

Key Encryption in Lifecycle Controller

This Dell Technical White Paper provides information about using the Key Encryption in Lifecycle Controller on on the 12th Generation servers and later of Dell.

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Executive Summary

This whitepaper provides information about using Key Encryption feature in Lifecycle Controller on Dell PowerEdge Servers.

Introduction

Key Encryption is a feature provided in Lifecycle Controller to enable local key encryption, rekey encryption, or delete the encryption key on storage controllers. This feature enables ease of operation by providing an easy-and-simple-to-use interactive GUI. The feature can be used if at least one security-capable controller is present in the system. Otherwise, the link is grayed-out.

Pre-requisits

A system must have any of the following security-capable storage controllers:

- H7XX Series or H7XXp series
- H8XX Series

Local Key Encryption

Local Key Encryption is used to generate an encryption key locally and applies the same on the storage controller.

To create Local Key Encryption:

- 1. Start Lifecycle Controller. In the left pane, click Hardware Configuration.
- 2. In the right pane, click Configuration Wizard.
- 3. Under Storage Configuration Wizards, click Key Encryption.
- 4. Select the **Storage Controller** on which you want to create a local key, and then click **Next**.

Select Controller	Configuration	Wizards: RAID Encr	yption Configurat	ion
Select Task Encryption Configuration	Step 1 of 3: Select the RAID control	ect Controller Iler for encryption configuratic apter in Slot 3 (Security Capa	n. ble)	
	Selected Controller En	cryption Mode: oter: No Encryption Virtual Disk Attributes		
	Selected Controller En PERC H710P Ada Selected Controller 1 Virtual Disks	cryption Mode: oter: No Encryption Virtual Disk Attributes RAID Level	Size (GB)	Encryption
	Selected Controller En PERC H710P Ada Selected Controller 1 Virtual Disks OS_VD	cryption Mode: oter: No Encryption Virtual Disk Attributes RAID Level RAID 0	Size (GB) 297.00	Encryption No
	Selected Controller En PERC H710P Ada Selected Controller 1 Virtual Disks OS_VD	cryption Mode: oter: No Encryption Virtual Disk Attributes RAID Level RAID 0	Size (GB) 297.00	Encryption No
	Selected Controller En PERC H710P Ada Selected Controller * Virtual Disks OS_VD	cryption Mode: oter: No Encryption Virtual Disk Attributes RAID Level RAID 0	Size (GB) 297.00	Encryption No
	Selected Controller En PERC H710P Ada Selected Controller 1 Virtual Disks OS_VD	cryption Mode: bter: No Encryption Virtual Disk Attributes RAID Level RAID 0	Size (GB) 297.00	Encryption No

Figure1. Select Storage Controller



5. Click Setup Local Key Encryption and click Next.



Figure2. Select Encryption Type

- 6. Type data in the following boxes and click **Finish**.
 - a. **Encryption Key Identifier**: Type a unique identifier that is used to identify the encryption key with which the virtual disks are encrypted. This feature enables you to identify the encryption key of the encrypted virtual disks.
 - b. **New Passphrase**: Type a security key to encrypt the virtual disks. The controller card uses this passphrase to encrypt the virtual disk data. A valid passphrase must have 8 to 32 characters. A passphrase must include a combination of upper- and lower case letters, numbers, symbols, and must not have white spaces.
 - c. **Confirm Passphrase**: Retype the passphrase to confirm. That is, the same security passphrase has to be entered in this field. If an incorrect passphrase is entered, the encryption key is not created, but a warning message is displayed.



Select Controller	Configuration Wizards: RAID Encryption Configuration
Encryption Configuration	Step 3 of 3: Encryption Configuration
	Enter a passphrase to end ypt the controller. Enter an Encryption Key Identifier that is displayed when the passphrase is required. Encryption Key Identifier New Passphrase Confirm Passphrase A valid passphrase contains 8-32 ASCI characters and includes a combination of uppercase and lowercase letters, numbers and symbols, and no spaces.
	Once disks are encrypted, they cannot be decrypted. Record the passphrase in a safe location as it cannot be retrieved or reset.

Figure 3. Encryption Configuration

Select Controller		Configuration Wizards: F	RAID Encryption Configuration	
Select Task	ation	Step 3 of 3: Encryption Co Enter a passphrase to encrypt the co Enter an Encryption Key Identifier that Encryption New Pass Confirm F Ontime Ava Iowa Confirm F Onc Confirm F	ntroller. t is displayed when the passphrase is required not match. Re-enter phrase and retry. CK	on of uppercase and se in a safe location as it
PowerEdge R620 Service Tag : HJE2D2	s		Cancel	Back Finish

Figure4. Message when passphrase does not match

After you type data in all the boxes, click **Finish**. Lifecycle controller validates the passphrase. If the passphrase fulfills all the criteria, a message is displayed.



Figure5. Security will be enabled on the controller

7. Click **Yes** to create an Encryption key. After successful creation of an ecryption key, a message is displayed.



Figure6. Encryption Key Successfully Created

Encrypting Unsecure Virtual Disks

This feature is used for securing the virtual disks created using RAID Configuration on security-capable disk drives (SEDs—Self Encryption–capable Disks).

To use this option, the pre-requisites are:

- The selected controller must be security-capable
- Self-encryption-capable disk drives with Virtual Disk created on them
- Controller is in local-key-encryption mode

To encrypt an unsecured virtual disk:

- 1. Start Lifecycle Controller. In the left pane, click Hardware Configuration.
- 2. In the right pane, click **Configuration Wizard**.
- 3. Under Storage Configuration Wizards, click Key Encryption.
- 4. Select the Storage Controller on which you want to enable this feature and click Next.
- 5. Click the Encrypt Unsecure Virtual Disk option, and then click Next.



Figure 7. Select Encrypt Unsecure Virtual Disks

6. Select a virtual disk you want to encrypt, and then click **Finish**.

Lifecycle Contr	roller Unified Server Conf	igurator		Help About Exit
Select Controller Select Task Encrypt Virtual Disks	Configuration	On Wizards: RAID En Encrypt Unsecure Virt al disks will be encrypted with er Encryption Mode: DP Mini: Local Key Encryption	tual Disks	Figuration
	Select the virtual Virtual Disks I sed_VD	Al disks RAID Level RAID 0	Size (GB) 465,250	Encryption Mode Local Key Encryption
PowerEdge R620 Service Tag : HJF2D2S	1		C	Cancel Back Finish

Figure8. Encrypt Unsecure Virtual Disks



Rekeying Controller and Encrypted Disks with a New Local Key

This option is available when the security key is already created on a controller card. You can change the existing security key to another key by using this feature available in Lifecycle Controller.

To rekey the existing security key:

- 1. Start Lifecycle Controller. In the left pane, click Hardware Configuration.
- 2. In the right pane, click **Configuration Wizard**.
- 3. Under Storage Configuration Wizards, click Key Encryption.
- 4. Select the Storage Controller on which you want to enable this feature and click **Next**.
- 5. Click Rekey Controller and Encrypted Disks with a New Key, and then click Next.

	ONTROLLER UNIFIED SERVER CONFIGURATOR	Help About Exit
Select Controller 🗸	Configuration Wizards: RAID Encryption Configuration	
Select Task Encryption Configuration	Step 2 of 3: Select Encryption Task Select an encryption task to perform on the virtual disk(s). Only valid selections will be active. Selected Controller Encryption Mode: PERC H710P Adapter: Local Key Encryption Encrypt Unsecure Virtual Disks Switch from Local Encryption to Key Manager Rekey Controller and Encrypted Disks with a New Key Remove Encryption and Delete Data	
PowerEdge T420 Service Tag:HH9RD2S	Cancel Back	Next

Figure9. Select the Rekey option

6. Type appropriate data in the Existing Passphrase, New Encryption Key Identifier, New Passphrase, and Confirm Passphrase text boxes and click Finish.

elect Controller	 Configuration Wizards: RAID Encryption Configuration
elect Task	 ✓
ekey controller	Step 3 of 3: Rekey Controller
	Rekeying the controller will encrypt all existing controller virtual disks with a new key.
	Existing Encryption Key Identifier - Test1
	Existing Passphrase
	New Encryption Key Identifier
	New Passphrase
	Confirm Passphrase
	A valid passphrase contains 8-32 ASCII characters and includes a combination of uppercase and lowercase letters, numbers and symbols, and no spaces.
	Once disks are encrypted, they cannot be decrypted. Record the passphrase in a safe location as it cannot be retrieved or reset.

Figure10. Rekey Controller

After clicking **Finish**, Lifecycle Controller validates the existing passphrase, and then the new passphrase. If the validation is successful, a message is displayed.

Encrypti	on	⊳	
Security v	vill be enabled on t	his controller. Record the	Э
Encryption	n key identifier and	d passphrase in a safe lo	cation. If
the key id	lentifier or passphr	ase is forgotten, the dat	a will be
inaccessib	le. Are vou sure v	ou want to create a sec	urity key
			0.0



7. Click **Yes** to recreate the key with a new passphrase. After successfully recreating the encryption key, a message is displayed.



Figure12. Key Encryption Successfully Created



Removing Encryption and Deleting Data

This feature is used to disable the encryption already present in the controller and the virtual disks, and then deleting data on the secured virtual disk. To disable the encryption and delete data on the secured virtual disks:

- 1. Start Lifecycle Controller. In the left pane, click Hardware Configuration.
- 2. In the right pane, click **Configuration Wizard**.
- 3. Under Storage Configuration Wizards, click Key Encryption.
- 4. Select the Storage Controller on which you want to enable this feature and click Next.
- 5. Click the **Remove Encryption and Delete Data** option and click **Next**.

Lifecycle Controller	Unified Server Configurator	Help About Exit
Select Controller	Configuration Wizards: RAID Encryption Configuration	
Select Task		
Encryption Configuration	Step 2 of 3: Select Encryption Task	
	Select an encryption task to perform on the virtual disk(s). Only valid selections will be active.	
	Selected Controller Encryption Mode:	
	PERC H710P Mini: Local Key Encryption	
	 Encrypt Unsecure Virtual Disks Switch from Local Encryption to Key Manager Rekey Controller and Encrypted Disks with a New Key Remove Encryption and Delete Data 	
PowerEdge R620	Cancel Back	Next
Service Tag: HJF2D2S		

Figure13. Select Encryption Task

Select the Delete encryption key and all the secure virtual disks option, and then click Finish.
 This feature permanently deletes the encryption key, virtual disks, and the data stored on the virtual disks.

Select Controller	Configuration ¹	Wizards: RAID Encr	yption Configura	tion		
Select Task	Step 3 of 3: Del	Step 3 of 3: Delete Encryption Configuration The current encyption configuration is listed below. Removing the encryption deletes the encryption key, all data, and virtual disks. Image: Delete encryption key and all the secure virtual disks. Selected Controller Encryption Mode: PERC H710P Adapter: Local Key Encryption				
	The current encyption data, and virtual disks.					
	Selected Controller	Virtual Disk Attributes	C. (07)			
	Virtual Disks	RAID Level	Size (GB)	Secure		

Figure14. Delete Encryption Configuration

After clicking **Finish**, a message is displayed asking whether or not you want to permanently delete data.



Figure15. Delete Encryption Key

7. To delete encryption key and all the secure virtual disks, click **Yes**. After successful deletion of encryption key, a message is displayed.



Figure16. Encryption Key Successfully Deleted

