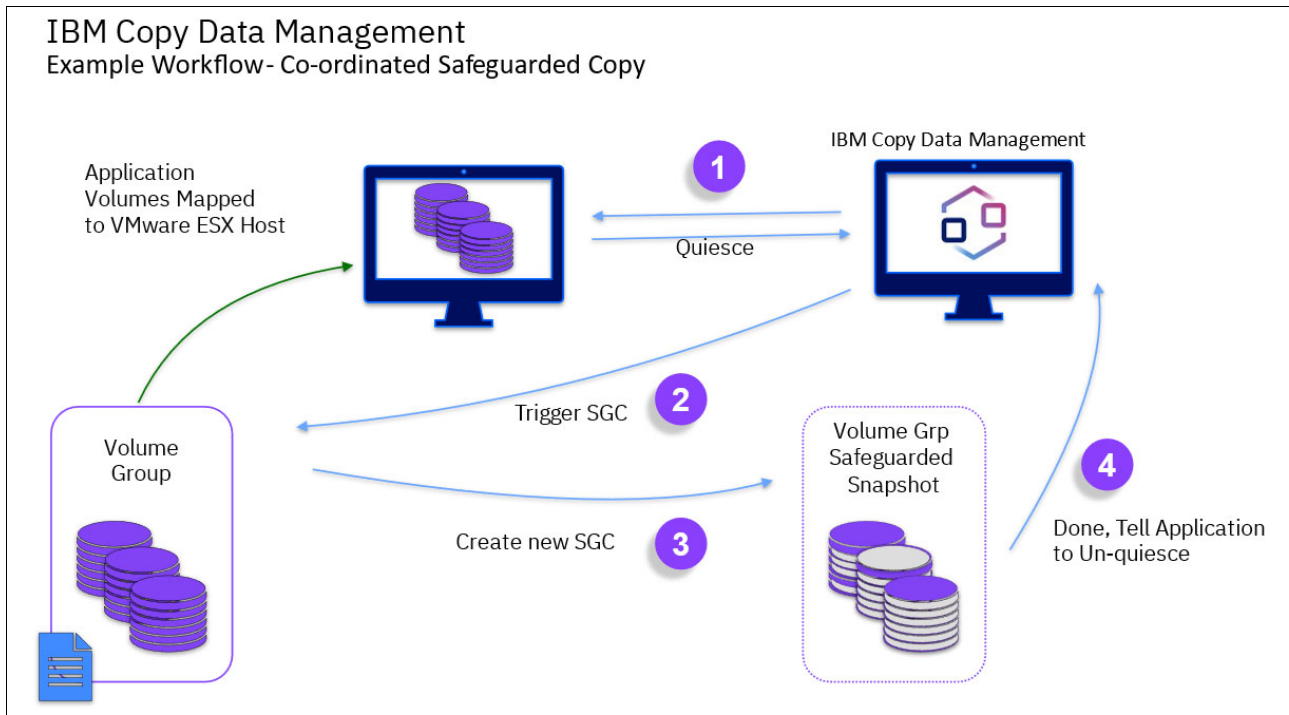


Figure 4 IBM Storage Copy Data Management coordinated workflow

Customer production environments are now protected by using SCDM via a regular scheduled safeguarded copy in concert with the VMware application aware quiesced process, providing an RTO of essentially zero.

In addition, Storage Copy Data Manager provides CMTG with levels of Disaster Recovery automation and resilience orchestration not previously obtainable. Historically, CMTG used IBM's Global Mirror with Change Volumes<sup>3</sup> (GMCV) asynchronous block level replication functionality to replicate production storage to DR. This method provided 'Crash Consistent' replicated volumes with a Recovery Point Objective (RPO) of between 5 and 15 minutes.

The CMTG DR environment is now further safeguarded by using SCDM orchestration which co-ordinates both the VMware quiesce process, and a combination of IBM GMCV and the IBM FlashCopy® snapshot functionality within the IBM storage subsystem.

By leveraging SCDM, CMTG now has a mechanism to have a known, good, and application aware VMware-quiesced snapshot library of every customer environment in DR updated on a regular basis for additional resilience. This ensures that a known good point-in-time customer image can be accessed and promoted to production in a timely manner if the DR GMCV copy has a non-bootable VM.

<sup>3</sup> <https://www.ibm.com/docs/en/flashsystem-5x00/8.6.x?topic=functions-remote-copy-function>

See Figure 5 through Figure 7 on page 10 for example screenshots of the solution.

The screenshot displays the 'Jobs' section of the IBM Spectrum Copy Data Management interface. A table lists various jobs, all of which are in a 'COMPLETED' status. The table columns include Name, Type, Status, Next Runtime, Last Runtime, Last Run Duration, and Last Run Status. The jobs listed are primarily 'VMware Backup' tasks.

Name	Type	Status	Next Runtime	Last Runtime	Last Run Duration	Last Run Status
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:01 2023	0h 5m 12s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:01 2023	0h 5m 47s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:01 2023	0h 7m 57s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:02 2023	0h 5m 45s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:02 2023	0h 6m 36s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:02 2023	0h 6m 32s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:02 2023	0h 5m 39s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:03 2023	0h 6m 59s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:03 2023	0h 6m 43s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:03 2023	0h 6m 36s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:04 2023	0h 6m 59s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:04 2023	0h 6m 27s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:00:00 2023	Jun 26 12:00:04 2023	0h 6m 14s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:15:00 2023	Jun 26 12:15:00 2023	0h 5m 16s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:15:00 2023	Jun 26 12:15:00 2023	0h 5m 14s	COMPLETED
sa_scdmtest1_sgc	VMware Backup	COMPLETED	Jun 27 12:15:00 2023	Jun 26 12:15:01 2023	0h 5m 12s	COMPLETED

Figure 5 IBM Copy Data Management Job Report: List of completed jobs and tasks

The screenshot shows the configuration for a 'Safeguarded Copy' job. The job name is 'sa\_scdmtest1\_sgc (VMware Backup)'. The 'Advanced Options' dialog box is open, showing the following settings:

- Maximum concurrent tasks: 1
- Create VM snapshots for all VMs:
- Maximum concurrent snapshots on ESX: 3
- Application Consistency:
  - Do not make any VMs application/file system consistent
  - Make all VMs application/file system consistent
  - Make these VMs application/file system consistent
  - Truncate application logs
- Selected VMs: PDC1, CMTGH

The background shows a table of VMs with columns for Type, RPO, and Schedule Time. The selected VMs are 'IBM Spectrum Virtualize' with an RPO of 'Every 1 day(s)' and a schedule time of 'Oct 6 06:00:00 2022'.

Figure 6 Example Safeguarded Copy job

Name	Type	Status	Next Runtime	Last Runtime ↑	Last Run Duration	Last Run Status
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:01 2023	0h 7m 48s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:01 2023	0h 5m 57s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:01 2023	0h 6m 5s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:02 2023	0h 6m 37s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:02 2023	0h 6m 11s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:03 2023	0h 6m 27s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 04:45:00 2023	Jun 27 04:45:03 2023	0h 6m 40s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:00 2023	0h 6m 22s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:01 2023	0h 5m 24s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:01 2023	0h 7m 15s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:01 2023	0h 7m 46s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:01 2023	0h 5m 48s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:02 2023	0h 5m 39s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:02 2023	0h 6m 10s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:02 2023	0h 6m 9s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:00:00 2023	Jun 27 05:00:03 2023	0h 6m 29s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:00 2023	0h 4m 48s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:00 2023	0h 5m 21s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:01 2023	0h 5m 36s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:01 2023	0h 5m 32s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:01 2023	0h 5m 53s	COMPLETED
...	VMware Backup	COMPLETED	Jun 28 05:15:00 2023	Jun 27 05:15:02 2023	0h 6m 13s	COMPLETED

Figure 7 Safeguarded Copy Orchestrated run times

## Solution outcomes

The combination of IBM’s FlashSystem Storage, Flash Core Module technology and Safeguarded Copy immutability, coupled with IBM Storage Copy Data Manager, has significantly complimented the quality of the services offered by CMTG. They now form a foundation offering to their entire hosted private cloud customer base, further enhancing the *Peace of Mind* principle at CMTG’s core.

CMTG now protects their hosted customer data from themselves, from end user operator error, ransomware and hacking attempts by leveraging the IBM’s Safeguarded Copy secure immutability function of their IBM FlashSystem storage. CMTG also has the additional comfort of knowing that they can restore and re-present into production tested, known good, clean customer environments that are updated multiple times per day or as required.

The result is that the overall Recovery Time Objective (RTO) is significantly reduced by several orders of magnitude with customer immutable copies available and fully operational within the hour by using customer snapshots that are themselves proven and tested. In addition, this flexibility further offers the ability to manage the RPO. The RPO is the maximum acceptable amount of data loss after an unplanned data-loss incident that is expressed as an amount of time. Essentially, more frequent application aware snapshots equate to a smaller RPO.

The solution also provides an additional benefit. The ability to isolate and lock any affected data store makes it available for future investigation, and subsequent analysis as is outlined by IBM in their Cyber Vault solution architecture brief<sup>4</sup>.

As described, IBM Storage Copy Data Manager has also further enhanced CMTG’s services capability for their hosted customer environment from a disaster recovery perspective. SCDM offers the capability to automate and orchestrate safeguarded copy snapshot management at the operating system and application layer and also oversees inter-site storage replication. SCDM allows the re-presentation of known good, tested, clean and complete customer data

<sup>4</sup> <https://www.ibm.com/downloads/cas/ODKXBLR9> [https://www.youtube.com/watch?v=\\_Qn9iBG8ub4](https://www.youtube.com/watch?v=_Qn9iBG8ub4)

sets to their disaster recovery data center, so the customer can be fully operational within the hour.

This functionality fulfills the CMTG requirement to maintain an operating system consistent copy of their hosted customer data set at the very least once a day at the CMTG DR site, which is in addition to the continual asynchronous replication processes in place. DR and inter-site storage layer replication has been historically attended to by using IBM Global Mirror Change Volume technology (GMCV). However, the level of service that CMTG provides to their customers has been enhanced by leveraging SCDM to orchestrate and enhance the event.

Historically, CMTG replicated data to DR at 5 minute intervals and offered crash consistency only, because there was no assurance of application or operating system consistency. With the addition of SCDM, CMTG now orchestrates the safeguarded snapshot of the entire hosted customer environment. By using SCDM, CMTG replicates data in a clean known good state. The customer environment can be represented into production in DR quickly, cleanly and efficiently in an extremely timely manner, which provides enormous flexibility and comfort to both CMTG and their customers.

SCDM as an orchestration tool coordinates the automation of all these complex events. SCDM manages the interaction with multiple storage subsystems and the capability within each. SCDM also manages the triggering of events with third party vendor technology. This technology offers significant function and value to CMTG and their customers that is more than the sum of its parts. The technology also provides a single dashboard view of the data services and their current state for ease of use.

## Conclusions

In working with IBM, CMTG continues to provide enterprise class data hosting and resilience that protects customer data from not only natural disasters but also the danger of cybercrime.

CMTG managing director and co-founder Carl Filpo said the partnership with IBM has resulted in a unique solution that has become the cornerstone of their business offerings.

*“At CMTG, we are not simply interested in ticking boxes; our focus is on delivering a genuine and robust solution to combat cybercrime and prevent data loss. Our customers’ peace of mind is paramount, knowing that their valuable data entrusted to us is not only well-protected, replicated, and backed up, but also fully recoverable within the hour in case of any unfortunate incident.*

*We strive to ensure that all our clients can continue to operate seamlessly, free from worry about events that may occur. The cutting-edge solution we’re providing in collaboration with IBM, goes beyond anything currently available in the cloud space. The result of the technology is that our customers will gain a significant advantage and comfort, and that’s something we’re extremely excited to offer.”*



# Authors

This blueprint guide was produced by a team of specialists from around the world.

**Neil Morris** has been an integral part of CMTG in Western Australia since 2007. Initially serving as a Senior Technical Specialist for many years, over the past decade he has overseen CMTG's Hosted Cloud platform, responsible for the day-to-day management of the company's Hosted Cloud, ensuring the platform's resilience and availability.

Well versed in IBM Storage Infrastructure and Software, which has underpinned CMTG's hosted cloud since inception, he has co-architected the multiple layers of resilience, availability, and backup that protect CMTG's customers and has been primarily responsible for architecting CMTG's immutability orchestration innovation currently deployed.

**Stephen Doney** is the Client & Vendor relationship manager at CMTG in Western Australia, focused on vendor/client engagement and customer satisfaction. He has enjoyed a working relationship with CMTG for over a decade across diverse roles with technology vendors, IBM included, recommending innovative operational technologies to enhance the multiple layers of resilience within CMTG's cloud platform.

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