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HP ZCENTRAL AND HARDWARE MONITORING

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The HP ZCentral development team has enabled HW Monitoring on specific HP Z platforms. These alerts will trigger system LEDs and in-Windows user notifications. The alerts will also send messages to HP ZCentral Connect through the AMT messaging interface. The alerts are designed to inform users and administrators of issues that the workstation platform may be experiencing. The alerts include:

- Power Supply Unit Failures
- Various systems hangs and errors
- System identification/location

Supported Platform Matrix

Platform	Power Supply Unit Alerting	Timer Driven Alerts	System ID LED
HP ZCentral 4R Workstation	Yes	Yes	Yes
HP Z2 Mini Workstation	No	Yes	No
HP Z2 Small Form Factor Workstation	No	Yes	No
HP Z2 Tower Workstation	No	Yes	No
HP Z4 Workstation	No	Yes	No
HP Z6 Workstation	No	Yes	No
HP Z8 Workstation	No	Yes	No

Hardware Monitoring work by using Intel® Active Management Technology (AMT). If you are using an HP Workstation that is designed to support Hardware Monitoring you must provision the system for AMT. Provisioning a system for Active Management Technology (AMT) is provided in the whitepaper at the link below:

http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-7256ENW

POWER SUPPLY UNIT ALERTING

HW Monitoring can provide alerts to HP ZConnect about the status of the Power Supplies in the systems that HP ZConnect is aware of, if the system supports this type of messaging.

HP ZCENTRAL 4R

The HP ZCentral 4R Workstation has the option to hold 1 or 2 PSUs. When 2 PSUs are installed they can be placed in either Redundant or Aggregate Mode.

- Redundant Mode – The system has 2 supplies installed, the system power maxes out at the level of 1 supply. If one of the supplies fails, the system is still operational.
- Aggregate Mode – The system has 2 supplies installed and the max power of the system is the addition of the two supplies. If one supply fails, the system may still be operational as long as it is not drawing more power than what a single supply can provide.

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POWER SUPPLY ALERTING WHEN THE WORKSTATION IS USED IN CONJUNCTION WITH HP ZCENTRAL

The chain of events and reporting is highly dependent on the starting state of the system (Initial Power on or at the OS level) and the PSU Mode. For PSUs the system attempts to detect both physically and functionally. Depending on what is detected the system can show various error states.

From the state where the system is initially powered the chart below (reading left to right) shows what the system might detect and the resulting messages that can occur in Post, in HP ZConnect, and on the system LEDs.

			From Power on			
Detected Physically	**Detected Functionally**	**PSU Mode**	**Post**	**HP ZConnect**	**LEDs**	**System Behavior**
1 PSU	1 PSU	Aggregate	No stops, no warnings, if another supply was ever installed, the system would go to Aggregate mode	Non-Redundant Mode – Status Good	PSU LED is green Fault LED is off (PWR LED is blue)	Boot as normal
2 PSU	1 PSU	Redundant	F1 Prompt: BIOS expected 2 supplies but found only 1, you are no longer redundant – choose continue if you want to boot to the OS	Expected two Power Supply Units in Redundant Mode, one Power Supply Unit is offline – No Redundancy	Faulted PSU LED will be "NON GREEN" Fault LED is blinking 3.4 – Power LED (red, white)	IF BIOS CONFIG OPTION SET TO CONTINUE: Boot to OS ELSE: Stopped at F1 Prompt until user takes an action
	1 PSU	Aggregate	F1 Prompt: BIOS expected 2 supplies but found only 1, you are no longer Aggregate mode and are therefore in a lower power PSU configuration – you can choose continue if you want to boot to the OS but the system could overcurrent and shutdown	Expected two Power Supply Units in Non-Redundant Mode, one Power Supply Unit is offline – System is in a lower power configuration.	Faulted PSU LED will be "NON GREEN" Fault LED is blinking 3.4 – Power LED (red, white)	REGARDLESS OF THE CONFIG OPTION SETTING: They will stop at an F1 Prompt
	2 PSU	Redundant	No Warning – move through BIOS normally	Redundant Mode – Status Good	PSU LED is green Fault LED is off (PWR LED is blue)	Boot as normal
	2 PSU	Aggregate	No Warning – move through BIOS normally	Non-Redundant Mode – Status Good	PSU LED is green Fault LED is off (PWR LED is blue)	Boot as normal

SCENARIOS WHEN IN THE OS AND A PSU EVENT HAPPEN

When the system is at the OS you can also see PSU failures, but the messaging will be dependent on the system current state and the nature of the failure.

- In OS, 2 PSUs, Aggregate Mode – 1 PSU Lost by removing AC or PSU Fails
- In OS, 2 PSUs, Aggregate Mode – 1 PSU Lost by removing PSU
- In OS, 2 PSUs, Redundant Mode – 1 PSU Lost by removing AC or PSU Fails
- In OS, 2 PSUs, Redundant Mode – 1 PSU Lost by removing PSU

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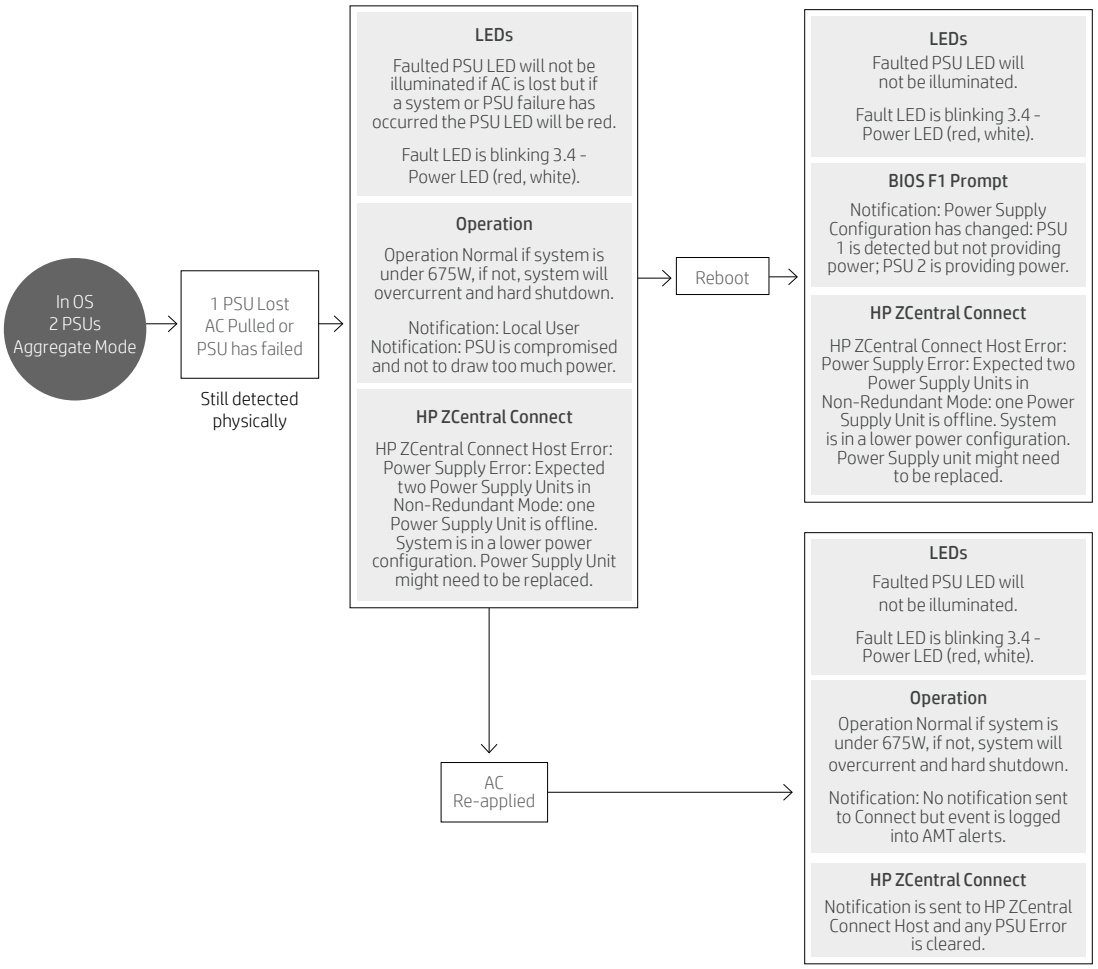
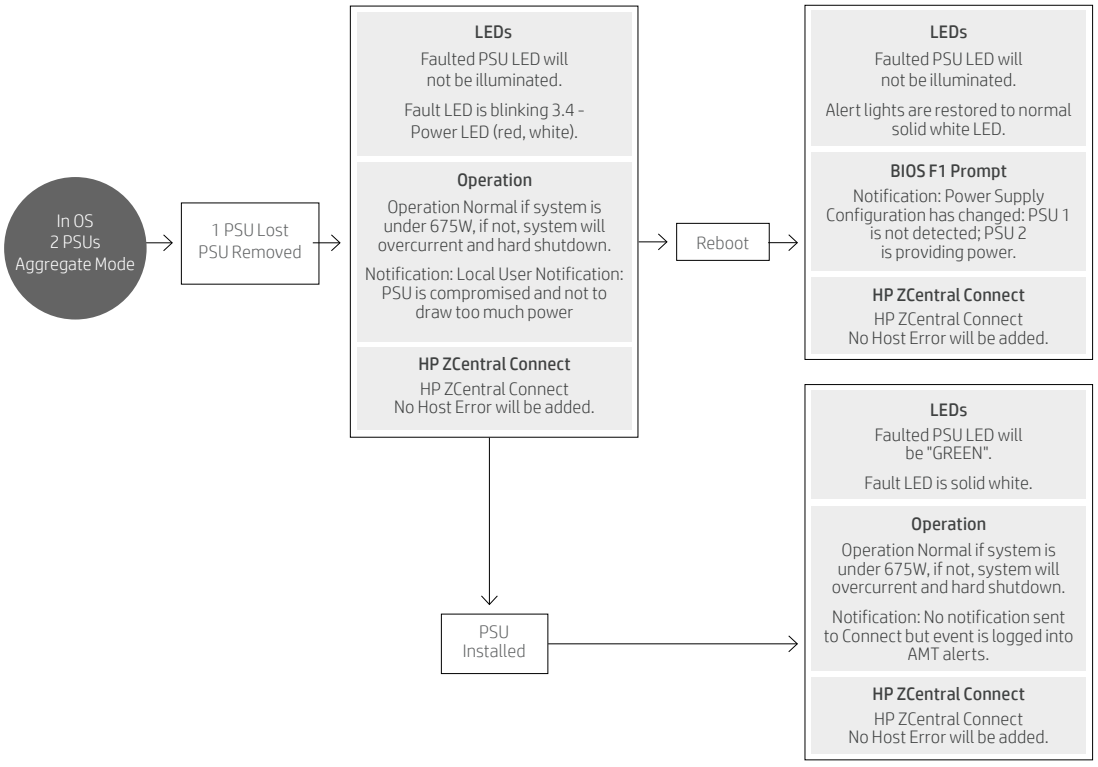


AGGREGATE MODE – PSU REMOVED



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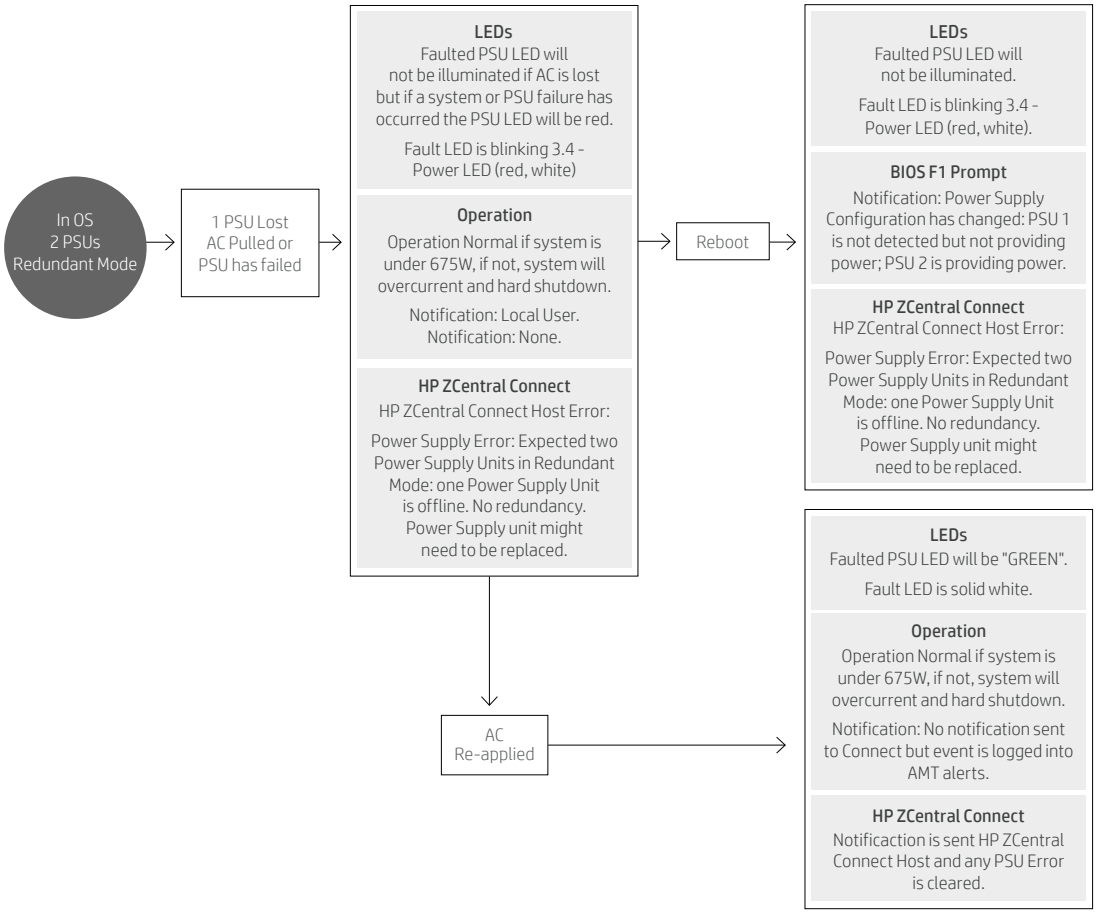
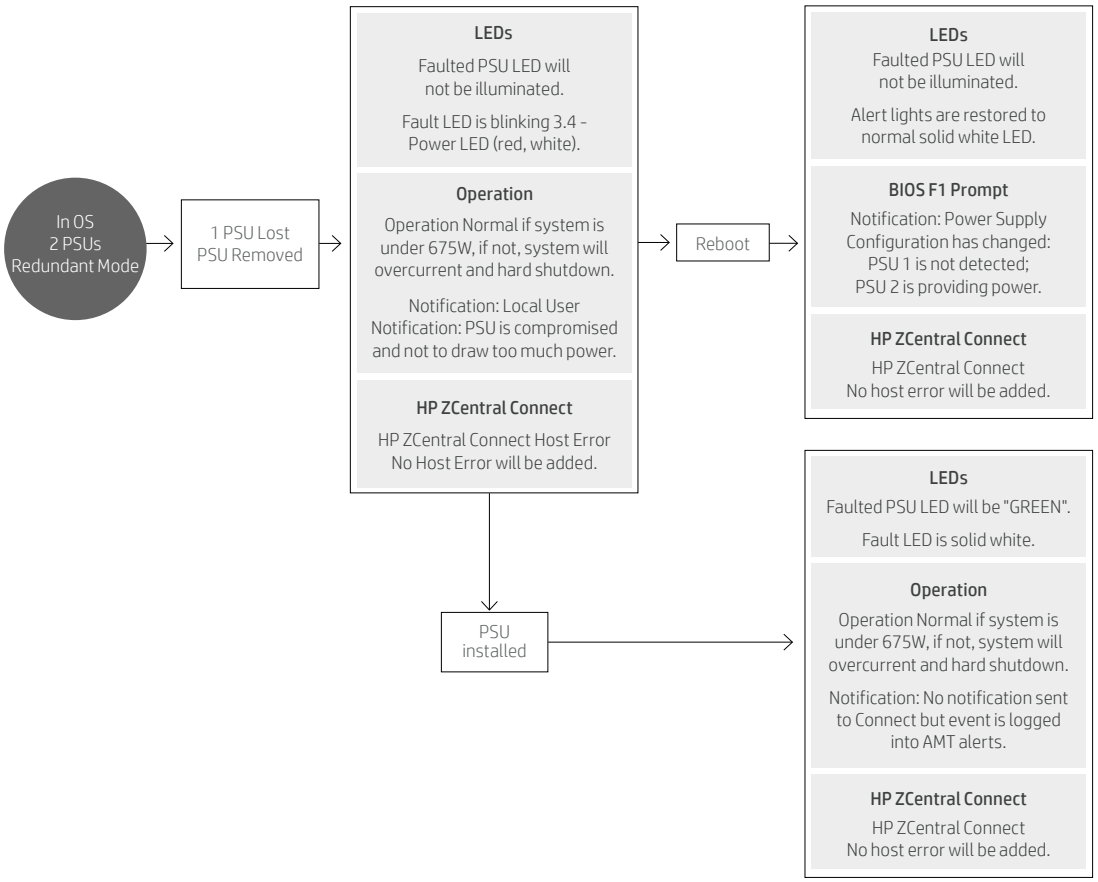
REDUNDANT MODE - AC LOST OR PSU HAS FAILED



REDUNDANT MODE – PSU REMOVED



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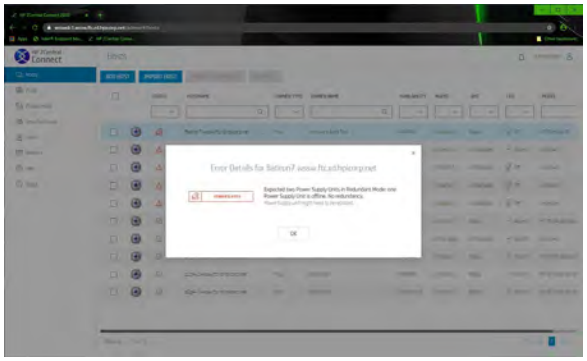
HP ZCENTRAL 4R WORKSTATION FAULT STATE

When the HP ZCentral 4R detects a failed PSU, the system power button will display the fault state by blinking between red and white. 3 red blinks followed by 4 white blinks. Additionally, the system's speaker will beep 3 long beeps followed by 4 short beeps for 5 cycles, in sync with the power button LED. If this is encountered, please consult the HP ZCentral 4R Workstation Maintenance and Service Guide.

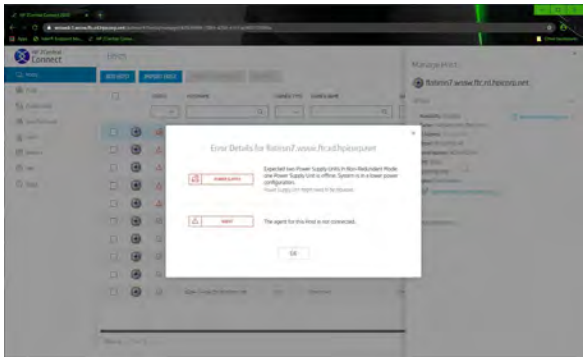
The LED on the PSU will also show a failure and will go to a “non-green” state. Either red or not lit.

If using HP ZConnect and a PSU is lost in either redundant or in aggregate mode an error or warning message will be displayed within the HP ZConnect Interface.

IN REDUNDANT MODE



IN AGGREGATE MODE



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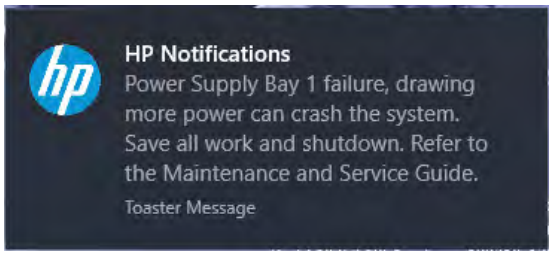
If HP Notifications version 1.1.26.1 or greater is installed on Windows and PSU mode is set to aggregate, desktop toast notifications will appear when a PSU is lost.



TIMER DRIVEN ALERTS

BIOS uses the Alert Standard Format (ASF) Watchdog timer which is implemented by Intel® AMT firmware and is used to detect and alert on BIOS and OS hangs. The timeout can be adjusted in BIOS as shown below, the default is five minutes. The watchdog timer is **<off>** by default. The box must be checked to enable the timers such that alerts will be sent to the HP ZCentral Connect Admin Portal.

BIOS WATCHDOG TIMER SETUP SCREEN

WATCHDOG TIMER CAPABILITIES

The table below identifies the types of problems that can be caught if the watchdog timers are enabled.

#	Check	Timers
1	Check if we were stuck in BIOS	ASF "BIOS" watchdog timer. It is set by BIOS right after HECI protocol is available in early POST. If BIOS does not clear it after a specific time set in the timer the ASF message for BIOS hang will be sent out.
2	Check if we hung in the OS	If there is an ASF message for OS hang, it is ASF "OS" watchdog timer set by OS driver. Not all the OS hang cases involve a watchdog timer.
3	Check if we hung loading the OS	ASF "OS" watchdog timer. It is set by BIOS before passing the control to OS. If OS does not clear it after a specific time set in the timer the ASF message for OS hang will be sent out.
4	Check if we got a blue screen	If there is an ASF message for OS hang, it is ASF "OS" watchdog timer set by OS driver. Not all the OS hang cases involve a watchdog timer.
5	Check if we got a system reset	Depending on where the system resets, it can be ASF "BIOS" watchdog timer (set by BIOS in POST), or ASF "OS" watchdog timer (set by OS driver in OS), or one of internal undocumented watchdog timers inside ME controller (reset in early POST due to missing DRAM-Init-Done Ack, for example). Not all reset cases trigger a watchdog timer timeout.
6	Check if we got a system hang	Depending on where the system hangs it can be ASF "BIOS" watchdog timer (set by BIOS in POST), or ASF "OS" watchdog timer (set by OS driver in OS). Not all hang cases trigger a watchdog timer timeout.

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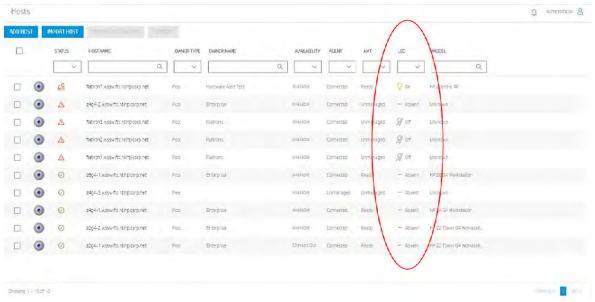
SYSTEM ID LED

On the HP ZCentral 4R the System ID LED can be used to identify a specific system within a group of systems. The LED can be activated from specific menus within HP ZConnect. When activated you can see the LED on both the front and rear of the chassis.

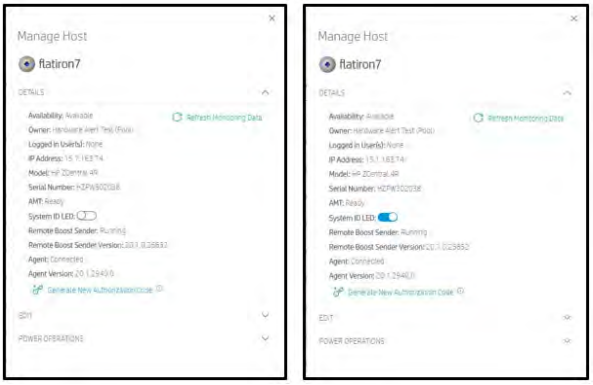
HP ZCENTRAL 4R FRONT

HP ZCENTRAL 4R REAR

The System ID LED can be activated from HP ZConnect providing the system has a System ID LED. The Hosts menu will show which systems have this capability. It will also show you of the systems that have the capability what state they are currently in.



Within a system you can toggle the System ID LED.



SYSTEM ID LED PERSISTENCE

The System ID LED will stay persistent through all system power states. When AC is removed from the system or if the system is in some sleep modes, the light will not stay on, but will come back on when the system is brought out of those states. The light must be turned off from the HP ZConnect interface.

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