



CATE Storage & Backup Engineering
Citi Architecture & Technology Engineering

FAST VP on VMAX20K / VMAX40K

CSBE-11010-RN

Release Notes

Version 2.7

Version Control

Version	Date	Author	Comments
0.1	15 th June 2011	Chris Clayton	Initial release
0.2	2 nd November 2011	Chris Clayton	Added issues on EFD disk erasure and requirement to have more than a device in no more than one storage group in use by FAST VP.
1.0	17 th November	Chris Clayton	Production Release
1.1	8 th June 2012	Chris Clayton	FC RAID protection for new purchases changed from RAID6 to RAID1
1.2	4 th January 2013	Chis Clayton	Added support for 5876 code.
2.0	24 th April 2013	Chis Clayton	Added support for VMAX40K
2.1	18 th June 2013	Carl Williams	Updated for new in-family 5876 code support
2.2	29 th October 2013	Carl Williams	Updated for new in-family 5876 code support Added note on ACE communication bug encountered in NAM Re-tested ZSR on FAST devices – Removed requirement of pinning devices following testing.
2.3	01 st Feb 2014	Carl Williams	Updated in line with SE 7.6 release
2.4	14 th May 2014	Carl Williams	Updated for new in-family 5876 code support
2.5	15 th August 2014	Carl Williams	Update for 5876 epack
2.6	14 th November 2014	Carl Williams	Update for 5876 epack
2.7	09 th February 2015	Carl Williams	Updated for new in-family 5876 code support

Legal Notice

Information contained herein is for Internal Use and may be used only for business purposes authorized by Citigroup.

CITI, CITIBANK, CITICORP and CITIGROUP are trademarks and service marks of Citicorp and are used and registered throughout the world. Citibank, Citicorp, Citigroup and their subsidiaries also claim rights in certain other trademarks and service marks contained in these pages.

Contact

Please address any comments or questions regarding the information contained in this document via email to the “CATE Storage and Backup Engineering” distribution list or alternatively to dl.CATE.Storage.and.Backup.Engineering.

Latest Versions

It is recommended that the latest version of the document be used from the CSBE website <https://catecollaboration.citigroup.net/domains/platstor/gdse/products/techstdshmpgs/symmetrix.aspx>. Newer versions may include expanded scope, or comments on issues discovered after deployment.

Table of Contents

Version Control	2
Legal Notice	2
Contact.....	3
Latest Versions.....	3
Table of Contents.....	3
1 VMAX FAST VP Certification Matrix	4
2 References	5
3 CATE supported FAST configurations for new deployments	6
3.1 18“Silver” (normal production) FAST configurations	6
3.2 “Gold” (franchise critical) FAST configurations	6
4 Known Issues	7
4.1 SPA2.2 compatibility with VMAX40K	7
4.2 Storage Group membership	7
4.3 Skewed workloads.....	7

1 VMAX FAST VP Certification Matrix

Certification Matrix		
Storage arrays supported	V-MAX20K & VMAX40K only (not VMAX10K)	
Solutions Enabler Version	Recommended: 7.6 with 5876 (VMAX20K & VMAX40K) Supported: 7.5 with 5876 (VMAX20K & VMAX40K) 7.3 with 5875 (VMAX20K only until Q1 2014)	
Microcode Version	Recommended: VMAX20K: 5876.272.177 – Epack 004 VMAX40K: 5876.272.177 – Epack 004 Citi Supported as prior release : VMAX20K & VMAX40K: 5876.268.174 – Epack 5876_268_0159_174_5032_optimizer_10_2_7_76.exe - w31	
V-MAX FAST with SRDF Configurations	FAST V1 Standard (thick) Storage	FAST VP Virtually Provisioned (thin) Storage
2-Site SRDF/S	Will not be certified	Not certified, due to bugs and lack of deployment opportunities.
2-Site SRDF/A	Will not be certified	Not certified, due to bugs and lack of deployment opportunities.
3-Site SRDF/EDP (dataless bunker)	Will not be certified	No plans to certify (3-Site SRDF/EDP now a restricted product)

3-Site Cascaded SRDF	Will not be certified	No plans to certify (3-Site Cascaded SRDF now a restricted product)
3-Site Concurrent SRDF/Star	Will not be certified	No plans to certify (3-Site SRDF/Star now a restricted product)

2 References

Document	Location
EMC documentation	
Implementing FAST VP for EMC Symmetrix VMAX Series Arrays Technical Notes	https://catecollaboration.citigroup.net/domains/platstor/gdse/products/platforms/Symmetrix/Implementing_FASTVP_TechnicalNotes_.pdf
GDSE documentation	
FAST VP - Directives & Best Practice for VMAX20K & VMAX40K	http://catecollaboration.citigroup.net/domains/platstor/gdse/products/platforms/Symmetrix/11010-sg.pdf
VMAX FAST VP Test Results	https://catecollaboration.citigroup.net/domains/platstor/gdse/products/Eval/CSBE-10050-TR.pdf
EMC Symmetrix VMAX Virtual Provisioning Core Policies and Directives	http://catecollaboration.citigroup.net/domains/platstor/gdse/products/platforms/Symmetrix/09058-sg.pdf
VMAX Virtual LUN – Directives and Best Practice	https://catecollaboration.citigroup.net/domains/platstor/gdse/products/platforms/Symmetrix/09033-SG.pdf

3 CATE supported FAST configurations for new deployments

3.1 18“Silver” (normal production) FAST configurations

These configurations are intended for most applications.

Chris Clayton - 10th April 2013													
VMAX40K	Number of Engines	Thin Pool Capacity (Eng TB)	EFD drives per loop	SAS drives per loop	SATA drives per loop	EFD drives	SAS drives	SATA drives	Additional Spare Drive Count	Total Drives	% of EFD capacity	% of FC capacity	% of SATA capacity
"New Small" FAST VP config VMAX40K 4-Engine (4 * 96GB) (384 GB total cache) - 100GB 2.5" SSD RAID5(3+1) - 300GB 2.5" 10K SAS RAID1 - 1TB 2.5" SATA RAID6(6+2)	4	216	4	20	6	128	640	192	4*EFD 14*SAS 4*1TB	982	4%	39%	57%
"New Medium" FAST VP config VMAX40K 4-Engine (4 * 96GB) (384 GB total cache) - 100GB 2.5" SSD RAID5(3+1) - 300GB 2.5" 10K SAS RAID1 - 1TB 2.5" SATA RAID6(6+2)	4	315	6	28	9	192	896	288	4*EFD 18*SAS 6*1TB	1404	4%	37%	59%

See CATE "FAST VP - Directives & Best Practice for VMAX20K & VMAX40K" for further details.

3.2 "Gold" (franchise critical) FAST configurations

This configuration is only for Franchise Critical applications.

VMAX40K 2-tier "GOLD" FAST	Number of Engines	Thin Pool Capacity (Eng TB)	EFD drives per loop	SAS drives per loop	SATA drives per loop	EFD drives	SAS drives	SATA drives	Additional Spare Drive Count	Total Drives	% of EFD capacity	% of FC capacity	% of SATA capacity
"Small Gold" FAST VP config VMAX40K 4-Engine (4 * 192GB) (768GB total cache) - 100GB 2.5" SSD RAID5(3+1) - 300GB 2.5" 10K SAS RAID1	4	189	6	42	0	192	1344	0	4*EFD 28*SAS	1568	6.8%	93.2%	0%

See CATE "FAST VP - Directives & Best Practice for VMAX20K & VMAX40K" for further details Appendix H for further details on 2-Tier FAST VP configurations.

4 Known Issues

4.1 SPA2.2 compatibility with VMAX40K

SPA 2.2 is not fully compatible with VMAX40K. Unisphere for VMAX must be used instead with VMAX40K.

https://catecollaboration.citigroup.net/domains/platstor/gdse/products/platforms/Symmetrix/CSBE-12025-SG_UniVMAX.pdf

See also the FAST VP Solutions Guide for advice on how to use Unisphere with FAST VP.

4.2 Storage Group membership

A device cannot belong to more than one storage group in use by FAST.

Hence, in cluster configurations, a single (shared) storage group (SG) should be used for disks that are to be shared between members. If each host has its own storage group (i.e. the same device may appear in multiple SGs), then it will not be possible to bring all SGs under FAST VP control, and potentially resulting in some devices unique to a storage group not being managed by FAST VP.

Devices that are unique to a host can and should go into the host-specific SG.

4.3 Skewed workloads

FAST VP is only suitable for workload with high-to-moderate skew. A skewed workload is one where majority of the I/O goes to a minority of the storage. The following diagram shows a real-world workload where device activity is high for a very small percentage of the storage and this would move to flash, providing good response for the application for the storage with the heaviest I/O.

