

# Supplement: ATTIME Suspend for VSP 5000 Series

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## About this document

This document (RN-900925-M137a-00, August 2024) provides information about the ATTIME suspend feature for Hitachi Virtual Storage Platform (VSP) 5000 series storage systems.

## Intended audience

This document is intended for customers and Hitachi Vantara partners who license and use VSP 5000 series storage systems.

# Getting help

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## Required microcode and firmware versions

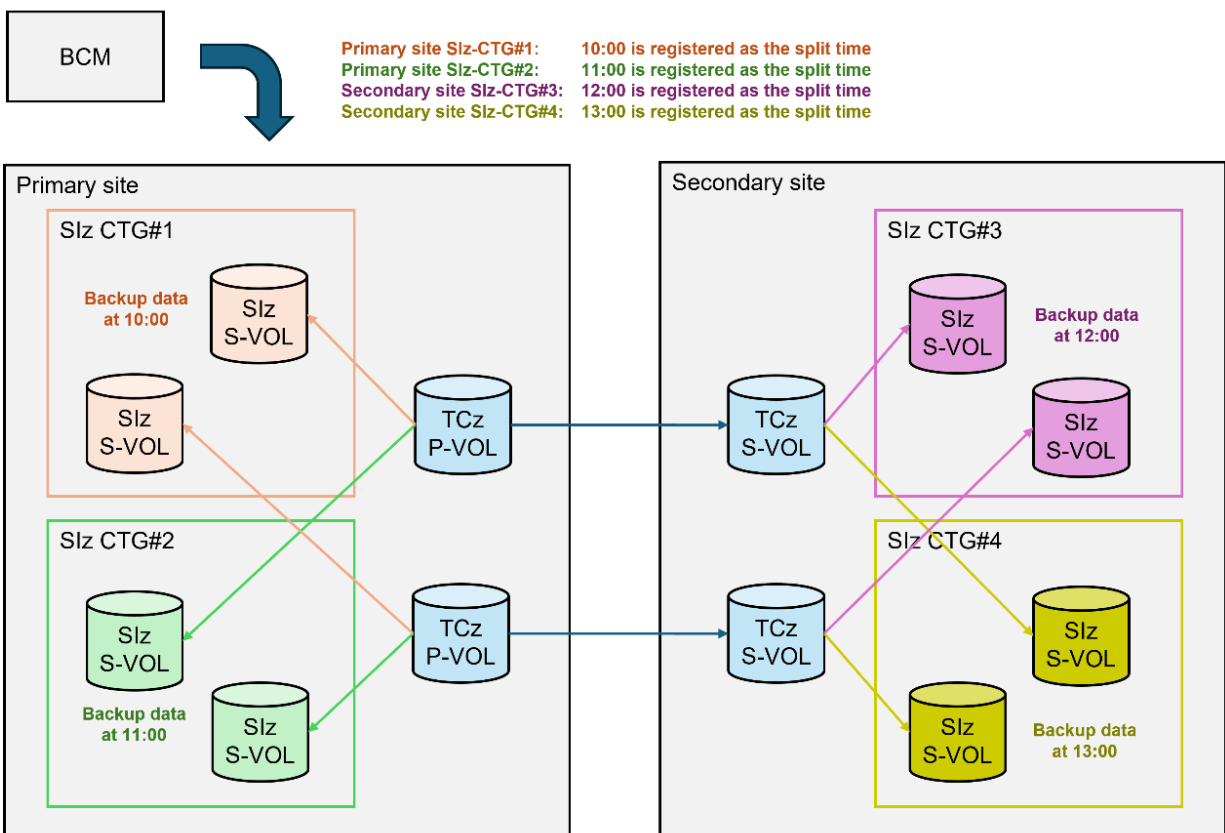
The following microcode and firmware versions are required to support the ATTIME suspend feature for linking Slz P-VOLs with TCz S-VOLs:

- VSP 5000 series:
  - DKCMAIN microcode: 90-09-25-00/00 or later
  - SVP firmware: 90-09-25/00 or later

# Overview of the ATTIME suspend function in a TCz+Siz configuration

You can use the ATTIME suspend function of Business Continuity Manager (BCM) to register the backup time setting for a ShadowImage for Mainframe (Siz) pair that is linked with a TrueCopy for Mainframe (TCz) pair. This backup processing is called *split processing*. The time at which the split processing starts is called the *split time*.

- If the DKCMAIN version is 90-01-01 or later and the BCM version is 02-00 or later, you can use the ATTIME suspend function for Siz P-VOLs linked with TCz P-VOLs.
- If the DKCMAIN version is 90-09-25 or later and the BCM version is 9.9.0 or later, you can use the ATTIME suspend function for Siz P-VOLs linked with TCz S-VOLs.



Legend:  
 BCM: Business Continuity Manager  
 CTG: Consistency Group  
 Siz: ShadowImage for Mainframe  
 TCz: TrueCopy for Mainframe  
 P-VOL: Primary volume  
 S-VOL: Secondary volume

# Requirements

The following table lists the requirements for the ATTIME suspend function in a TCz+Siz configuration.

Item	Description
Required versions	<p>To use the ATTIME suspend function, the primary site, the secondary site, and BCM must all support the ATTIME suspend function.</p> <p>Required versions for using the ATTIME suspend function for Siz P-VOLs linked with TCz P-VOLs:</p> <ul style="list-style-type: none"><li>• DKCMAIN: 90-01-01 or later</li><li>• BCM: 02-00 or later</li></ul> <p>Required versions for using the ATTIME suspend function for Siz P-VOLs linked with TCz S-VOLs:</p> <ul style="list-style-type: none"><li>• DKCMAIN: 90-09-25 or later</li><li>• BCM: 9.9.0 or later</li></ul>
Interface	<p>You can use BCM to perform operations of the ATTIME suspend function (registering the split time, canceling the registered split time, and viewing the registered split time). You cannot use HDvM - SN, CCI, PPRC commands, GDPS, or CSM for ATTIME suspend operations.</p>
Host I/O Timestamp Transfer	<p>When using the ATTIME suspend function, enable the Host I/O Timestamp Transfer option for all TCz pairs. If the Host I/O Timestamp Transfer option is not enabled, data consistency of the Siz pairs is not guaranteed in the Siz consistency group.</p> <p>For details about enabling Host I/O Timestamp Transfer, see <a href="#">Operation flows</a>.</p>

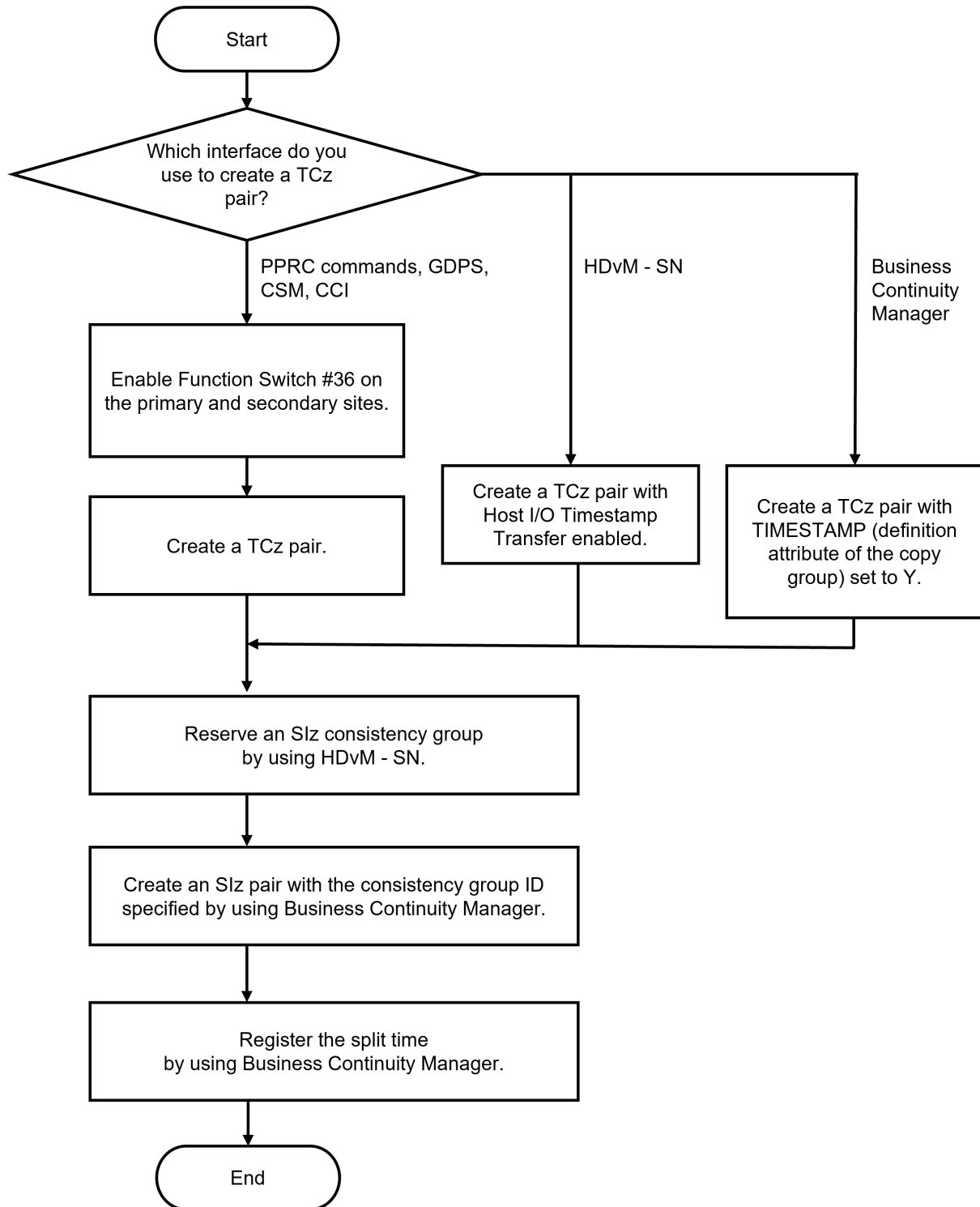
# Operation specifications

The following table lists the operation specifications for the ATTIME suspend function in a TCz+Slz configuration.

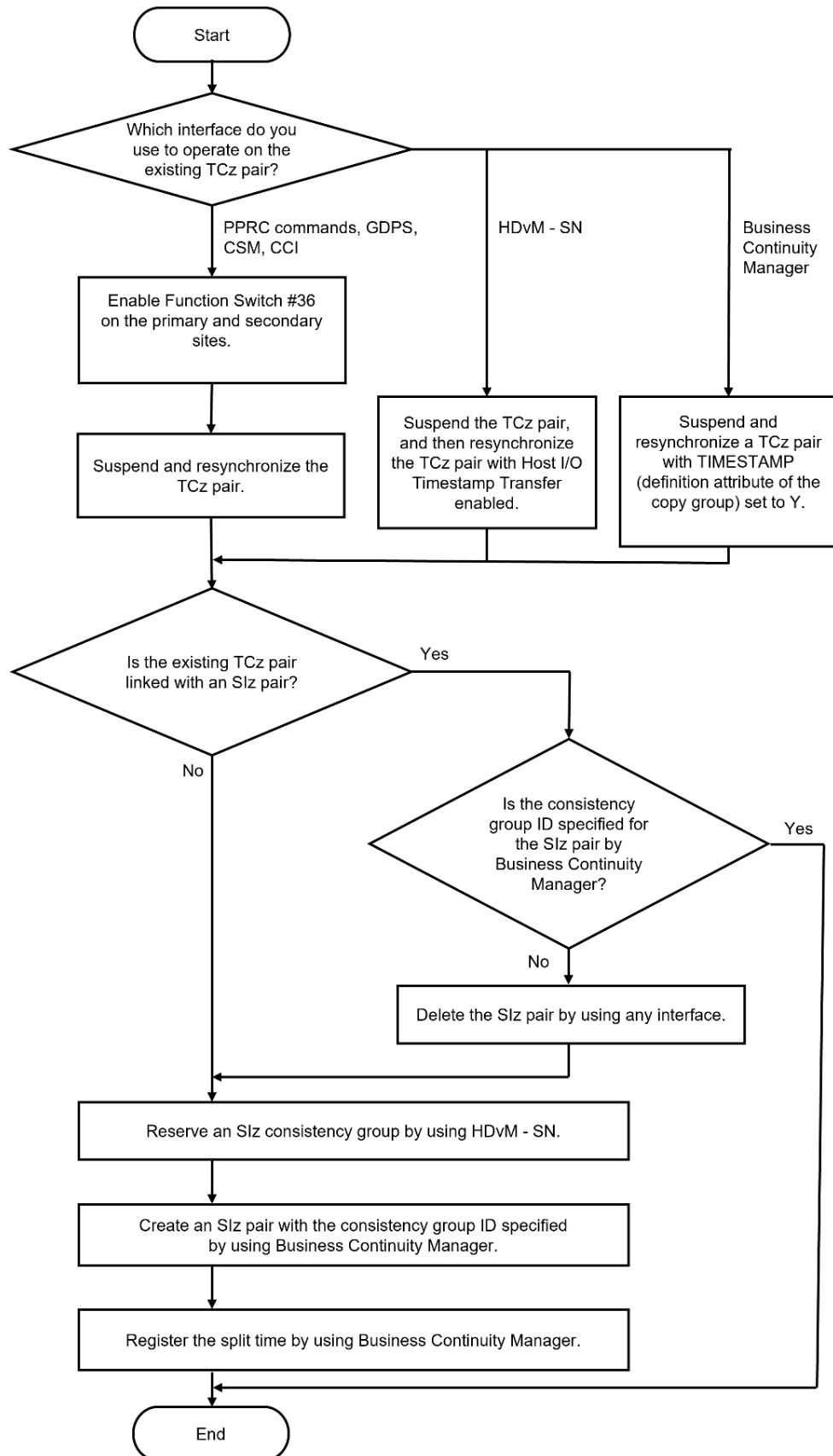
Item	Description
Registering the split time / canceling the registered split time	Registering/canceling the split time: <ul style="list-style-type: none"> <li>• Before the split processing runs, you can overwrite the registered split time. After the split processing runs, you cannot overwrite the registered split time. The registered split time remains valid even after a split processing runs on the Slz pair. To register the next split time for the Slz consistency group for which the split processing has already run, resynchronize the Slz pairs in the consistency group by using BCM beforehand.</li> <li>• If you power off a storage system, the split time registered in an Slz pair in the storage system is canceled. If you power off a storage system on the primary site of a TCz pair, the split time registered in the Slz pair linked with the TCz pair on the secondary site is not canceled.</li> <li>• The registered split time is valid even after you switch the TCz P-VOL and TCz S-VOL by using BCM, PPRC commands, GDPS, or CSM.</li> </ul>
Consistency groups	You can register the split times for pairs that belong to Slz consistency groups. You can register one split time for an Slz consistency group.
Split type	You can select only one of the two split types of Slz pair. There are two types of split types: Steady Split and Quick Split. If the DKCMAIN microcode version is 90-01-01 or later, you can select Quick Split. If the DKCMAIN microcode version is 90-09-25 or later, you can select Steady Split or Quick Split. For details about the split type, see the <i>ShadowImage for Mainframe User Guide</i> .
Number of backup generations	You can create up to three Slz S-VOLs for an Slz P-VOL. This allows you to create up to three generations of backup data.
Timing of split processing	The split time and the actual start time of the split processing are not necessarily the same. The start time of the split processing varies depending on the number of Slz pairs and when a host I/O is received.
Timeout setting	If the distance between the primary and secondary storage systems is long, or if there is a delay in data transfer caused by the circuit equipment, a host I/O with a timestamp after the registered split time might not be detected even if a predetermined timeout period has elapsed since the split time. In this case, after the timeout period elapses, the split processing for the Slz pair runs. Set the timeout value according to your environment because the timeout value is variable. We recommend that you set the timeout value to a value greater than the host MIH time and RIO MIH time. The recommended timeout value is at least 1 minute. Note that the default timeout value is within 0 minutes.

# Operation flows

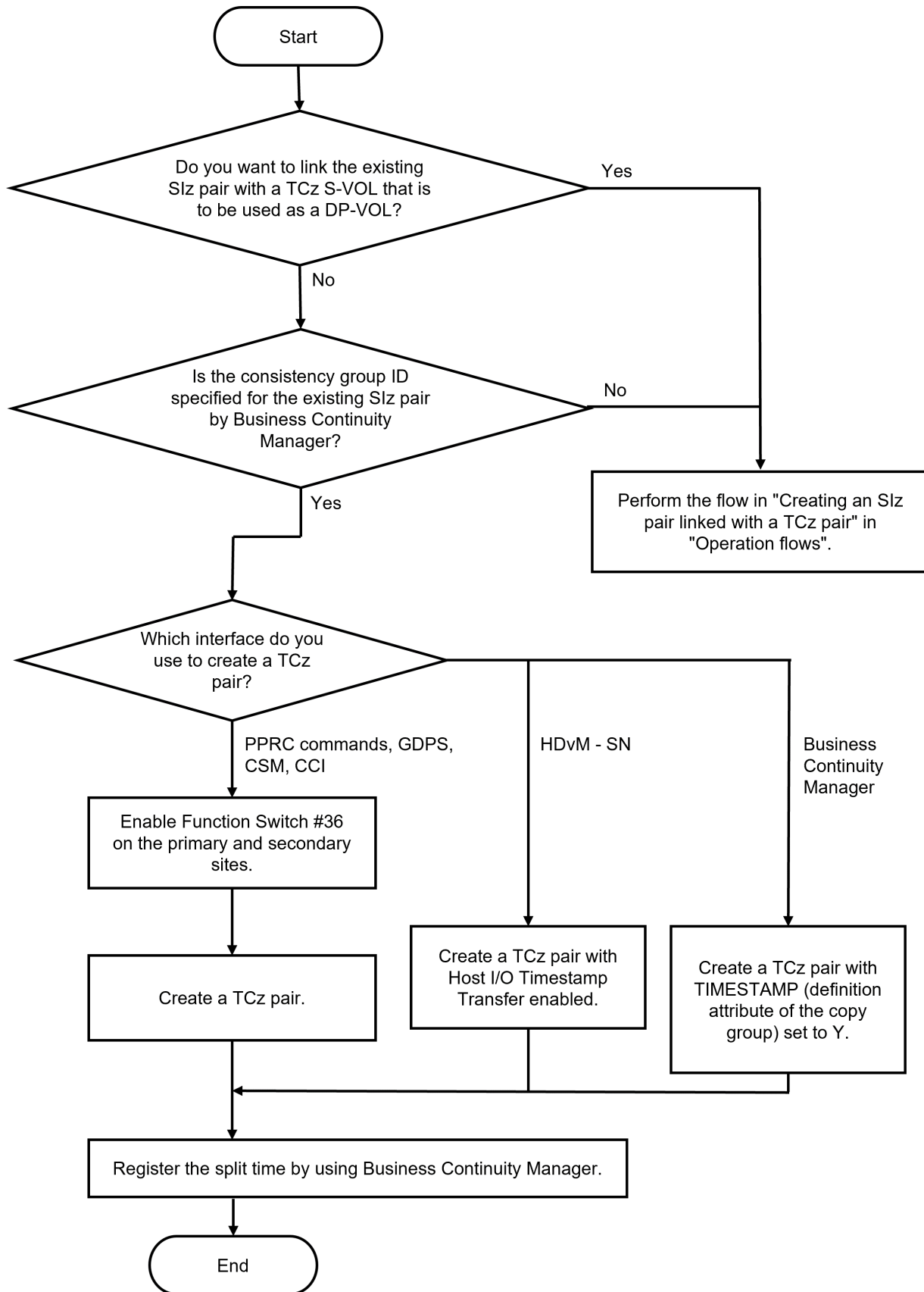
## Creating an SIz pair linked with a TCz pair



# Using an existing TCz pair

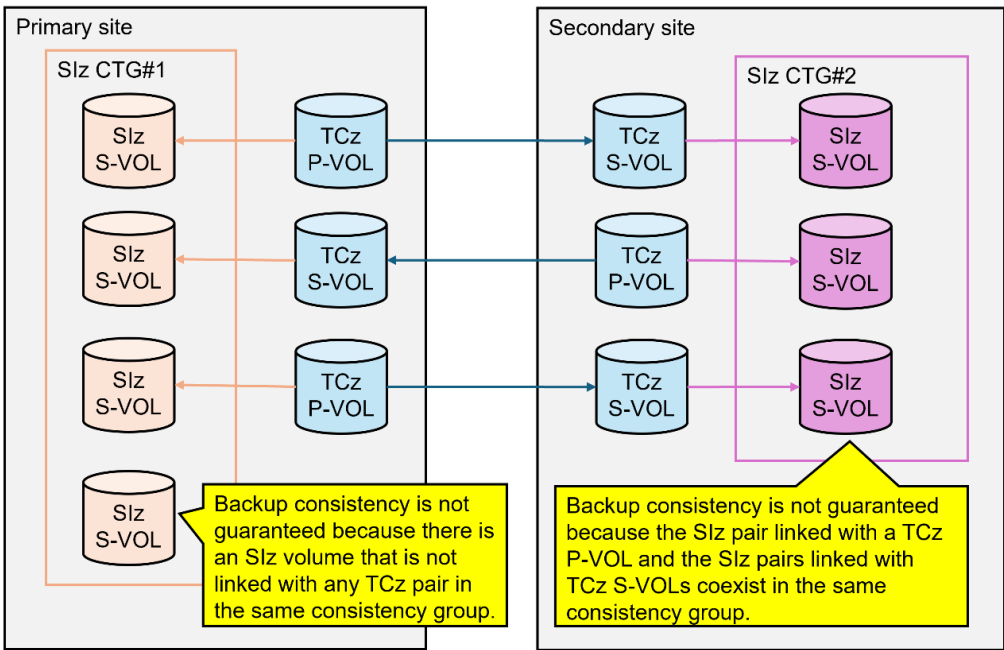


# Using an existing SIz pair



# Precautions

The following table lists precautions for using the ATTIME suspend function in a TCz+Siz configuration.

Item	Description
<p>Linkage with TCz pairs and backup consistency</p>	<p>Link all the TCz S-VOLs that you want to back up, with Siz pairs. If you want to guarantee backup consistency of some Siz pairs linked with TCz S-VOLs, those Siz pairs must belong to the same Siz consistency group. In that same Siz consistency group, if there is an Siz pair that is not linked with any TCz S-VOL, backup consistency is not guaranteed.</p> <p>Example (when backup consistency is not guaranteed):</p>  <p>Legend:            CTG: Consistency Group            Siz: ShadowImage for Mainframe            TCz: TrueCopy for Mainframe            P-VOL: Primary volume            S-VOL: Secondary volume</p>
<p>Pair status and backup consistency</p>	<p>To run split processing when a TCz P-VOL is linked with an Siz pair, the status of the Siz pair must be either DUPLEX or PENDING. To run split processing when a TCz S-VOL is linked with an Siz pair, the status of the TCz pair must be either Duplex or SSWS, and the status of the Siz pair must be either DUPLEX or PENDING. If the pair statuses are other than above during split processing, backup consistency is not guaranteed.</p>
<p>Whether pair operations are available</p>	<p>If the split time has been registered in an Siz consistency group, you cannot create, resynchronize, or split an Siz pair in the consistency group. To create, resynchronize, or split a pair, cancel the registered split time beforehand. Note that, even if the split time has been registered in an Siz consistency group, you can delete an Siz pair in the</p>

Item	Description
	<p>consistency group. If you delete all Siz pairs in an Siz consistency group, the registered split time is canceled.</p>
<p>Write I/O before and after the registered split time</p>	<p>If a write I/O (with a timestamp after the registered split time) is received while another write I/O (with a timestamp before the registered split time) is being processed, the split processing on Siz pairs starts. In this case, the write I/O (with a timestamp before the registered split time) might not be written to the Siz S-VOLs. Also, if you split an Siz pair while a write I/O on multiple tracks is being processed, only a part of the write I/O might be written to the Siz S-VOL.</p> <p>If a write I/O processing on a TCz P-VOL is stopped before the registered split time passes, a write I/O (with a timestamp before the registered split time) is written to the corresponding Siz S-VOL. When you stop a write I/O by using the FREEZE command, finish the write I/O being processed before the registered split time passes. Note that the wait time to be specified in the FREEZE command must be shorter than the host MIH value.</p> <p>Example (when a write I/O with a host timestamp before the registered split time is not written):</p> <p>Legend:  CTG: Consistency Group  Siz: ShadowImage for Mainframe  TCz: TrueCopy for Mainframe  P-VOL: Primary volume  S-VOL: Secondary volume</p>

Item	Description
Split processing and split time operations during microcode exchange processing	<p>If you exchange the following versions of microcodes after registering the split time, backup consistency might not be guaranteed. Before exchanging microcodes, cancel the registered split time. Then, re-register the split time after microcode exchange is complete.</p> <p>If the BCM version is 9.9.0 or later and you are exchanging the following versions of microcodes, do not perform any of the following operations: registering the split time, canceling the registered split time, or viewing the registration information. Otherwise, the operation might fail.</p> <ul style="list-style-type: none"> <li>• From DKCMAIN microcode version earlier than 90-09-25 to DKCMAIN microcode version 90-09-25 or later</li> <li>• From DKCMAIN microcode version 90-09-25 or later to DKCMAIN microcode version earlier than 90-09-25</li> </ul>
An Slz pair is in a state in which it cannot be split.	<p>If an Slz pair is in a state in which it cannot be split, the split processing cannot run even after the registered split time passes. In that case, cancel the registered split time, put the Slz pair in a state in which it can be split, and then re-register the split time.</p> <p>The causes of an Slz pair being in a state in which it cannot be split are as follows:</p> <ol style="list-style-type: none"> <li>1. The Slz pair is blocked.</li> <li>2. Soft Fence is set for an Slz pair volume.</li> <li>3. The Protect attribute is set for an Slz pair volume.</li> <li>4. An Slz pair volume is the migration source volume of Volume Migration, and the migration processing cannot be stopped.</li> <li>5. The status of some pairs that share Slz P-VOLs is Deleting/TRANS.</li> <li>6. The status of some pairs that share Slz P-VOLs is Resync-R/REVRSY.</li> </ol> <p>To change the Slz pair state so that the Slz pair can be split:</p> <ul style="list-style-type: none"> <li>• For cause 1: In the Restore LDEVs window of HDvM - SN, restore the Slz pair volumes.</li> <li>• For cause 2: Remove Soft Fence from the Slz pair volume.</li> <li>• For cause 3: In the Data Retention window of HDvM - SN, remove the Protect attribute from the Slz pair volume.</li> <li>• For cause 4: Wait until the migration processing of Volume Migration is complete.</li> <li>• For cause 5: Wait until deletion of the Slz pair is complete.</li> <li>• For cause 6: Wait until resynchronization of the Slz pair is complete.</li> </ul>

# Supported Slz consistency group actions and options

CTG action	System option	BCM	IBM PPRC	
			TSO command	ICKDSF command
ATTIME Suspend	No options	YKSUSPND	NO	NO
	Steady Split	YKSUSPND	NO	NO
	Quick Split	YKSUSPND	NO	NO
	Steady Split: Slz volumes shared with URz	YKSUSPND	NO	NO
	Quick Split: Slz volumes shared with URz	YKSUSPND	NO	NO
	Steady Split: Slz volumes shared with TCz	YKSUSPND	NO	NO
	Quick Split: Slz volumes shared with TCz	YKSUSPND	NO	NO
Cancel ATTIME Suspend	No options	YKSUSPND	NO	NO

## Audit log for the BCM At-time Split command

Item	Description
Timeout	<p>If the Copy Type is SIMF, the meaning of the value differs depending on the interface version (I/F Version) of the command. If the interface version of the command is earlier than 0x53, the value indicates the time difference from the time the command is issued to the time the suspend processing starts (in minutes). If the interface version of the command is 0x54 or later, the value indicates the time difference from the time the command is issued to the time the timeout occurs (in minutes).</p> <p>If the Copy Type is URMF, the timeout time (in minutes) is indicated.</p> <p>No value is output if Kind is Reset or if Copy Type is URMF and the timeout time is not specified.</p>

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