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Symmetrix director flags (bits) 1 comment

The following FA director flag settings need to be configured to support Windows Server 2003 and 2008

- Common Serial Number **(C)**
- Host SCSI Compliance 2007 **(OS2007)**
- SCSI-3 SPC-2 Compliance **(SPC2)**
- SCSI-3 compliance **(SC3)**
- For FC Switch Base Topology (FC−SW), Enable Auto Negotiation **(EAN)**, Point−to−Point **(PP)** , Unique WWN **(UWN)**.
- For FC Loop Base Topology (FC−AL), Enable Auto Negotiation **(EAN)**, Unique World Wide Name **(UWN)**

Additionally for Windows 2008 Failover Cluster, the Persistent Reservation attribute **SCSI3_persist_reserv** must be enabled on each Symmetrix DMX device used. This should **NOT** be done to devices for Windows 2003 clusters. EMC recommends that the SCSI3_persist_reserv attribute be only set on devices that require it.

Director flags can be set globally for each director, and the below example will show this configuration information. See "Setting Port Characteristics" in the Solutions Enabler Symmetrix Array Controls CLI Product Guide and Solutions Enabler Symmetrix Configuration Change CLI Product Guide for detailed information on changing the SCSI protocol Port Flags and the Fibre Protocol Port Flags.

Please note, making changes globally for each director will affect all hosts connected to that port. In most instances where there are multiple types of hosts (Linux, Windows, Solaris) it may be a better option to set it per initiator.

To see the current director flag settings, run the following Solutions Enabler command:

symcfg list -sid xxxx -v -dir all

You can also set any of the director flags per host initiator. See "Setting the HBA port flags" in the Solutions Enabler Symmetrix Array Controls CLI Product Guide or see "Setting the Heterogeneous Host Configuration" in the *Solutions Enabler Symmetrix Device Masking CLI Product Guide* for detailed information. If the Symmetrix is running an Enginuity version earlier than 5671.68.71, 5771.104.114, or 5772.55.51 the **OS2007** flag can only be enabled via a CE or symconfigure bin file change. Refer to solution emc183161 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc183161) for details.

To display what director flags have been set per host initiator, run the following Solutions Enabler command.

symmaskdb -sid XXXX list database -v (without the -v you will not see the flags)

To enable the necessary director flags for an initiator on director 4a port 0 using symmask:

symmask -sid xxxx -wwn xxxxxxxxxxxx -dir 4a -p 0 set hba_flags on C,OS2007,SC3,SPC2 -enable

symmask refresh (this command is required after performing the above command)

To enable the necessary director flags for an initiator group using Symaccess:

symaccess -sid xxxx -type init -name myig1 set ig_flags on C,OS2007,SC3,SPC2 -enable

To display the flags from the previous command using symmaccess:

symaccess -sid xxxx -type init show myig1 -detail

To enable the SC3, SPC2 & OS2007 flags globally on the FA 1D port 0 via symconfigure, create a text file similar to below..

set port 1d:0 SCSI_3=enable, SPC2_Protocol_Version=enable, SCSI_Support1=enable;

Notes:	**Can these flags be changed with the Symmetrix online?** ○ Yes, the SC-3, SPC-2, and OS2007 Edit Director flags can be enabled with the Symmetrix ○ These flags can be enabled via a EMC CE applied bin file change. The flags may be chang may all be enabled simultaneously in one bin file change. This will invoke the online Cha Service Processor. The SymmWin Change_Director_Flags (CdfOnl) script will not set the if enabling the SPC-2 Edit Director flag in the bin file via an ECC or Solutions Enabler co the EMC software will require that the affected FA ports be set offline before the activity *Controls CLI Product Guide* for details or refer to solution emc191535 (http://knowledgeba clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultTyp ○ Otherwise, the SC-3, SPC-2 and OS2007 Edit Director flags can be enabled on a fibre char online) using the Solutions Enabler *symmask set hba_flags* (or *symmask set heterogeneous*) co ○ Use of the Solutions Enabler *symmask set hba_flags* command is an EMC Best Practice reco an individual FA/HBA WWN basis. This ensures that only the hosts that require these Ed ○ In all cases, the changed state of these Edit Director flags will not be detected until the ho fibre channel (FA) or iSCSI (SE) port. **Note:** For more information on the above Solutions Enabler commands refer to the *Soluti* available from Powerlink (http://powerlink.emc.com/km/appmanager/km/secureDesktop Advisories > Software ~ S ~ Documentation > Solutions Enabler > v7.x (or Pre-v7.x) > Ger **Can these flags be changed with the hosts online?** ○ Yes, however a host reboot is required. ○ The EMC Windows and UNIX Solution Support advice is to always reboot the affected h the only way to be 100% safe and completely certain that the required changes has been ○ Use the Solutions Enabler *symmask set hba_flags* command (EMC Best Practice advice) to This will avoid the need to reboot other attached hosts (connected to the same Symmetri Edit Director flags. ○ This advice applies to Windows, HP-UX, and VMware host environments. Refer to emc7 (http://knowledgebase.emc.com/emcice/documentDisplay.do? clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultTyp for additional information on how to successfully migrate a VMware host environment f ○ If a host reboot is not be feasible, contact your local EMC Support Representative for adv

The Symmetrix Edit Director bit settings (iSCSI or Fibre Channel port flags) must be set to match the VMware ESX requirements as listed in the E-Lab Interoperability Navigator (or downloadable EMC Support Matrix) available via Powerlink (http://powerlink.emc.com/).

This advice applies to all VMware ESX releases including ESX 4.0. From the Powerlink home page go to Support > Interoperability and Product Lifecycle Information > E-Lab Interoperability Navigator > Launch E-Lab Interoperability Navigator.

For example (Symmetrix 8000 at 556x with VMware 1.5 / 2.x):

- PTOP for FC-SW OR HDAD for FC-AL
- VCM if using Volume Logix (optional)
- UWN for Unique WWN
- SC3 for heterogeneous port sharing (optional)
- C or common serial number bit

Similarly the legal bin file LUN values for VMware ESX are 000 to 0FF (255) as dictated by the VMkernel (and not the hosted operating system).

For example (Symmetrix DMX-3/4 at 577x with VMware 3.x, or above):

- Common serial number (C)
- Auto negotiation (EAN) enabled
- Fibrepath enabled on this port (VCM)
- SCSI 3 (SC3) (Optional)
- Unique Worldwide Name (UWN)
- SPC 2 (Decal) (SPC2) SPC 2 flag set

For example (Symmetrix DMX-3/4 at 577x with VMware ESX 4.0):

- Common serial number (C)
- Auto negotiation (EAN) enabled
- Fibrepath enabled on this port (VCM)
- SCSI 3 (SC3) (Optional)
- Unique Worldwide Name (UWN)
- SPC 2 (Decal) (SPC2) SPC 2 flag set
- OS2007 is optional (it can be enabled if required by other hosts in a port sharing heterogeneous host environment)

For example (Symmetrix V-Max at 587x with with VMware 3.5, VMware ESX 4.0):

- Common serial number (C)
- Auto negotiation (EAN) enabled
- Fibrepath enabled on this port (ACLX)
- SCSI 3 (SC3) (Optional)
- Unique Worldwide Name (UWN)
- SPC 2 (Decal) (SPC2) SPC 2 flag set
- OS2007 is optional (it can be enabled if required by other hosts in a port sharing heterogeneous host environment)

NOTE: Always refer to the E-Lab Interoperability Navigator or EMC Support Matrix (ESM) for the latest configuration advice.

NOTE: Always set the timeout values for the guest systems based on the requirements of each individual hosted operating system (OS). Refer to the the EMC Host Connectivity Guide (available from Powerlink (http://powerlink.emc.com/)) for each hosted OS. Refer to solution emc252033 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc252033) "*VMware ESX (Hypervisor) does not time I/O for a guest operating system. Thus the SCSI timeouts on commands issued by each VMware guest (Linux, Windows, Solaris) are those provided for these system*.".

For more information refer to the VMware web site at http://www.vmware.com/ (http://www.vmware.com/). Go to the Support & Downloads area and Technical Resource Center for the Storage/SAN Compatibility Guides.

Frequently Asked Question:

SPC-2 in a VMware environment:

The SPC-2 Edit Director flag is a requirement introduced with the release of VMware ESX version 3.0. This bin file setting (like all Edit Director flags) is a requirement of the VMkernel. It is not a requirement dictated by a hosted OS as the flag will not be visible to a hosted OS. The flag should only be enabled when this is specifically dictated by the requirements of ESX; as noted in the E-Lab Interoperability Navigator. Refer to solution emc117300 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc117300) for more information on the SPC-2 Edit Director flag.

Question: The server is running VMware 2.x and will be upgrading to VMware 3.5 (or above). How do I safely enable the SPC-2 flag?

Answer: Refer to the "**Enabling SPC-2 Compliancy on EMC Symmetrix DMX Devices Connected to VMware VI3 Environments**" Engineering White Paper available from Powerlink (http://powerlink.emc.com/km/live1/en_US/Offering_Technical/White_Paper/H4116-enabling-spc2-compl-emc-symmetrix-dmx-vmware-envnmt-wp.pdf). The procedure for enabling SPC-2 in a VMware ESX environment is detailed in this White Paper.

General summary: E-Lab recommends the VMware 2.x host at be taken offline before the SPC-2 bit is enabled. However, you CAN enable SPC-2 with the ESX 2.x host online (just prior to the planned upgrade). You must ensure that either the ESX host is the ONLY host attached to the director port before updating the bin file (via symconfigure or EMC CE applied bin file change) OR you must enable the SPC-2 flag on an individual HBA basis using the Solutions Enabler ***symmask set hba_flags on SPC2 enable*** commands. Refer to the **Solutions Enabler Symmetrix Array Controls CLI Product Guide** for more details (refer to solution emc149111 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc149111) for advice on enabling SPC-2 in a host / port sharing environment).

- Note that if you are upgrading from ESX Server 2.x to ESX Server 3.x *or above* you should enable the SPC-2 bit BEFORE you perform the upgrade from ESX Server 2.x to ESX Server 3.x *or above*.
- If you are enabling SPC-2 for VMware ESX v3.x AFTER upgrading from v2.x you will get a "**Snapshot – disabling access**" message when rebooting.
- This is due to the VMware VMFS3 looking at the altered SCSI Inquiry response from the iSCSI or Fibre Channel port and comparing this to the different (original) LUN ID signature written to the disks under FS3.
- Refer to the VMware Knowledge Base (KB) at http://kb.vmware.com/selfservice/microsites/microsite.do (http://kb.vmware.com/selfservice/microsites/microsite.do). Search for articles on "LUN detected as a snapshot because LUN presentation settings were incorrect" and "Resignaturing VMFS3 Volumes"with the specific symptom "You recently set the SPC-2 flag on the EMC Symmetrix storage array". These KB articles will resolve this problem.

Posted May 4, 2012 by g6237118

One response to “*Symmetrix director flags (bits)*”

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