



# System Erase in Dell 13th Generation PowerEdge Servers

This Dell technical white paper provides a detailed information about system erase feature by using interfaces such as WS-Man , RACADM, and Lifecycle Controller.

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## Authors

Anis Ahmed

Pooja Sharma

Sravanakumar Reddy

Pradeep Bhandary

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## Executive Summary

Today's server infrastructure must be flexible enough to accommodate redeployments within a datacenter. You can use the same server multiple times to reconfigure for another workload, reallocate to another division, or assign to a new customer. It is important to erase all hardware configuration settings of the server before reusing it. Dell provides a System Erase feature as part of the iDRAC with Lifecycle Controller (LC) embedded systems management solution. This feature provides granular erase capabilities across BIOS, diagnostics, management configuration data, non-volatile storage cache, and internal SD cards. This paper reviews the usage and behavior of this powerful management feature.



# 1 Introduction

Customers often have the need to take an existing production server and 'repurpose' this server for another task, or for use in another department. System Erase is a quick means to remove user information, logs, and settings to prepare the server for its new use. Dell's 12th generation servers have the option for system erase, and this Dell technical white paper provides detailed information about the additional capabilities of integrated Dell Remote Access Controller 8 (iDRAC8) to perform a system erase on 13th generation and later versions of Dell servers.

## 1.1 Existing Solution

The existing System Wipe feature for iDRAC7 does not allow any selection of targeted components. This system erase feature in iDRAC8 allows to create granular and user-selectable categories to increase flexibility and improve the repurposing aspect of the existing feature.

## 1.2 System Erase

This document describes the enhancements to the System Wipe feature, which is also referred to as LC Wipe or Delete Configuration and Reset Defaults. This feature is designed to erase logs, configuration data, and other components stored on a non-volatile memory. The purpose of the feature is to erase content, including user data, before a system is retired or reused.

The following components are erased by using WS-Man, RACADM, and LC interfaces.

- BIOS - BIOS reset to default.
- DIAG - Embedded diagnostics is erased.
- DRVPACK - Embedded OS driver pack is erased.
- iDRAC - iDRAC reset to default.
- LCDATA - LC data is erased.

Additionally, LC supports to erase the following storage components

- Hardware Cache (clear PERC NVCache)
- vFlash SD Card (initialize card)

Note: All of the above system erase operations will shut down the system.

## 1.3 Prerequisites

Ensure the following prerequisites are met before performing a system erase:

- A software license for 13th generation and later versions of Dell PowerEdge servers. For more information about managing licenses using iDRAC Web interface, complete the following steps:
  1. Click **Overview** → **Server** → **Licenses**. The Licenses window is displayed.
  2. Click **Help** In the upper-right corner of the window to view the *iDRAC Online Help*.



- The server must have a valid service tag with seven characters.
- iDRAC server control privilege is required to perform this operation.
- LC should be enabled to perform this operation.



## 2 Usecases

### 2.1 Erasing single component

You can erase a single component by using the following:

- Using WS-Man
- Using RACADM
- Using LC

#### 2.1.1 Using WS-Man

WS-Man uses the method name SystemErase under DCIM\_LCService class. This method takes the component name as input. A job ID is returned to you after a successful completion of job. You can also check the LCL logs to get the list of actions that are completed during this process.

```
winrm i SystemErase http://schemas.dmtf.org/wbem/wscim/1/cim-  
schema/2/root/dcim/DCIM_LCService?SystemCreationClassName=DCIM_ComputerSystem+CreationCla  
ssName=DCIM_LCService+SystemName=DCIM:ComputerSystem+Name=DCIM:LCService -u:root -  
p:password -r:https://192.168.0.18/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-8 -a:basic  
@{Component="BIOS"}
```

#### 2.1.2 Using RACADM

This method takes the component name as input. A job ID is returned to you after a successful completion of job. You can also check the LCL logs to get the list of actions completed during this process.

Syntax: `racadm systemerase <component>`

Valid components are: `bios`, `diag`, `drvpack`, `idrac` and `lcdata`.

Example: `racadm systemerase bios`

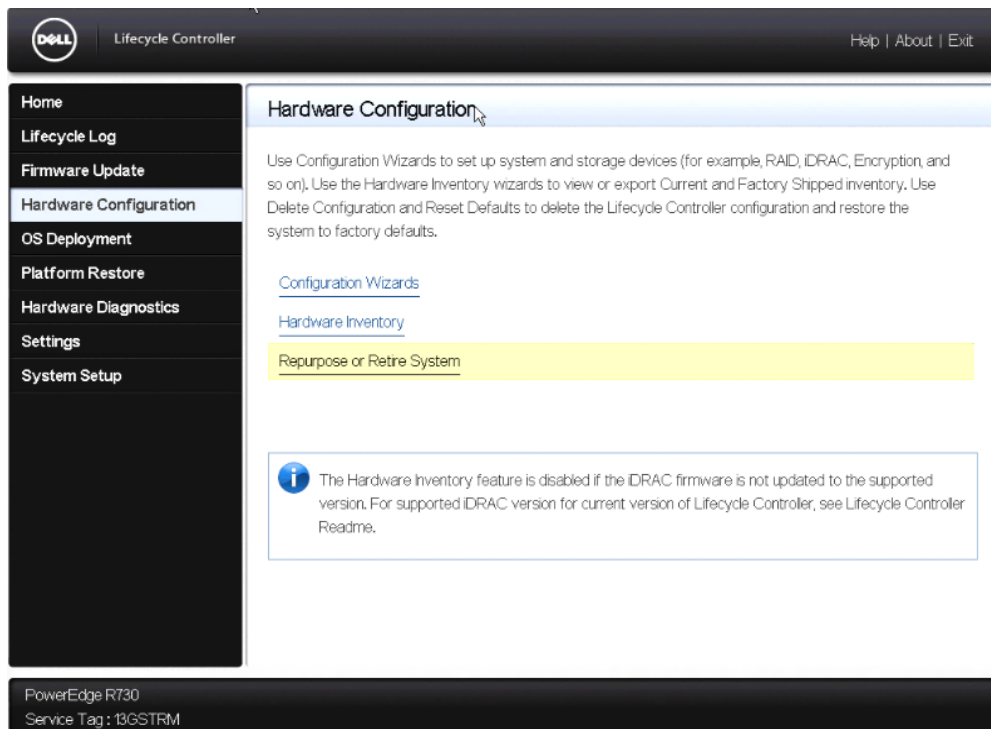


### 2.1.3 Using LC

To erase a single component by using the LifeCycle Controller (LC) GUI, complete the following steps

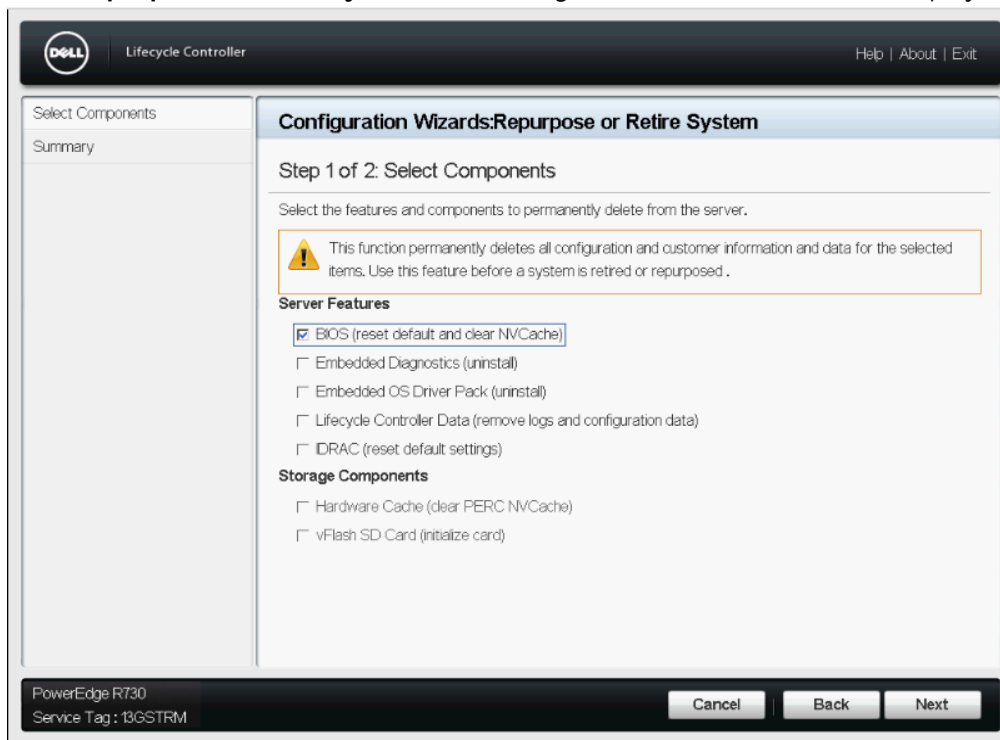
1. Press F10 during system reboot to launch LC GUI. LC launches successfully.
2. Click **Hardware Configuration**. The Hardware Configuration window is displayed.

**Note:** Erasing server features include erasing LC data, BIOS reset to defaults, iDRAC reset to defaults, uninstalling Diagnostics application, and uninstalling Single OS Driver Pack application.





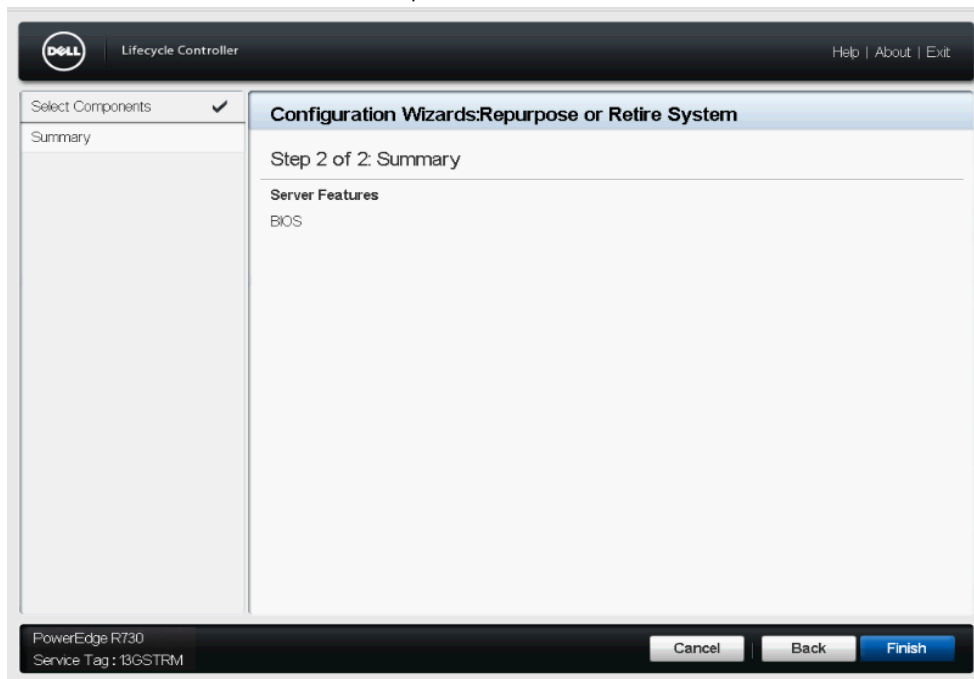
3. Click **Repurpose or Retire System**. The Configuration Wizards window is displayed.



4. Select the server feature that you want to erase or reset to defaults and click **Next**.

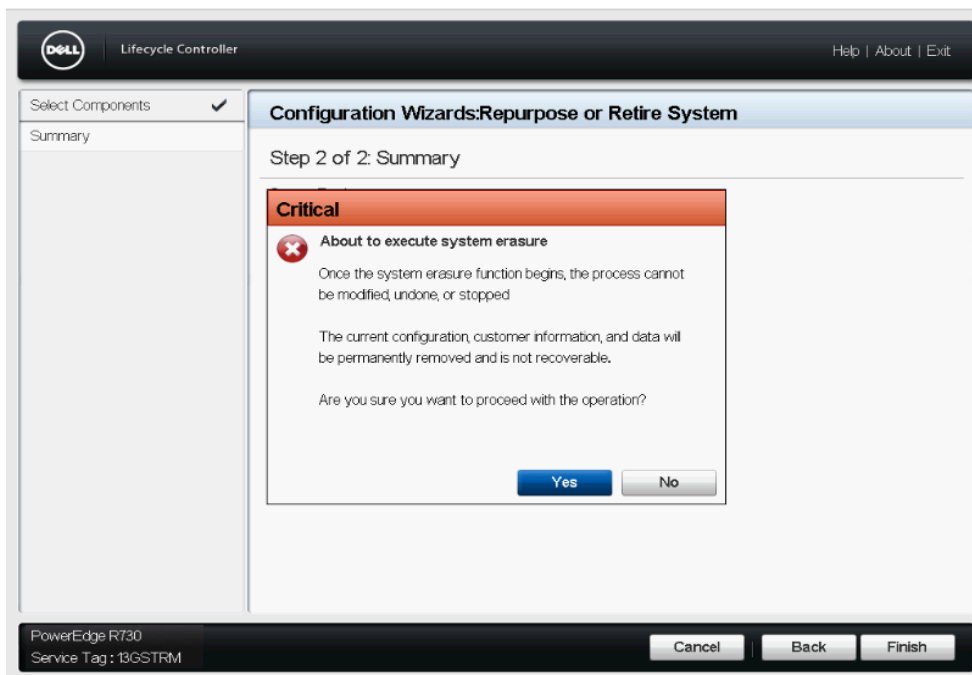
After you finish identifying and selecting the server features, you can proceed for confirming the erase operation after verifying the Summary Page. The Summary page shows the summary of the features selected for erase operation.

5. Click **Finish** to initiate the erase operation.

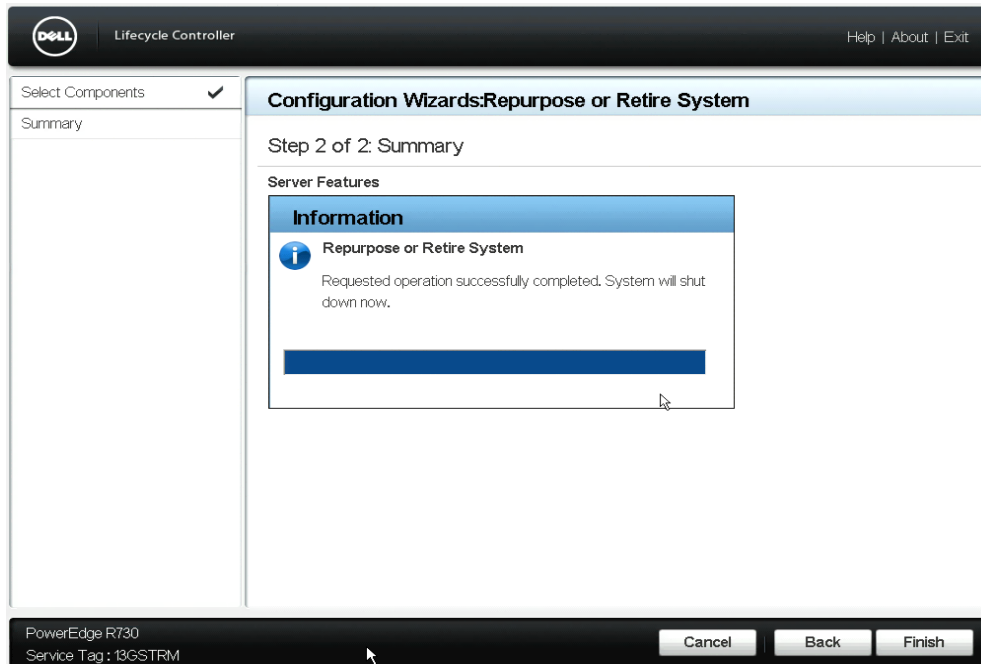


A critical error message is displayed. This is the final screen where you are cautioned to either proceed or stop the task.

6. Click **Yes** to begin the task, which cannot be undone or stopped.



An Information message is displayed as shown in the figure below. LC takes over the session for erasing different server features that are selected in previous steps. From this point, you cannot stop, modify, or undo the erase operation.



Now, the iDRAC will reboot and enter SSM to complete the operation.

## 2.2 Erasing multiple components

You can erase multiple components by using the following:

- Using WS-Man
- Using RACADM
- Using Lifecycle Controller

### 2.2.1 Using WS-Man

This method takes multiple component names as input. A job ID is returned to you after a successful completion of job. You can also check the LCL logs to get the list of actions completed during this process.

```
winrm i SystemErase http://schemas.dmtf.org/wbem/wscim/1/cim-  
schema/2/root/dcim/DCIM_LCService?SystemCreationClassName=DCIM_ComputerSystem+Cr  
eationClassName=DCIM_LCService+SystemName=DCIM:ComputerSystem+Name=DCIM:LCServic  
e -u:root -p:password -r:https://192.168.0.18/wsman -SkipCNcheck -SkipCAcheck -  
encoding:utf-8 -a:basic -file: SystemErase.xml
```

```
<p:SystemErase_INPUT xmlns:p="http://schemas.dmtf.org/wbem/wscim/1/cim-  
schema/2/root/dcim/DCIM_LCService">  
<p:Component>BIOS</p:Component>  
<p:Component>DIAG</p:Component>  
<p:Component>DRVPACK</p:Component>  
</p:SystemErase_INPUT>
```

## 2.2.2 Using RACADM Using RACADM

This method takes the component names as input. Multiple options can also be provided. A job ID is returned to you after a successful completion of job. You can also check the LCL logs to get the list of actions completed during this process.

Syntax: `racadm systemerase <component1>, <component2>...<component5>`

Valid components are: `bios`, `diag`, `drvpack`, `idrac` and `lcdata`.

Example: `racadm systemerase bios,diag,drvpack`

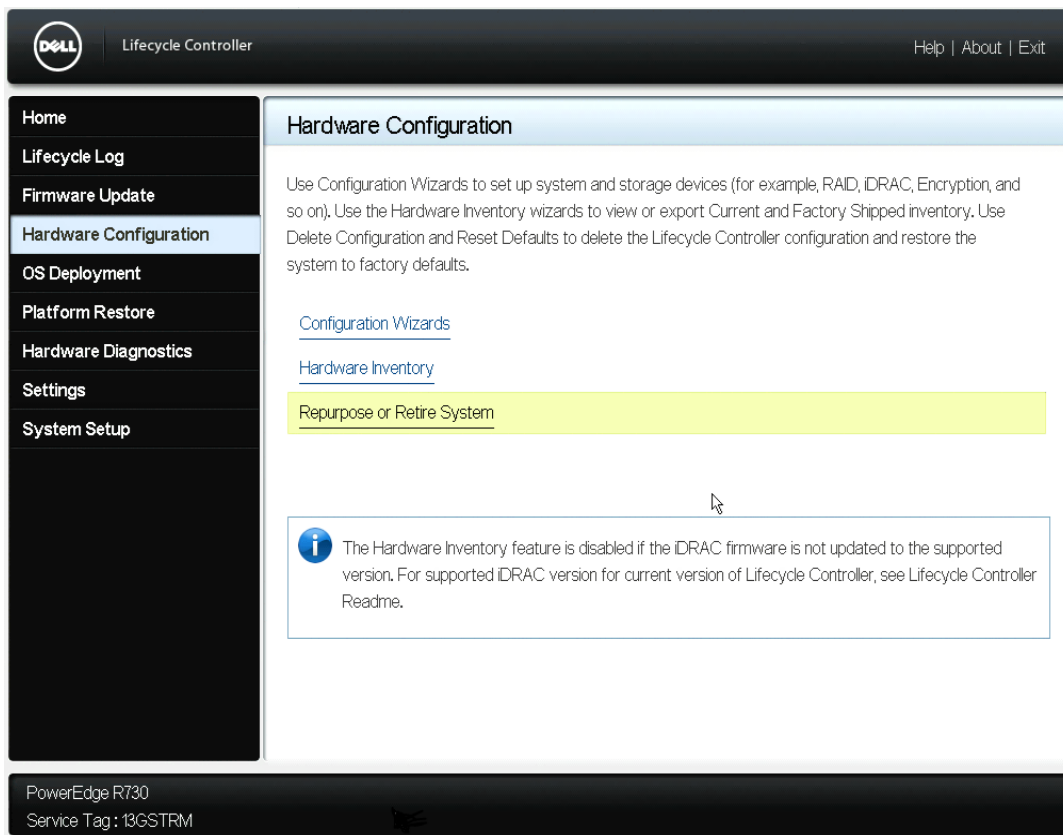
## 2.2.3 Using LC

To erase a multiple components by using the LifeCycle Controller (LC) GUI, complete the following steps.

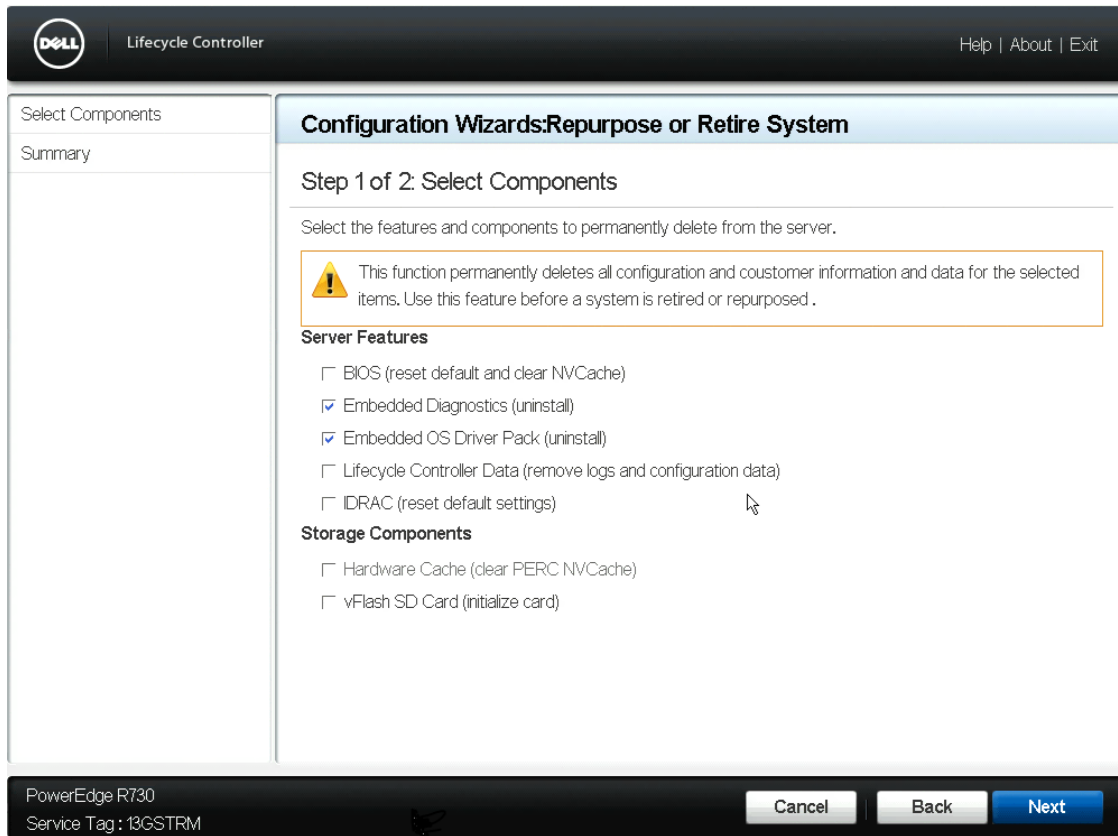
1. Press F10 during system reboot to launch Lifecycle Controller GUI. LC launches successfully.
2. Click **Hardware Configuration**. The Hardware Configuration window is displayed.

**Note:** Erasing server features include erasing LC data, BIOS reset to defaults, iDRAC reset to defaults, uninstalling Diagnostics application, and uninstalling Single OS Driver Pack application.





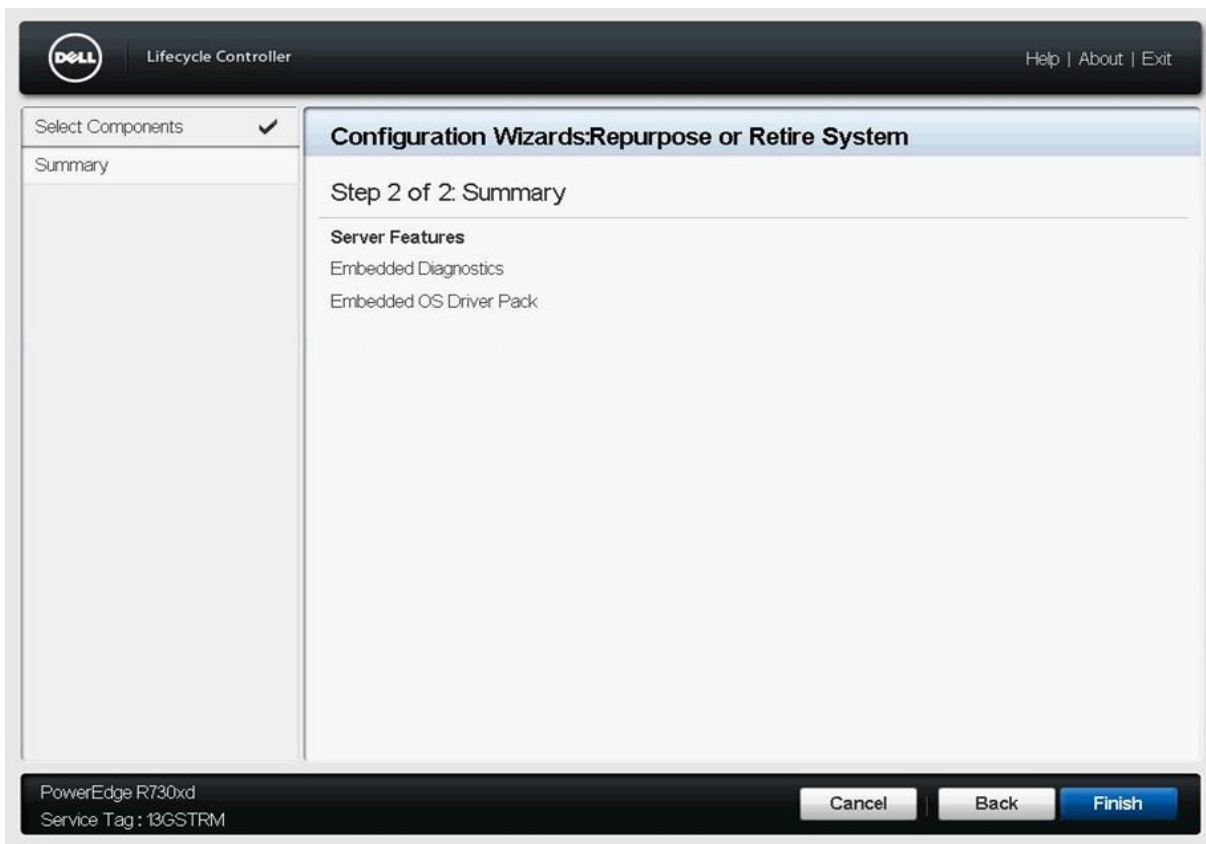
3. Click **Repurpose or Retire System**. The Configuration Wizards window is displayed.



4. Select the server features that you want to erase or reset to defaults and click **Next**.

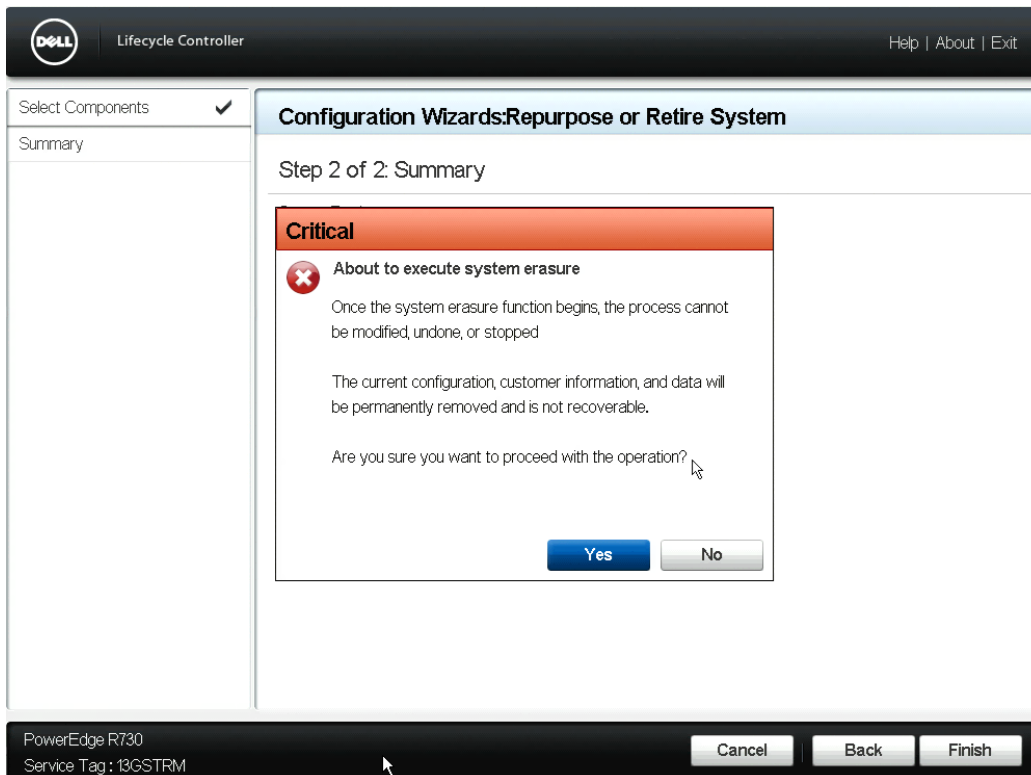
After you finish identifying and selecting the server features, you can proceed for confirming the erase operation after verifying the Summary Page. The Summary Page shows the summary of the features selected for erase operation.

5. Click **Finish** to initiate the erase operation.



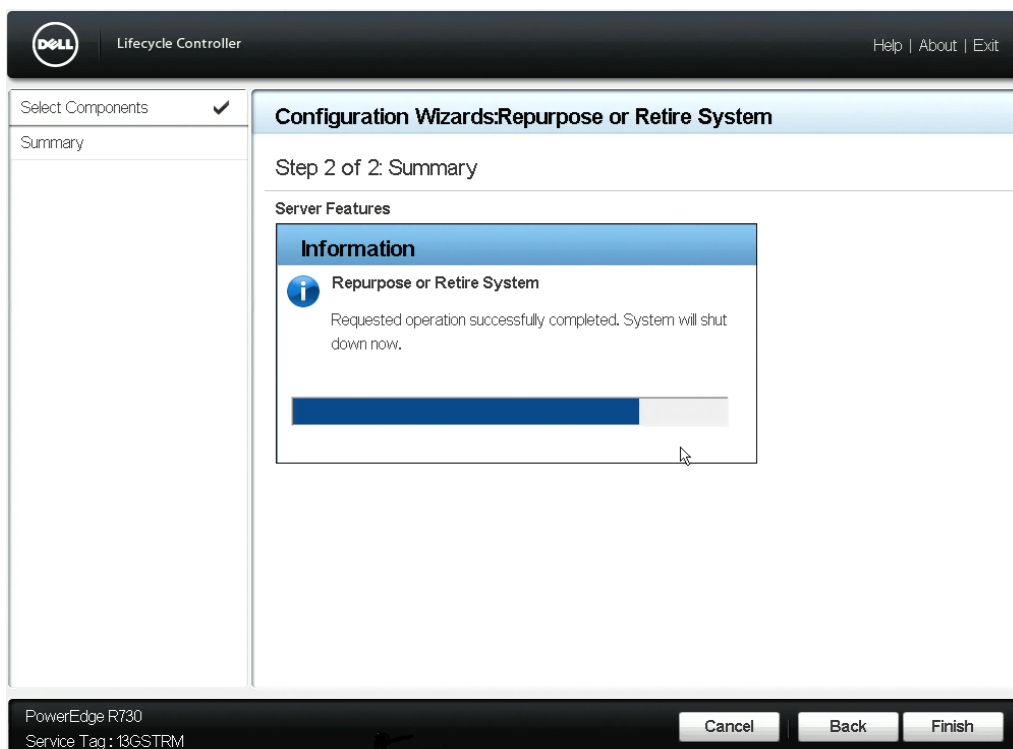
A critical error message is displayed. This is the final screen where you are cautioned to either proceed or stop the task.

6. Click **Yes** to begin the task, which cannot be undone or stopped.

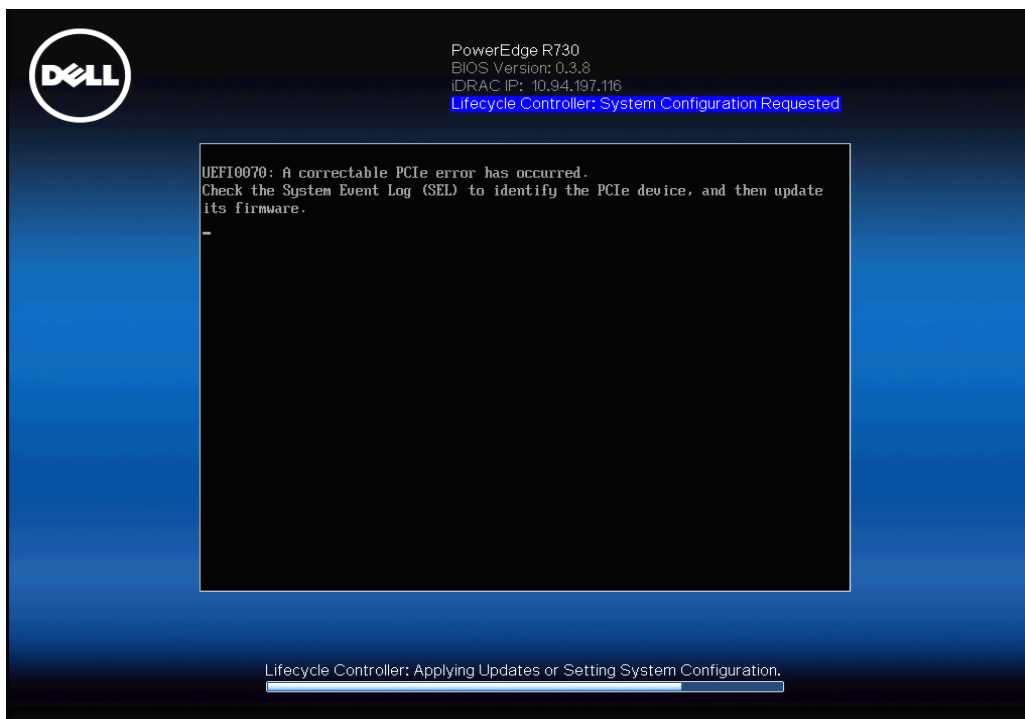




An Information message is displayed as shown in the figure below. LC takes over the session for erasing different server features that are selected in previous steps. From this point, you cannot stop, modify, or undo the erase operation.

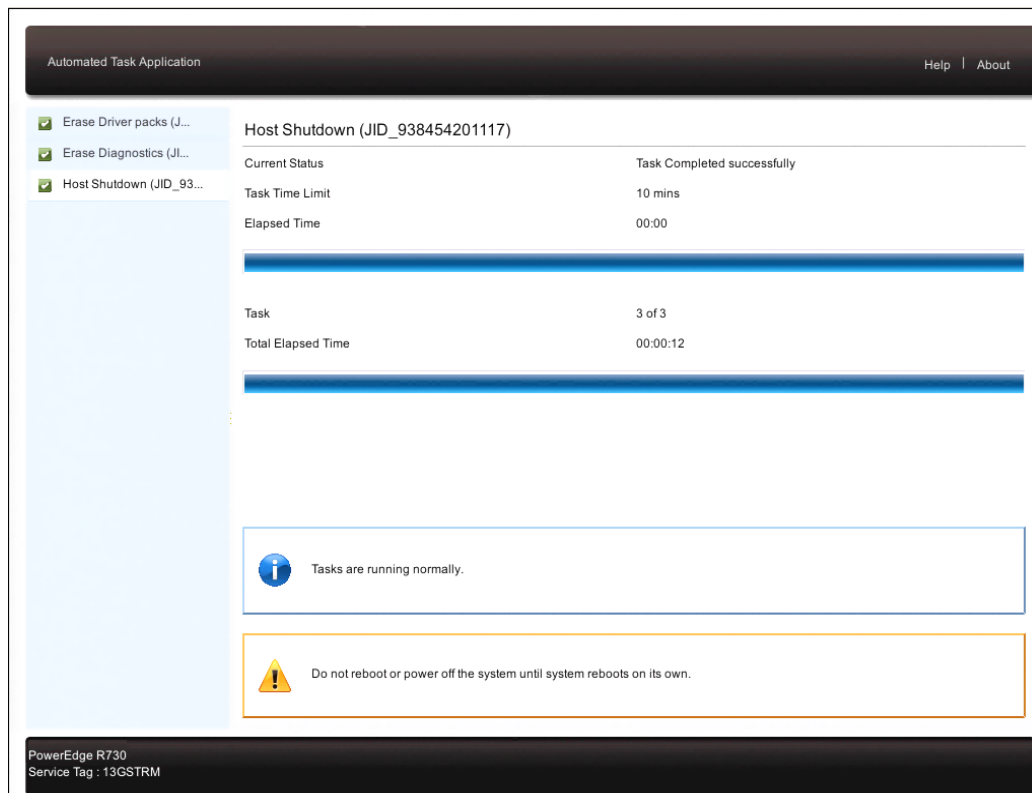


You can verify the status and progress of erase operation for different server features or storage components in the Automated Task Application or System Services Manager (SSM). This page is automatically launched by LC during the erase operation and you have no control on this page. Different tasks queued up for erase operation is shown in the screenshot below.



The erase operation takes place sequentially one after the other and consumes a fixed amount of time for its completion. A job ID is created when erase operation is initiated as shown in the screenshot below. An example of the format of job ID is JID\_12345678910. The success or failure is identified by Green or Red check marks respectively in front of each task.





All the erase operation tasks are logged in the Lifecycle Log feature. To check the status of the erase operation, complete the following steps:

1. Click **Lifecycle Log** to launch LC logs from the LC GUI Home Screen.
2. Click **View Lifecycle Log History**.



## Lifecycle Log

### View Log History

Filter by Category

All

No. ▼	Category ▼	Severity ▼	Message ID ▼	Description	Date and Time ▼
16	Audit	Informational	SYS1000	System is turning on.	2014-06-11 05:04:00-0500
15	Audit	Informational	RAC0701	Requested system powerup.	2014-06-11 05:03:59-0500
14	Configuration	Informational	SYS151	Completed System Erase Job ID: JID_93845201117	2014-06-11 05:03:15-0500
13	Configuration	Informational	SYS018	Job completed successfully.	2014-06-11 05:03:15-0500
12	Configuration	Informational	SYS163	The Integrated Remote Access Controller (iDRAC) is restarting to complete the System Erase operation. Do not restart server until the iDRAC restarts.	2014-06-11 05:03:10-0500
11	Audit	Informational	SYS1003	System CPU Resetting.	2014-06-11 05:03:07-0500
10	Audit	Informational	SYS1001	System is turning off.	2014-06-11 05:03:07-0500
9	Configuration	Informational	SYS156	Erase operations for System Erase tasks successfully completed.	2014-06-11 05:02:41-0500
8	System Health	Informational	NIC01	The NIC Embedded 1 Port 1 network link is	2014-06-11 05:00:28-0500

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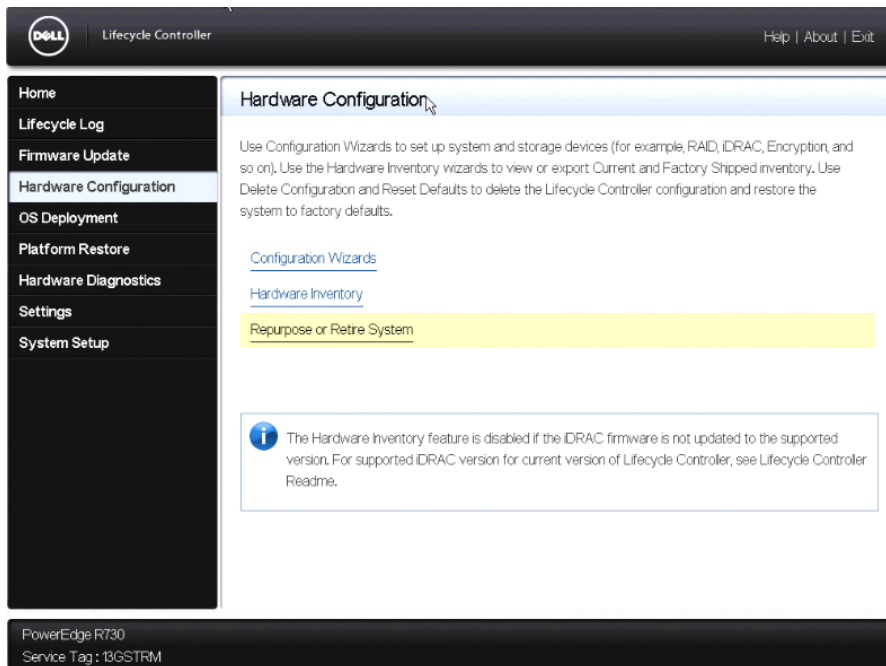
## 2.3 Erasing Storage Components

You can erase storage components by using LC.

### 2.3.1 Using LC

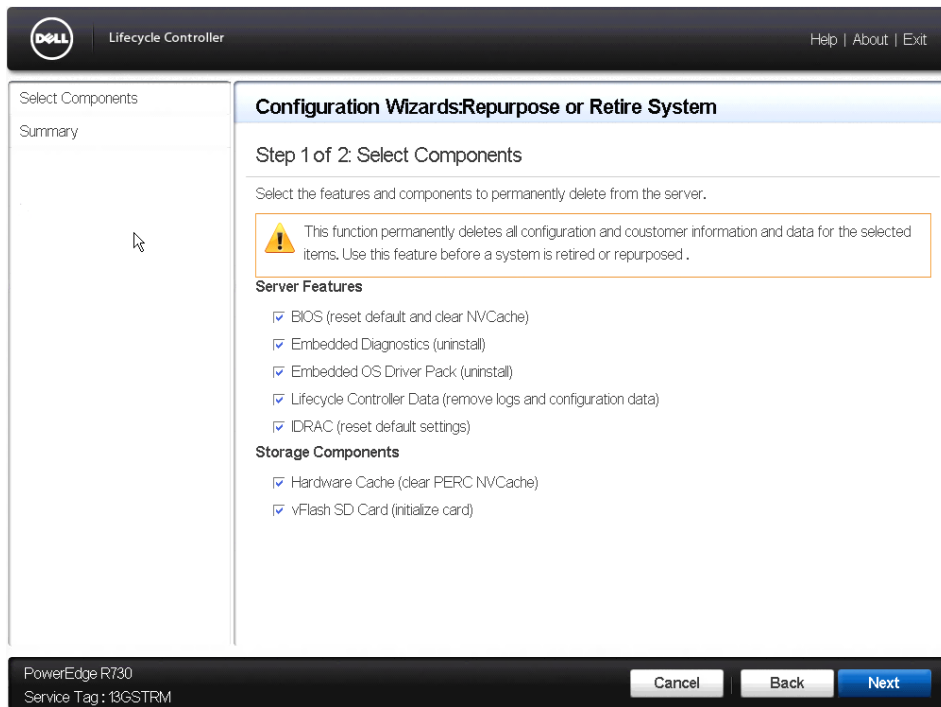
To erase storage components by using LC, complete the following steps:

1. Press F10 during system reboot to launch Lifecycle Controller GUI. LC launches successfully.
2. Click **Hardware Configuration**. The Hardware Configuration window is displayed.



**Note:** Erasing server features include erasing LC data, BIOS reset to defaults, iDRAC reset to defaults, uninstalling Diagnostics application, and uninstalling Single OS Driver Pack application.

3. Click **Repurpose or Retire System**. The Configuration Wizards window is displayed.

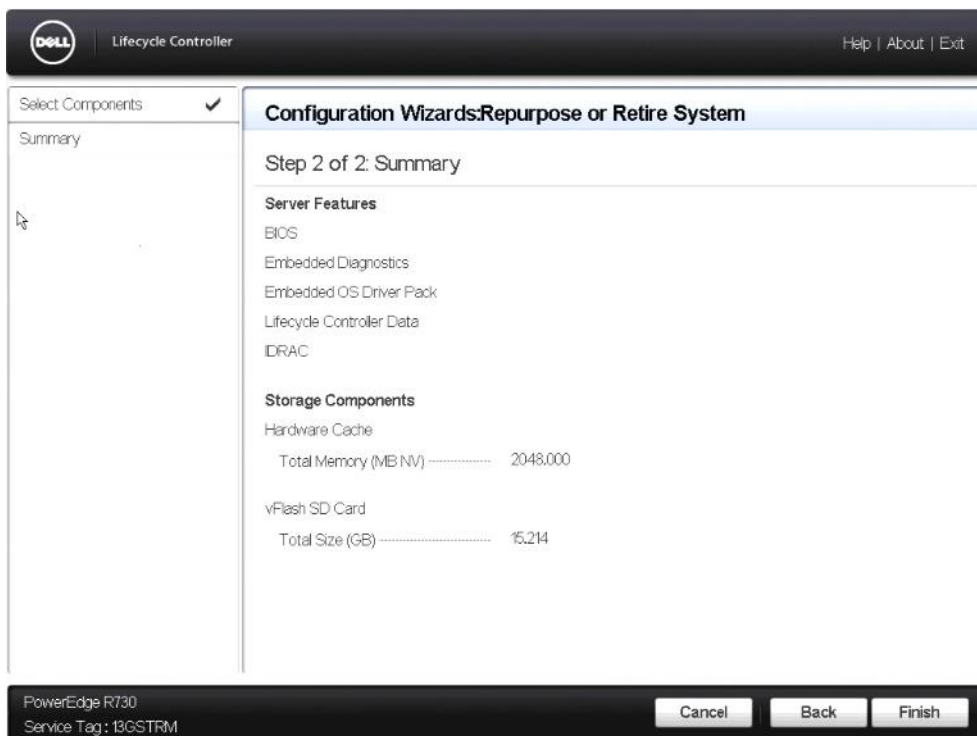


4. Select the server features and storage components that you want to erase or reset to defaults.
5. Select the appropriate check-box under Storage Components to erase the Hardware Cache or vFlash SD card.

**Note:** The screenshot has all the components selected, including the storage components.

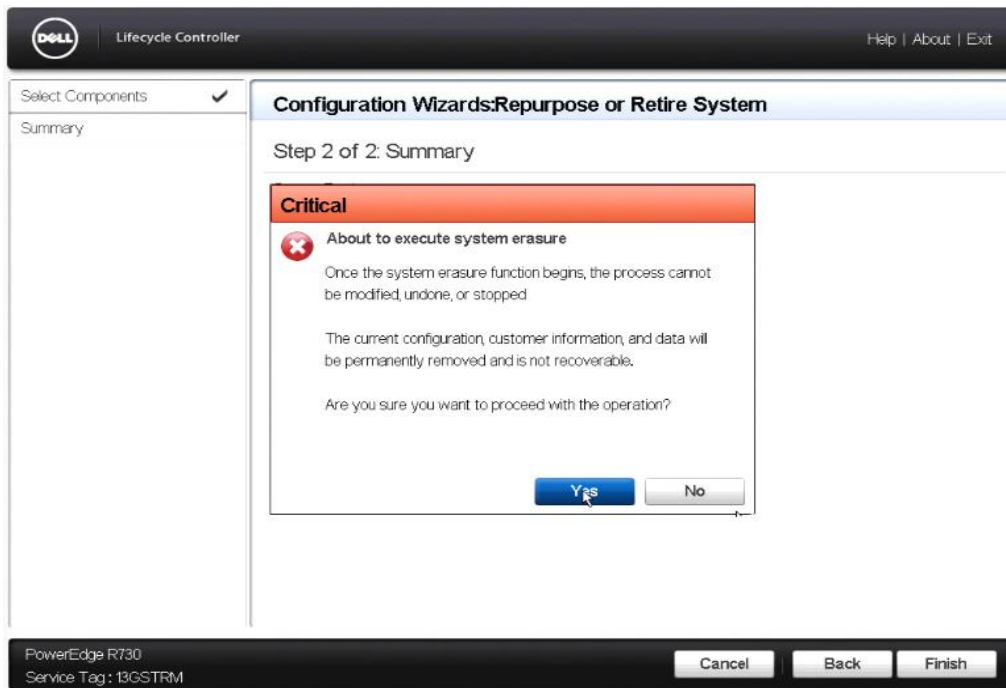
After you finish identifying and selecting the server features and storage components, you can proceed for confirming the erase operation after verifying the Summary page. The Summary page shows the summary of the features selected for erase operation.

6. Click **Finish** to initiate the erase operation.



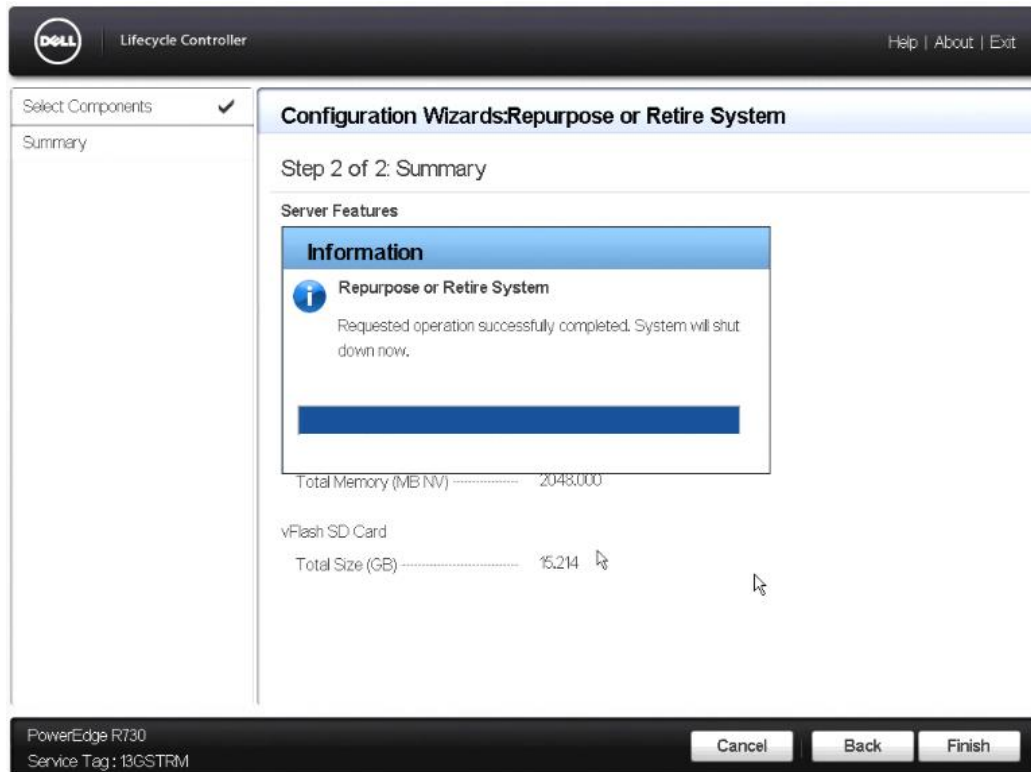
A critical error message is displayed. This is the final screen where you are cautioned to either proceed or stop the task.

- Click **Yes** to begin the task, which cannot be undone or stopped.

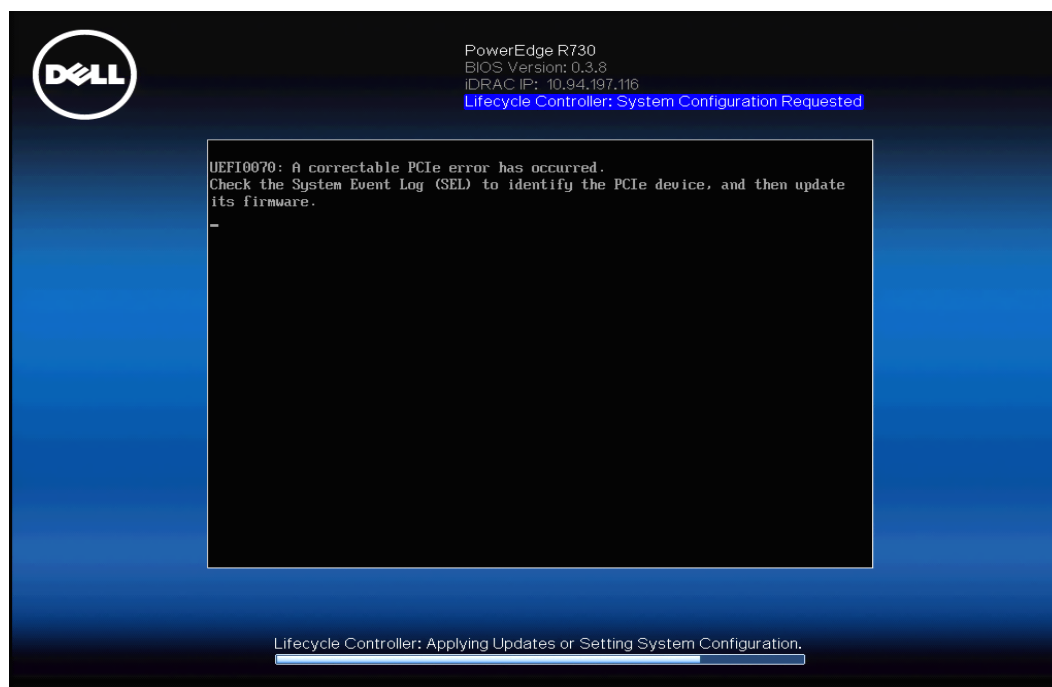




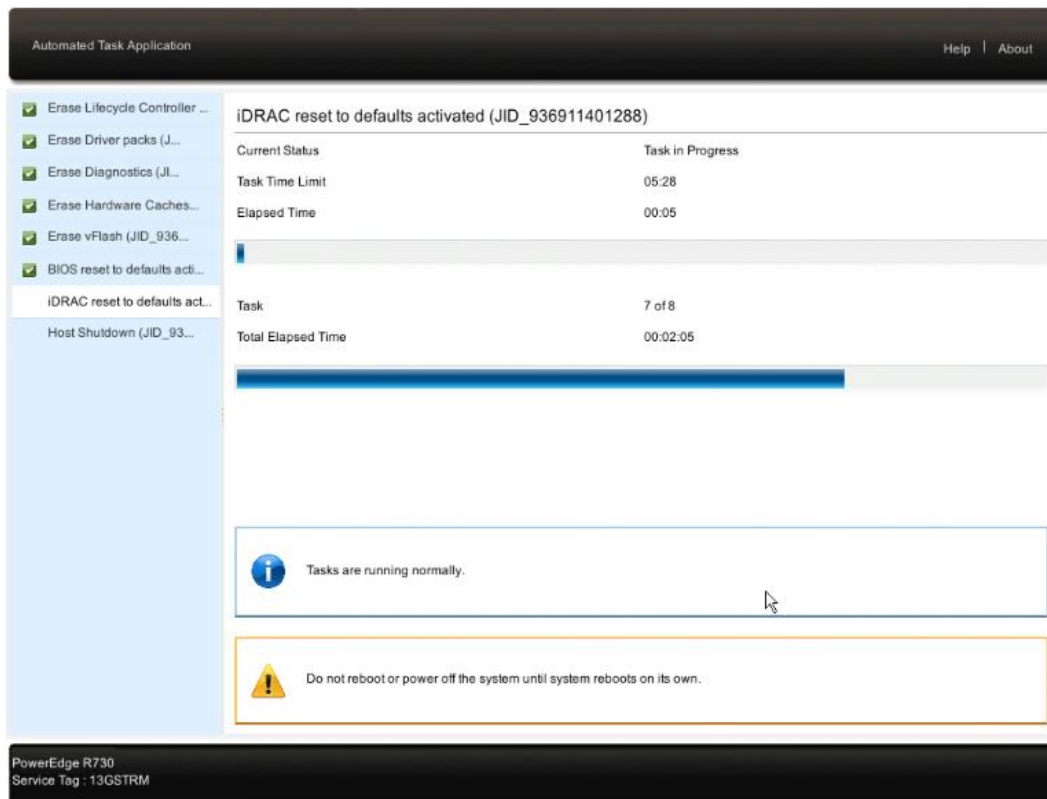
An Information message is displayed as shown in the figure below. LC takes over the session for erasing different server features that are selected in previous steps. From this point, you cannot stop, modify, or undo the erase operation.



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All the erase operation tasks are logged in the Lifecycle Log feature. To check the status of the erase operation, complete the following steps:

1. Click **Lifecycle Log** to launch LC logs from the LC GUI Home Screen.
2. Click **View Lifecycle Log History**.



## Lifecycle Log

### View Log History

Filter by Category 

No. ▼	Category ▼	Severity ▼	Message ID ▼	Description	Date and Time ▼
16	Audit	Informational	SYS1000	System is turning on.	2014-06-11 05:04:00-0500
15	Audit	Informational	RAC0701	Requested system powerup.	2014-06-11 05:03:59-0500
14	Configuration	Informational	SYS151	Completed System Erase Job ID: JID_93845201117	2014-06-11 05:03:15-0500
13	Configuration	Informational	SYS018	Job completed successfully.	2014-06-11 05:03:15-0500
12	Configuration	Informational	SYS163	The Integrated Remote Access Controller (iDRAC) is restarting to complete the System Erase operation. Do not restart server until the iDRAC restarts.	2014-06-11 05:03:10-0500
11	Audit	Informational	SYS1003	System CPU Resetting.	2014-06-11 05:03:07-0500
10	Audit	Informational	SYS1001	System is turning off.	2014-06-11 05:03:07-0500
9	Configuration	Informational	SYS156	Erase operations for System Erase tasks successfully completed.	2014-06-11 05:02:41-0500
8	System Health	Informational	NIC001	The NIC, Embedded 1 Port 1 network link is	2014-06-11 05:00:28-0500

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## 3 Error codes

### 3.1.1 WS-Man

The possible WS-Man error codes for this feature and the recommended actions are as shown the table below:

Error Codes	Recommended Actions
RED042: Invalid number of input parameters.	Verify whether all required parameters are provided. Refer to the Lifecycle Controller-Remote Services documentation.
LC016: Missing required parameter, <parameter>.	Include all the parameters required for the command. Check Lifecycle Controller Profile documentation and try again.
LC017:	Verify that parameter values provided to the method are typed as they appear in the enumeration and that the parameter data type matches the Lifecycle Controller Profile documentation.
LC040: Memory resource allocation failure.	Power cycle system and retry the operation. If the problem persists, reapply firmware packages for LC and iDRAC.
LC044: An instance of Lifecycle Controller system configuration wipe is already running.	Wait for the LC system configuration wipe operation that is currently running to complete before requesting for another operation.
LC063: Cannot create new jobs until the existing running jobs are completed or deleted.	Retry after all the existing jobs are completed or deleted.

Recommended action

### 3.1.2 RACADM

The possible RACADM error codes for this feature and the recommended actions are as shown the table below:

Error Codes	Recommended Actions
RAC1062: Unable to initiate the SystemErase operation.	The component identifier specified is not valid. Execute the RACADM command "racadm help systemerase" to see the list of supported components.
RAC1063: Unable to initiate the SystemErase operation because Lifecycle Controller is disabled.	Execute the RACADM command "racadm set LifecycleController.LCAttributes.LifecycleControllerState 1" to enable LC, and retry the operation.
RAC1064: Unable to initiate the SystemErase operation because another instance of SystemErase job is already in progress.	To check the job status, execute the RACADM command "racadm jobqueue view" and retry the operation after the current SystemErase operation has completed.



RAC1065: Unable to initiate the SystemErase operation because iDRAC encountered an internal error.	If the issue persists, restart the iDRAC and then retry the operation after the iDRAC has finished restarting.
--	--

### 3.1.3 Lifecycle Controller

The possible LC error codes for this feature and the recommended actions are as shown the table below:

Error Codes	Recommended Actions
SWC0077: Unable to initiate the Repurpose or Retire System operation.	Retry the operation. If the problem persists, do one the following: 1) Check if there are other operations running on the iDRAC and wait for the operations to complete, and retry the operation. 2) Restart the server, and retry the operation.
SWC0073: Unable to start operation with the current iDRAC version.	Update iDRAC firmware to the latest version and retry the operation. If the issue persists, contact your service provider.



## 4 System State and Behavior Post Erase Operation

The server state and behavior after erase operation depends on the server features and storage components that you select.. Each Feature has specific reset or erase behavior and you must be aware of it before using this feature. The details given below in this document illustrates about the specific reset behavior or system state applied after Repurpose or Retire feature when it is applied by using LC.

### 4.1 Erasing LC Data

The Lifecycle Controller Data option erases any content, which is not installed or cannot be updated.

The following is the list of features that are erased:

- **Lifecycle logs:** All the lifecycle logs will be cleared from the system.
- **Note:** The logs for Erase operation will still be shown.
- **Configuration Database:** Current snapshot of hardware and software inventory is deleted.
- **Note:** By running Collect System Inventory on Restart (CSIOR) will generate current inventory once again
- **Rollback Firmware:** Both previous and current firmware that is stored on embedded flash card will be deleted and you cannot rollback firmware for any devices present on the server,
- **Factory Shipped Inventory:** Hardware inventory information as shipped from factory will be deleted. The feature Factory Shipped Inventory from Lifecycle Controller will no longer be available and links will be grayed out.

### 4.2 Uninstalling Embedded Diagnostics

Hardware Diagnostics application will be deleted from the server and software Inventory will show as 0.

### 4.3 Uninstalling Embedded OS Driver Pack

OS Driver Pack application will be deleted from the server and Software Inventory will show as 0.

**Note:** You must install OS Driver pack to use OS Deployment feature from the LC.

### 4.4 BIOS Reset to Default



All user configured settings in BIOS will be reset to defaults. Non-volatile cache is also cleared. LC network settings will be reset to "No Configuration".

## 4.5 iDRAC Reset to Default

All user configured settings in iDRAC will be reset to defaults.

## 4.6 Erasing Hardware Cache (PERC NV Cache)

PERC NV Cache Clear is available only for PERC 9 series and later versions of controllers. This includes discarding pinned cache.

## 4.7 vFlash SD Card Initialization

Erases the user data and deletes all partitions, including SRVCNF for Backup Server Profile available in vFlash SD card.

