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**Report of Successful Completion of Qualification Testing**

International Business Machines Corporation and Hitachi, Ltd. have successfully completed compatibility and interoperability testing of Hitachi Universal Storage Platform™ V (Hitachi USP V) series products at code level 60-03-24 in the following IBM System z10, IBM System z9, and IBM eServer zSeries environments:

IBM and Hitachi hereby confirm that testing for the support of ESCON®, FICON®, and FCP connectivity of the following has been successfully completed:

<b>CPU</b>	<b>IBM System Z9 2094-S18 Driver 67 MCL</b>
	<b>IBM System z10 Enterprise Class (z10 EC) at Driver 73G bundle 38</b>
	<b>IBM eServer™ zSeries® 800, 900, and 990 (z800, z900, z990) at D55K</b>
<b>OS&amp;GDPS®</b>	<b>z/OS 1.8 &amp; 1.9</b>
	<b>GDPS 3.5</b>
	<b>SuSe SLES 10</b>
<b>Functions</b>	<b>GDPS/PPRC HyperSwap Manager</b> <ul style="list-style-type: none"> <li>• Freeze/run</li> <li>• Planned HyperSwap</li> <li>• Unplanned HyperSwap</li> <li>• HyperSwap Failover/Failback</li> </ul>
	<b>GDPS/PPRC</b> <ul style="list-style-type: none"> <li>• Freze/run</li> <li>• Planned HyperSwap</li> <li>• Unplanned HyperSwap</li> <li>• HyperSwap Failover/Failback</li> <li>• Multiplatform Resiliency for System z (xDR)</li> <li>• FlashCopy</li> </ul>
	<b>GDPS/XRC</b> <ul style="list-style-type: none"> <li>• FlashCopy (including zero suspend FlashCopy)</li> <li>• SDM clustering</li> </ul>

<b>Storages</b>	<b>Hitachi Universal Storage Platform V</b>
	<b>Hitachi Universal Storage Platform VM</b>

More detailed testing results are available from IBM or Hitachi on request.

**Limitations:**

The following considerations and limitations apply to the tested configurations:

- Open LUN management is not supported at the testing time (GDPS/PPRC).
- Space efficient Flash Copy feature is not supported at the testing time (GDPS/PPRC and GDPS/XRC).
- Enhanced reader feature is not supported at the testing time (GDPS/XRC).

IBM does not make any representations or warranties of any kind regarding the Hitachi products and is not liable for such products or any claims made regarding such products. The fact that the listed Hitachi products passed the enumerated IBM tests does not imply that the products will operate properly in any particular customer environment. Hitachi retains sole responsibility for its products, the performance of such products and all claims relating to such products, including without limitation its products' compliance to product specifications, safety requirements, regulatory agencies requirements and industry standards.

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IBM Distinguished Engineer  
System z Platform  
Systems and Technology Group  
International Business Machines  
Corporation

## Attachment A -- Test Matrix

<b><u>GDPS/PPRC</u></b>		
<b><u>HyperSwap Manager</u></b>		
<b>Test Case Suite</b>	<b>Successfully Completed</b>	<b>Test Case Suite Description</b>
<ul style="list-style-type: none"> <li>• <b>Initial Tests</b></li> </ul>	✓	Basic remote copy operations using panels Basic Freeze tests (GO/STOP/COND)
<ul style="list-style-type: none"> <li>• <b>Planned Actions</b></li> </ul>	✓	Remote copy operations using HYPERSW command Simulate Site maintenance (SITE1 and SITE2)
<ul style="list-style-type: none"> <li>• <b>Unplanned Actions</b></li> </ul>	✓	GDPS reacts to a failure, depending on the FREEZE option (GO / STOP / COND / SWAP&GO / SWAP & STOP) Test failures were generated by PPRC links unplug, Chpid unplug, DASD control Unit power off and elongated I/O response times
<ul style="list-style-type: none"> <li>• <b>Disruptive Testing (aka Config Testing)</b></li> </ul>	✓	GDPS reacts to a failure, depending on the FREEZE option (GO/STOP/COND/ SWAP&GO / SWAP & STOP) Failures were generated by Control Unit Emergency power off and control unit internal failures
<ul style="list-style-type: none"> <li>• <b>HyperSwap Stress test</b></li> </ul>	✓	Run a planned HyperSwap, with the Production system and the Controlling system having CPU contention
<ul style="list-style-type: none"> <li>• <b>Miscellaneous</b></li> </ul>	✓	HyperSwap extension (checking of secondary PPRC status – failure, XRC session, Concurrent Copy, etc.)

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<b>GDPS/PPRC</b>		
<b>Test Case Suite</b>	<b>Successfully Completed</b>	<b>Test Case Suite Description</b>
<ul style="list-style-type: none"> <li>• <b>Initial Tests</b></li> </ul>	✓	Basic remote copy operations using panels Basic Freeze tests (GO/STOP/COND)
<ul style="list-style-type: none"> <li>• <b>Planned Actions</b></li> </ul>	✓	Remote copy operations using scripts (START/STOP SECONDARY, Flashcopy, HyperSwap (Resync & Suspend), etc.) Simulate Site maintenance (SITE1 and SITE2)
<ul style="list-style-type: none"> <li>• <b>Unplanned Actions</b></li> </ul>	✓	GDPS reacts to a failure, depending on the FREEZE option (GO / STOP / COND / SWAP&GO / SWAP & STOP) Failures were generated by PPRC links unplug, Chpid unplug, DASD control Unit power off and elongated I/O response times
<ul style="list-style-type: none"> <li>• <b>Disruptive Testing (aka Config Testing)</b></li> </ul>	✓	GDPS reacts to a failure, depending on the FREEZE option (GO / STOP / COND / SWAP&GO / SWAP & STOP) Failures were generated by Control Unit Emergency power off and control unit internal failures
<ul style="list-style-type: none"> <li>• <b>HyperSwap Stress test</b></li> </ul>	✓	Run a planned HyperSwap, with the Production system and the Controlling system having CPU contention
<ul style="list-style-type: none"> <li>• <b>Miscellaneous</b></li> </ul>	✓	HyperSwap extension ( checking of secondary PPRC status – failure, XRC session, Concurrent Copy, etc.)
<ul style="list-style-type: none"> <li>• <b>Multiplatform Resiliency for System z (xDR)</b></li> </ul>	✓	GDPS xDR reacts to a failure, depending on the FREEZE option (GO / STOP / COND / SWAP&GO / SWAP & STOP) Failures were generated by PPRC links unplug, Chpid unplug, DASD control Unit power off and elongated I/O response times, on both sites
<ul style="list-style-type: none"> <li>• <b>FlashCopy</b></li> </ul>	✓	Prior FlashCopy limitations (NOCOPY2COPY, Persistent/INCREMENTAL) are removed. Note that the traditional FlashCopy testcases are executed as part of Planned Actions and Unplanned Actions.

## Attachment A -- Test Matrix

<b><u>GDPS/XRC</u></b>		
<b>Test Case Suite</b>	<b>Successfully Completed</b>	<b>Test Case Suite Description</b>
<ul style="list-style-type: none"> <li>• <b>Initial Tests</b></li> </ul>	✓	Basic remote copy operations using panels. Tests using single SDM and coupled SDMs
<ul style="list-style-type: none"> <li>• <b>Planned Actions</b></li> </ul>	✓	Remote copy operations using scripts (START/STOP, SUSPEND session, etc.) Simulate Site maintenance (SITE1 and SITE2) Simulate SITE1 failure and restart Production in recovery site.
<ul style="list-style-type: none"> <li>• <b>FlashCopy</b></li> </ul>	✓	Prior FlashCopy limitations (NOCOPY2COPY, Persistent/INCREMENTAL) are removed. Note that the traditional FlashCopy testcases are executed as part of Planned Actions.