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Symmetrix Non-Disruptive Enginuity Upgrade (NDU) Leave a comment

What happens during a Symmetrix NDU?

- The new Enginuity code is sent from the Symmetrix Service Processor to all Symmetrix directors. Once all directors have been loaded, a special synchronized Fast IML is performed on all directors to load this new code into active memory. This Fast IML is performed simultaneously on all Symmetrix directors (this is true of all Symmetrix models up to and including the VMAX Series). During this special NDU Fast IML step, all host I/O is paused as the data structures in Symmetrix Global Memory are updated. When upgrading from one Enginuity family to the next, the time required for this internal re-structuring will vary, depending on the size of the Symmetrix, the amount of physical cache, and whether there is a disk format change between the Enginuity families. This step, and the resulting pause in host I/O, is notably longer than the standard (non-NDU) Fast IML step performed during In-Family Code Upgrades or Online Configuration Changes.Note the following:
- - The Fast IML step of the NDU process (to activate the new Enginuity code) is performed simultaneously on all Symmetrix directors.
  - - This is true of Symmetrix configured for both CKD and FBA host environments. The Symmetrix product has never performed a sequential IML of either the disk directors or host channel adapters for any type of Enginuity code or configuration change.
  - PowerPath or other multi-pathing software is not required for a successful NDU upgrade. PowerPath or other multi-pathing software will not prevent possible impact during a Symmetrix NDU.
  - - In an open systems environment, the iSCSI (SE) or Fibre Channel (FA) directors are fully reset during the special NDU Fast IML step. During this special NDU Fast IML, all active host I/Os are discarded (at the appropriate safe point). All host login information is discarded. All FA, SE, and SRDF links are bounced as part of this IML process. This resetting of the SE and FA directors will force all attached switches and HBAs to log out and log back in to the Symmetrix. State Change Notifications are sent at the start and finish of the special NDU Fast IML step. All attached HBAs will need to re-drive the earlier discarded I/O. Multi-pathing software is not useful as all paths (all Symmetrix ports) are lost simultaneously.

  - There should be no host application failure messages or path failure messages during an NDU.
  - - Again, all host I/O is paused for a few seconds to tens of seconds during the special NDU Fast IML step. The Symmetrix NDU process is a non-disruptive activity if all of the EMC-recommended operating system timeout values, HBA driver versions, HBA driver settings, and switch firmware revisions are correct. If the HBA driver versions and HBA driver settings are correct, the temporary link outages are tolerated and will not be reported to

PowerPath or any other multi-pathing software. All HBAs should recover and resume host I/O well within the EMC-specified host timeout period.
    - If booting from the Symmetrix, additional care is required when planning an NDU. In some instances the affected hosts will need to be shutdown. This depends on the host type and Symmetrix model. Refer to solution emc92626 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc92626) for specific advice when boot devices reside in the Symmetrix. Contact the EMC Solution Support Center or your local EMC Service Representative for further information.

Since the Symmetrix NDU is an upgrade process that puts many parts of the storage environment under significant stress, note the following EMC Customer Service recommendations:

- It is critical that *all* of the EMC Engineering-recommended operating system timeout values, the HBA driver versions, the HBA driver settings, and switch firmware revision requirements are met. Refer to Powerlink and the E-Lab Navigator tool or check the latest Host Connectivity Guide for these values. Otherwise, contact the EMC Solution Support Center or your local EMC Service Representative for assistance.
- - These EMC-recommended driver and firmware versions and the EMC-recommended host and driver settings, reflect the results of extensive qualification testing by EMC Engineering.
  - To confirm that your storage environment is fully qualified for the NDU process you must run the EMCGrab utility on all hosts attached to the Symmetrix. You then need to verify the EMCGrab output using the EMC Host Environment Analysis Tool (HEAT). Refer to solution emc203900 (http://knowledgebase.emc.com/emcice/documentDisplay.do?clusterName=DefaultCluster&preview=1&groupId=1&page=&docType=1006&resultType=5002&docProp=$solution_id&docPropValue=emc203900). Any warnings in the HEAT output can then be investigated and resolved with assistance from your EMC Service Representative.
- It is crucial to have the EMC-recommended Edit Director flag settings applied before the NDU.
- - The recommended settings (refer to Powerlink and the E-Lab Navigator tool) reflect the results of extensive qualification testing by EMC Engineering.
  - Contact the EMC Solution Support Center or your local EMC Service Representative for assistance in confirming (or updating) your current Edit Director flag settings.
- EMC Engineering supports only Symmetrix NDU activities from the recommended target level (or later) for the existing or original Enginuity family to the target level (or later) for the new Enginuity family.

Note that an Enginuity NDU involving the Symmetrix VMAX Series is different to the NDU process of earlier Symmetrix models.

- Major changes have been made to the NDU function in Enginuity 5875 and later:
- - There is no cache format change from Enginuity 5874 to 5875. Therefore the time required for the special NDU Fast IML is the same as required for a VMAX “in-family” Enginuity upgrade.
  - The light on the FA ports is no longer dropped during the special NDU Fast IML step. Therefore all attached switches and HBAs no longer need to log out and log back in to the Symmetrix. I/O will be paused and queued but will resume immediately after the NDU Fast IML step.
  - The EMC-recommended driver and firmware versions and the EMC-recommended host and driver settings should always be set. However, the gathering and analysis of HEAT and EMCGrab outputs (or the use of E-Lab Advisor) before a VMAX NDU is no longer required.

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