Release Note for systems built with IBM Spectrum Virtualize

This is the release note for the 7.8 release and details the issues resolved in all Program Temporary Fixes (PTFs) between 7.8.0.0 and 7.8.1.16. This document will be updated with additional information whenever a PTF is released.

This document was last updated on 1 November 2022.

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Note. Detailed build version numbers are included in the Update Matrices in the Useful Links section

1. New Features

The following new features have been introduced in the 7.8.0 release:

- Support for IBM Spectrum Virtualize Family High Density Expansion enclosure
- Support for IBM SKLM Encryption Key Manager
- Multi-Tier Storage Pools now supported with Tier 1 Flash Drives (previously known as Read Intensive drives)
- EasyTier Warm Promote will notice data in a Nearline tier that becomes hot within 5 minutes
- Transparent Cloud Tiering - Cloud Snapshot
- Ability to non-disruptively upgrade V5010/V5020 systems to V5020/V5030
- Ability to non-disruptively upgrade V7000 Gen 2 systems to V7000 Gen 2+

The following new features have been introduced in the 7.8.1 release:

- Metro or Global Mirror relationships can be resized whilst the relationship is 'consistent_synchronized', as long as the master or auxiliary volumes are not in a FlashCopy mapping. Global Mirror with Change Volumes can not be resized
- Host clusters can be configured in the GUI and can have a throttle (MBps or IOps) applied to them
- Configuring a Change Volume on a Metro Mirror or Global Mirror relationship will generate a consistent snapshot whenever a consistent_stopped relationship is restarted
- Port Congestion statistic has been added to improve performance analysis of 16Gb/s FC ports
- Maximum FlashCopy Background Copy rate has been increased
- Host multi-pathing drivers will be instructed to fail-over to the alternate node, before a node goes down for upgrade, to enhance multi-pathing failover behaviour

The following feature has been introduced in the 7.8.1.9 release:

- Removal of support for DSA-based host key algorithms when using SSH login

2. Known Issues and Restrictions

Note: For clarity, the term "node" will be used to refer to a SAN Volume Controller node or Storwize system node canister.

Details	Introduced
During upgrade node failover does not bring up the normal alert message requiring a refresh of the GUI. Customers will need to manually refresh the GUI upon upgrade to v7.8.1.6.	7.8.1.6

Details	Introduced
This is a temporary restriction that may be lifted in a future PTF.	
	7.8.0.0
There is a known issue with 8-node systems and IBM Security Key Lifecycle Manager 3.0 that can cause the status of key server end points, on the system, to occasionally report as degraded or offline. The issue intermittently occurs when the system attempts to validate the key server but the server response times out to some of the nodes. When the issue occurs Error Code 1785 (A problem occurred with the Key Server) will be visible in the system event log. This issue will not cause any loss of access to encrypted data.	
	7.8.0.0
There is an extremely small possibility that, on a system using both Encryption and Transparent Cloud Tiering, the system can enter a state where an encryption re-key operation is stuck in 'prepared' or 'prepare_failed' state, and a cloud account is stuck in 'offline' state. The user will be unable to cancel or commit the encryption rekey, because the cloud account is offline. The user will be unable to remove the cloud account because an encryption rekey is in progress. The system can only be recovered from this state using a T4 Recovery procedure. It is also possible that SAS-attached storage arrays go offline.	
	7.8.0.0
Spectrum Virtualize as Software customers should not enable the Transparent Cloud Tiering function. This restriction will be removed under APAR HU01495.	
	7.8.0.0
Due to memory constraints, Storwize V7000 Gen1 control enclosures with one or more compressed volumes cannot be upgraded to v7.8.0.0 or later.	
	7.8.0.0
Some configuration information will be incorrect in Spectrum Control. This does not have any functional impact and will be resolved in a future release of Spectrum control.	
	7.8.0.0
No SAS Direct Attached Windows 2008 Hyper-V hosts will be able to connect to Storwize systems running v7.8.0.0.	
	7.7.0.0
When a system first upgrades from pre-7.7.0 to 7.7.0 or later, the in-memory audit log will be cleared. This means the catauditlog CLI command, and the GUI, will not show any commands that were issued before the upgrade. The upgrade test utility will write the existing auditlog to a file in /dumps/audit on the config node. If the auditlog is needed at a later point, this file can be copied from the config node. Subsequent upgrades will not affect the contents of the auditlog.	
	7.7.0.0
Priority Flow Control for iSCSI is only supported on Brocade VDX 10GbE switches. This is a temporary restriction that may be lifted in a future v7.8 PTF.	

Details	Introduced
	n/a
Systems, with NPIV enabled, presenting storage to SUSE Linux Enterprise Server (SLES) or Red Hat Enterprise Linux (RHEL) hosts running the ibmvfc driver on IBM Power can experience path loss or read-only file system events.	
This is cause by issues within the ibmvfc driver and VIOS code.	
Refer to this troubleshooting page for more information.	
Host Disconnects Using VMware vSphere 5.5.0 Update 2 and vSphere 6.0	n/a
Refer to this flash for more information	
If an update stalls or fails then Contact IBM Support for Further Assistance	n/a
The following restrictions were valid for previous PTFs, but have now been lifted	
	7.8.1.3
In the GUI, when filtering volumes by host, if there are more than 50 host objects, then the host list will not include the host names.	
This issue has been resolved by APAR HU01687 in PTF v7.8.1.5.	
	7.8.1.1
Systems attached to 3PAR controllers cannot be upgraded to v7.8.1.1 or later.	
This was a temporary restriction that has been lifted.	
	7.8.0.0
No upgrade or service activity should be attempted while a Transparent Cloud Tiering Snapshot task is in progress.	
This was a temporary restriction that has been lifted.	
	7.8.0.0
The drive limit remains 1056 drives per cluster.	
This was a temporary restriction that has been lifted.	

3. Issues Resolved

This release contains all of the fixes included in the 7.7.1.3 release, plus the following additional fixes.

A release may contain fixes for security issues, fixes for APARs or both. Consult both tables below to understand the complete set of fixes included in the release.

3.1 Security Issues Resolved

Security issues are documented using a reference number provided by "Common Vulnerabilities and Exposures" (CVE).

CVE Identifier	Link for additional Information	Resolved in
Search for CVE ..		Select Versions
CVE-2018-25032	6622021	7.8.1.16
CVE-2022-0778	6622017	7.8.1.15
CVE-2021-35603	6622019	7.8.1.15
CVE-2021-35550	6622019	7.8.1.15
CVE-2021-29873	6497111	7.8.1.14

CVE Identifier	Link for additional Information	Resolved in
CVE-2020-2781	6445063	7.8.1.13
CVE-2020-13935	6445063	7.8.1.13
CVE-2020-14577	6445063	7.8.1.13
CVE-2020-14578	6445063	7.8.1.13
CVE-2020-14579	6445063	7.8.1.13
CVE-2019-5544	6250889	7.8.1.12
CVE-2019-2964	6250887	7.8.1.12
CVE-2019-2989	6250887	7.8.1.12
CVE-2018-12404	6250885	7.8.1.12
CVE-2019-11477	1164286	7.8.1.11
CVE-2019-11478	1164286	7.8.1.11
CVE-2019-11479	1164286	7.8.1.11
CVE-2019-2602	1073958	7.8.1.10
CVE-2018-3180	ibm10884526	7.8.1.10
CVE-2018-12547	ibm10884526	7.8.1.10
CVE-2008-5161	ibm10874368	7.8.1.9
CVE-2018-5391	ibm10872368	7.8.1.8
CVE-2018-5732	ibm10741135	7.8.1.8
CVE-2018-11776	ibm10741137	7.8.1.8
CVE-2017-17449	ibm10872364	7.8.1.8
CVE-2017-18017	ibm10872364	7.8.1.8
CVE-2018-1517	ibm10872456	7.8.1.8
CVE-2018-2783	ibm10872456	7.8.1.8
CVE-2018-12539	ibm10872456	7.8.1.8
CVE-2018-1775	ibm10872486	7.8.1.8
CVE-2017-17833	ibm10872546	7.8.1.8
CVE-2018-11784	ibm10872550	7.8.1.8
CVE-2016-10708	ibm10717661	7.8.1.6
CVE-2016-10142	ibm10717931	7.8.1.6
CVE-2017-11176	ibm10717931	7.8.1.6
CVE-2018-1433	ssg1S1012263	7.8.1.6
CVE-2018-1434	ssg1S1012263	7.8.1.6
CVE-2018-1438	ssg1S1012263	7.8.1.6
CVE-2018-1461	ssg1S1012263	7.8.1.6
CVE-2018-1462	ssg1S1012263	7.8.1.6
CVE-2018-1463	ssg1S1012263	7.8.1.6
CVE-2018-1464	ssg1S1012263	7.8.1.6
CVE-2018-1465	ssg1S1012263	7.8.1.6
CVE-2018-1466	ssg1S1012263	7.8.1.6
CVE-2016-6210	ssg1S1012276	7.8.1.6

CVE Identifier	Link for additional Information	Resolved in
CVE-2016-6515	ssg1S1012276	7.8.1.6
CVE-2013-4312	ssg1S1012277	7.8.1.6
CVE-2015-8374	ssg1S1012277	7.8.1.6
CVE-2015-8543	ssg1S1012277	7.8.1.6
CVE-2015-8746	ssg1S1012277	7.8.1.6
CVE-2015-8812	ssg1S1012277	7.8.1.6
CVE-2015-8844	ssg1S1012277	7.8.1.6
CVE-2015-8845	ssg1S1012277	7.8.1.6
CVE-2015-8956	ssg1S1012277	7.8.1.6
CVE-2016-2053	ssg1S1012277	7.8.1.6
CVE-2016-2069	ssg1S1012277	7.8.1.6
CVE-2016-2384	ssg1S1012277	7.8.1.6
CVE-2016-2847	ssg1S1012277	7.8.1.6
CVE-2016-3070	ssg1S1012277	7.8.1.6
CVE-2016-3156	ssg1S1012277	7.8.1.6
CVE-2016-3699	ssg1S1012277	7.8.1.6
CVE-2016-4569	ssg1S1012277	7.8.1.6
CVE-2016-4578	ssg1S1012277	7.8.1.6
CVE-2016-4581	ssg1S1012277	7.8.1.6
CVE-2016-4794	ssg1S1012277	7.8.1.6
CVE-2016-5412	ssg1S1012277	7.8.1.6
CVE-2016-5828	ssg1S1012277	7.8.1.6
CVE-2016-5829	ssg1S1012277	7.8.1.6
CVE-2016-6136	ssg1S1012277	7.8.1.6
CVE-2016-6198	ssg1S1012277	7.8.1.6
CVE-2016-6327	ssg1S1012277	7.8.1.6
CVE-2016-6480	ssg1S1012277	7.8.1.6
CVE-2016-6828	ssg1S1012277	7.8.1.6
CVE-2016-7117	ssg1S1012277	7.8.1.6
CVE-2016-10229	ssg1S1012277	7.8.1.6
CVE-2016-0634	ssg1S1012278	7.8.1.6
CVE-2017-5647	ssg1S1010892	7.8.1.3
CVE-2016-2183	ssg1S1010205	7.8.1.1
CVE-2016-5546	ssg1S1010205	7.8.1.1
CVE-2016-5547	ssg1S1010205	7.8.1.1
CVE-2016-5548	ssg1S1010205	7.8.1.1
CVE-2016-5549	ssg1S1010205	7.8.1.1
CVE-2017-5638	ssg1S1010113	7.8.1.0
CVE-2016-4461	ssg1S1010883	7.8.1.0
CVE-2016-5385	ssg1S1009581	7.8.0.2

CVE Identifier	Link for additional Information	Resolved in
CVE-2016-5386	ssg1S1009581	7.8.0.2
CVE-2016-5387	ssg1S1009581	7.8.0.2
CVE-2016-5388	ssg1S1009581	7.8.0.2
CVE-2016-6796	ssg1S1010114	7.8.0.2
CVE-2016-6816	ssg1S1010114	7.8.0.2
CVE-2016-6817	ssg1S1010114	7.8.0.2
CVE-2016-2177	ssg1S1010115	7.8.0.2
CVE-2016-2178	ssg1S1010115	7.8.0.2
CVE-2016-2183	ssg1S1010115	7.8.0.2
CVE-2016-6302	ssg1S1010115	7.8.0.2
CVE-2016-6304	ssg1S1010115	7.8.0.2
CVE-2016-6306	ssg1S1010115	7.8.0.2
CVE-2016-5696	ssg1S1010116	7.8.0.2
CVE-2016-2834	ssg1S1010117	7.8.0.2
CVE-2016-5285	ssg1S1010117	7.8.0.2
CVE-2016-8635	ssg1S1010117	7.8.0.2
CVE-2017-6056	ssg1S1010022	7.8.0.0

3.2 APARs Resolved

Show details for all APARs

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
Search APAR	Select Products	Select Severity	Select Versions		Select Tags
HU02342	All	Critical	Occasionally when an offline drive returns to online state later than its peers in the same RAID array there can be multiple node warmstarts that send nodes	7.8.0.5	RAID

APAR	Affected Products	Severity	Resolved in / Description	Feature Tags
		Select Severity		
			into a service state (show details)	
HU02406	All	Critical	8.1.15 An interoperability issue between Cisco NX-OS firmware and the Spectrum Virtualize Fibre Channel driver can cause a node warmstart on NPIV failback (for example during an upgrade) with the potential for a loss of access. For more details refer to this Flash (show details)	Interoperability
HU02471	All	Critical	8.1.15 After starting a FlashCopy map with -restore in a	FlashCopy, Global Mirror with Change Volumes

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
				graph with a GMCV secondary disk that was stopped with -access there can be a data integrity issue (show details)	
HU02332 & HU02336	All	Suggested	8.1.5	When an I/O is received, from a host, with invalid or inconsistent SCSI data but a good checksum it may cause a node warmstart (show details)	Hosts
HU02429	All	Critical	3.3.1.4	System can go offline shortly after changing the SMTP settings using the chemailserver command	System Monitoring

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
			via the GUI (show details)		
HU02277	All	HIPER	RAID parity scrubbing can become stalled causing an accumulation of media errors leading to multiple drive failures with the possibility of data integrity loss. For more details refer to this Flash (show details)	7.8.1.13	RAID
HU02338	All	HIPER	An issue in the setting up of reverse FlashCopy mappings can cause the background copy to finish prematurely providing an incomplete target image	7.8.1.13	FlashCopy

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity		(show details)	
HU02222	All	Critical	Where the source volume of an incremental FlashCopy map is also a Metro or Global Mirror target volume that is using a change volume or is a Hyperswap volume, then there is a possibility that not all data will be copied to the FlashCopy target. For more details refer to this Flash (show details)	7.8.1.13	Global Mirror with Change Volumes
HU02201 & HU02221	All	High Importance	Shortly after upgrading drive firmware,	7.8.1.13	Drives

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
		Select Severity		
			specific drive models can fail due to Too many long IOs to drive for too long errors (show details)	
HU02238	All	HIPER	Force 7.8.1.12 stopping a FlashCopy map, where the source volume is a Metro or Global Mirror target volume, may cause other FlashCopy maps to return invalid data if they are not 100% copied, in specific configurations. For more details refer to this Flash	FlashCopy, Global Mirror, Metro Mirror

APAR	Affected Products	Severity	Resolution Description	Feature Tags
		Select Severity		
			(show details)	
HU01970	All	Critical	7.8.1.12 When a GMCV relationship is stopped, with the -access option, and the secondary volume is immediately deleted with -force, then all nodes may repeatedly warmstart (show details)	Global Mirror with Change Volumes
HU02197	All	Critical	7.8.1.12 Bulk volume removals can adversely impact related FlashCopy mappings leading to a Tier 2 recovery (show details)	FlashCopy
IT25367	All	Critical	7.8.1.12 A T2 recovery may occur when an attempt is made to upgrade,	Drives

APAR	Affected Products	Severity	Resolved in / Description	Feature Tags
		Select Severity		
			or downgrade, the firmware for an unsupported drive type (show details)	
HU01832	All	Suggested	7.8.1.2 Creation and distribution of the config file may cause an out-of-memory condition, leading to a node warmstart (show details)	Reliability Availability Serviceability
HU01868	All	Suggested	7.8.1.12 After deleting an encrypted external MDisk, it is possible for the encrypted status of volumes to change to no, even though all remaining MDisks are encrypted (show details)	Encryption

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
HU01917	All	Suggested	Chrome 12 browser support requires a self-signed certificate to include subject alternate name (show details)	Graphical User Interface
HU02014	SVC	HIPER	7.8.1.11 After a loss of power, where a node has a dead CMOS battery, it will fail to restart correctly. It is possible for both nodes in an I/O group to experience this issue (show details)	Reliability Availability Serviceability
HU01887	All	Critical	7.8.1.11 In circumstances where host configuration data becomes inconsistent, across nodes, an	Command Line Interface, Host Cluster

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			issue in the CLI policing code may cause multiple warmstarts (show details)		
HU02043	All	Critical	Collecting a snap can cause nodes to run out of boot drive space and go offline with node error 565 (show details)	7.8.1.11	Support Data Collection
HU02063	All	Critical	HyperSwap clusters with only two surviving nodes may experience warmstarts on both of those nodes where rcbuffersize is set to 512MB (show details)	7.8.1.11	HyperSwap
IT26257	All	Critical	Starting a relationship,	7.8.1.11	HyperSwap

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			when the remote volume is offline, may result in a T2 recovery (show details)		
HU01836	All	High Importance	When an auxiliary volume is moved an issue with pausing the master volume can lead to node warmstarts (show details)	7.8.1.11	HyperSwap
HU01923	All	High Importance	An issue in the way Global Mirror handles write sequence numbers >512 may cause multiple node warmstarts (show details)	7.8.1.11	Global Mirror
HU01944	All	High Importance	Proactive host failover not waiting for 25		Reliability Availability Serviceability

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			seconds before allowing nodes to go offline during upgrades or maintenance (show details)	
HU01952	SVC, V7000	High Importance	7.8.1.11 When the compression accelerator hardware driver detects an uncorrectable error the node will reboot (show details)	Compression
HU02049	All	High Importance	7.8.1.11 GUI session handling has an issue that can generate many exceptions, adversely impacting GUI performance (show details)	Graphical User Interface
HU02149	SVC	High Importance	7.8.1.11 When an Enhanced Stretch Cluster is using NPIV, in transitional mode, the path priority	Hosts

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
			is not being reported correctly to some hosts (show details)		
HU01830	All	Suggested	Missing security-enhancing HTTP response headers (show details)	7.8.1.11	Security
HU01863	All	Suggested	In rare circumstances, a drive replacement may result in a ghost drive (i.e. a drive with the same ID as the replaced drive stuck in a permanently offline state) (show details)	7.8.1.11	Drives
HU01892	All	Suggested	LUNs of greater than 2TB, presented by HP XP7 storage controllers,	7.8.1.11	Backend Storage

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
				are not supported (show details)	
HU01981	All	Suggested	Although an issue, in the HBA firmware, is handled correctly it can still cause a node warmstart (show details)	7.8.1.6	Reliability Availability Serviceability
HU01988	All	Suggested	In the Monitoring -> 3D view page, the "export to csv" button does not function (show details)	7.8.1.11	Graphical User Interface
HU02085	All	Suggested	Freeze time of Global Mirror remote copy consistency groups may not be updated correctly in certain scenarios	7.8.1.1	Global Mirror

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity	(show details)	
HU02102	All	Suggested	7.8.1.11 Excessive processing time required for FlashCopy bitmap operations, associated with large (> 20TB) Global Mirror change volumes, may lead to a node warmstart (show details)	Global Mirror with Change Volumes
HU02126	SVC, V7000, V5000	Suggested	7.8.1.11 There is a low probability that excessive SSH connections may trigger a single node warmstart on the configuration node (show details)	Command Line Interface
HU01781	All	Critical	7.8.1.10 An issue with workload balancing in the kernel scheduler can deprive some	

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
			processes of the necessary resource to complete successfully resulting in a node warmstarts, that may impact performance, with the possibility of a loss of access to volumes (show details)		
HU01888 & HU01997	All	Critical	An issue with restore mappings, in the FlashCopy component, can cause an I/O group to warmstart (show details)	7.8.1.10	FlashCopy
HU01972	All	High Importance	When an array is in a quiescing state, for example where a member has	7.8.1.10	Distributed RAID, RAID

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
				been deleted, I/O may become pended leading to multiple warmstarts (show details)	
HU00744	All	Suggested	7.8.1.10	Single node warmstart due to an accounting issue within the cache component (show details)	Cache
HU00921	All	Suggested	7.8.1.10	A node warmstart may occur when an MDisk state change gives rise to duplicate discovery processes (show details)	
HU01737	All	Suggested	7.8.1.10	On the Update System screen, for Test Only, if a valid code image is selected, in	System Update

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			the Run Update Test Utility dialog, then clicking the Test button will initiate a system update (show details)		
HU01915 & IT28654	All	Suggested	Systems, with encryption enabled, that are using key servers to manage encryption keys, may fail to connect to the key servers if the servers SSL certificates are part of a chain of trust (show details)	7.8.1.3,	Encryption
HU01617	All	HIPER	Due to a timing window issue, stopping a	7.8.1.9	FlashCopy

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
			FlashCopy mapping, with the -autodelete option, may result in a Tier 2 recovery (show details)		
HU01708	All	HIPER	A node removal operation during an array rebuild can cause a loss of parity data leading to bad blocks (show details)	7.8.1.9	RAID
HU01865	All	HIPER	When creating a HyperSwap relationship, using addvolumecopy (or similar methods), the system should perform a synchronisation operation to copy the data from the original	7.8.1.9	HyperSwap

APAR	Affected Products	Severity	Description	Resolution in	Feature Tags
			copy to the new copy. In some rare cases this synchronisation is skipped, leaving the new copy with bad data (all zeros) [(show details)](#)		
HU01913	All	HIPER	A timing window issue in the DRAID6 rebuild process can cause node warmstarts with the possibility of a loss of access [(show details)](#)	7.8.1.9	Distributed RAID
HU01723	All	Critical	A timing window issue, around nodes leaving and re-joining clusters, can lead to	7.8.1.9	Reliability Availability Serviceability

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
			hung I/O and node warmstarts (show details)		
HU01876	All	Critical	Where systems are connected to controllers, that have FC ports that are capable of acting as initiators and targets, when NPIV is enabled then node warmstarts can occur (show details)	7.8.1.9	Backend Storage
IT27460	All	Critical	Lease expiry can occur between local nodes when remote connection is lost, due to the mishandling of messaging credits (show details)	7.8.1.9	Reliability Availability Serviceability
IT29040	All	Critical	Occasionally a	7.8.1.9	Distributed RAID, RAID

APAR	Affected Products	Severity	Resolution in	Feature Tags
		Select Severity		
			DRAID rebuild, with drives of 8TB or more, can encounter an issue which causes node warmstarts and potential loss of access (show details)	
HU01907	SVC	High Importance	7.8.1.9 An issue in the handling of the power cable sense registers can cause a node to be put into service state with a 560 error (show details)	Reliability Availability Serviceability
HU01485	SVC	Suggested	7.8.1.9 When a SV1 node is started, with only one PSU powered,	System Monitoring

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			powering up the other PSU will not extinguish the Power Fault LED.Note: To apply this fix (in new BMC firmware) each node will need to be power cycled (i.e. remove AC power and battery), one at a time, after the upgrade has completed (show details)	
HU01659	SVC	Suggested	7.8.1.9 Node Fault LED can be seen to flash in the absence of an error condition.Note: To apply	System Monitoring

APAR	Affected Products	Severity	Resolution Description	Feature Tags
			this fix (in new BMC firmware) each node will need to be power cycled (i.e. remove AC power and battery), one at a time, after the upgrade has completed (show details)	
HU01849	All	Suggested	At 8.1.9 An excessive number of SSH sessions may lead to a node warmstart (show details)	System Monitoring
IT26049	All	Suggested	At 8.1.9 An issue with CPU scheduling may cause the GUI to respond slowly (show details)	Graphical User Interface

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity		
HU01492 & HU02024	SVC, V7000, V5000	HIPER	7.8.1.8 All ports of a 16Gb HBA can be affected when a single port is congested. This can lead to lease expiries if all ports used for inter-node communication are on the same FC adapter (show details)	Reliability Availability Serviceability
HU01726	All	HIPER	7.8.1.8 A slow raid member drive in an MDisk may cause node warmstarts and the MDisk to go offline for a short time (show details)	Distributed RAID

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
HU01940	All	HIPER	7.8.1.9	Changing the use of a drive can cause a Tier 2 recovery (warmstarts on all nodes in the cluster). This occurs only if the drive change occurs within a small timing window, so the probability of the issue occurring is low (show details)	Drives
HU01572	All	Critical	7.8.1.8	SCSI 3 commands from unconfigured WWPNs may result in multiple warmstarts leading to a loss of access	iSCSI

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity		(show details)	
HU01678	All	Critical	Entering an invalid parameter in the addvdiskaccess command may initiate a Tier 2 recovery (show details)	7.8.1.8	Command Line Interface
HU01735	All	Critical	Multiple power failures can cause a RAID array to get into a stuck state leading to offline volumes (show details)	7.8.1.8	RAID
HU01774	All	Critical	After a failed mkhost command for an iSCSI host any I/O from that host will cause multiple warmstarts (show details)	7.8.1.8	iSCSI
HU01799	All	Critical	Timing window	7.8.1.8	HyperSwap

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
			issue can affect operation of the HyperSwap addvolumecopy command causing all nodes to warmstart (show details)	
HU01825	All	Critical	7.8.1.8 Invoking a chrcrelationship command when one of the relationships in a consistency group is running in the opposite direction to the others may cause a node warmstart followed by a Tier 2 recovery (show details)	FlashCopy
HU01847	All	Critical	7.8.1.8 FlashCopy handling of medium errors across a number of drives	FlashCopy

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
			on backend controllers may lead to multiple node warmstarts (show details)		
HU01899	All	Critical	In a HyperSwap cluster, when the primary I/O group has a dead domain, nodes will repeatedly warmstart (show details)	7.8.1.8	HyperSwap
IT25850	All	Critical	I/O performance may be adversely affected towards the end of DRAID rebuilds. For some systems there may be multiple warmstarts leading to a loss of access (show details)	7.8.1.8	Distributed RAID
HU01507	All	High Importance	Until the	7.8.1.8	Volume Mirroring

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			initial synchronisation process completes, high system latency may be experienced when a volume is created with two compressed copies or when space-efficient copy is added to a volume with an existing compressed copy (show details)		
HU01579	All	High Importance	In systems where all drives are of type HUSMM80xx0ASS20 it will not be possible to assign a quorum drive (show details)	7.8.1.8	Drives, Quorum
HU01661	All	High Importance	A cache-protection mechanism	7.8.1.8	HyperSwap

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
		Select Severity		
			flag setting can become stuck leading to repeated stops of consistency group synchronisation (show details)	
HU01733	All	High Importance	Canister information, for the High Density Expansion Enclosure, may be incorrectly reported (show details)	Reliability Availability Serviceability
HU01797	All	High Importance	Hitachi G1500 backend controllers may exhibit higher than expected latency (show details)	Backend Storage
HU01813	All	High Importance	An issue with Global Mirror stream recovery handling at secondary sites can adversely impact replication performance (show details)	Global Mirror

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
HU01824	All	High Importance	Switching replication direction for HyperSwap relationships can lead to long I/O timeouts [(show details)](#)	3.6.1.8	HyperSwap
HU01839	All	High Importance	Where a VMware host is being served volumes, from two different controllers, and an issue, on one controller, causes the related volumes to be taken offline then I/O performance, for the volumes from the other controller, will be adversely affected [(show details)](#)	7.8.1.8	Hosts
HU01842	All	High Importance	Bursts of I/O to Read-	7.8.1.8	Drives

APAR	Affected Products	Severity	Description	Feature Tags

Intensive Drives can be interpreted as dropped frames against the resident slots, leading to redundant drives being incorrectly failed (show details)

| HU01846 | SVC | High Importance | 7.8.1.8 Silent battery discharge condition will unexpectedly take a SVC node offline putting it into a 572 service state (show details) | Reliability Availability Serviceability |

| HU01902 | V7000, V5000, V3700, V3500 | High Importance | 7.8.1.8 During an upgrade, an issue with VPD migration, can cause a timeout leading to a stalled upgrade (show details) | System Update |

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
		Select Severity		
HU01276	All	Suggested	7.8.1.8 An issue in the handling of debug data from the FC adapter can cause a node warmstart (show details)	Reliability Availability Serviceability
HU01467	All	Suggested	7.8.1.8 Failures in the handling of performance statistics files may lead to missing samples in Spectrum Control and other tools (show details)	System Monitoring
HU01512	All	Suggested	7.8.1.8 During a DRAID MDisk copy-back operation a miscalculation of the remaining work may cause a node warmstart (show details)	Distributed RAID

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity		
HU01523	All	Suggested	7.8.1.8 An issue with FC adapter initialisation can lead to a node warmstart (show details)	Reliability Availability Serviceability
HU01556	All	Suggested	7.8.1.8 The handling of memory pool usage by Remote Copy may lead to a node warmstart (show details)	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01564	All	Suggested	7.8.1.8 FlashCopy maps cleaning process is not monitoring the grains correctly which may cause FlashCopy maps to not stop (show details)	FlashCopy
HU01657	SVC, V7000, V5000	Suggested	7.8.1.8 The 16Gb FC HBA firmware may experience an issue,	Reliability Availability Serviceability

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			with the detection of unresponsive links, leading to a single node warmstart (show details)		
HU01715	All	Suggested	Issuing a rmvolumecopy command followed by an expandvdisksize command may result in hung I/O leading to a node warmstart (show details)	7.8.1.6	HyperSwap
HU01719	All	Suggested	Node warmstart due to a parity error in the HBA driver firmware (show details)	7.8.1.8	Reliability Availability Serviceability
HU01751	All	Suggested	When RAID attempts to flag a strip as bad, and that	7.8.1.8	RAID

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			strip has already been flagged, a node may warmstart (show details)	
HU01760	All	Suggested	7.8.1.0 FlashCopy map progress appears to be stuck at zero percent (show details)	FlashCopy
HU01786	All	Suggested	7.8.1.8 An issue in the monitoring of SSD write endurance can result in false 1215/2560 errors in the Event Log (show details)	Drives
HU01790	All	Suggested	7.8.1.8 On the Create Volumes page the Accessible I/O Groups selection may not update when the Caching	Graphical User Interface

APAR	Affected Products	Severity	Resolved in Description		Feature Tags
		Select Severity			
			I/O group selection is changed (show details)		
HU01793	All	Suggested	7.8.1.8	The Maximum final size value in the Expand Volume dialog can display an incorrect value preventing expansion (show details)	Graphical User Interface
HU02028	All	Suggested	7.8.1.8	An issue, with timer cancellation, in the Remote Copy component may cause a node warmstart (show details)	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
IT19561	All	Suggested	7.8.1.8	An issue with register clearance in the FC driver code may cause a node warmstart (show details)	Reliability Availability Serviceability

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
IT22591	All	Suggested	7.8.1.8	An issue in the HBA adapter firmware may result in node warmstarts (show details)	Reliability Availability Serviceability
IT24900	V7000, V5000	Suggested	7.8.1.8	Whilst replacing a control enclosure midplane an issue at boot can prevent VPD being assigned delaying a return to service (show details)	Reliability Availability Serviceability
IT26836	V7000, V5000	Suggested	7.8.1.8	Loading drive firmware may cause a node warmstart (show details)	Drives
HU01802	All	Critical	7.8.1.7	USB encryption key can become inaccessible after upgrade. If the system is later rebooted	Encryption

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			then any encrypted volumes will be unavailable (show details)	
HU01785	All	High Importance	An 7.8.1.7 issue with memory mapping may lead to multiple node warmstarts (show details)	
HU01792	All	HIPER	When 7.8.1.6 a DRAID array has multiple drive failures and the number of failed drives is greater than the number of rebuild areas in the array it is possible that the storage pool will be taken offline during the copyback	Distributed RAID

APAR	Affected Products	Severity	Description	Feature Tags
			phase of a rebuild. For more details refer to this Flash (show details)	
HU01866	SVC	HIPER	7.8.1.6 A faulty PSU sensor, in a node, can fill the sel log causing the service processor (BMC) to disable logging. If a snap is subsequently taken, from the node, a timeout will occur and it will be taken offline. It is possible for this to affect both nodes in	System Monitoring

APAR	Affected Products	Severity	Description	Resolution in	Feature Tags

Select Severity

an I/O group (show details)

| HU01524 | All | Critical | When a system loses input power, nodes will shut down until power is restored. If a node was in the process of creating a bad block for an MDisk, at the moment it shuts down, then there is a chance that the system will hit repeated Tier 2 recoveries when it powers back up (show details) | 7.8.1.6 | RAID |

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
HU01767	All	Critical	7.8.1.6	Reads of 4K/8K from an array can under exceptional circumstances return invalid data. For more details refer to this Flash (show details)	RAID, Thin Provisioning
IT17919	All	Critical	7.8.1.6	A rare timing window issue in the handling of Remote Copy state can result in multi-node warmstarts (show details)	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01420	All	High Importance	7.8.1.6	An issue in DRAID can cause repeated node warmstarts in the circumstances of a degraded copyback operation to a	Distributed RAID

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			drive (show details)		
HU01476	All	High Importance	A remote copy relationship may suffer a loss of synchronisation when the relationship is renamed (show details)	7.8.1.6	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01623	All	High Importance	An issue in the handling of inter-node communications can lead to latency for Remote Copy relationships (show details)	7.8.1.6	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01630	All	High Importance	When a system with FlashCopy mappings is upgraded there may be multiple node warmstarts (show details)	7.8.1.6	FlashCopy
HU01697	All	High Importance	A timeout issue in RAID	7.8.1.6	RAID

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			member management can lead to multiple node warmstarts (show details)		
HU01771	SVC, V7000	High Importance	An issue with the CMOS battery in a node can cause an unexpectedly large log file to be generated by the BMC. At log collection the node may be taken offline (show details)	7.8.1.6	System Monitoring
HU01446	All	Suggested	When a host workload overloads the back-end controller and VMware hosts are issuing ATS commands a race condition	7.8.1.6	Hosts

APAR	Affected Products	Severity	Description	Feature Tags
			may be triggered leading to a node warmstart (show details)	
HU01472	All	Suggested	7.8.1.6 A locking issue in Global Mirror can cause a warmstart on the secondary cluster (show details)	Global Mirror
HU01619	All	Suggested	7.8.1.6 A misreading of the PSU register can lead to failure events being logged incorrectly (show details)	System Monitoring
HU01628	All	Suggested	7.8.1.6 In the GUI on the Volumes page whilst using the filter function some volumes entries may not be	Graphical User Interface

APAR	Affected Products	Severity	Description Resolution	Feature Tags
			displayed until the page has completed loading (show details)	
HU01664	All	Suggested	A timing window issue during an upgrade can cause the node restarting to warmstart stalling the upgrade (show details)	System Update
HU01698	All	Suggested	A node warmstart may occur when deleting a compressed volume if a host has written to the volume minutes before the volume is deleted (show details)	Compression
HU01740	All	Suggested	The timeout setting for key server	Encryption

Severity: Select Severity

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
			commands may be too brief, when the server is busy, causing those commands to fail (show details)		
HU01747	All	Suggested	The incorrect detection of a cache issue can lead to a node warmstart (show details)	7.6.1.6	Cache
HU00247	All	Critical	A rare deadlock condition can lead to a RAID5 or RAID6 array rebuild stalling at 99% (show details)	7.8.1.5	Distributed RAID, RAID
HU01620	All	Critical	Configuration changes can slow critical processes and, if this coincides	7.8.1.5	Transparent Cloud Tiering

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			with cloud account statistical data being adjusted, a Tier 2 recovery may occur (show details)	
IC57642	All	Critical	7.8.1.5 A complex combination of failure conditions in the fabric connecting nodes can result in lease expiries, possibly cluster-wide (show details)	Reliability Availability Serviceability
IT19192	All	Critical	7.8.1.5 An issue in the handling of GUI certificates may cause warmstarts leading to a Tier 2 recovery (show details)	Graphical User Interface, Reliability Availability Serviceability
IT23747	All	High Importance	7.8.1.5 For large drive sizes the	Distributed RAID

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
		Select Severity	DRAID rebuild process can consume significant CPU resource adversely impacting system performance (show details)	
HU01655	All	Suggested	7.8.1.5 The algorithm used to calculate an SSDs replacement date can sometimes produce incorrect results leading to a premature End-of-Life error being reported (show details)	Drives
HU01679	All	Suggested	7.8.1.5 An issue in the RAID component can very occasionally cause a single node warmstart (show details)	RAID
HU01687	All	Suggested	7.8.1.5 For volumes by host,	Graphical User Interface

APAR	Affected Products	Severity	Description	Resolution in	Feature Tags
		Select Severity			
			ports by host and volumes by pool pages in the GUI when the number of items is greater than 50 then the item name will not be displayed (show details)		
HU01704	All	Suggested	In systems using HyperSwap a rare timing window issue can result in a node warmstart (show details)	7.8.1.5	HyperSwap
HU01724	All	Suggested	An I/O lock handling issue between nodes can lead to a single node warmstart	7.8.1.5	RAID

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
				(show details)	
HU01729	All	Suggested	Remote copy uses multiple streams to send data between clusters. During a stream disconnect a node, unable to progress, may warmstart (show details)	7.8.1.5	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01730	SVC	Suggested	When running the DMP for a 1046 error the picture may not indicate the correct position of the failed adapter (show details)	7.8.1.5	GUI Fix Procedure
HU01731	SVC, V7000, V5000	Suggested	When a node is placed into service mode it is possible for all	7.8.1.5	Compression

APAR	Affected Products	Severity	Description / Resolution	Feature Tags
		Select Severity		
			compression cards within the node to be marked as failed [(show details)](#)	
HU01763	SVC	Suggested	7.8.1.5 A single node warmstart may occur on a DH8 config node when inventory email is created. The issue only occurs if this coincides with a very high rate of CLI commands and high I/O workload on the config node [(show details)](#)	Command Line Interface, System Monitoring
IT23140	All	Suggested	7.8.1.5 When viewing the licensed functions GUI page the	Graphical User Interface

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity	individual calculations for SCUs, for each tier, may be wrong. However the total is correct (show details)	
HU01706	All	HIPER	Areas of volumes written with all-zero data may contain non-zero data. For more details refer to this Flash (show details)	
HU01646	All	HIPER	A new failure mechanism in the 16Gb HBA driver can under certain circumstances lead to a lease expiry of the entire cluster	Reliability Availability Serviceability

Resolution

7.8.1.4

7.8.1.3

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity	(show details)	
HU01321	All	Critical	7.8.1.3 Multi-node warmstarts may occur when changing the direction of a remote copy relationship whilst write I/O to the (former) primary volume is still occurring (show details)	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01490	All	Critical	7.8.1.3 When attempting to add/remove multiple IQNs to/from a host the tables that record host-wwpn mappings can become inconsistent resulting in repeated node warmstarts across I/O groups (show details)	iSCSI
HU01549	All	Critical	7.8.1.3 During a	System Update, iSCSI

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
			system upgrade HyperV-clustered hosts may experience a loss of access to any iSCSI connected volumes (show details)	
HU01625	All	Critical	7.8.1.3 systems with a consistency group of HyperSwap or Metro Mirror relationships if an upgrade attempts to commit whilst a relationship is out of synch then there may be multiple warmstarts and a Tier 2 recovery (show details)	System Update, HyperSwap, Metro Mirror
IT23034	All	Critical	7.8.1.3 HyperSwap volumes and mirrored	HyperSwap

APAR	Affected Products	Severity	Resolved in / Description	Feature Tags
			copies, at a single site, using rmvolumecopy to remove a copy, from an auxiliary volume, may result in a cluster-wide warmstart necessitating a Tier 2 recovery (show details)	
HU01481	All	High Importance	7.8.1.3 A failed I/O can trigger HyperSwap to unexpectedly change the direction of the relationship leading to node warmstarts (show details)	HyperSwap
HU01525	All	High Importance	7.8.1.3 During an upgrade a resource locking issue in the compression component can	Compression, System Update

APAR	Affected Products	Severity	Resolution in	Description	Feature Tags
		Select Severity		cause a node to warmstart multiple times and become unavailable (show details)	
HU01569	SVC	High Importance	7.8.1.3	When compression utilisation is high the config node may exhibit longer I/O response times than non-config nodes (show details)	Compression
HU01584	All	High Importance	7.8.1.3	An issue in array indexing can cause a RAID array to go offline repeatedly (show details)	RAID
HU01614	All	High Importance	7.8.1.3	After a node is upgraded hosts defined as TPGS may have paths	Hosts

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity	Resolution	
			set to inactive (show details)	
HU01632	All	High Importance	A 7.8.1.3 congested fabric causes the Fibre Channel adapter firmware to abort I/O resulting in node warmstarts (show details)	Reliability Availability Serviceability
HU01636	V5000, V3700, V3500	High Importance	A 7.8.1.3 connectivity issue with certain host SAS HBAs can prevent hosts from establishing stable communication with the storage controller (show details)	Hosts
HU01638	All	High Importance	When 7.8.1.3 upgrading to v7.6 or later, if there is another cluster in the same zone which	System Update

APAR	Affected Products	Severity	Resolved in / Description	Feature Tags
			is at v5.1 or earlier then nodes will warmstart and the upgrade will fail (show details)	
HU01645	SVC	High Importance	7.8.1.3 After upgrading to v7.8 a reboot of a node will initiate a continual boot cycle (show details)	System Update
HU01385	All	Suggested	7.8.1.3 A warmstart may occur if a rmvolumecopy or rmrcrelationship command are issued on a volume while I/O is being forwarded to the associated copy (show details)	HyperSwap

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity		
HU01457	V7000	Suggested	7.8.1.3 In a hybrid V7000 cluster where one I/O group supports 10k volumes and another does not some operations on volumes may incorrectly be denied in the GUI (show details)	Graphical User Interface
HU01535	All	Suggested	7.8.1.3 An issue with Fibre Channel driver handling of command processing can result in a node warmstart (show details)	
HU01563	V7000	Suggested	7.8.1.3 Where an IBM SONAS host id is used it can under rare circumstances cause	

APAR	Affected Products	Severity	Resolution Description	Feature Tags
		Select Severity		
			a warmstart (show details)	
HU01582	All	Suggested	7.8.1.3 A compression issue in IP replication can result in a node warmstart (show details)	IP Replication
HU01624	All	Suggested	7.8.1.3 GUI response can become very slow in systems with a large number of compressed and uncompressed volume (show details)	Graphical User Interface
HU01631	All	Suggested	7.8.1.3 A memory leak in EasyTier when pools are in Balanced mode can lead to node warmstarts (show details)	EasyTier
HU01654	SVC, V7000, V5000	Suggested	7.8.1.3 There may be a node	HyperSwap

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
				warmstart when a switch of direction, in a HyperSwap relationship, fails to complete properly (show details)	
HU01239 & HU01255 & HU01586	All	HIPER	7.8.1.2	The presence of a faulty SAN component can delay lease messages between nodes leading to a cluster-wide lease expiry and consequential loss of access (show details)	Reliability Availability Serviceability
HU01626	All	High Importance	7.8.1.2	Node downgrade from v7.8.x to v7.7.1 or earlier (e.g. during an aborted upgrade) may prevent the node from	System Update

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
				rejoining the cluster. Systems that have already completed upgrade to v7.8.x are not affected by this issue (show details)	
HU01505	All	HIPER	7.8.1.1	A non-redundant drive experiencing many errors can be taken offline obstructing rebuild activity (show details)	Backend Storage, RAID
HU01570	V7000, V5000, V3700, V3500	HIPER	7.8.1.1	Reseating a drive in an array may cause the MDisk to go offline (show details)	Drives, RAID
IT20627	All	Critical	7.8.1.1	When Read-Intensive drives are used as quorum disks a	Quorum

APAR	Affected Products	Severity	Description / Resolution	Feature Tags
		Select Severity		
			drive outage can occur. Under some circumstances this can lead to a loss of access [(show details)](#)	
HU01477	V7000, V5000, V3700, V3500	High Importance	7.8.1.1 Due to the way enclosure data is read it is possible for a firmware mismatch between nodes to occur during an upgrade [(show details)](#)	System Update
HU01503	All	High Importance	7.8.1.1 When the 3PAR host type is set to legacy the round robin algorithm, used to select the MDisk port for	Backend Storage

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
				I/O submission to 3PAR controllers, does not work correctly and I/O may be submitted to fewer controller ports, adversely affecting performance (show details)	
HU01609 & IT15343	All	High Importance	7.8.1	When the system is busy, the compression component may be paged out of memory resulting in latency that can lead to warmstarts (show details)	Compression
IT19726	SVC	High Importance	7.8.1	Warmstarts may occur when the attached SAN fabric is congested and HBA transmit paths	Hosts

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			become stalled preventing the HBA firmware from generating the completion for a FC command (show details)	
HU00763 & HU01237	V7000, V5000, V3700, V3500	Suggested	7.8.1.1 A node warmstart may occur when a quorum disk is accessed at the same time as the login to that disk is closed (show details)	Quorum
HU01332	All	Suggested	7.8.1.1 Performance monitor and Spectrum Control show zero CPU utilisation for compression (show details)	System Monitoring
HU01353	All	Suggested	7.8.1.1 CLI allows the input of carriage	Command Line Interface

APAR	Affected Products	Severity	Description	Feature Tags
			return characters into certain fields, after cluster creation, resulting in invalid cluster VPD and failed node adds (show details)	
HU01391 & HU01581	V7000, V5000, V3700, V3500	Suggested	7.8.1.7 Storwize systems may experience a warmstart due to an uncorrectable error in the SAS firmware (show details)	Drives
HU01430	V7000, V5000, V3700, V3500	Suggested	7.8.1.6 Memory resource shortages in systems with 8GB of RAM can lead to node warmstarts (show details)	
HU01469	V3700, V3500	Suggested	7.8.1.6 Resource exhaustion in the iSCSI component can result	iSCSI

APAR	Affected Products	Severity	Resolution in / Description	Feature Tags
			in a node warmstart (show details)	
HU01471	V5000	Suggested	7.8.1 — Power system down using the GUI on V5000 causes the fans to run high while the system is offline but power is still applied to the enclosure (show details)	
HU01484	All	Suggested	7.8.1 — During a RAID array rebuild there may be node warmstarts (show details)	RAID
HU01496	SVC	Suggested	7.8.1 — SVC node type SV1 reports wrong FRU part number for compression accelerator	Command Line Interface

Select Severity

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity		(show details)	
HU01520	V3700, V3500	Suggested	Where the system is being used as secondary site for Remote Copy during an upgrade to v7.8.1 the node may warmstart (show details)	7.8.1	System Update, Global Mirror, Metro Mirror
HU01531	All	Suggested	Spectrum Control is unable to receive notifications from SVC/Storwize. Spectrum Control may experience an out-of-memory condition (show details)	7.8.1	System Monitoring
HU01566	SVC	Suggested	After upgrading, numerous 1370 errors are seen in the Event Log (show details)	7.8.1	System Update
IT19973	All	Suggested	Call home	7.8.1	

APAR	Affected Products	Severity	Resolution Description	Feature Tags
		Select Severity		
			emails may not be sent due to a failure to retry (show details)	
HU01474	SVC, V7000	HIPER	7.8.1.0 Host writes to a read-only secondary volume trigger I/O timeout warmstarts (show details)	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01479	All	HIPER	7.8.1.0 The handling of drive reseats can sometimes allow I/O to occur before the drive has been correctly failed resulting in offline MDisks (show details)	Distributed RAID
HU01483	All	HIPER	7.8.1.0 distributedarray command may get stuck in the prepare state.	Distributed RAID

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity		Any interaction with the volumes in that array will result in multiple warmstarts (show details)	
HU01675	V7000	HIPER	7.8.1.0	Memory allocation issues may cause GUI and I/O performance issues (show details)	Compression, Graphical User Interface
HU01220	All	Critical	7.8.1.0	Changing the type of a RC consistency group when a volume in a subordinate relationship is offline will cause a Tier 2 recovery (show details)	Global Mirror with Change Volumes, Global Mirror
HU01252	SVC	Critical	7.8.1.0	Where a SVC is presenting storage from an	

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
				8-node V7000, an upgrade to that V7000 can pause I/O long enough for the SVC to take related MDisks offline (show details)	
HU01416	All	Critical	8.1.0	ISL configuration activity may cause a cluster-wide lease expiry (show details)	Reliability Availability Serviceability
HU00747	V7000, V5000, V3700, V3500	High Importance	7.8.4.0	Node warmstarts can occur when drives become degraded (show details)	Backend Storage
HU01309	SVC	High Importance	7.6.1.0	For FC logins, on a node that is online for more than 200 days, if	Backend Storage

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
		Select Severity	a fabric event makes a login inactive then the node may be unable to re-establish the login (show details)	
HU01371	SVC, V7000, V5000	High Importance	7.8.1.0 A remote copy command related to HyperSwap may hang resulting in a warmstart of the config node (show details)	HyperSwap
HU01388	SVC, V7000, V5000	High Importance	7.8.1.0 Where a HyperSwap volume is the source of a FlashCopy mapping and the HyperSwap relationship is out of sync when the HyperSwap	HyperSwap, FlashCopy

APAR	Affected Products	Severity	Description	Feature Tags
			volume comes back online a switch of direction will occur and FlashCopy operation may delay I/O leading to node warmstarts (show details)	
HU01394	All	High Importance	7.8.1.0 Node warmstarts may occur on systems which are performing Global Mirror replication, due to a low-probability timing window (show details)	Global Mirror
HU01395	All	High Importance	7.8.1.0 Malformed URLs sent by security scanners whilst correctly discarded can cause considerable exception logging on config nodes leading	Global Mirror

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
			to performance degradation that can adversely affect remote copy (show details)		
HU01413	All	High Importance	Node warmstarts when establishing an FC partnership between a system on v7.7.1 or later with another system which in turn has a partnership to another system running v6.4.1 or earlier (show details)	7.8.1.0	Global Mirror, Global Mirror with Change Volumes, Metro Mirror
HU01428	V7000, V5000, V3700, V3500	High Importance	Scheduling issue adversely affects performance resulting in node warmstarts (show details)	7.8.1.0	Reliability Availability Serviceability
HU01480	All	High Importance	Under some circumstances the config node	7.8.1.0	Command Line Interface, Graphical User Interface

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
			does not fail over properly when using IPv6 adversely affecting management access via GUI and CLI (show details)		
IT19019	V5000	High Importance	V5000 control enclosure midplane FRU replacement may fail leading to both nodes reporting a 506 error (show details)	7.8.0.0	Reliability Availability Serviceability
HU01057	SVC	Suggested	Slow GUI performance for some pages as the lsnodebootdrive command generates unexpected output (show details)	7.8.1.0	Graphical User Interface
HU01404	All	Suggested	A node warmstart may occur when a new volume	7.8.1.0	

APAR	Affected Products	Severity	Resolution / Description	Feature Tags
			is created using fast format and foreground I/O is submitted to the volume (show details)	
HU01445	SVC, V7000	Suggested	7.8.0.0 Systems with heavily used RAID-1 or RAID-10 arrays may experience a node warmstart (show details)	
HU01463	All	Suggested	7.8.1.0 SSH Forwarding is enabled on the SSH server (show details)	
HU01466	SVC, V7000, V5000	Suggested	7.8.0.0 Stretched cluster and HyperSwap I/O routing does not work properly due to incorrect ALUA data (show details)	Hosts, HyperSwap

APAR	Affected Products	Severity	Description	Resolved in	Feature Tags
		Select Severity			
HU01470	All	Suggested	7.8.1.0 might fail during svcconfig recover - execute while running chemail if the email_machine_address contains a comma (show details)	7.8.1.0	Reliability Availability Serviceability
HU01473	All	Suggested	EasyTier migrates an excessive number of cold extents to an overloaded nearline array (show details)	7.8.1.0	EasyTier
HU01487	All	Suggested	Small increase in read response time for source volumes with additional FlashCopy maps (show details)	7.8.1.0	FlashCopy, Global Mirror with Change Volumes
HU01497	All	Suggested	A drive can still be offline even though the error is	7.8.1.0	Distributed RAID

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
				showing as corrected in the Event Log (show details)	
HU01498	All	Suggested	7.8.1.0	GUI may be exposed to CVE-2017-5638 (see Section 3.1)	Security
IT19232	V7000, V5000, V3700, V3500	Suggested	7.8.1.2	Storwize systems can report unexpected drive location errors as a result of a RAID issue (show details)	
HU01225 & HU01330 & HU01412	All	Critical	7.8.0.2	Node warmstarts due to inconsistencies arising from the way cache interacts with compression (show details)	Cache, Compression
HU01410	SVC	Critical	7.8.0.2	An issue in the handling of FlashCopy map	FlashCopy

APAR	Affected Products	Severity	Resolution Description	Feature Tags
		Select Severity		
			preparation can cause both nodes in an I/O group to be put into service state [(show details)](#)	
HU01442	All	Critical	7.8.0.2 Upgrading to v7.7.1.5 or v7.8.0.1 with encryption enable will result in multiple Tier 2 recoveries and a loss of access [(show details)](#)	Encryption, System Update
HU00762	All	High Importance	7.8.0.2 Due to an issue in the cache component, nodes within an I/O group are not able to form a caching-pair and	Cache

APAR	Affected Products	Severity	Description / Resolution in	Feature Tags
		Select Severity		
			are serving I/O through a single node (show details)	
HU01409	All	High Importance	Cisco Nexus 3000 switches at v5.0(3) have a defect which prevents a config node IP address changing in the event of a fail over (show details) 7.8.0.2	Reliability Availability Serviceability
HU01426	All	High Importance	Systems running v7.6.1 or earlier, with compressed volumes, that upgrade to v7.8.0 or later will fail when the first node warmstarts and enters a service state 7.8.0.2	System Update

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
		Select Severity			
HU01432	All	Suggested	Node warmstart due to an accounting issue within the cache component (show details)	7.8.0.2	Cache
HU01459	V7000, V5000	Suggested	The event log indicates incorrect enclosure type (show details)	7.8.0.2	System Monitoring
IT18752	All	Suggested	When the config node processes an lsdependentvdisks command, issued via the GUI, that has a large number of objects in its parameters, it may warmstart (show details)	7.8.0.2	Graphical User Interface
HU01382	All	HIPER	Mishandling of extent migration following a rmarray command can	7.8.0.2	Distributed RAID

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
			lead to multiple simultaneous node warmstarts with a loss of access (show details)	
HU01415	V3700	Critical	7.8.0.1 When a V3700 with 1GE adapters is upgraded to v7.8.0.0 iSCSI hosts will lose access to volumes (show details)	iSCSI, Hosts
HU01193	All	HIPER	7.8.0.0 A drive failure whilst an array rebuild is in progress can lead to both nodes in an I/O group warmstarting (show details)	Distributed RAID
HU01379	All	HIPER	7.8.0.0 Resource leak in the handling of	Drives

APAR	Affected Products	Severity	Description	Resolution	Feature Tags
				Read Intensive drives leads to offline volumes (show details)	
HU00906	All	Critical	When a compressed volume mirror copy is taken offline, write response times to the primary copy may reach prohibitively high levels leading to a loss of access to that volume (show details)	7.8.0.0	Compression, Volume Mirroring
HU01021 & HU01157	All	Critical	A fault in a backend controller can cause excessive path state changes leading to node warmstarts and offline volumes	7.8.0.0	Backend Storage

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity	(show details)	
HU01267	All	Critical	7.8.0.0 An unusual interaction between Remote Copy and FlashCopy can lead to both nodes in an I/O group warmstarting (show details)	Global Mirror with Change Volumes
HU01320	All	Critical	7.8.0.0 A rare timing condition can cause hung I/O leading to warmstarts on both nodes in an I/O group. Probability can be increased in the presence of failing drives. (show details)	Hosts
HU01340	All	Critical	7.8.0.0 A port translation issue between v7.5 or earlier	System Update

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity		
			and v7.7.0 or later requires a Tier 2 recovery to complete an upgrade (show details)	
HU01392	All	Critical	7.8.0 Under certain rare conditions FC mappings not in a consistency group can be added to a special internal consistency group resulting in a Tier 2 recovery (show details)	FlashCopy
HU01455	All	Critical	7.8.0 VMware hosts with ATS enabled can see LUN disconnects to volumes when GMCV is used (show details)	Global Mirror with Change Volumes

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
HU01519	V7000	Critical	7.8.0.0	One PSU may silently fail leading to the possibility of a dual node reboot (show details)	Reliability Availability Serviceability
HU01635	All	Critical	7.8.0.0	A slow memory leak in the host layer can lead to an out-of-memory condition resulting in offline volumes or performance degradation (show details)	Hosts, Performance
HU01783	All	Critical	7.8.0.0	Replacing a failed drive in a DRAID array, with a smaller drive, may result in multiple Tier 2 recoveries putting	Distributed RAID

APAR	Affected Products	Severity	Resolution in Description	Feature Tags
			all nodes in service state with error 564 and/or 550 (show details)	
HU01831	All	Critical	Closed-wide warmstarts may occur when the SAN delivers a FDISC frame with an invalid WWPN (show details)	Reliability Availability Serviceability
HU01177	All	High Importance	7.8.0.0 A small timing window issue exists where a node warmstart or power failure can lead to repeated warmstarts of that node until a node rescue is performed (show details)	Reliability Availability Serviceability

APAR	Affected Products	Severity	Resolved in	Description	Feature Tags
		Select Severity			
HU01223	All	High Importance	7.8.0.0	The handling of a rebooted nodes return to the cluster can occasionally become delayed resulting in a stoppage of inter-cluster relationships (show details)	Metro Mirror
HU01254	SVC	High Importance	7.8.0.0	A fluctuation of input AC power can cause a 584 error on a node (show details)	Reliability Availability Serviceability
HU01268	V7000, V5000, V3700, V3500	High Importance	7.8.0.0	Upgrade to 7.7.x fails on Storwize systems in the replication layer where a T3 recovery was performed in the past	System Update

APAR	Affected Products	Severity	Resolution in	Feature Tags
		Select Severity		
			(show details)	
HU01347	All	High Importance	7.8.0.0 During an upgrade to v7.7.1 a deadlock in node communications can occur leading to a timeout and node warmstarts (show details)	Thin Provisioning
HU01381	All	High Importance	7.8.0.0 A rare timing issue in FlashCopy may lead to a node warmstarting repeatedly and then entering a service state (show details)	FlashCopy
HU01402	V7000	High Importance	7.8.0.0 Nodes can power down unexpectedly as they are unable to determine from their partner whether power	Reliability Availability Serviceability

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity	is available (show details)	
HU01488	V7000, V5000	High Importance	7.8.0.0 SAS transport errors on an enclosure slot have the potential to affect an adjacent slot leading to double drive failures (show details)	Drives
IT14917	All	High Importance	7.8.0.0 Node warmstarts due to a timing window in the cache component. For more details refer to this Flash (show details)	Cache
IT16012	SVC	High Importance	7.8.0.0 Internal node boot drive RAID scrub process at 1am every Sunday can impact system	Performance

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
			performance (show details)	
IT17564	All	High Importance	7.8.0.0 All nodes in an I/O group may warmstart when a DRAID array experiences drive failures (show details)	Distributed RAID
HU00831	All	Suggested	7.8.0.0 Single node warmstart due to hung I/O caused by cache deadlock (show details)	Cache
HU01098	All	Suggested	7.8.0.0 Some older backend controller code levels do not support C2 commands resulting in 1370 entries in the Event Log for every detectmdisk (show details)	Backend Storage
HU01213	All	Suggested	7.8.0.0 The LDAP password	LDAP

APAR	Affected Products	Severity	Description/Resolution	Feature Tags
		Select Severity	is visible in the auditlog (show details)	
HU01228	All	Suggested	7.8.0.0 Automatic T3 recovery may fail due to the handling of quorum registration generating duplicate entries (show details)	Reliability Availability Serviceability
HU01229	V7000, V5000, V3700, V3500	Suggested	7.8.0.0 The DMP for a 3105 event does not identify the correct problem canister (show details)	GUI Fix Procedure
HU01230	All	Suggested	7.8.0.0 A host aborting an outstanding logout command can lead to a single node warmstart (show details)	
HU01247	All	Suggested	7.8.0.0 When a FlashCopy consistency group	FlashCopy

APAR	Affected Products	Severity	Resolved in Description	Feature Tags
		Select Severity		
			is stopped more than once in rapid succession a node warmstart may result (show details)	
HU01264	All	Suggested	7.8.0.0 Node warmstart due to an issue in the compression optimisation process (show details)	Compression
HU01269	All	Suggested	7.8.0.0 A rare timing conflict between two process may lead to a node warmstart (show details)	
HU01304	All	Suggested	7.8.0.0 SSH authentication fails if multiple SSH keys are configured on the client (show details)	
HU01323	All	Suggested	7.8.0.0 Systems using Volume	Volume Mirroring

APAR	Affected Products	Severity	Description / Resolved in	Feature Tags
		Select Severity		
			Mirroring that upgrade to v7.7.1.x and have a storage pool go offline may experience a node warmstart (show details)	
HU01370	All	Suggested	7.8.0.0 — lsfabric command may not list all logins when it is used with parameters (show details)	Command Line Interface
HU01374	All	Suggested	7.8.0.0 — Where an issue with Global Mirror causes excessive I/O delay, a timeout may not function resulting in a node warmstart (show details)	Global Mirror
HU01399	All	Suggested	7.8.0.0 — For certain config nodes	Command Line Interface

APAR	Affected Products	Severity	Description	Feature Tags
		Select Severity		
			the CLI Help commands may not work (show details)	
IT17302	V5000, V3700, V3500	Suggested	Unexpected 2189000 450341042 entries in the Event Log (show details)	System Monitoring
IT18086	All	Suggested	When 736000 a volume is moved between I/O groups a node may warmstart (show details)	

4. Useful Links

Description	Link
Support Websites	- SAN Volume Controller - Storwize V7000 - Storwize V5000 - Storwize V3700 - Storwize V3500
Update Matrices, including detailed build version	All Products
Support Information pages providing links to the following information: - Interoperability information - Product documentation - Limitations and restrictions, including maximum configuration limits	- SAN Volume Controller - Storwize V7000 - Storwize V5000 - Storwize V3700 - Storwize V3500

Description	Link
Supported Drive Types and Firmware Levels	- [V7000](#) - [V5000](#) - [V3500 & V3700](#)
SAN Volume Controller and Storwize Family Inter-cluster Metro Mirror and Global Mirror Compatibility Cross Reference	- [All Products](#)
Software Upgrade Test Utility	- [All Products](#)
Software Upgrade Planning	- [All Products](#)