

SNAPSHOT UPGRADE FEATURE



Key Benefits

- > Improves IMS, DB2, and VSAM application availability
- > Extends the capability for non-disruptive maintenance to a DB2 and IMS data sharing environment
- > Enables creation of point-in-time copies of DB2, IMS, and VSAM data
- > Minimizes outages associated with database maintenance
- > Minimizes host resource storage consumption by using intelligent storage devices to process snapshots
- > Allows creation of point-in-time backup copies with minimal interruption of business-critical application processing
- > Provides real-time monitoring of resources and control of intelligent storage devices

BUSINESS CHALLENGE

In today's business environment, data availability is crucial as information-processing capabilities evolve to better accommodate round-the-clock, global business operations. Organizations relying on mainframe applications need the ability to create backup copies of DB2, IMS, or VSAM data with minimal interruption of business-critical application processing. Shrinking batch windows and growing batch workloads are becoming increasingly problematic for many users.

BMC SOFTWARE SOLUTION

The SNAPSHOT UPGRADE FEATURE (SUF) increases data availability through the use of snapshot technology.

When used with supported BMC Software utilities, SUF enables the creation of point-in-time copies of DB2, IMS, or VSAM data concurrent with business-critical batch and online activity. Users retain full read and write access to the databases that are critical to their business. This capability can be essential for data administrators striving to meet increasingly stringent service-level agreements with limited resources and a shrinking batch window. With SUF, snapshot copies and updates can be performed in parallel. Updates do not have to wait until the copy operation is complete.

SUF is a valuable tool for reducing the time and costs associated with database maintenance. SUF is part of the EXTENDED BUFFER MANAGER (XBM) product line. You can also use the XBM products to improve the performance of DB2 and IMS databases through I/O caching techniques.

SOLUTION INTEGRATION

SUF is included as a component in the following BMC Software solutions:

- > Backup and Recovery Solution for IMS
- > Database Administration for DB2
- > Database Performance for DB2
- > MAXM[®] Reorg/EP for IMS
- > MAXM Reorg/Online for IMS
- > Recovery Management for DB2
- > RECOVERY UTILITY for VSAM
- > Smart Recover for SAP

The inclusion of SUF in the solutions provides them with the capability to perform snapshot processing, and other hardware-related features.

TYPES OF SNAPSHOTS

SUF supports the following methods of snapshot processing:

Software Snapshots

SUF provides a snapshot capability that places page images in the XBM extended buffer to allow the supported BMC Software utilities to process data that is consistent with a specific point in time. This feature lets you create a point of consistency and then release the objects, so that the objects are available for updates.

As the snapshot job progresses, SUF monitors write requests that update the targeted objects. If a write request is issued for a targeted object, XBM places an image of the page before it is updated (called a preimage) in the extended buffer. If the utility subsequently issues a read request for the updated page, SUF satisfies the request by using the preimage from the extended buffer.

If the preimage is required by the utility but is not available in cache (because of a cache failure or some other problem), XBM sends a return code and reason code to the utility. The utility determines whether to continue or fail the operation. When the utility uses the preimage, the used preimage is removed from the XBM cache. Software snapshots require one of the following supported BMC Software utilities:

- > COPY PLUS for DB2
- > CHECK PLUS for DB2
- > IMAGE COPY PLUS for IMS
- > MAXM Reorg/EP
- > MAXM Reorg/Online
- > REORG PLUS for DB2
- > UNLOAD PLUS® for DB2

Hardware Snapshots

The Storage Systems Integration (SSI) component of SUF provides snapshot functionality by using intelligent hardware storage devices. SSI-assisted (or *hardware*) snapshots require no software cache to provide a preimage for snapshot utilities.

When used with SUF, a supported intelligent storage device provides the following methods for replicating data—the device can be used to establish a volume mirror or to replicate the data through a data-set snapshot.

SUF uses either available method to establish the consistent image of the data that it subsequently provides to the supported utility for processing:

- > For a *volume-mirror snapshot*, the user-controlled mirror is separated from the source volume where the registered data sets reside. This separation splits the link between the two volumes, leaving a point-in-time copy of all data on the mirror from which the utility read requests are satisfied. Updates to the source volume can continue. When the snapshot is finished, the mirror relationship is reestablished.

- > For a *data-set snapshot*, SUF issues the appropriate request to have the data set replicated (or *snapped*) within the intelligent storage control unit. A hardware vendor-specific application program interface (API) is called to copy (or *snap*) the data set to create a point-in-time copy from which utility read requests are satisfied. Updates to the registered data sets can continue. When the snapshot is finished, the temporary copy is deleted.

The following BMC Software utilities support hardware snapshots:

- > COPY PLUS for DB2
- > CHECK PLUS for DB2
- > IMAGE COPY PLUS for IMS
- > MAXM Reorg/EP
- > MAXM Reorg/Online
- > REORG PLUS for DB2
- > Smart Recover for SAP
- > UNLOAD PLUS for DB2

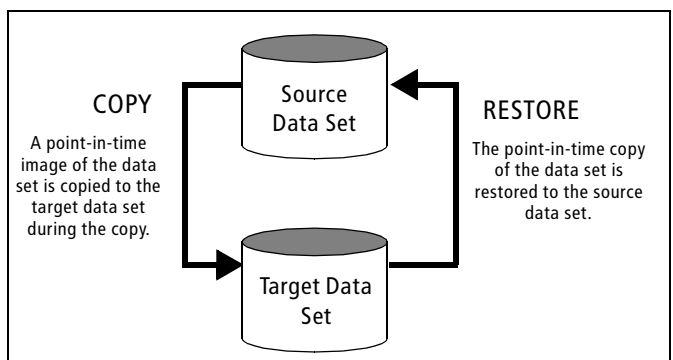
Hardware snapshots support the following types of intelligent storage devices:

- > EMC Symmetrix
- > Hitachi 7700E/9900
- > IBM Enterprise Storage Subsystem / FlashCopy version 2
- > IBM RAMAC Virtual Array
- > IBM Shark [for peer-to-peer remote copy (PPRC)]
- > StorageTek Shared Virtual Array
- > any other storage device capable of generic PPRC

Instant Snapshots

The SSI component also allows SUF to use intelligent storage devices to perform Instant Snapshots. When a utility requests an Instant Snapshot, SUF directs a copy of physical data on a storage device to a different location on the same device (or on another device within the same control unit or frame). If requested by the utility, SUF can also snap, or reapply, this copied data to the original location for recovery.

Instant Snapshots allow point-in-time images to be copied and restored.



SNAPSHOT UPGRADE FEATURE

SUF supports with the following BMC Software utilities to create and process this physical data copy:

- > COPY PLUS for DB2
- > IMAGE COPY PLUS for IMS
- > MAXM Reorg/EP
- > MAXM Reorg/Online
- > RECOVER PLUS for DB2
- > RECOVERY PLUS for IMS
- > RECOVERY UTILITY for VSAM
- > REORG PLUS for DB2
- > UNLOAD PLUS for DB2

An Instant Snapshot requires one of the supported BMC Software utilities and intelligent storage devices:

- > EMC Symmetrix
- > IBM Enterprise Storage Subsystem / FlashCopy version 2
- > IBM RAMAC Virtual Array
- > StorageTek Shared Virtual Array

FEATURES OF SUF

SUF provides the following features:

ISPF Interface

SUF features a CUA-compliant ISPF interface. From this menu-driven interface, you customize SUF and set up data on your system for snapshot processing.

XBM Repository

The XBM repository stores all information for the data resources that it manages and stores options that control the way that SUF operates. You define the information in the repository through the ISPF interface.

SSI Component

The SSI component provides the following capabilities:

- > supports snapshot processing by using intelligent storage devices
- > provides an interface to allow manipulation of storage devices
- > monitors storage device status

If the SSI component detects that a data set which is targeted for snapshot processing resides on supported hardware, the SSI component transparently invokes the hardware's ability to produce near-instantaneous copies of the data. This capability allows SUF to minimize host resource storage consumption and to increase snapshot reliability.

PSS Component

The Parallel Sysplex Support (PSS) component of SUF provides support for processing snapshots in a DB2 sysplex or IMS data-sharing environment. The PSS component leverages IBM coupling facility technology to make database preimages from all processors in the sysplex available for snapshot processing.

Point-in-time copies of databases can be made available to BMC Software snapshot-enabled utilities across the sysplex. This capability delivers the following benefits:

- > ensures data integrity, even when the data is updated on a different MVS image from the one where the snapshot utility is executing
- > maintains statistics for all SUF subsystems in a sysplex environment

Monitoring

SUF provides the following types of monitoring:

Performance statistics. These monitors display statistics about the performance and activity of the DB2 or IMS data sets, not just those data sets that are managed by SUF.

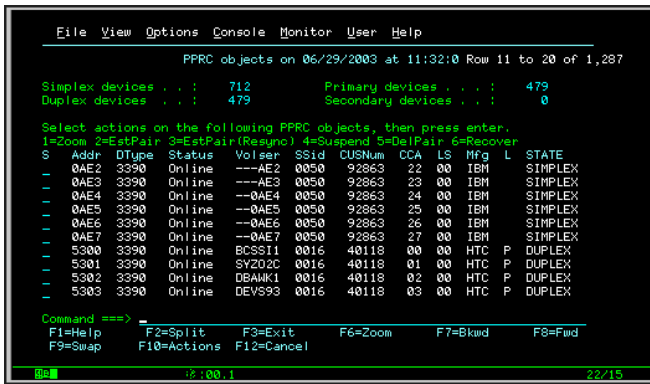
Status and progress. These monitors display the current status and progress for some snapshot-enabled utilities, including COPY PLUS for DB2 and REORG PLUS for DB2, and for suspend/resume groups. The monitors also display information about (and enable manipulation of) supported intelligent storage devices.

SUF also gives you the option of recording historical information about the subsystem's operation to System Management Facilities (SMF) records. You can analyze these records to detect trends and to determine the effectiveness of SUF over time.

Controlling Hardware Devices

Through the SUF ISPF interface, you can monitor and issue commands to hardware devices. This feature provides consolidated control of hardware devices from multiple storage vendors through a single ISPF interface. Instead of learning to use a different interface for each storage device, you can use the SUF interface as the single point of control to issue commands to all supported hardware devices.

SUF and XBM let you control your supported intelligent storage devices from a single interface.



The devices to which you can issue commands include:

- > EMC TimeFinder devices
- > Hitachi ShadowImage and RemoteCopy devices
- > PPRC devices

Helping You Maintain Advantage

BMC Software Professional Services helps your company maintain its competitive advantage through a comprehensive suite of services that includes service level management consulting, installation, implementation, configuration, and customization. Our professional services and education offerings are designed to ensure the ongoing availability of critical business applications, maximize product potential, reduce project risk, deliver IT value to your business, and improve your operations. For more information about BMC Software Professional Services, visit <http://www.bmc.com/profserv>.

About BMC Software

BMC Software, Inc. [NYSE:BMC], is a leading provider of enterprise management solutions that empower companies to manage their IT infrastructure from a business perspective. Delivering Business Service Management, BMC Software solutions span enterprise systems, applications, databases, and service management. Founded in 1980, BMC Software has offices worldwide and fiscal 2003 revenues of more than \$1.3 billion. For more information about BMC Software, visit www.bmc.com.



48129