



Hewlett Packard
Enterprise

HPE Apollo 2000 System

Maintenance and Service Guide

Abstract

This guide describes identification and maintenance procedures, diagnostic tools, specifications and requirements for hardware components and software. This guide is for an experienced service technician. Hewlett Packard Enterprise assumes that you are qualified in the servicing of computer equipment, trained in recognizing hazards in products, and are familiar with weight and stability precautions.

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HPE Apollo 2000 System

Introduction

The HPE Apollo 2000 System consists of a chassis and nodes. There are three chassis options with different storage configurations. The four server tray slots on the chassis must be populated with server nodes or node blanks.

Chassis

- HPE Apollo r2200 Chassis (12 low-profile LFF model)
- HPE Apollo r2600 Chassis (24 SFF model)
- HPE Apollo r2800 Chassis (24 SFF model with storage expander backplane)

Nodes

- HPE ProLiant XL170r Gen9 Server Node (1U)
- HPE ProLiant XL190r Gen9 Server Node (2U)

The chassis supports the combination of 1U and 2U nodes. One chassis can support a maximum of the following:

- Four 1U nodes
- Two 1U nodes and one 2U node
- Two 2U nodes

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

Customer self repair

Hewlett Packard Enterprise products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period Hewlett Packard Enterprise (or Hewlett Packard Enterprise service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, Hewlett Packard Enterprise will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request Hewlett Packard Enterprise to replace these parts, you will be charged for the travel and labor costs of this service.
- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that Hewlett Packard Enterprise replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

NOTE: Some Hewlett Packard Enterprise parts are not designed for customer self repair. In order to satisfy the customer warranty, Hewlett Packard Enterprise requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the Hewlett Packard Enterprise Support Center and a technician will help you over the telephone. Hewlett Packard Enterprise specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to Hewlett Packard Enterprise. In cases where it is required to return the defective part to Hewlett Packard Enterprise, you must ship the defective part back to Hewlett Packard Enterprise within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in Hewlett Packard Enterprise billing you for the replacement. With a customer self repair, Hewlett Packard Enterprise will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about the Hewlett Packard Enterprise CSR program, contact your local service provider. For the North American program, go to the Hewlett Packard Enterprise CSR website (<http://www.hpe.com/support/selfrepair>).

Parts only warranty service

Your Hewlett Packard Enterprise Limited Warranty may include a parts only warranty service. Under the terms of parts only warranty service, Hewlett Packard Enterprise will provide replacement parts free of charge.

For parts only warranty service, CSR part replacement is mandatory. If you request Hewlett Packard Enterprise to replace these parts, you will be charged for the travel and labor costs of this service.

Réparation par le client (CSR)

Les produits Hewlett Packard Enterprise comportent de nombreuses pièces CSR (Customer Self Repair = réparation par le client) afin de minimiser les délais de réparation et faciliter le remplacement des pièces défectueuses. Si pendant la période de diagnostic, Hewlett Packard Enterprise (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, Hewlett Packard Enterprise vous l'envoie directement. Il existe deux catégories de pièces CSR :

- **Obligatoire**—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à Hewlett Packard Enterprise de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
- **Facultatif**—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à Hewlett Packard Enterprise de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

REMARQUE: Certaines pièces Hewlett Packard Enterprise ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, Hewlett Packard Enterprise exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention "Non" dans le Catalogue illustré.

Les pièces CSR sont livrées le jour ouvré suivant, dans la limite des stocks disponibles et selon votre situation géographique. Si votre situation géographique le permet et que vous demandez une livraison le jour même ou dans les 4 heures, celle-ci vous sera facturée. Pour toute assistance, appelez le Centre d'assistance Hewlett Packard Enterprise pour qu'un technicien vous aide au téléphone. Dans les documents envoyés avec la pièce de rechange CSR, Hewlett Packard Enterprise précise s'il est nécessaire de lui retourner la pièce défectueuse. Si c'est le cas, vous devez le faire dans le délai indiqué, généralement cinq (5) jours ouvrés. La pièce et sa documentation doivent être retournées dans l'emballage fourni. Si vous ne retournez pas la pièce défectueuse, Hewlett Packard Enterprise se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d'une pièce CSR, Hewlett Packard Enterprise supporte l'ensemble des frais d'expédition et de retour, et détermine la société de courses ou le transporteur à utiliser.

Pour plus d'informations sur le programme CSR de Hewlett Packard Enterprise, contactez votre Mainteneur Agréé local. Pour plus d'informations sur ce programme en Amérique du Nord, consultez le site Web Hewlett Packard Enterprise (<http://www.hpe.com/support/selfrepair>).

Service de garantie "pièces seules"

Votre garantie limitée Hewlett Packard Enterprise peut inclure un service de garantie "pièces seules". Dans ce cas, les pièces de rechange fournies par Hewlett Packard Enterprise ne sont pas facturées.

Dans le cadre de ce service, la réparation des pièces CSR par le client est obligatoire. Si vous demandez à Hewlett Packard Enterprise de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Riparazione da parte del cliente

Per abbreviare i tempi di riparazione e garantire una maggiore flessibilità nella sostituzione di parti difettose, i prodotti Hewlett Packard Enterprise sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica Hewlett Packard Enterprise (o un centro di servizi o di assistenza Hewlett Packard Enterprise) identifica il guasto come riparabile mediante un ricambio CSR, Hewlett Packard Enterprise lo spedisce direttamente al cliente per la sostituzione. Vi sono due categorie di parti CSR:

- **Obbligatorie**—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad Hewlett Packard Enterprise, deve sostenere le spese di spedizione e di manodopera per il servizio.
- **Opzionali**—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad Hewlett Packard Enterprise, potrebbe dover sostenere spese aggiuntive a seconda del tipo di garanzia previsto per il prodotto.

NOTA: alcuni componenti Hewlett Packard Enterprise non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, Hewlett Packard Enterprise richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

In base alla disponibilità e alla località geografica, le parti CSR vengono spedite con consegna entro il giorno lavorativo seguente. La consegna nel giorno stesso o entro quattro ore è offerta con un supplemento di costo solo in alcune zone. In caso di necessità si può richiedere l'assistenza telefonica di un addetto del centro di supporto tecnico Hewlett Packard Enterprise. Nel materiale fornito con una parte di ricambio CSR, Hewlett Packard Enterprise specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad Hewlett Packard Enterprise del componente difettoso, lo si deve spedire ad Hewlett Packard Enterprise entro un determinato periodo di tempo, generalmente cinque (5) giorni lavorativi. Il componente difettoso deve essere restituito con la documentazione associata nell'imballo di spedizione fornito. La mancata restituzione del componente può comportare la fatturazione del ricambio da parte di Hewlett Packard Enterprise. Nel caso di riparazione da parte del cliente, Hewlett Packard Enterprise sostiene tutte le spese di spedizione e resa e sceglie il corriere/vettore da utilizzare.

Per ulteriori informazioni sul programma CSR di Hewlett Packard Enterprise, contattare il centro di assistenza di zona. Per il programma in Nord America fare riferimento al sito Web (<http://www.hpe.com/support/selfrepair>).

Servizio di garanzia per i soli componenti

La garanzia limitata Hewlett Packard Enterprise può includere un servizio di garanzia per i soli componenti. Nei termini di garanzia del servizio per i soli componenti, Hewlett Packard Enterprise fornirà gratuitamente le parti di ricambio.

Per il servizio di garanzia per i soli componenti è obbligatoria la formula CSR che prevede la riparazione da parte del cliente. Se il cliente invece richiede la sostituzione ad Hewlett Packard Enterprise dovrà sostenere le spese di spedizione e di manodopera per il servizio.

Customer Self Repair

Hewlett Packard Enterprise Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn Hewlett Packard Enterprise (oder ein Hewlett Packard Enterprise Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen Hewlett Packard Enterprise dieses Bauteil zum Austausch direkt zu. CSR-Teile werden in zwei Kategorien unterteilt:

- **Zwingend**—Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.
- **Optional**—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

HINWEIS: Einige Hewlett Packard Enterprise Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem Hewlett Packard Enterprise Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

CSR-Teile werden abhängig von der Verfügbarkeit und vom Lieferziel am folgenden Geschäftstag geliefert. Für bestimmte Standorte ist eine Lieferung am selben Tag oder innerhalb von vier Stunden gegen einen Aufpreis verfügbar. Wenn Sie Hilfe benötigen, können Sie das Hewlett Packard Enterprise

Support Center anrufen und sich von einem Mitarbeiter per Telefon helfen lassen. Den Materialien von Hewlett Packard Enterprise, die mit einem CSR-Ersatzteil geliefert werden, können Sie entnehmen, ob das defekte Teil an Hewlett Packard Enterprise zurückgeschickt werden muss. Wenn es erforderlich ist, das defekte Teil an Hewlett Packard Enterprise zurückzuschicken, müssen Sie dies innerhalb eines vorgegebenen Zeitraums tun, in der Regel innerhalb von fünf (5) Geschäftstagen. Das defekte Teil muss mit der zugehörigen Dokumentation in der Verpackung zurückgeschickt werden, die im Lieferumfang enthalten ist. Wenn Sie das defekte Teil nicht zurückschicken, kann Hewlett Packard Enterprise Ihnen das Ersatzteil in Rechnung stellen. Im Falle von Customer Self Repair kommt Hewlett Packard Enterprise für alle Kosten für die Lieferung und Rücksendung auf und bestimmt den Kurier-/Frachtdienst.

Weitere Informationen über das Hewlett Packard Enterprise Customer Self Repair Programm erhalten Sie von Ihrem Servicepartner vor Ort. Informationen über das CSR-Programm in Nordamerika finden Sie auf der Hewlett Packard Enterprise Website unter (<http://www.hpe.com/support/selfrepair>).

Parts-only Warranty Service (Garantieservice ausschließlich für Teile)

Ihre Hewlett Packard Enterprise Garantie umfasst möglicherweise einen Parts-only Warranty Service (Garantieservice ausschließlich für Teile). Gemäß den Bestimmungen des Parts-only Warranty Service stellt Hewlett Packard Enterprise Ersatzteile kostenlos zur Verfügung.

Für den Parts-only Warranty Service ist das CSR-Verfahren zwingend vorgegeben. Wenn Sie den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Reparaciones del propio cliente

Los productos de Hewlett Packard Enterprise incluyen muchos componentes que el propio usuario puede reemplazar (Customer Self Repair, CSR) para minimizar el tiempo de reparación y ofrecer una mayor flexibilidad a la hora de realizar sustituciones de componentes defectuosos. Si, durante la fase de diagnóstico, Hewlett Packard Enterprise (o los proveedores o socios de servicio de Hewlett Packard Enterprise) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, Hewlett Packard Enterprise le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:

- **Obligatorio**—Componentes cuya reparación por parte del usuario es obligatoria. Si solicita a Hewlett Packard Enterprise que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
- **Opcional**—Componentes cuya reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que Hewlett Packard Enterprise realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

NOTA: Algunos componentes de Hewlett Packard Enterprise no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, Hewlett Packard Enterprise pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

Según la disponibilidad y la situación geográfica, los componentes CSR se enviarán para que lleguen a su destino al siguiente día laborable. Si la situación geográfica lo permite, se puede solicitar la entrega en el mismo día o en cuatro horas con un coste adicional. Si precisa asistencia técnica, puede llamar al Centro de asistencia técnica de Hewlett Packard Enterprise y recibirá ayuda telefónica por parte de un técnico. Con el envío de materiales para la sustitución de componentes CSR, Hewlett Packard Enterprise especificará si los componentes defectuosos deberán devolverse a Hewlett Packard Enterprise. En aquellos casos en los que sea necesario devolver algún componente a Hewlett Packard Enterprise,

deberá hacerlo en el periodo de tiempo especificado, normalmente cinco días laborables. Los componentes defectuosos deberán devolverse con toda la documentación relacionada y con el embalaje de envío. Si no enviara el componente defectuoso requerido, Hewlett Packard Enterprise podrá cobrarle por el de sustitución. En el caso de todas sustituciones que lleve a cabo el cliente, Hewlett Packard Enterprise se hará cargo de todos los gastos de envío y devolución de componentes y escogerá la empresa de transporte que se utilice para dicho servicio.

Para obtener más información acerca del programa de Reparaciones del propio cliente de Hewlett Packard Enterprise, póngase en contacto con su proveedor de servicios local. Si está interesado en el programa para Norteamérica, visite la página web de Hewlett Packard Enterprise CSR (<http://www.hpe.com/support/selfrepair>).

Servicio de garantía exclusivo de componentes

La garantía limitada de Hewlett Packard Enterprise puede que incluya un servicio de garantía exclusivo de componentes. Según las condiciones de este servicio exclusivo de componentes, Hewlett Packard Enterprise le facilitará los componentes de repuesto sin cargo adicional alguno.

Para este servicio de garantía exclusivo de componentes, es obligatoria la sustitución de componentes por parte del usuario (CSR). Si solicita a Hewlett Packard Enterprise que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

Customer Self Repair

Veel onderdelen in Hewlett Packard Enterprise producten zijn door de klant zelf te repareren, waardoor de reparatieduur tot een minimum beperkt kan blijven en de flexibiliteit in het vervangen van defecte onderdelen groter is. Deze onderdelen worden CSR-onderdelen (Customer Self Repair) genoemd. Als Hewlett Packard Enterprise (of een Hewlett Packard Enterprise Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt Hewlett Packard Enterprise dat onderdeel rechtstreeks naar u, zodat u het defecte onderdeel daarmee kunt vervangen. Er zijn twee categorieën CSR-onderdelen:

- **Verplicht**—Onderdelen waarvoor reparatie door de klant verplicht is. Als u Hewlett Packard Enterprise verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.
- **Optioneel**—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter Hewlett Packard Enterprise verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

OPMERKING: Sommige Hewlett Packard Enterprise onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

Afhankelijk van de leverbaarheid en de locatie worden CSR-onderdelen verzonden voor levering op de eerstvolgende werkdag. Levering op dezelfde dag of binnen vier uur kan tegen meerkosten worden aangeboden, indien dit mogelijk is gezien de locatie. Indien assistentie is gewenst, belt u het Hewlett Packard Enterprise Support Center om via de telefoon ondersteuning van een technicus te ontvangen. Hewlett Packard Enterprise vermeldt in de documentatie bij het vervangende CSR-onderdeel of het defecte onderdeel aan Hewlett Packard Enterprise moet worden geretourneerd. Als het defecte onderdeel aan Hewlett Packard Enterprise moet worden teruggezonden, moet u het defecte onderdeel binnen een bepaalde periode, gewoonlijk vijf (5) werkdagen, retourneren aan Hewlett Packard Enterprise. Het defecte onderdeel moet met de bijbehorende documentatie worden geretourneerd in het meegeleverde verpakkingsmateriaal. Als u het defecte onderdeel niet terugzendt, kan Hewlett Packard

Enterprise u voor het vervangende onderdeel kosten in rekening brengen. Bij reparatie door de klant betaalt Hewlett Packard Enterprise alle verzendkosten voor het vervangende en geretourneerde onderdeel en kiest Hewlett Packard Enterprise zelf welke koerier/transportonderneming hiervoor wordt gebruikt.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van Hewlett Packard Enterprise. Informatie over Service Partners vindt u op de Hewlett Packard Enterprise website (<http://www.hpe.com/support/selfrepair>).

Garantieservice "Parts Only"

Het is mogelijk dat de Hewlett Packard Enterprise garantie alleen de garantieservice "Parts Only" omvat. Volgens de bepalingen van de Parts Only garantieservice zal Hewlett Packard Enterprise kosteloos vervangende onderdelen ter beschikking stellen.

Voor de Parts Only garantieservice is vervanging door CSR-onderdelen verplicht. Als u Hewlett Packard Enterprise verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht

Reparo feito pelo cliente

Os produtos da Hewlett Packard Enterprise são projetados com muitas peças para reparo feito pelo cliente (CSR) de modo a minimizar o tempo de reparo e permitir maior flexibilidade na substituição de peças com defeito. Se, durante o período de diagnóstico, a Hewlett Packard Enterprise (ou fornecedores/parceiros da Hewlett Packard Enterprise) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a Hewlett Packard Enterprise enviará a peça diretamente ao cliente. Há duas categorias de peças CSR:

- **Obrigatória**—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a Hewlett Packard Enterprise substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
- **Opcional**—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a Hewlett Packard Enterprise as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

OBSERVAÇÃO: Algumas peças da Hewlett Packard Enterprise não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a Hewlett Packard Enterprise exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

Conforme a disponibilidade e o local geográfico, as peças CSR serão enviadas no primeiro dia útil após o pedido. Onde as condições geográficas permitirem, a entrega no mesmo dia ou em quatro horas pode ser feita mediante uma taxa adicional. Se precisar de auxílio, entre em contato com o Centro de suporte técnico da Hewlett Packard Enterprise para que um técnico o ajude por telefone. A Hewlett Packard Enterprise especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à Hewlett Packard Enterprise. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à Hewlett Packard Enterprise, você deverá enviar a peça com defeito de volta para a Hewlett Packard Enterprise dentro do período de tempo definido, normalmente em 5 (cinco) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a Hewlett Packard Enterprise poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a Hewlett Packard Enterprise paga todas as despesas de transporte e de devolução da peça e determina a transportadora/serviço postal a ser utilizado.

Para obter mais informações sobre o programa de reparo feito pelo cliente da Hewlett Packard Enterprise, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site da Hewlett Packard Enterprise (<http://www.hpe.com/support/selfrepair>).

Serviço de garantia apenas para peças

A garantia limitada da Hewlett Packard Enterprise pode incluir um serviço de garantia apenas para peças. Segundo os termos do serviço de garantia apenas para peças, a Hewlett Packard Enterprise fornece as peças de reposição sem cobrar nenhuma taxa.

No caso desse serviço, a substituição de peças CSR é obrigatória. Se desejar que a Hewlett Packard Enterprise substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

カスタマーセルフリペア

修理時間を短縮し、故障部品の交換における高い柔軟性を確保するために、Hewlett Packard Enterprise製品には多数のカスタマーセルフリペア（CSR）部品があります。診断の際に、CSR部品を使用すれば修理ができるとHewlett Packard Enterprise（Hewlett Packard EnterpriseまたはHewlett Packard Enterprise正規保守代理店）が判断した場合、Hewlett Packard Enterpriseはその部品を直接、お客様に発送し、お客様に交換していただきます。CSR部品には以下の2種類があります。

- **必須** - カスタマーセルフリペアが必須の部品。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。
- **任意** - カスタマーセルフリペアが任意である部品。この部品もカスタマーセルフリペア用です。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

注：Hewlett Packard Enterprise製品の一部の部品は、カスタマーセルフリペアの対象外です。製品の保証を継続するためには、Hewlett Packard EnterpriseまたはHewlett Packard Enterprise正規保守代理店による交換作業が必須となります。部品カタログには、当該部品がカスタマーセルフリペア除外品である旨が記載されています。

部品供給が可能な場合、地域によっては、CSR部品を翌営業日に届くように発送します。また、地域によっては、追加費用を負担いただくことにより同日または4時間以内に届くように発送することも可能な場合があります。サポートが必要なときは、Hewlett Packard Enterpriseサポートセンターに電話していただければ、技術者が電話でアドバイスします。交換用のCSR部品または同梱物には、故障部品をHewlett Packard Enterpriseに返送する必要がある場合は、指定期限内（通常は5営業日以内）に故障部品をHewlett Packard Enterpriseに返送してください。故障部品を返送する場合は、届いた時の梱包箱に関連書類とともに入れてください。故障部品を返送しない場合、Hewlett Packard Enterpriseから部品費用が請求されます。カスタマーセルフリペアの際には、Hewlett Packard Enterpriseは送料および部品返送費を全額負担し、使用する宅配便会社や運送会社を指定します。

部品のみ保証サービス

Hewlett Packard Enterprise保証サービスには、部品のみ保証サービスが適用される場合があります。このサービスでは、交換部品は無償で提供されます。

部品のみ保証サービスにおいては、CSR部品をお客様により交換作業していただくことが必須になります。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様のご負担となります。

客户自行维修

Hewlett Packard Enterprise 产品提供许多客户自行维修 (CSR) 部件，以尽可能缩短维修时间和在更换缺陷部件方面提供更大的灵活性。如果在诊断期间 Hewlett Packard Enterprise (或 Hewlett Packard Enterprise 服务提供商或服务合作伙伴) 确定可以通过使用 CSR 部件完成维修，Hewlett Packard Enterprise 将直接把该部件发送给您进行更换。有两类 CSR 部件：

- **强制性的** — 要求客户必须自行维修的部件。如果您请求 Hewlett Packard Enterprise 更换这些部件，则必须为该服务支付差旅费和人工费用。
- **可选的** — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 Hewlett Packard Enterprise 为您更换这些部件，则根据为您的产品指定的保修服务类型，Hewlett Packard Enterprise 可能收取或不再收取任何附加费用。

注：某些 Hewlett Packard Enterprise 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，Hewlett Packard Enterprise 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

CSR 部件将在下一个工作日发运（取决于备货情况和允许的地理范围）。在允许的地理范围内，可在当天或四小时内发运，但要收取额外费用。如果需要帮助，您可以致电 Hewlett Packard Enterprise 技术支持中心，将会有技术人员通过电话为您提供帮助。Hewlett Packard Enterprise 会在随更换的 CSR 部件发运的材料中指明是否必须将有缺陷的部件返还给 Hewlett Packard Enterprise。如果要求您将有缺陷的部件返还给 Hewlett Packard Enterprise，那么您必须在规定的期限内（通常是五 (5) 个工作日）将缺陷部件发给 Hewlett Packard Enterprise。有缺陷的部件必须随所提供的发运材料中的相关文件一起返还。如果未能送还有缺陷的部件，Hewlett Packard Enterprise 可能会要求您支付更换费用。客户自行维修时，Hewlett Packard Enterprise 将承担所有相关运输和部件返回费用，并指定快递商/承运商。

有关 Hewlett Packard Enterprise 客户自行维修计划的详细信息，请与您当地的服务提供商联系。有关北美地区的计划，请访问 Hewlett Packard Enterprise 网站 (<http://www.hpe.com/support/selfrepair>)。

仅部件保修服务

您的 Hewlett Packard Enterprise 有限保修服务可能涉及仅部件保修服务。根据仅部件保修服务条款的规定，Hewlett Packard Enterprise 将免费提供更换的部件。

仅部件保修服务要求进行 CSR 部件更换。如果您请求 Hewlett Packard Enterprise 更换这些部件，则必须为该服务支付差旅费和人工费用。

客戶自行維修

Hewlett Packard Enterprise 產品設計了許多「客戶自行維修」(CSR) 的零件以減少維修時間，並且使得更換瑕疵零件時能有更大的彈性。如果在診斷期間，Hewlett Packard Enterprise (或 Hewlett Packard Enterprise 服務供應商或維修夥伴) 辨認出此項維修工作可以藉由使用 CSR 零件來完成，則 Hewlett Packard Enterprise 將直接寄送該零件給您作更換。CSR 零件分為兩種類別：

- **強制的** — 客戶自行維修所使用的零件是強制性的。如果您要求 Hewlett Packard Enterprise 更換這些零件，Hewlett Packard Enterprise 將會向您收取此服務所需的外出費用與勞動成本。
- **選購的** — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 Hewlett Packard Enterprise 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

備註：某些 Hewlett Packard Enterprise 零件沒有消費者可自行維修的設計。為符合客戶保固，Hewlett Packard Enterprise 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

基於材料取得及環境允許的情況下，CSR 零件將於下一個工作日以快遞寄送。在環境的允許下當天或四小時內送達，則可能需要額外的費用。若您需要協助，可致電 Hewlett Packard Enterprise 支援中心，會有一位技術人員透過電話來協助您。不論損壞的零件是否必須退回，Hewlett Packard Enterprise 皆會在與 CSR 替換零件一起運送的材料中註明。若要将損壞的零件退回 Hewlett Packard Enterprise，您必須在指定的一段時間內 (通常為五 (5) 個工作天)，將損壞的零件寄回 Hewlett Packard Enterprise。損壞的零件必須與寄送資料中隨附的相關技術文件一併退還。如果無法退還損壞的零件，Hewlett Packard Enterprise 可能要向您收取替換費用。針對客戶自行維修情形，Hewlett Packard Enterprise 將負責所有運費及零件退還費用，並指定使用何家快遞/貨運公司。

如需 Hewlett Packard Enterprise 的 CSR 方案詳細資訊，請連絡您當地的服務供應商。至於北美方案，請參閱 Hewlett Packard Enterprise 的 CSR 網站 [selfrepair](http://www.hpe.com/support/selfrepair) (<http://www.hpe.com/support/selfrepair>)。

僅限零件的保固服務

您的「Hewlett Packard Enterprise 有限保固」可能包含僅限零件的保固服務。在僅限零件的保固服務情況下，Hewlett Packard Enterprise 將免費提供替換零件。

針對僅限零件的保固服務，CSR 零件替換是強制性的。如果您要求 Hewlett Packard Enterprise 更換這些零件，Hewlett Packard Enterprise 將會向您收取此服務所需的外出費用與勞動成本。

고객 셀프 수리

Hewlett Packard Enterprise 제품은 수리 시간을 최소화하고 결함이 있는 부품 교체 시 더욱 융통성을 발휘할 수 있도록 하기 위해 고객 셀프 수리(CSR) 부품을 다량 사용하여 설계되었습니다. 진단 기간 동안 Hewlett Packard Enterprise(또는 Hewlett Packard Enterprise 서비스 공급업체 또는 서비스 협력업체)에서 CSR 부품을 사용하여 수리가 가능하다고 판단되면 Hewlett Packard Enterprise는 해당 부품을 바로 사용자에게 보내어 사용자가 교체할 수 있도록 합니다. CSR 부품에는 두 가지 종류가 있습니다.

- 필수 - 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 Hewlett Packard Enterprise에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.
- 선택 사항 - 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 Hewlett Packard Enterprise에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

참고: 일부 Hewlett Packard Enterprise 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. Hewlett Packard Enterprise는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

CSR 부품은 재고 상태와 지리적 조건이 허용하는 경우 다음 영업일 납품이 가능하도록 배송이 이루어집니다. 지리적 조건이 허용하는 경우 추가 비용이 청구되는 조건으로 당일 또는 4시간 배송이 가능할 수도 있습니다. 도움이 필요하시면 Hewlett Packard Enterprise Support Center로 전화하십시오. 전문 기술자가 전화로 도움을 줄 것입니다. Hewlett Packard Enterprise는 결함이 발생한 부품을 Hewlett Packard Enterprise로 반환해야 하는지 여부를 CSR 교체 부품과 함께 배송된 자료에 지정합니다. 결함이 발생한 부품을 Hewlett Packard Enterprise로 반환해야 하는 경우에는 지정된 기간 내(통상 영업일 기준 5일)에 Hewlett Packard Enterprise로 반환해야 합니다. 이때 결함이 발생한 부품은 제공된 포장 재료에 넣어 관련 설명서와 함께 반환해야 합니다. 결함이 발생한 부품을 반환하지 않는 경우 Hewlett Packard Enterprise가 교체 부품에 대해 비용을 청구할 수 있습니다. 고객 셀프 수리의 경우, Hewlett Packard Enterprise는 모든 운송 및 부품 반환 비용을 부담하며 이용할 운송업체 및 택배 서비스를 결정합니다.

Hewlett Packard Enterprise CSR 프로그램에 대한 자세한 내용은 가까운 서비스 제공업체에 문의하십시오. 북미 지역의 프로그램에 대해서는 Hewlett Packard Enterprise CSR 웹사이트(<http://www.hpe.com/support/selfrepair>)를 참조하십시오.

부품 제공 보증 서비스

Hewlett Packard Enterprise 제한 보증에는 부품 제공 보증 서비스가 포함될 수 있습니다. 이러한 경우 Hewlett Packard Enterprise는 부품 제공 보증 서비스의 조건에 따라 교체 부품만을 무료로 제공합니다.

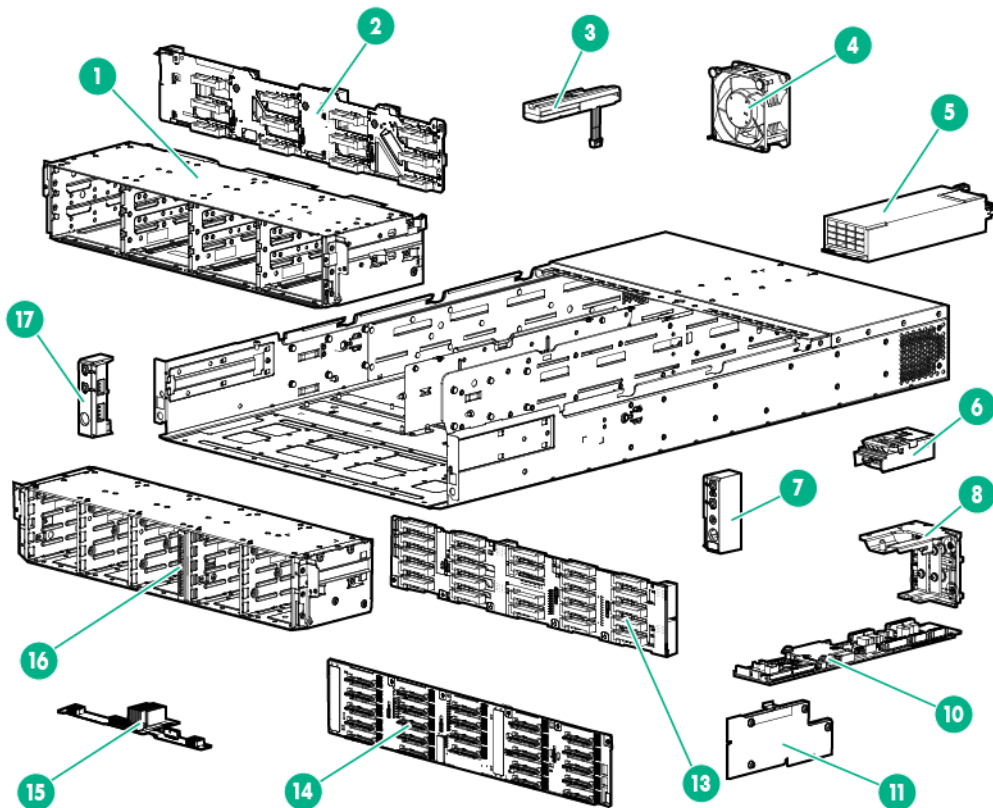
부품 제공 보증 서비스 제공 시 CSR 부품 교체는 의무 사항입니다. 사용자가 Hewlett Packard Enterprise에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

Illustrated parts catalog

System components

Hewlett Packard Enterprise continually improves and changes product parts. For complete and current supported parts information, see the Hewlett Packard Enterprise PartSurfer website (<http://www.hpe.com/info/partssurfer>).

Chassis system components



Item	Description	Spare part number	Customer self repair (on page 7)
1	12 low-profile LFF drive cage	—	—
2	12 low-profile LFF drive backplane for Apollo r2200 Chassis	800357-001	No ³
3	HPE Smart Storage Battery	815983-001	Mandatory ¹
4	Fan module	808849-001	Optional ²
5	Power supplies	—	—
	a) HPE 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit – 94% efficiency*	754383-001	Mandatory ¹
	b) HPE 800W Flex Slot Platinum Hot Plug Power Supply Kit – 94% efficiency*	754381-001	Mandatory ¹

Item	Description	Spare part number	Customer self repair (on page 7)
	c) HPE 800W Flex Slot Universal Hot Plug Power Supply Kit – 94% efficiency*	754379-001	Mandatory ¹
	d) HPE 800W Flex Slot Titanium Hot Plug Power Supply Kit – 96% efficiency*	754378-001	Mandatory ¹
	e) HPE 800W Flex Slot -48VDC Hot Plug Power Supply Kit – 94% efficiency*	754382-001	Mandatory ¹
6	RCM module	800361-001	Mandatory ¹
7	Right bezel ear	—	—
8	PDB pass-through board assembly	—	—
9	PDB pass-through board*	800356-001	No ³
10	Power distribution board	800355-001	No ³
11	RPS link board assembly	—	—
12	RPS link board*	800375-001	Optional ²
13	24 SFF backplane for Apollo r2600 Chassis	800358-001	No ³
14	Storage expander backplane (Apollo r2800 Chassis drive backplane)	800359-001	No ³
15	Storage expander card (for Apollo r2800 Chassis only)	800360-001	No ³
16	24 SFF drive cage	—	—
17	Left bezel ear	808850-001	Optional ²
18	Fan power cable assembly*	808848-001	Mandatory ¹
19	Chassis cable kit	811569-001	—
	a) RCM 2.0 cable*	—	No ³
	b) PDB pass-through cable*	—	Mandatory ¹
	c) Left front I/O cable* for HPE Apollo r2600/r2800 Chassis	—	Mandatory ¹
	d) Front I/O cables *	—	Mandatory ¹
	e) RCM 2.0 to 1.0 adapter cable*	—	Mandatory ¹
20	12 LFF Apollo r2200 Chassis*	841639-001	Optional ²
21	24 SFF Apollo r2600 Chassis*	841640-001	Optional ²
22	24 SFF Apollo r2800 Chassis*	841641-001	Optional ²

*Not shown

¹Mandatory—Parts for which customer self repair is mandatory. If you request Hewlett Packard Enterprise to replace these parts, you will be charged for the travel and labor costs of this service.

²Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that Hewlett Packard Enterprise replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

³No—Some Hewlett Packard Enterprise parts are not designed for customer self repair. In order to satisfy the customer warranty, Hewlett Packard Enterprise requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

¹Obligatoire—Pièces pour lesquelles le client doit procéder lui-même aux réparations. Si vous demandez à Hewlett Packard Enterprise de procéder au remplacement de ces pièces, les frais de transport et de main d'œuvre pour ce service vous seront facturés.

²Facultatif—Pièces pour lesquelles une réparation par le client est facultative. Ces pièces sont également conçues pour que le client puisse procéder lui-même aux réparations. Cependant, les frais supplémentaires engendrés par le remplacement de ces pièces par Hewlett Packard Enterprise dépendent du type de service de garantie désigné pour votre produit.

³Non—Certaines pièces Hewlett Packard Enterprise ne sont pas conçues pour être remplacées par le client. Afin de se conformer aux exigences de la garantie la garantie du client, Hewlett Packard Enterprise demande à un fournisseur de services agréé de procéder au remplacement de la pièce. Ces pièces sont signalées par le mot « Non » dans le Catalogue de pièces illustré.

¹Obbligatorio—Parti per le quali il cliente è tenuto a effettuare autonomamente la riparazione. Se si richiede l'intervento di Hewlett Packard Enterprise per la sostituzione di queste parti, al cliente verranno addebitate le spese di viaggio e manodopera dell'operazione.

²Facoltativo—Parti per le quali la riparazione in autonomia da parte del cliente è facoltativa. Queste parti sono progettate per consentire anche la riparazione da parte del cliente. Tuttavia, se il cliente richiede l'intervento di Hewlett Packard Enterprise per la sostituzione, potrebbero essere addebitate spese aggiuntive a seconda del tipo di garanzia in assistenza previsto per il prodotto.

³No—Alcune parti Hewlett Packard Enterprise non sono progettate la riparazione in autonomia da parte del cliente. In base a quanto previsto dalla garanzia per il cliente, Hewlett Packard Enterprise richiede l'intervento di un tecnico autorizzato per la sostituzione della parte. Queste parti sono contrassegnate con "No" nel catalogo parti illustrato.

¹Zwingend—Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

²Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

³Nein—Einige Hewlett Packard Enterprise Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem Hewlett Packard Enterprise Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

¹Obligatorio—Componentes cuya reparación por parte del usuario es obligatoria. Si solicita a Hewlett Packard Enterprise que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

²Opcional—Componentes cuya reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que Hewlett Packard Enterprise realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

³No—Algunos componentes de Hewlett Packard Enterprise no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, Hewlett Packard Enterprise pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

¹Verplicht—Onderdelen die de klant zelf moet vervangen. Als u Hewlett Packard Enterprise vraagt deze onderdelen te vervangen, worden er reis- en arbeidskosten voor deze service in rekening gebracht.

²Optioneel—Onderdelen die de klant zelf kan vervangen. Deze onderdelen zijn ook ontworpen om door de klant zelf te worden vervangen. Als u Hewlett Packard Enterprise verzoekt om deze te vervangen, kan het zijn dat hiervoor extra kosten in rekening worden gebracht, afhankelijk van het soort garantie dat op uw product van toepassing is.

³Geen—Sommige onderdelen van Hewlett Packard Enterprise zijn niet ontworpen om door de klant zelf te worden vervangen. Om te voldoen aan de garantievoorwaarden eist Hewlett Packard Enterprise dat een geautoriseerde serviceverlener het onderdeel vervangt. Deze onderdelen worden aangeduid met 'Geen' in de geïllustreerde onderdelencatalogus.

¹Obrigatório—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a Hewlett Packard Enterprise substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

²Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a Hewlett Packard Enterprise as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

³Não—Algumas peças da Hewlett Packard Enterprise não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a Hewlett Packard Enterprise exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

¹Mandatory : 必須 — カスタマーセルフリペアが必須の部品。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

²Optional : 任意 — カスタマーセルフリペアが任意である部品。この部品もカスタマーセルフリペア用です。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

³No : 除外 — Hewlett Packard Enterprise製品の一部の部品は、カスタマーセルフリペアの対象外です。製品の保証を継続するためには、Hewlett Packard EnterpriseまたはHewlett Packard Enterprise正規保守代理店による交換作業が必須となります。部品カタログには、当該部品がカスタマーセルフリペア除外品である旨が記載されています。

¹Mandatory — 客户必须自行维修的部件。如果您请求 Hewlett Packard Enterprise 更换这些部件，则必须为该服务支付差旅费和人工费用。

²Optional — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 Hewlett Packard Enterprise 为您更换这些部件，则根据为您的产品指定的保修服务类型，Hewlett Packard Enterprise 可能收取或不再收取任何附加费用。

³No — 某些 Hewlett Packard Enterprise 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，Hewlett Packard Enterprise 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

¹Mandatory — 客戶自行維修所使用的零件是強制性的。如果您要求 Hewlett Packard Enterprise 更換這些零件，Hewlett Packard Enterprise 將會向您收取此服務所需的外出費用與勞動成本。

²Optional — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 Hewlett Packard Enterprise 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

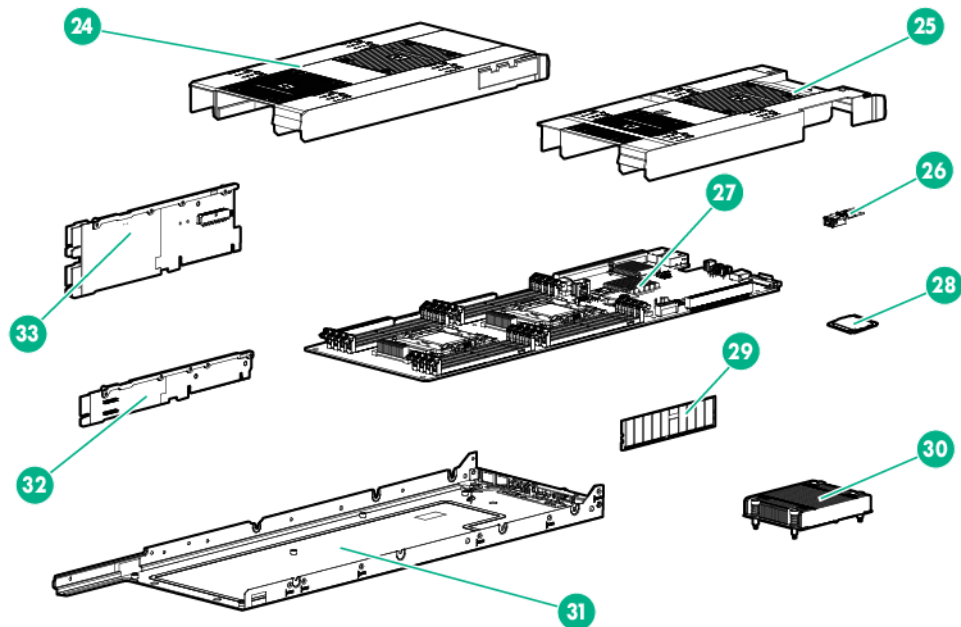
³No — 某些 Hewlett Packard Enterprise 零件沒有消費者可自行維修的設計。為符合客戶保固，Hewlett Packard Enterprise 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

¹Mandatory — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 Hewlett Packard Enterprise에 이 부품의 교체를 요청할 경우 해당 서비스에 대한 출장비 및 작업비가 청구됩니다.

²Optional — 고객 셀프 수리가 선택 사항인 부품. 이러한 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 Hewlett Packard Enterprise에 이러한 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

³No — 일부 Hewlett Packard Enterprise 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. Hewlett Packard Enterprise는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 요구하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

Node system components



Item	Description	Spare part number	Customer self-repair
23	Air baffle kit (includes 1U baffle and 2U baffle)*	811223-001	Mandatory ¹
24	1U air baffle	—	—
25	2U air baffle	—	—
26	Dedicated iLO management port	800369-001	Optional ²

Item	Description	Spare part number	Customer self-repair
27	System board assemblies (include alcohol pad and thermal compound)	—	—
	a) System board assembly for Intel Xeon E5-2600 v3 processors only	800362-001	No ³
	b) System board assembly for both Intel Xeon E5-2600 v4 processors and Intel Xeon E5-2600 v3 processors	842587-001	No ³
28	Processor	—	—
	Intel Xeon E5-2600 v3 processors		
	a) 1.6-GHz Intel Xeon E5-2603 v3, 6C, 85W	762441-001	Optional ²
	b) 1.8-GHz Intel Xeon E5-2650L v3, 12C, 65W*	762461-001	Optional ²
	c) 1.8-GHz Intel Xeon E5-2630L v3, 8C, 55W*	762459-001	Optional ²
	d) 1.9-GHz Intel Xeon E5-2609 v3, 6C, 85W*	762443-001	Optional ²
	e) 2.0-GHz Intel Xeon E5-2683 v3, 14C, 120W*	762453-001	Optional ²
	f) 2.3-GHz Intel Xeon E5-2698 v3, 16C, 135W*	780760-001	Optional ²
	g) 2.3-GHz Intel Xeon E5-2670 v3, 12C, 120W*	762450-001	Optional ²
	h) 2.3-GHz Intel Xeon E5-2650 v3, 10C, 105W*	762448-001	Optional ²
	i) 2.3-GHz Intel Xeon E5-2699 v3, 18C, 145W*	780761-001	Optional ²
	j) 2.3-GHz Intel Xeon E5-2695 v3, 14C, 120W*	762454-001	Optional ²
	k) 2.4-GHz Intel Xeon E5-2630 v3, 8C, 85W*	762446-001	Optional ²
	l) 2.4-GHz Intel Xeon E5-2620 v3, 6C, 85W*	762445-001	Optional ²
	m) 2.5-GHz Intel Xeon E5-2680 v3, 12C, 120W*	762451-001	Optional ²
	n) 2.6-GHz Intel Xeon E5-2640 v3, 8C, 90W*	762447-001	Optional ²
	o) 2.6-GHz Intel Xeon E5-2660 v3, 10C, 105W*	762449-001	Optional ²
	p) 2.6 GHz Intel Xeon E5-2697 v3, 14C, 145W*	765154-001	Optional ²
	q) 2.6-GHz Intel Xeon E5-2690 v3, 12C, 135W*	762452-001	Optional ²
	r) 3.2-GHz Intel Xeon E5-2667 v3, 8C, 135W*	762457-001	Optional ²
	s) 3.2-GHz Intel Xeon E5-1680 v3, 8C, 140W*	846824-001	Optional ²
	t) 3.4-GHz Intel Xeon E5-2643 v3, 6C, 135W*	762456-001	Optional ²
	u) 3.5-GHz Intel Xeon E5-2637 v3, 4C, 135W*	762455-001	Optional ²
	v) 3.5-GHz Intel Xeon E5-1650 v3, 6C, 140W*	801578-001	Optional ²
	w) 3.7-GHz Intel Xeon E5-1630 v3, 4C, 140W*	846823-001	Optional ²
	Intel Xeon E5-2600 v4 processors		
	a) 1.7-GHz Intel Xeon E5-2650L v4, 14C, 65W*	835609-001	Optional ²
	b) 1.7-GHz Intel Xeon E5-2603 v4, 6C, 85W*	835599-001	Optional ²
	c) 1.7-GHz Intel Xeon E5-2609 v4, 8C, 85W*	835600-001	Optional ²
	d) 1.8-GHz Intel Xeon E5-2630L v4, 10C, 55W*	835608-001	Optional ²

Item	Description	Spare part number	Customer self-repair
	e) 2.0-GHz Intel Xeon E5-2660 v4, 14C, 105W*	835605-001	Optional ²
	f) 2.1-GHz Intel Xeon E5-2620 v4, 8C, 85W*	835601-001	Optional ²
	g) 2.1-GHz Intel Xeon E5-2683 v4, 16C, 120W*	835614-001	Optional ²
	h) 2.1-GHz Intel Xeon E5-2695 v4, 18C, 120W*	835615-001	Optional ²
	i) 2.2-GHz Intel Xeon E5-2630 v4, 10C, 85W*	835602-001	Optional ²
	j) 2.2-GHz Intel Xeon E5-2650 v4, 12C, 105W*	835604-001	Optional ²
	k) 2.2-GHz Intel Xeon E5-2698 v4, 20C, 135W*	835617-001	Optional ²
	l) 2.2-GHz Intel Xeon E5-2699 v4, 22C, 145W*	835618-001	Optional ²
	m) 2.3-GHz Intel Xeon E5-2697 v4, 18C 145W*	835616-001	Optional ²
	n) 2.4-GHz Intel Xeon E5-2640 v4, 10C, 90W*	835603-001	Optional ²
	o) 2.4-GHz Intel Xeon E5-2680 v4, 14C, 120W*	835606-001	Optional ²
	p) 2.6-GHz Intel Xeon E5-2623 v4, 4C, 85W*	835610-001	Optional ²
	q) 2.6-GHz Intel Xeon E5-2690 v4, 14C, 135W*	835607-001	Optional ²
	r) 2.6-GHz Intel Xeon E5-2697A v4, 16C, 145W*	841035-001	Optional ²
	s) 3.2-GHz Intel Xeon E5-2667 v4, 8C, 135W*	835613-001	Optional ²
	t) 3.4-GHz Intel Xeon E5-2643 v4, 6C, 135W*	835612-001	Optional ²
29	DIMM		Optional ²
	DIMMs designed for Intel Xeon E5-2600 v3 processors		
	a) 4 GB, single-rank x8 PC4-2133R-15	774169-001	Mandatory ¹
	b) 8 GB, single-rank x4 PC4-2133R-15*	774170-001	Mandatory ¹
	c) 8 GB, dual-rank x8 PC4-2133R-15*	774171-001	Mandatory ¹
	d) 16 GB, dual-rank x4 PC4-2133R-15*	774172-001	Mandatory ¹
	e) 16 GB, dual-rank x4 PC4-2133L-15*	774173-001	Mandatory ¹
	f) 32 GB, quad-rank x4 PC4-2133L-15*	774174-001	Mandatory ¹
	g) 32 GB, dual-rank x4 PC4-2133R-15*	774175-001	Mandatory ¹
	DIMMs designed for Intel Xeon E5-2600 v4 processors		
	a) 8 GB, single-rank x8 PC4-2400T-R*	819410-001	Mandatory ¹
	b) 16 GB, single-rank x4 PC4-2400T-R*	819411-001	Mandatory ¹
	c) 16 GB, dual-rank x4 PC4-2400T-R*	846740-001	Mandatory ¹
	d) 32 GB, dual-rank x4 PC4-2400T-R*	819412-001	Mandatory ¹
	e) 32 GB, dual-rank x4 PC4-2400T-L*	852545-001	Mandatory ¹
	f) 64 GB, quad-rank x4 PC4-2400T-L*	819413-001	Mandatory ¹
30	Heatsink	—	

Item	Description	Spare part number	Customer self-repair
	a) Heatsink for Processor 1 (49 fins)	800377-001	Optional ²
	b) Heatsink for Processor 2* (18 fins)	800376-001	Optional ²
31	Node tray	—	
32	1U bayonet board	811224-001	Optional ²
33	2U bayonet board	811225-001	Optional ²
34	PCIe x16 right 1U node riser board for Processor 1*	828928-001	Optional ²
35	PCIe x16 right 1U node riser board for Processor 2*	800366-001	Optional ²
36	FlexibleLOM x8 1U node riser board*	800367-001	Optional ²
37	FlexibleLOM x16x8 2U node riser board*	800368-001	Optional ²
38	Low-profile PCIe x16 left 1U/2U node riser board (for the single-slot left PCI riser cage assembly and single-slot 2U node PCI riser cage assembly)*	800370-001	Optional ²
39	M.2 SATA SSD enablement board*	800371-001	Optional ²
40	PCIe transfer board*	800372-001	Optional ²
41	Three-slot 110S PCIe x16 2U node riser board*	800373-001	Optional ²
42	Three-slot GPU-direct PCIe x16 2U node riser board*	800374-001	Optional ²
43	Three-slot GPU-direct with re-timer PCIe x16 2U node riser board*	828927-001	Optional ²
44	Storage cable kit *	808851-001	Optional ²
	a) Apollo r2200 Chassis power cable for Node 1 and Node 2*	—	—
	b) HPE Apollo r2600/r2800 Chassis power cable for Node 1 and Node 2*	—	—
	c) HPE Apollo r2200/r2600/r2800 Chassis power cable for Node 3 and Node 4*	—	—
	d) HPE Apollo r2200/r2600 Chassis power cable for hot-plug drives*	—	—
	e) Apollo r2800 Chassis power cable for hot-plug drives*	—	—
	f) PDB to Storage expander card fan power cable (Apollo r2800 Chassis only)*	—	—
	g) Storage expander card to right fan cage power cable (Apollo r2800 Chassis only)*	—	—
	h) RCM 2.0 to RCM 1.0 adapter cable*	—	—
	i) Mini-SAS P440 2U node cable*	—	—
	j) Mini-SAS H240 2U node cable*	—	—
	n) Mini-SAS P440/P840 cable*	—	—
	o) Mini-SAS H240 1U node cable*	—	—
	p) B140i 1U node SATA cable*	—	—
	q) B140i 2U node SATA cable*	—	—
45	Accelerator cable kit*	808852-001	Mandatory ¹
	a) Dual accelerator power cable for a three-slot riser cage assembly (this cable supports NVIDIA Tesla K40 GPUs, NVIDIA GRID K2 RAF GPUs, AMD FirePro S9150 GPUs, AMD FirePro S7150 GPUs, and Intel Xeon Phi 5110P Coprocessors)*	—	—

Item	Description	Spare part number	Customer self-repair
	b) Single accelerator power cable for a FlexibleLOM 2U node riser cage assembly (this cable supports NVIDIA Quadro K4200 GPUs, NVIDIA Quadro M4000 GPUs, NVIDIA Tesla K40 GPUs, AMD FirePro S9150 GPUs, and Intel Xeon Phi 5110P Coprocessors)*	—	—
	c) 2-pin accelerator adapter cable (for NVIDIA GRID K2 RAF GPUs only)*	—	—
46	Accelerator 1 power cable for a three-slot riser cage assembly (this cable supports NVIDIA Tesla K40 GPUs, NVIDIA GRID K2 RAF GPUs, AMD FirePro S9150 GPUs, AMD FirePro S7150 GPUs, and Intel Xeon Phi 5110P Coprocessors)*	867336-001	Mandatory ¹
47	Accelerator 2 power cable for a three-slot riser cage assembly (this cable supports NVIDIA Tesla K40 GPUs, NVIDIA GRID K2 RAF GPUs, AMD FirePro S9150 GPUs, AMD FirePro S7150 GPUs, and Intel Xeon Phi 5110P Coprocessors)*	867337-001	Mandatory ¹
48	Dual NVIDIA Tesla K80/M60/M40 GPU power cable kit*	811571-001	Mandatory ¹
	a) Accelerator 1 power cable for a three-slot riser cage assembly*	—	—
	b) Accelerator 2 power cable for a three-slot riser cage assembly*	—	—
49	GPU accelerators*		
	a) NVIDIA Quadro K4200 GPU Module	783875-001	—
	b) NVIDIA Quadro M4000 GPU Module	841576-001	—
	c) NVIDIA GRID K2 RAF GPU	756822-001	—
	d) NVIDIA Tesla K40 12 GB Module	747401-001	—
	e) NVIDIA Tesla K80 GPU Module	797637-001	—
	f) NVIDIA Tesla M60 RAF GPU Module	820178-001	—
	g) NVIDIA Tesla M40 24GB GPU Module	855178-001	—
	h) AMD FirePro S7150 Accelerator	820179-001	—
	i) AMD FirePro S9150 Accelerator	797639-001	—
	j) Intel Xeon Phi 5110P Coprocessor	708360-001	—

*Not shown

¹Mandatory—Parts for which customer self repair is mandatory. If you request Hewlett Packard Enterprise to replace these parts, you will be charged for the travel and labor costs of this service.

²Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that Hewlett Packard Enterprise replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

³No—Some Hewlett Packard Enterprise parts are not designed for customer self repair. In order to satisfy the customer warranty, Hewlett Packard Enterprise requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

¹Obligatoire—Pièces pour lesquelles le client doit procéder lui-même aux réparations. Si vous demandez à Hewlett Packard Enterprise de procéder au remplacement de ces pièces, les frais de transport et de main d'œuvre pour ce service vous seront facturés.

²Facultatif—Pièces pour lesquelles une réparation par le client est facultative. Ces pièces sont également conçues pour que le client puisse procéder lui-même aux réparations. Cependant, les frais supplémentaires engendrés par le remplacement de ces pièces par Hewlett Packard Enterprise dépendent du type de service de garantie désigné pour votre produit.

³Non—Certaines pièces Hewlett Packard Enterprise ne sont pas conçues pour être remplacées par le client. Afin de se conformer aux exigences de la garantie la garantie du client, Hewlett Packard Enterprise demande à un fournisseur de services agréé de procéder au remplacement de la pièce. Ces pièces sont signalées par le mot « Non » dans le Catalogue de pièces illustré.

¹Obbligatorio—Parti per le quali il cliente è tenuto a effettuare autonomamente la riparazione. Se si richiede l'intervento di Hewlett Packard Enterprise per la sostituzione di queste parti, al cliente verranno addebitate le spese di viaggio e manodopera dell'operazione.

²Facoltativo—Parti per le quali la riparazione in autonomia da parte del cliente è facoltativa. Queste parti sono progettate per consentire anche la riparazione da parte del cliente. Tuttavia, se il cliente richiede l'intervento di Hewlett Packard Enterprise per la sostituzione, potrebbero essere addebitate spese aggiuntive a seconda del tipo di garanzia in assistenza previsto per il prodotto.

³No—Alcune parti Hewlett Packard Enterprise non sono progettate la riparazione in autonomia da parte del cliente. In base a quanto previsto dalla garanzia per il cliente, Hewlett Packard Enterprise richiede l'intervento di un tecnico autorizzato per la sostituzione della parte. Queste parti sono contrassegnate con "No" nel catalogo parti illustrato.

¹Zwingend—Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

²Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

³Nein—Einige Hewlett Packard Enterprise Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem Hewlett Packard Enterprise Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

¹Obligatorio—Componentes cuya reparación por parte del usuario es obligatoria. Si solicita a Hewlett Packard Enterprise que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

²Opcional—Componentes cuya reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que Hewlett Packard Enterprise realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

³No—Algunos componentes de Hewlett Packard Enterprise no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, Hewlett Packard Enterprise pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

¹Verplicht—Onderdelen die de klant zelf moet vervangen. Als u Hewlett Packard Enterprise vraagt deze onderdelen te vervangen, worden er reis- en arbeidskosten voor deze service in rekening gebracht.

²Optioneel—Onderdelen die de klant zelf kan vervangen. Deze onderdelen zijn ook ontworpen om door de klant zelf te worden vervangen. Als u Hewlett Packard Enterprise verzoekt om deze te vervangen, kan het zijn dat hiervoor extra kosten in rekening worden gebracht, afhankelijk van het soort garantie dat op uw product van toepassing is.

³Geen—Sommige onderdelen van Hewlett Packard Enterprise zijn niet ontworpen om door de klant zelf te worden vervangen. Om te voldoen aan de garantievoorwaarden eist Hewlett Packard Enterprise dat een geautoriseerde serviceverlener het onderdeel vervangt. Deze onderdelen worden aangeduid met 'Geen' in de geïllustreerde onderdelencatalogus.

¹Obrigatório—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a Hewlett Packard Enterprise substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

²Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a Hewlett Packard Enterprise as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

³Não—Algumas peças da Hewlett Packard Enterprise não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a Hewlett Packard Enterprise exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

¹Mandatory : 必須 — カスタマーセルフリペアが必須の部品。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

²Optional : 任意 — カスタマーセルフリペアが任意である部品。この部品もカスタマーセルフリペア用です。当該部品について、もしもお客様がHewlett Packard Enterpriseに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

³No : 除外 — Hewlett Packard Enterprise製品の一部の部品は、カスタマーセルフリペアの対象外です。製品の保証を継続するためには、Hewlett Packard EnterpriseまたはHewlett Packard Enterprise正規保守代理店による交換作業が必須となります。部品カタログには、当該部品がカスタマーセルフリペア除外品である旨が記載されています。

¹Mandatory — 客户必须自行维修的部件。如果您请求 Hewlett Packard Enterprise 更换这些部件，则必须为该服务支付差旅费和人工费用。

²Optional — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 Hewlett Packard Enterprise 为您更换这些部件，则根据为您的产品指定的保修服务类型，Hewlett Packard Enterprise 可能收取或不再收取任何附加费用。

³No — 某些 Hewlett Packard Enterprise 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，Hewlett Packard Enterprise 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

¹Mandatory — 客戶自行維修所使用的零件是強制性的。如果您要求 Hewlett Packard Enterprise 更換這些零件，Hewlett Packard Enterprise 將會向您收取此服務所需的外出費用與勞動成本。

²Optional — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 Hewlett Packard Enterprise 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

³No — 某些 Hewlett Packard Enterprise 零件沒有消費者可自行維修的設計。為符合客戶保固，Hewlett Packard Enterprise 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

¹Mandatory — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 Hewlett Packard Enterprise에 이 부품의 교체를 요청할 경우 해당 서비스에 대한 출장비 및 작업비가 청구됩니다.

²Optional — 고객 셀프 수리가 선택 사항인 부품. 이러한 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 Hewlett Packard Enterprise에 이러한 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

³No — 일부 Hewlett Packard Enterprise 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. Hewlett Packard Enterprise는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 요구하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

Removal and replacement procedures

Required tools

You need the following items for some procedures:

- T-10/T-15/T-20 Torx screwdriver
- Flathead screwdriver (for replacing the system battery)
- HPE Insight Diagnostics ("[Insight Diagnostics](#)" on page 117)
- Thin-nose pliers (for replacing the chassis power distribution board)

Safety considerations

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you must follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Symbols on equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



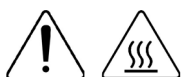
This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.



This symbol on an RJ-45 receptacle indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.



These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to disconnect power from the system completely.

Server warnings and cautions



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the node. Pressing the Power On/Standby button does not shut off system power completely. Portions of the power supply and some internal circuitry remain active until AC power is removed.



CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply. This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.



CAUTION: Do not operate the node for long periods with the access panel open or removed. Operating the node in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Rack warnings



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.



WARNING: To reduce the risk of personal injury or equipment damage when unloading a rack:

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115 kg (253 lb), can stand more than 2.1 m (7 ft) tall, and might become unstable when being moved on its casters.
- Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.



WARNING: To reduce the risk of personal injury or damage to the equipment, adequately stabilize the rack before extending a component outside the rack. Extend only one component at a time. A rack may become unstable if more than one component is extended.



WARNING: When installing a server in a telco rack, be sure that the rack frame is adequately secured at the top and bottom to the building structure.

Preparation procedures

To access some components and perform certain service procedures, you must perform one or more of the following procedures:

- Power down the system (on page 29).
- Power down the node (on page 29).
- Remove the node from the chassis (on page 30).
- Remove the power supply (on page 31).
- Remove the chassis from the rack (on page 32).
- Remove the security bezel (on page 33).
- Remove the PDB cover (on page 33).
- Remove the chassis access panel (on page 34).
- Remove the fan cages (on page 35).
- Remove the chassis PDB assembly (on page 36).
- Remove the rear I/O blank (on page 38).
- Remove the air baffle (on page 39).
- Remove the bayonet board assembly (on page 40).
- Remove the PCI riser cage assembly (on page 42).
- Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly (on page 48).
- Remove Accelerator 1 from the three-slot riser cage assembly (on page 50).
- Remove Accelerator 2 from the three-slot riser cage assembly (on page 53).

Power down the system



IMPORTANT: When the nodes are in standby mode, auxiliary power is still being provided to the system.

1. Power down the nodes ("[Power down the node](#)" on page 29).
2. Disconnect the power cords from the power supplies.

Power down the node



CAUTION: Before powering down the node, perform a backup of critical server data and programs. Removing the node while the Do not remove LED is on may result in data loss or corruption. The node can be safely removed from the chassis only after the Do not remove LED is off ("[Node rear panel LEDs and buttons](#)" on page 125).



IMPORTANT: When the node is in standby mode, auxiliary power is still being provided to the system.

To power down the node, use one of the following methods:

- Press and release the Power On/Standby button.
This method initiates a controlled shutdown of applications and the OS before the node enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the node to enter standby mode.
This method forces the node to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through iLO 4.
This method initiates a controlled remote shutdown of applications and the OS before the node enters standby mode.

Before proceeding, verify that the node is in standby mode by observing that the system power LED is amber.

Remove the node from the chassis



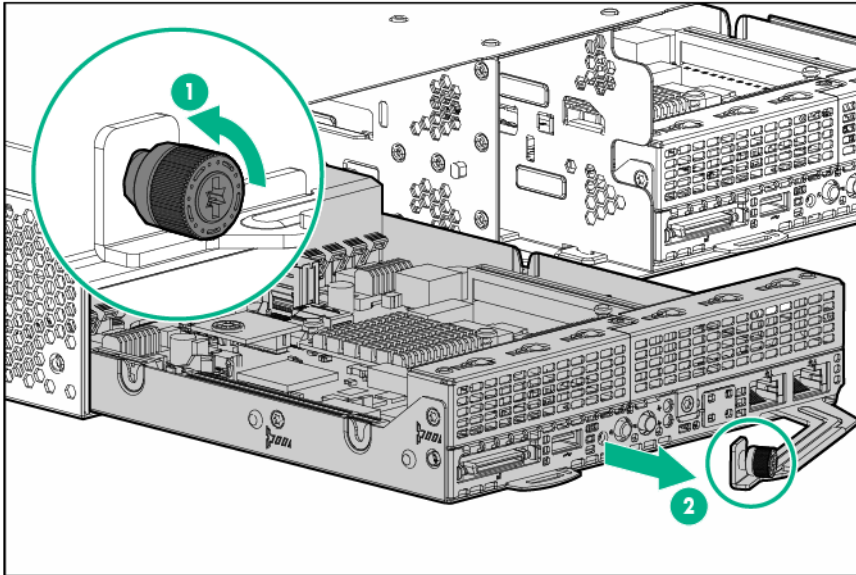
CAUTION: Before powering down the node, perform a backup of critical server data and programs. Removing the node while the Do not remove LED is on may result in data loss or corruption. The node can be safely removed from the chassis only after the Do not remove LED is off ("[Node rear panel LEDs and buttons](#)" on page 125).



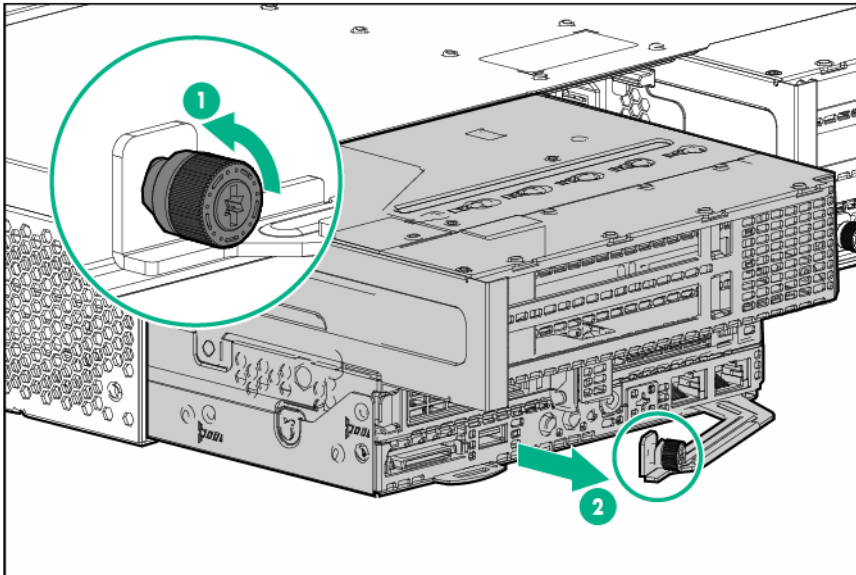
CAUTION: To avoid damage to the node, always support the bottom of the node when removing it from the chassis.

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis:
 - a. Loosen the thumbscrew.
 - b. Pull back the handle and remove the node.

— 1U node



— 2U node



CAUTION: To avoid damage to the device, do not use the removal handle to carry it.

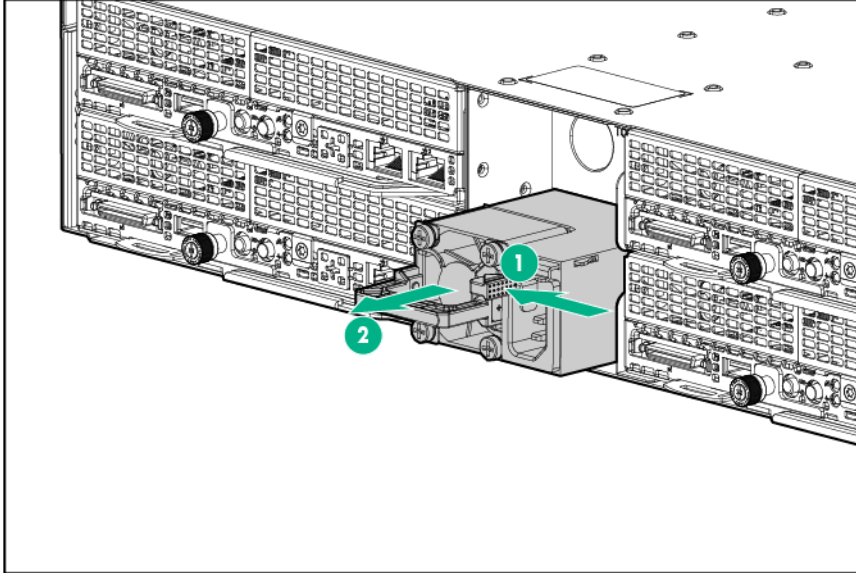
4. Place the node on a flat, level surface.

Remove the power supply

To remove the component:

1. Power down all nodes ("Power down the node" on page 29).
2. Access the product rear panel.
3. If installed, remove the RCM module ("RCM module" on page 71).
4. Release the power cord from the strain relief strap.
5. Remove all power:

- a. Disconnect the power cord from the power source.
 - b. Disconnect the power cord from the chassis.
6. Remove the power supply.



Remove the chassis from the rack



WARNING: The chassis is very heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Remove all installed components from the chassis before installing or moving the chassis.
- Use caution and get help to lift and stabilize the chassis during installation or removal, especially when the chassis is not fastened to the rack.



WARNING: To reduce the risk of personal injury or damage to the equipment, you must adequately support the chassis during installation and removal.



WARNING: Always use at least two people to lift the chassis into the rack. If the chassis is being loaded into the rack above chest level, a third person must assist with aligning the chassis with the rails while the other two people support the weight of the chassis.

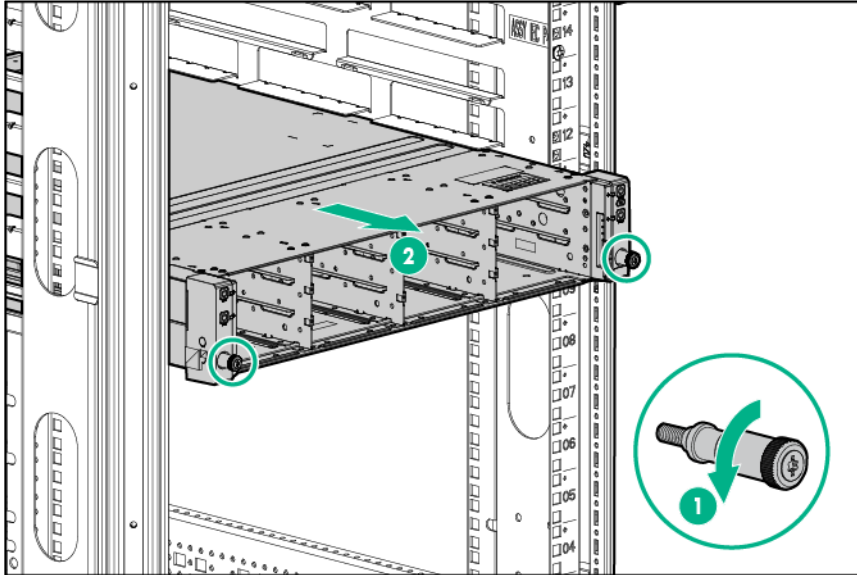
1. Power down all nodes ("[Power down the node](#)" on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.



IMPORTANT: Label the drives before removing them. The drives must be returned to their original locations.

3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).

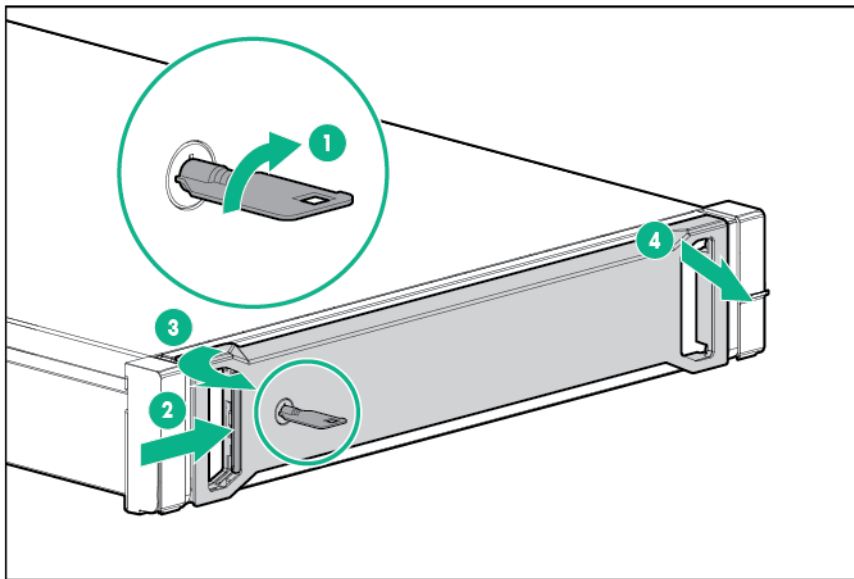
8. Loosen the thumbscrews and extend the chassis from the rack.



9. Remove the chassis from the rack.
For more information, see the documentation that ships with the rack mounting option.
10. Place the chassis on a flat surface.

Remove the security bezel

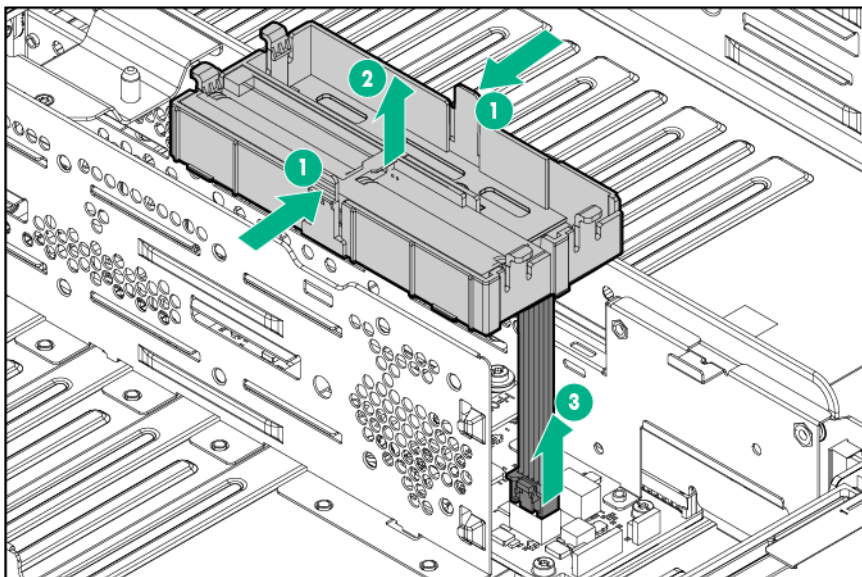
To access the front panel components, unlock and then remove the security bezel.



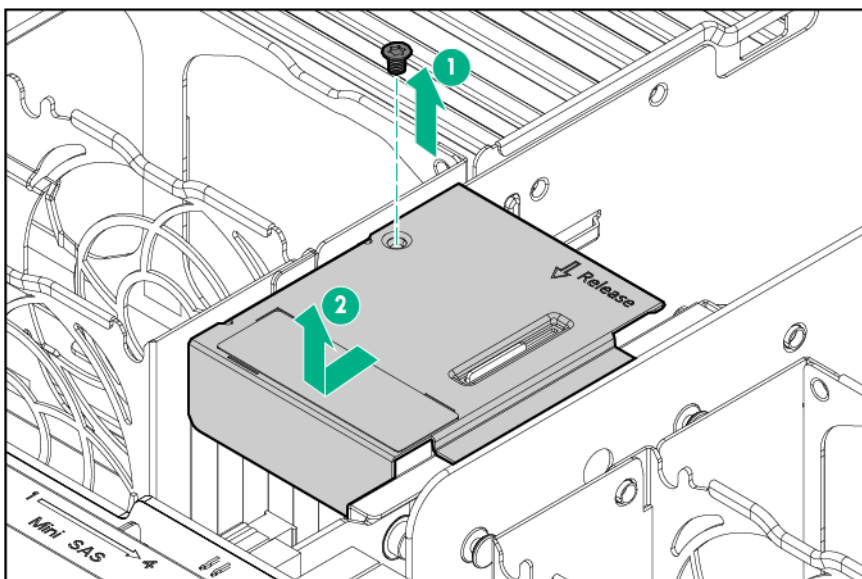
Remove the PDB cover

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).

6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.



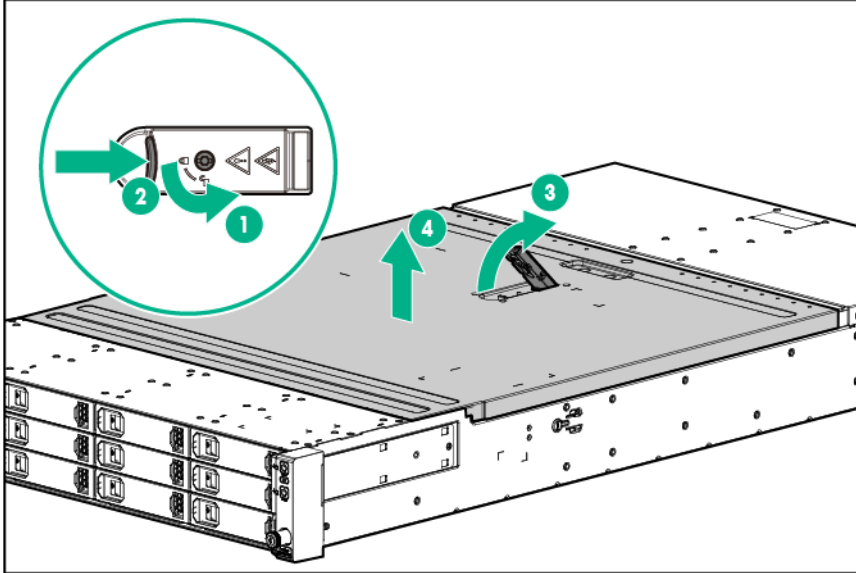
11. Remove the PDB cover (on page 33).
 - a. Remove the screw.
 - b. Slide back the PDB cover and remove it from the chassis.



Remove the chassis access panel

1. Power down all nodes ("[Power down the node](#)" on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).

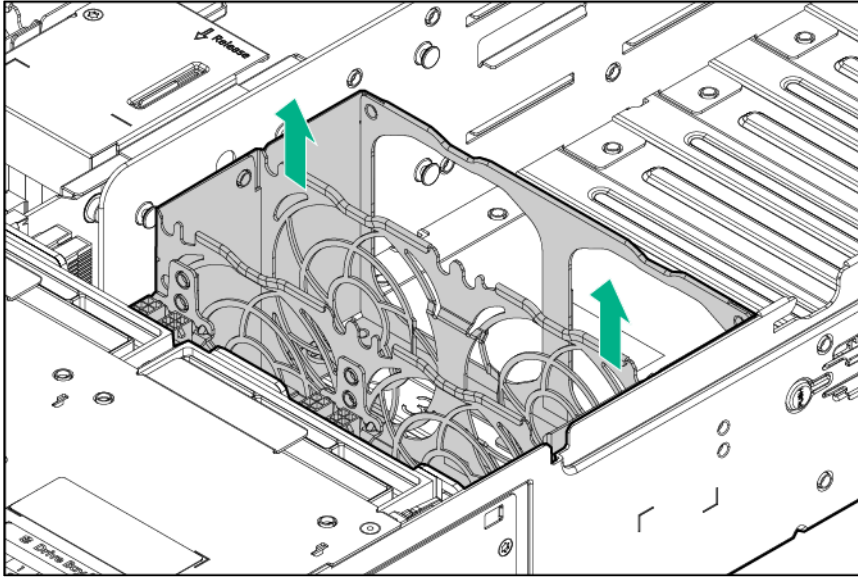
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("Hot-plug drive" on page 72).
6. If installed, remove the RCM module ("RCM module" on page 71).
7. Remove all power supplies ("Remove the power supply" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Unlock the access panel latch using the T-15 Torx screwdriver and release the access panel latch.
10. Slide the access panel back about 1.5 cm (0.5 in).
11. Lift and remove the access panel.



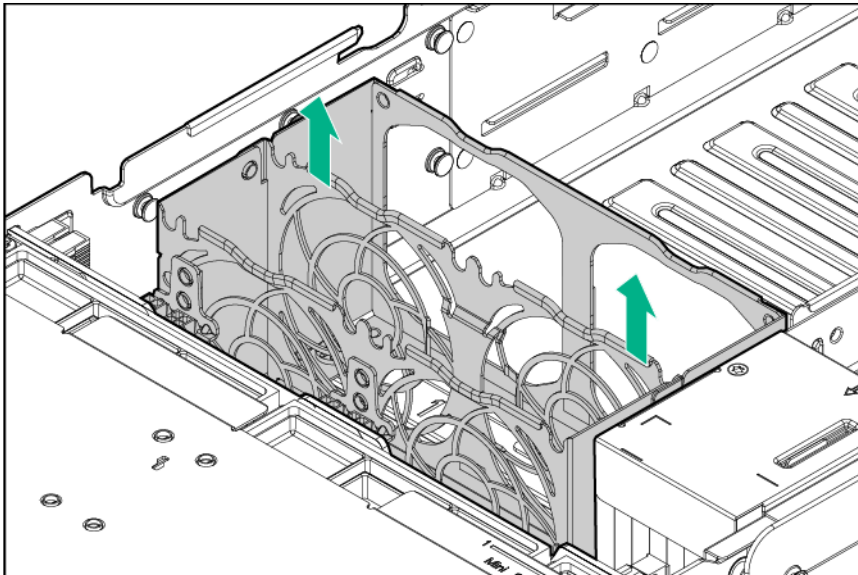
Remove the fan cages

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("Remove the node from the chassis" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("Hot-plug drive" on page 72).
6. If installed, remove the RCM module ("RCM module" on page 71).
7. Remove all power supplies ("Remove the power supply" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("Remove the chassis access panel" on page 34).
10. Remove all fan modules ("Fan module" on page 69).
11. Disconnect the fan power cable assemblies from the fan cages.
12. Remove the fan cages.

- Right fan cage



- Left fan cage

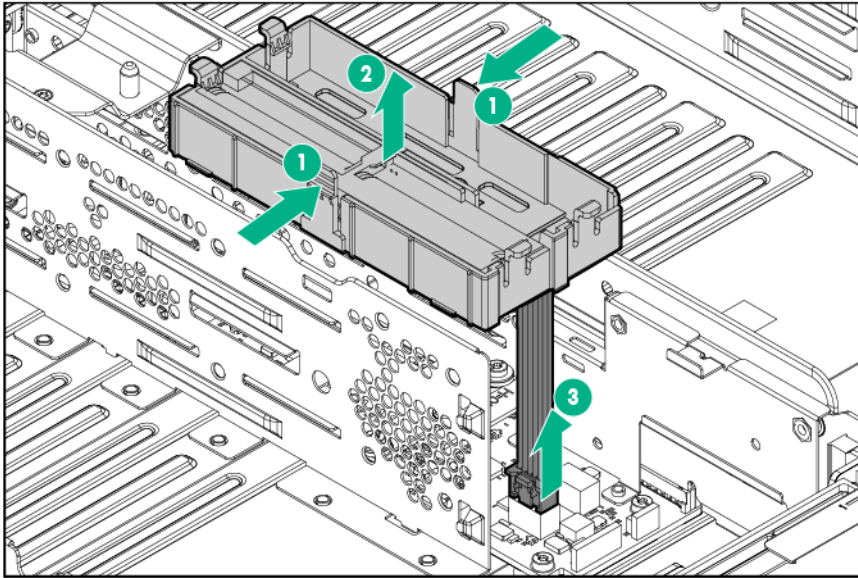


Remove the chassis PDB assembly

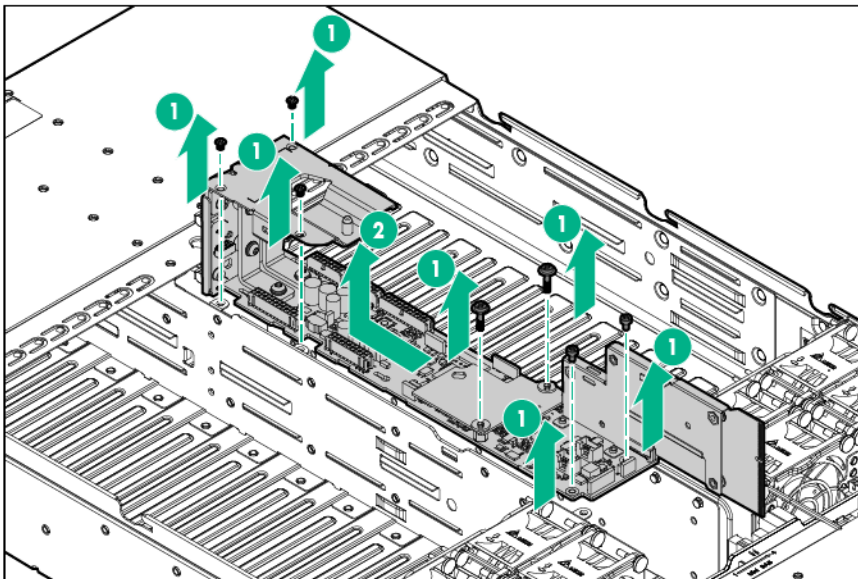
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).

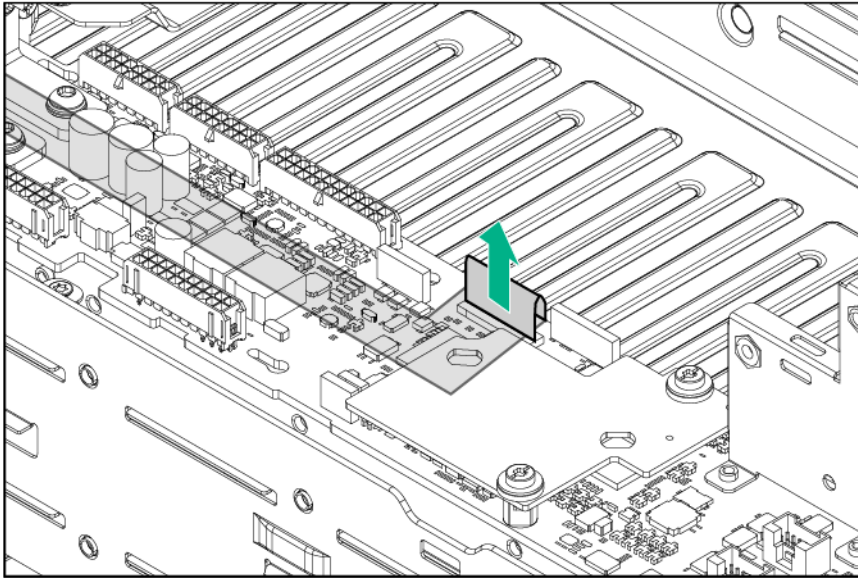
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.



11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly.
 - a. Remove the screws.
 - b. Slide the chassis PDB assembly toward to the rear of the server to disconnect the RPS link board from drive backplane.
 - c. Slightly lift the chassis PDB assembly from the chassis.

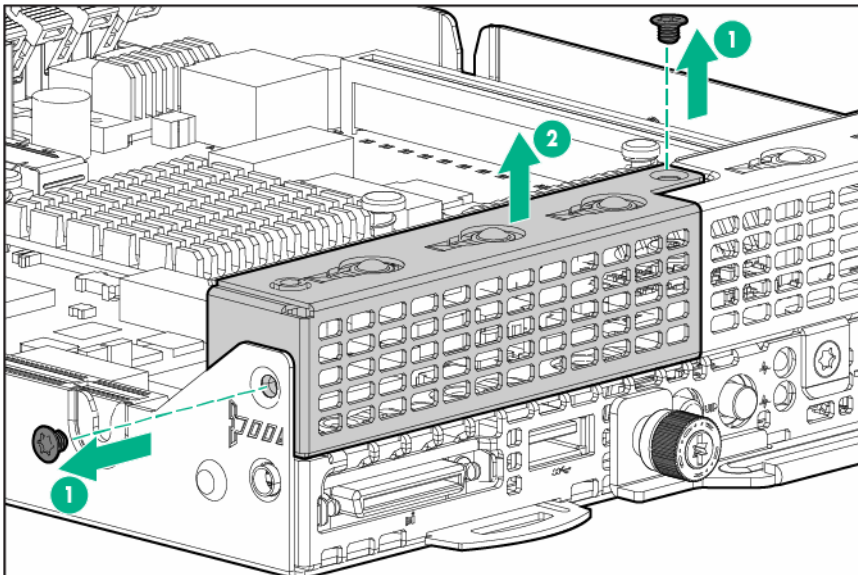


- d. Disconnect the RCM 2.0 cable from the power distribution board and remove the chassis PDB assembly.

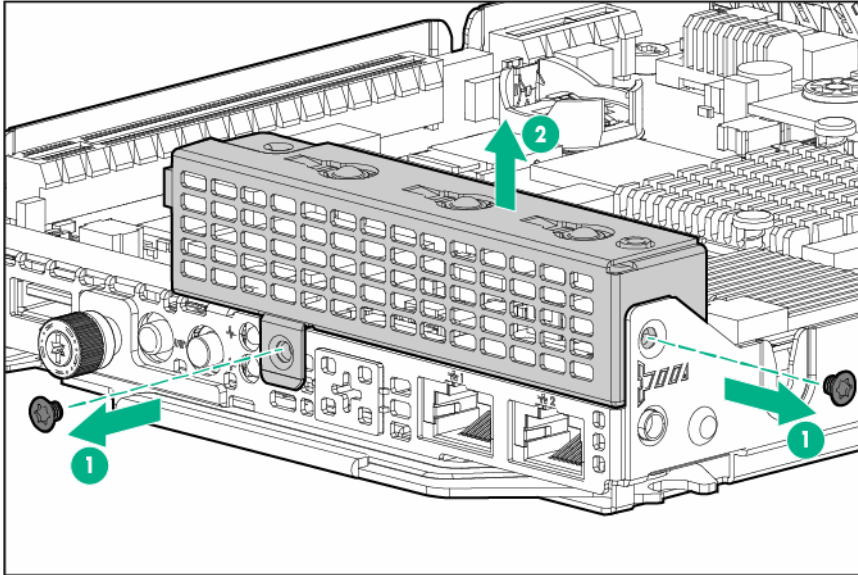


Remove the rear I/O blank

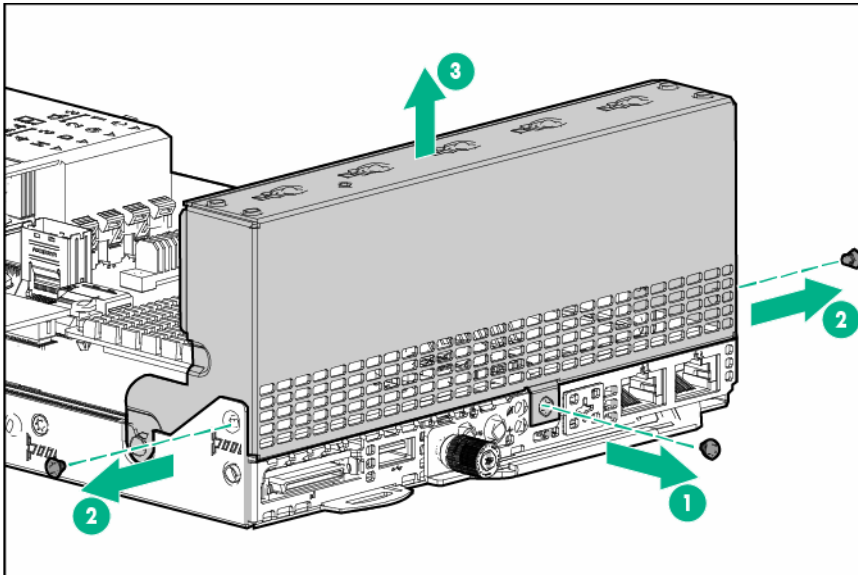
1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the rear I/O blanks:
 - o 1U left rear I/O blank



- 1U right rear I/O blank



- 2U rear I/O blank

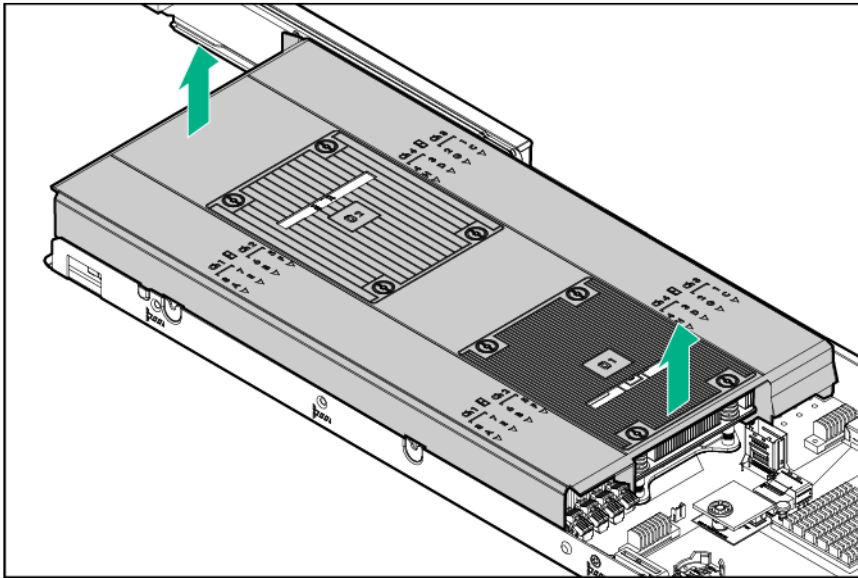


CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

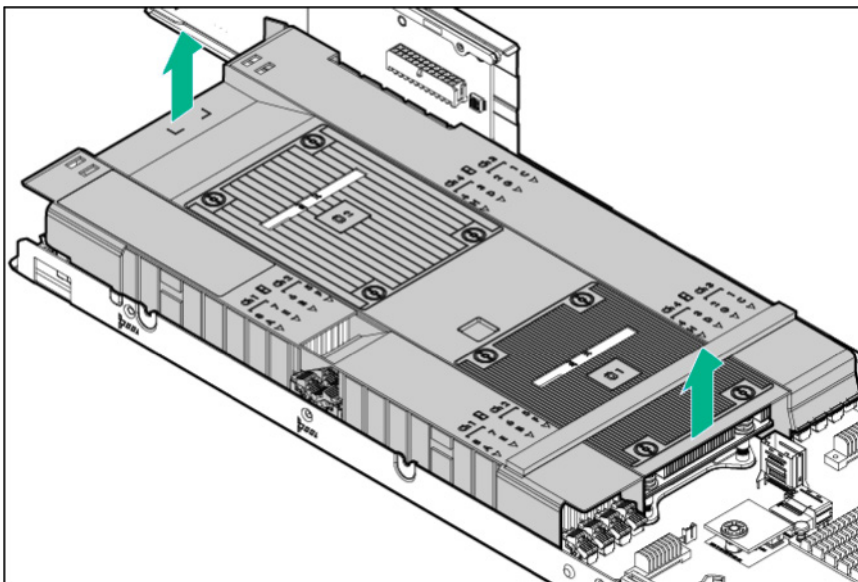
Remove the air baffle

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. If installed in a 2U node, remove the FlexibleLOM 2U node riser cage assembly ("FlexibleLOM 2U node riser cage assembly" on page 46).

6. If installed in a 2U node, remove the three-slot riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
7. Remove the air baffle:
 - o 1U air baffle



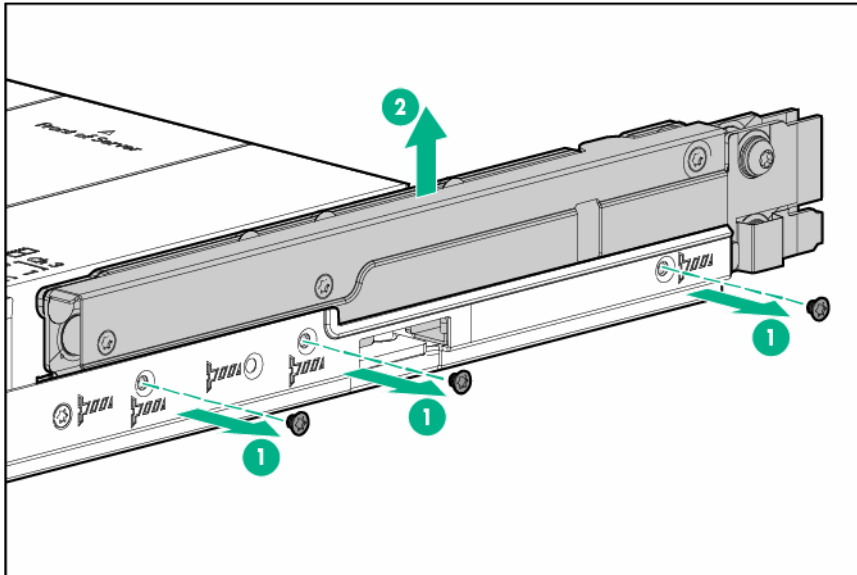
- o 2U air baffle



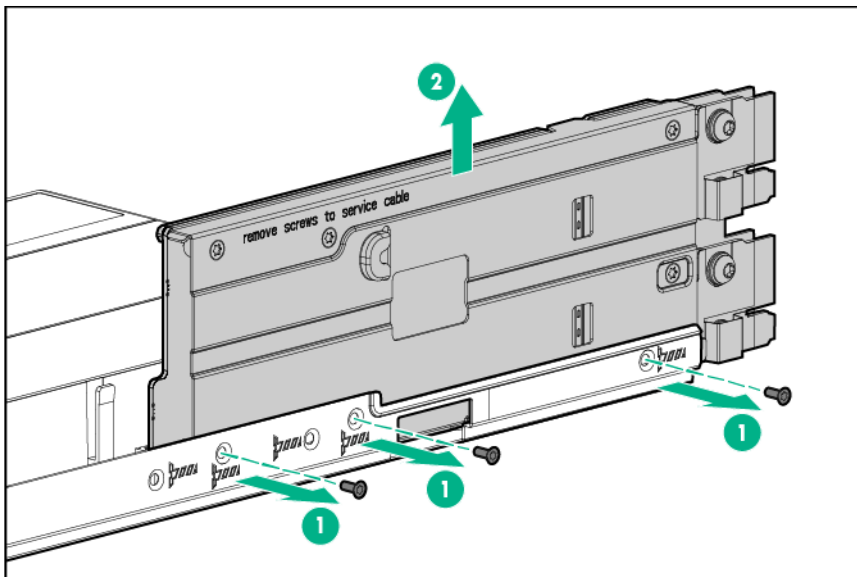
Remove the bayonet board assembly

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. If installed in a 2U node, remove the FlexibleLOM 2U node riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
6. If installed in a 2U node, remove the three-slot riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).

7. If an accelerator power cable is installed, disconnect it from the bayonet board.
8. If a B140i SATA cable is installed, disconnect it from the system board.
9. Remove the bayonet board assembly from the node.
 - 1U bayonet board assembly

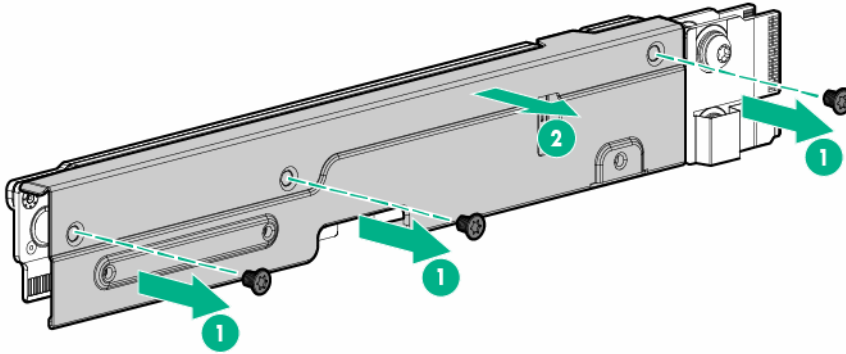


- 2U bayonet board assembly

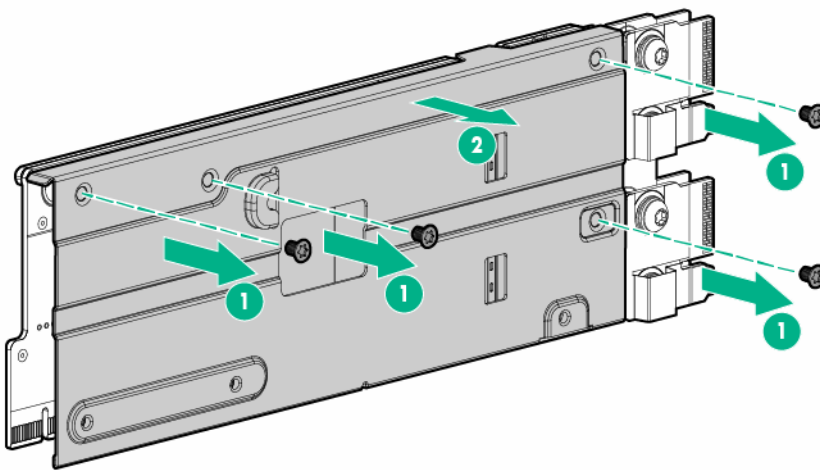


10. If installing a SATA or Mini-SAS cable, remove the bayonet board bracket from the bayonet board.

- 1U bayonet board bracket



- 2U bayonet board bracket



Remove the PCI riser cage assembly

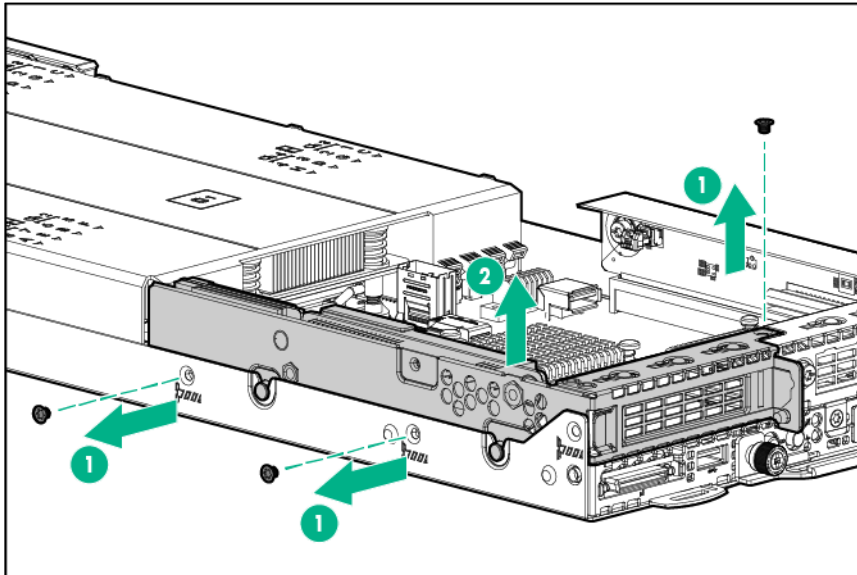
- ⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.
- ⚠ **CAUTION:** To prevent damage to the server or expansion boards, power down the server, and disconnect all power cords before removing or installing the PCI riser cage.

Single-slot left PCI riser cage assembly

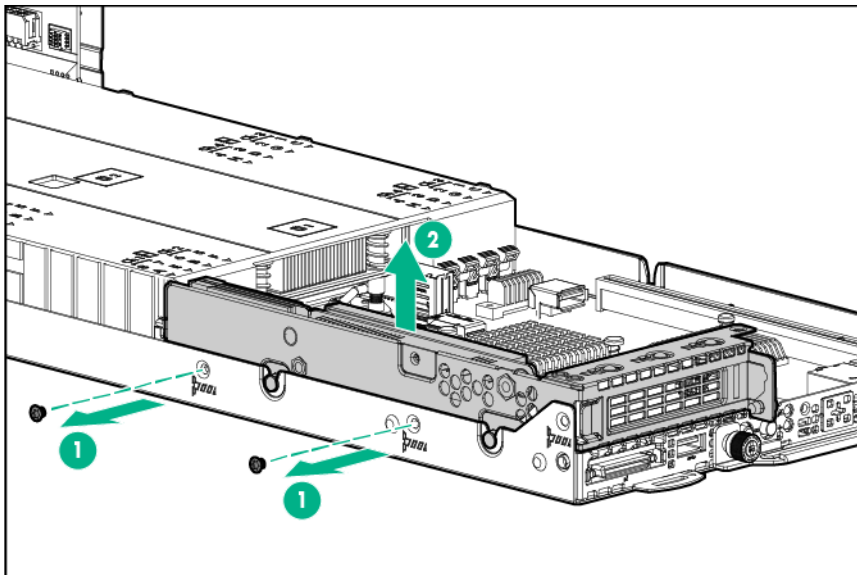
To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. In a 2U node, remove the three-slot riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
6. Remove the single-slot left PCI riser cage assembly:

- 1U node



- 2U node



CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

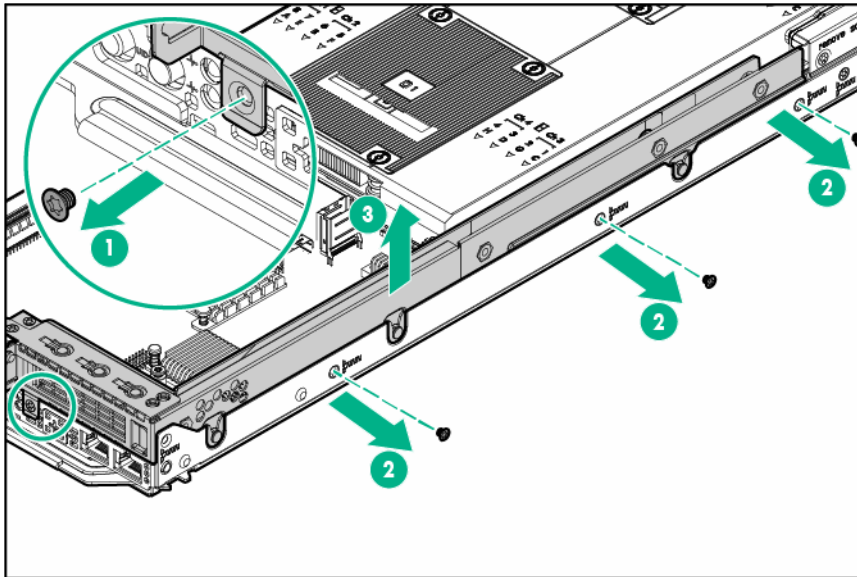
Single-slot 1U node right PCI riser cage assemblies

NOTE: Single-slot 1U node right PCI riser cage assemblies feature different riser boards. For more information on the riser board slot specifications, see "PCIe riser board slot definitions."

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Do one of the following:

- Remove the 1U left rear I/O blank ("Remove the rear I/O blank" on page 38).
 - Remove the single-slot left PCI riser cage assembly (on page 42).
5. Remove the single-slot 1U node right PCI riser cage assembly.



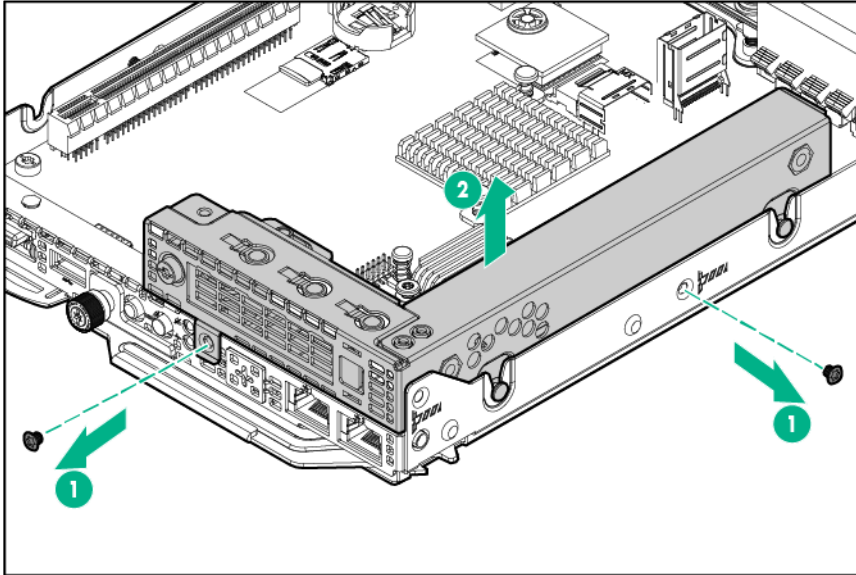
CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

FlexibleLOM 1U node riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Do one of the following:
 - Remove the 1U left rear I/O blank ("Remove the rear I/O blank" on page 38).
 - Remove the single-slot left PCI riser cage assembly (on page 42).

5. Remove the FlexibleLOM 1U node riser cage assembly.

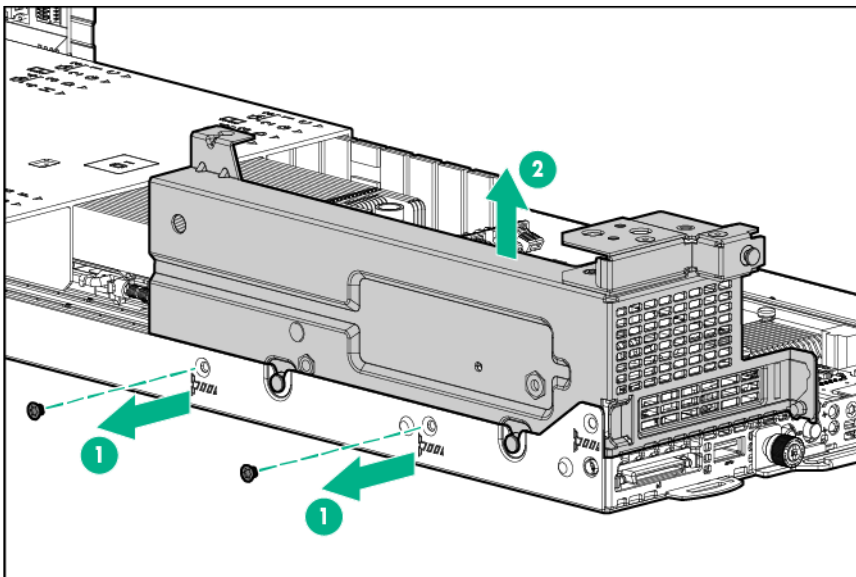


CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

Single-slot 2U node PCI riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the FlexibleLOM 2U node riser cage assembly (on page 46).
6. Remove the single-slot 2U node PCI riser cage assembly.



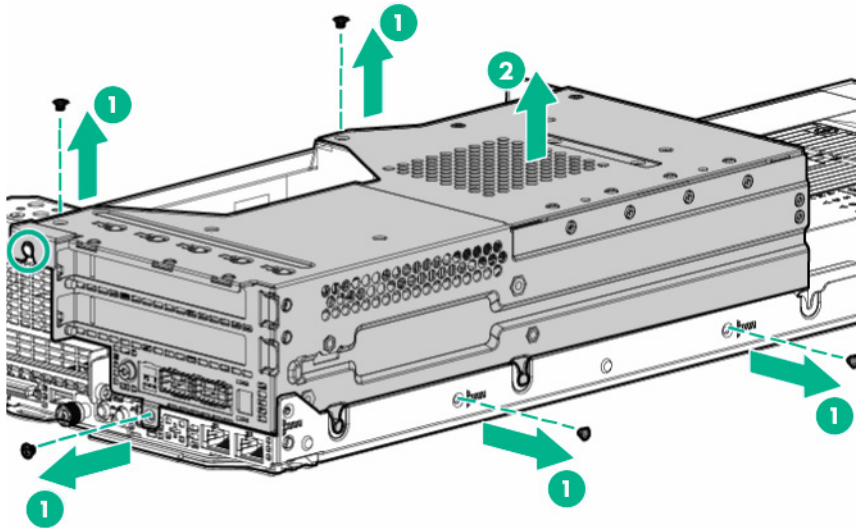


CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

FlexibleLOM 2U node riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the FlexibleLOM 2U node riser cage assembly.



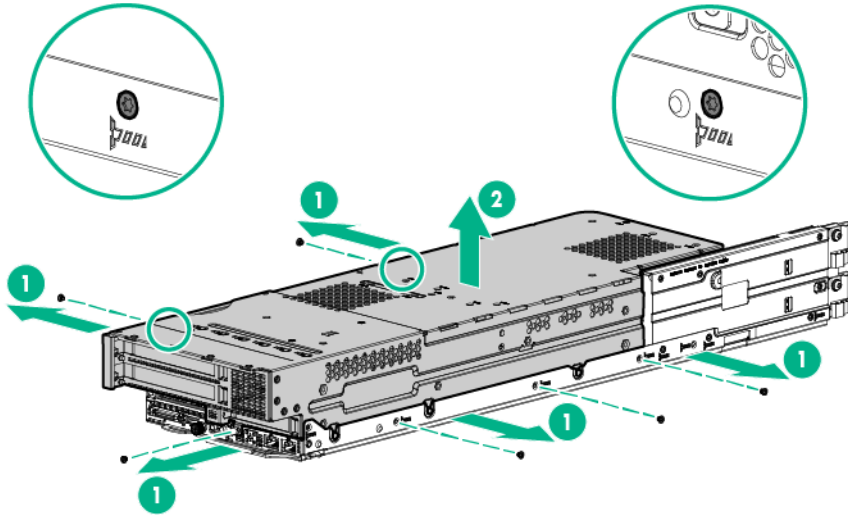
Three-slot riser cage assemblies

NOTE: Three-slot riser cage assemblies feature different riser boards. For more information on the riser board slot specifications, see "PCIe riser board slot definitions."

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.

5. Remove the three-slot riser cage assembly.



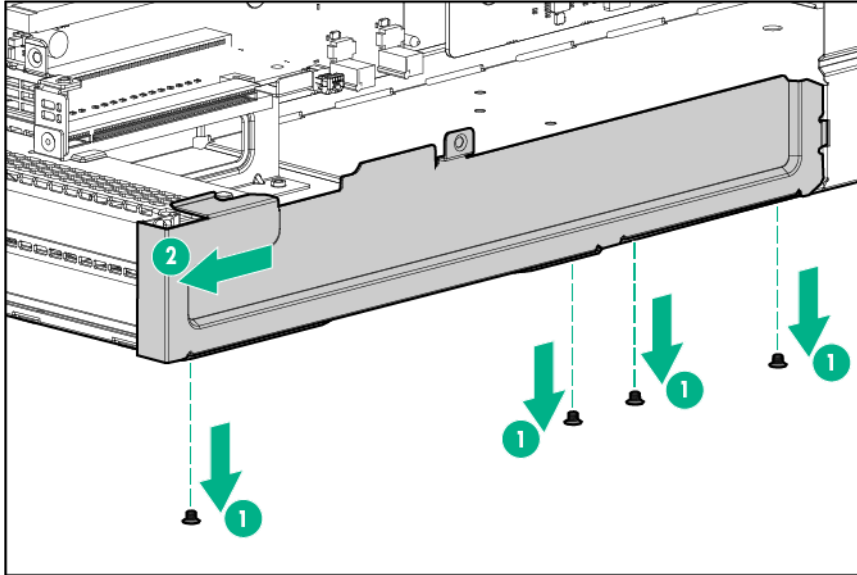
CAUTION: To prevent improper cooling and thermal damage, do not operate the node unless all PCI riser cages or rear I/O blanks are installed, and do not operate the node unless all PCI slots have either an expansion slot cover or an expansion board installed.

Remove the riser cage bracket from the three-slot riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the three-slot riser cage assembly ("Three-slot riser cage assemblies" on page 46).

6. Remove the riser cage bracket from the three-slot riser cage assembly.

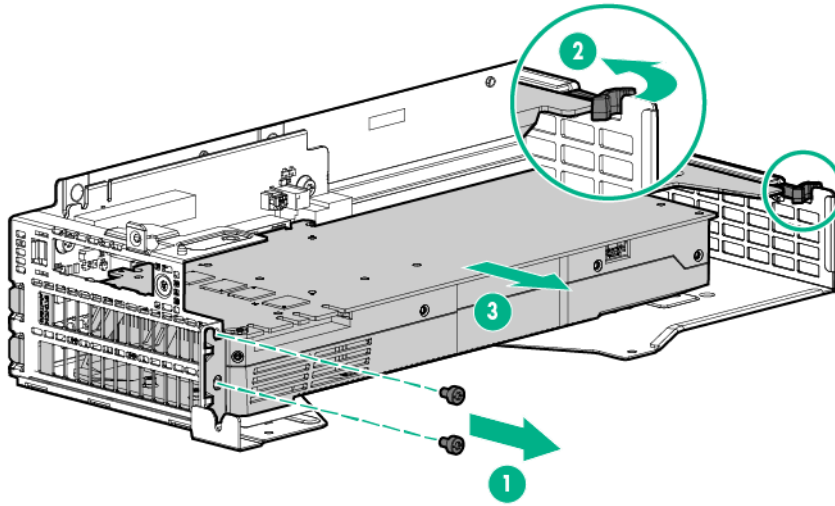


Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly

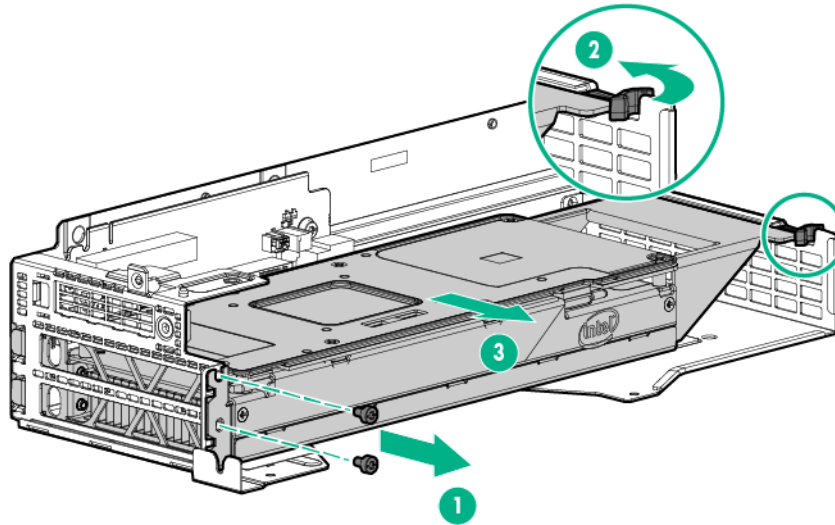
To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the FlexibleLOM 2U node riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Disconnect the accelerator power cable from Accelerator 1.
8. Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly:

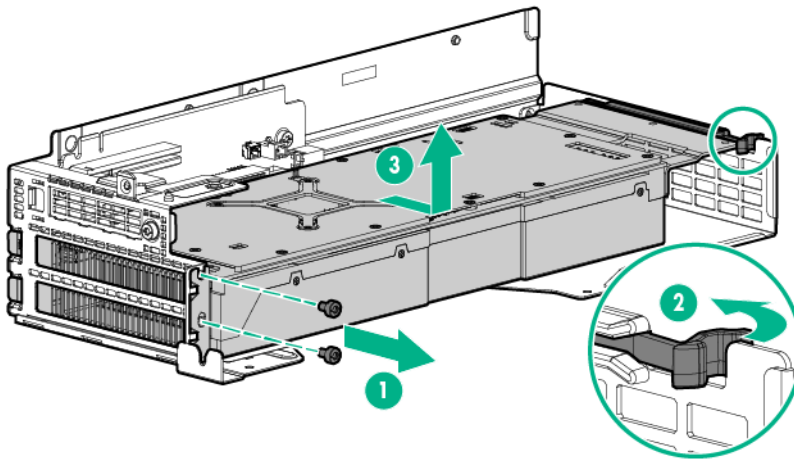
- NVIDIA Tesla K40 GPU



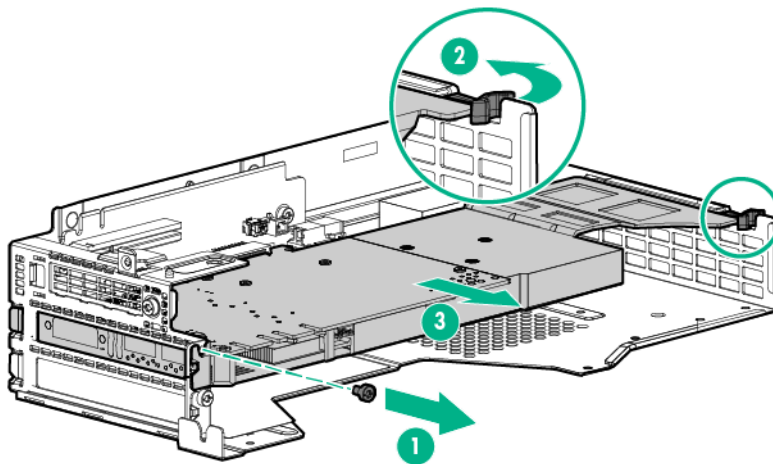
- Intel Xeon Phi Coprocessor 5110P



- AMD FirePro S9150 GPU



- NVIDIA Quadro K4200 GPU or NVIDIA Quadro M4000 GPU

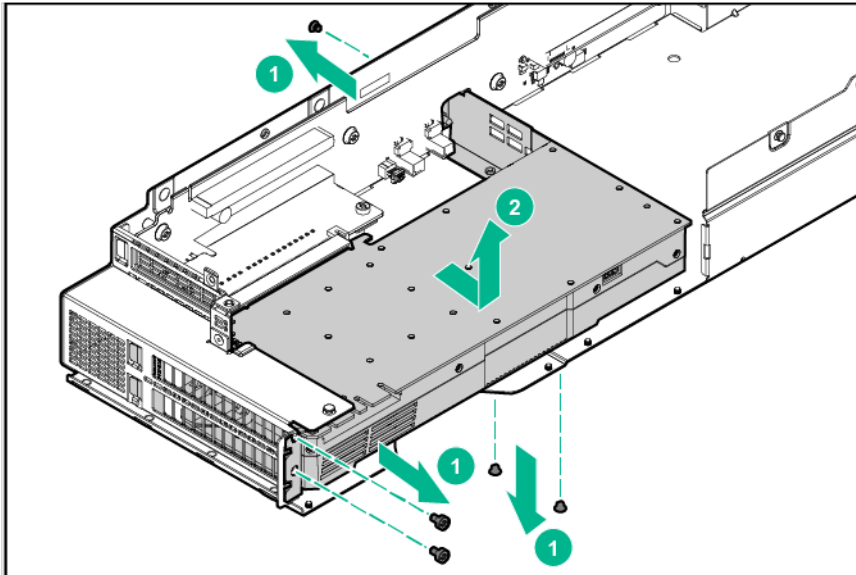


Remove Accelerator 1 from the three-slot riser cage assembly

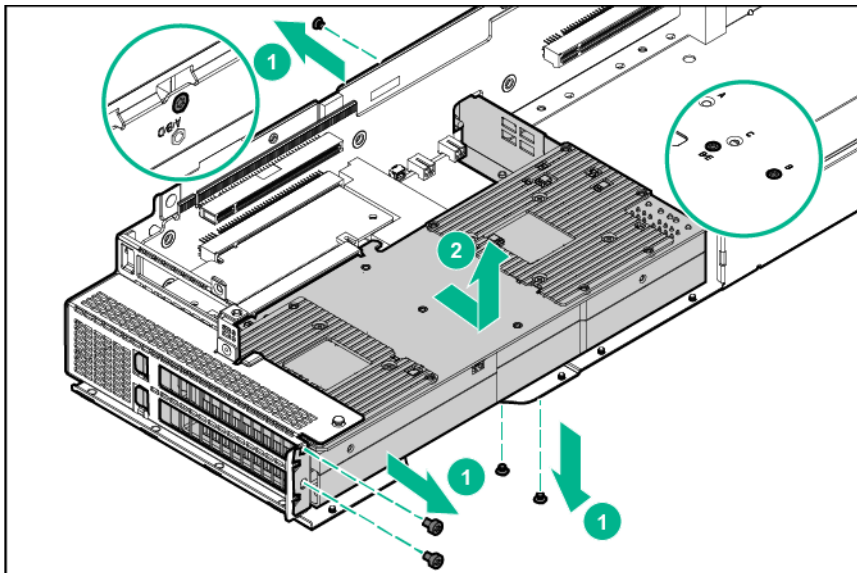
To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the three-slot riser cage assembly ("Three-slot riser cage assemblies" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Remove the riser cage bracket from the three-slot riser cage assembly (on page 47).
8. Disconnect all cables from the accelerators.
9. Remove Accelerator 2 from the three-slot riser cage assembly (on page 53).
10. Remove Accelerator 1 from the three-slot riser cage assembly.

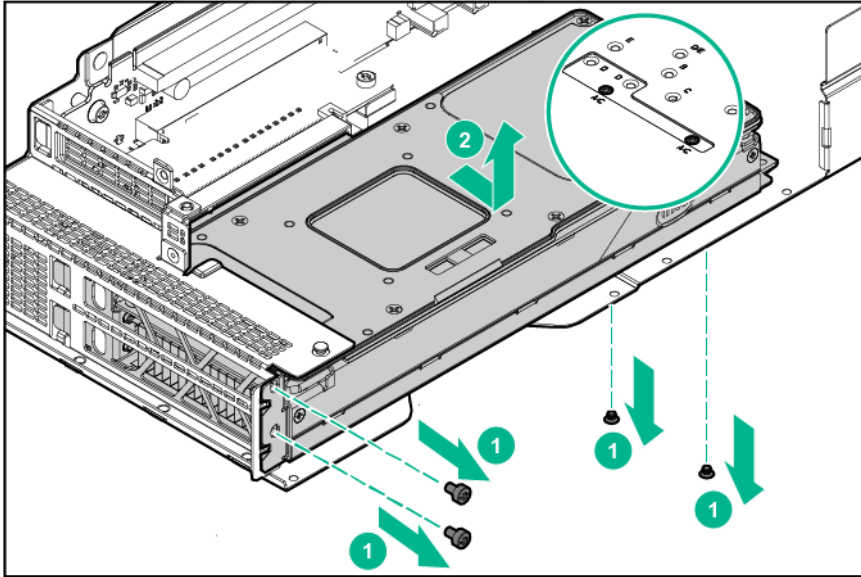
- NVIDIA K40, K80, M60, or M40 GPU



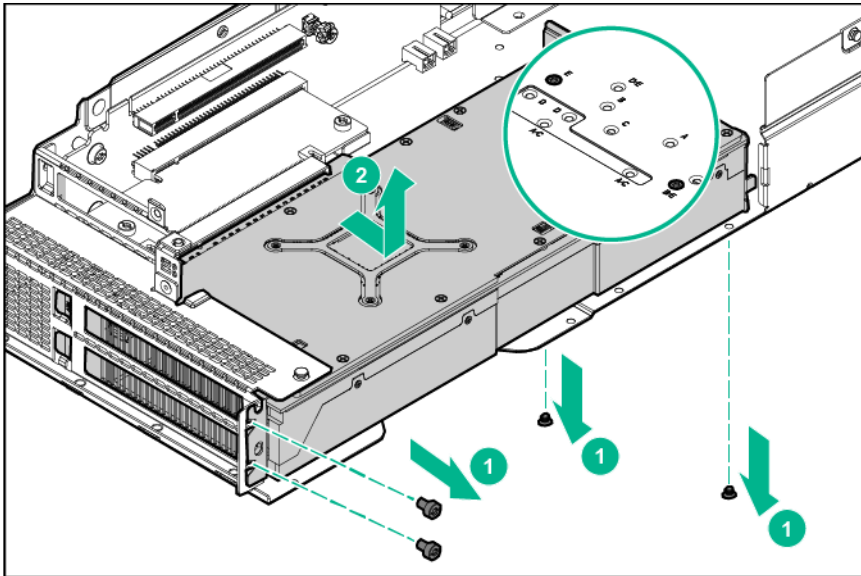
- NVIDIA GRID K2 GPU



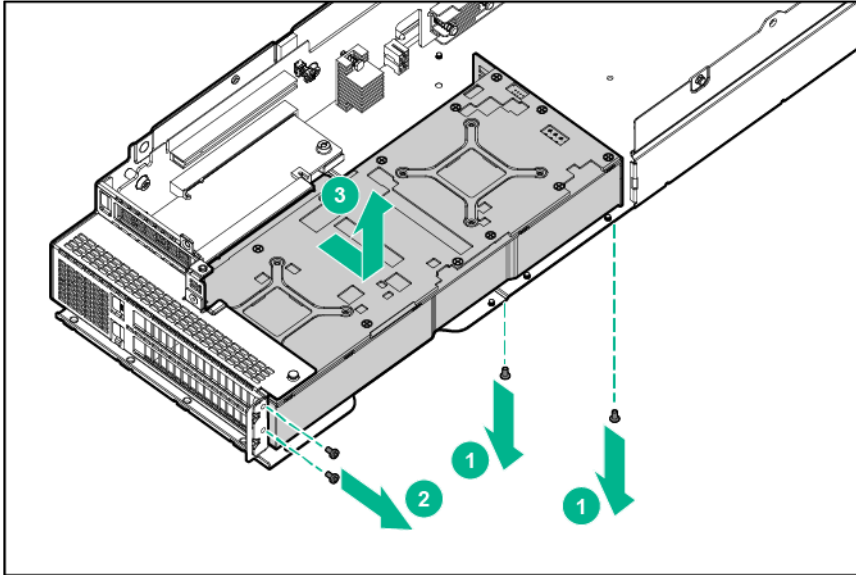
- o Intel Xeon Phi Coprocessor 5110P



- o AMD FirePro S9150 GPU



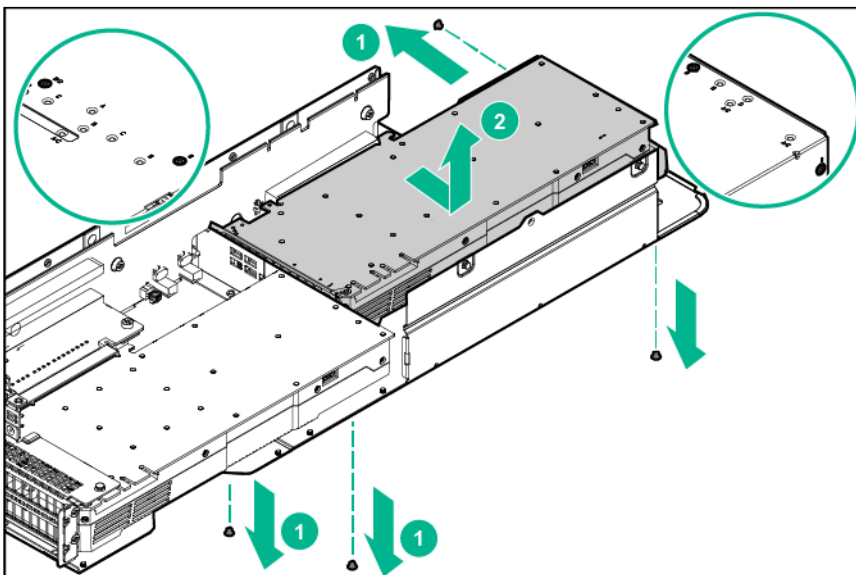
- AMD FirePro S7150 GPU



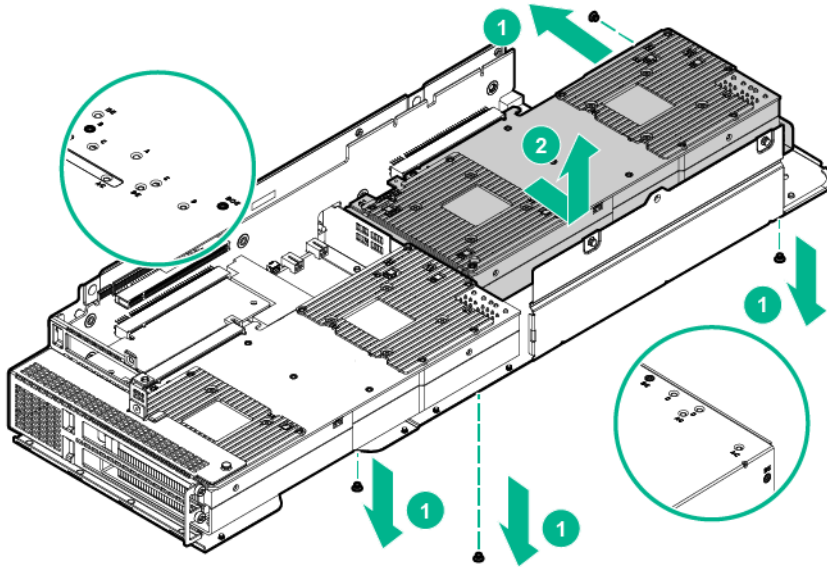
Remove Accelerator 2 from the three-slot riser cage assembly

To remove the component:

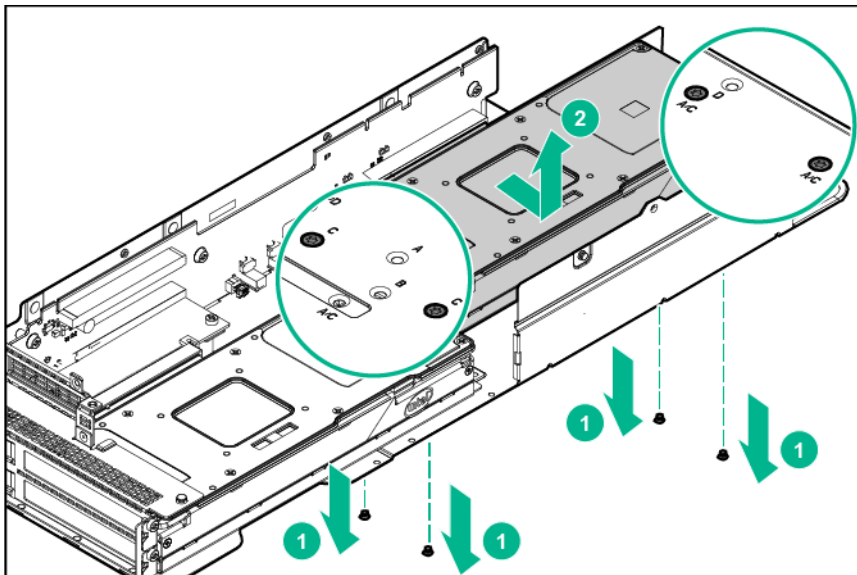
1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the three-slot riser cage assembly ("Three-slot riser cage assemblies" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Remove the riser cage bracket from the three-slot riser cage assembly (on page 47).
8. Disconnect all cables from the accelerators.
9. Remove Accelerator 2 from the three-slot riser cage assembly:
 - NVIDIA K40, K80, M60, or M40 GPU



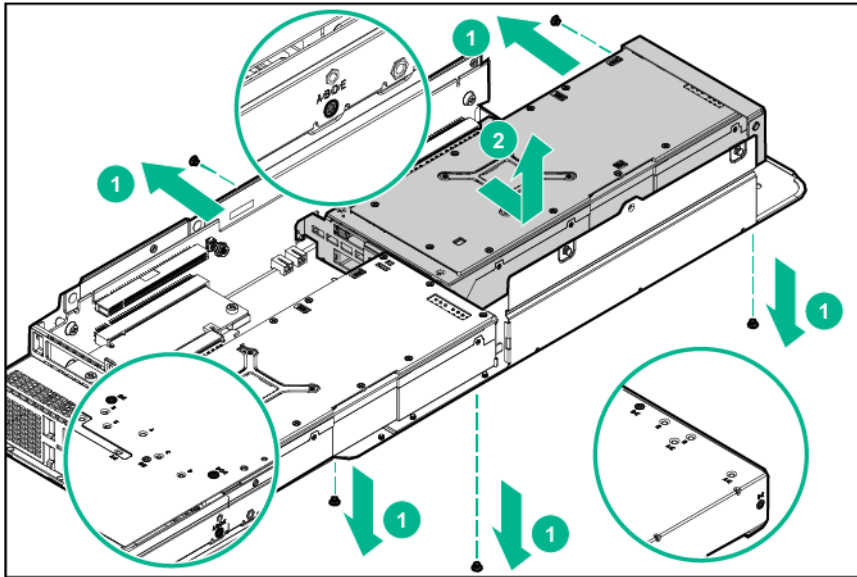
- o NVIDIA GRID K2 GPU



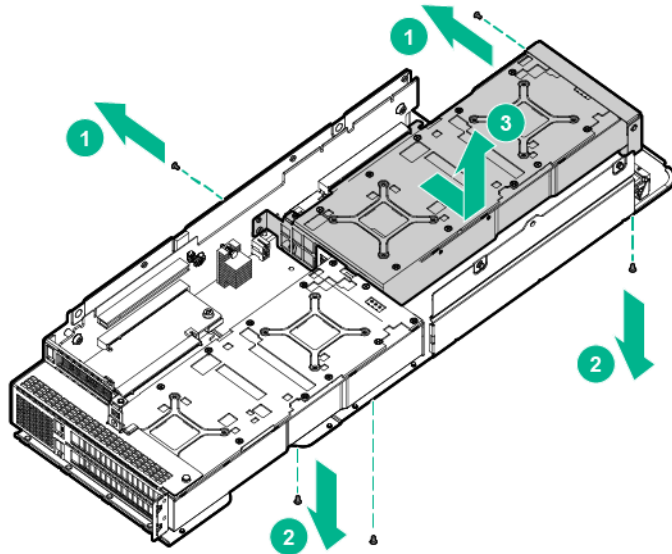
- o Intel Xeon Phi Coprocessor 5110P



- AMD FirePro S9150 GPU



- AMD FirePro S7150 GPU



Chassis assembly



CAUTION: If replacing the HPE Apollo r2800 Chassis, verify the original drive bay mapping configuration to prevent possible data loss. For more information, see "Drive bay mapping for the HPE Apollo r2800 Chassis (on page 59)."

To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("Remove the node from the chassis" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("Hot-plug drive" on page 72).
6. If installed, remove the RCM module ("RCM module" on page 71).

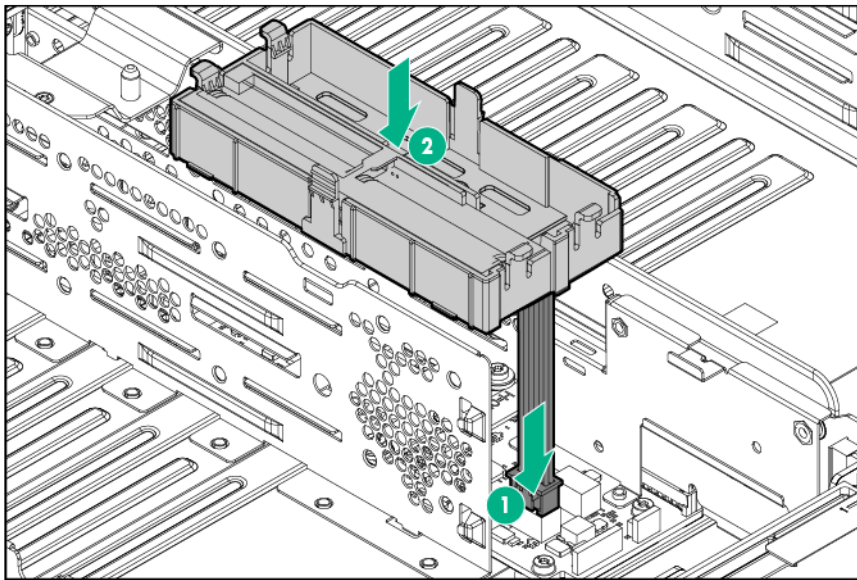
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).

To replace the component:

1. Remove the Smart Storage Battery and fan modules from the failed chassis:
 - a. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
 - b. If installed, remove the HPE Smart Storage Battery (on page 70).
 - c. Remove all fan modules ("[Fan module](#)" on page 69).
2. Install the Smart Storage Battery and fan modules into the new chassis:
 - a. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
 - b. Install the HPE Smart Storage Battery into the chassis.



IMPORTANT: Ensure that the battery cable is connected to the correct connector. For detailed cabling information, see "[HPE Smart Storage Battery cabling](#)" (on page 148)."



- c. Install all fan modules and connect the fan cables to the power connectors ("[Fan module cabling](#)" on page 148).
3. Install the access panel.



WARNING: Always use at least two people to lift the chassis into the rack. If the chassis is being loaded into the rack above chest level, a third person must assist with aligning the chassis with the rails while the other two people support the weight of the chassis.



WARNING: The chassis is very heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Remove all installed chassis components from their chassis before installing or moving the chassis.
- Use caution and get help to lift and stabilize chassis during installation or removal, especially when the chassis is not fastened to the rack.



WARNING: To avoid risk of personal injury or damage to the equipment, do not stack anything on top of rail-mounted equipment or use it as a work surface when extended from the rack.



CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

4. Install the chassis into the rack and tighten the thumbscrews.
5. Install all power supplies.
6. If removed, install the RCM module.
7. Install all drives.
8. If removed, install the security bezel.
9. Install all nodes into the chassis.
10. Connect all peripheral cables to the nodes.
11. Power up the nodes.

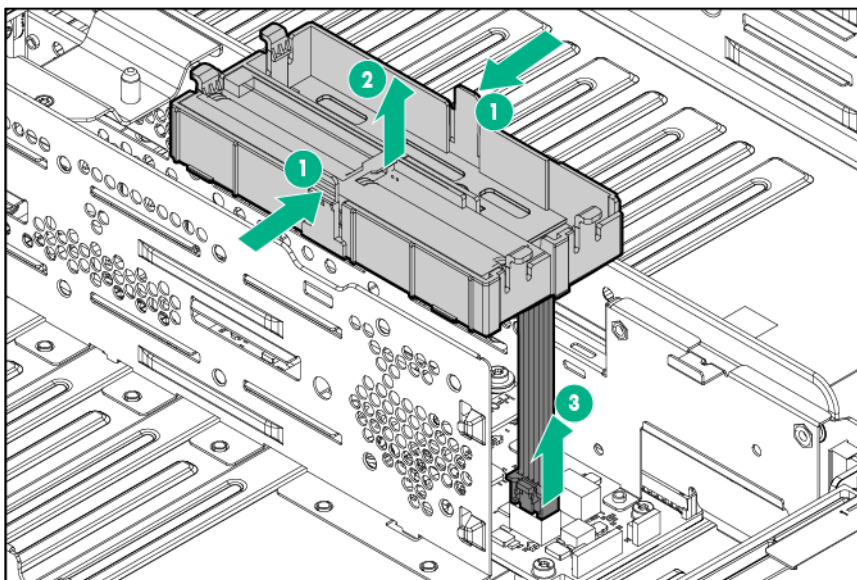
Power distribution board (PDB)



CAUTION: If replacing the power distribution board in the Apollo r2800 Chassis, verify the original drive bay mapping configuration to prevent possible data loss. For more information, see "Drive bay mapping for the HPE Apollo r2800 Chassis (on page 59)."

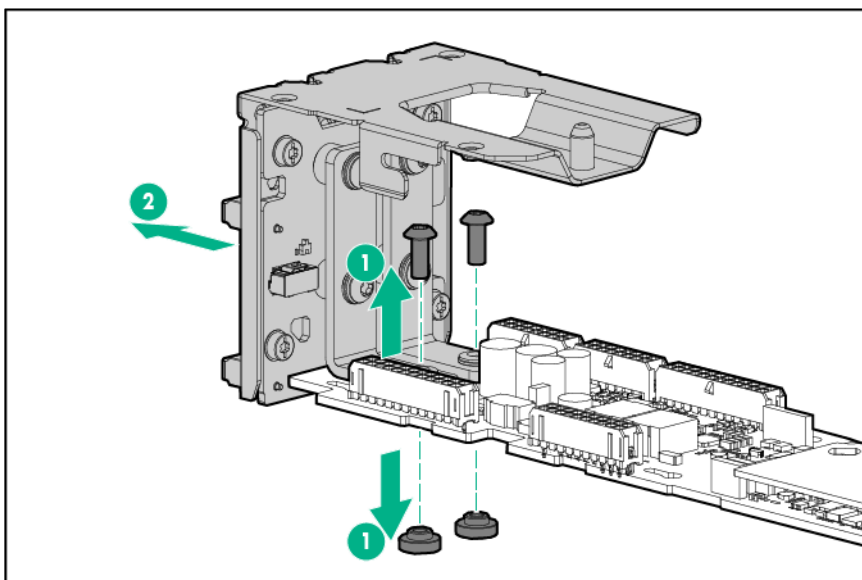
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("Remove the node from the chassis" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("Hot-plug drive" on page 72).
6. If installed, remove the RCM module ("RCM module" on page 71).
7. Remove all power supplies ("Remove the power supply" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("Remove the chassis access panel" on page 34).
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.

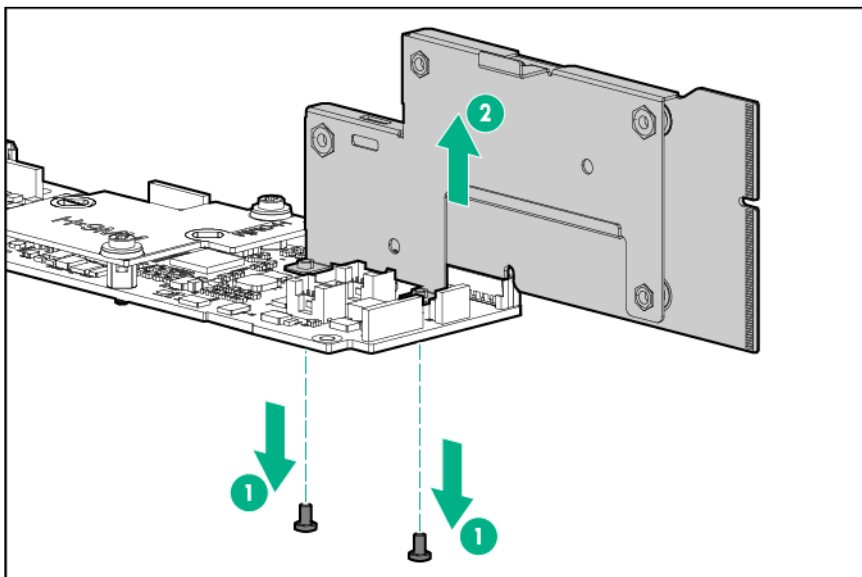


11. Remove the PDB cover (on page 33).

12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly (on page 36).
15. Remove the PDB pass-through board assembly.
 - a. Use a pair of thin-nose pliers to firmly grasp the cap nuts on the bottom of the PDB.
 - b. Remove the screws with a T-20 Torx screwdriver.
 - c. Remove the PDB pass-through board assembly from the PDB.



16. Using a T-15 Torx screwdriver, remove the RPS link board assembly.



To replace the component, reverse the removal procedure.

Drive bay mapping for the HPE Apollo r2800 Chassis

The HPE Apollo r2800 Chassis, featuring the storage expander backplane, supports the flexibility to assign drive bays to specific server nodes. System administrators with the Integrated Lights Out (iLO) administrator login credentials may provide and execute iLO XML commands or scripts to change the association of drive bays to server node numbers.

Drive bay mapping configuration changes may be made from any server node and take effect after all server nodes in the HPE Apollo r2800 Chassis are turned off and the Chassis firmware is able to reset the storage expander backplane. All nodes must remain powered off for at least 5 seconds after executing the configuration changes. The server nodes may be remotely restarted through the iLO remote interface, or may be locally restarted by pressing the power button for each node.

This feature requires the following minimum firmware versions:

- Apollo 2000 System Chassis firmware version 1.4.0 or later
- Storage Expander firmware version 1.0 or later
- iLO firmware version 2.10 or later

Factory default configuration

The factory default configuration evenly distributes the 24 SFF drive bays in the HPE Apollo r2800 Chassis.

Six drive bays are allocated to each 1U node.

- Node 1: drive bays 1 through 6
- Node 2: drive bays 7 through 12
- Node 3: drive bays 13 through 18
- Node 4: drive bays 19 through 24

Twelve drive bays are allocated to each 2U node.

- Node 1: drive bays 1 through 12
- Node 3: drive bays 13 through 24

For node numbering, see "Chassis rear panel components (on page 122)."

For drive bay numbering, see "HPE Apollo r2800 Chassis drive bay numbering (on page 132)."

Mapping drive bays



CAUTION: Before mapping any drive bays, note the current configuration. Any changes to the drive bay mapping configuration where there are any drives set up in a Smart Array RAID configuration could cause data loss.

IMPORTANT: The HPE Apollo r2800 Chassis does not support nodes using the HPE Dynamic Smart Array B140i Controller or the HPE P840 Smart Array Controller. Hewlett Packard Enterprise recommends installing an HPE H240 Host Bus Adapter or HPE P440 Smart Array Controller.

For detailed information and examples on drive bay mapping configuration changes in the HPE Apollo r2800 Chassis, see the *HPE iLO 4 Scripting and Command Line Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/ilo/docs>).

To map drives in the HPE Apollo r2800 Chassis:

1. Determine which drive bays to map to each node.
2. Using Integrated Lights Out (iLO) administrator login credentials, use a script that includes the READ_BACKPLANE_INFO command to get the current mapping information from the HPE Apollo r2800 Chassis.
3. Build an XML script to map the drive bays.
4. Using a script that includes the READ_ZONE_TABLE command, verify the changes to the zone table. The drives can also be labeled to clearly show the drive bay mapping configuration.
5. Power down the nodes ("[Power down the node](#)" on page 29).



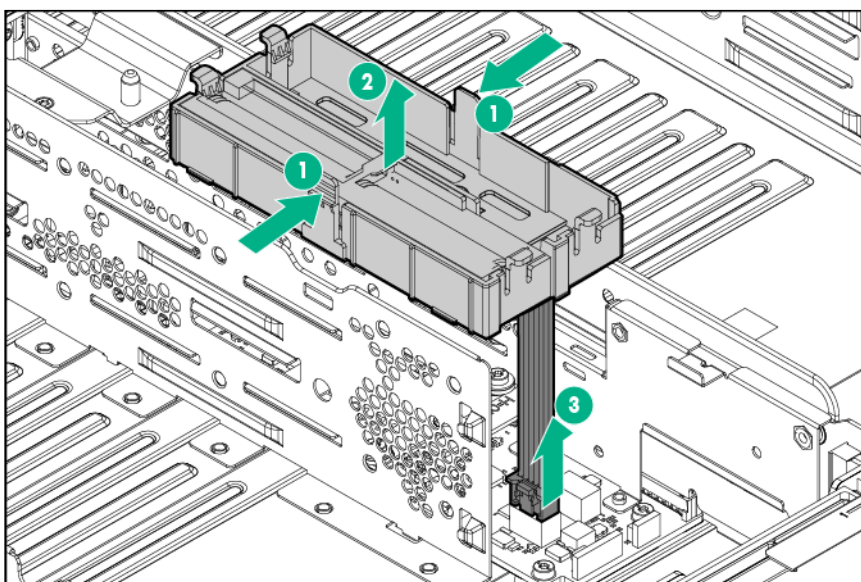
IMPORTANT: All nodes must remain powered off for at least 5 seconds after executing the configuration changes.

6. Power up the nodes.

PDB pass-through board

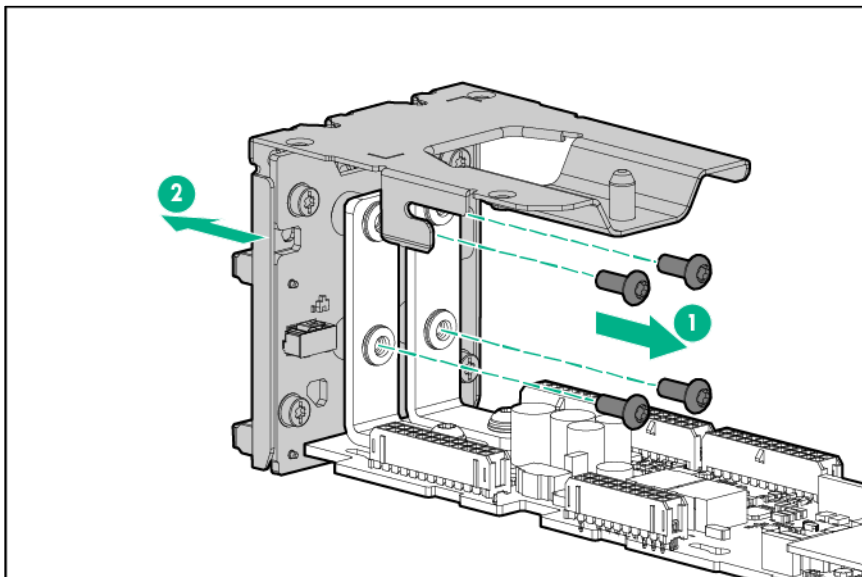
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.

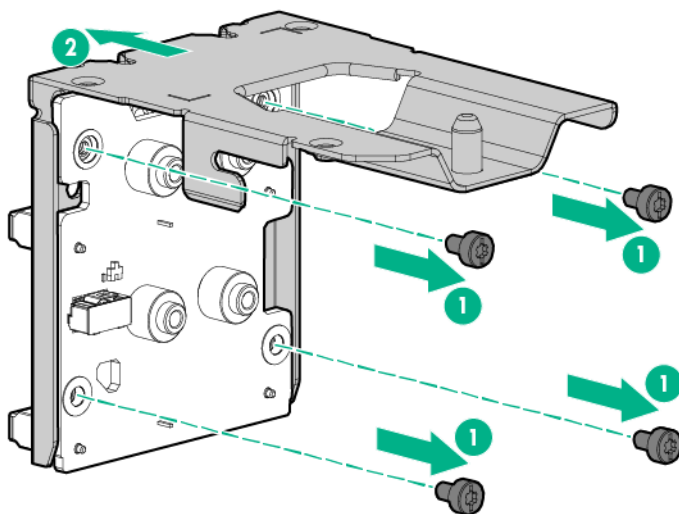


11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.

14. Remove the chassis PDB assembly (on page 36).
15. Using a T-20 Torx screwdriver, remove the PDB pass-through board assembly from the bus bars.



16. Using a T-15 Torx screwdriver, remove the support bracket from the PDB pass-through board.

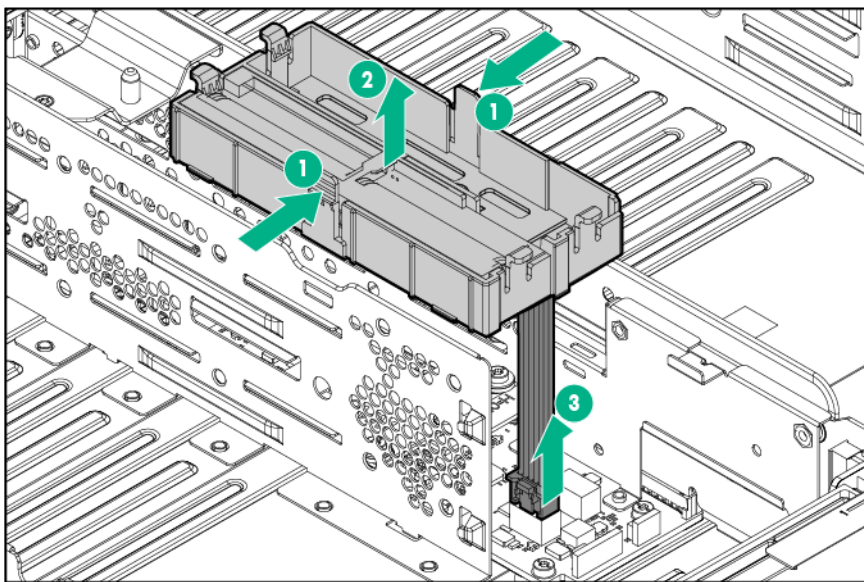


To replace the component, reverse the removal procedure.

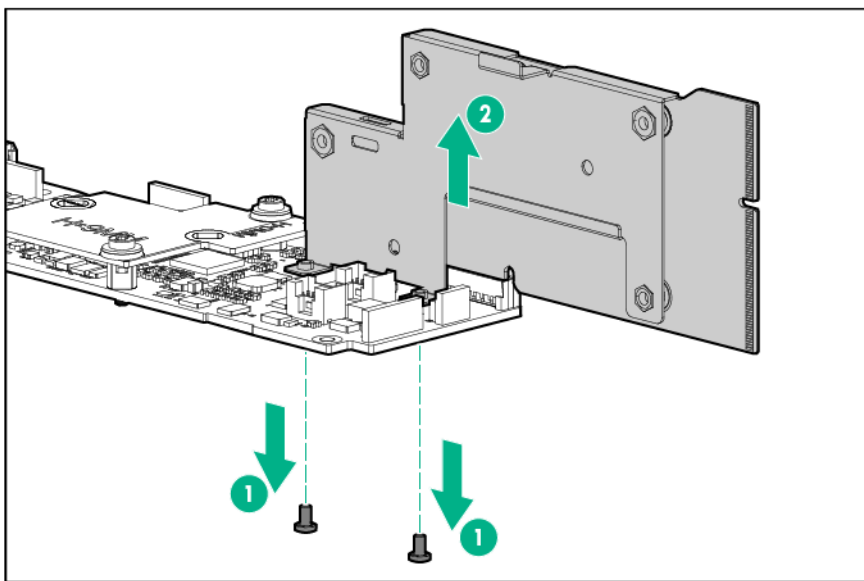
RPS link board

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).

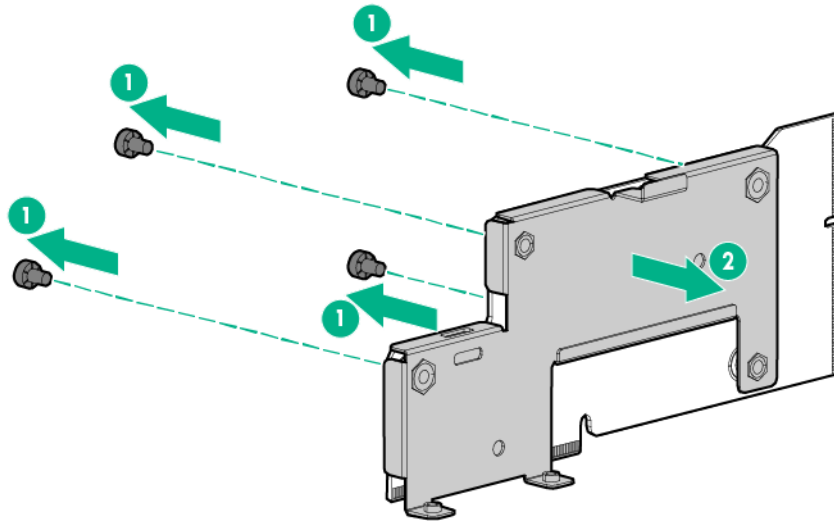
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.



11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly (on page 36).
15. Using a T-15 Torx screwdriver, remove the RPS link board assembly.



16. Remove the support bracket from the RPS link board.



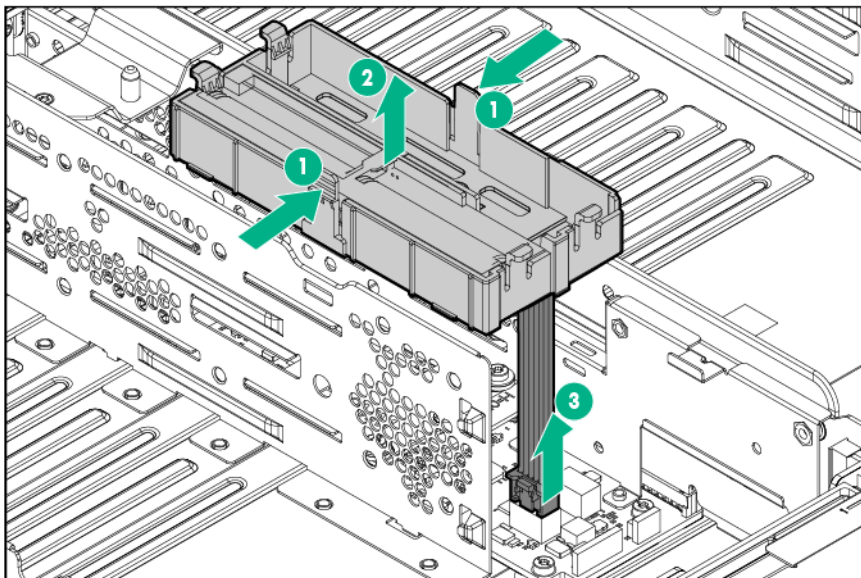
To replace the component, reverse the removal procedure.

RCM 2.0 cable

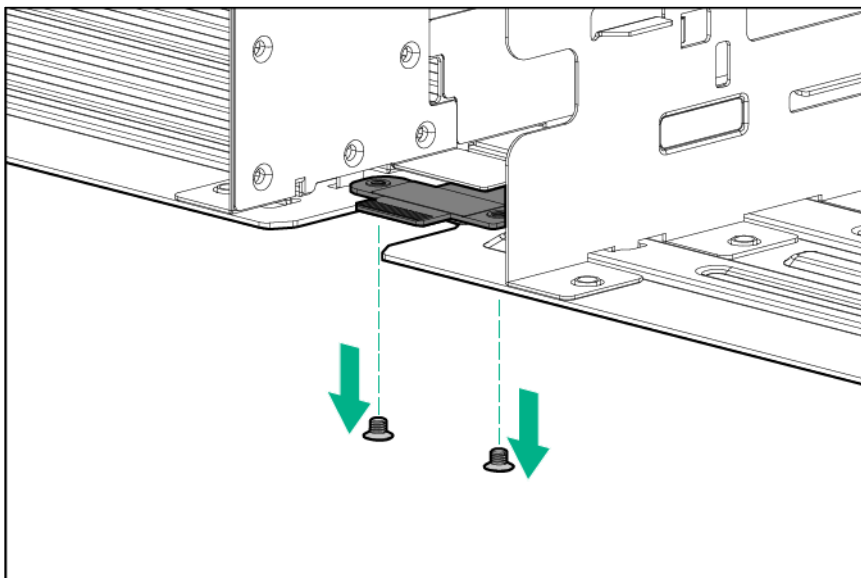
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).

10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.



11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly (on page 36).
15. Remove the two screws from the bottom of the chassis.



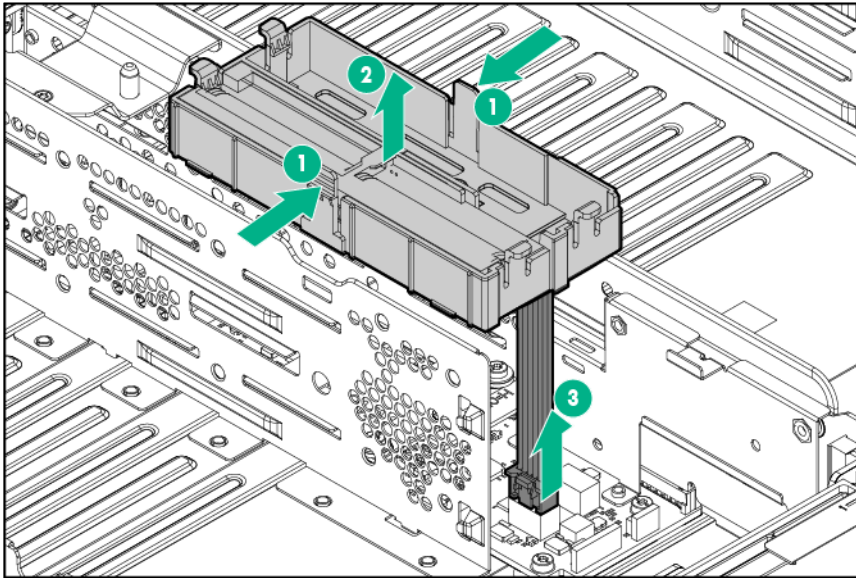
16. Remove the RCM 2.0 cable.
- To replace the component, reverse the removal procedure.

Drive backplane

To remove the component:

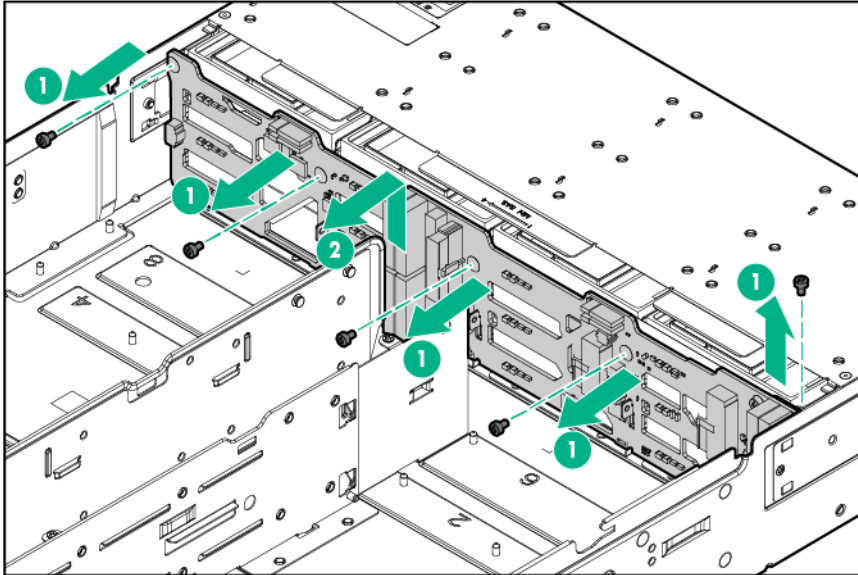
1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.

3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.

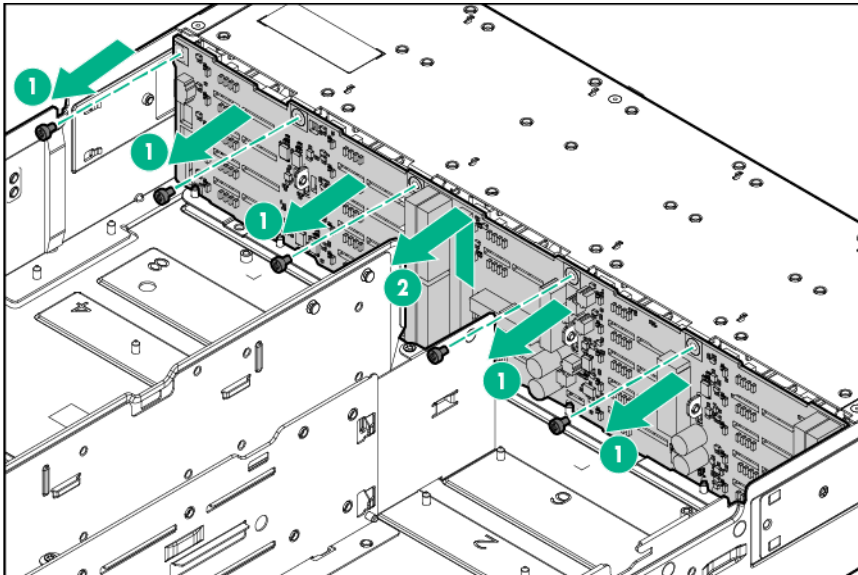


11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly (on page 36).
15. Remove all fan modules ("[Fan module](#)" on page 69).
16. Remove the fan cages (on page 35).
17. If replacing the storage expander backplane in the Apollo r2800 Chassis, remove the storage expander card ("[Storage expander card \(HPE Apollo r2800 Chassis only\)](#)" on page 67).
18. Disconnect all the cables from the drive backplane.
19. Remove the drive backplane.

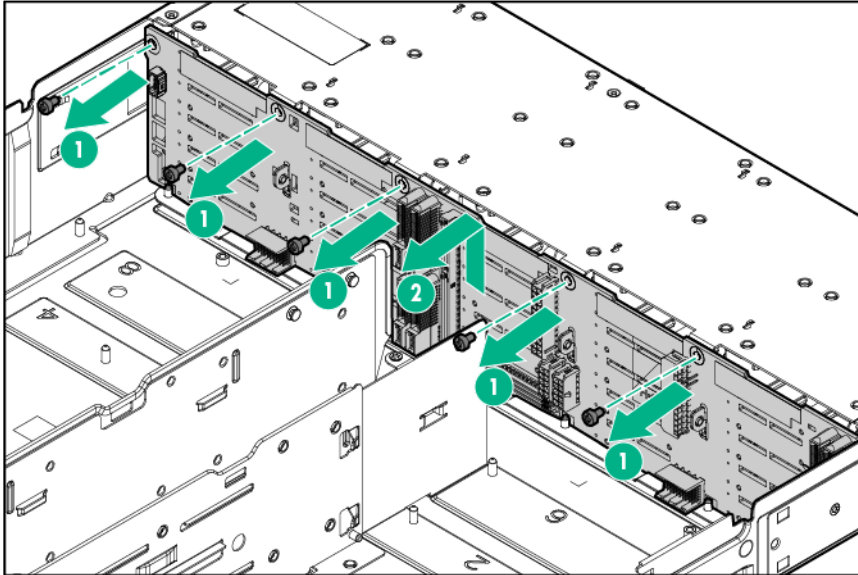
- 12 low-profile LFF drive backplane for Apollo r2200 Chassis



- 24 SFF drive backplane for Apollo r2600 Chassis



- Storage expander backplane (24 SFF drive backplane for Apollo r2800 Chassis)



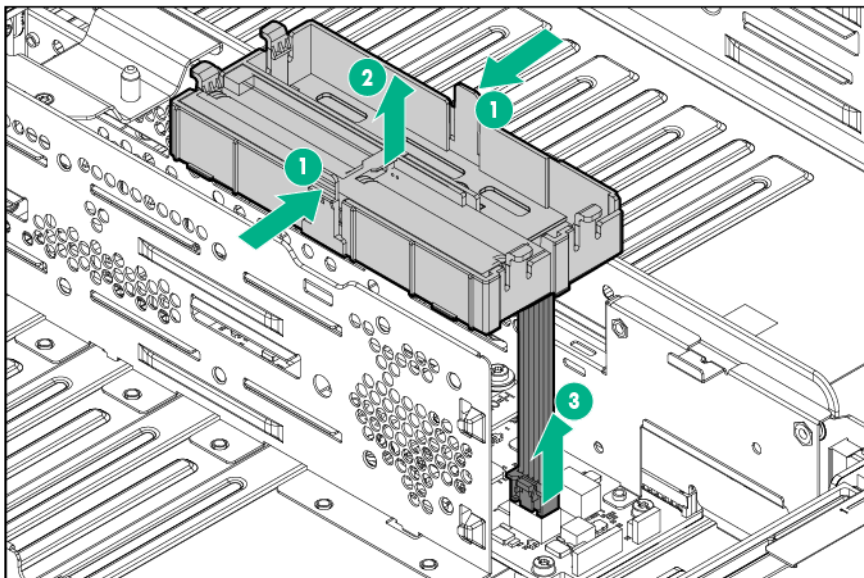
To replace the component, reverse the removal procedure.

Storage expander card (HPE Apollo r2800 Chassis only)

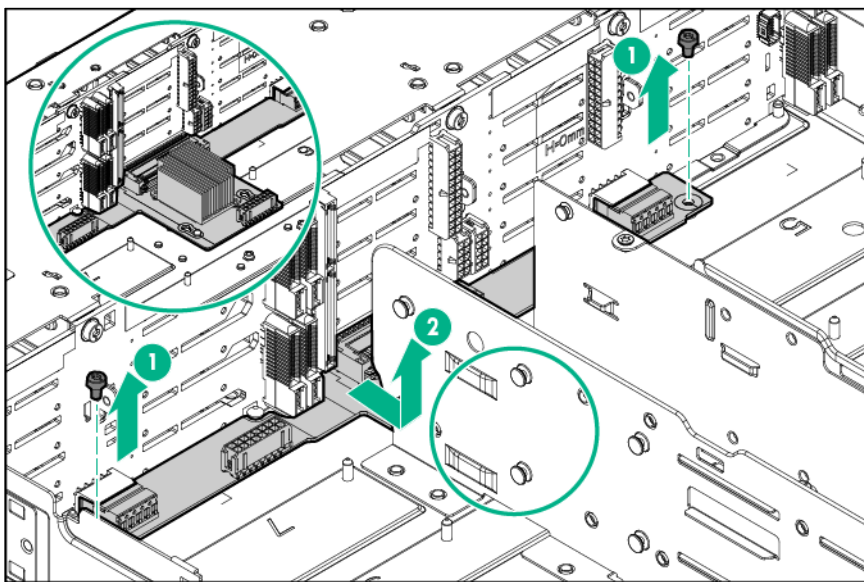
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).

10. If Smart Storage Battery is installed, slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the Smart Storage Battery cable.



11. Remove the PDB cover (on page 33).
12. Disconnect all cables from the PDB.
13. Disconnect the PDB pass-through cable from the pass-through board.
14. Remove the chassis PDB assembly (on page 36).
15. Remove all fan modules ("Fan module" on page 69).
16. Remove the fan cages (on page 35).
17. Disconnect all cables from the storage expander card.
18. Remove the r2800 storage expander card.

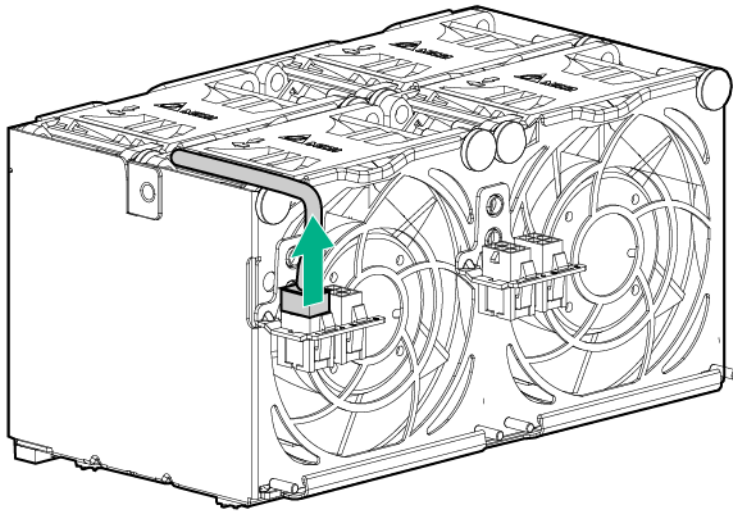


To replace the component, reverse the removal procedure.

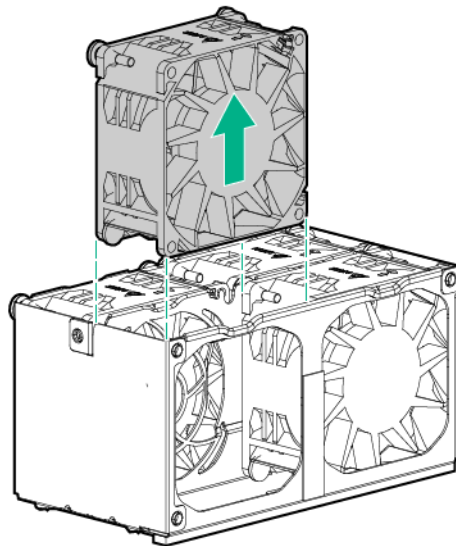
Fan module

To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("Remove the node from the chassis" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("Hot-plug drive" on page 72).
6. If installed, remove the RCM module. ("RCM module" on page 71)
7. Remove all power supplies ("Remove the power supply" on page 31).
8. Remove the chassis from the rack (on page 32)
9. Remove the access panel ("Remove the chassis access panel" on page 34).
10. Disconnect the cable from the fan cage.



11. Remove the fan module.



To replace the component, reverse the removal procedure.

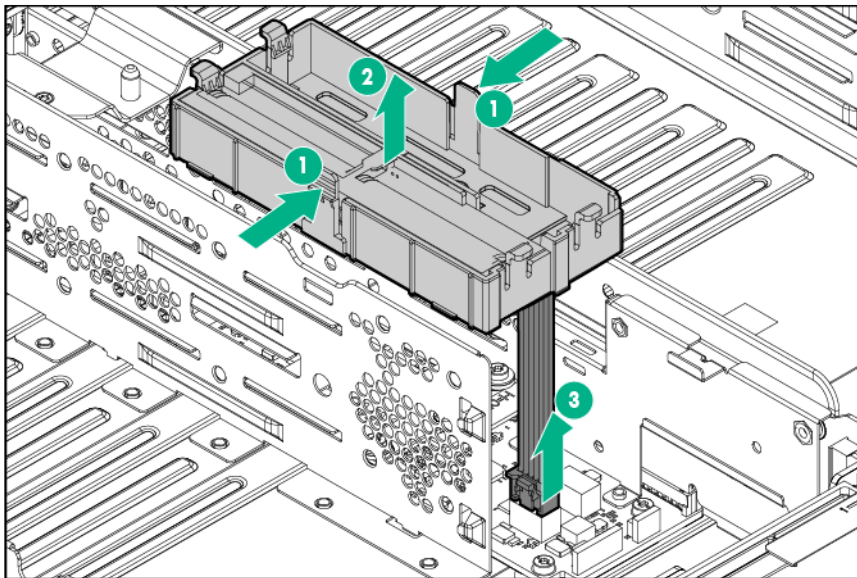
HPE Smart Storage Battery

⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

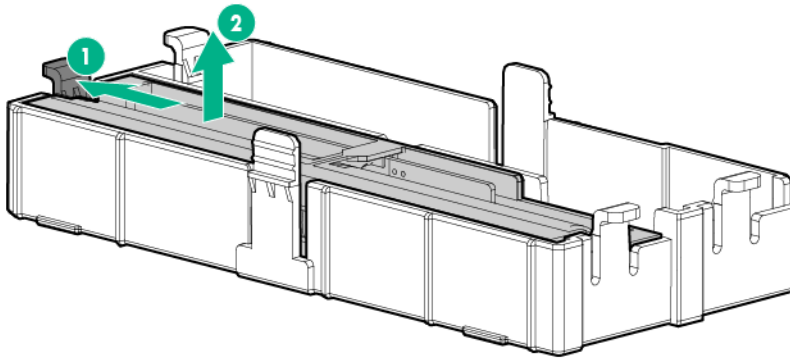
⚠ CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module. ("[RCM module](#)" on page 71)
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Loosen the thumbscrews and extend the chassis from the rack.
9. Remove the chassis from the rack (on page 32).
10. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
11. Slightly pull up the battery holder from the chassis to access the battery cable connection underneath it, and then disconnect the HPE Smart Storage Battery cable.



12. Remove the Smart Storage Battery from its holder.



To replace the component, reverse the removal procedure.

RCM module

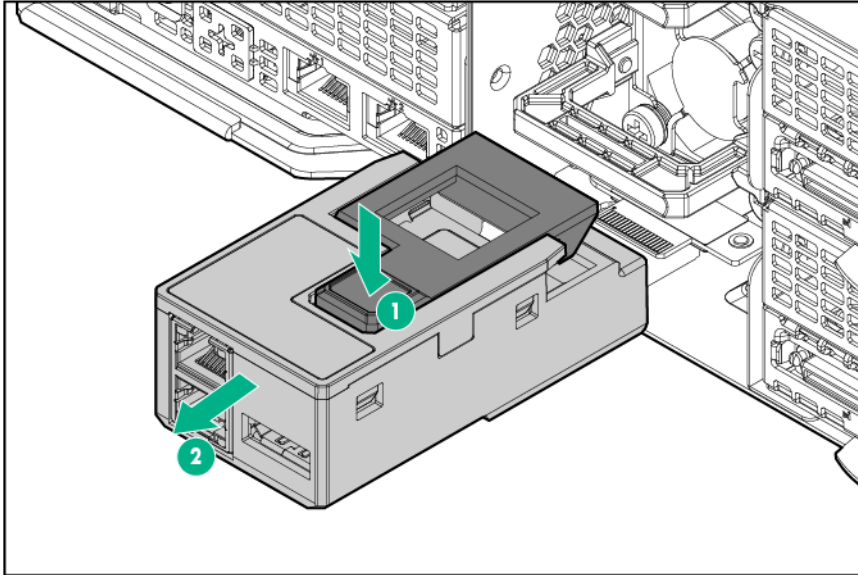
Observe the following rules and limitations when installing an RCM module:

- If a dedicated iLO management port module is installed in a node, the node cannot be accessed through the RCM module.
- If a dedicated iLO management port module is installed in a node, the node can only connect to a network through the dedicated iLO management port module.
- If using the RCM module iLO ports or the dedicated iLO management port module to connect to a network, the network must operate at a speed of 1 Gb/s. The server cannot connect to the network if the network is operating at a speed of 10/100 Mb/s or 10 Gb/s.
- Use either the HPE APM port or an iLO port to connect to a network. Having both ports connected at the same time results in a loopback condition.
- Do not connect both iLO ports to the network at the same time. Only one iLO port can be connected to the network, while the other iLO port can be used only as a connection to a second enclosure. Having both ports connected at the same time results in a loopback condition.

To remove the component:

1. Power down all nodes ("[Power down the node](#)" on [page 29](#)).
2. Access the product rear panel.
3. Disconnect all cables from the RCM module.

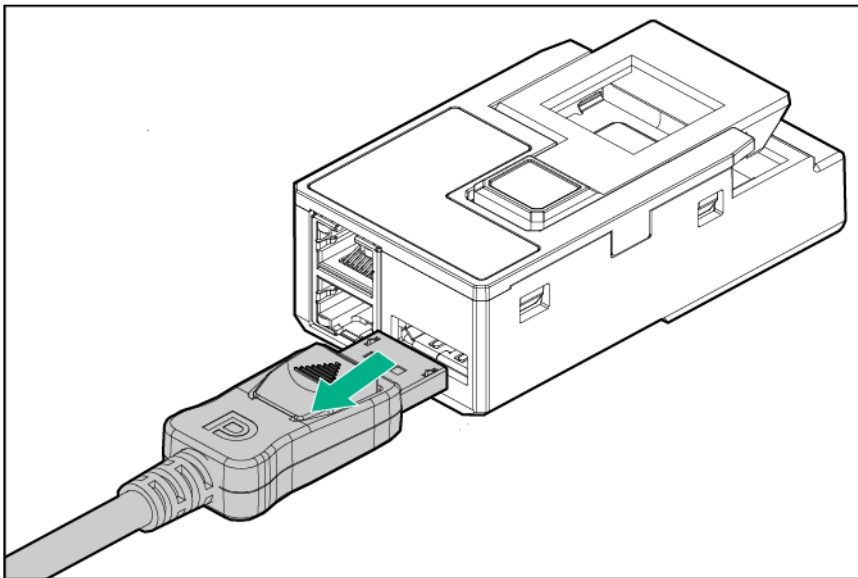
4. Remove the RCM module.



RCM 2.0 to 1.0 adapter cable

To remove the component:

1. Power down the system (on page 29).
2. Disconnect the RCM 2.0 to 1.0 adapter cable from APM.
3. Disconnect the RCM 2.0 to 1.0 adapter cable from the RCM module.



To replace the component, reverse the removal procedure.

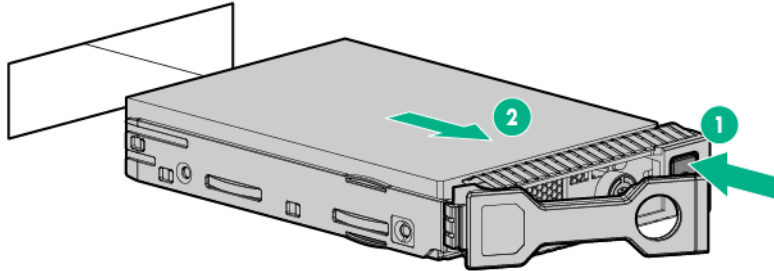
Hot-plug drive



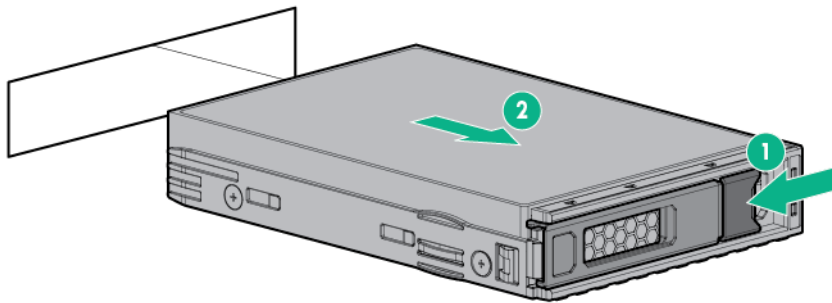
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Back up all node data on the drive.
2. Determine the status of the drive from the hot-plug drive LED definitions (on page 134, on page 134).
3. Remove the hot-plug drive.
 - o SFF HPE SmartDrive



- o Low-profile LFF hot-plug drive



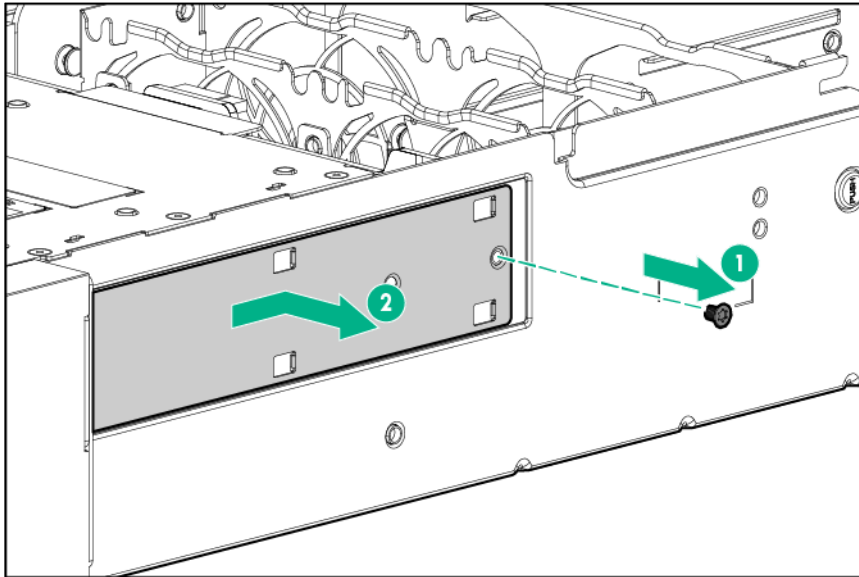
To replace the component, reverse the removal procedure.

Bezel ear

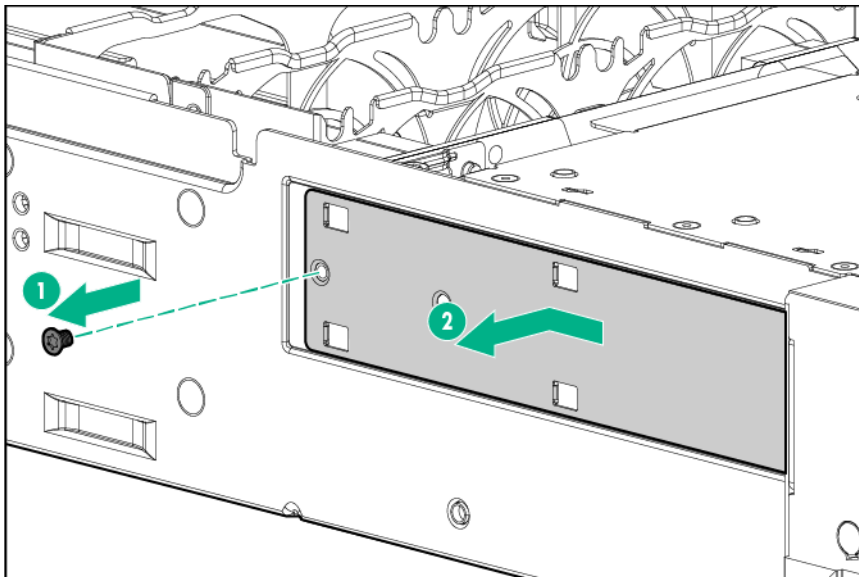
To remove the component:

1. Power down the system (on page 29).
2. Disconnect all peripheral cables from the nodes and chassis.
3. Remove all nodes from the chassis ("[Remove the node from the chassis](#)" on page 30).
4. If installed, remove the security bezel (on page 33).
5. Remove all drives ("[Hot-plug drive](#)" on page 72).
6. If installed, remove the RCM module ("[RCM module](#)" on page 71).
7. Remove all power supplies ("[Remove the power supply](#)" on page 31).
8. Remove the chassis from the rack (on page 32).
9. Remove the access panel ("[Remove the chassis access panel](#)" on page 34).
10. Remove all fan modules ("[Fan module](#)" on page 69).
11. Remove the fan cages (on page 35).
12. Remove the front I/O cable cover.

- o Right front I/O cable cover

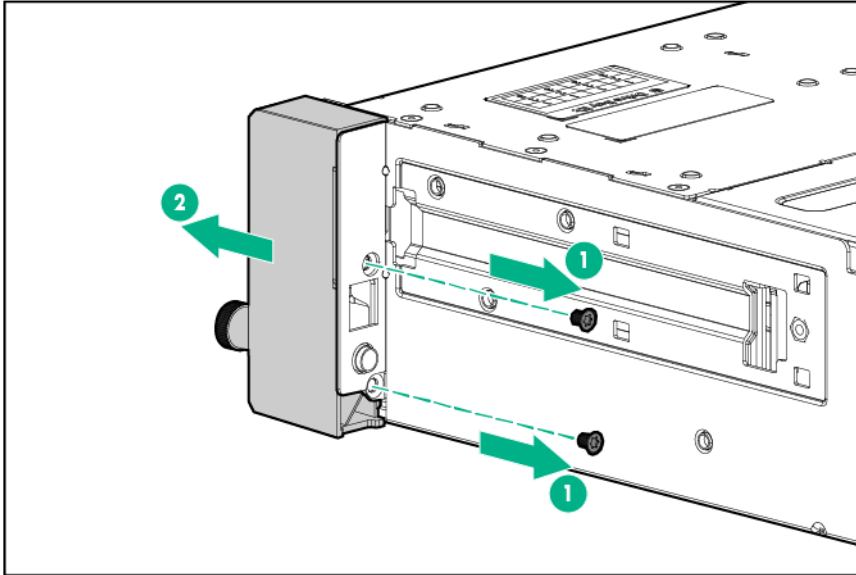


- o Left front I/O cable cover

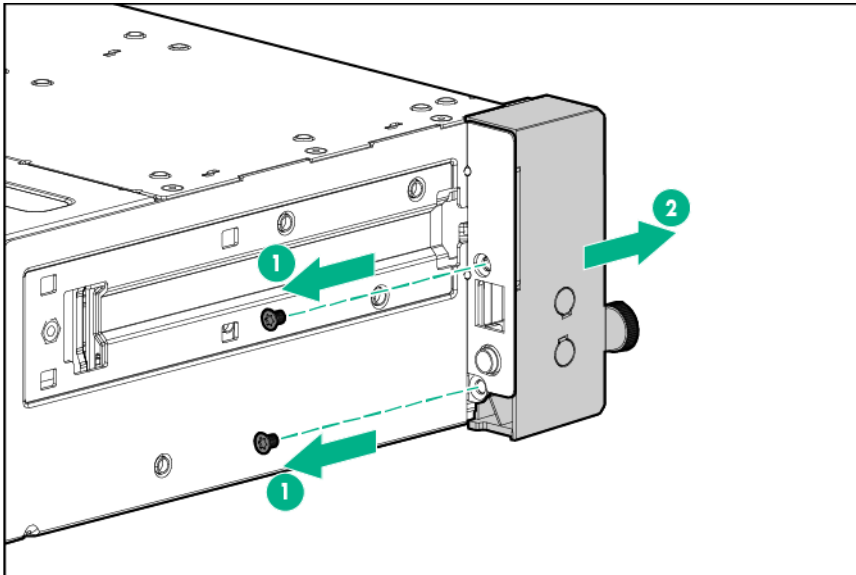


13. Disconnect the front I/O cable from the drive backplane.
14. Remove the bezel ear.

- Right bezel ear



- Left bezel ear



15. Disconnect the front I/O cable from the bezel ear.

To replace the component, reverse the removal procedure.

FBWC module



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



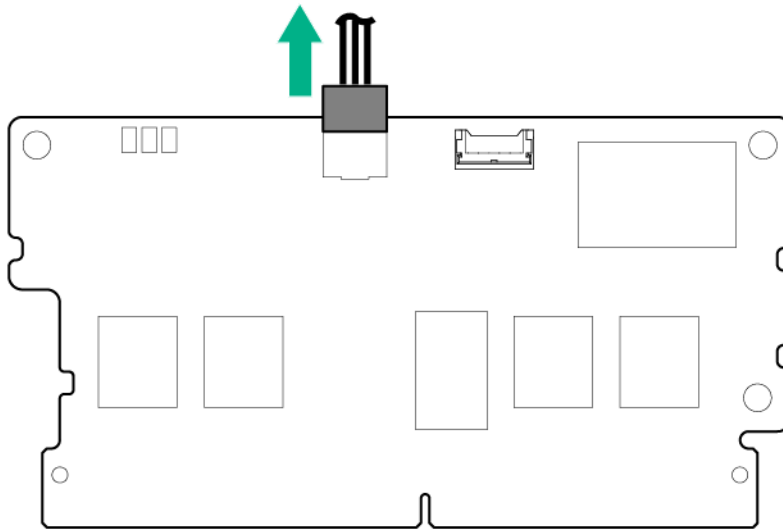
CAUTION: In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.



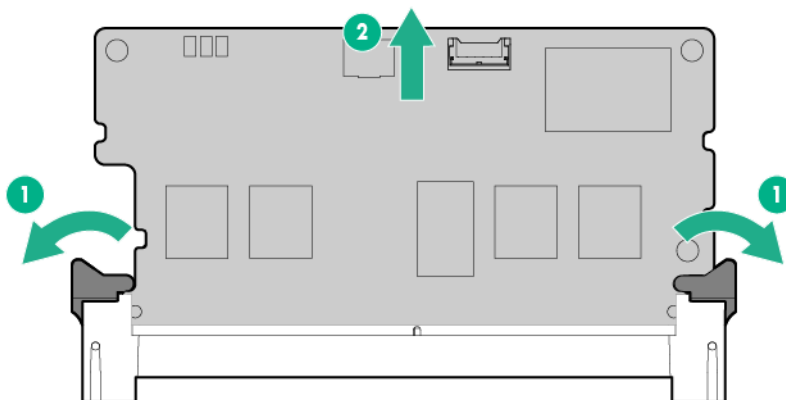
CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Remove the PCI riser cage assembly (on page 42).
5. If necessary for easier access to the cache module connector and/or removal of an air scoop, remove the storage controller from the PCI riser cage or from the system board.
6. If the cache module is covered by an air scoop, remove the air scoop.
7. Disconnect the cache module backup power cable from the cache module.



8. Remove the cache module.



To replace the component, reverse the removal procedure.

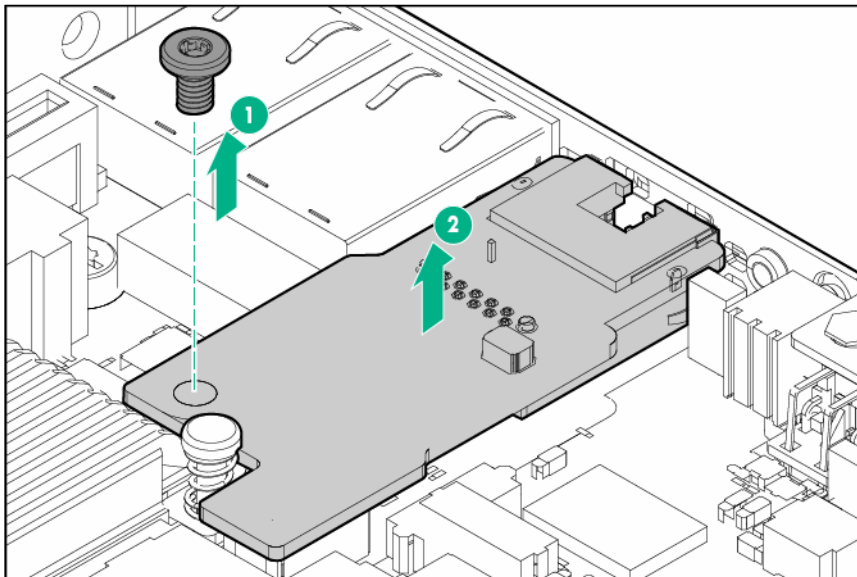
Dedicated iLO management port module

Observe the following rules and limitations when installing an dedicated iLO management port module:

- If a dedicated iLO management port module is installed in a node, the node can only connect to a network through the dedicated iLO management port module.
- If a dedicated iLO management port module is installed in a node, the node cannot be accessed through the RCM module (on page 71).
- If using the RCM module iLO ports or the dedicated iLO management port module to connect to a network, the network must operate at a speed of 1 Gb/s. The server cannot connect to the network if the network is operating at a speed of 10/100 Mb/s or 10 Gb/s.

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the server node from the chassis ("Remove the node from the chassis" on page 30).
4. Place the node on a flat, level surface.
5. Remove any installed PCI riser cage assemblies ("Remove the PCI riser cage assembly" on page 42).
6. Remove all rear I/O blanks ("Remove the rear I/O blank" on page 38).
7. Remove the failed dedicated iLO management port card.



To replace the component, reverse the removal procedure.

Enabling the dedicated iLO management module

To enable the dedicated iLO management module:

1. During the server startup sequence after installing the module, press **F9** in the POST screen.
The System Utilities screen appears.
2. Select **System Configuration | iLO 4 Configuration Utility**.
The iLO 4 Configuration Utility screen appears.
3. Select **Network Options**, and then press **Enter**.
The Network Options screen appears.

4. Set the **Network Interface Adapter** field to **ON**, and then press **Enter**.
5. Press **F10** to save your changes.
A message prompt to confirm the iLO settings reset appears.
6. Press **Enter** to reboot the iLO settings.
7. Press **Esc** until the main menu is displayed.
8. Select **Reboot the System** to exit the utility and resume the boot process.
The IP address of the enabled dedicated iLO connector appears on the POST screen on the subsequent boot-up. Access the Network Options screen again to view this IP address for later reference.

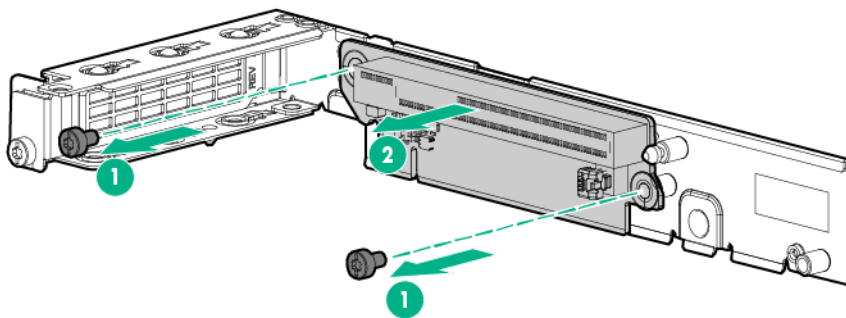
Riser boards

To remove the component:

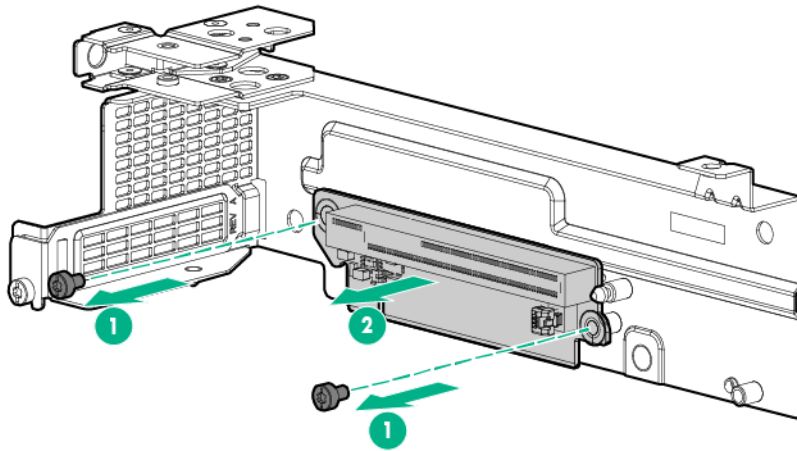


CAUTION: To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser board assembly.

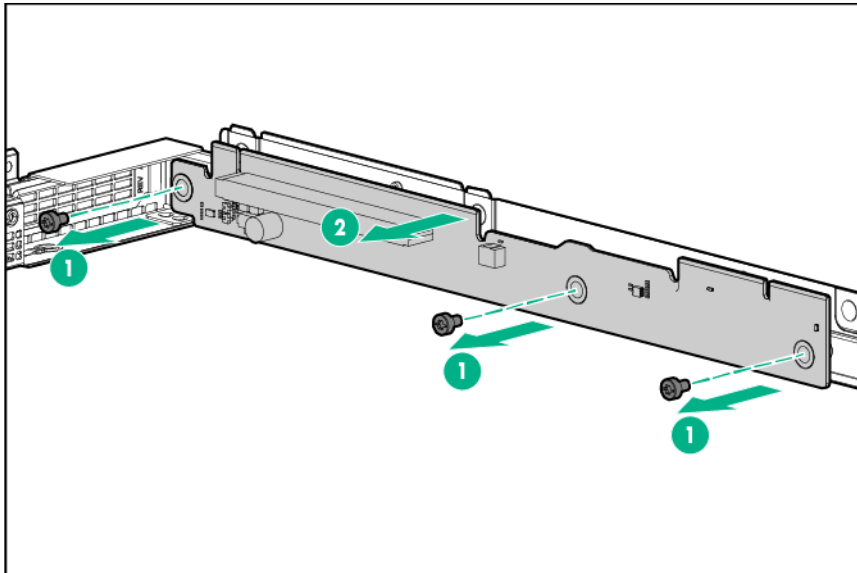
1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Remove the PCI riser cage assembly (on page 42).
5. In a three-slot riser cage assembly, remove the riser cage bracket from the three-slot riser cage assembly ("[Remove the riser cage bracket from the three-slot riser cage assembly](#)" on page 47).
6. Remove all expansion boards from the riser cage assembly.
 - Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly (on page 48)
 - Remove Accelerator 2 from the three-slot riser cage assembly (on page 53)
 - Remove Accelerator 1 from the three-slot riser cage assembly (on page 50)
7. Disconnect all cables from the riser board.
8. If replacing a riser board in a three-slot riser cage assembly, remove the PCIe transfer board ("[PCIe transfer board](#)" on page 82).
9. Remove the failed riser board.
 - PCIe x16 left riser board (Single-slot left PCI riser cage assembly)



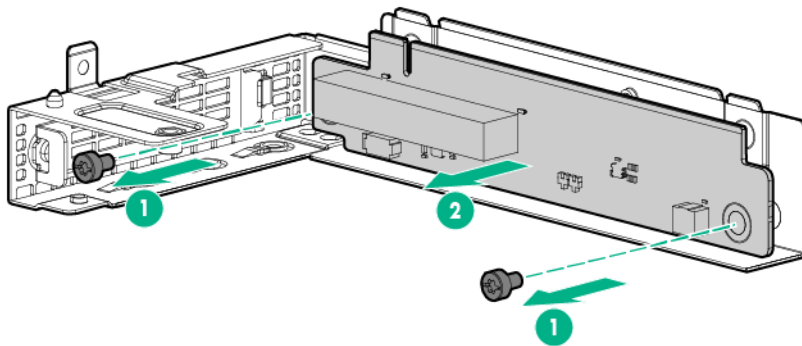
- PCIe x16 left riser board (Single-slot 2U node PCI riser cage assembly)



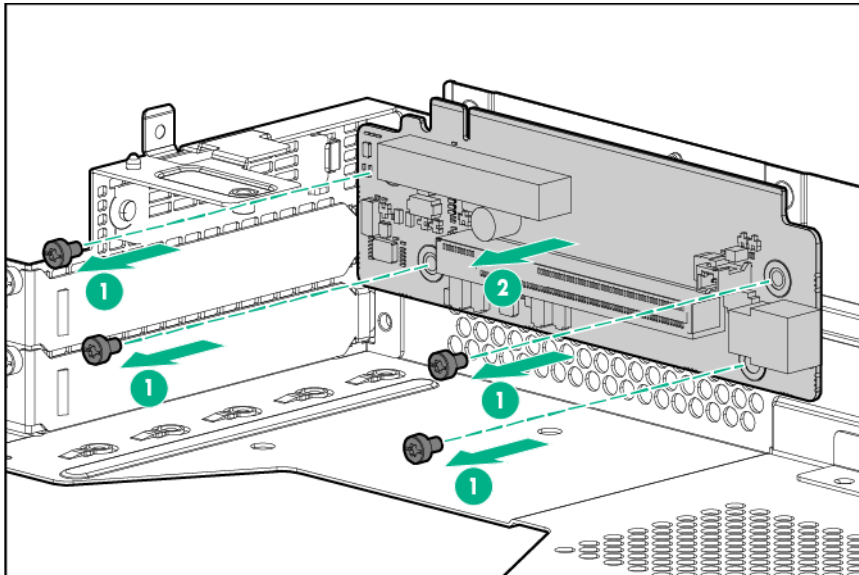
- PCIe x16 right 1U node riser board



- FlexibleLOM x8 1U node riser board



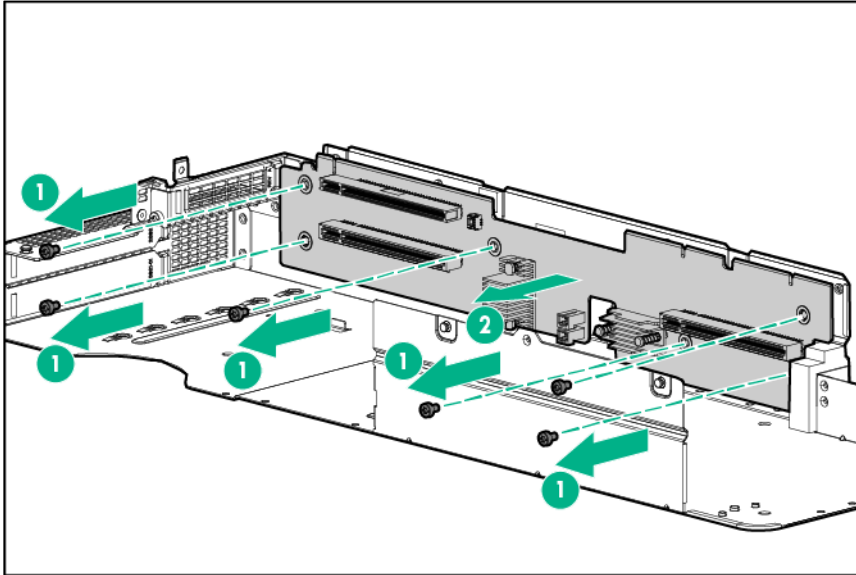
- FlexibleLOM x16x8 2U node riser board



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- This diagram illustrates the assembly of the front panel into the main chassis. It shows the front panel being aligned with the chassis and secured with screws. The numbered arrows indicate the following steps:
1. Insert the front panel into the chassis.
 2. Tighten the screws securing the front panel.
 1. Tighten the screws securing the front panel.
 1. Tighten the screws securing the front panel.
 1. Tighten the screws securing the front panel.
 1. Tighten the screws securing the front panel.

- Three-slot GPU-direct with re-timer PCIe x16 2U node riser board



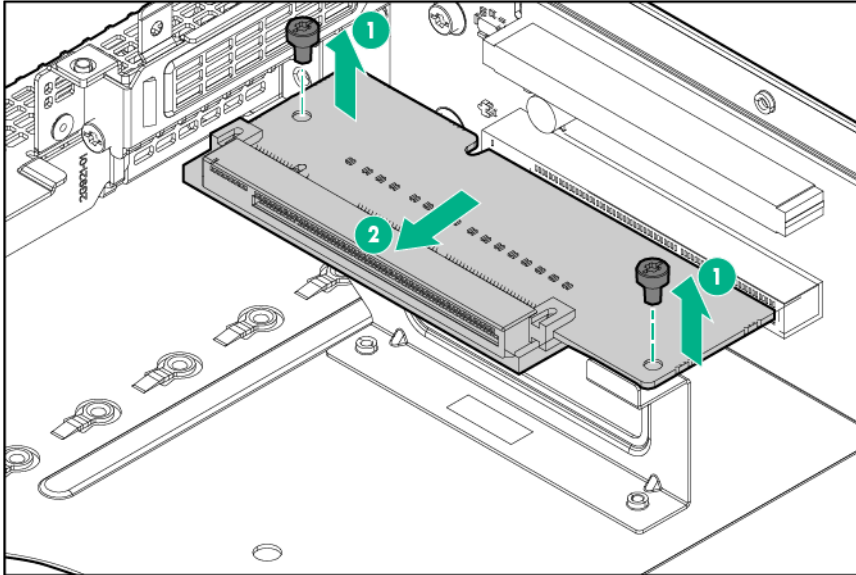
To replace the component, reverse the removal procedure.

PCIe transfer board

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Remove the three-slot PCI riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
5. In a three-slot riser cage assembly, remove the riser cage bracket from the three-slot riser cage assembly ("[Remove the riser cage bracket from the three-slot riser cage assembly](#)" on page 47).
6. Remove all expansion boards from the riser cage assembly.
 - Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly (on page 48)
 - Remove Accelerator 2 from the three-slot riser cage assembly (on page 53)
 - Remove Accelerator 1 from the three-slot riser cage assembly (on page 50)
7. Disconnect all cables from the riser board.

8. Remove the PCIe transfer board.



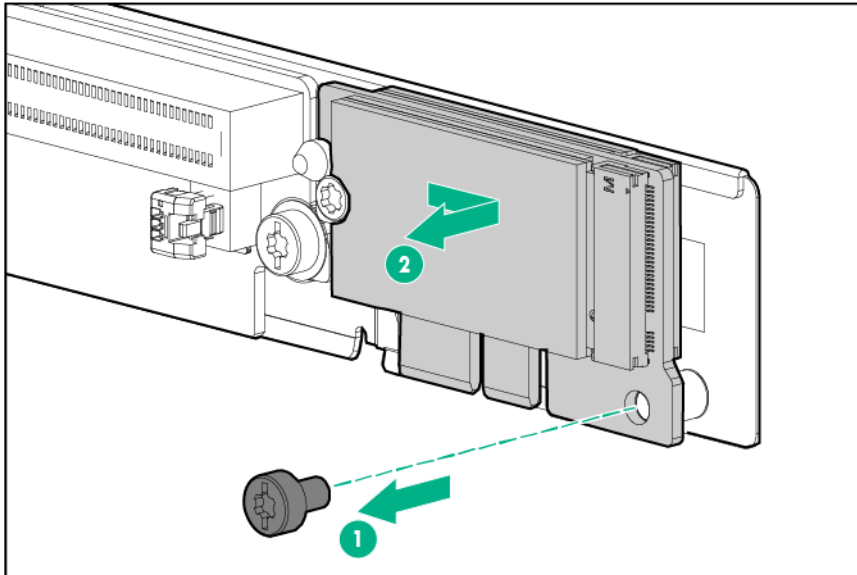
To replace the component, reverse the removal procedure.

M.2 SATA SSD enablement board

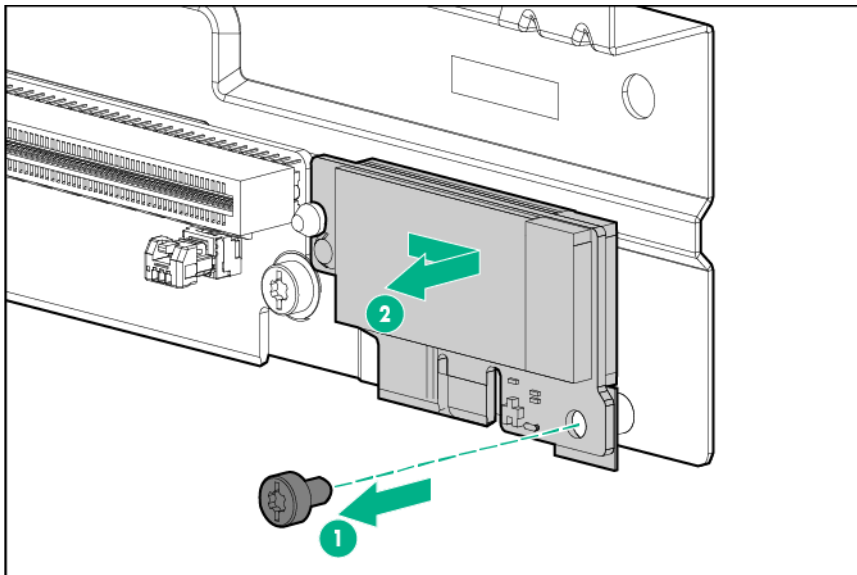
To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. In a 2U node, do one of the following:
 - o Remove the three-slot PCI riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
 - o Remove the FlexibleLOM 2U node PCI riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
5. Do one of the following:
 - o Remove the single-slot left PCI riser cage assembly ("[Single-slot left PCI riser cage assembly](#)" on page 42).
 - o Remove the single-slot 2U node PCI riser cage assembly ("[Single-slot 2U node PCI riser cage assembly](#)" on page 45).
6. If installed, remove the storage controller.
7. Disconnect all cables from the riser board.
8. Loosen the T-15 screw and remove the enablement board from the PCI riser cage assembly.

- Single-slot left PCI riser cage assembly

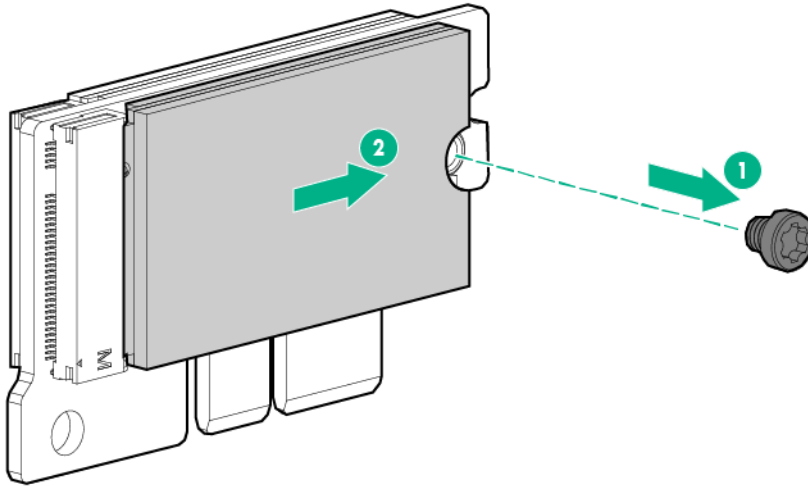


- Single-slot 2U node PCI riser cage assembly

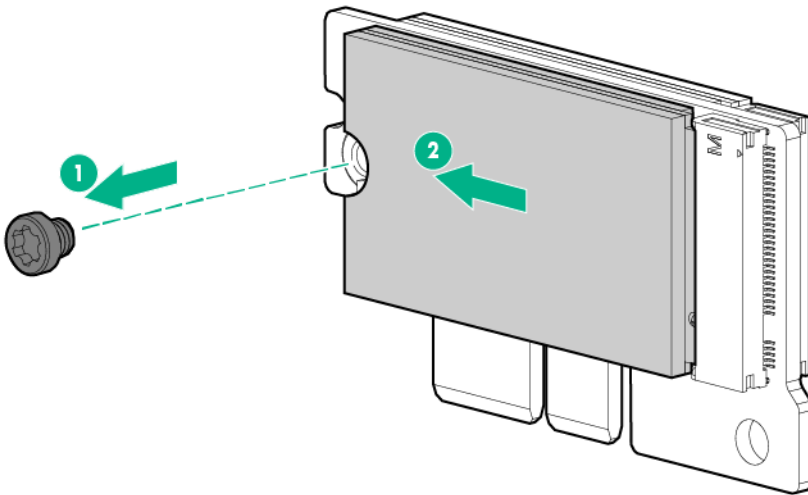


9. Loosen the T-10 screw and remove the M.2 SATA SSD cards from the failed enablement board.

- Remove the first M.2 SATA SSD card



- Remove the second M.2 SATA SSD card



To replace the component, reverse the removal procedure.

Heatsink

- ⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.
- ⚠ **CAUTION:** To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this node.
- ⚠ **CAUTION:** To prevent possible node malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

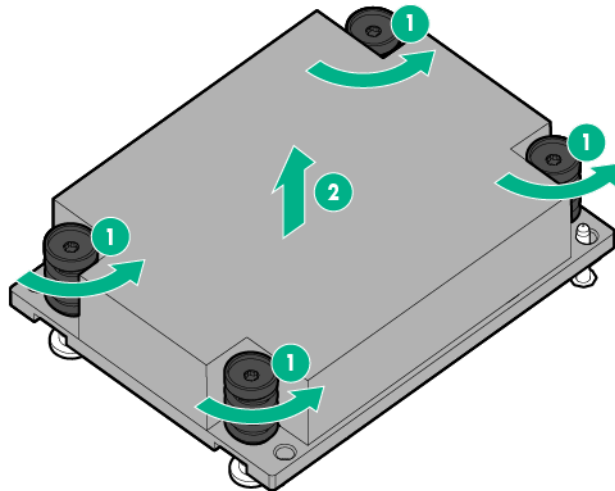


CAUTION: The heatsink thermal interface media is not reusable and must be replaced if the heatsink is removed from the processor after it has been installed.



IMPORTANT: Processor socket 1 must be populated at all times or the node does not function.

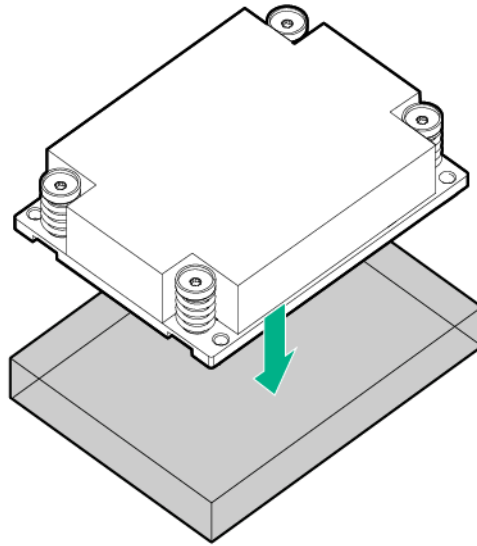
1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. In a 2U node, do one of the following:
 - Remove the three-slot PCI riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
 - Remove the FlexibleLOM 2U node PCI riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
6. Remove the air baffle (on page 39).
7. Remove the heatsink.



To replace the component:

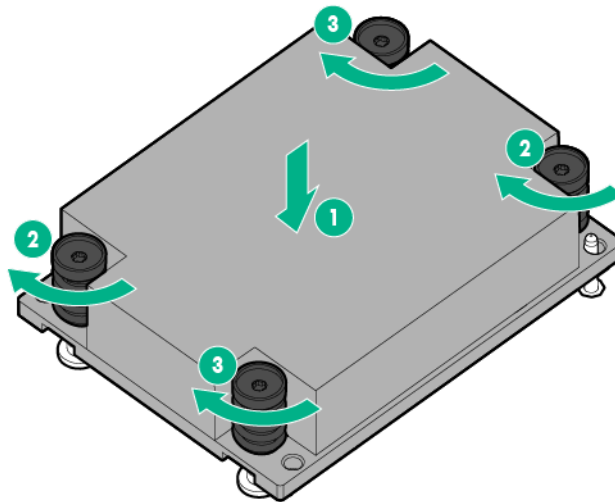
1. Clean the old thermal grease from the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.

2. Remove the thermal interface protective cover from the heatsink.



CAUTION: Heatsink retaining screws should be tightened in diagonally opposite pairs (in an "X" pattern).

3. Install the heatsink:
 - a. Position the heatsink on the processor backplate.
 - b. Tighten one pair of diagonally opposite screws halfway, and then tighten the other pair of screws.
 - c. Finish the installation by completely tightening the screws in the same sequence.



4. Install the air baffle.
5. Install any removed PCI riser cage assemblies.
6. Install the node into the chassis.
7. Connect all peripheral cables to the node.
8. Power up the node.

Processor



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this node.



CAUTION: To prevent possible node malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.



CAUTION: To prevent possible node overheating, always populate processor socket 2 with a processor and a heatsink or a processor socket cover and a heatsink blank.



CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.



IMPORTANT: If installing a processor with a faster speed, update the system ROM before installing the processor.

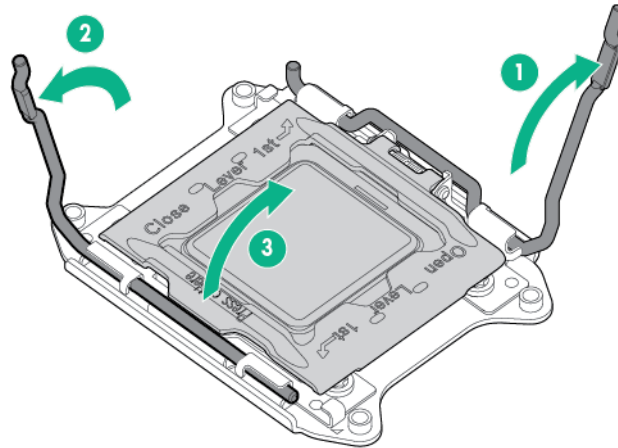


IMPORTANT: Processor socket 1 must be populated at all times or the node does not function.

To remove the component:

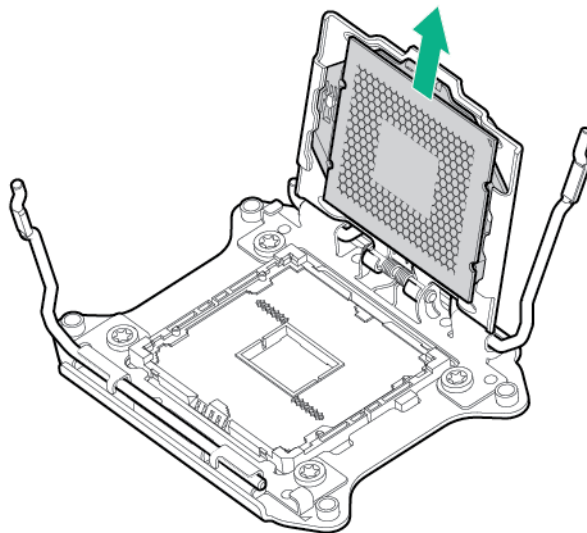
1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. In a 2U node, do one of the following:
 - o Remove the three-slot PCI riser cage assembly ("[Three-slot riser cage assemblies](#)" on page 46).
 - o Remove the FlexibleLOM 2U node PCI riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
6. Remove the air baffle (on page 39).
7. Remove the heatsink ("[Heatsink](#)" on page 85).

8. Open each of the processor locking levers in the order indicated, and then open the processor retaining bracket.



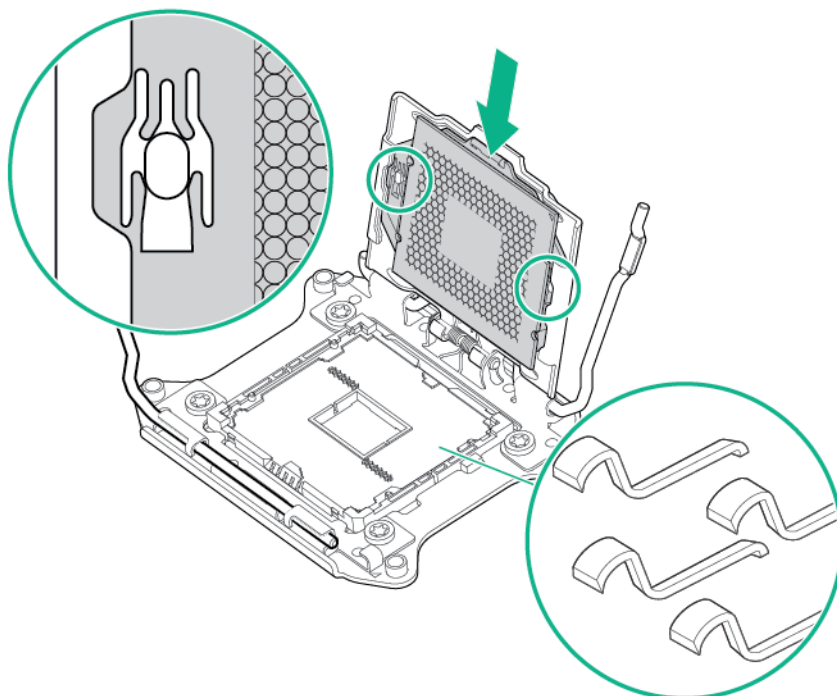
CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the system board, do not touch the processor or the processor socket contacts.

9. Remove the processor from the processor retaining bracket.



To replace the component:

1. Install the processor. Verify that the processor is fully seated in the processor retaining bracket by visually inspecting the processor installation guides on either side of the processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.**



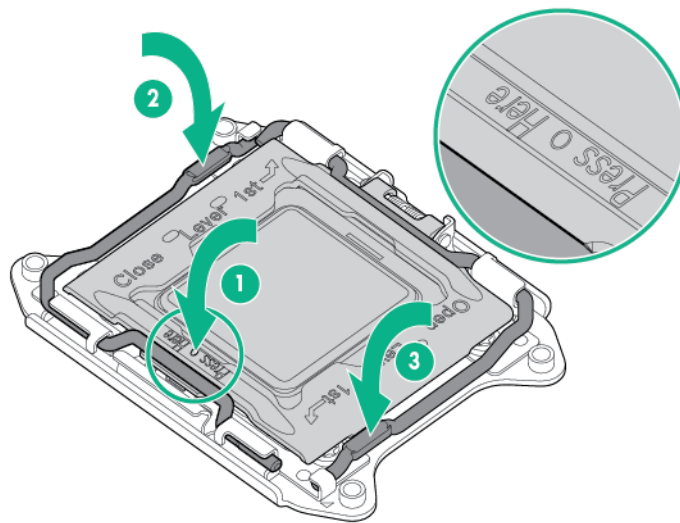
CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the system board, do not touch the processor or the processor socket contacts.



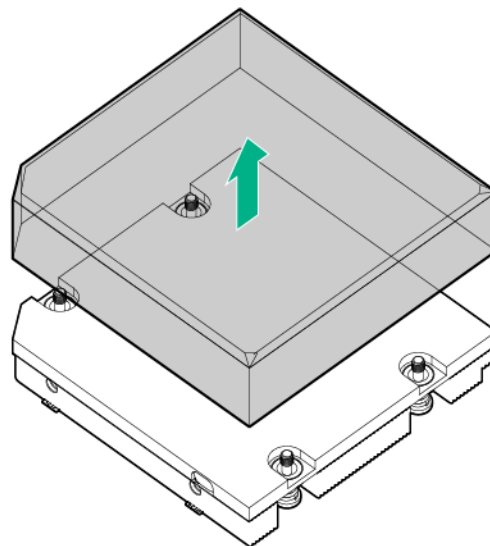
CAUTION: Do not press down on the processor. Pressing down on the processor might damage the processor socket and the system board. Press only in the area indicated on the processor retaining bracket.

2. Close the processor retaining bracket. When the processor is installed properly inside the processor retaining bracket, the processor retaining bracket clears the flange on the front of the socket.

3. Press and hold the processor retaining bracket in place, and then close each processor locking lever. Press only in the area indicated on the processor retaining bracket.

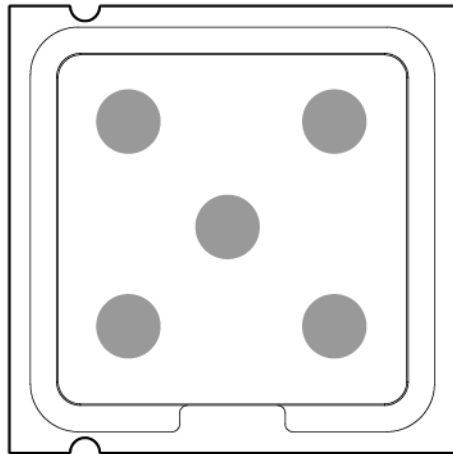


4. Remove the thermal interface protective cover from the heatsink.

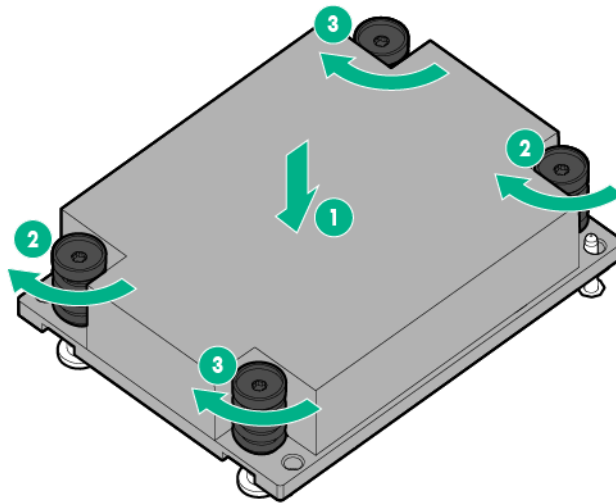


5. Clean the old thermal grease from the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.

6. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution.



7. Install the heatsink:
 - a. Position the heatsink on the processor backplate.
 - b. Tighten one pair of diagonally opposite screws halfway, and then tighten the other pair of screws.
 - c. Finish the installation by completely tightening the screws in the same sequence.

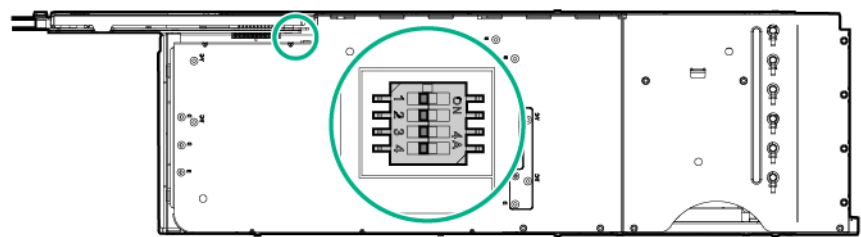


8. Install the air baffle.
9. Install any removed PCI riser cage assemblies.
10. Install the node into the chassis.
11. Connect all peripheral cables to the node.
12. Power up the node.

Accelerators

Accelerator power setting switch

Before installing an accelerator option, set the accelerator power setting switch to the correct settings based on the power consumption of the accelerator. The switch is located on the 2U bayonet board.



- Switches 1 and 2 correspond to Accelerator 1.
- Switches 3 and 4 correspond to Accelerator 2.

	Switch	150W	225W/235W	300W	No accelerator installed (default)
Accelerator 1	1	OFF	ON	ON	OFF
	2	ON	OFF	ON	OFF
Accelerator 2	3	OFF	ON	ON	OFF
	4	ON	OFF	ON	OFF

For accelerator numbering, see "Accelerator numbering (on page 136)."

Accelerator population rules

Observe the following population rules when installing an accelerator in the node:

- The FlexibleLOM 2U node riser cage assembly supports one accelerator option. Install the accelerator into slot 2.
- A three-slot riser cage assembly supports a maximum of two accelerators.
 - If installing a single NVIDIA GRID K2 RAF GPU, NVIDIA Tesla K80 GPU, NVIDIA Tesla M60 GPU, or NVIDIA Tesla M40 GPU, install it into slot 3 and leave slot 4 empty.
 - For all other accelerator models, and to ensure proper thermal cooling, populate both slot 3 and slot 4 with accelerators.
 - The mixing of different accelerator models is not supported.

For more information on the riser board slot specifications, see "PCIe riser board slot definitions."

Supported riser cage assemblies and accelerator power cables

FlexibleLOM 2U node riser cage assembly (PN 798184-B21)

Single accelerator options	Power cable	2-pin adapter cable
- Intel Xeon Phi Coprocessor 5110P - AMD FirePro S9150 GPU - NVIDIA Quadro M4000 GPU - NVIDIA Quadro K4200 GPU Accelerator - NVIDIA Tesla K40 GPU Accelerator	800288-001	Not supported

Three-slot 110S PCI riser cage assembly (PN 798186-B21)

Dual accelerator options	Power cable	2-pin adapter cables
- Intel Xeon Phi Coprocessor 5110P - AMD FirePro S9150 GPU - NVIDIA Tesla K40 GPU Accelerator	Both 825634-001 and 825635-001 are required	Not supported
NVIDIA Tesla M40 GPU Accelerator*	Both 825636-001 and 825637-001 are required	Not supported
NVIDIA GRID K2 Reverse Air Flow GPU Accelerator*	Both 825634-001 and 825635-001 are required	805206-001 required for each accelerator

Three-slot GPU-direct PCI riser cage assembly (PN 798188-B21)

Dual accelerator options	Power cable	2-pin adapter cables
- Intel Xeon Phi Coprocessor 5110P - AMD FirePro S9150 GPU - NVIDIA Tesla K40 GPU Accelerator	Both 825634-001 and 825635-001 are required	Not supported
NVIDIA GRID K2 Reverse Air Flow GPU Accelerator*	Both 825634-001 and 825635-001 are required	805206-001 required for each accelerator

* A single accelerator option is supported.

Three-slot GPU-direct with re-timer PCI riser cage assembly (PN 827353-B21)

Dual accelerator options	Power cable	2-pin adapter cables
AMD FirePro S7150 GPU	Both 825634-001 and 825635-001 are required	Not supported

Dual accelerator options	Power cable	2-pin adapter cables
• NVIDIA Tesla K80 GPU Accelerator* • NVIDIA Tesla M60 GPU Accelerator* • NVIDIA Tesla M40 GPU Accelerator*	Both 825636-001 and 825637-001 are required	Not supported

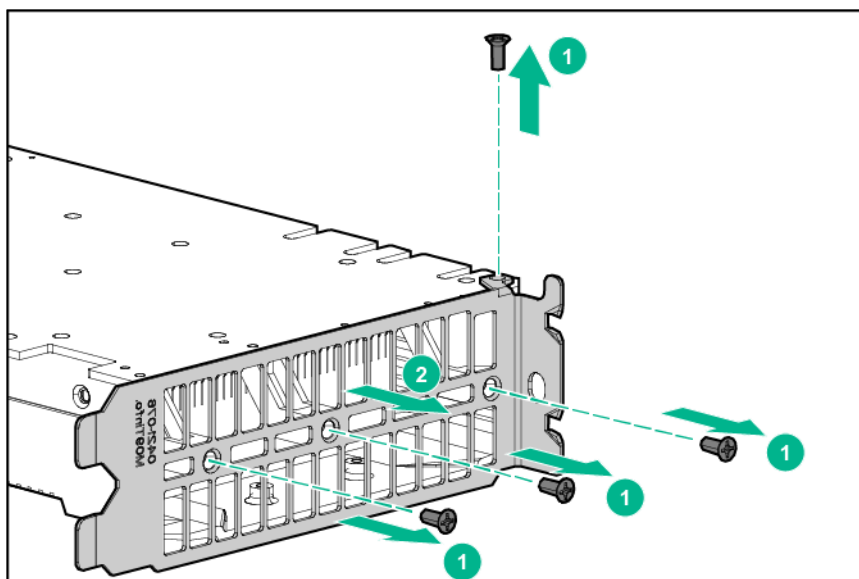
* A single accelerator option is supported.

For more information, see "Accelerator cabling (on page 153)."

Replacing Accelerator 1 in the FlexibleLOM 2U node riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the FlexibleLOM 2U node riser cage assembly ("FlexibleLOM 2U node riser cage assembly" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Disconnect the accelerator power cable from Accelerator 1.
8. Remove Accelerator 1 from the FlexibleLOM 2U node riser cage assembly (on page 48).
9. If replacing a NVIDIA Tesla K40 GPU, remove the front support bracket. Keep this bracket and install it onto the new K40 GPU.



To replace the component, reverse the removal procedure.

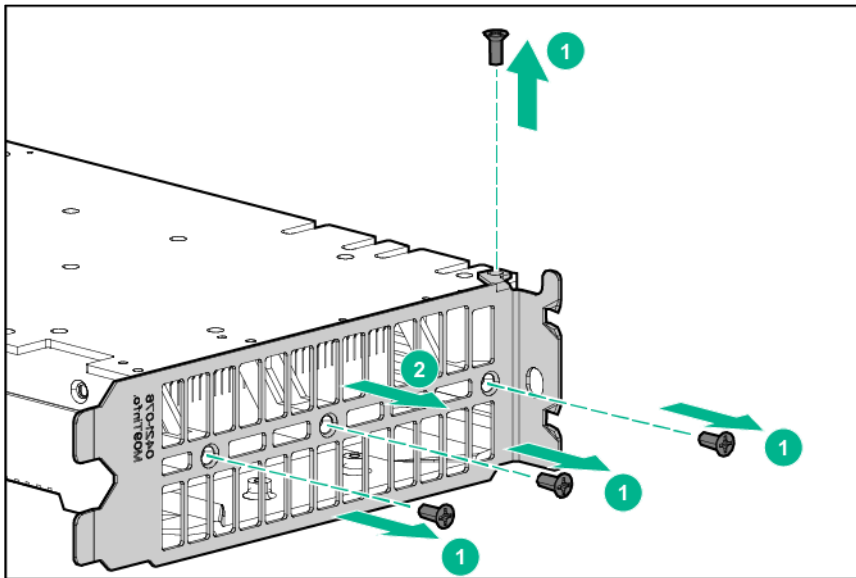
Replacing Accelerator 1 in a three-slot riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the three-slot riser cage assembly ("Three-slot riser cage assemblies" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Remove the riser cage bracket from the three-slot riser cage assembly (on page 47).
8. Disconnect all cables from the accelerators.
9. Remove Accelerator 2 from the three-slot riser cage assembly (on page 53).
10. Remove Accelerator 1 from the three-slot riser cage assembly (on page 50).

To replace the component:

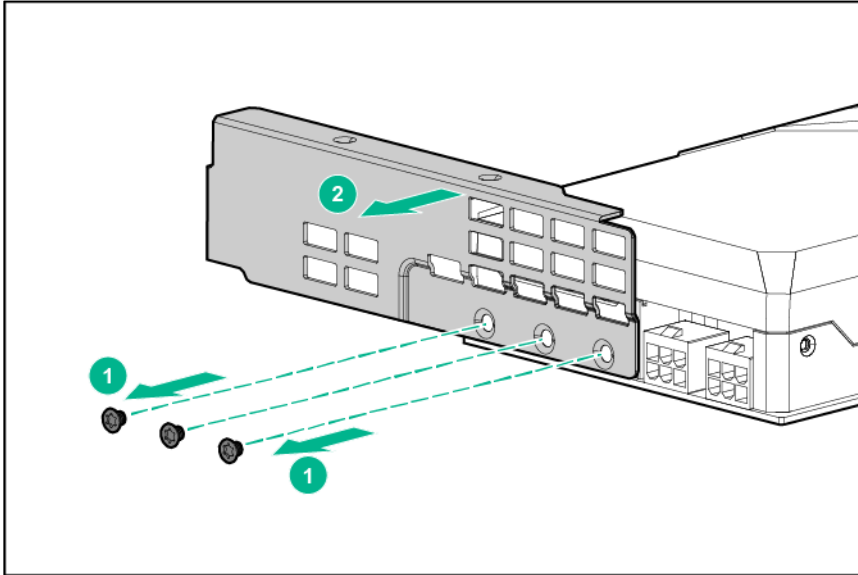
1. If replacing a NVIDIA Tesla K40 GPU, remove the front support bracket. Keep this bracket and install it onto the new K40 GPU.



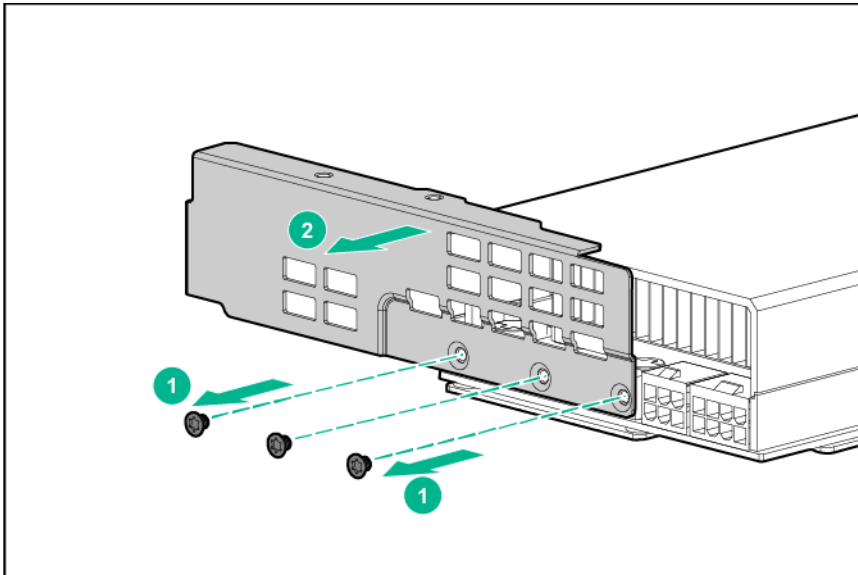
2. Remove the rear support bracket for Accelerator 1.

IMPORTANT: Keep this bracket to install it onto the new accelerator.

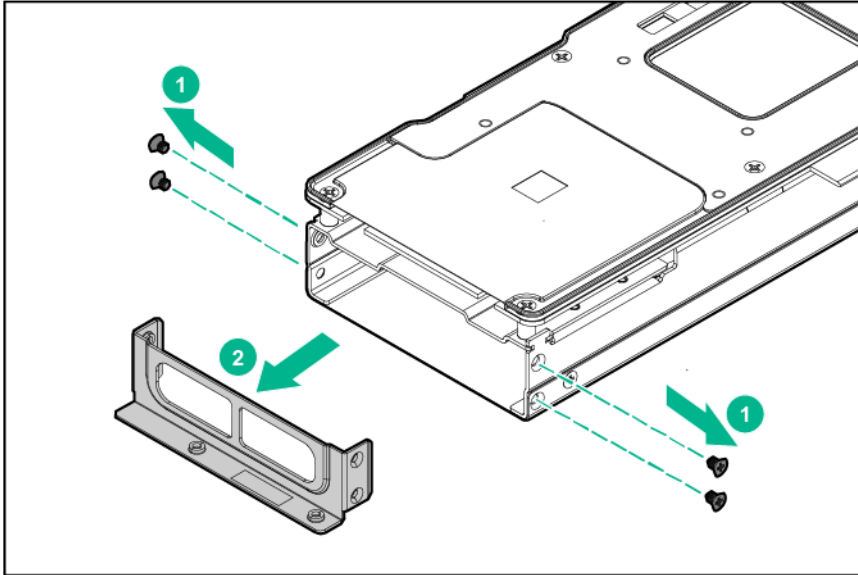
- NVIDIA Tesla K40, K80, M60, or M40 GPU



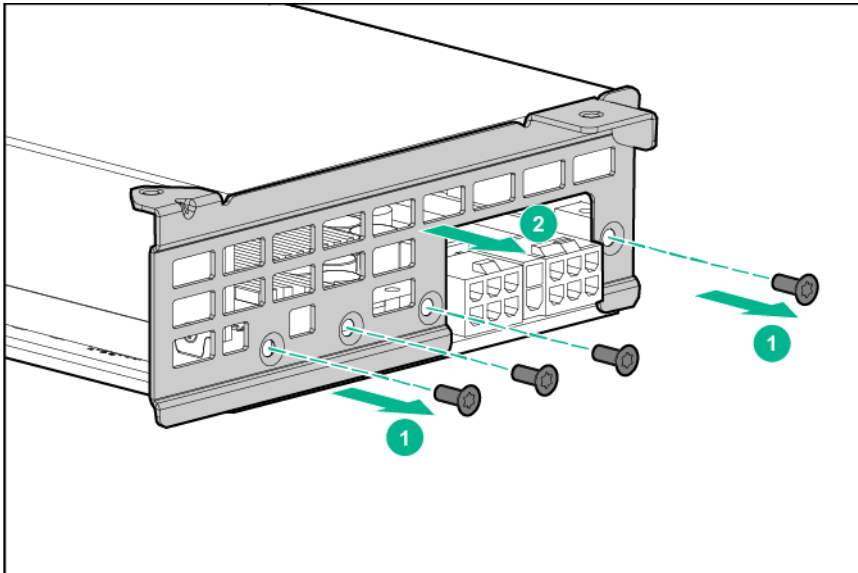
- NVIDIA GRID K2 GPU



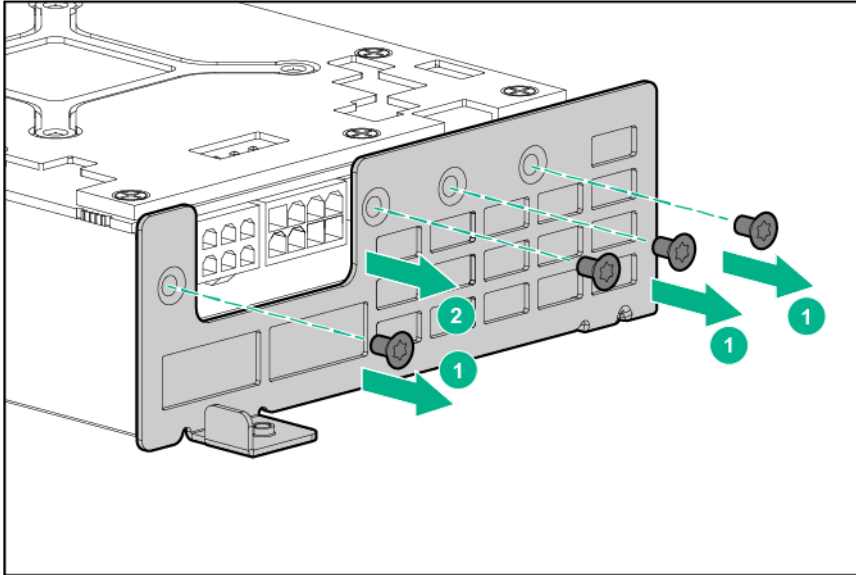
- Intel Xeon Phi Coprocessor 5110P



- AMD FirePro S9150 GPU



- AMD FirePro S7150 GPU



3. Remove the existing rear support bracket from the new accelerator. Keep this bracket to install it onto the failed accelerator.
4. Install the rear support bracket for Accelerator 1 onto the new accelerator.
5. If replacing a NVIDIA Tesla K40 GPU, install the front support bracket for Accelerator 1 onto the new K40 GPU.

To replace the component, reverse the removal procedure.

Replacing Accelerator 2 in a three-slot riser cage assembly

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove the three-slot riser cage assembly ("Three-slot riser cage assemblies" on page 46).
6. Disconnect the accelerator power cable from the bayonet board.
7. Remove the riser cage bracket from the three-slot riser cage assembly (on page 47).
8. Disconnect all cables from the accelerators.
9. Remove Accelerator 2 from the three-slot riser cage assembly (on page 53).

To replace the component:

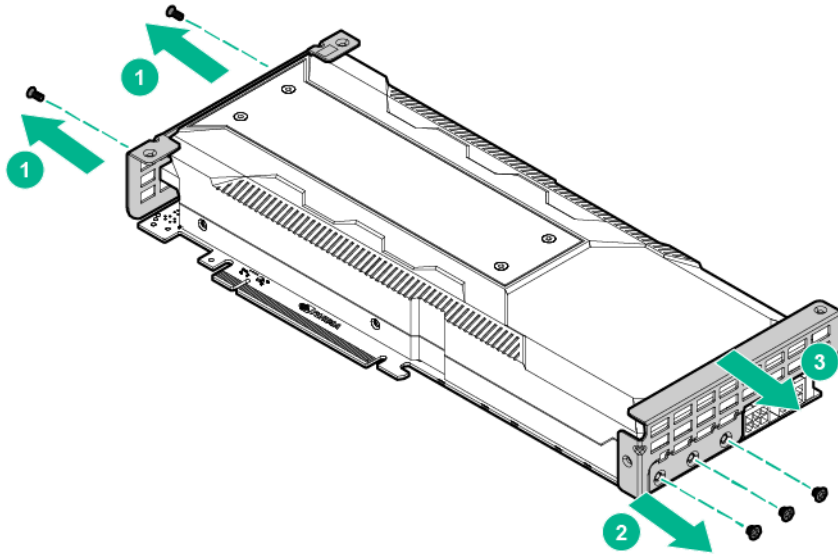
1. Remove the front and rear support brackets for Accelerator 2.



IMPORTANT: Keep these brackets to install them onto the new accelerator.

- NVIDIA Tesla K40, K80, M60, or M40 GPU
 - a. Remove the front support bracket for Accelerator 2.

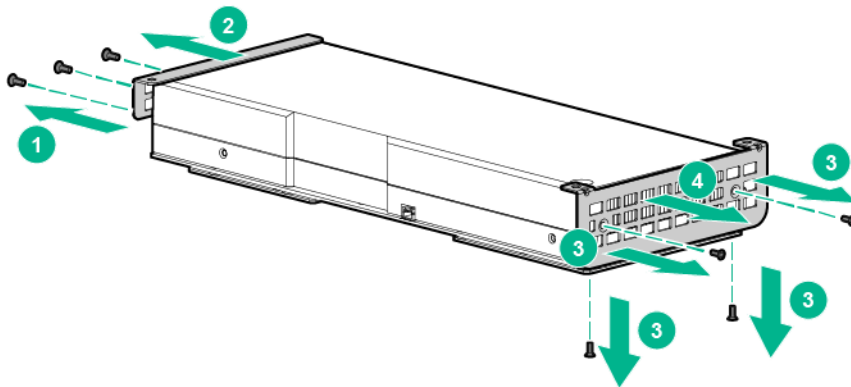
- b. Remove the rear support bracket for Accelerator 2.



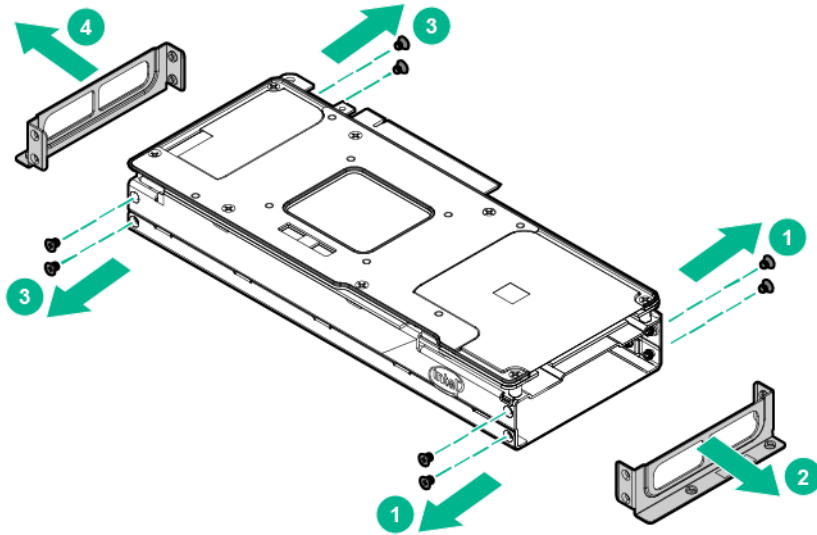
- o NVIDIA GRID K2 GPU

- a. Remove the rear support bracket for Accelerator 2.

- b. Remove the front support bracket for Accelerator 2.

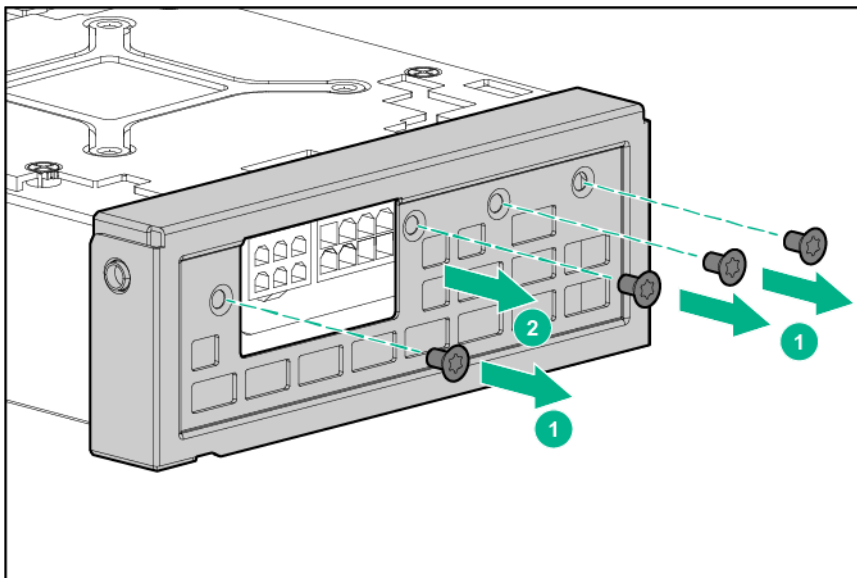


- o Intel Xeon Phi Coprocessor 5110P

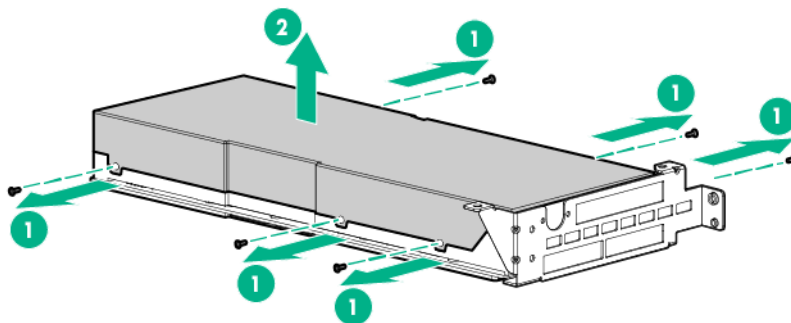


- o AMD FirePro S9150 GPU

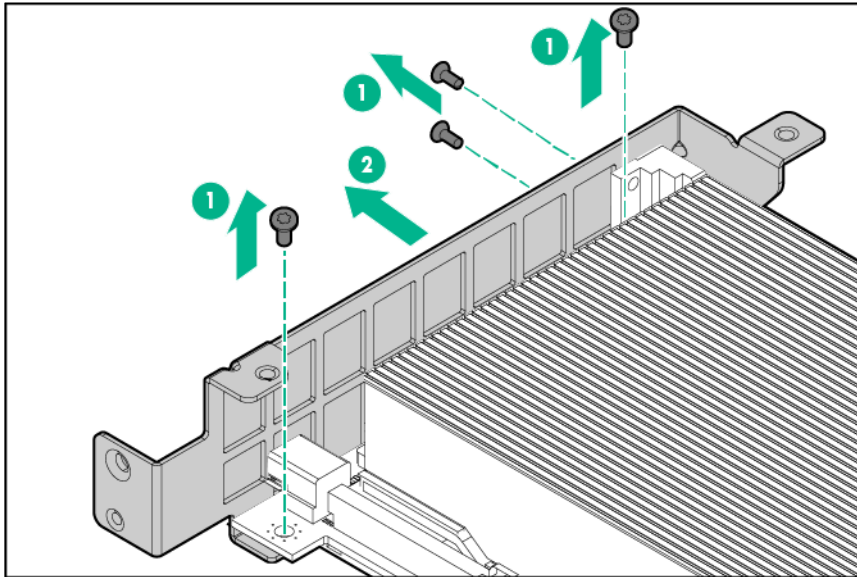
- a. Remove the rear support bracket.



- b. Remove the cover from Accelerator 2.

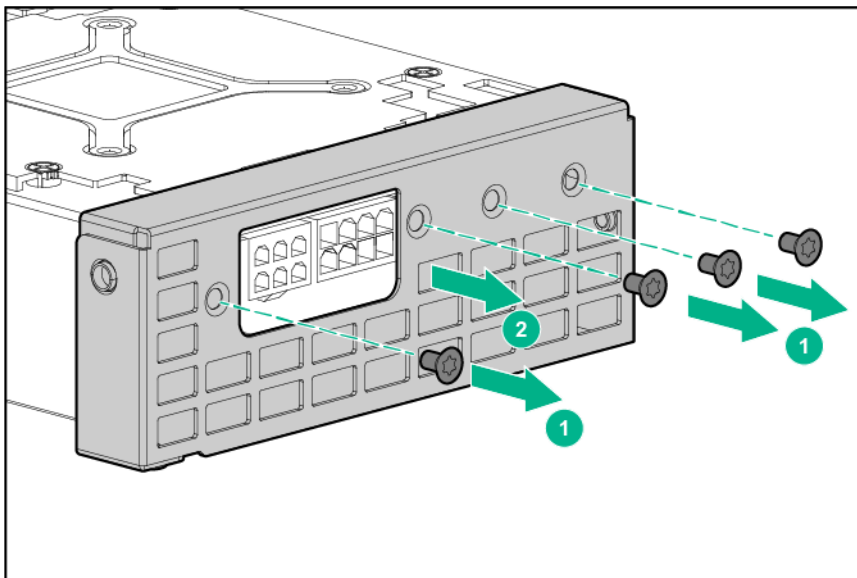


c. Remove the front support bracket.

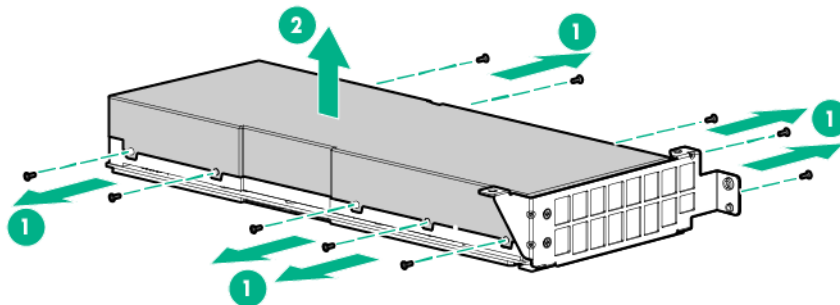


o AMD FirePro S7150 GPU

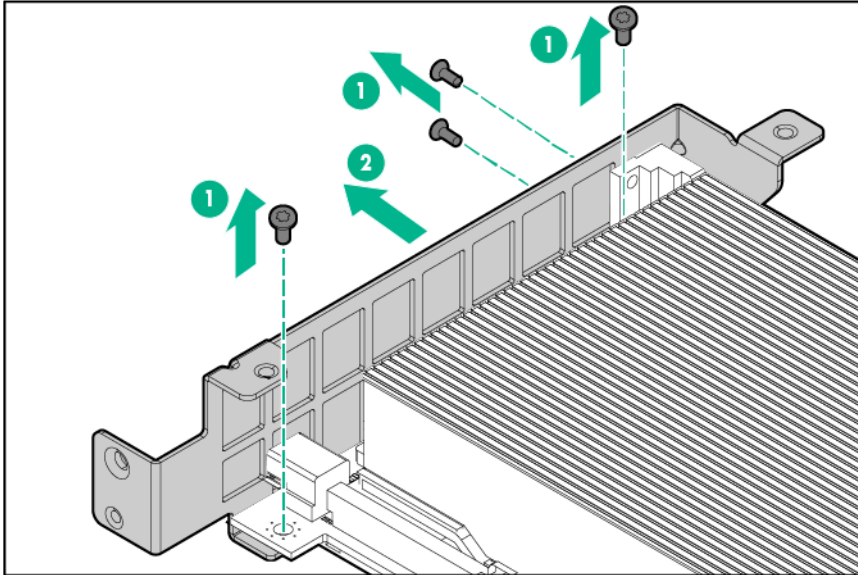
a. Remove the rear support bracket.



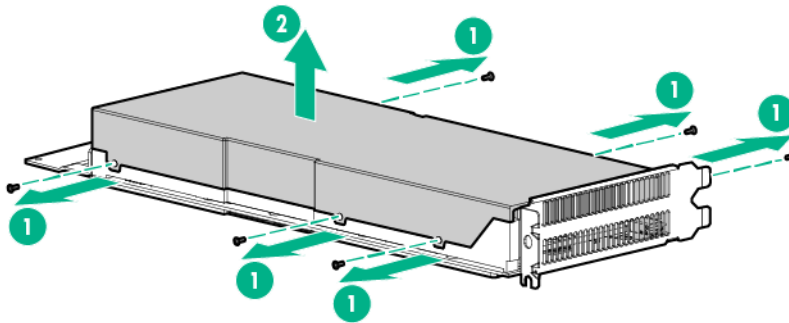
b. Remove the cover from Accelerator 2.



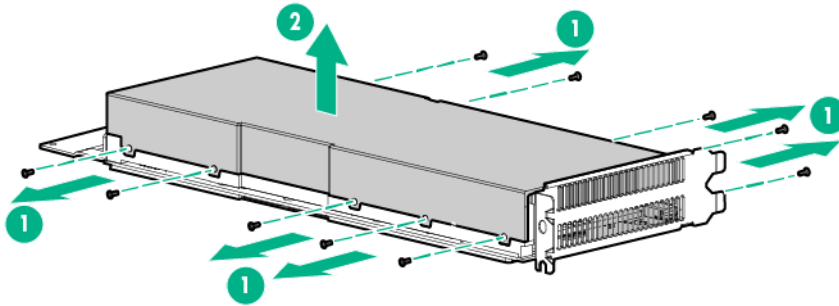
c. Remove the front support bracket.



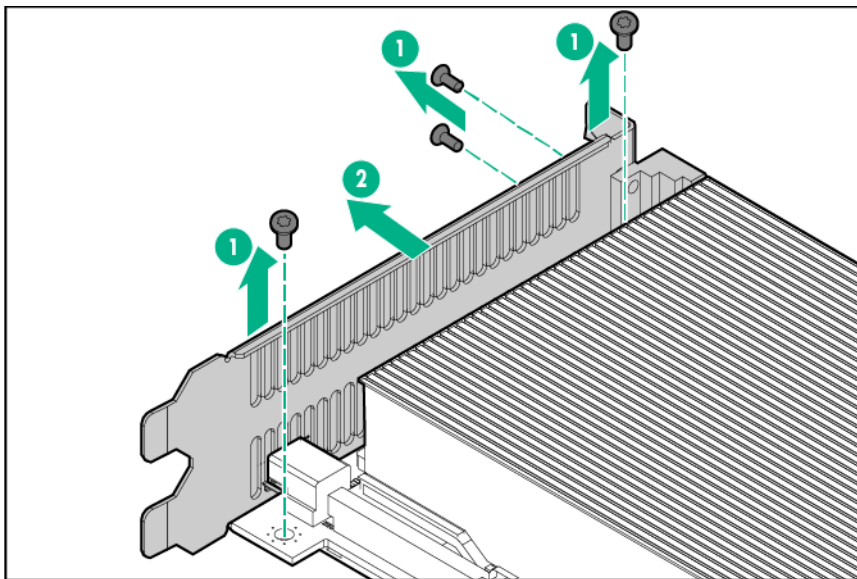
2. Remove the existing rear support bracket from the new accelerator. Keep this bracket to install it onto the failed accelerator.
3. If replacing an AMD FirePro S9150 GPU or AMD FirePro S7150 GPU, remove the cover from the new accelerator:
 - o AMD FirePro S9150 GPU



- AMD FirePro S7150 GPU



4. Remove the existing front support bracket from the accelerator. Keep this bracket to install it onto the failed accelerator.
 - AMD FirePro S9150 GPU or AMD FirePro S7150 GPU



5. Install the front and rear support brackets for Accelerator 2 onto the new accelerator:
 - a. Install the front support bracket for Accelerator 2.
 - b. If replacing an AMD FirePro S9150 GPU or AMD FirePro S7150 GPU, reinstall the cover.
 - c. Install the rear support bracket for Accelerator 2.

To replace the component, reverse the removal procedure.

Expansion board

Expansion boards supported with this server include any board installed in the PCIe riser cage assembly, including controllers, NIC cards, and accelerators.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Remove the PCI riser cage assembly (on page 42).
5. Disconnect any internal cables that are connected to the expansion board.
6. Remove the failed expansion board.
 - o Replacing Accelerator 1 in the FlexibleLOM 2U node riser cage assembly (on page 95)
 - o Replacing Accelerator 2 in the three-slot riser cage assembly ("Replacing Accelerator 2 in a three-slot riser cage assembly" on page 99)
 - o Replacing Accelerator 1 in the three-slot riser cage assembly ("Replacing Accelerator 1 in a three-slot riser cage assembly" on page 96)
7. If you are removing a storage controller board with a cache module installed, remove the cache module ("FBWC module" on page 75).

To replace the component, reverse the removal procedure.

DIMMs

Memory and processor information

Intel Xeon E5-2600 v3 processors are optimized for:

- Single-rank and dual-rank PC4-2133 (DDR4-2133) RDIMMs operating at up to 2133 MT/s
- Dual-rank and quad-rank PC4-2133 (DDR4-2133) LRDIMMs operating at up to 2133 MT/s

Intel Xeon E5-2600 v4 processors are optimized for:

- Single-rank and dual-rank PC4-2400T (DDR4-2400) RDIMMs operating at up to 2400 MT/s
- Dual-rank and quad-rank PC4-2400T (DDR4-2400) LRDIMMs operating at up to 2400 MT/s

For the latest memory configuration information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

Removing the DIMMs



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

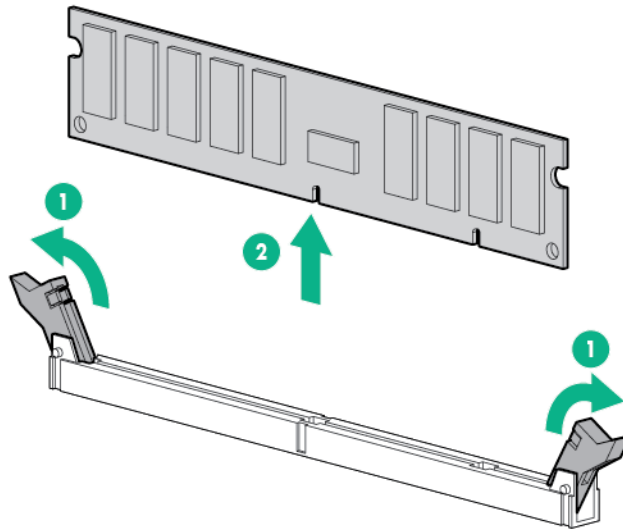


CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. In a 2U node, do one of the following:
 - o Remove the three-slot PCI riser cage assembly ("Three-slot riser cage assemblies" on page 46).

- Remove the FlexibleLOM 2U node PCI riser cage assembly ("[FlexibleLOM 2U node riser cage assembly](#)" on page 46).
- 6. Remove the air baffle (on page 39).
- 7. Open the DIMM slot latches.
- 8. Remove the DIMM.



To replace the component, reverse the removal procedure.

System battery

If the node no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.



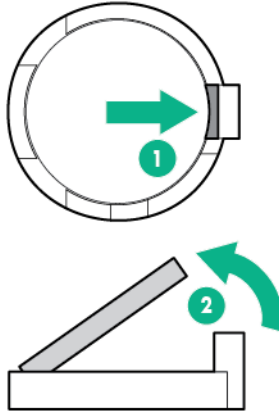
WARNING: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

To remove the component:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove any installed PCI riser cage assemblies ("[Remove the PCI riser cage assembly](#)" on page 42).
6. Locate the battery on the system board ("[System board components](#)" on page 127).
7. If the system battery is secured by a metal tab, do the following:
 - a. Use your finger or a small flat-bladed, nonconductive tool to press the metal tab. This will partially release the battery from the socket.

- b. Remove the battery.



IMPORTANT: Replacing the system board battery resets the system ROM to its default configuration. After replacing the battery, reconfigure the system through RBSU.

To replace the component, reverse the removal procedure.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

System board



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

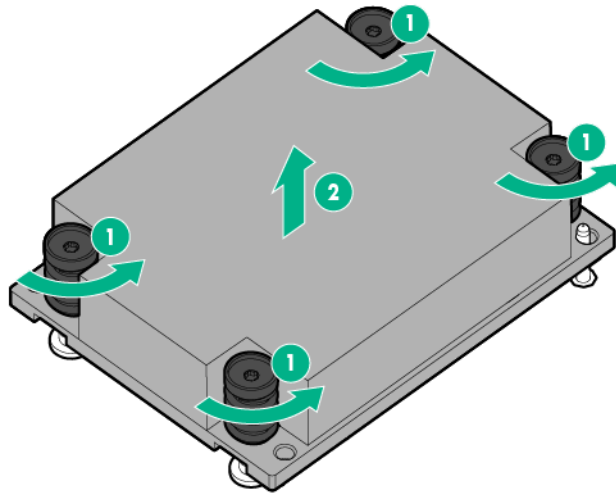


CAUTION: To avoid ESD damage, when removing electrostatic-sensitive components from the failed system board, place the components on a static-dissipating work surface or inside separate antistatic bags.

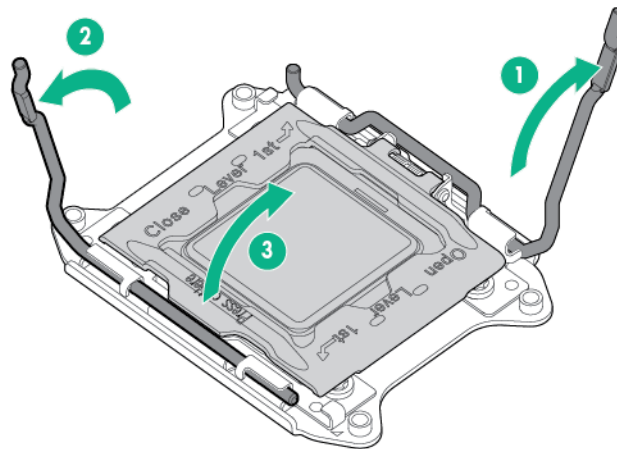
To remove the system board:

1. Power down the node (on page 29).
2. Disconnect all peripheral cables from the node.
3. Remove the node from the chassis (on page 30).
4. Place the node on a flat, level surface.
5. Remove any installed PCI riser cage assemblies ("Remove the PCI riser cage assembly" on page 42).
6. Remove all rear I/O blanks ("Remove the rear I/O blank" on page 38).
7. Remove the bayonet board assembly (on page 40).
8. Remove the air baffle (on page 39).
9. Remove all DIMMs ("Removing the DIMMs" on page 105).
10. Remove the heatsink:
 - a. Loosen one pair of diagonally opposite screws halfway, and then loosen the other pair of screws.
 - b. Completely loosen all screws in the same sequence.

- c. Remove the heatsink from the processor backplate.

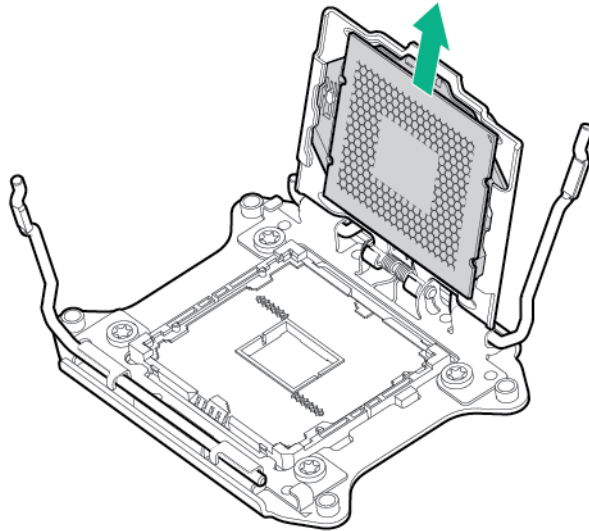


11. Open each of the processor locking levers in the order indicated, and then open the processor retaining bracket.

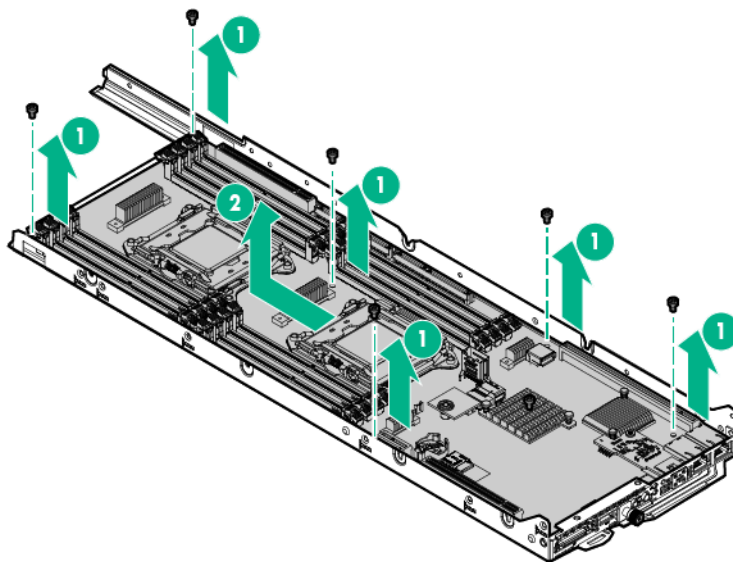


CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the system board, do not touch the processor or the processor socket contacts.

12. Remove the processor from the processor retaining bracket.

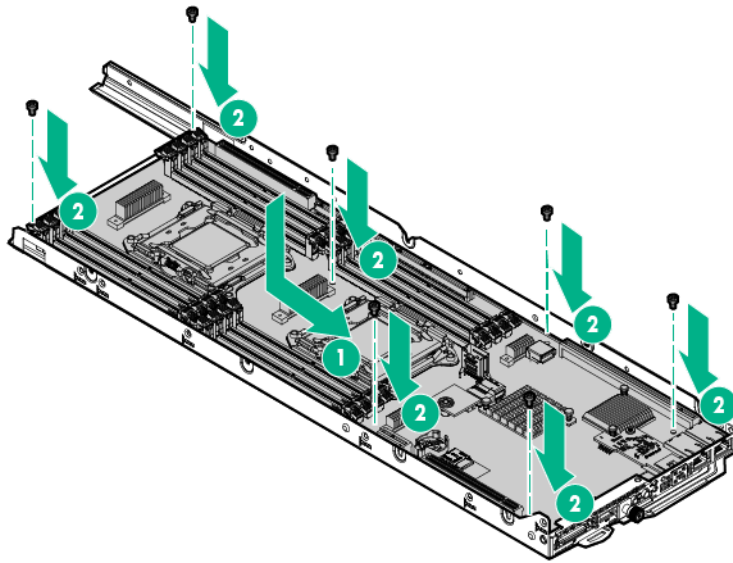


13. If installed, remove the dedicated iLO module ("[Dedicated iLO management port module](#)" on page [77](#)).
14. Disconnect all cables connected to the system board.
15. Remove the failed system board.

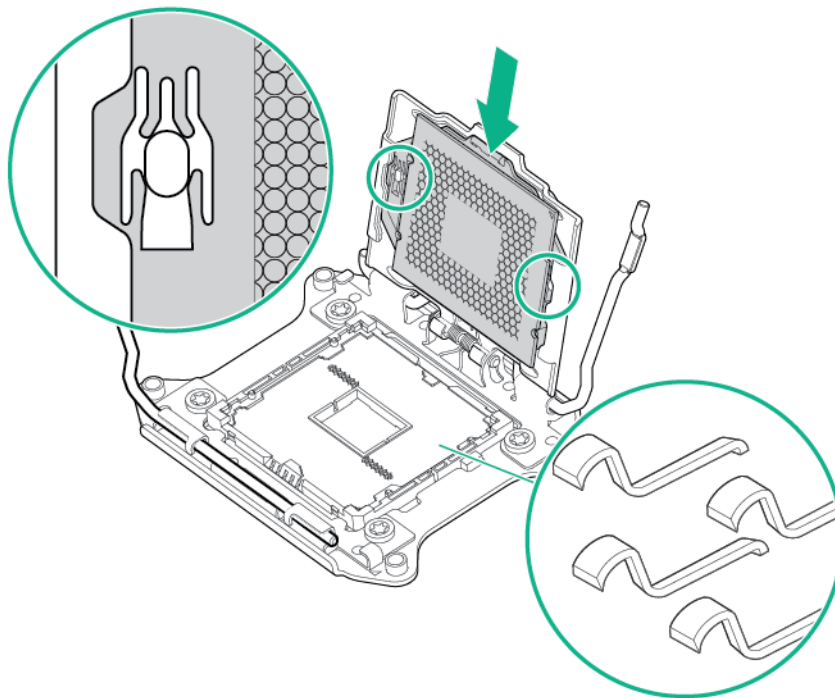


To replace the system board:

1. Install the system board.



2. Install the processor. Verify that the processor is fully seated in the processor retaining bracket by visually inspecting the processor installation guides on either side of the processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.**

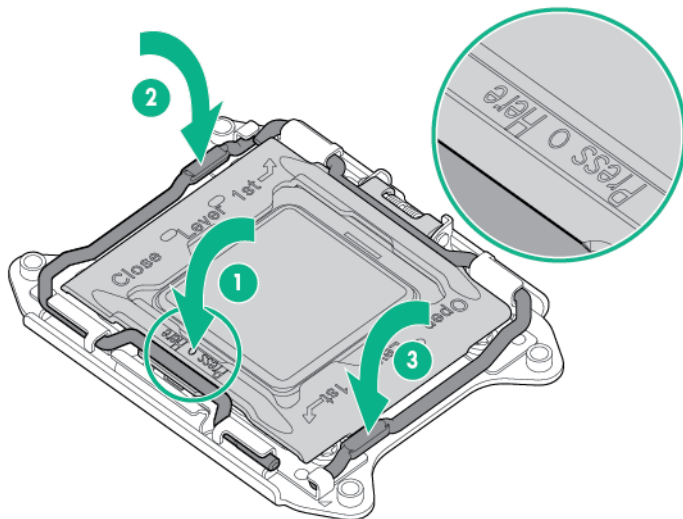


CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the system board, do not touch the processor or the processor socket contacts.

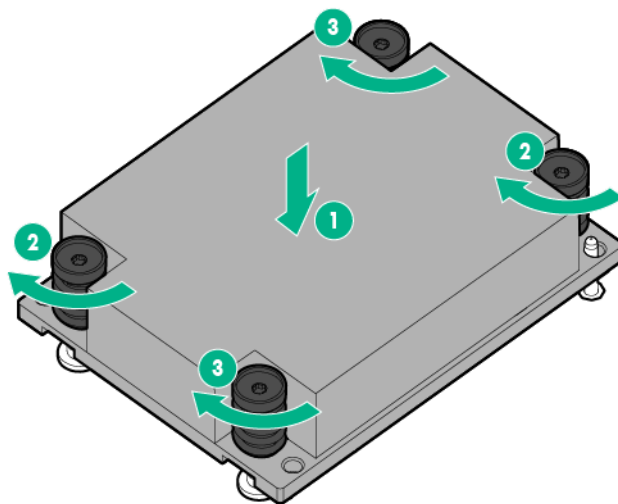


CAUTION: Do not press down on the processor. Pressing down on the processor might damage the processor socket and the system board. Press only in the area indicated on the processor retaining bracket.

3. Close the processor retaining bracket. When the processor is installed properly inside the processor retaining bracket, the processor retaining bracket clears the flange on the front of the socket.
4. Press and hold the processor retaining bracket in place, and then close each processor locking lever. Press only in the area indicated on the processor retaining bracket.



5. Install the heatsink:
 - a. Position the heatsink on the processor backplate.
 - b. Tighten one pair of diagonally opposite screws halfway, and then tighten the other pair of screws.
 - c. Finish the installation by completely tightening the screws in the same sequence.



6. Install all components removed from the failed system board.
7. Install the air baffle.
8. Install the bayonet board assembly into the node.
9. If any SATA or Mini-SAS cables are installed, secure the cables under the thin plastic covers along the side of the node tray.
10. Connect all cables disconnected from the failed system board.
11. Install any removed PCI riser cage assemblies and rear I/O blanks.

12. Install the node into the chassis.
13. Connect all peripheral cables to the nodes.
14. Press the Power On/Standby button.

The node exits standby mode and applies full power to the system. The system power LED changes from amber to green.

Re-entering the server serial number and product ID



IMPORTANT: The serial number is located on the node serial number and iLO label pull tab. For more information, see "Node rear panel components."

After you replace the system board, you must re-enter the node serial number and the product ID.

1. During the node startup sequence, press the **F9** key to access RBSU.
2. Select the **Advanced Options** menu.
3. Select **Service Options**.
4. Select **Serial Number**. The following warning appears:
Warning: The serial number should ONLY be modified by qualified service personnel. This value should always match the serial number located on the chassis.
5. Press the **Enter** key to clear the warning.
6. Enter the serial number and press the **Enter** key.
7. Select **Product ID**. The following warning appears:
Warning: The Product ID should ONLY be modified by qualified service personnel. This value should always match the Product ID located on the chassis.
8. Enter the product ID and press the **Enter** key.
9. Press the **Esc** key to close the menu.
10. Press the **Esc** key to exit RBSU.
11. Press the **F10** key to confirm exiting RBSU. The node automatically reboots.

HP Trusted Platform Module

The TPM is not a customer-removable part.



CAUTION: Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.

If you suspect a TPM board failure, leave the TPM installed and remove the system board. Contact a Hewlett Packard Enterprise authorized service provider for a replacement system board and TPM board.

Troubleshooting

Troubleshooting resources

The *HPE ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hpe.com/support/Gen9_TSG_en)
- French (http://www.hpe.com/support/Gen9_TSG_fr)
- Spanish (http://www.hpe.com/support/Gen9_TSG_es)
- German (http://www.hpe.com/support/Gen9_TSG_de)
- Japanese (http://www.hpe.com/support/Gen9_TSG_ja)
- Simplified Chinese (http://www.hpe.com/support/Gen9_TSG_zh_cn)

The *HPE ProLiant Gen9 Troubleshooting Guide, Volume II: Error Messages* provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hpe.com/support/Gen9_EMG_en)
- French (http://www.hpe.com/support/Gen9_EMG_fr)
- Spanish (http://www.hpe.com/support/Gen9_EMG_es)
- German (http://www.hpe.com/support/Gen9_EMG_de)
- Japanese (http://www.hpe.com/support/Gen9_EMG_ja)
- Simplified Chinese (http://www.hpe.com/support/Gen9_EMG_zh_cn)

Diagnostic tools

UEFI System Utilities

The UEFI System Utilities is embedded in the system ROM. The UEFI System Utilities enable you to perform a wide range of configuration activities, including:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Selecting a language
- Launching other preboot environments such as the Embedded UEFI Shell and Intelligent Provisioning

For more information, see the UEFI System Utilities user guide for your product on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>).

To access mobile-ready online help for the UEFI System Utilities and UEFI Shell, scan the QR code at the bottom of the screen. For on-screen help, press the **F1** key.

Using UEFI System Utilities

To use the System Utilities, use the following keys.

Action	Key
Access System Utilities	F9 during server POST
Navigate menus	Up and Down arrows
Select items	Enter
Save selections	F10
Access Help for a highlighted configuration option*	F1

*Scan the QR code on the screen to access online help for the UEFI System Utilities and UEFI Shell.

Default configuration settings are applied to the server at one of the following times:

- Upon the first system power-up
- After defaults have been restored

Default configuration settings are sufficient for typical server operations; however, you can modify configuration settings as needed. The system prompts you for access to the UEFI System Utilities each time the system is powered up.

Flexible boot control

This feature enables you to do the following:

- Add Boot Options:

- Browse all FAT16 and FAT32 file systems.
- To add a new UEFI boot option, select an X64 UEFI application with an .EFI extension. For example, adding an OS boot loader or other UEFI application as a new UEFI boot option.
The new boot option is appended to the boot-order list. When you select a file, you are prompted to enter the boot option description. This description, and any optional data to be passed to an .EFI application, is then displayed in the boot menu.
- Boot to System Utilities
After pre-POST, the boot options screen appears. During this time, you can access the UEFI System Utilities by pressing the **F9** key.
- Choose between supported modes:
 - Legacy BIOS Boot Mode
 - UEFI Boot Mode



IMPORTANT: If the default boot mode settings are different than the user-defined settings, the system may not boot the OS installation if the defaults are restored. To avoid this issue, use the User Defined Defaults feature in UEFI System Utilities to override the factory default settings.

For more information, see the UEFI System Utilities user guide for your product on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>).

Restoring and customizing configuration settings

You can reset all configuration settings to the factory default settings, or you can restore and use the system default configuration settings.

You can also configure default settings as necessary, and then save the configuration as the custom default configuration. When the system loads the default settings, it uses the custom default settings instead of the factory defaults.

Secure Boot configuration

Secure Boot is integrated in the UEFI specification on which the Hewlett Packard Enterprise implementation of UEFI is based. Secure Boot is implemented in the BIOS and does not require special hardware. Secure Boot ensures that each component launched during the boot process is digitally signed. Secure Boot also ensures that the signature is validated against a set of trusted certificates embedded in the UEFI BIOS. Secure Boot validates the software identity of the following components in the boot process:

- UEFI drivers loaded from PCIe cards
- UEFI drivers loaded from mass storage devices
- Preboot UEFI shell applications
- OS UEFI boot loaders

Once enabled, only firmware components and operating systems with boot loaders that have an appropriate digital signature can execute during the boot process. Only operating systems that support Secure Boot and have an EFI boot loader signed with one of the authorized keys can boot. For more information about supported operating systems, see the UEFI System Utilities and Shell release notes for your node on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>).

A physically present user can customize the certificates embedded in the UEFI BIOS by adding or removing their own certificates.

When Secure Boot is enabled, the System Maintenance Switch does not restore all manufacturing defaults when set to the ON position. For security reasons, the following are not restored to defaults when the System Maintenance Switch is in the ON position:

- Secure Boot is not disabled and remains enabled.
- The Boot Mode remains in UEFI Boot Mode even if the default boot mode is Legacy Boot Mode.
- The Secure Boot Database is not restored to its default state.
- iSCSI Software Initiator configuration settings are not restored to defaults.

Embedded UEFI shell

The system BIOS in all ProLiant Gen9 servers includes an Embedded UEFI Shell in the ROM. The UEFI Shell environment provides an API, a command-line prompt, and a set of CLIs that allow scripting, file manipulation, and system information. These features enhance the capabilities of the UEFI System Utilities.

For more information, see the following documents:

- *UEFI Shell User Guide for HPE ProLiant Gen9 Servers* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>)
- *UEFI Shell Specification* on the UEFI website (<http://www.uefi.org/specifications>)

Embedded Diagnostics option

The system BIOS in all ProLiant Gen9 servers includes an Embedded Diagnostics option in the ROM. The Embedded Diagnostics option can run comprehensive diagnostics of the server hardware, including processors, memory, drives, and other server components.

For more information on the Embedded Diagnostics option, see the UEFI System Utilities user guide for your node on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>).

iLO RESTful API support for UEFI

The ProLiant Gen9 servers include support for a UEFI-compliant System BIOS, along with UEFI System Utilities and Embedded UEFI Shell preboot environments. ProLiant Gen9 servers also support configuring the UEFI BIOS settings using the iLO RESTful API, a management interface that server management tools can use to perform configuration, inventory, and monitoring of a ProLiant server. The iLO RESTful API uses basic HTTPS operations (GET, PUT, POST, DELETE, and PATCH) to submit or return JSON-formatted data with iLO web server.

For more information about the iLO RESTful API and the RESTful Interface Tool, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/restfulinterface/docs>).

Re-entering the server serial number and product ID

After you replace the system board, you must re-enter the node serial number and the product ID:

1. During the node startup sequence, press the **F9** key to access UEFI System Utilities.
2. Select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Advanced System ROM Options > Serial Number**, and then press the **Enter** key.
3. Enter the serial number and press the **Enter** key.

The following message appears:

The serial number should only be modified by qualified service personnel.
This value should always match the serial number located on the chassis.

4. To clear the warning, press the **Enter** key.

5. Enter the serial number and press the **Enter** key.

6. Select **Product ID**.

The following warning appears:

Warning: The Product ID should ONLY be modified by qualified service personnel. This value should always match the Product ID located on the chassis.

7. Enter the product ID and press the **Enter** key.

8. To confirm exiting System Utilities, press the **F10** key.

The node automatically reboots.

HPE ProLiant Pre-boot Health Summary

If the node will not start up, you can use iLO to display diagnostic information on an external monitor. This feature is supported on nodes that support external video and have a UID button or an SUV connector. When power is available to the node but the node is not powered on, iLO runs on auxiliary power and can take control of the node video adapter to display the HPE ProLiant Pre-boot Health Summary.

For additional information, see the following documents:

- *iLO 4 User Guide* — See the Hewlett Packard Enterprise website (<http://www.hpe.com/info/ilo/docs>).
- *ProLiant Gen9 Troubleshooting Guide, Volume I: Troubleshooting* — See "Troubleshooting Resources (on page 113)."

Insight Diagnostics

The Insight Diagnostics is a proactive node management tool, available in both offline and online versions. The tool provides diagnostics and troubleshooting capabilities to assist IT administrators who verify node installations, troubleshoot problems, and perform repair validation.

The Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, boot the node using Intelligent Provisioning.

The Insight Diagnostics Online Edition is a web-based application that captures system configuration and other related data needed for effective node management. Available in Microsoft Windows and Linux versions, the utility helps to ensure proper system operation.

For more information or to download the utility, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/InsightDiagnostics>). The Insight Diagnostics Online Edition is also available in the SPP.

Insight Diagnostics survey functionality

Insight Diagnostics (on page 117) provides survey functionality that gathers critical hardware and software information on ProLiant nodes.

This functionality supports operating systems that the node supports. For operating systems supported by the node, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/supportos>).

If a significant change occurs between data-gathering intervals, the survey function marks the previous information and overwrites the survey data files to reflect the latest changes.

Survey functionality is installed with every Intelligent Provisioning-assisted Insight Diagnostics installation, or it can be installed through the SPP.

Active Health System

The Active Health System monitors and records changes in the server hardware and system configuration.

The Active Health System provides:

- Continuous health monitoring of over 1600 system parameters
- Logging of all configuration changes
- Consolidated health and service alerts with precise time stamps
- Agentless monitoring that does not affect application performance

The Agentless Management Service is available in the SPP, which can be downloaded from the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/spp/download>). The Active Health System log can be downloaded manually from iLO 4 or Intelligent Provisioning and sent to Hewlett Packard Enterprise.

For more information, see the following documents:

- *iLO User Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/ilo/docs>)
- *Intelligent Provisioning User Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/intelligentprovisioning/docs>)

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with 1-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HPE SIM
- From within the UEFI System Utilities (on page 114)
- From within the Embedded UEFI shell (on page 116)
- From within operating system-specific IML viewers:
 - For Windows: IML Viewer
 - For Linux: IML Viewer Application
- From within the iLO web interface
- From within Insight Diagnostics (on page 117)

USB support

Hewlett Packard Enterprise nodes support both USB 2.0 ports and USB 3.0 ports. Both port types support installing all types of USB devices (USB 1.0, USB 2.0, and USB 3.0), but might run at lower speeds in specific situations:

- USB 3.0 capable devices operate at USB 2.0 speeds when installed in a USB 2.0 port.
- In UEFI Boot Mode, Hewlett Packard Enterprise provides legacy USB support in the preboot environment before the operating system loading for USB 1.0, USB 2.0, and USB 3.0 speeds.
- In Legacy BIOS Boot Mode, Hewlett Packard Enterprise provides legacy USB support in the preboot environment before the operating system loading for USB 1.0 and USB 2.0 speeds. USB 3.0 ports can be used with all devices in Legacy BIOS Boot Mode but are not available at USB 3.0 speeds in the preboot environment. Standard USB support (USB support from within the operating system) is

provided by the OS through the appropriate USB device drivers. Support for USB 3.0 varies by operating system.

For maximum compatibility of USB 3.0 devices with all operating systems, Hewlett Packard Enterprise provides a configuration setting for USB 3.0 Mode. Auto is the default setting. This setting impacts USB 3.0 devices when connected to USB 3.0 ports in the following manner:

- **Auto (default)**—If configured in Auto Mode, USB 3.0 capable devices operate at USB 2.0 speeds in the preboot environment and during boot. When a USB 3.0 capable OS USB driver loads, USB 3.0 devices transition to USB 3.0 speeds. This mode is compatible with operating systems that do not support USB 3.0 while allowing USB 3.0 devices to operate at USB 3.0 speeds with state-of-the-art operating systems.
- **Enabled**—If Enabled, USB 3.0 capable devices operate at USB 3.0 speeds at all times (including the preboot environment) when in UEFI Boot Mode. Do not use this mode with operating systems that do not support USB 3.0. If operating in Legacy Boot BIOS Mode, the USB 3.0 ports cannot function in the preboot environment and are not bootable.
- **Disabled**—If configured for Disabled, USB 3.0 capable devices function at USB 2.0 speeds at all times.

The pre-OS behavior and default operation of the USB ports is configurable in the UEFI System Utilities. For more information, see the UEFI System Utilities user guide for your product on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/UEFI/docs>).

External USB functionality

Hewlett Packard Enterprise provides external USB support to enable local connection of USB devices for node administration, configuration, and diagnostic procedures.

For additional security, external USB functionality can be disabled through USB options in UEFI System Utilities.

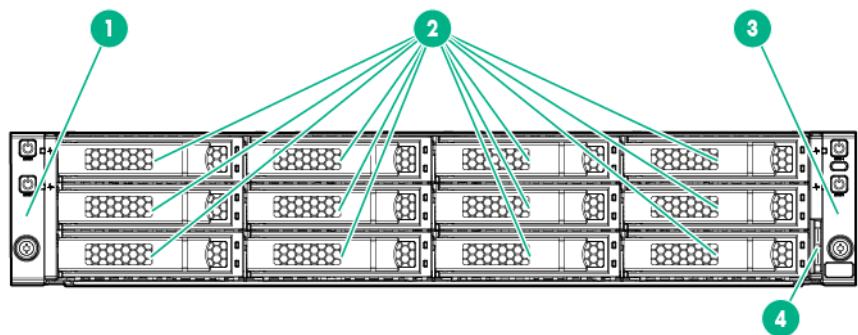
Internal USB functionality

An internal USB connector is available for use with security key devices and USB drive keys. This solution provides for use of a permanent USB key installed in the internal connector, avoiding issues of clearance on the front of the rack and physical access to secure data.

Component identification

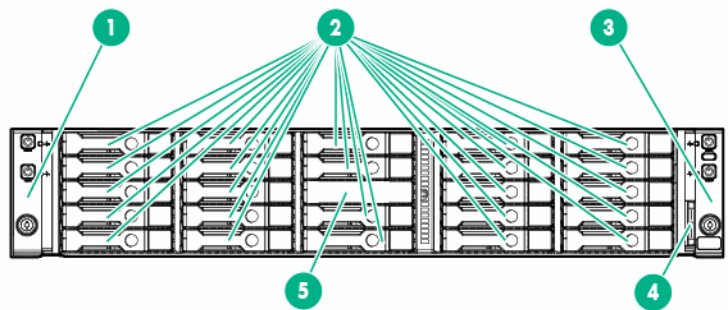
Chassis front panel components

- HPE Apollo r2200 Chassis



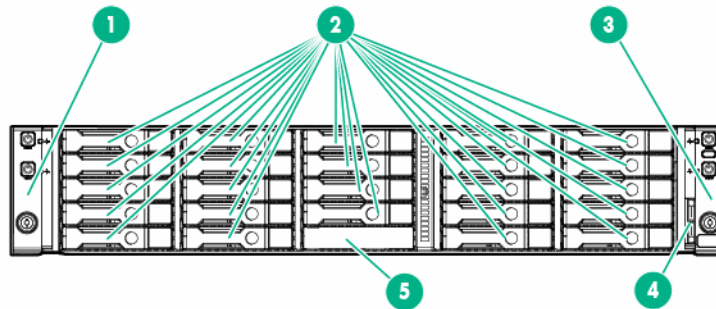
Item	Description
1	Left bezel ear
2	Low-profile LFF hot-plug drives
3	Right bezel ear
4	Chassis serial label pull tab

- HPE Apollo r2600 Chassis



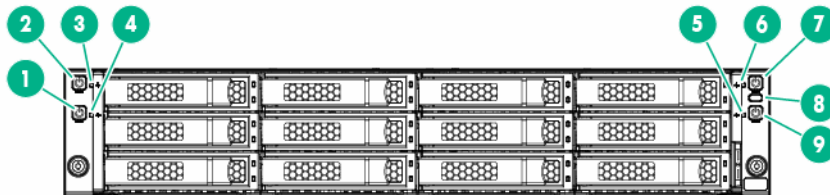
Item	Description
1	Left bezel ear
2	SFF HPE SmartDrives
3	Right bezel ear
4	Chassis serial label pull tab
5	Non-removable bezel blank

- HPE Apollo r2800 Chassis



Item	Description
1	Left bezel ear
2	SFF HPE SmartDrives
3	Right bezel ear
4	Chassis serial label pull tab
5	Non-removable bezel blank

Chassis front panel LEDs and buttons



Item	Description	Status
1	Power On/Standby button and system power LED (Node 1) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
2	Power On/Standby button and system power LED (Node 2) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
3	Health LED (Node 2) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
4	Health LED (Node 1) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
5	Health LED (Node 3) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³

Item	Description	Status
6	Health LED (Node 4) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
7	Power On/Standby button and system power LED (Node 4) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
8	UID button/LED ¹	Solid blue = Activated Flashing blue: 1 flash per second = Remote management or firmware upgrade in progress 4 flashes per second = iLO manual soft reboot sequence initiated 8 flashes per second = iLO manual hard reboot sequence in progress Off = Deactivated
9	Power On/Standby button and system power LED (Node 3) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²

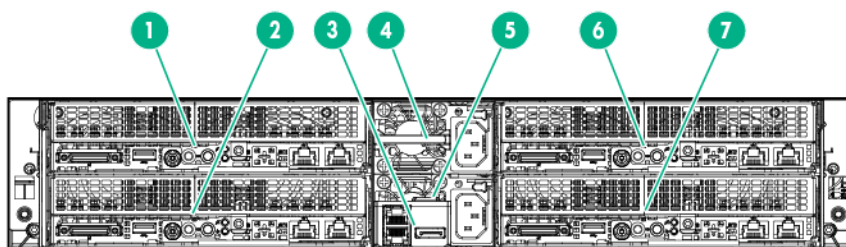
¹ When the LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see "Power fault LEDs (on page 127)."

² Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the front I/O cable is disconnected.

³ If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

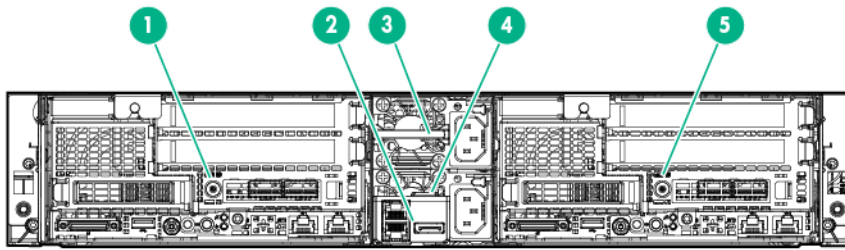
Chassis rear panel components

- Four 1U nodes



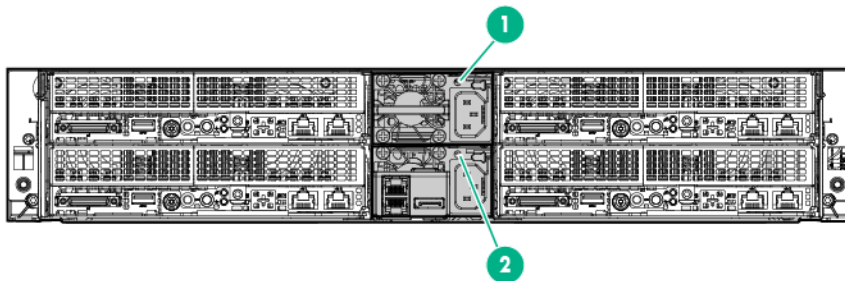
Item	Description
1	Node 4
2	Node 3
3	RCM module (optional)
4	Power supply 2
5	Power supply 1
6	Node 2
7	Node 1

- Two 2U nodes



Item	Description
1	Node 3
2	RCM module (optional)
3	Power supply 2
4	Power supply 1
5	Node 1

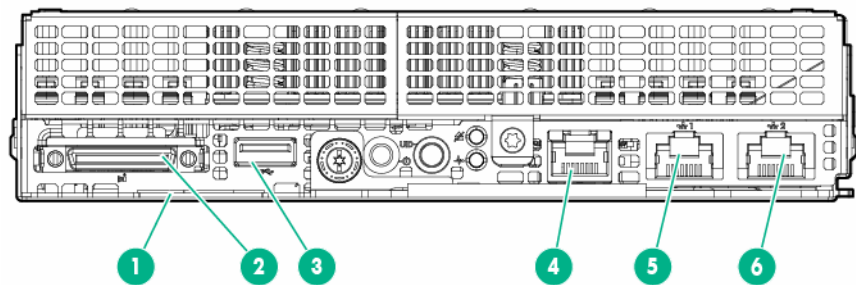
Chassis rear panel LEDs



Item	Description	Status
1	Power supply 2 LED	Solid green = Normal Off = One or more of the following conditions exists: • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error
2	Power supply 1 LED	Solid green = Normal Off = One or more of the following conditions exists: • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error

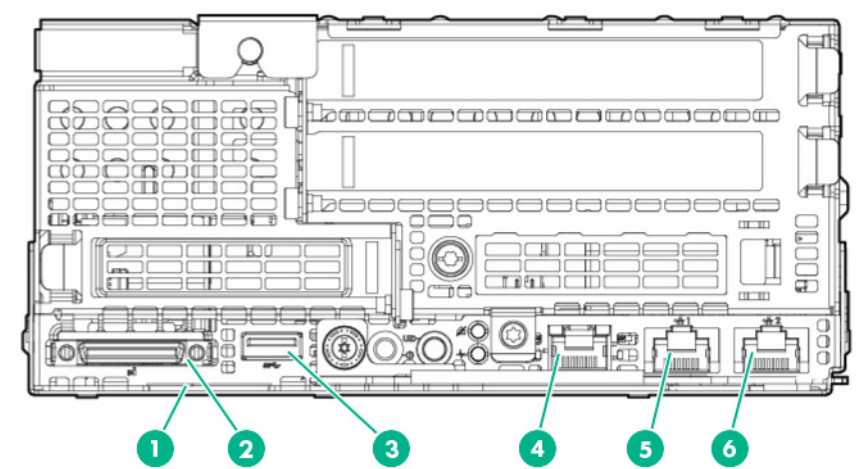
Node rear panel components

- 1U node rear panel components



Item	Description
1	Node serial number and iLO label pull tab
2	SUV connector
3	USB 3.0 connector
4	Dedicated iLO port (optional)
5	NIC connector 1
6	NIC connector 2

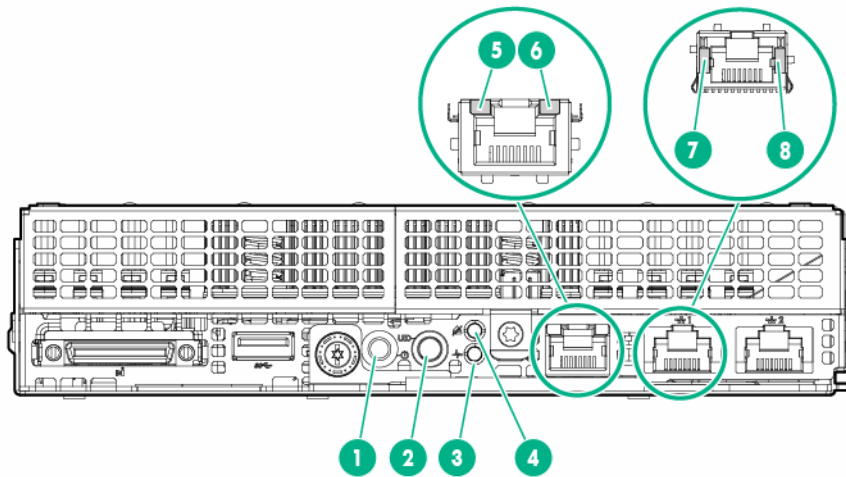
- 2U node rear panel components



Item	Description
1	Node serial number and iLO label pull tab
2	SUV connector
3	USB 3.0 connector
4	Dedicated iLO port (optional)
5	NIC connector 1
6	NIC connector 2

Node rear panel LEDs and buttons

- 1U node



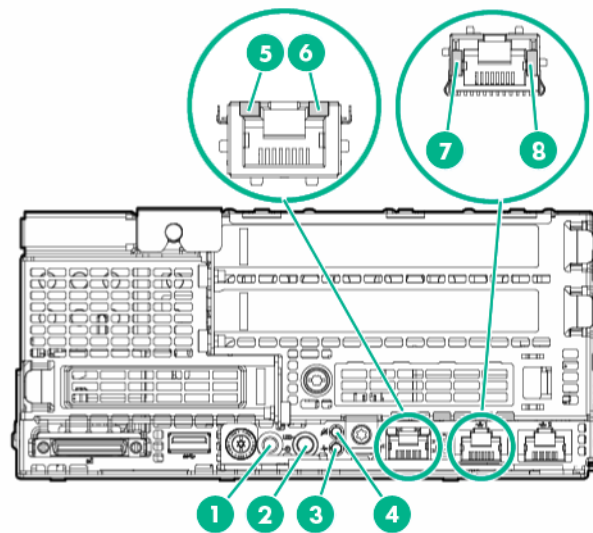
Item	Description	Status
1	Power button/LED ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
2	UID button/LED ¹	Solid blue = Activated • 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual soft reboot sequence initiated • 8 flashes per second = iLO manual hard reboot sequence in progress Off = Deactivated
3	Health LED ¹	Solid green = Normal Flashing green = iLO rebooting Flashing amber = System degraded Flashing red = System critical ³
4	Do not remove LED	Flashing white = Do not remove the node. Removing the node may terminate the current operation and cause data loss. Off = The node can be removed.
5	iLO activity LED	Green or flashing green = Network activity Off = No network activity
6	iLO link LED	Green = Linked to network Off = No network connection
7	NIC link LED ¹	Green = Linked to network Off = No network connection
8	NIC activity LED ¹	Green or flashing green = Network activity Off = No network activity

¹ When the LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see "Power fault LEDs (on page 127)."

² Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the front I/O cable is disconnected.

³ If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

- 2U node



Item	Description	Status
1	Power button/LED ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
2	UID button/LED ¹	Solid blue = Activated • 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual soft reboot sequence initiated • 8 flashes per second = iLO manual hard reboot sequence in progress Off = Deactivated
3	Health LED ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
4	Do not remove LED	Flashing white = Do not remove the node. Removing the node may terminate the current operation and cause data loss. Off = The node can be removed.
5	iLO activity LED	Green or flashing green = Network activity Off = No network activity
6	iLO link LED	Green = Linked to network Off = No network connection
7	NIC link LED ¹	Green = Linked to network Off = No network connection
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¹ When the LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see "Power fault LEDs (on page 127)."

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³ If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

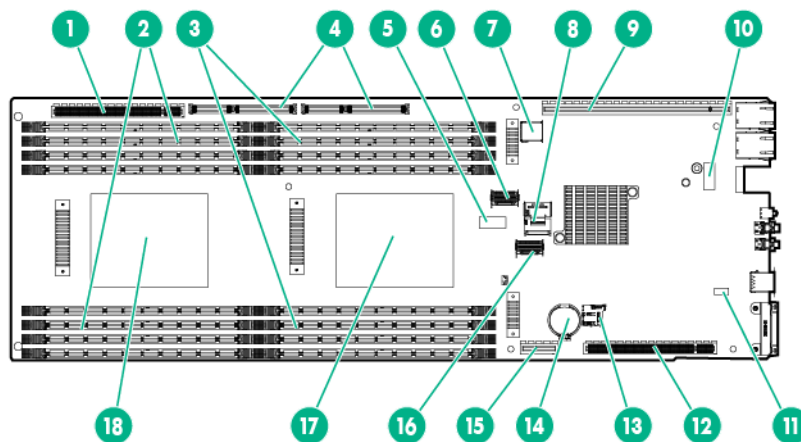
Power fault LEDs

The following table provides a list of power fault LEDs, and the subsystems that are affected. Not all power faults are used by all servers.

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Removable HPE Flexible Smart Array controller/Smart SAS HBA controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

System board components

NOTE: HPE ProLiant XL170r and XL190r Gen9 Server Nodes share the same system board.



Item	Description
1	Bayonet board slot
2	DIMMs for processor 2
3	DIMMs for processor 1
4	PCIe x40 riser board connector*
5	System maintenance switch
6	Mini-SAS connector 1 (SATA x4)
7	Internal USB 3.0 connector

Item	Description
8	Mini-SAS connector 2 (SATA x4)
9	PCIe x24 riser board connector*
10	Dedicated iLO port connector
11	NMI header
12	PCIe x16 riser board connector*
13	microSD slot
14	System battery
15	M.2 SSD riser connector
16	TPM connector
17	Processor 1
18	Processor 2

* For more information on the riser board slots supported by the onboard PCI riser connectors, see "PCIe riser board slot definitions."

System maintenance switch

Position	Default	Function
S1	Off	Off = iLO 4 security is enabled. On = iLO 4 security is disabled.
S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved
S4	Off	Reserved
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6	Off	Off = No function. On = ROM reads system configuration as invalid.
S7	Off	Off = Set default boot mode to UEFI. On = Set default boot mode to legacy.
S8	—	Reserved
S9	—	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	Reserved

You can access the redundant ROM by setting S1, S5, and S6 to On.

When the system maintenance switch position 6 is set to the On position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.



CAUTION: Clearing CMOS, NVRAM, or both deletes configuration information. Be sure to configure the node properly to prevent data loss.



IMPORTANT: Before using the S7 switch to change to Legacy BIOS Boot Mode, be sure the HPE Dynamic Smart Array B140i Controller is disabled. Do not use the B140i controller when the node is in Legacy BIOS Boot Mode.

NMI functionality

An NMI crash dump creates a crash dump log before resetting a system which is not responding.

Crash dump log analysis is an essential part of diagnosing reliability problems, such as failures of operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to restart the system. Resetting the system erases any information which could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a system reset.

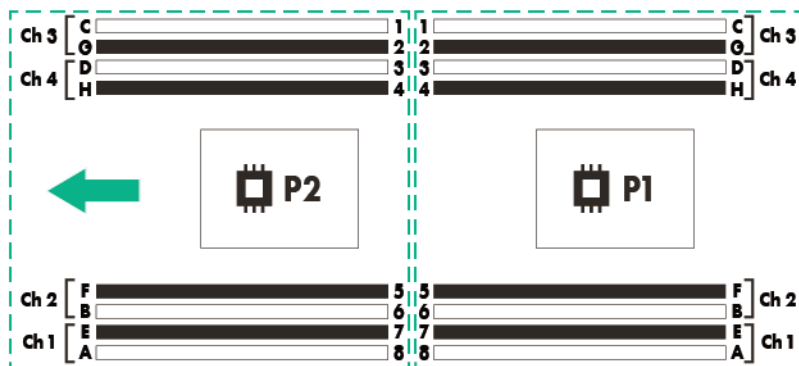
To force the system to invoke the NMI handler and generate a crash dump log, do one of the following:

- Use the iLO Virtual NMI feature.
- Short the NMI header ("System board components" on page 127).

For more information, see the Hewlett Packard Enterprise website (<http://www.hpe.com/support/NMI-CrashDump>).

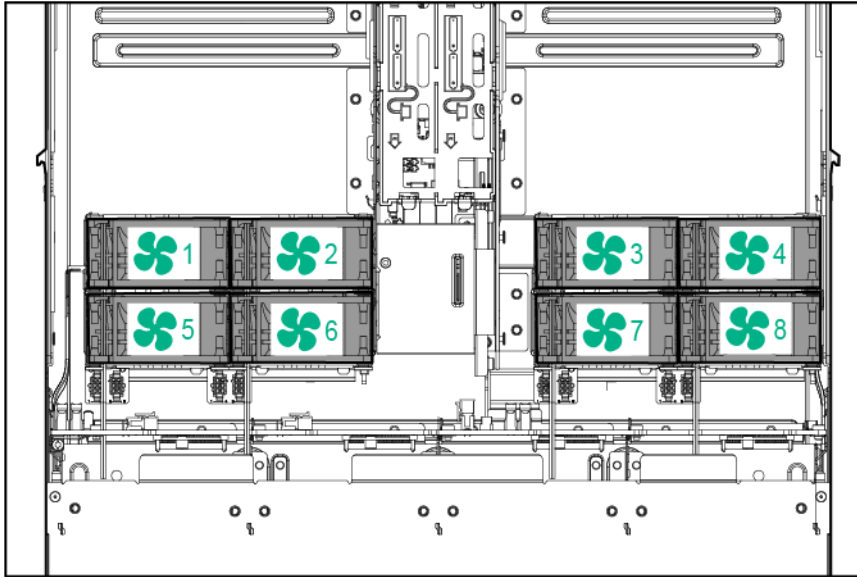
DIMM slot locations

DIMM slots are numbered sequentially (1 through 8) for each processor. The supported AMP modes use the letter assignments for population guidelines.



NOTE: The arrow indicates the front of the chassis.

Fan locations



Drive bay numbering



CAUTION: To prevent improper cooling and thermal damage, do not operate the chassis unless all bays are populated with a component or a blank.

NOTE: A SATA or mini-SAS cable must be installed in a node for the node to correspond to drives in the chassis.

HPE Apollo r2200 Chassis drive bay numbering

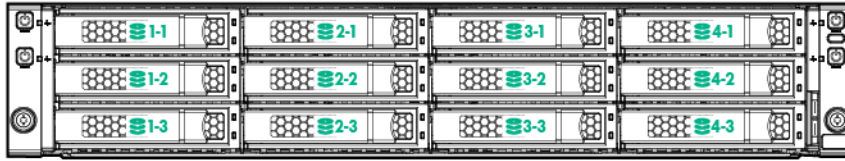
One 1U node corresponds to a maximum of three low-profile LFF hot-plug drives.

- Node 1 corresponds to drive bays 1-1 through 1-3.
- Node 2 corresponds to drive bays 2-1 through 2-3.
- Node 3 corresponds to drive bays 3-1 through 3-3.
- Node 4 corresponds to drive bays 4-1 through 4-3.

One 2U node corresponds to a maximum of six low-profile LFF hot-plug drives.

- Node 1 corresponds to drive bays 1-1 through 2-3.

- Node 3 corresponds to drive bays 3-1 through 4-3.



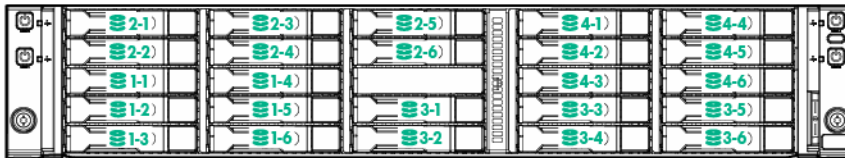
HPE Apollo r2600 Chassis drive bay numbering

One 1U node corresponds to a maximum of six SFF SmartDrives.

- Node 1 corresponds to drive bays 1-1 through 1-6.
- Node 2 corresponds to drive bays 2-1 through 2-6.
- Node 3 corresponds to drive bays 3-1 through 3-6.
- Node 4 corresponds to drive bays 4-1 through 4-6.

If a P840 Smart Array controller is installed, one 2U node corresponds to a maximum of twelve SFF SmartDrives.

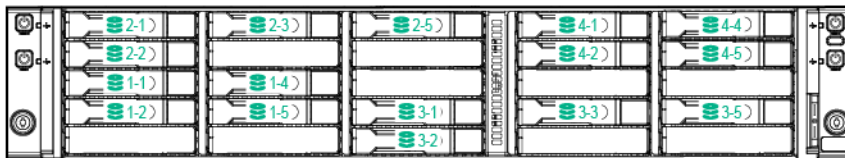
- Node 1 corresponds to drive bays 1-1 through 2-6.
- Node 3 corresponds to drive bays 3-1 through 4-6.



If using the Dynamic Smart Array B140i Controller, HPE H240 Host Bus Adapter, or HPE P440 Smart Array Controller: one 2U node corresponds to a maximum of eight SFF SmartDrives. The remaining drive bays must be populated with drive blanks.

- Node 1 corresponds to drive bays 1-1, 1-2, 1-4, 1-5, 2-1, 2-2, 2-3 and 2-5.

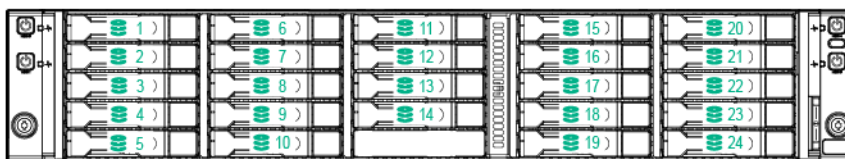
- Node 3 corresponds to drive bays 3-1, 3-2, 3-3, 3-5, 4-1, 4-2, 4-4 and 4-5.



For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

HPE Apollo r2800 Chassis drive bay numbering

IMPORTANT: The HPE Apollo r2800 Chassis does not support nodes using the HPE Dynamic Smart Array B140i Controller or the HPE P840 Smart Array Controller. Hewlett Packard Enterprise recommends installing an HPE H240 Host Bus Adapter or HPE P440 Smart Array Controller.

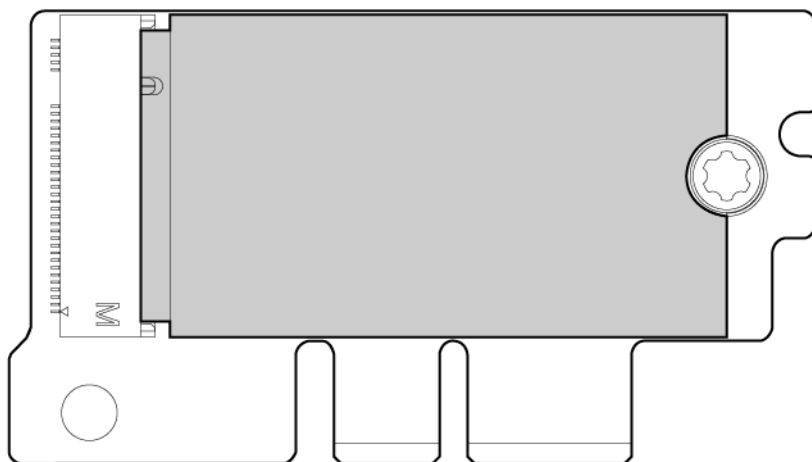


For information on drive bay mapping in the HPE Apollo r2800 Chassis and the factory default configuration, see "Drive bay mapping for the HPE Apollo r2800 Chassis (on page 59)."

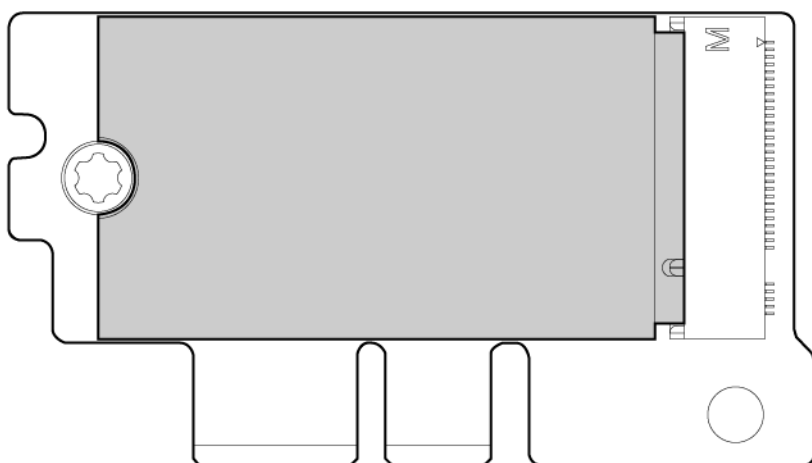
For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

M.2 SATA SSD bay numbering

- Bay 9

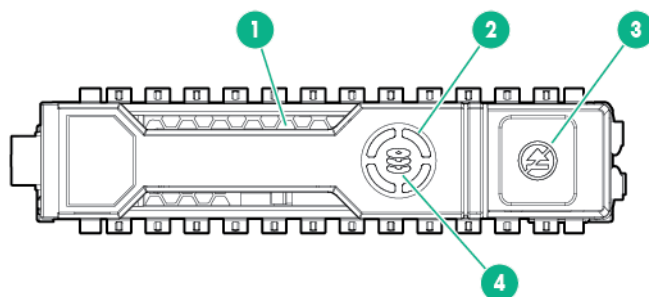


- Bay 10



Hot-plug drive LED definitions

Hot-plug drive LED definitions



Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity.
		Off	No drive activity.
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, strip size migration, capacity expansion, or logical drive extension, or is erasing.
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.

The blue Locate LED is behind the release lever and is visible when illuminated.

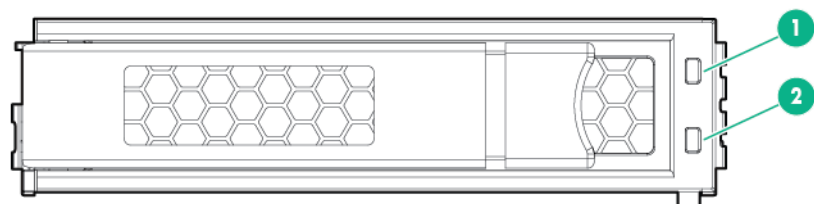


IMPORTANT: The Dynamic Smart Array B140i Controller is only available in UEFI Boot Mode. It cannot be enabled in Legacy BIOS Boot Mode. If the B140i controller is disabled, drives connected to the system board Mini-SAS connectors operate in AHCI or Legacy mode. Under this condition:

- The drives cannot be a part of a hardware RAID or a logical drive.
- The Locate, Drive status, and Do not remove LEDs of the affected drives are disabled.

Use BIOS/Platform Configuration (RBSU) in the UEFI System Utilities (on page 114) to enable or disable the B140i controller (System Configuration → BIOS/Platform Configuration (RBSU) → System Options → SATA Controller Options → Embedded SATA Configuration).

Low-profile LFF hot-plug drive LED definitions

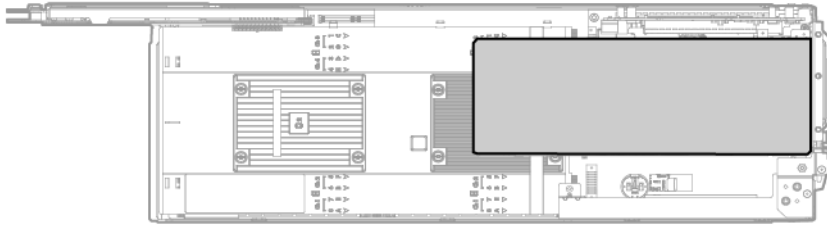


Item	Definition
1	Fault/UID (amber/blue)
2	Online/Activity (green)

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Definition
On, off, or flashing	Alternating amber and blue	One or more of the following conditions exist: • The drive has failed. • A predictive failure alert has been received for this drive. • The drive has been selected by a management application.
On, off, or flashing	Solid blue	One or both of the following conditions exist: • The drive is operating normally. • The drive has been selected by a management application.
On	Flashing amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online but is not currently active.
1 flash per second	Flashing amber	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss. The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not remove the drive until the expansion or migration is complete.
1 flash per second	Off	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss. The drive is rebuilding, erasing, or is part of an array that is undergoing capacity expansion or stripe migration.
4 flashes per second	Flashing amber	The drive is active but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
4 flashes per second	Off	The drive is active and is operating normally.
Off	Solid amber	A critical fault condition has been identified for this drive and the controller has placed it offline. Replace the drive as soon as possible.
Off	Flashing amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

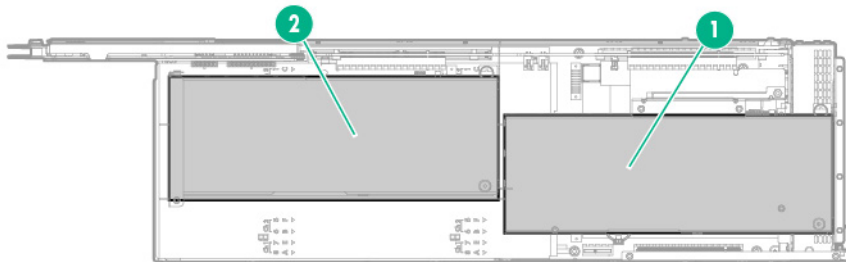
Accelerator numbering

One accelerator in a FlexibleLOM 2U node riser cage assembly



Item	Description
1	Accelerator 1

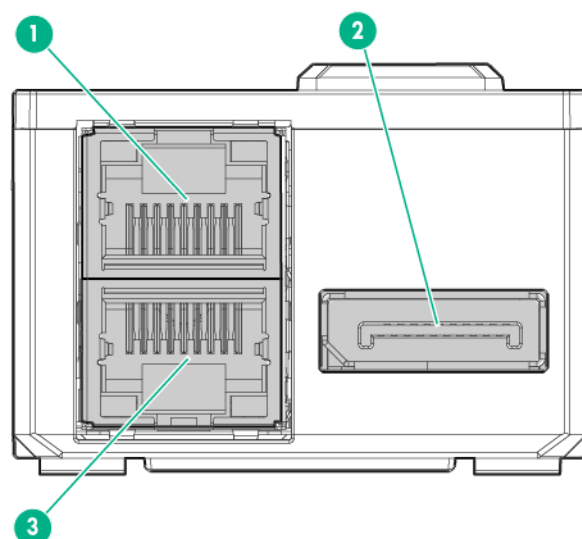
Two accelerators in a three-slot riser cage assembly



Item	Description
1	Accelerator 1
2	Accelerator 2

For more information, see "Accelerators (on page 93)."

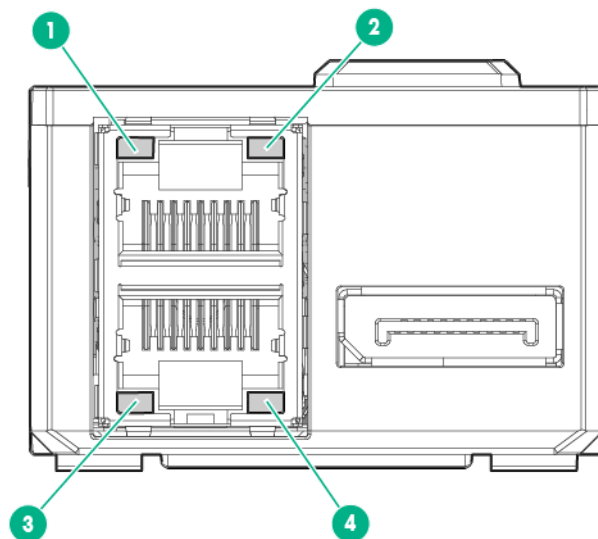
RCM module components



Item	Description
1	iLO connector
2	HPE APM 2.0 connector
3	iLO connector

For more information, see "RCM module (on page 71)."

RCM module LEDs



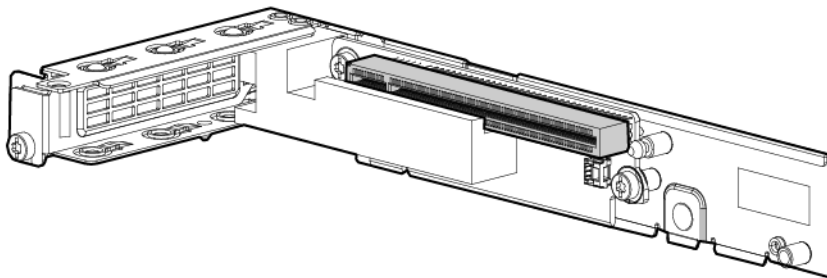
Item	Description
1	iLO activity LED Green or flashing green = Network activity Off = No network activity
2	iLO link LED Green = Linked to network Off = No network connection

Item	Description
3	iLO link LED Green = Linked to network Off = No network connection
4	iLO activity LED Green or flashing green = Network activity Off = No network activity

For more information, see "RCM module (on page 71)."

PCIe riser board slot definitions

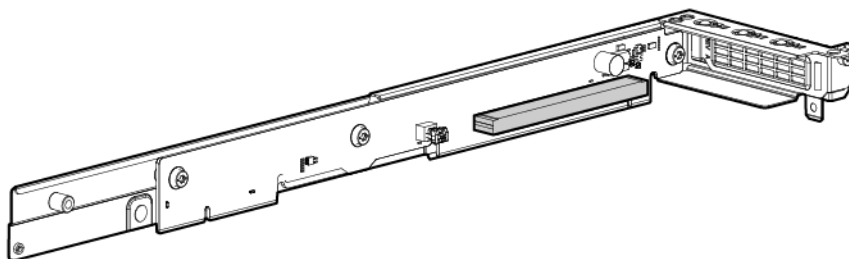
- Single-slot left PCI riser cage assembly (PN 798178-B21)



Form factor	Slot number	Slot description
Storage controller or low-profile PCIe NIC card	1	PCIe3 x16 (16, 8, 4, 1) for Processor 1

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

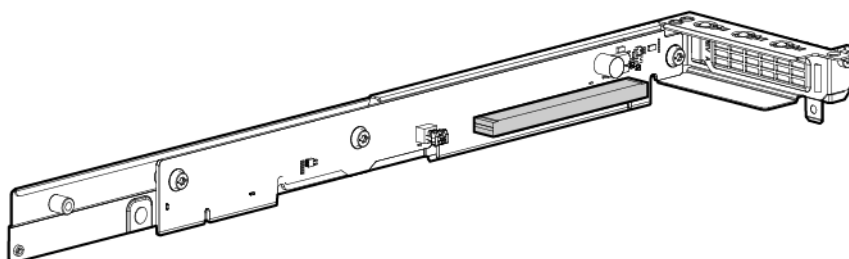
- Single-slot 1U right PCI riser cage assembly for Processor 2 (PN 798182-B21)



Form factor	Slot number	Slot description
Storage controller or low-profile PCIe NIC card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 2

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

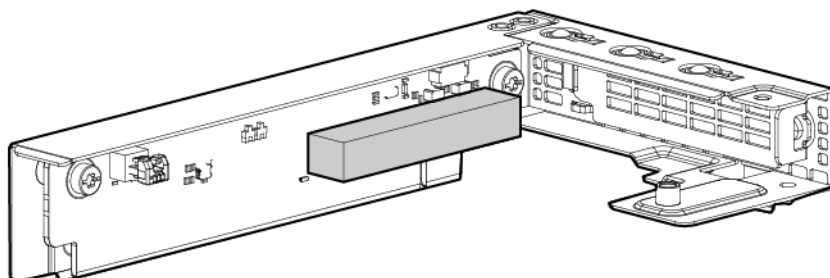
- Single-slot 1U right PCI riser cage assembly for Processor 1 (PN 819939-B21)



Form factor	Slot number	Slot description
Storage controller or low-profile PCIe NIC card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 1

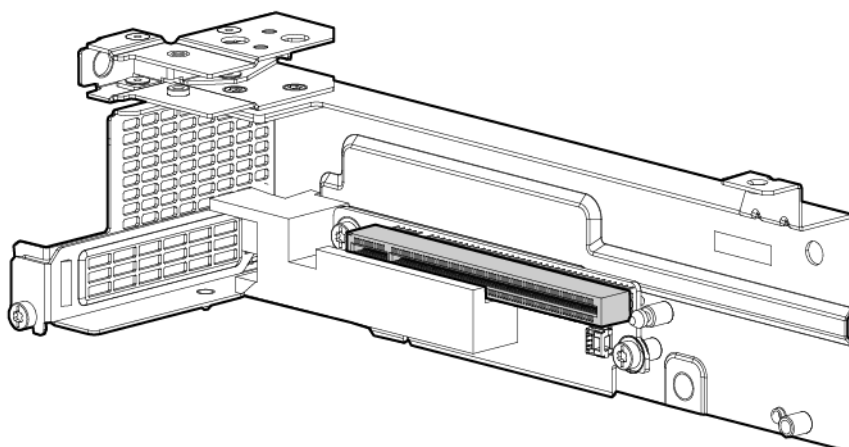
For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

- FlexibleLOM 1U node riser cage assembly (PN 798180-B21)



Form factor	Slot number	Slot description
FlexibleLOM	FlexibleLOM slot	PCIe3 x8 for Processor 1

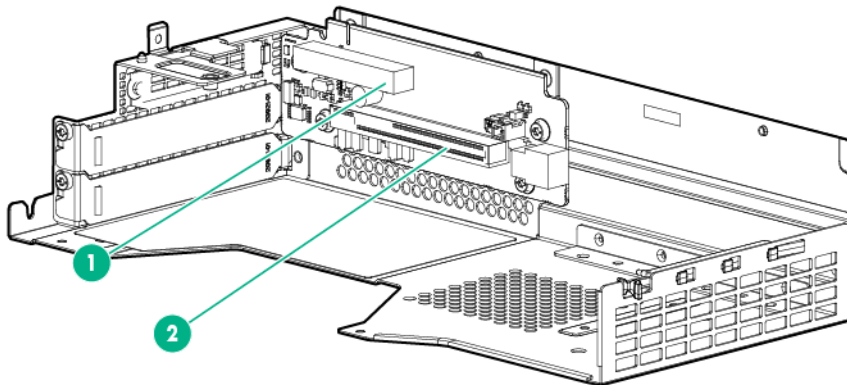
- Single-slot 2U node PCI riser cage assembly (PN 800293-B21)



Form factor	Slot number	Slot description
Storage controller or low-profile PCIe NIC card	1	PCIe3 x16 (16, 8, 4, 1) for Processor 1

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

- FlexibleLOM 2U node riser cage assembly (PN 798184-B21)

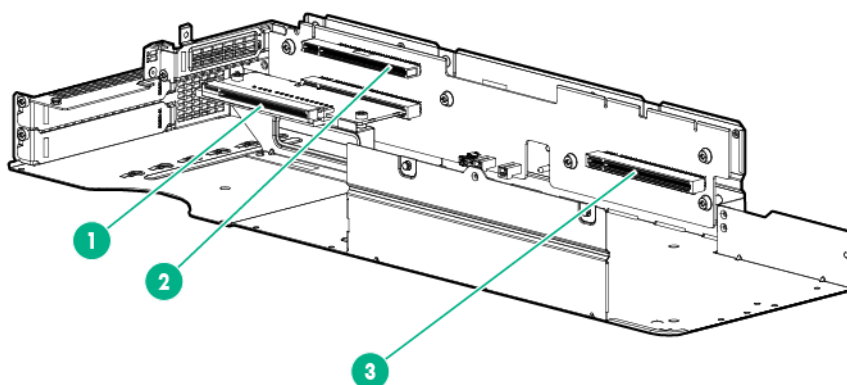


Item	Form factor	Slot number	Slot description
1	FlexibleLOM	FlexibleLOM slot	PCIe3 x8 for Processor 1
2	Storage controller or accelerator card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 1

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

For more information on installing an accelerator, see "Accelerator options" in the *HPE Apollo 2000 System User Guide*.

- Three-slot 110S PCI riser cage assembly (PN 798186-B21)



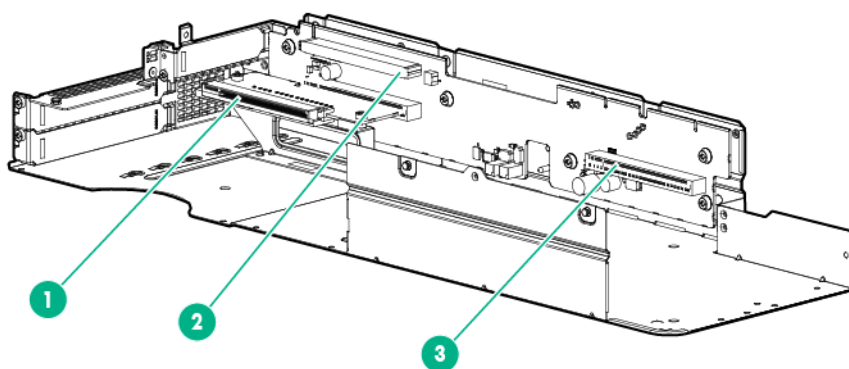
Item	Form factor	Slot number	Slot description
1	Accelerator card	3	PCIe3 x16 (16, 8, 4, 1) for Processor 1

2	Storage controller or low-profile PCIe NIC card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 2
3	Accelerator card	4	PCIe3 x16 (16, 8, 4, 1) for Processor 2

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

For more information on installing an accelerator, see "Accelerator options" in the *HPE Apollo 2000 System User Guide*.

- Three-slot GPU-direct PCI riser cage assembly (PN 798188-B21)

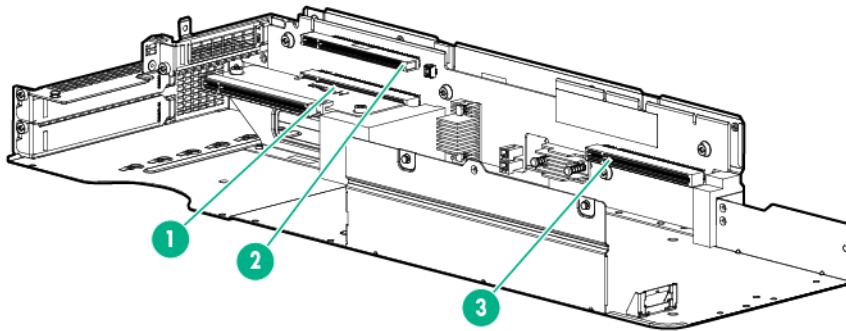


Item	Form factor	Slot number	Slot description
1	Accelerator card	3	PCIe3 x16 (16, 8, 4, 1) for Processor 2
2	Storage controller or low-profile PCIe NIC card	2	PCIe3 x16 (8, 4, 1) for Processor 2
3	Accelerator card	4	PCIe3 x16 (16, 8, 4, 1) for Processor 2

For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

For more information on installing an accelerator, see "Accelerator options" in the *HPE Apollo 2000 System User Guide*.

- Three-slot GPU-direct with re-timer PCI riser cage assembly (PN 827353-B21)



Item	Form factor	Slot number	Slot description
1	Accelerator card	3	PCIe3 x16 (16, 8, 4, 1) for Processor 2
2	Storage controller or low-profile PCIe NIC card	2	PCIe3 x16 (8, 4, 1) for Processor 2
3	Accelerator card	4	PCIe3 x16 (16, 8, 4, 1) for Processor 2

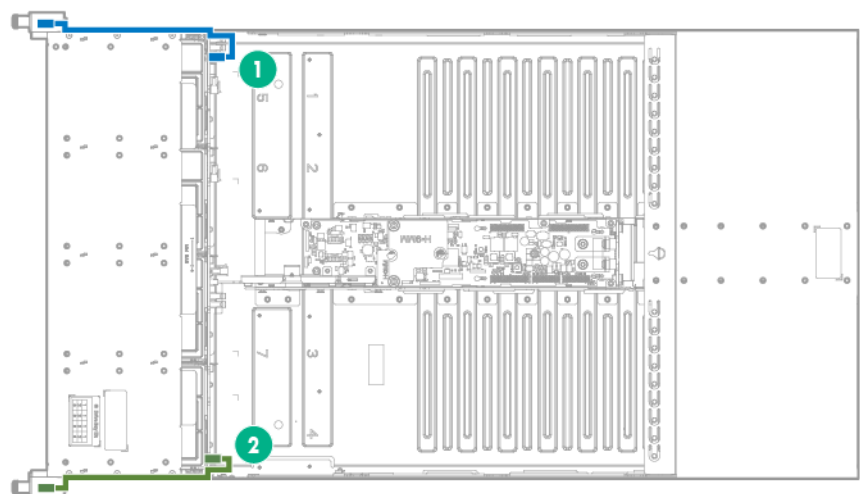
For more information on installing a storage controller, see "Controller options" in the *HPE Apollo 2000 System User Guide*.

For more information on installing an accelerator, see "Accelerator options" in the *HPE Apollo 2000 System User Guide*.

Cabling

Chassis cabling

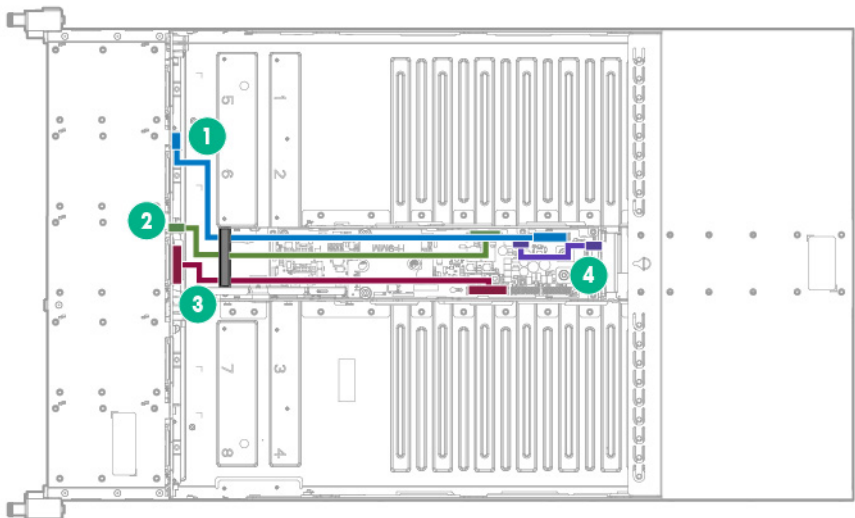
Front I/O cabling



Item	Description
1	Left front I/O cable
2	Right front I/O cable

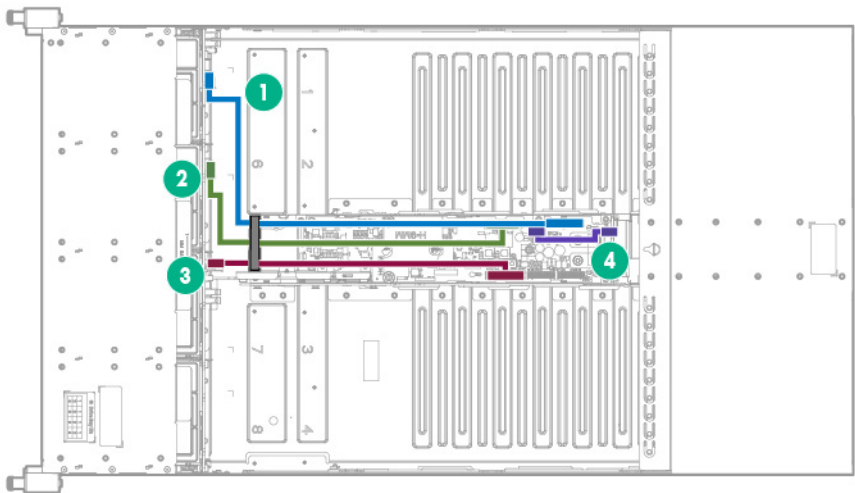
Drive backplane power cabling

HPE Apollo r2600 Chassis



Item	Description
1	Power cable for Node 1 and Node 2
2	Power cable for drives
3	Power cable for Node 3 and Node 4
4	PDB pass-through cable

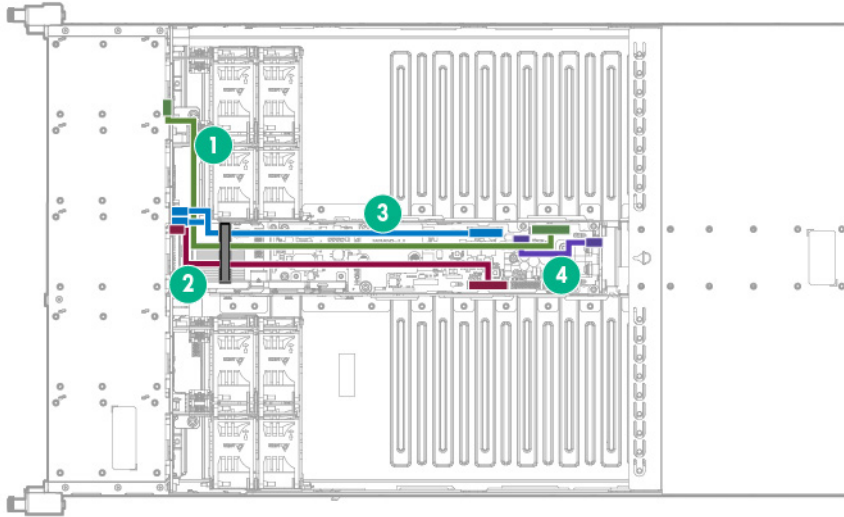
HPE Apollo r2200 Chassis



Item	Description
1	Power cable for Node 1 and Node 2
2	Power cable for drives

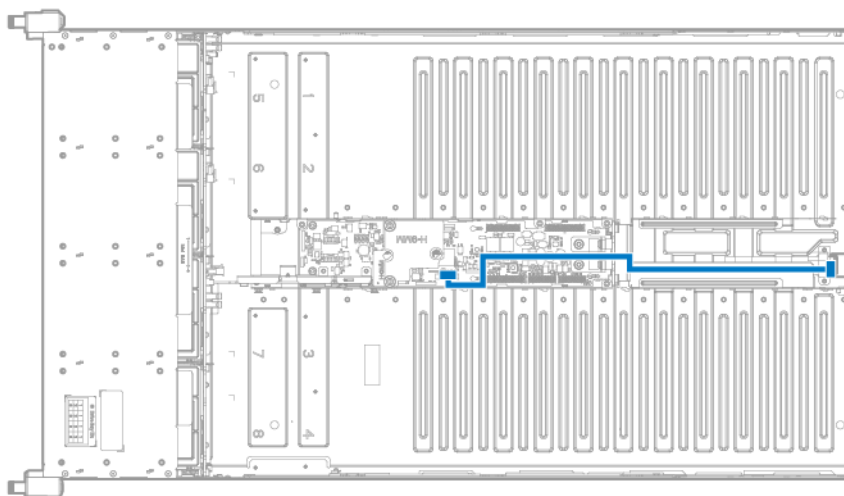
Item	Description
3	Power cable for Node 3 and Node 4
4	PDB pass-through cable

HPE Apollo r2800 Chassis



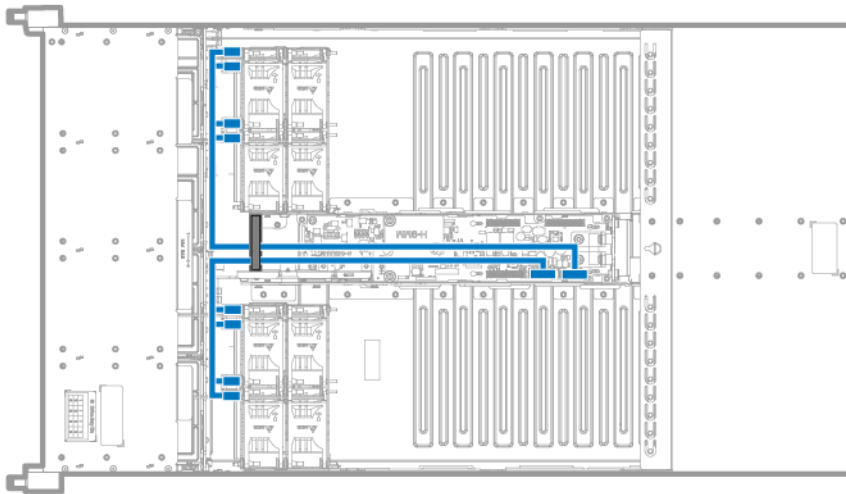
Item	Description
1	Power cable for Node 1 and Node 2
2	Power cable for Node 3 and Node 4
3	Power cable for drives
4	PDB pass-through cable

RCM 2.0 cabling



Fan power cabling

HPE Apollo r2200 Chassis and HPE Apollo r2600 Chassis

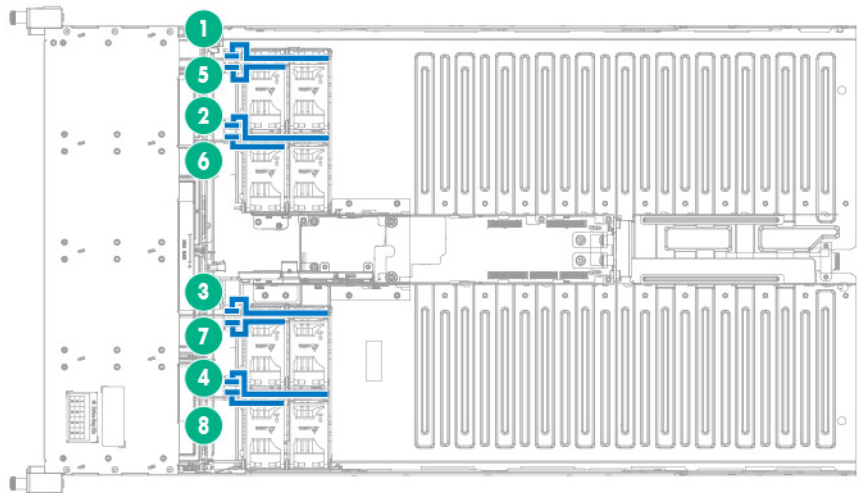


HPE Apollo r2800 Chassis



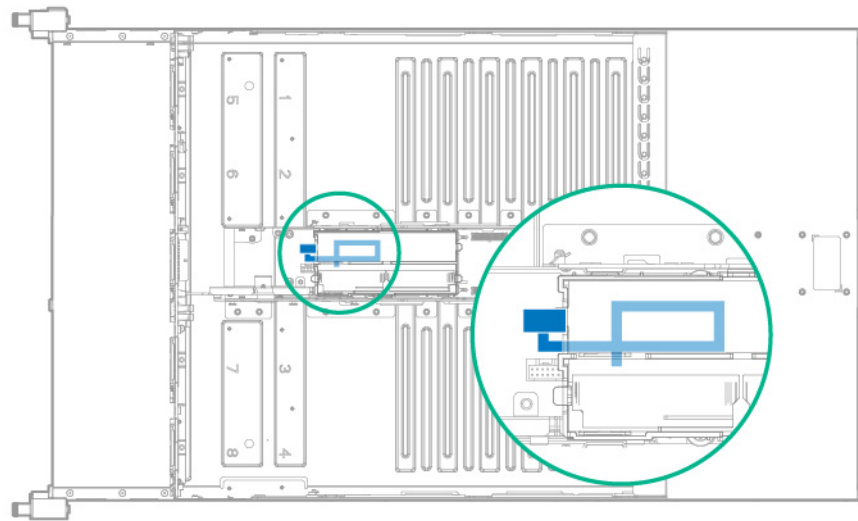
Item	Description
1	PDB to left fan cage power cable
2	Storage expander card to right fan cage power cable
3	PDB to storage expander card fan power cable

Fan module cabling



Item	Description
1	Fan 1 cable
2	Fan 2 cable
3	Fan 3 cable
4	Fan 4 cable
5	Fan 5 cable
6	Fan 6 cable
7	Fan 7 cable
8	Fan 8 cable

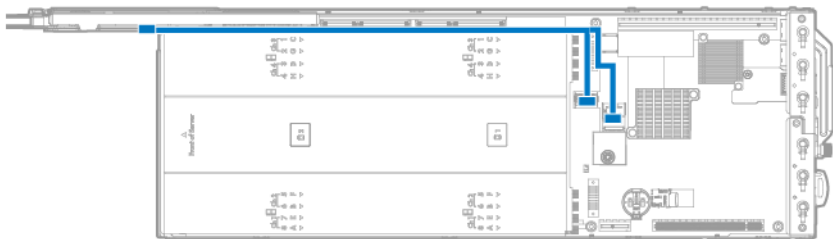
HPE Smart Storage Battery cabling



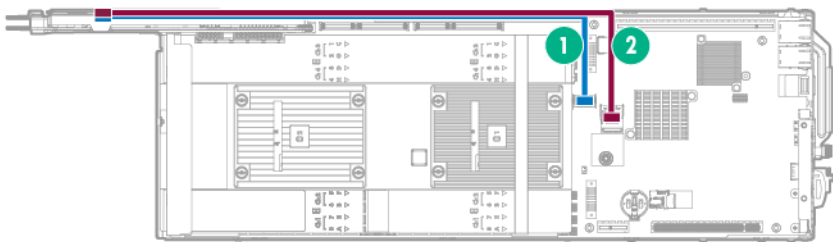
Node cabling

SATA and mini-SAS cabling

B140i 1U node SATA cabling

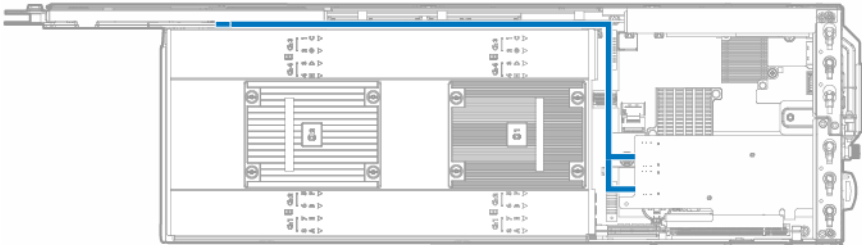


B140i 2U node SATA cabling



Item	Description	Connection
1	SATA 1 cable	Mini-SAS connector 1 (SATA x4) on the system board to Port 1 on the bayonet board
2	SATA 2 cable	Mini-SAS connector 2 (SATA x4) on the system board to Port 2 on the bayonet board

Mini-SAS H240 1U node cabling



Mini-SAS H240 2U node cabling

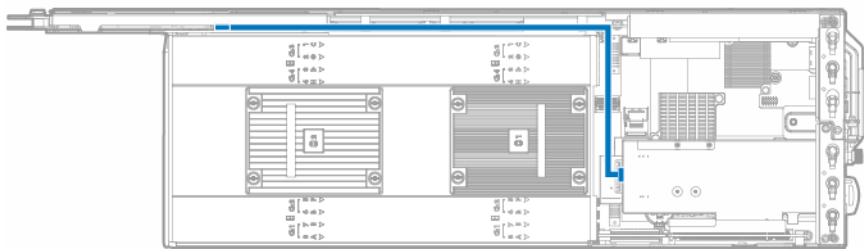


Mini-SAS P440 2U node cabling

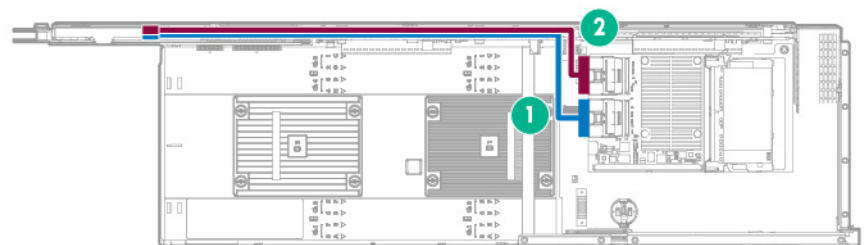


Mini-SAS P440/P840 cabling

HPE P440 Smart Array controller installed in a 1U node



HPE P840 Smart Array controller installed in FlexibleLOM 2U node riser cage assembly



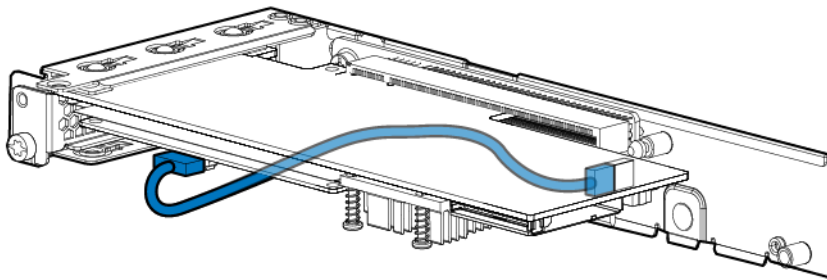
Item	Description	Connection
1	Mini-SAS P440/P840 cable	Port 1 on P840 Smart Array controller to Port 1 on the bayonet board
2	Mini-SAS P440/P840 cable	Port 2 on P840 Smart Array controller to Port 2 on the bayonet board

FBWC module cabling

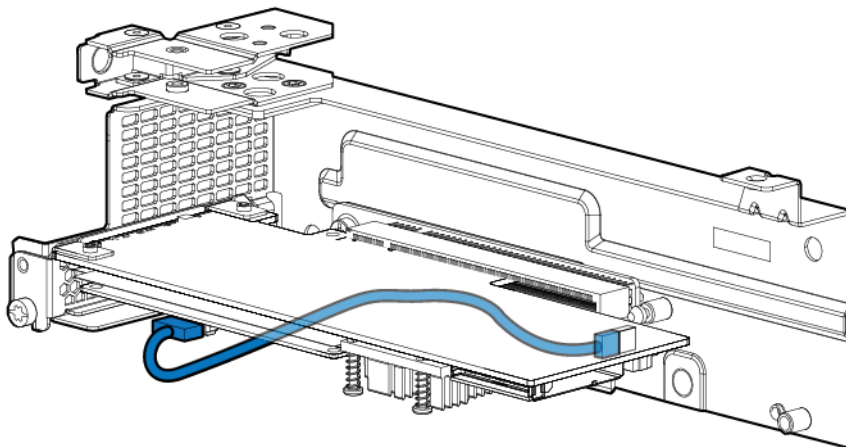
The FBWC solution is a separately purchased option. This node only supports FBWC module installation when a Smart Array P-Series controller is installed.

Depending on the controller option installed, the actual storage controller connectors might look different from what is shown in this section.

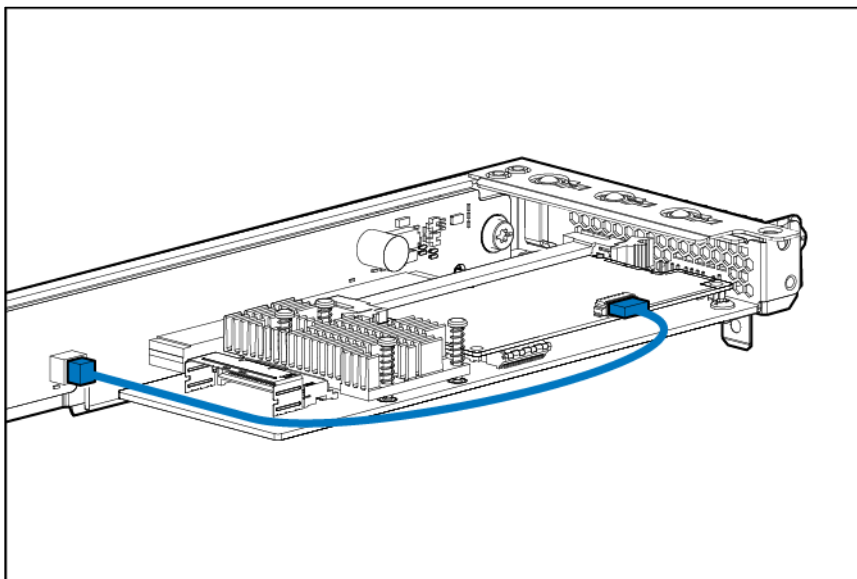
HPE P440 Smart Array controller in a single-slot left PCI riser cage assembly



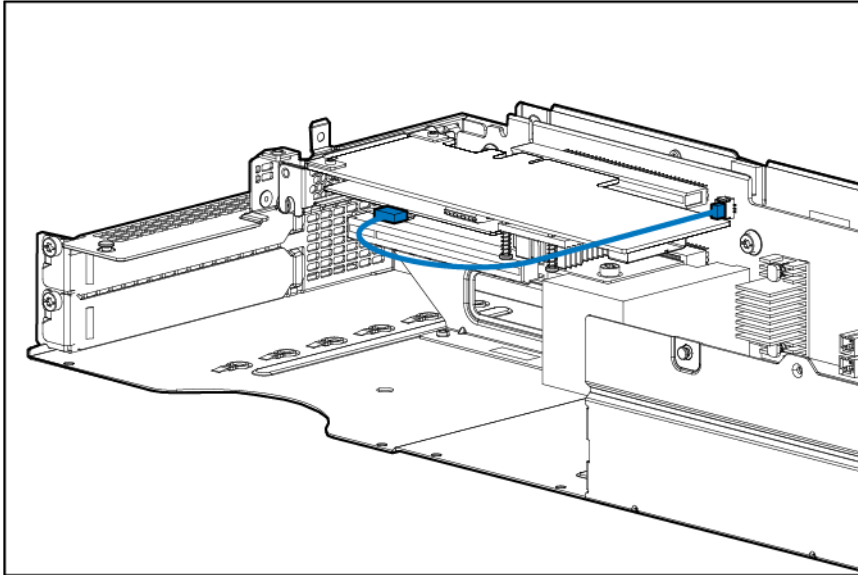
HPE P440 Smart Array controller in a single-slot 2U node PCI riser cage assembly



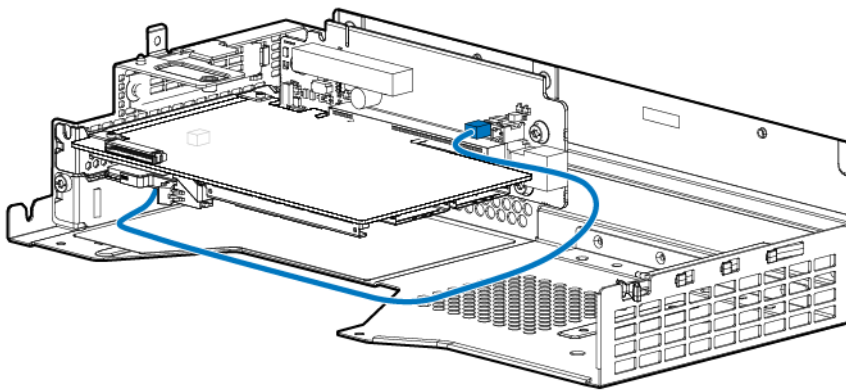
HPE P440 Smart Array controller in a single-slot 1U node right PCI riser cage assembly



HPE P440 Smart Array controller in a three-slot riser cage assembly



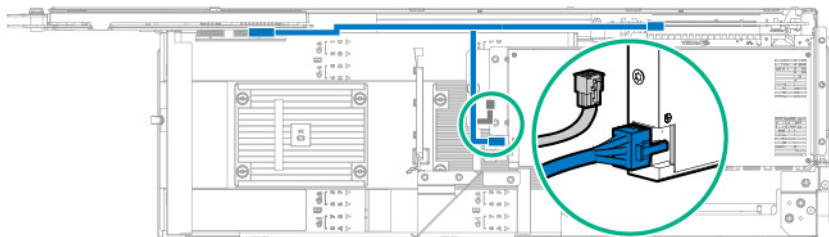
HPE P840 Smart Array controller in a FlexibleLOM 2U node riser cage assembly



Accelerator cabling

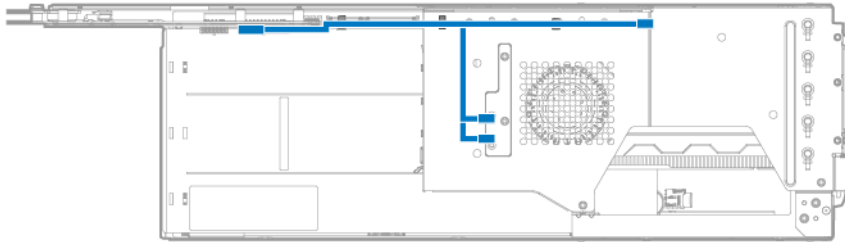
Accelerator cabling in the FlexibleLOM 2U node riser cage assembly

NVIDIA Quadro K4200 GPU or NVIDIA Quadro M4000 GPU



NVIDIA Tesla K40 GPU or AMD FirePro S9150 GPU

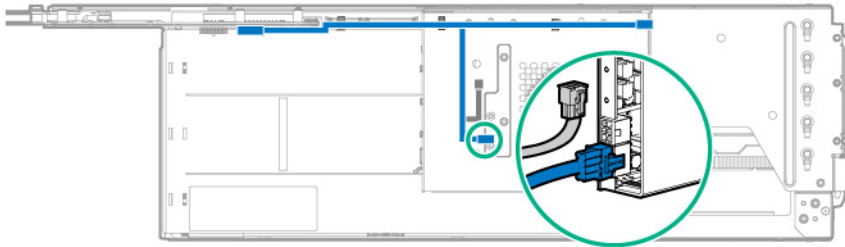
NOTE: Depending on the accelerator model purchased, the accelerator and cabling might look slightly different than shown.



Intel Xeon Phi Coprocessor 5110P



IMPORTANT: If installing an Intel Xeon Phi Coprocessor 5110P, connect the power cable to the 2x4 connector only. Do not connect the power cable to the 2x3 connector.



Accelerator cabling in a three-slot riser cage assembly

NOTE: Depending on the accelerator model purchased, the accelerator and cabling might look slightly different than shown.

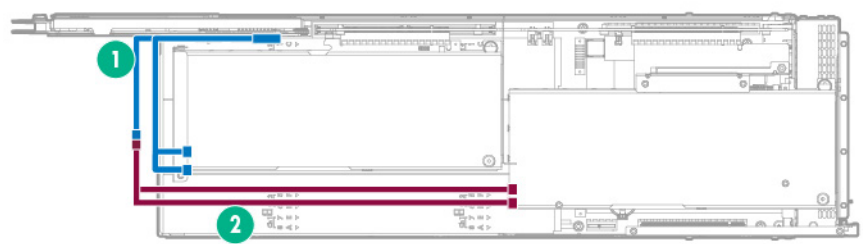
NOTE: Three-slot riser cage assemblies feature different riser boards. For more information on the riser board slot specifications, see "PCIe riser board slot definitions."

Single NVIDIA GRID K2 Reverse Air Flow GPU



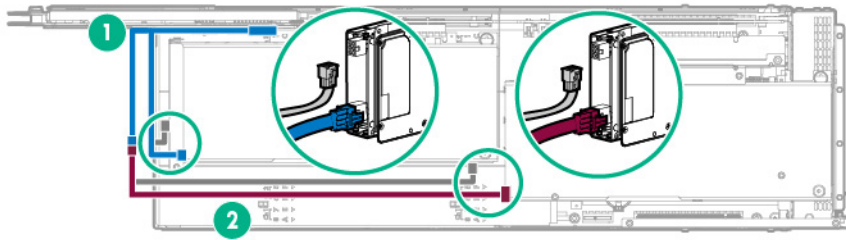
Item	Description
1	Accelerator 2 power cable (PN 825635-001)
2	Accelerator 1 power cable (PN 825634-001)

Dual NVIDIA Tesla K40 GPUs, NVIDIA GRID K2 Reverse Air Flow GPUs, AMD FirePro S9150 GPUs, or AMD FirePro S7150 GPUs



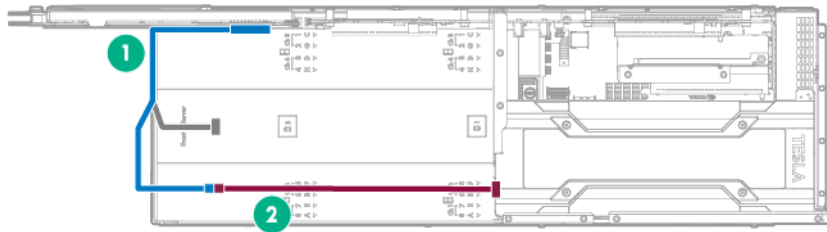
Item	Description
1	Accelerator 2 power cable (PN 825635-001)
2	Accelerator 1 power cable (PN 825634-001)

Dual Intel Xeon Phi Coprocessor 5110P



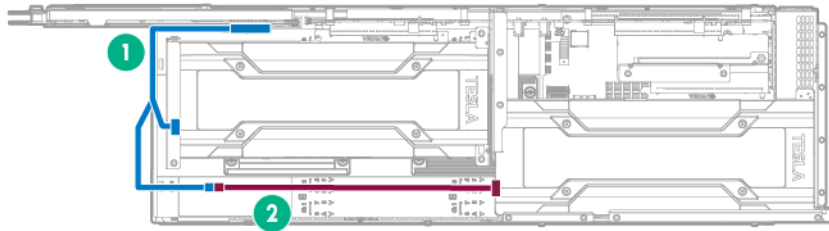
Item	Description
1	Accelerator 2 power cable (PN 825635-001)
2	Accelerator 1 power cable (PN 825634-001)

Single NVIDIA Tesla K80 GPU, NVIDIA Tesla M60 GPU, or NVIDIA Tesla M40 GPU



Item	Description
1	Accelerator 2 power cable (PN 825637-001)
2	Accelerator 1 power cable (PN 825636-001)

Dual NVIDIA Tesla K80, NVIDIA Tesla M60, or NVIDIA Tesla M40 GPUs



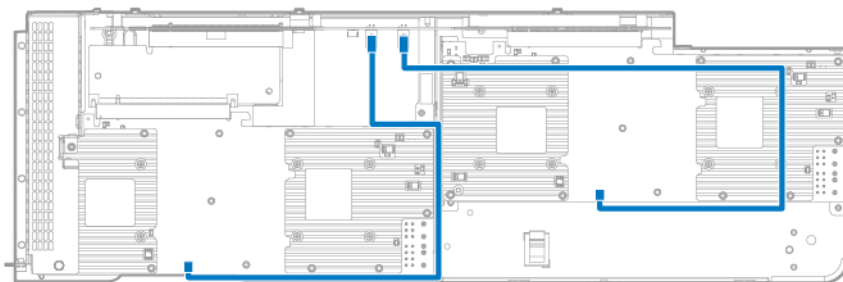
Item	Description
1	Accelerator 2 power cable (PN 825637-001)
2	Accelerator 1 power cable (PN 825636-001)

2-pin adapter cables

Single NVIDIA GRID K2 Reverse Air Flow GPU



Dual NVIDIA GRID K2 Reverse Air Flow GPUs



Specifications

Environmental specifications

Specification	Value
Temperature range*	—
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity Maximum to be 24°C (75.2°F) dew point or 90% relative humidity
Nonoperating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

* All temperature ratings shown are for sea level. An altitude derating of 1.0°C per 304.8 m (1.8°F per 1000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Maximum rate of change is 20°C per hour (36°F per hour). The upper limit and rate of change might be limited by the type and number of options installed.

For certain approved hardware configurations, the supported system inlet temperature range is extended:

- 5°C to 10°C (41°F to 50°F) and 35°C to 40°C (95°F to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft).
- 40°C to 45°C (104°F to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft).

The approved hardware configurations for this system are listed on the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/ASHRAE>).

Mechanical specifications

HPE Apollo r2200 Chassis (12 LFF)

Specifications	Value
Dimensions	—
Height	8.73 cm (3.44 in)
Depth	86.33 cm (33.40 in)
Width	44.81 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	25.37 kg (55.94 lb)
Weight (minimum)	11.94 kg (26.37 lb)

HPE Apollo r2600 Chassis (24 SFF)

Specifications	Value
Dimensions	—
Height	8.73 cm (3.44 in)
Depth	82.27 cm (32.40 in)
Width	44.81 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	23.45 kg (51.70 lb)
Weight (minimum)	9.86 kg (21.74 lb)

HPE Apollo r2800 Chassis (24 SFF with storage expander backplane)

Specifications	Value
Dimensions	—
Height	8.73 cm (3.44 in)
Depth	82.27 cm (32.40 in)
Width	44.81 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	23.59 kg (52.00 lb)
Weight (minimum)	10.00 kg (22.05 lb)

HPE ProLiant XL170r Gen9 Server Node (1U)

Specifications	Value
Dimensions	—
Height	4.13 cm (1.63 in)
Depth	64.15 cm (25.26 in)
Width	17.95 cm (7.07 in)
Weight (approximate values)	—
Weight (maximum)	1.73 kg (3.82 lb)
Weight (minimum)	1.67 kg (3.69 lb)

HPE ProLiant XL190r Gen9 Server Node (2U)

Specifications	Value
Dimensions	—
Height	8.36 cm (3.30 in)
Depth	69.15 cm (27.23 in)
Width	17.95 cm (7.07 in)
Weight (approximate values)	—
Weight (maximum)	6.47 kg (14.27 lb)
Weight (minimum)	4.73 kg (10.43 lb)

Power supply specifications

Depending on installed options, the node is configured with one of the following power supplies:

- HPE 800W Flex Slot Titanium Hot Plug Power Supply Kit – 96% efficiency
- HPE 800W Flex Slot Platinum Hot Plug Power Supply Kit – 94% efficiency

- HPE 800W Flex Slot Universal Hot Plug Power Supply Kit – 94% efficiency
- HPE 800W Flex Slot -48VDC Hot Plug Power Supply Kit – 94% efficiency
- HPE 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit – 94% efficiency

For more information about the power supply features, specifications, and compatibility, see the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/powersupplies>).

Hot-plug power supply calculations

For hot-plug power supply specifications and calculators to determine electrical and heat loading for the server, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/hpepoweradvisor>).

Acronyms and abbreviations

AMP

Advanced Memory Protection

API

application program interface

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers

BP

backplane

CSR

Customer Self Repair

FAT

file allocation table

FBWC

flash-backed write cache

GPU

graphics processing unit

HBA

host bus adapter

HPE SIM

HPE Systems Insight Manager

iLO

Integrated Lights-Out

IML

Integrated Management Log

LFF

large form factor

LOM

Lights-Out Management

NMI

nonmaskable interrupt

NVRAM

nonvolatile memory

ODD

Optical Disk Drive

PCIe

Peripheral Component Interconnect Express

PDB

power distribution board

POST

Power-On Self-Test

RBSU

ROM-Based Setup Utility

REST

representational state transfer

RPS

redundant power supply

SAS

serial attached SCSI

SATA

serial ATA

SD

Secure Digital

SFF

small form factor

SIM

Systems Insight Manager

SPP

Service Pack for ProLiant

TPM

Trusted Platform Module

UEFI

Unified Extensible Firmware Interface

UID

unit identification

USB

universal serial bus

Documentation feedback

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