HP ProLiant DL170e G6 Server

Maintenance and Service Guide

Part number 612341-003
Third edition September 2013

Contents

Customer self repair

HP 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 HP (or HP service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, HP 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 HP 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 HP 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 HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP 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 HP Technical Support Center and a technician will help you over the telephone. HP specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to HP. In cases where it is required to return the defective part to HP, you must ship the defective part back to HP 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 HP billing you for the replacement. With a customer self repair, HP will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about HP's Customer Self Repair program, contact your local service provider. For the North American program, see the HP website (**http://www.hp.com/go/selfrepair**).

Parts only warranty service

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

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

Réparation par le client (CSR)

Les produits HP 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, HP (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, HP 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 HP 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 HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

REMARQUE: Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP 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 bénéficier d'une assistance téléphonique, appelez le Centre d'assistance technique HP. Dans les documents envoyés avec la pièce de rechange CSR, HP 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, HP se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d'une pièce CSR, HP 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 HP, contactez votre Mainteneur Agrée local. Pour plus d'informations sur ce programme en Amérique du Nord, consultez le site Web HP (**http://www.hp.com/go/selfrepair**).

Service de garantie "pièces seules"

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

Dans le cadre de ce service, la réparation des pièces CSR par le client est obligatoire. Si vous demandez à HP 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 HP sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica HP (o un centro di servizi o di assistenza HP) identifica il guasto come riparabile mediante un ricambio CSR, HP lo spedirà 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 HP, 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 HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

NOTA: alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP 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 HP. Nel materiale fornito con una parte di ricambio CSR, HP specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad HP del componente difettoso, lo si deve spedire ad HP 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 HP. Nel caso di riparazione da parte del cliente, HP sostiene tutte le spese di spedizione e resa e sceglie il corriere/vettore da utilizzare.

Per ulteriori informazioni sul programma CSR di HP contattare il centro di assistenza di zona. Per il programma in Nord America fare riferimento al sito Web HP (**http://www.hp.com/go/selfrepair**).

Servizio di garanzia per i soli componenti

La garanzia limitata HP può includere un servizio di garanzia per i soli componenti. Nei termini di garanzia del servizio per i soli componenti, HP 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 HP, dovrà sostenere le spese di spedizione e di manodopera per il servizio.

Customer self repair

HP Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn HP (oder ein HP Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen HP 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 HP 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 HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

HINWEIS: Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP 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 HP technische Support Center anrufen und sich von einem Mitarbeiter per Telefon helfen lassen. Den Materialien, die mit einem CSR-Ersatzteil geliefert werden, können Sie entnehmen, ob das defekte Teil an HP zurückgeschickt werden muss. Wenn es erforderlich ist, das defekte Teil an HP 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 HP Ihnen das Ersatzteil in Rechnung stellen. Im Falle von Customer Self Repair kommt HP für alle Kosten für die Lieferung und Rücksendung auf und bestimmt den Kurier-/Frachtdienst.

Weitere Informationen über das HP Customer Self Repair Programm erhalten Sie von Ihrem Servicepartner vor Ort. Informationen über das CSR-Programm in Nordamerika finden Sie auf der HP Website unter (**http://www.hp.com/go/selfrepair**).

Parts-only warranty service (Garantieservice ausschließlich für Teile)

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

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

Reparaciones del propio cliente

Los productos de HP 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, HP (o los proveedores o socios de servicio de HP) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, HP le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:

- **Obligatorio**—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP 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 para los que la 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 HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

NOTA: Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP 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 HP y recibirá ayuda telefónica por parte de un técnico. Con el envío de materiales para la sustitución de componentes CSR, HP especificará si los componentes defectuosos deberán devolverse a HP. En aquellos casos en los que sea necesario devolver algún componente a HP, 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, HP podrá cobrarle por el de sustitución. En el caso de todas sustituciones que lleve a cabo el cliente, HP 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 HP, póngase en contacto con su proveedor de servicios local. Si está interesado en el programa para Norteamérica, visite la página web de HP siguiente (**http://www.hp.com/go/selfrepair**).

Servicio de garantía exclusivo de componentes

La garantía limitada de HP puede que incluya un servicio de garantía exclusivo de componentes. Según las condiciones de este servicio exclusivo de componentes, HP 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 HP 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 HP 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 HP (of een HP Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt HP 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 HP 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 HP 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 HP 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 gewenst is, belt u een HP Service Partner om via de telefoon technische ondersteuning te ontvangen. HP vermeldt in de documentatie bij het vervangende CSR-onderdeel of het defecte onderdeel aan HP moet worden geretourneerd. Als het defecte onderdeel aan HP moet worden teruggezonden, moet u het defecte onderdeel binnen een bepaalde periode, gewoonlijk vijf (5) werkdagen, retourneren aan HP. Het defecte onderdeel moet met de bijbehorende documentatie worden geretourneerd in het meegeleverde verpakkingsmateriaal. Als u het defecte onderdeel niet terugzendt, kan HP u voor het vervangende onderdeel kosten in rekening brengen. Bij reparatie door de klant betaalt HP alle verzendkosten voor het vervangende en geretourneerde onderdeel en kiest HP zelf welke koerier/transportonderneming hiervoor wordt gebruikt.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van HP. Informatie over Service Partners vindt u op de HP website (**http://www.hp.com/go/selfrepair**).

Garantieservice "Parts Only"

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

Voor de Parts Only garantieservice is vervanging door CSR-onderdelen verplicht. Als u HP 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 HP 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 HP (ou fornecedores/parceiros de serviço da HP) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a peça de reposição será enviada diretamente ao cliente. Existem duas categorias de peças CSR:

- **Obrigatória**—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP 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 HP 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 HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP 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 HP para que um técnico o ajude por telefone. A HP especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à HP. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à HP dentro do período determinado, normalmente cinco (5) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a HP poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a HP 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 HP, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site da HP (**http://www.hp.com/go/selfrepair**).

Serviço de garantia apenas para peças

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

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

顧客自己修理保証サービス

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、HP製品には多数の顧客自己修理（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HP（HPまたはHP正規保守代理店）が判断した場合、HP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通りがあります。

- 必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHP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 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHP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： HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP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、当該部品が顧客自己修理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、HPの修理受付窓口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HPに返送する必要があるかどうかが表示されています。故障部品をHP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HP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、HPから部品費用が請求されます。顧客自己修理の際には、HP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

HP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となります。当該部品について、もしもお客様がHP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はお客様の負担となります。

客户自行维修

HP 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 HP（或 HP 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，HP 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 HP 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 HP 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，HP 可能收取或不再收取任何附加费用。

注：某些 HP 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，HP 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 HP 技术支持中心，将会有技术人员通过电话为您提供帮助。HP 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 HP。如果要求您将有缺陷的部件返还给 HP，那么您必须在规定期限内（通常是五 (5) 个工作日）将缺陷部件发给 HP。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，HP 可能会要求您支付更换费用。客户自行维修时，HP 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 HP 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 HP 网站 (http://www.hp.com/go/selfrepair)。

仅部件保修服务

您的 HP 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，HP 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 HP 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

HP 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 HP（或 HP 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 HP 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 HP 更換這些零件，HP 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 HP 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 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 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「HP 技術支援中心」，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，HP 皆會在與 CSR 替換零件一起運送的材料中註明。若要將損壞的零件退回 HP，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 HP。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，HP 可能要向您收取替換費用。針對客戶自行維修情形，HP 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 HP 的「客戶自行維修」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 HP 網站 (http://www.hp.com/go/selfrepair)。

僅限零件的保固服務

您的「HP 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，HP 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 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

고객 셀프 수리

HP 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 HP(또는 HP 서비스 공급업체 또는 서비스 협력업체)에서 CSR 부품을 사용하여 수리가 가능하다고 판단되면 HP는 해당 부품을 바로 사용자에게 보내어 사용자가 교체할 수 있도록 합니다. CSR 부품에는 두 가지 종류가 있습니다.

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

참고: 일부 HP 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 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 HP 기술 지원 센터로 전화하십시오. 전문 기술자가 전화로 도움을 줄 것입니다. HP는 결함이 발생한 부품을 HP로 반환해야 하는지 여부를 CSR 교체 부품과 함께 배송된 자료에 지정합니다. 결함이 발생한 부품을 HP로 반환해야 하는 경우에는 지정된 기간 내(통상 영업일 기준 5일)에 HP로 반환해야 합니다. 이 때 결함이 발생한 부품은 제공된 포장 재료에 넣어 관련 설명서와 함께 반환해야 합니다. 결함이 발생한 부품을 반환하지 않는 경우 HP가 교체 부품에 대해 비용을 청구할 수 있습니다. 고객 셀프 수리의 경우, HP는 모든 운송 및 부품 반환 비용을 부담하며 이용할 운송업체 및 택배 서비스를 결정합니다.

HP 고객 셀프 수리 프로그램에 대한 자세한 내용은 가까운 서비스 제공업체에 문의하십시오. 북미 지역의 프로그램에 대해서는 HP 웹 사이트(http://www.hp.com/go/selfrepair)를 참조하십시오.

부품 제공 보증 서비스

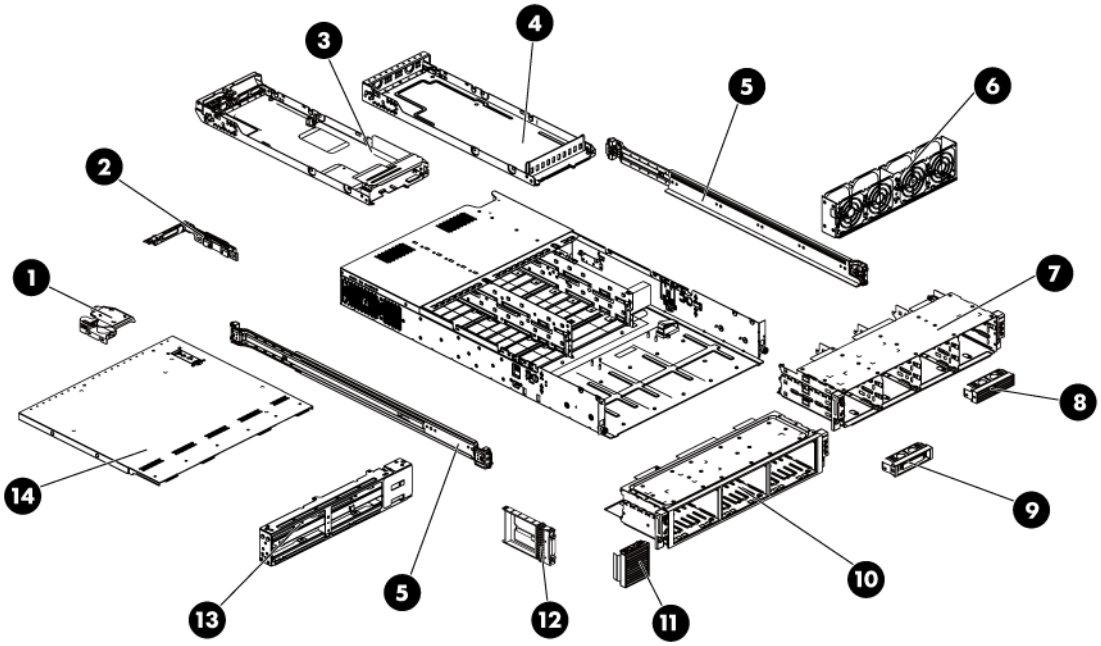
HP 제한 보증에는 부품 제공 보증 서비스가 포함될 수 있습니다. 이러한 경우 HP는 부품 제공 보증 서비스의 조건에 따라 교체 부품만을 무료로 제공합니다.

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

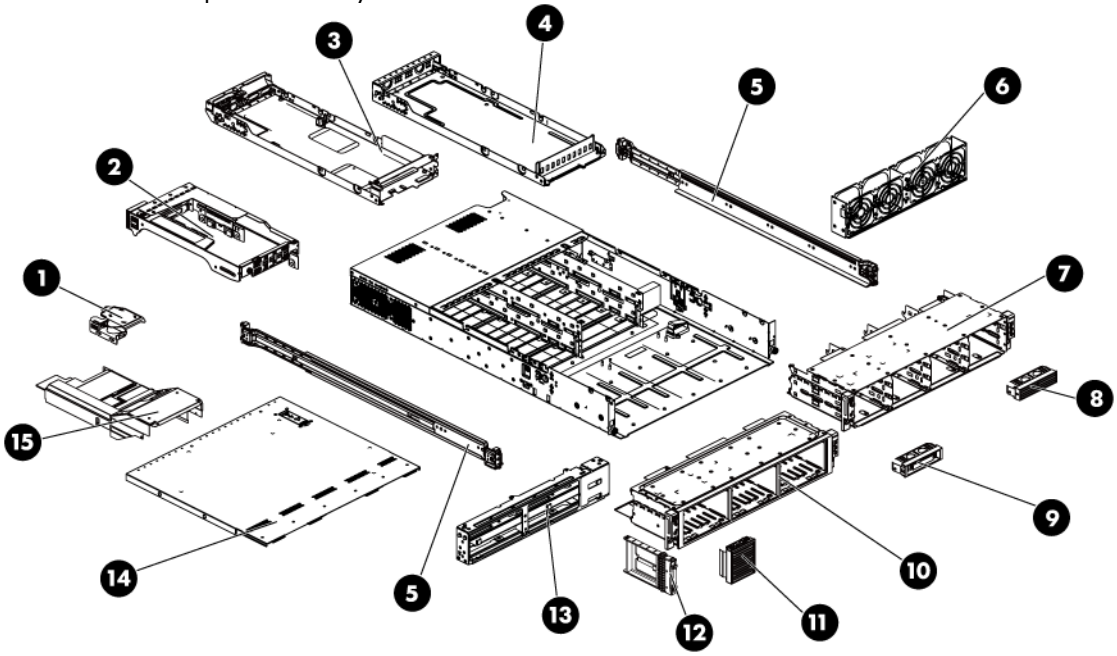
Illustrated parts catalog

Mechanical components

Mechanical Components for System with 1U Node:



Mechanical Components for System with 2U Node:



NOTE: The 1U and 2U system can be configured with the 8 LFF, 12 LFF, 16 SFF or 24 SFF HDD cage. The LFF and SFF hard drive blanks are used for the 8 LFF and 16 SFF HDD configurations.

Table 1 Mechanical Components Spare Parts List

Item	Description		Spare Part Number	Customer Self Repair
1	Onboard SATA cable guard/battery holder		None	Mandatory[1]
2	PCI cage	1U	None	Mandatory[1]
		2U	None	
3	System board tray	1U	None	Mandatory[1]
		2U	None	
4	1U node blank (optional)	For 2U node, two 1U node blanks are needed	None	Mandatory[1]
5	Rail kit		620811-001	Mandatory[1]
6	Fan cage		None	Mandatory[1]
7	LFF HDD cage, 8 & 12 LFF		629067-001	Optional[2]
8	LFF HDD non hot plug blank		575443-001	Mandatory[1]
9	LFF HDD hot plug blank		511817-001	Mandatory[1]
10	SFF HDD cage, 24 SFF		629069-001	Optional[2]
	SFF HDD cage, 16 SFF		629068-001	Optional[2]
11	16 SFF HDD blank		632800-001	Mandatory[1]
12	SFF HDD blank		392613-001	Mandatory[1]
13	Midplane assembly, Cage/Midplane		620789-001	Mandatory[1]
14	Top cover		632798-001	Mandatory[1]
15	Air baffle	2U	632800-001	Mandatory[1]

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

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

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

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

[2]Optional: 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 HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP 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.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.

[2]Optional: 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 HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.

[2]Optional: 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 HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No" bzw. „Nein" gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

[2]Optional: Opcional—componentes para los que la 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 HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP 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.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.

[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

[3]No: Nee—Sommige HP 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".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

[2]Optional: 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 HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca “No” (Não), no catálogo de peças ilustrado.

System components

The following figures use the 12-LFF-HDD configuration as examples to illustrate the system components for 1U and 2U systems.

System components for server with 1U node:

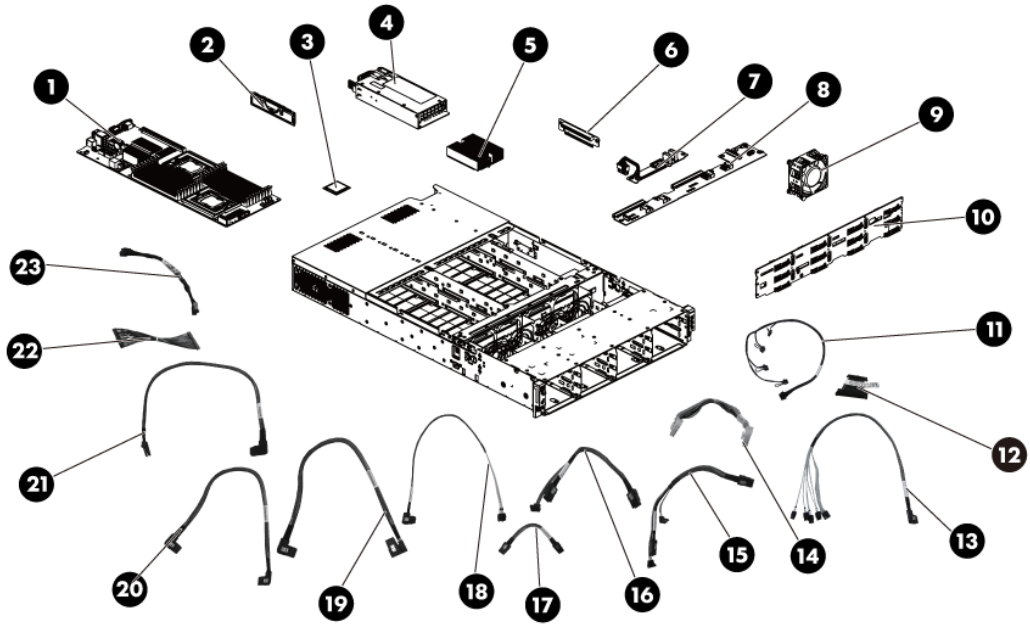


Table 2 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
1	System board	628386-001	Optional[2]
2	Memory modules		
	DIMM, 2GB PC3-10600R, 128Mx8, RoHS	501533-001	Mandatory[1]
	DIMM, 4GB PC3-10600R, 256Mx4, RoHS	501534-001	Mandatory[1]
	DIMM, 4GB PC3-10600R, 512Mx4	595424-001	Mandatory[1]
	DIMM, 4GB PC3L 10600R, 512Mx4	606426-001	Mandatory[1]
	DIMM, 16GB PC3-8500R, 512Mx4, RoHS	501538-001	Mandatory[1]
	DIMM, 8GB PC3-10600R, 512Mx4, RoHS	501536-001	Mandatory[1]
	DIMM, 8GB PC3L 10600R, 512Mx4	606427-001	Mandatory[1]
	DIMM, 1GB PC3-10600E, 128Mx8, RoHS	501539-001	Mandatory[1]
	DIMM, 2GB PC3-10600E, 128Mx8, RoHS	501540-001	Mandatory[1]
	DIMM, 4GB PC3-10600E, 256Mx8, RoHS	501541-001	Mandatory[1]
	DIMM, 4GB PC3L-10600E, 256Mx8	619974-001	Mandatory[1]

Table 2 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
3	Processors, 1366 FCLGA Series		
	Westmere 2.93 GHz, 95 W, X5670	594882-001	Optional[2]
	Westmere 2.8 GHz, 95 W, X5660	594883-001	Optional[2]
	Westmere 2.66 GHz, 95 W, X5650	594884-001	Optional[2]
	Westmere 2.66 GHz, 80 W, E5640	594885-001	Optional[2]
	Westmere 2.53 GHz, 80 W, E5630	594886-001	Optional[2]
	Westmere 2.4 GHz, 80 W, E5620	594887-001	Optional[2]
	Nehalem 2.13 GHz, 80 W, E5506	506013-001	Optional[2]
	Westmere 2.26 GHz, 60 W, L5640	594890-001	Optional[2]
	Westmere 2.13 GHz, 40 W, L5630	594891-001	Optional[2]
	Westmere 1.60 GHz, 80 W, E5603	628700-001	Optional[2]
	Westmere 2.26 GHz, 80 W, E5607	628698-001	Optional[2]
	Westmere 2.4 GHz, 80 W, E5645	628696-001	Optional[2]
	Westmere 2.53 GHz, 80 W, E5649	628695-001	Optional[2]
	Westmere 3.06 GHz, 95 W, X5675	638134-001	Optional[2]
	Westmere 3.46 GHz, 130 W, X5690	638136-001	Optional[2]
4	1200-W, 12V, hot plug power supply	498152-001	Mandatory[1]
	750-W, 12V, hot plug power supply	599383-001	Mandatory[1]
5	Processor heat sink	620812-001	Mandatory[1]
6	1U riser card (PCIe x16)	536654-001	Optional[2]
7	Adapter board	620787-001	Optional[2]
8	Midplane assembly	629066-001	Optional[2]
9	System fan	620793-001	Mandatory[1]
10	8 & 12 LFF HDD backplane board	620790-001	Optional[2]
	16 SFF HDD backplane board	620791-001	Optional[2]
	24 SFF HDD backplane board	620792-001	Optional[2]
11	Cable, system fan power	629070-001	Optional[2]
12	Cable, RPS, adapter board to system board	620799-001	Optional[2]
13	Cable, 4 SATA to Mini-SAS	620795-001	Optional[2]
14	Cable, HDD backplane power	620809-001	Optional[2]
15	Cable, 2 SATA to Mini-SAS	620796-001	Optional[2]

Table 2 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
16	Cable, Mini-SAS to Mini-SAS/SATA		
	Cable, Mini-SAS to Mini-SAS/SATA E	632802-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS/SATA	632803-001	Optional[2]
17	Cable, Mini-SAS to Mini-SAS		
	Cable, Mini-SAS to Mini-SAS 25cm	620802-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 33cm	620803-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 45cm	629072-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 46cm	620810-001	Optional[2]
18	Cable, Mini SAS to 2 SATA		
	Cable, Mini SAS to 2 SATA 25/19cm	620804-001	Optional[2]
	Cable, Mini SAS 2 SATA 35/39cm	620805-001	Optional[2]
19	Cable, U Type Mini SAS to Mini SAS	620797-001	Optional[2]
20	Cable, Right Exit Mini SAS to Mini SAS	620798-001	Optional[2]
21	Cable, Mini SAS to SAS 160mm A	632804-001	Optional[2]
22	Cable, RPS, power backplane to midplane	620807-001	Optional[2]
23	Cable, power backplane cable	632799-001	Optional[2]
*	Bezel, right front power, node 3 & 4	620816-001	Mandatory[1]
*	Bezel, left front power, node 1 & 2	620817-001	Mandatory[1]
*	IPMI riser board	536668-001	Optional[2]
*	Bus bar	620808-001	Mandatory[1]

System components for server with 2U node:

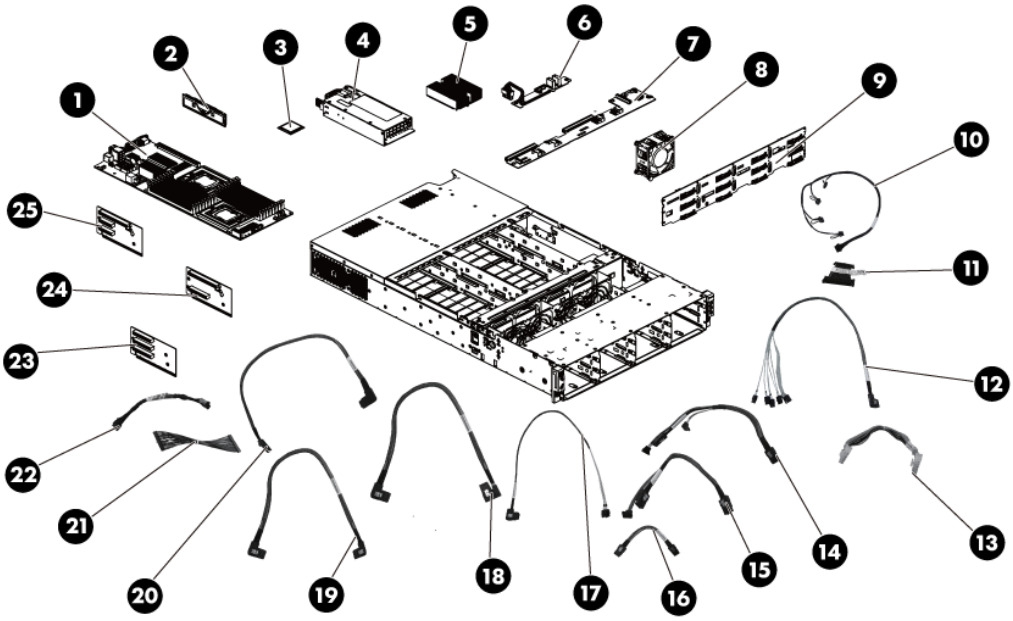

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Table 3 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
1	System board	628386-001	Optional[2]
2	Memory modules		
	DIMM, 2GB PC3-10600R, 128Mx8, RoHS	501533-001	Mandatory[1]
	DIMM, 4GB PC3-10600R, 256Mx4, RoHS	501534-001	Mandatory[1]
	DIMM, 4GB PC3-10600R, 512Mx4	595424-001	Mandatory[1]
	DIMM, 4GB PC3L 10600R, 512Mx4	606426-001	Mandatory[1]
	DIMM, 16GB PC3-8500R, 512Mx4, RoHS	501538-001	Mandatory[1]
	DIMM, 8GB PC3-10600R, 512Mx4, RoHS	501536-001	Mandatory[1]
	DIMM, 8GB PC3L 10600R, 512Mx4	606427-001	Mandatory[1]
	DIMM, 1GB PC3-10600E, 128Mx8, RoHS	501539-001	Mandatory[1]
	DIMM, 2GB PC3-10600E, 128Mx8, RoHS	501540-001	Mandatory[1]
	DIMM, 4GB PC3-10600E, 256Mx8, RoHS	501541-001	Mandatory[1]
	DIMM, 4GB PC3L-10600E, 256Mx8	619974-001	Mandatory[1]
3	Processors, 1366 FCLGA Series		
	Westmere 2.93 GHz, 95 W, X5670	594882-001	Optional[2]
	Westmere 2.8 GHz, 95 W, X5660	594883-001	Optional[2]
	Westmere 2.66 GHz, 95 W, X5650	594884-001	Optional[2]
	Westmere 2.66 GHz, 80 W, E5640	594885-001	Optional[2]
	Westmere 2.53 GHz, 80 W, E5630	594886-001	Optional[2]
	Westmere 2.4 GHz, 80 W, E5620	594887-001	Optional[2]
	Nehalem 2.13 GHz, 80 W, E5506	506013-001	Optional[2]
	Westmere 2.26 GHz, 60 W, L5640	594890-001	Optional[2]
	Westmere 2.13 GHz, 40 W, L5630	594891-001	Optional[2]
	Westmere 1.60 GHz, 80 W, E5603	628700-001	Optional[2]
	Westmere 2.26 GHz, 80 W, E5607	628698-001	Optional[2]
	Westmere 2.4 GHz, 80 W, E5645	628696-001	Optional[2]
	Westmere 2.53 GHz, 80 W, E5649	628695-001	Optional[2]
	Westmere 3.06 GHz, 95 W, X5675	638134-001	Optional[2]
	Westmere 3.46 GHz, 130 W, X5690	638136-001	Optional[2]
4	1200-W, PHB power supply	579229-001	Mandatory[1]

Table 3 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
5	Processor heat sink	620812-001	Mandatory[1]
6	Adapter board	620787-001	Optional[2]
7	Midplane assembly	629066-001	Optional[2]
8	System fan	620793-001	Mandatory[1]
9	8 & 12 LFF HDD backplane board	620790-001	Optional[2]
	16 SFF HDD backplane board	620791-001	Optional[2]
	24 SFF HDD backplane board	620792-001	Optional[2]
10	Cable, system fan power	629070-001	Optional[2]
11	Cable, RPS, adapter board to system board	620799-001	Optional[2]
12	Cable, 4 SATA to Mini-SAS	620795-001	Optional[2]
13	Cable, HDD backplane power	620809-001	Optional[2]
14	Cable, 2 SATA to Mini-SAS	620796-001	Optional[2]
15	Cable, ASSY, Mini-SAS to Mini-SAS/SATA		
	Cable, ASSY, Mini-SAS to Mini-SAS/SATA E	632802-001	Optional[2]
	Cable, ASSY, Mini-SAS to Mini-SAS/SATA	632803-001	Optional[2]
16	Cable, ASSY, Mini-SAS to Mini-SAS		
	Cable, Mini-SAS to Mini-SAS 25cm	620802-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 33cm	620803-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 45cm	629072-001	Optional[2]
	Cable, Mini-SAS to Mini-SAS 46cm	620810-001	Optional[2]
17	Cable, Mini SAS to 2 SATA		
	Cable, Mini SAS to 2 SATA 25/19cm	620804-001	Optional[2]
	Cable, Mini SAS to 2 SATA 35/39cm	620805-001	Optional[2]
18	Cable, U Type Mini SAS to Mini SAS cable	620797-001	Optional[2]
19	Cable, Right Exit Mini SAS to Mini SAS cable	620798-001	Optional[2]
20	Cable, Mini SAS to SAS 160mm A	632804-001	Optional[2]
21	Cable, RPS, power backplane to midplane	620807-001	Optional[2]
22	Cable, power backplane cable	632799-001	Optional[2]
23	2U riser card (PCIe x8, x8, x8)	536656-001	Optional[2]
24	2U riser card (PCIe x16, x8)	536655-001	Optional[2]
25	2U riser card (PCIe x16, x4, x4)	536657-001	Optional[2]

Table 3 System Components Spare Parts List

Item	Description	Spare Part Number	Customer Self Repair
*	Bezel, left front power, node 1	620819-001	Mandatory[1]
*	Bezel, right front power, node 3	620820-001	Mandatory[1]
*	IPMI riser board	536668-001	Optional[2]
*	Bus bar	620808-001	Mandatory[1]
*	Cable, GPU power	620794-001	Optional[2]

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

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

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

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

[2]Optional: 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 HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP 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.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.

[2]Optional: 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 HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand-und Arbeitskosten für diesen Service berechnet.

[2]Optional: 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 HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No" bzw. „Nein" gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

[2]Optional: Opcional—componentes para los que la 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 HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP 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.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.

[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

[3]No: Nee—Sommige HP 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".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

[2]Optional: 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 HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

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

HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- In other locations, see the HP website at **http://www.hp.com/**.

For HP technical support:

- In North America:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, see the HP website at **http://www.hp.com/**.
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, see the HP website at **http://www.hp.com/**.

Before you contact HP

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware model number and serial number
- Third-party hardware or software model number
- Operating system type and revision level

Removal and replacement procedures

This chapter provides subassembly/module-level removal and replacement procedures for the HP ProLiant DL170e G6 server.

Review the specifications of a new component before installing it to make sure it is compatible with the server. When you integrate new components into the system, record its model and serial number, and any other pertinent information for future reference. After completing any removal or replacement procedure, run the diagnostics program to verify that all components operate properly.

NOTE: The figures used in this chapter to illustrate procedural steps are labeled numerically (i.e., 1, 2…). When these figures are used in substep items, the alphabetically labeled instructions correspond to the numbered labels on the related figure (i.e., label 1 corresponds to step a, label 2 corresponds to step b, etc.). The procedures described in this section assume that the server is out of the rack and is positioned on a flat, stable surface.

Hardware configuration tools

You will need the following tools:

- T-10/T-15 wrench (torque wrench)
- Slotted or crossed screwdrivers

The following references and software tools will assist with the hardware configuration:

- IPMI Event Log
- Diagnostics Software

Hardware configuration information

Electrostatic discharge information

An electrostatic discharge (ESD) can damage static-sensitive devices or micro circuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Use a wrist strap connected to the work surface, and properly grounded (earthed) tools and equipment.
- Keep work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.
- Make sure that you are always properly grounded (earthed) when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives with the Printed Circuit Board (PCB) assembly-side down.
- Use conductive field service tools.

Pre-installation procedure

The nodes in this server are hot-pluggable. For removal or replacement of any component (processors, DIMMs, etc.) on the node, you can turn off and remove the corresponding node instead of turning off the entire server and opening the cover.

1. Turn off the node and all the peripherals connected to it.
2. Remove all the external cables connected to the node.
3. Remove the node out of the server and place it on a flat surface.
4. Remove the PCIe cage and air baffle.

However, when you remove or replace other components (fans, HDD backplanes, etc.) in the chassis, you need to perform the following steps:

WARNING: Failure to properly turn off the server before you open the server or before your start installing and removing components may cause serious damage as well as bodily harm.

1. Turn off the server and all the peripherals connected to it.
2. Unplug all cables from the power outlet(s) to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. If necessary, label each one to expedite reassembly.
3. Disconnect telecommunication cables to avoid exposure to shock hazard from ringing voltages.
4. If server is installed in a rack, remove server and place it on a flat surface.
5. Remove the top cover according to the instructions described in the “System covers” section in this chapter.
6. Follow the ESD precautions listed previously in this chapter when handling a server component.

IMPORTANT: To streamline the configuration process, read through the entire installation and removal procedures first and make sure you understand them before you begin.

Post-installation instructions

Observe the following items after installing or removing a component (processors, DIMMs, etc.) from the node:

1. Install the PCIe cage and air baffle.
2. Install the node into the server.
3. Connect all external cables to the node.
4. Press the node power button on the front panel of the server to turn on the node.

Observe the following items after installing or removing a component (fans, HDD backplanes, etc.) from the chassis:

1. Be sure all components are installed according to the described step-by-step instructions.
2. Check to make sure you have not left loose tools or parts inside the server.
3. Reinstall the PCIe cage, air baffle, peripherals, and system cables that you have removed.
4. Reinstall the top cover.

5. Reinstall server into rack.
6. Connect all external cables and the AC power cord(s) to the system.
7. Press the node power buttons on the front panel to turn on the corresponding system.

Server warnings and cautions

Before installing a server, be sure that you understand the following warnings and cautions.

⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

⚠ **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:** Do not operate the server for long periods with the system cover open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

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.

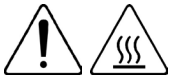
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

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.

Weight in kg.
Weight in lb.

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 completely disconnect power from the system.

Powering down the server

The corresponding system does not completely power down when the node power buttons on the front panel are pressed. The button toggles between On and Standby. The standby position removes power from most electronics and the drives, but some internal circuitry remains active. To completely remove all power from the system, disconnect all power cords from the server.

To power down the server:

1. Shut down the server as directed by the operating system documentation.
2. Press the node power buttons to toggle to Standby.

   This places the server in standby mode changing the power LED indicator to amber. In this mode, the main power supply output is disabled. Standby does not completely disable or remove power from the system.
3. Disconnect the AC power cord(s) from the power outlet(s) and then from the server.
4. Be sure that the power LED indicator is turned off and that the fan noise has stopped.
5. Disconnect all peripheral devices from the server.

The nodes in this server are hot-pluggable, so it is enough to power down a single node instead of the entire server when removing and operating a single node.

To power down a single node:

1. Press the node power button to toggle to Standby.
2. Disconnect all external cables from the node.

For steps about removing the node from the server, see the section of System board removal and replacement procedure.

System covers

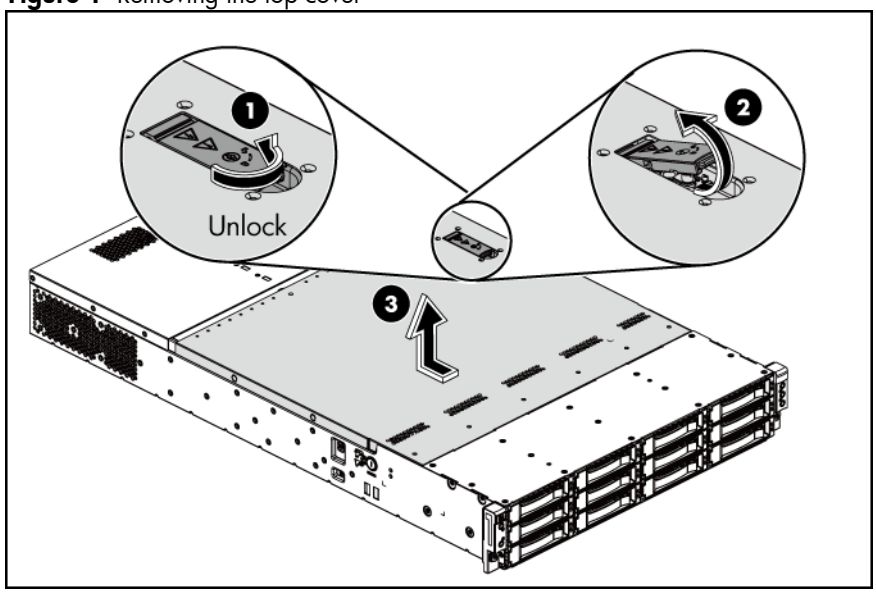
The server supports hot-pluggable system board trays, so that you do not need to remove the top cover before you remove the system board trays from the chassis. However, for other chassis components besides those on the system board trays, you need to remove the top cover before you remove or replace them.

Top cover

To remove the top cover:

1. Unlock the button on the top cover using the T10/T15 wrench.
2. Pull up the latch in the open (up) position.
3. Slide the top cover approximately 12.5 mm (0.5 in.) toward the rear of the unit and then lift the top cover away from the chassis.

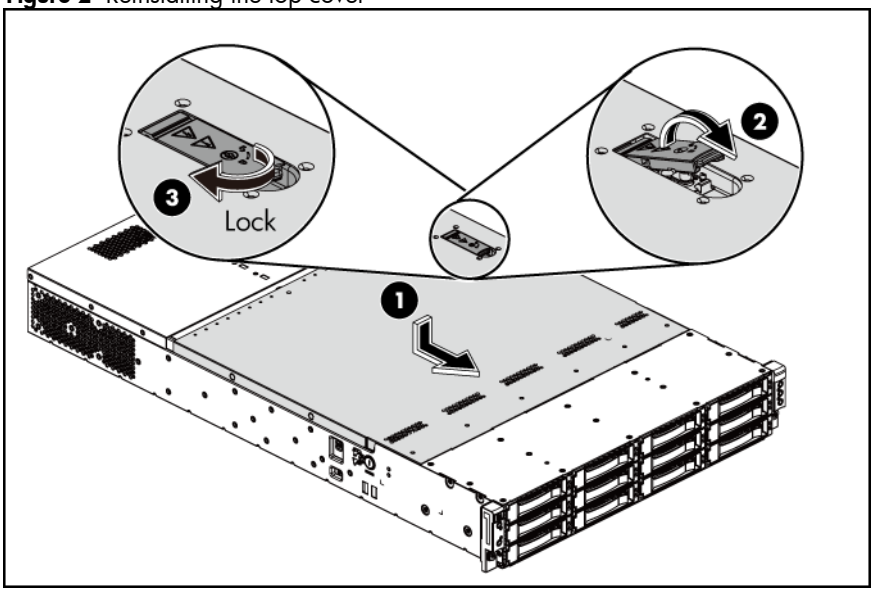
Figure 1 Removing the top cover



To install the top cover:

1. Place the latch in the open position. Insert the bottom tabs of the top cover into the matching slots in the server chassis. Align the top cover to the chassis and then slide it towards the front panel to position it into place.
2. Press down the latch.
3. Lock the cover in place with the T10/T15 wrench.

Figure 2 Reinstalling the top cover



Drives

The server can support up to twelve 3.5 in. hard disk drives and twenty-four 2.5 in. hard disk drives.

Cable management

Always follow good cable management practices when working inside the computer.

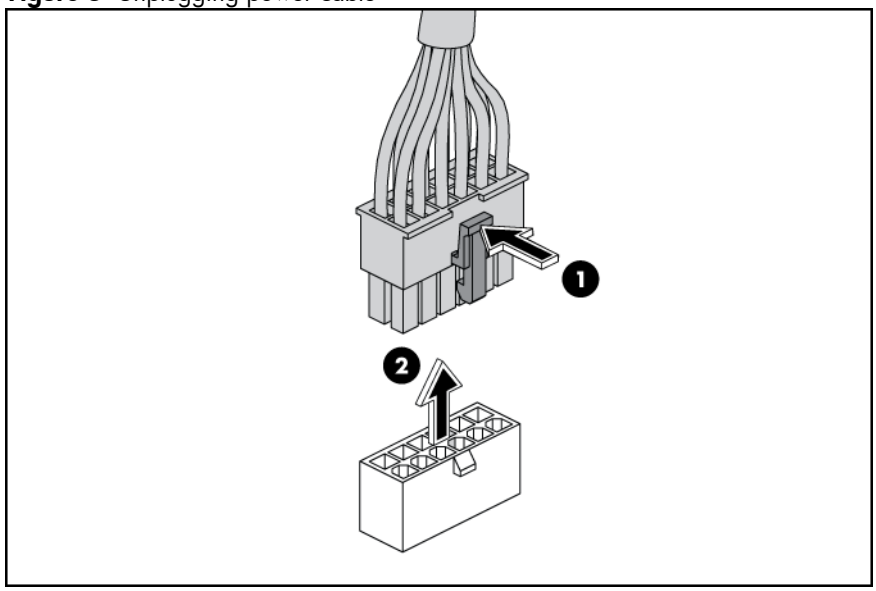
- Keep cables away from major heat sources like the heat sink.
- Do not jam cables on top of expansion cards or memory modules. Printed circuit cards are not designed to withstand excessive pressure.
- Keep cables clear of sliding or moveable parts to prevent cutting or crimping.
- When folding a flat ribbon cable, never fold to a sharp crease. Sharp creases may damage the wires.
- Some flat ribbon cables come pre-folded. Never change the folds on these cables.
- Do not sharply bend any cable. A sharp bend can break the internal wires.
- Never bend a SATA data cable tighter than a 30 mm (1.18 in.) radius.
- Never crease a SATA data cable.
- Do not rely on components like the drive cage, power supply, or system cover to push cables down into the chassis.

Removing power supply cables from the system board connectors (J36) follow below steps:

1. Squeeze on the top of the retaining latch attached to the cable end of the connector.
2. Grasp the cable end of the connector and pull it straight up.

△ **CAUTION:** Always pull the connector—NEVER pull on the cable. Pulling on the cable could damage the cable and result in a failed power supply.

Figure 3 Unplugging power cable



Cable connections

The following tables provide information about switching power supply cable connector labels.

Table 4 Cable Connections for Bottom Power Backplane

Cable		From	To	Bottom Power Backplane Designator
RPS cable 1		Bottom power backplane RPS power connector	Bottom Midplane power connector (J10)	J5
RPS cable 2		Bottom power backplane RPS power connector	Top Midplane power connector (J16)	J6
HDD BP power cable		Bottom power backplane HDD power connector	HDD BP power connector (J1)	J7
System fan power cable	P1	Bottom power backplane 2x8 pin fan power connector	System Fan 1	J3
	P2		System Fan 2	
	P3		System Fan 3	
	P4		System Fan 4	
Power backplane cable		Bottom power backplane power signal connector	Top power backplane power signal connector (J2)	J12

Table 5 System Board Power Cable Connections

Cable	From	To	System Board Designator
Adapter to system board PWR cable	Bottom adapter board board-in power terminal	System board 12-pin power connector	J36
Adapter to system board RPS cable	Bottom adapter board RPS connector (J2)	System board RPS connector	J42

The following table provides the system board designators that various cables plug into. For more detailed information about system board components, see system board components.

Table 6 System Board Cable Connections

Cable		From	To	System Board Designator
Internal USB connector		USB 2.0 port	Node USB	J38
Mini-SAS to 4-SATA/SGPIO cable	P0	Mini-SAS Connector 1 (J3) on adapter board	Node SATA0	J32
	P1		Node SATA1	J9
	P2		Node SATA2	J18
	P3		Node SATA3	J19
	SGPIO cable		Node SGPIO connector	J39
Mini-SAS to 2-SATA cable	P1	Mini-SAS Connector 2 (J4) on adapter board	Node SATA4	J22
	P2		Node SATA5	J25

Table 7 8 LFF HDD BP Cable Connection (4-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS 25cm	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J2
Mini-SAS to Mini-SAS 33cm	Top midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 2	J3
Mini-SAS to Mini-SAS 25cm	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J9
Mini-SAS to Mini-SAS 33cm	Top midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 4	J10

Table 8 8 LFF HDD BP Cable Connection (2-node)

Cable	From	To	BP Designator
Mini-SAS to 2 Mini-SAS	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J2
		HDD BP Mini-SAS connector 2	J3
Mini-SAS to 2 Mini-SAS	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J9
		HDD BP Mini-SAS connector 4	J10

Table 9 12 LFF HDD BP Cable Connection (4-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS/SATA short	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J2
		HDD BP Mini-SATA connector 1	J4
Mini-SAS to Mini-SAS/SATA long	Top midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 2	J3
		HDD BP Mini-SATA connector 2	J5
Mini-SAS to Mini-SAS/SATA long	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J9
		HDD BP Mini-SATA connector 3	J7
Mini-SAS to Mini-SAS/SATA short	Top midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 4	J10
		HDD BP Mini-SATA connector 4	J8

Table 10 12 LFF HDD BP Cable Connection (2-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS+2 SATA short	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J2
		HDD BP Mini-SATA connector 1	J4
		HDD BP Mini-SATA connector 2	J5
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 2 (J3)	HDD BP Mini-SAS connector 2	J3
Mini-SAS to Mini-SAS+2 SATA long	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J9
		HDD BP Mini-SATA connector 3	J7
		HDD BP Mini-SATA connector 4	J8
Mini-SAS to Mini-SAS 16cm	Bottom midplane Mini-SAS connector 2 (J2)	HDD BP Mini-SAS connector 4	J10

Table 11 16 SFF HDD BP Cable Connection (4-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J29
Mini-SAS to Mini-SAS 33cm	Top midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 2	J25
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J31
Mini-SAS to Mini-SAS 25cm	Top midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 4	J28

Table 12 16 SFF HDD BP Cable Connection (2-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J29
Mini-SAS to Mini-SAS 45cm	Bottom midplane Mini-SAS connector 2 (J3)	HDD BP Mini-SAS connector 2	J25
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 3	J31
Mini-SAS to Mini-SAS 25cm	Bottom midplane Mini-SAS connector 2 (J2)	HDD BP Mini-SAS connector 4	J28

NOTE: For 2 nodes to support 16 SFF HDD, besides cabling the HDD BP and midplane as shown in Table 12, you still need to install one P410 card on each 2U node and connect the P410 card cables as shown in Table 13.

Table 13 Cable Connection for P410 Cards on 16-SFF-HDD and 2-Node System

Cable	From	To	Adapter Board Designator
Right Exit Mini-SAS to Mini-SAS cable	Mini-SAS connector 1 (J6) on P410 card	Mini-SAS connector 1 on bottom adapter board	J3
U Type Mini-SAS to Mini-SAS cable	Mini-SAS connector 2 (J5) on P410 card	Mini-SAS connector 2 on bottom adapter board	J4

Table 14 24 SFF HDD BP Cable Connection (4-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS 25cm	Bottom midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 1	J29
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 2 (J3)	HDD BP Mini-SAS connector 2	J25
Mini-SAS to Mini-SAS 33cm	Top midplane Mini-SAS connector 1 (J5)	HDD BP Mini-SAS connector 3	J31
Mini-SAS to Mini-SAS 45cm	Top midplane Mini-SAS connector 2 (J3)	HDD BP Mini-SAS connector 4	J28
Mini-SAS to Mini-SAS 33cm	Bottom midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 5	J26

Table 14 24 SFF HDD BP Cable Connection (4-node)

Cable	From	To	BP Designator
Mini-SAS to Mini-SAS 25cm	Bottom midplane Mini-SAS connector 2 (J2)	HDD BP Mini-SAS connector 6	J28
Mini-SAS to Mini-SAS 25cm	Top midplane Mini-SAS connector 1 (J6)	HDD BP Mini-SAS connector 7	J40
Mini-SAS to Mini-SAS 25cm	Top midplane Mini-SAS connector 2 (J2)	HDD BP Mini-SAS connector 8	J30

NOTE: For 2 nodes to support 24 SFF HDD, besides cabling the HDD BP and midplane as shown in Table 14, you still need to install two P410 cards on 2U node and connect the P410 card cables as shown in Table 15.

Table 15 Cable Connection for P410 Cards on 24-SFF-HDD and 2-Node System

Cable	From	To	Adapter Board Designator
(Bottom P410 card) Right Exit Mini-SAS to Mini-SAS cable	Mini-SAS connector 1 (J6) on bottom P410 card	Mini-SAS connector 1 on bottom adapter board	J3
(Bottom P410 card) U Type Mini-SAS to Mini-SAS cable	Mini-SAS connector 2 (J5) on bottom P410 card	Mini-SAS connector 2 on bottom adapter board	J4
(Top P410 card) Right Exit Mini-SAS to Mini-SAS cable	Mini-SAS connector 1 (J6) on top P410 card	Mini-SAS connector 1 on top adapter board	J3

Table 16 Cable Connection for P212 Card

Cable	From	To	Adapter Board Designator
Mini-SAS to Mini-SAS cable 46cm	Mini-SAS connector (J6) on P212 card	Mini-SAS connector 1 on adapter board	J3

Table 17 Cable Connection for SAS Expander Card with P410 Card and Adapter Boards

Cable	From	To
Mini-SAS to Mini-SAS cable 46cm	Mini-SAS connector 2 on SAS expander card	Mini-SAS connector 1 on bottom adapter board
Mini-SAS to Mini-SAS cable 46cm	Mini-SAS connector 3 on SAS expander card	Mini-SAS connector 2 on bottom adapter board
Mini-SAS to Mini-SAS cable 46cm	Mini-SAS connector 4 on SAS expander card	Mini-SAS connector 1 on top adapter board
Mini-SAS to Mini-SAS cable 46cm	Mini-SAS connector 5 on SAS expander card	Mini-SAS connector 2 on top adapter board
Mini-SAS to Mini-SAS cable 16cm	Mini-SAS connector 8 on SAS expander card	Mini-SAS connector 1 on P410 card
Mini-SAS to Mini-SAS cable 16cm	Mini-SAS connector 9 on SAS expander card	Mini-SAS connector 2 on P410 card

Table 18 Cable Connection for GPU Card

Cable	From	To
GPU power cable	(2U node) Top adapter board board-in power terminal	GPU power connector(s)

Drive bay and hard drive configuration

The server supports the following hard disk drive bay configuration:

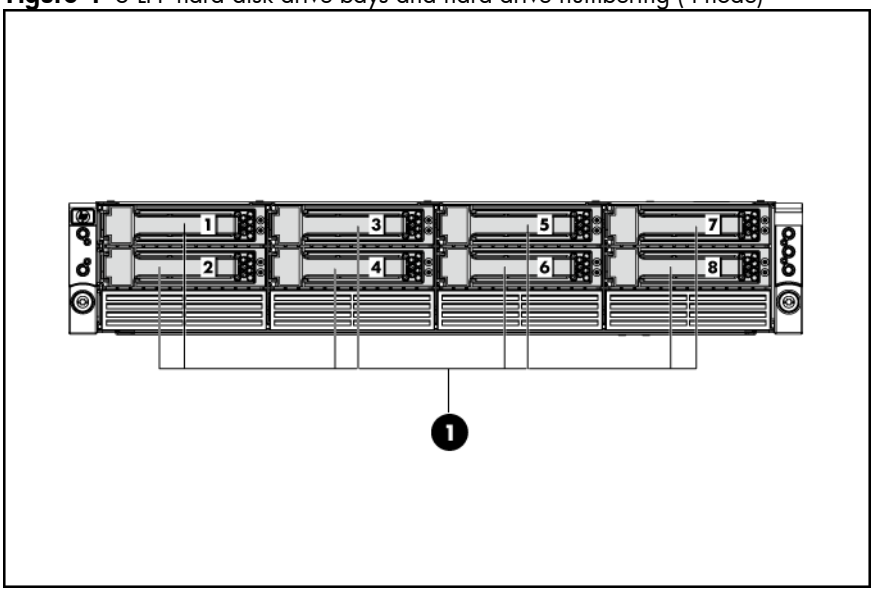
- 8 or 12 LFF hard disk drive bays, or
- 16 or 24 SFF hard disk drive bays

And correspondingly, the different types of hard disk drive bay configuration support the following hard drive configuration in respective:

- 8 or 12 LFF hard drives, or
- 16 or 24 SFF hard drives

NOTE: For HP ProLiant DL170e G6 server with 8 LFF HDD, the 4-node and 2-node systems are different in the hard drive bay configuration as shown below.

Figure 4 8 LFF hard disk drive bays and hard drive numbering (4-node)

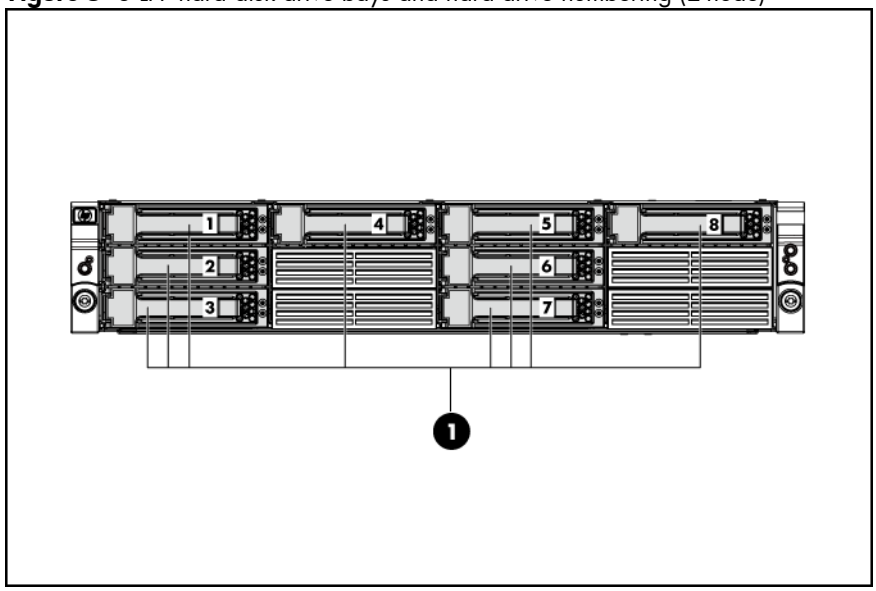


Item	Description
1	LFF hard disk drive bays (eight)

Supported hard drive configuration for 8 LFF HDD 4-node model: 4 nodes (1, 2, 3&4) each with 2 HDDs

1-1	2-1	3-1	4-1
1-2	2-2	3-2	4-2

Figure 5 8 LFF hard disk drive bays and hard drive numbering (2-node)



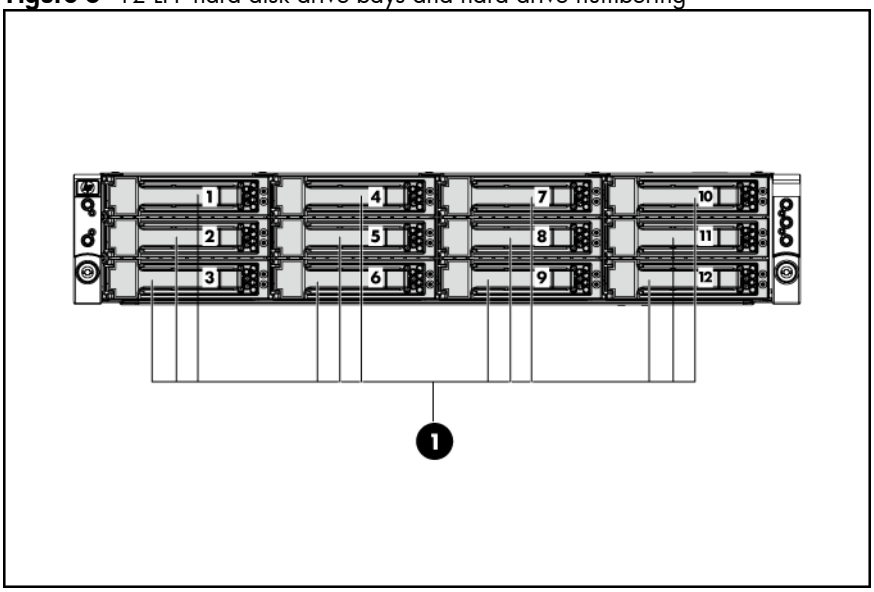
Item	Description
1	LFF hard disk drive bays (eight)

Supported hard drive configuration for 8 LFF HDD 2-node model: 2 nodes (1&3) each with 4 HDDs

1-1	1-4	3-1	3-4
1-2		3-2	
1-3		3-3	

NOTE: For 12 LFF, 16 SFF and 24 SFF models, we use the 4-node systems as examples to describe the hard disk drive bays and hard drive numbering. The 2-node systems share the same drive bay configuration and hard drive numbering with the corresponding 4-node systems.

Figure 6 12 LFF hard disk drive bays and hard drive numbering



Item	Description
1	LFF hard disk drive bays (twelve)

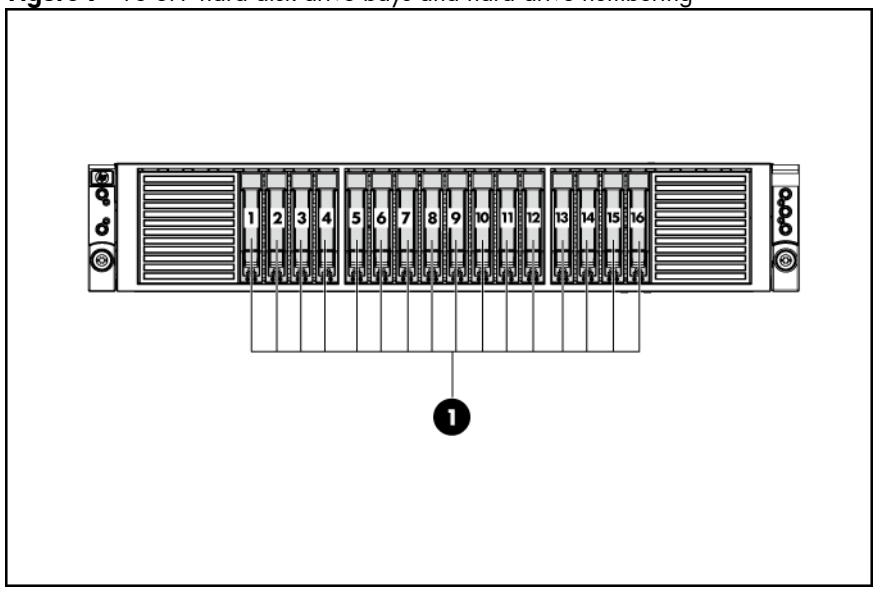
Supported drive configuration for 12 LFF HDD 4-node model: 4 nodes (1, 2, 3&4) each with 3 HDDs

1-1	2-1	3-1	4-1
1-2	2-2	3-2	4-2
1-3	2-3	3-3	4-3

Supported drive configuration for 12 LFF HDD 2-node model: 2 nodes (1&3) each with 6 HDDs

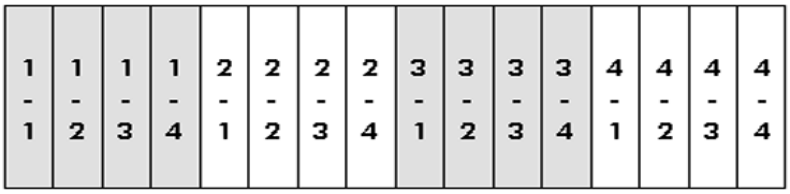
1-1	1-4	3-1	3-4
1-2	1-5	3-2	3-5
1-3	1-6	3-3	3-6

Figure 7 16 SFF hard disk drive bays and hard drive numbering



Item	Description
1	SFF hard disk drive bays (sixteen)

Supported drive configuration for 16 SFF HDD 4-node model: 4 nodes (1, 2, 3&4) each with 4 HDDs



Supported drive configuration for 16 SFF HDD 2-node model: 2 nodes (1&3) each with 8 HDDs

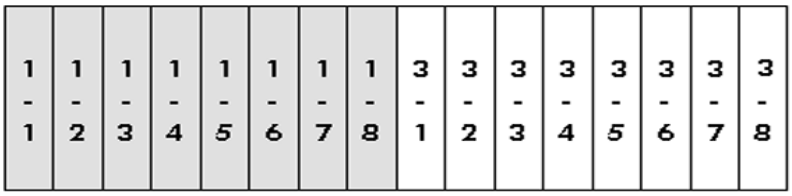
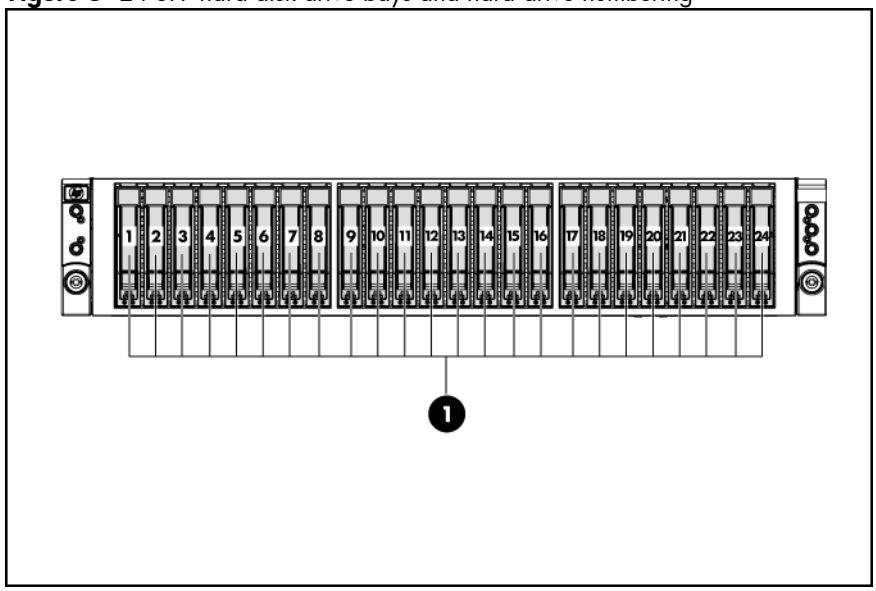
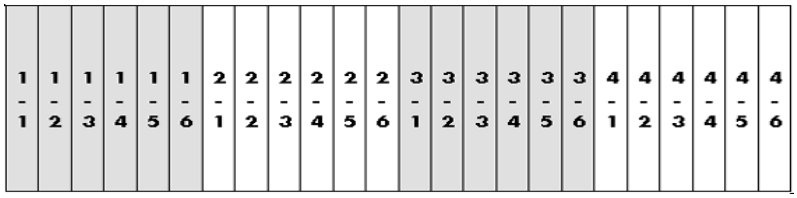


Figure 8 24 SFF hard disk drive bays and hard drive numbering

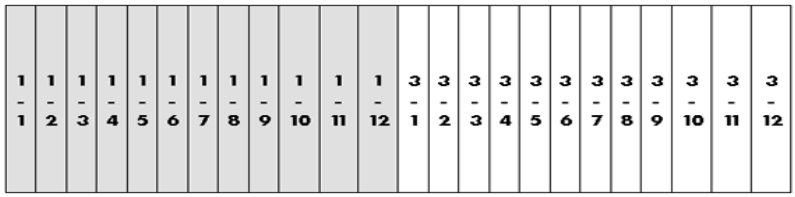


Item	Description
1	SFF hard disk drive bays (twenty-four)

Supported drive configuration for 24 SFF HDD 4-node model: 4 nodes (1, 2, 3&4) each with 6 HDDs



Supported drive configuration for 24 SFF HDD 2-node model: 2 nodes (1&3) each with 12 HDDs

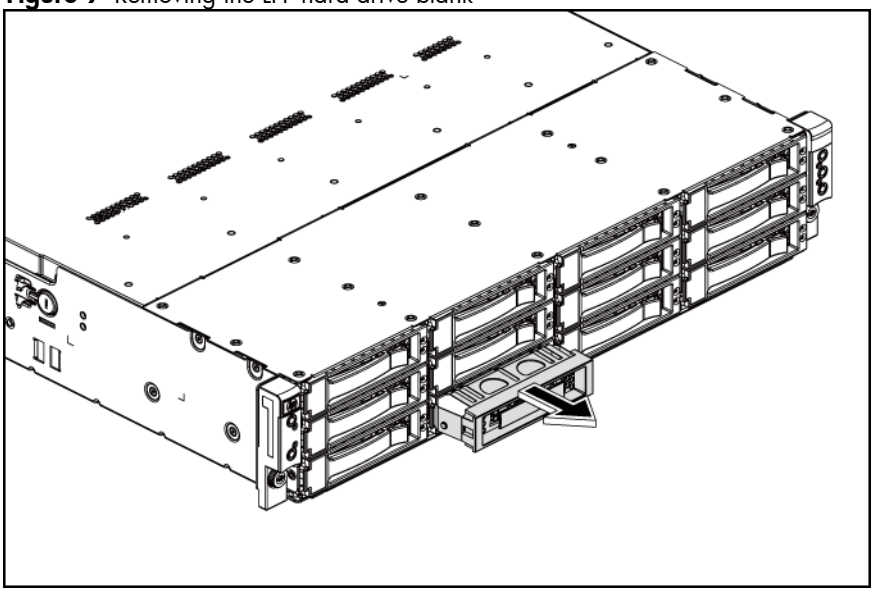


Removing the hard drives

To remove the LFF hard drive blank:

1. Pull the LFF hard drive blank out of the drive bay.

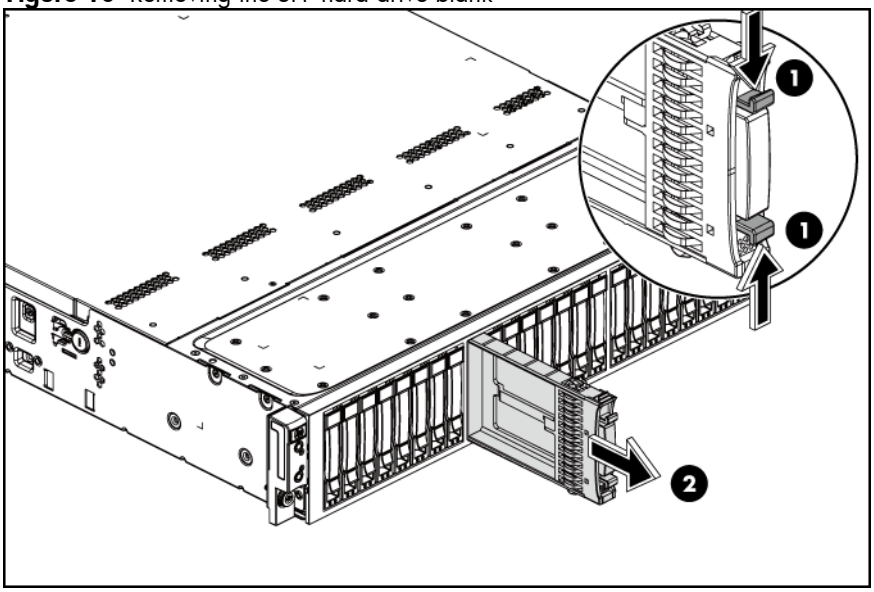
Figure 9 Removing the LFF hard drive blank



To remove the SFF hard drive blank:

1. Press the SFF hard drive blank latch to hold the hard drive blank.
2. Pull the blank out of the cage.

Figure 10 Removing the SFF hard drive blank

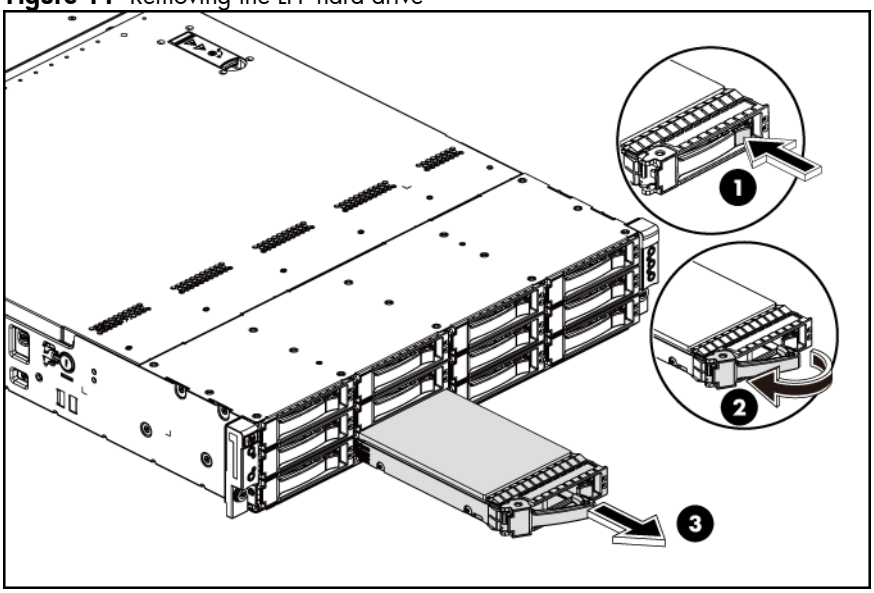


IMPORTANT: Do not discard the hard drive blank. If the drive is removed in the future, you must reinstall the hard drive blank to maintain proper system airflow.

To remove the LFF hard drive:

1. Press the hard disk carrier button to release the ejector lever.
2. Use the HDD carrier latch to pull the drive out of the cage.
   Make sure to support the drive when pulling it out of the cage.
3. Pull the hard drive assembly out of the drive bay.

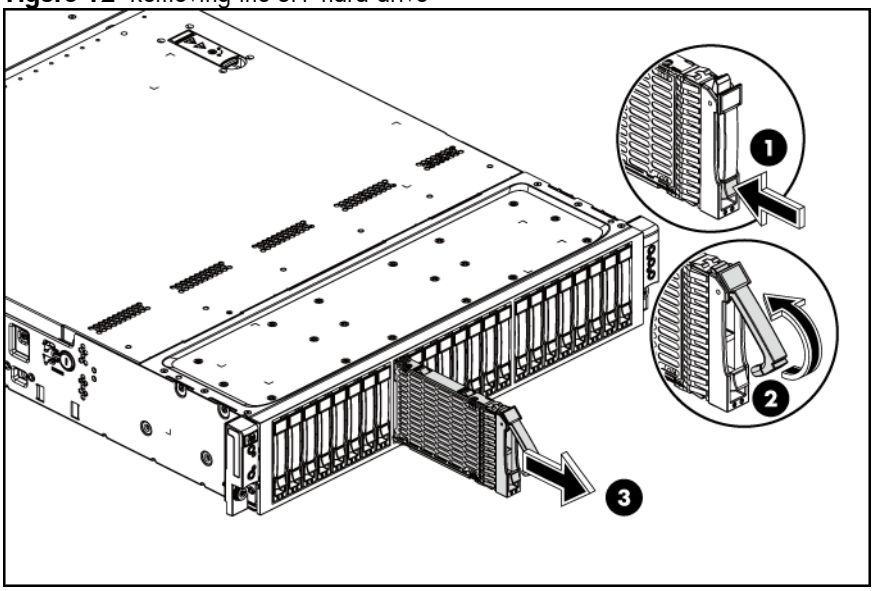
Figure 11 Removing the LFF hard drive



To remove the SFF hard drive:

1. Press the hard disk carrier button to release the ejector lever.
2. Use the HDD carrier latch to pull the drive out of the cage.
   Make sure to support the drive when pulling it out of the cage.
3. Pull the hard drive assembly out of the drive bay.

Figure 12 Removing the SFF hard drive

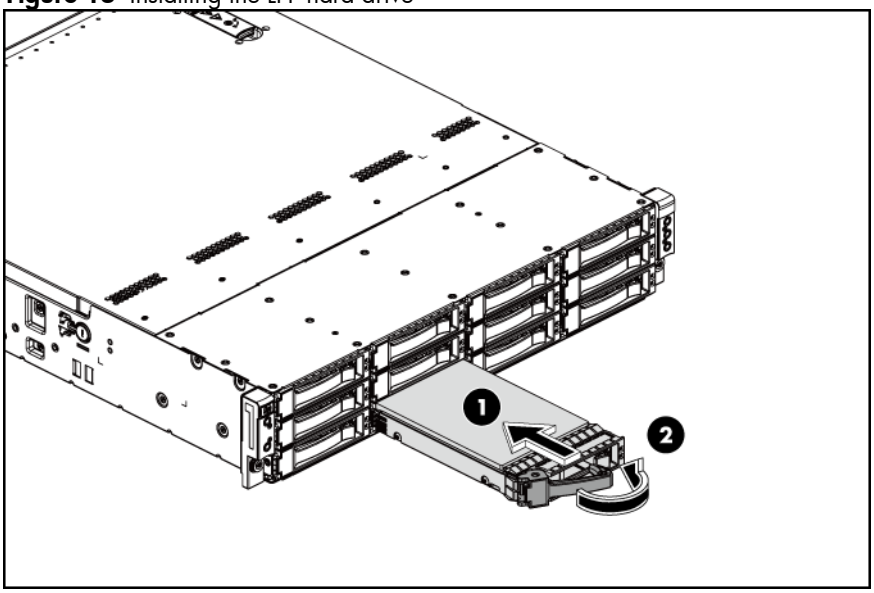


Reinstalling the hard drives

To install the LFF hard drive:

1. Push the hard drive assembly into the drive bay until it stops.
2. Press the HDD carrier latch inward until it clicks.

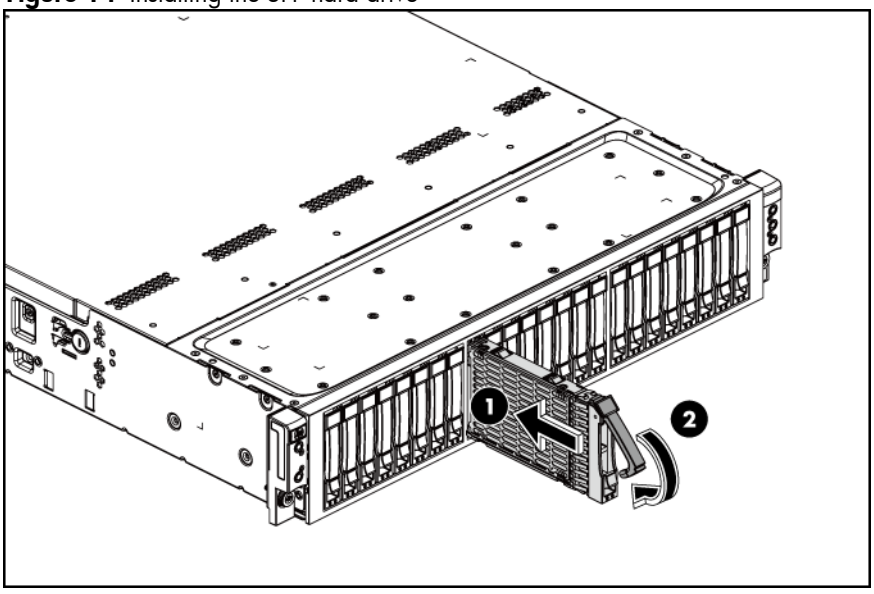
Figure 13 Installing the LFF hard drive



To install the SFF hard drive:

1. Push the hard drive assembly into the drive bay until it stops.
2. Press the HDD carrier latch inward until it clicks.

Figure 14 Installing the SFF hard drive



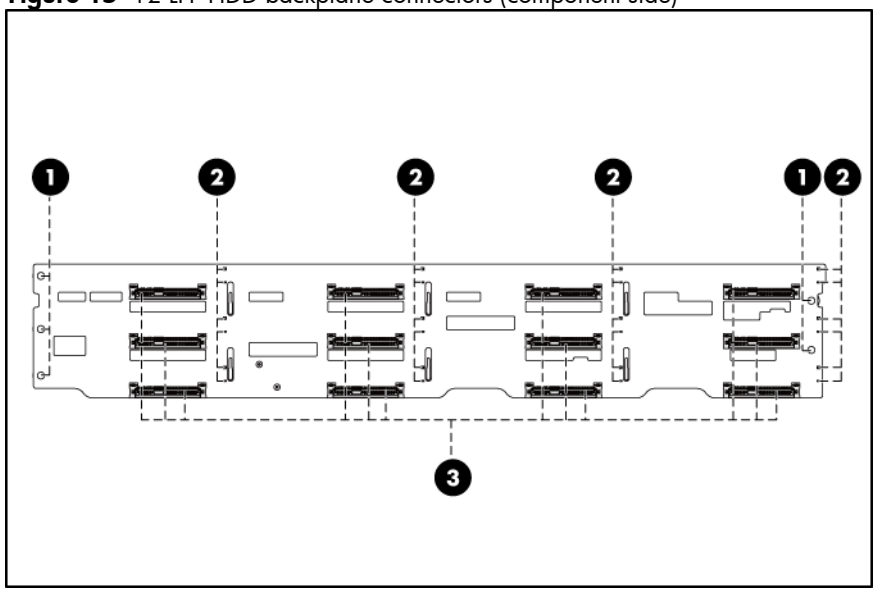
SAS/SATA HDD backplanes

The server supports the following SAS/SATA HDD backplanes:

- SAS/SATA HDD backplane for 12 LFF hard drives (for both 8 LFF and 12 LFF HDD models)
- SAS/SATA HDD backplane for 16 SFF hard drives
- SAS/SATA HDD backplane for 24 SFF hard drives

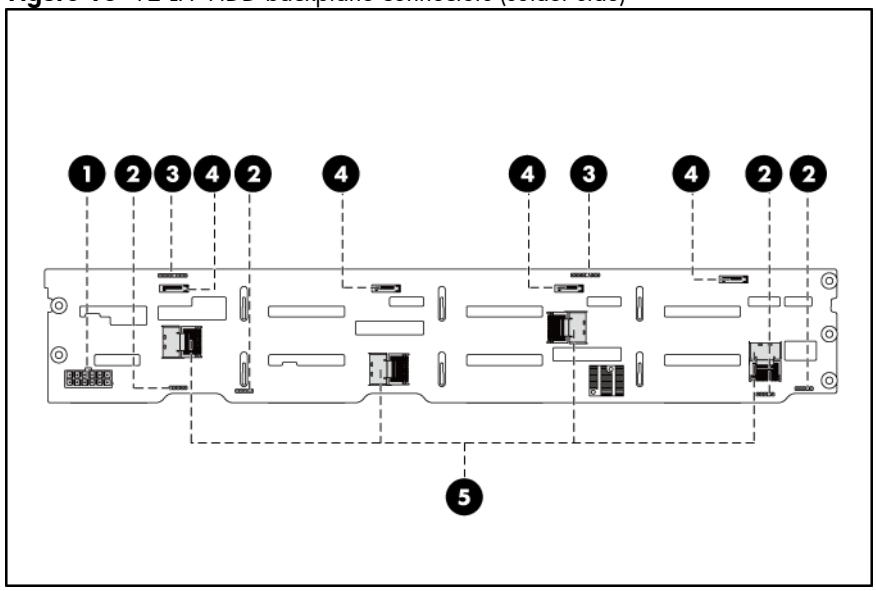
The following figures show the front and back sides of the SAS/SATA HDD backplanes:

Figure 15 12 LFF HDD backplane connectors (component side)



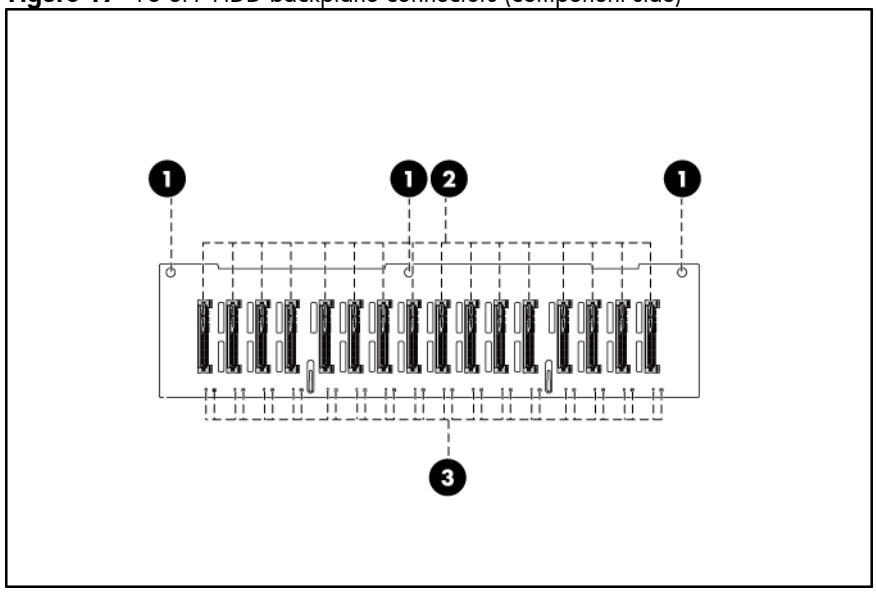
Item	Description
1	Screw holes
2	LED indicators
3	Headers for hard drive

Figure 16 12 LFF HDD backplane connectors (solder side)



Item	Description
1	2x6 pin power connector
2	PIC program connectors
3	CPLD program connectors
4	Mini-SATA connectors
5	Mini-SAS connectors

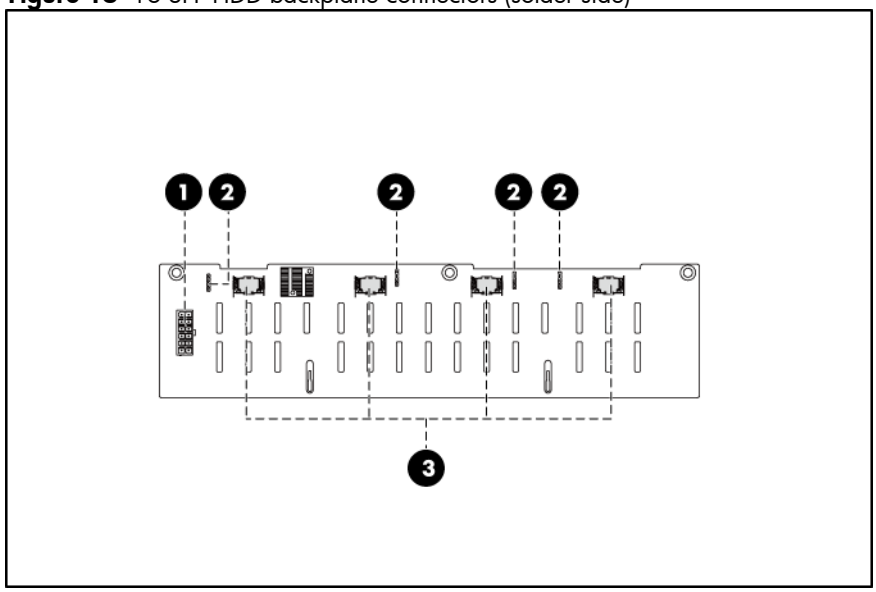
Figure 17 16 SFF HDD backplane connectors (component side)



Item	Description
1	Screw holes

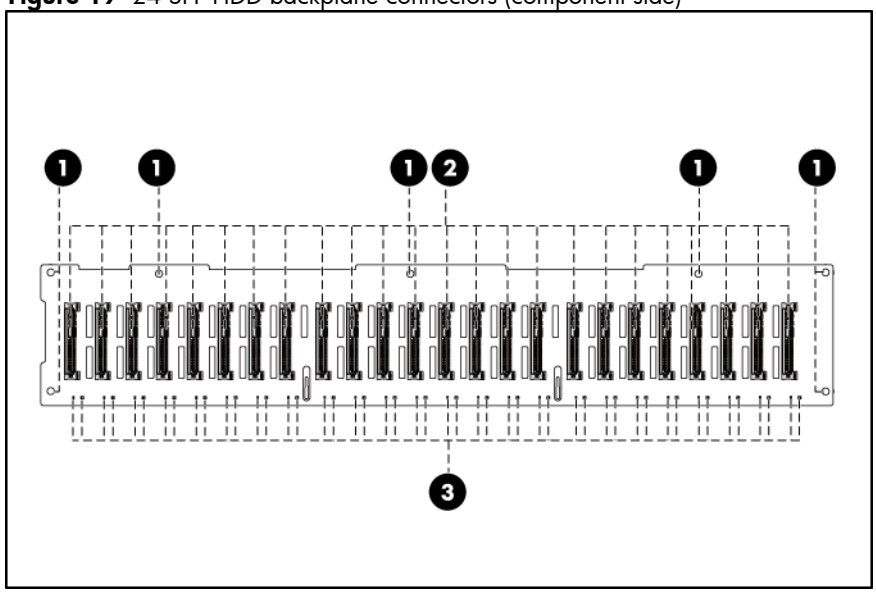
Item	Description
2	Headers for hard drive
3	LED indicators

Figure 18 16 SFF HDD backplane connectors (solder side)



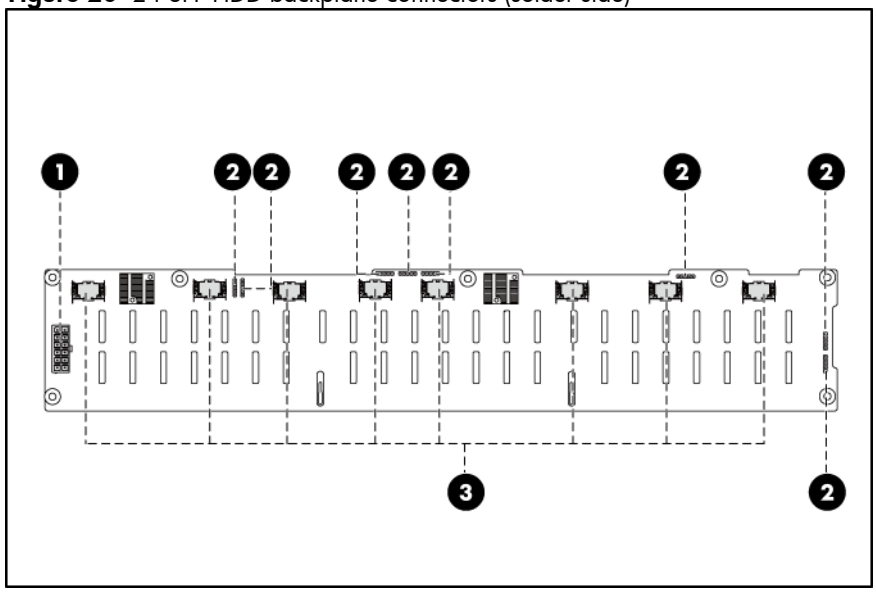
Item	Description
1	2x6 pin power connector
2	PIC program connectors
3	Mini-SAS connectors

Figure 19 24 SFF HDD backplane connectors (component side)



Item	Description
1	Screw holes
2	Headers for hard drive
3	LED indicators

Figure 20 24 SFF HDD backplane connectors (solder side)



Item	Description
1	2x6 pin power connector
2	PIC program connectors
3	Mini-SAS connectors

⚠ **WARNING:** Ensure that the system is powered off and all power sources have been disconnected from the server. Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.

NOTE: The figures below of replacing the backplane are detached from the chassis just for showing the operation steps clearly. In actual operation, make sure to make these steps in the chassis.

The following replacing procedures of the backplane use the 12 LFF HDD backplane as example.

To remove the backplane:

1. Remove all drives out of the drive bays.

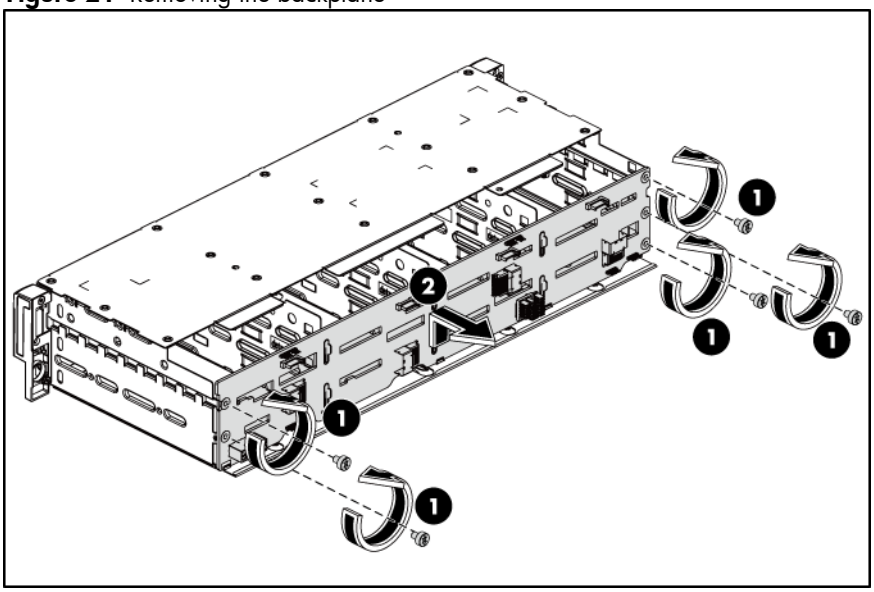
   See the Removing the hard drives section in this chapter for detailed procedures.
2. Remove the top cover.

   See the Top cover section in this chapter for detailed procedures.

3. Remove the system fan cage.

   See the System fan section in this chapter for detailed procedures.
4. Remove cables from the backplane.
5. Remove the backplane.
   a. Remove the screws that secure the backplane to the HDD cage.
   b. Pull the backplane out to release it from the HDD cage.

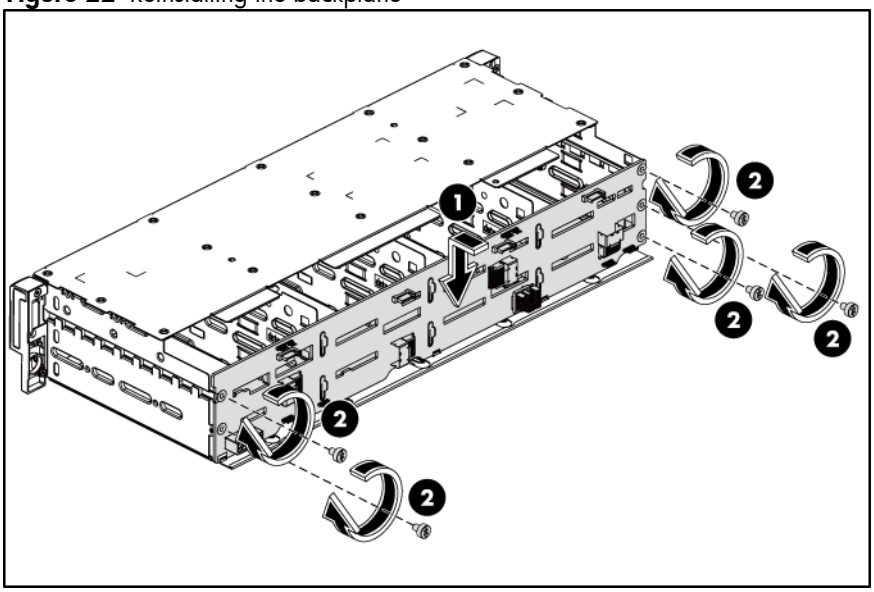
Figure 21 Removing the backplane



To install the backplane:

1. Orient the backplane so that the notches on the board align with the hooks on the HDD cage and press the board down until it clicks into place.
2. Secure the backplane with screws.

Figure 22 Reinstalling the backplane



3. Install all removed cables.

4. Reinstall the system fan cage.

   See the System fan section for detailed procedures.
5. Install the top cover.

   See the Top cover section in this chapter for detailed procedures.
6. Install the drives.

   See the Reinstalling the hard drives section in this chapter for detailed procedures.

Cable routing

The following figures show the cable routing methods for the following configurations supported by the HP ProLiant DL170e G6 server:

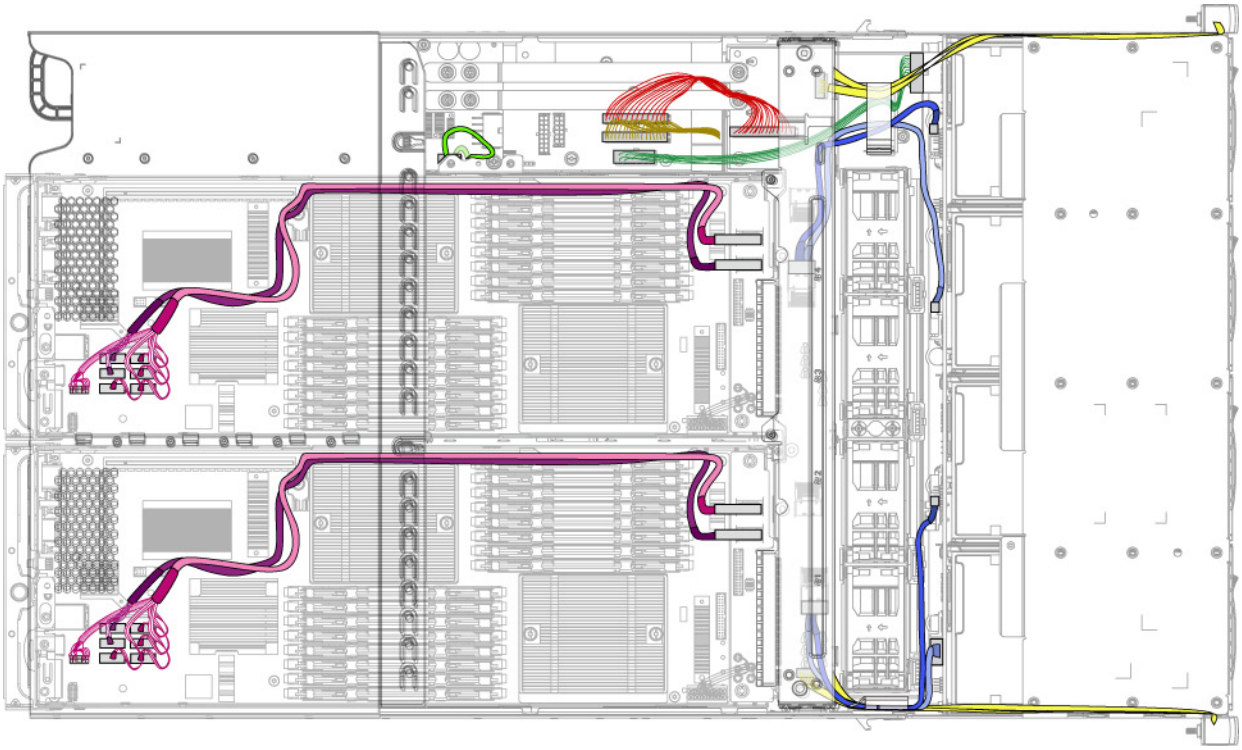
- 8 LFF HDDs / 4 nodes
- 8 LFF HDDs / 2 nodes
- 12 LFF HDDs / 4 nodes
- 12 LFF HDDs / 2 nodes
- 16 SFF HDDs / 4 nodes
- 16 SFF HDDs / 2 nodes
- 24 SFF HDDs / 4 nodes
- 24 SFF HDDs / 2 nodes

Colored figures are adopted in this section for clearer presentation of cable routings for the above configurations. The following colors are used in the following figures standing for the various types of cables:

Table 19 Description for Colors of Cables Presented in the Figures

Item	Description
	Ear board cable
	HDD backplane power cable
	Power signal cable
	RPS cable 1 (bottom power backplane RPS connector to bottom midplane RPS connector)
	RPS cable 2 (bottom power backplane RPS connector to top midplane RPS connector)
	Mini-SAS to 4-SATA/SGPIO cable
	Mini-SAS to 2-SATA cable
	Bottom midplane to HDD backplane Mini-SAS/Mini-SATA cable (see table under each figure for details)
	Top midplane to HDD backplane Mini-SAS/Mini-SATA cable (see table under each figure for details)
	(For single P410 in 1-P410 configuration or bottom P410 in 2-P410 configuration) Right Exit Mini-SAS to Mini-SAS cable
	(For top P410 in 2-P410 configuration) Right Exit Mini-SAS to Mini-SAS cable
	(For single P410 in 1-P410 configuration or bottom P410 in 2-P410 configuration) U Type Mini-SAS to Mini-SAS cable
For connection details of each cable, see the section of Cable connections.	

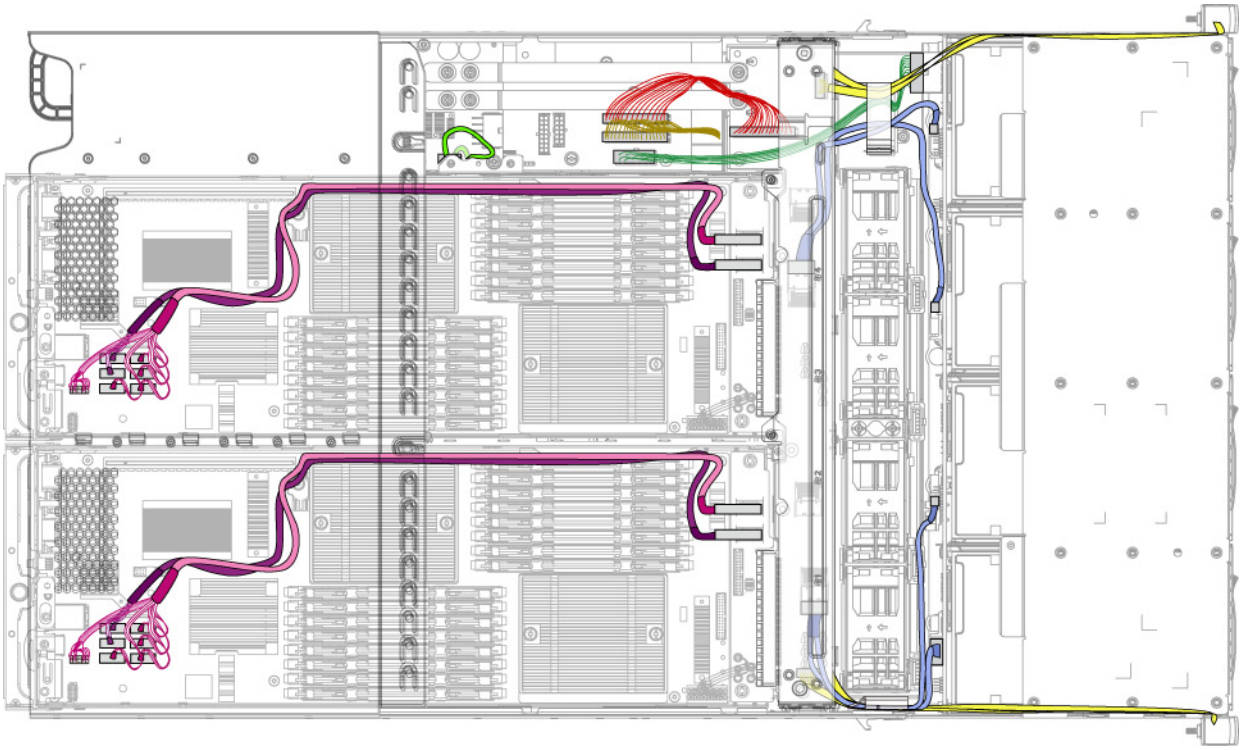
The following figure shows the cable routing for HP ProLiant DL170e G6 server with 8-LFF-HDD and 4-node configuration:



Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS cable
	Top midplane to HDD backplane Mini-SAS to Mini-SAS cable

For connection details about the Mini-SAS to Mini-SAS cables, see Table 7.
For details about other cables, see Table 19.

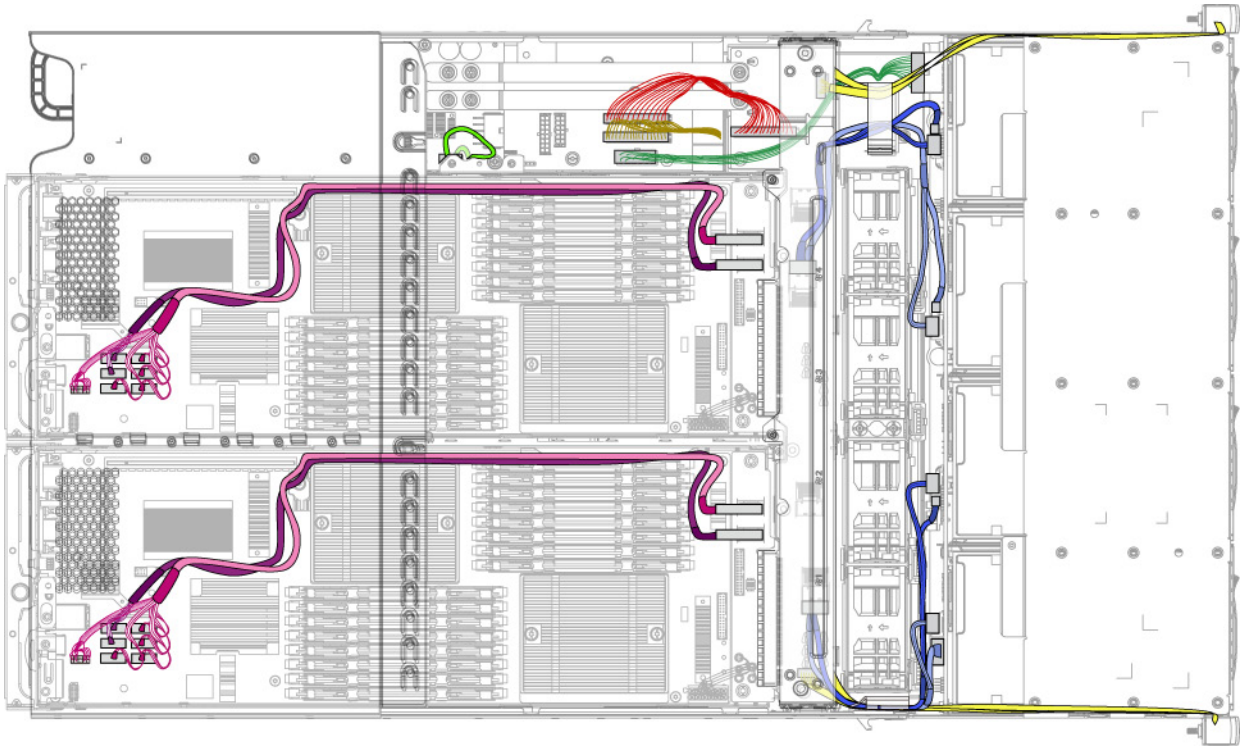
The following figure shows the cable routing for HP ProLiant DL170e G6 server with 8-LFF-HDD and 2-node configuration:



Item	Description
	Bottom midplane to HDD backplane Mini-SAS to 2 Mini-SAS cable

For connection details about the Mini-SAS to 2 Mini-SAS cable, see Table 8.
For details about other cables, see Table 19.

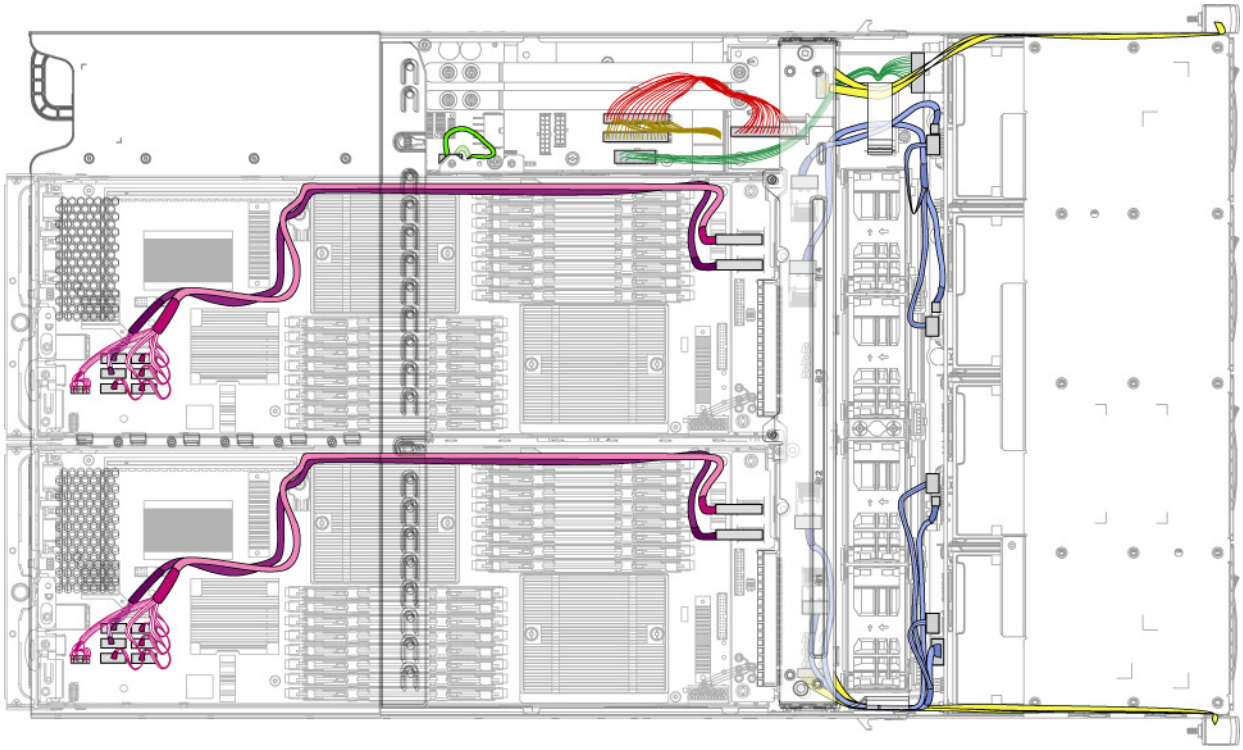
The following figure shows the cable routing for HP ProLiant DL170e G6 server with 12-LFF-HDD and 4-node configuration:



Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS/Mini-SATA cable
	Top midplane to HDD backplane Mini-SAS to Mini-SAS/Mini-SATA cable

For connection details of the Mini-SAS to Mini-SAS/Mini-SATA cable, see Table 9.
For details about other cables, see Table 19.

The following figure shows the cable routing for HP ProLiant DL170e G6 server with 12-LFF-HDD and 2-node configuration:

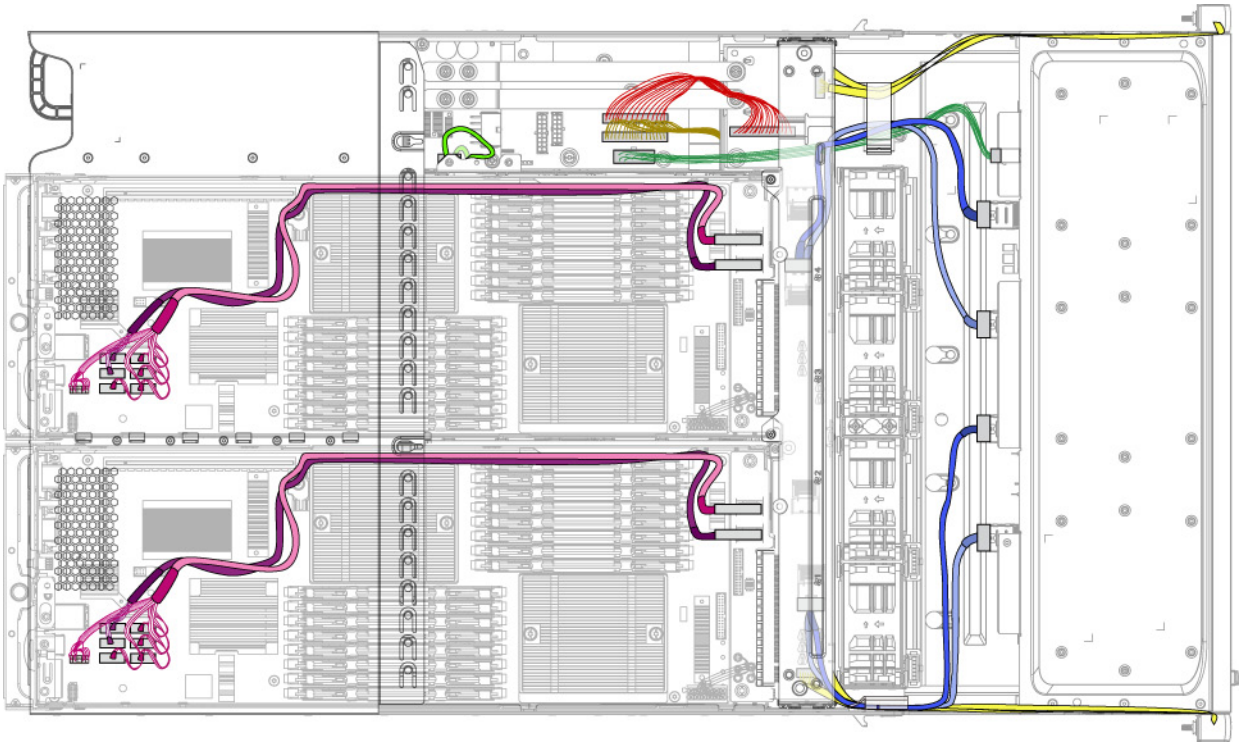


Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS cable & Mini-SAS to Mini-SAS/2 SATA cable

For connection details of the Mini-SAS to Mini-SAS cable and Mini-SAS to Mini-SAS/2 SATA cable, see Table 10.

For details about other cables, see Table 19.

The following figure shows the cable routing for HP ProLiant DL170e G6 server with 16-SFF-HDD and 4-node configuration:



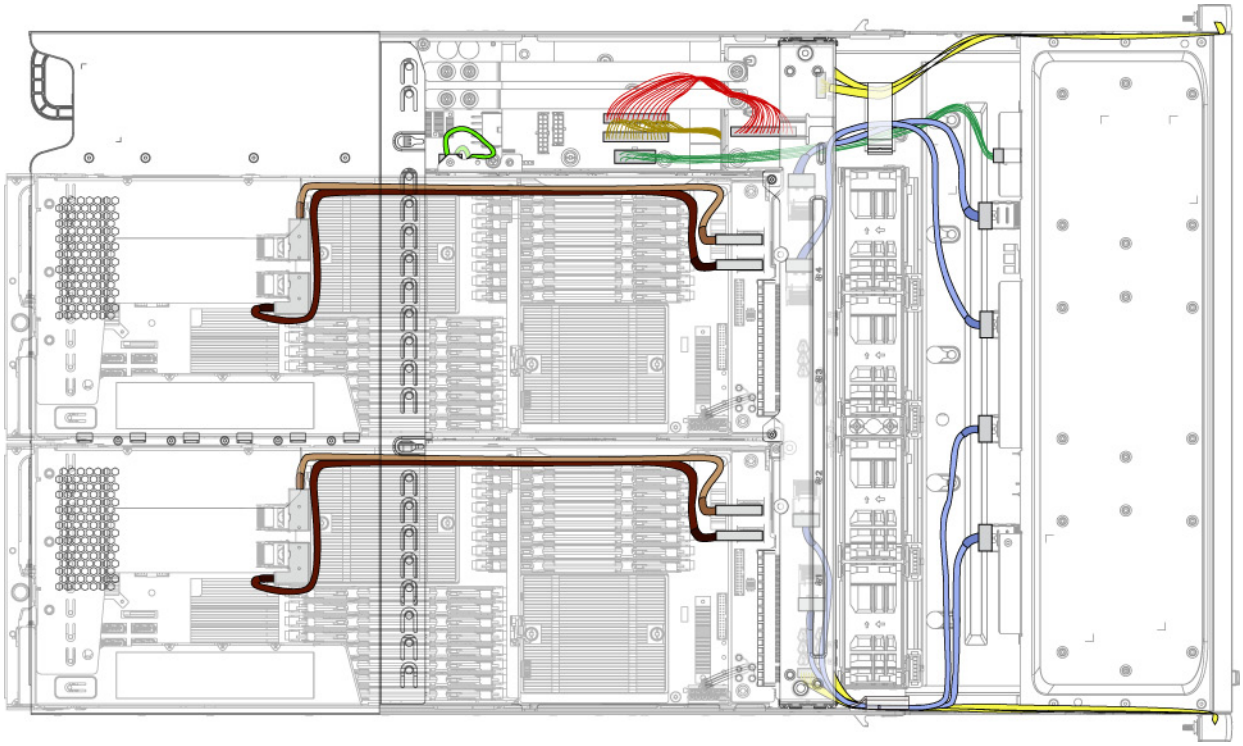
Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS cable
	Top midplane to HDD backplane Mini-SAS to Mini-SAS cable

For connection details about the Mini-SAS to Mini-SAS cable, see Table 11.
For details about other cables, see Table 19.

The 16-SFF-HDD and 2-node configuration requires the configuration of one smart array P410 controller board on each of the two system boards.

The following figure shows the cable routing for HP ProLiant DL170e G6 server with 16-SFF-HDD and 2-node configuration:

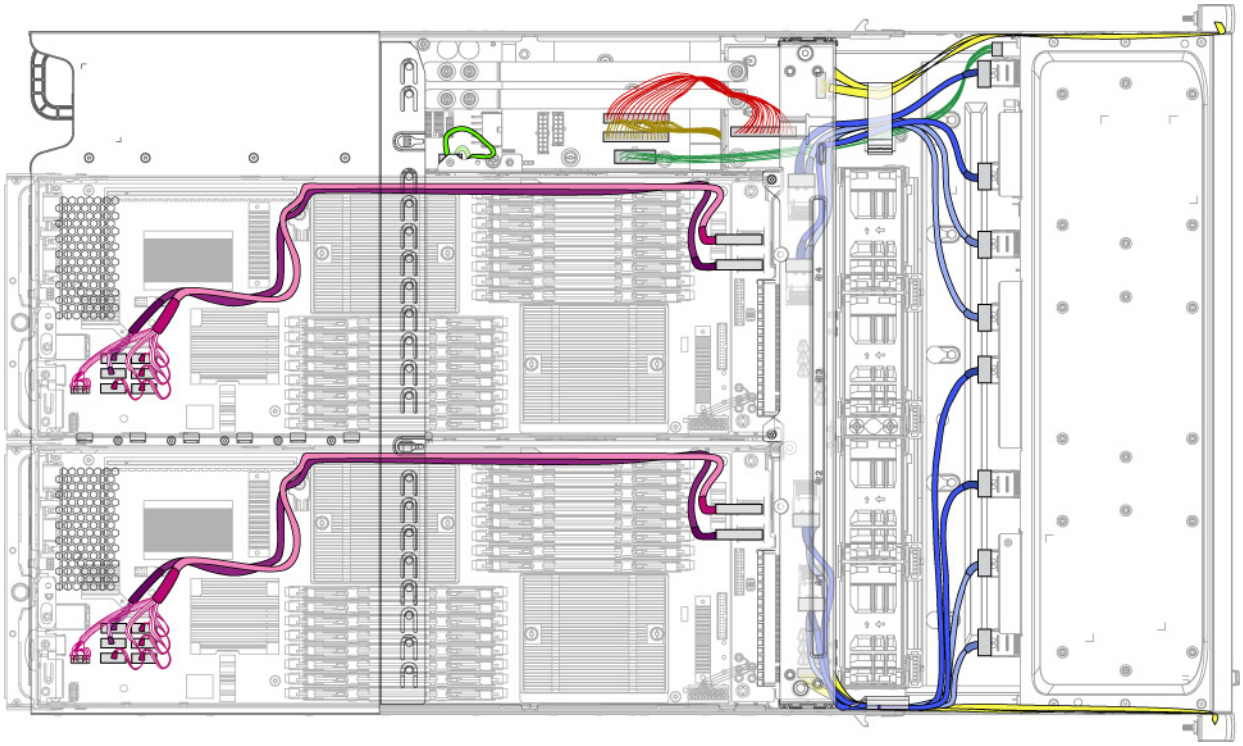
NOTE: For clear presentation of the cables of smart array P410 controller board, the following figure does not show the 2U air baffles. For related information of the 2U air baffles on this configuration, see Smart array P410 controller board.



Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS cable
	(P410) Right Exit Mini-SAS to Mini-SAS cable
	(P410) U Type Mini-SAS to Mini-SAS cable

For connection details about P410 cables, see Table 13.
For details about other cables, see Table 19.

The following figure shows the cable routing for HP ProLiant DL170e G6 server with 24-SFF-HDD and 4-node configuration:



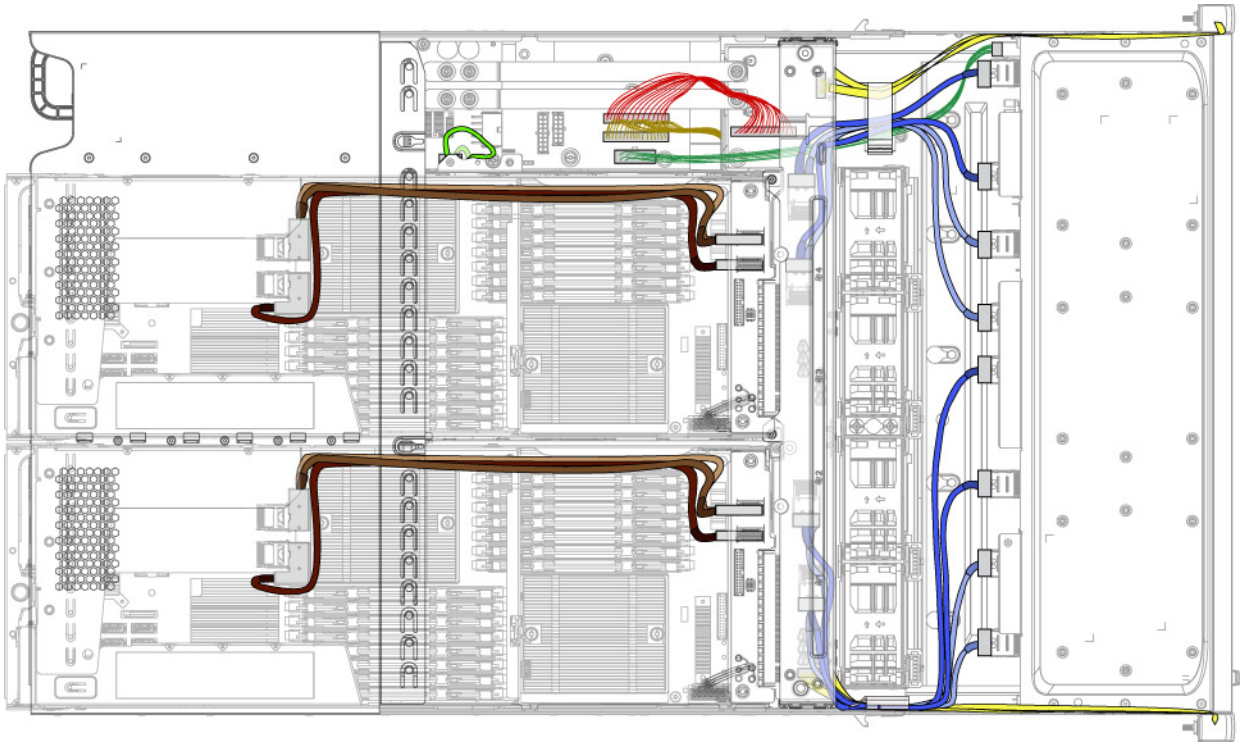
Item	Description
	Bottom midplane to HDD backplane Mini-SAS to Mini-SAS cable
	Top midplane to HDD backplane Mini-SAS to Mini-SAS cable

For connection details about the Mini-SAS to Mini-SAS cable, see Table 14.
For details about other cables, see Table 19.

The 24-SFF-HDD and 2-node configuration requires the configuration of two smart array P410 controller boards on each of the two system boards.

The following figure shows the cable routing for HP ProLiant DL170e G6 server with 24-SFF-HDD and 2-node configuration:

NOTE: For clear presentation of the cables of smart array P410 controller board, the following figure does not show the 2U air baffles. For related information of the 2U air baffles on this configuration, see Smart array P410 controller board.



Item	Description
	(Top P410) Right Exit Mini-SAS to Mini-SAS cable
	(Bottom P410) Right Exit Mini-SAS to Mini-SAS cable
	(Bottom P410) U Type Mini-SAS to Mini-SAS cable

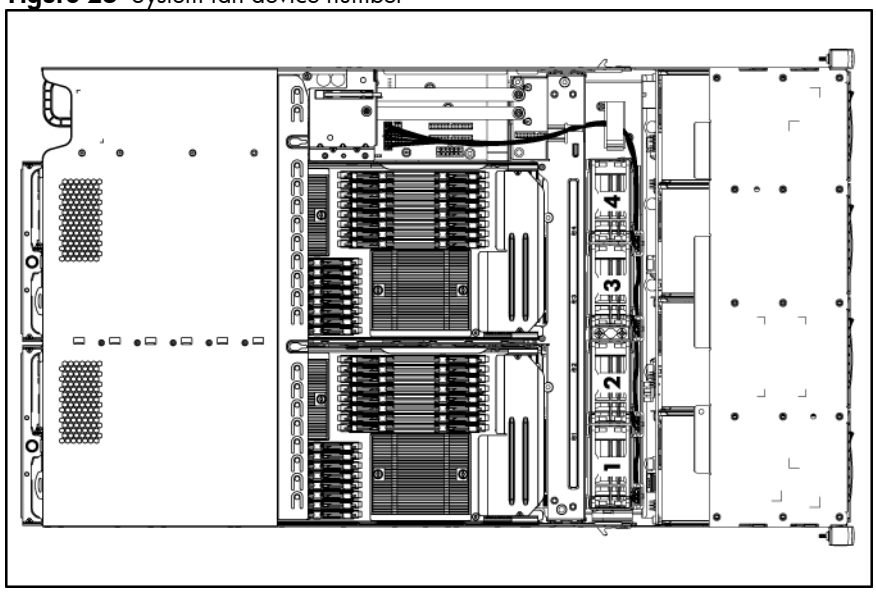
For connection details about P410 cables, see Table 15.
For details about other cables, see Table 19.

System fan

The server has four system fans located in the fan cage. The figure below identifies the system fans by their device number and shows their corresponding cable connections. For more detailed information about system fan cable connections, see “Cable connections”.

The figure below identifies the system fans by their device numbers.

Figure 23 System fan device number



Device number	Connector
System Fan 1	System fan power cable P1 connector
System Fan 2	System fan power cable P2 connector
System Fan 3	System fan power cable P3 connector
System Fan 4	System fan power cable P4 connector

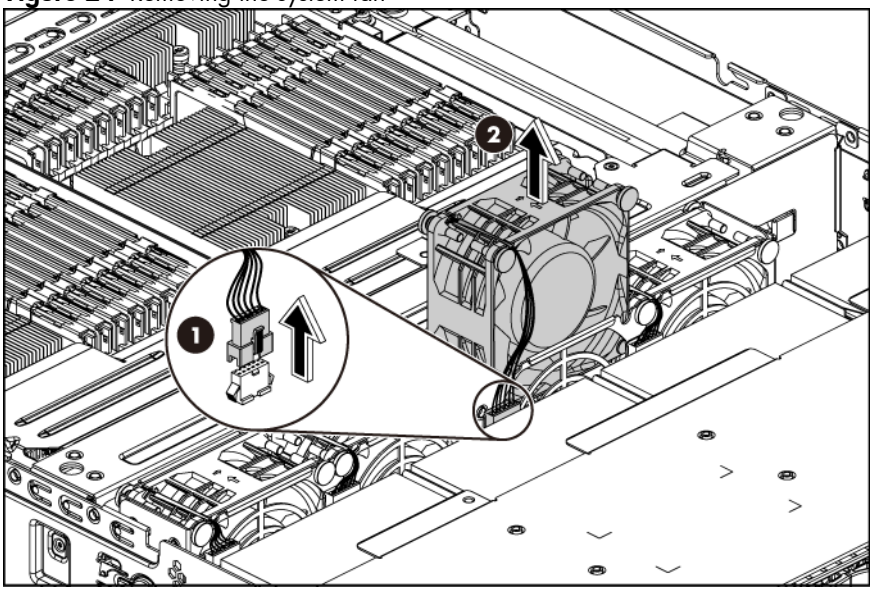
System fans 1 to 4 are for the memory modules, processors, the PCIe slots and system chipsets.

A new system fan can be installed to allow the server to operate properly in case a default system fan becomes defective.

To remove the system fan:

1. Power down the server.
2. Disconnect the power cord(s).
3. Unlock the server if necessary and remove the top cover as described in the section “System covers”.
4. Disconnect the fan cable from the corresponding fan power cable connector attached on the fan cage.
5. Lift the system fan away from the fan cage.

Figure 24 Removing the system fan

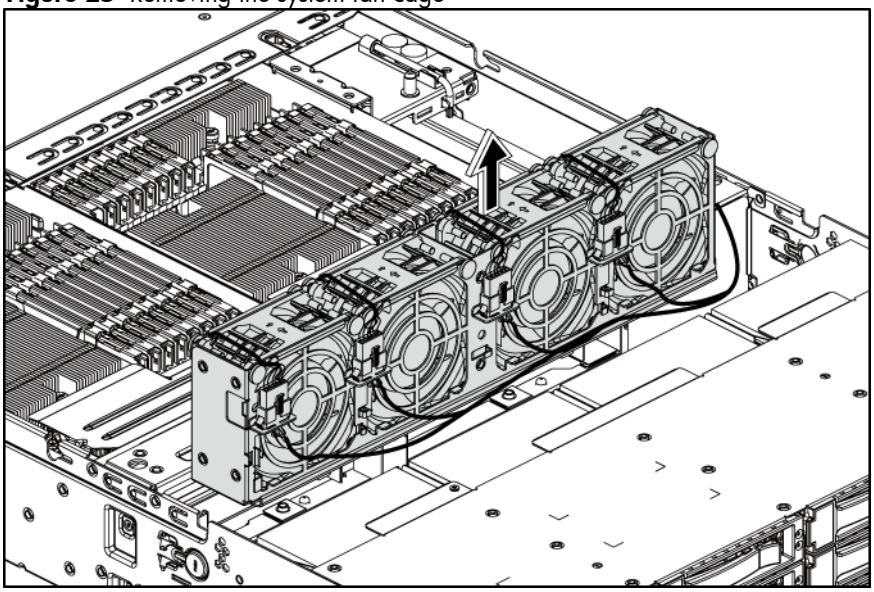


To remove the system fan cage:

The system fan cage with fans installed can be removed from the chassis and placed on top of the staked hood, so that there will be enough space for the further operations with the midplane module and HDD backplane.

1. Power down the server.
2. Disconnect the power cord(s).
3. Unlock the server if necessary and remove the top cover as described in the section “System covers”.
4. Lift the fan cage out of the chassis and place it on the top of the staked hood.

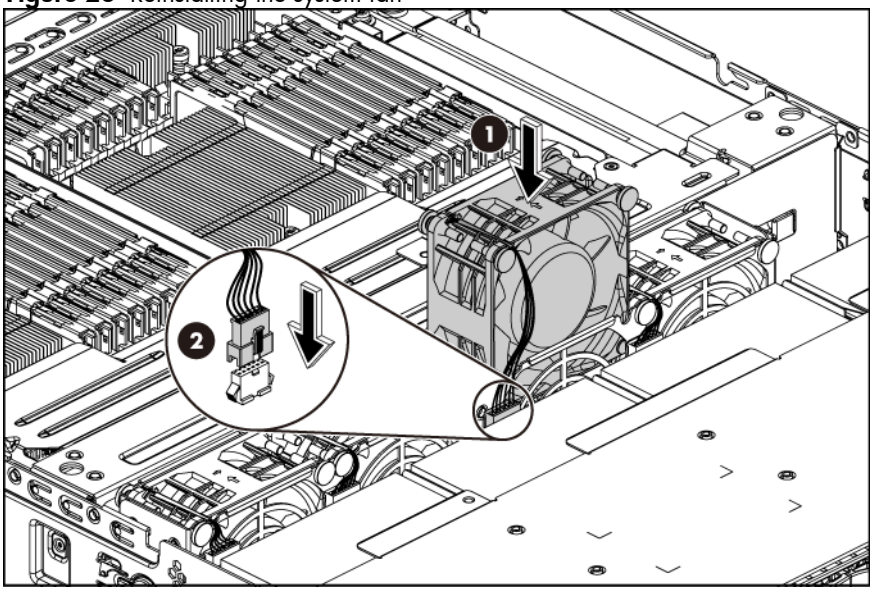
Figure 25 Removing the system fan cage



To install the system fan:

1. Press the system fan into the system fan bracket.
2. Connect the fan cable to its corresponding fan power connector attached on the fan cage.

Figure 26 Reinstalling the system fan



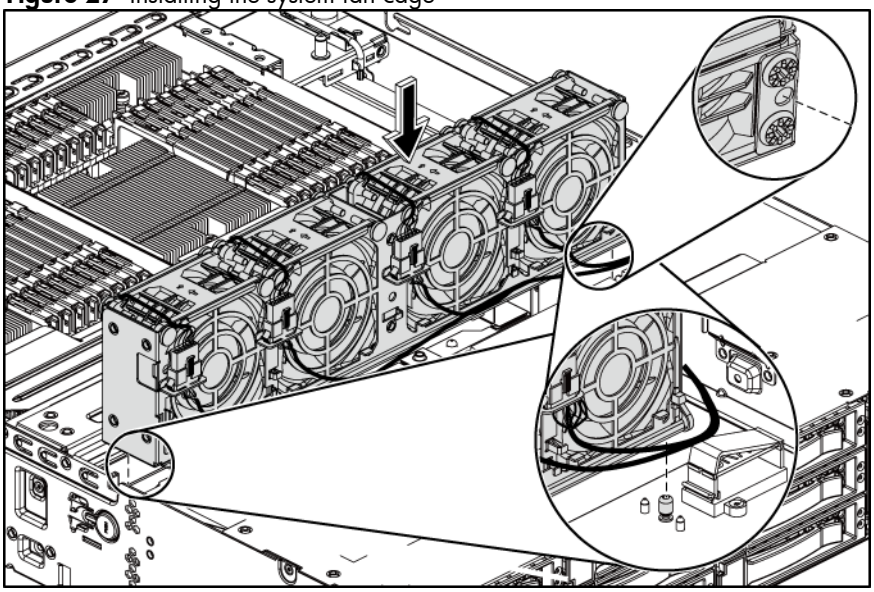
3. Reinstall the top cover as described in the section "System covers".
4. Connect the power cord(s).

To install the system fan cage:

After the operations with midplane module and HDD backplane, the system fan cage (with fans installed) that have been removed and placed on top of the staked hood can be reinstalled into place.

1. Align the fan cage to the stand-offs on the system tray and plug the fan cage to the system tray. Make sure the stand-offs are fully inserted to the flexible retainers on the fan cage.

Figure 27 Installing the system fan cage

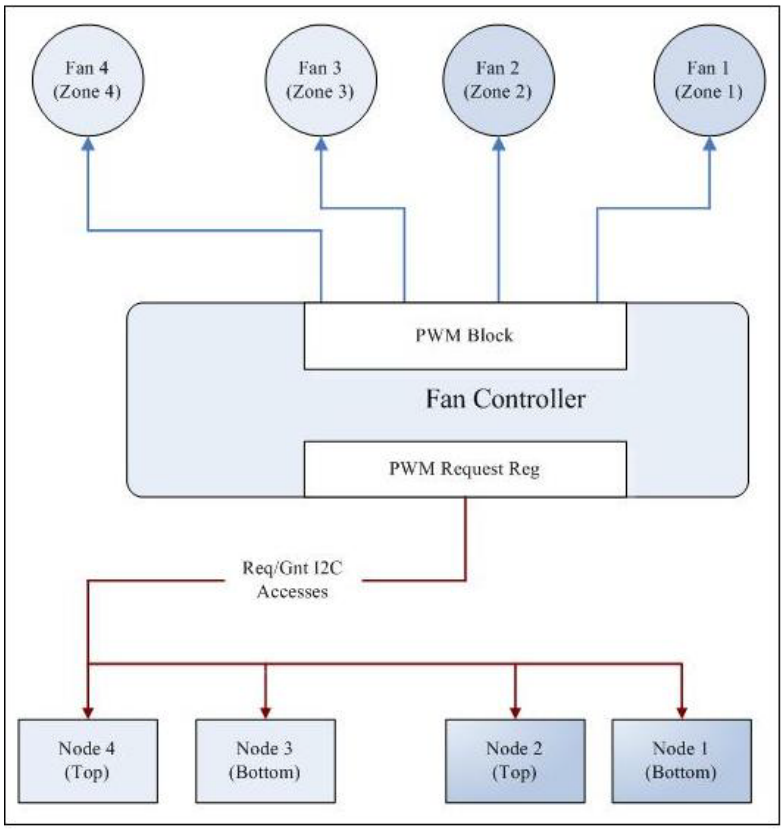


2. Reinstall the top cover as described in the section "System covers".

3. Connect the power cord(s).

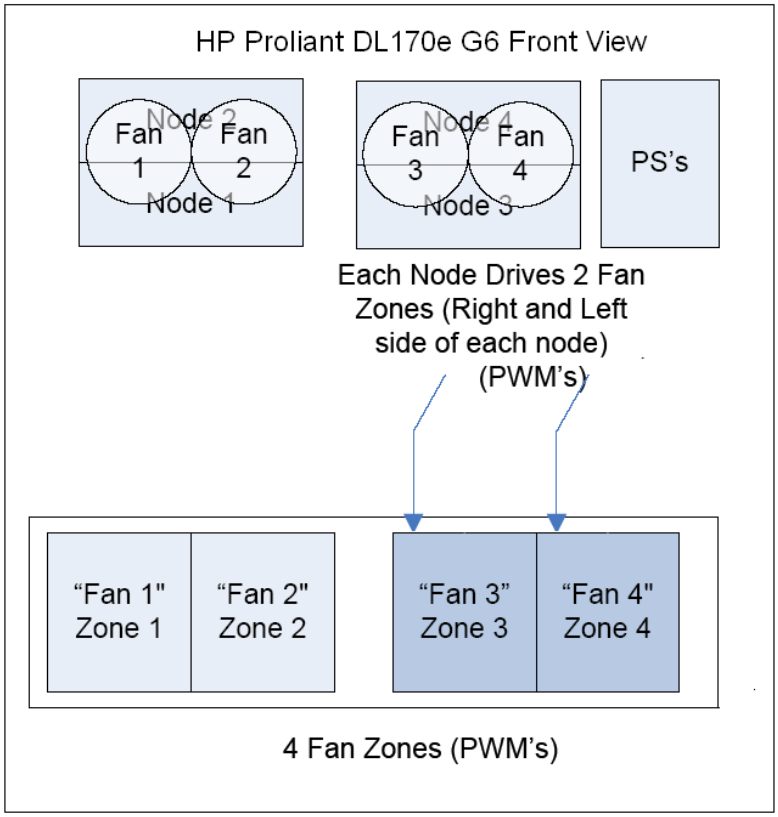
Fan zoning

For HP ProLiant DL170e G6 server, a microcontroller is embedded on the bottom power backplane, providing the speed controlling over the system fans through the PWM's. The microcontroller supports four fan zones, each comprising of one fan:



The microcontroller implements the fan speed controlling through the following ways:

- The microcontroller will contain a two (for left and right zones) Fan PWM request registers specified in the BMC SDR's. All nodes will attempt to write to the left or right Fan zone registers and the microcontroller firmware will steer the PWM request into the correct register inside the microcontroller register set, based on which node has the GNT during the PWM I2C write.
- Nodes 1 and 2 both drive PWM speeds for Fan Zone 1 and 2.
- Nodes 3 and 4 both drive PWM speeds for Fan Zone 3 and 4.
- Fans 1 and 2 (Zones 1 and 2) are critical fans for nodes 1 and 2.
- Fans 3 and 4 (Zones 3 and 4) are critical fans for nodes 3 and 4.
- The hottest (largest value) for each Fan Zone PWM requested over a 5 second window will be applied to the PWM outputs of each fan zone.



Fan fault handling

Fan fault signals will drive the lighting of an LED for each failed fan. Each node will log fan faults for its associated fan pair only. A failed fan is considered Critical and will cause the two associated nodes to perform a graceful shutdown (driven by the BMC). The surviving fan in the pair will go to certain PWM defined by thermal (automatically initiated by the microcontroller of fan) in order to maintain airflow across the HDD's. This PWM will be different than the minimum PWM set by the microcontroller in healthy fan case when one side of nodes is powered off. In other words, the microcontroller will have two different minimum PWM, one for fan fail case, and one for healthy fan case. The microcontroller will also mask fan faults for the fans not present in front of the node. The microcontroller will mask (not report) any fan faults during the 45 second period after any node is powered ON. This is required to allow various fans to settle and reach their normal operating speed. Nodes will often drive a short period of fan speeds set to blowout during POST, and these have been known to cause the reporting of spurious fan faults.

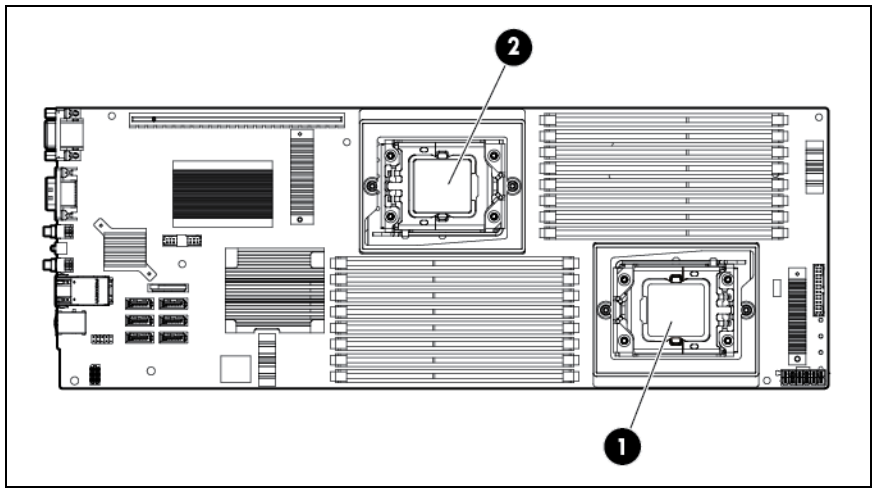
System board configuration

Processor

HP ProLiant DL170e G6 Server, with 4 nodes, supports eight-processor operation. With two processors installed, each Node supports boot functions through the processor installed in processor socket 1. However, if processor 1 fails, the system automatically boots from processor 2 and provides a processor failure message.
The processor socket supports 1366 FCLGA Series processors.

CAUTION: It is recommended to use processors of the same speeds or cache sizes to prevent possible server malfunction.

Figure 28 Processor locations



Item	Description
1	Processor 1
2	Processor 2

WARNING: To reduce the risk of personal injury from hot surfaces, allow the heat sink and the processor to cool before touching them.

NOTE: For 2U node, the 2U bottom plastic air baffle should be removed before the removal of the heat sinks. For detailed information, see Figure 86.

NOTE: Before removing and replacing processors, see Removal and replacement procedures for more information.

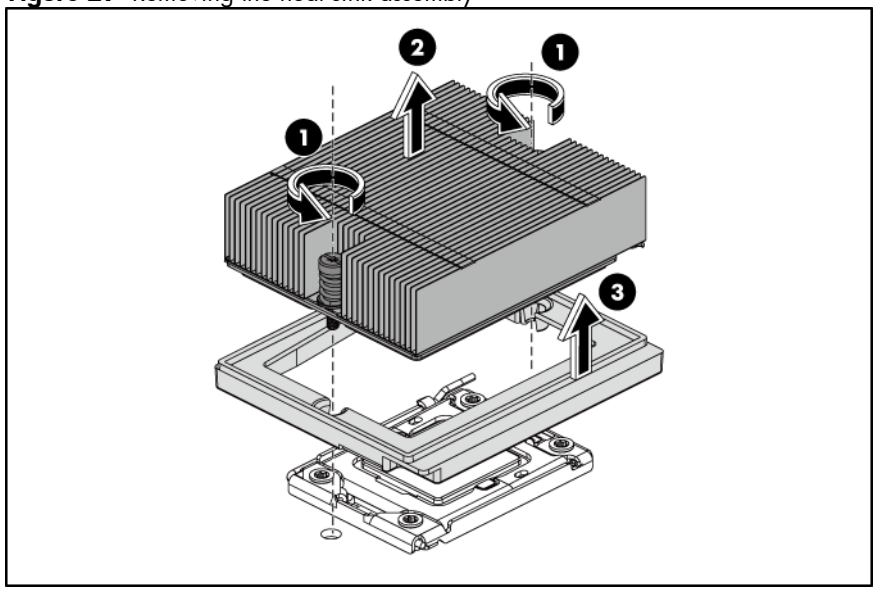
To remove the heat sink:

CAUTION: To prevent the heat sink from tilting to one side during installation and removal procedures, use a diagonally opposite pattern (an "X" pattern) when loosening and tightening the two spring-loaded screws. Do not over tighten the heat sink's spring-loaded screws to prevent them from breaking off. A maximum torque of 4 in-lb is set for the system.

1. Loosen the two spring-loaded screws counter-clockwise to release the heat sink connection from the system board.
2. Lift the heat sink away from the system board.
3. Remove the heat sink frame from the processor socket.

CAUTION: Place the heat sink down in an upright position with the thermal patch facing upward. Do not let the thermal patch touch the work surface.

Figure 29 Removing the heat sink assembly

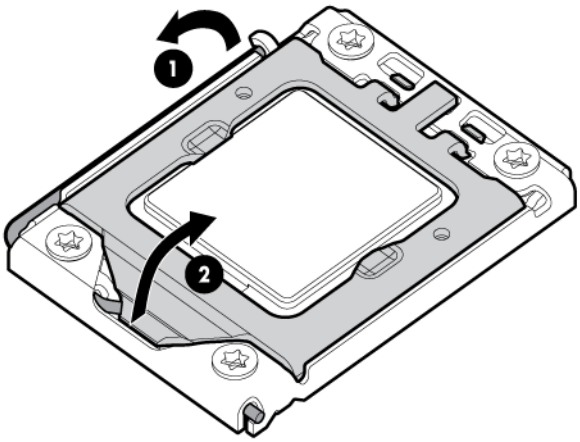


IMPORTANT: If the heat sink has been removed for any reason on a previously installed processor, it is critical that you apply more thermal interface material to the integrated heat spreader on the processor to ensure proper thermal bonding between the processor and the heat sink.

To remove a processor:

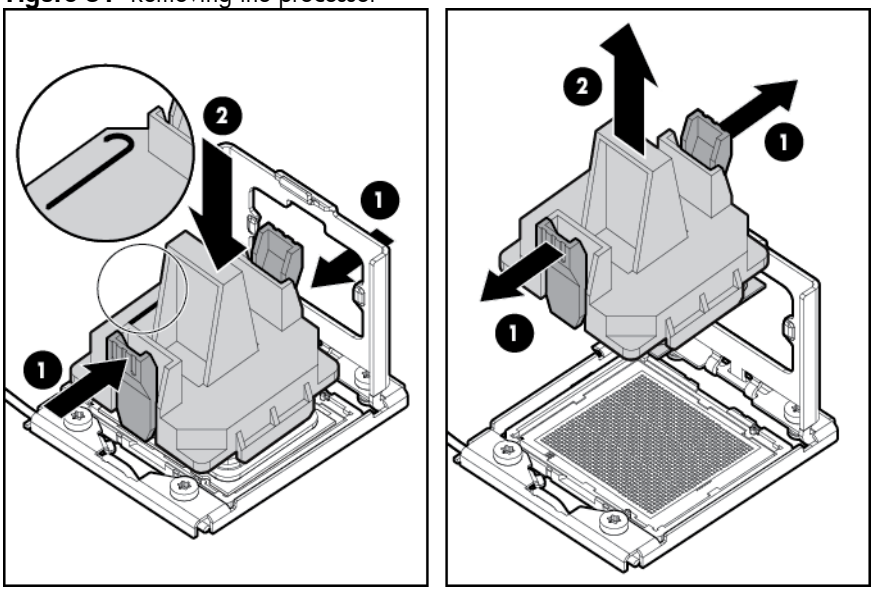
1. Open the processor locking lever and the processor socket retaining bracket.

Figure 30 Opening the processor socket retaining bracket



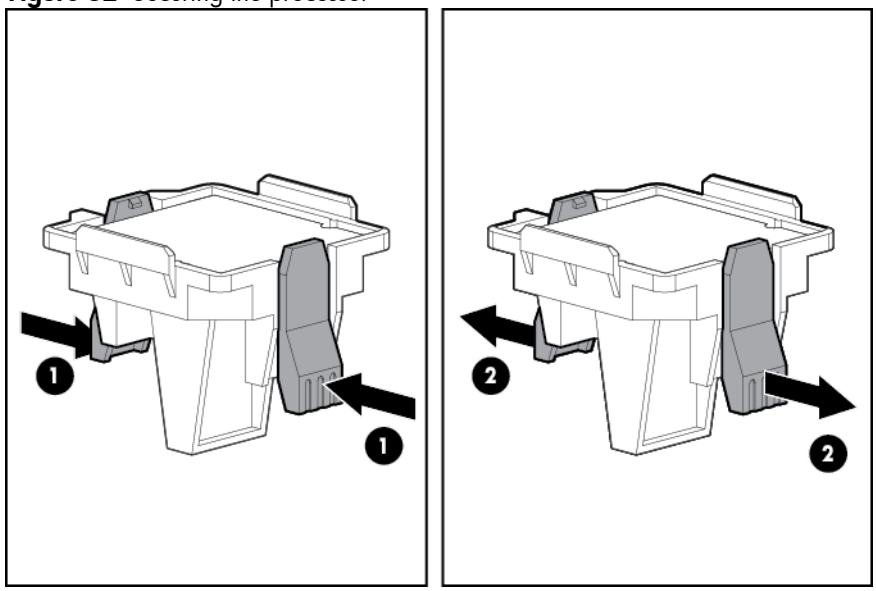
2. Using the processor removal tool, remove the processor from the system board:
   a. Line up the processor tool, ensuring the locking lever graphic on the tool is correctly oriented.
   b. Press in on the plastic tabs, and then place the tool on the processor.
   c. Release the tabs, and then carefully lift the processor and tool straight up.

Figure 31 Removing the processor



3. Carefully rotate the tool, and then push in and release the tabs to secure the processor in the tool.

Figure 32 Securing the processor

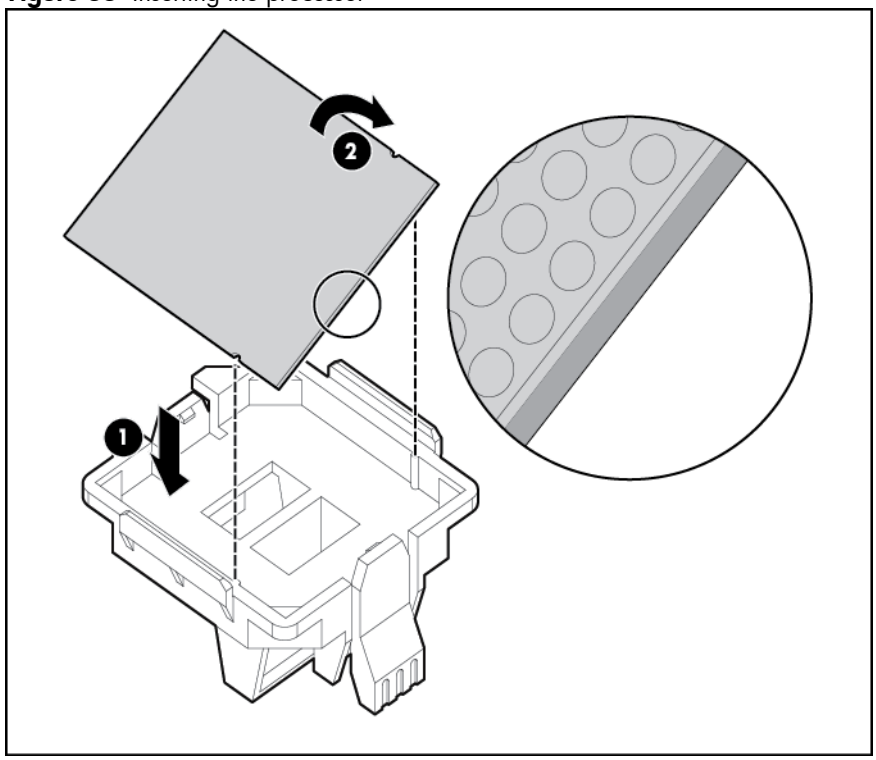


CAUTION: To avoid damage to the processor, do not touch the bottom of the processor, especially the contact area.

To install the new processor:

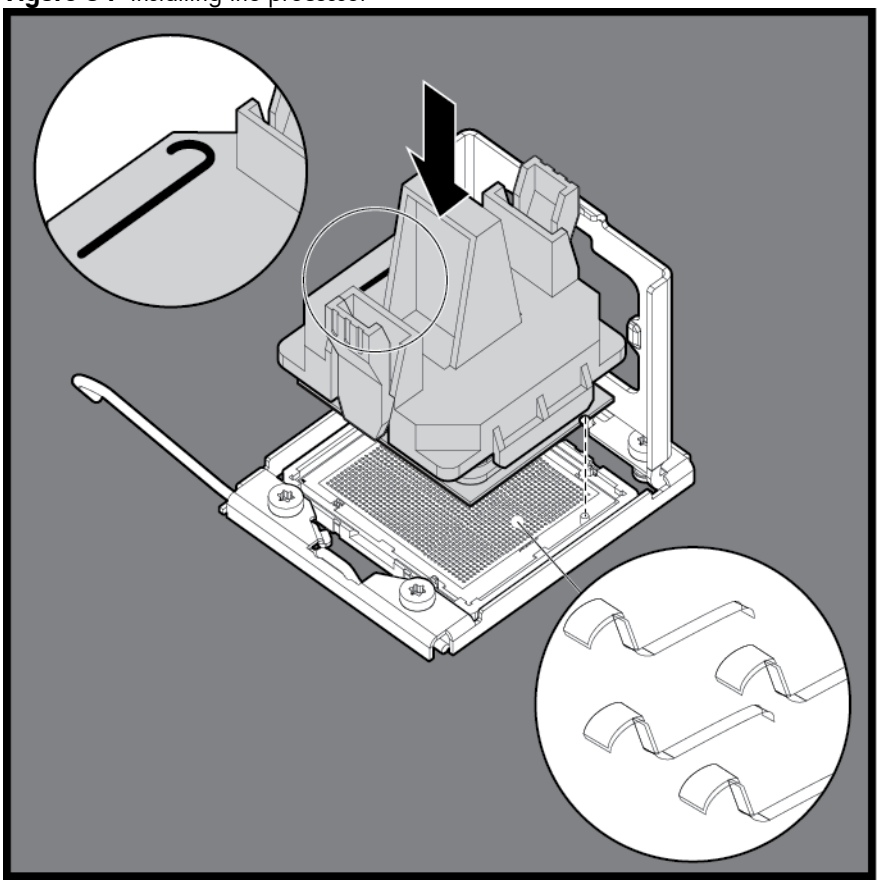
1. Carefully insert the processor into the processor installation tool. Handle the processor by the edges only, and do not touch the bottom of the processor, especially the contact area.

Figure 33 Inserting the processor



2. Be sure the tool is oriented correctly. Align the processor installation tool with the socket, and then install the processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.**

Figure 34 Installing the processor

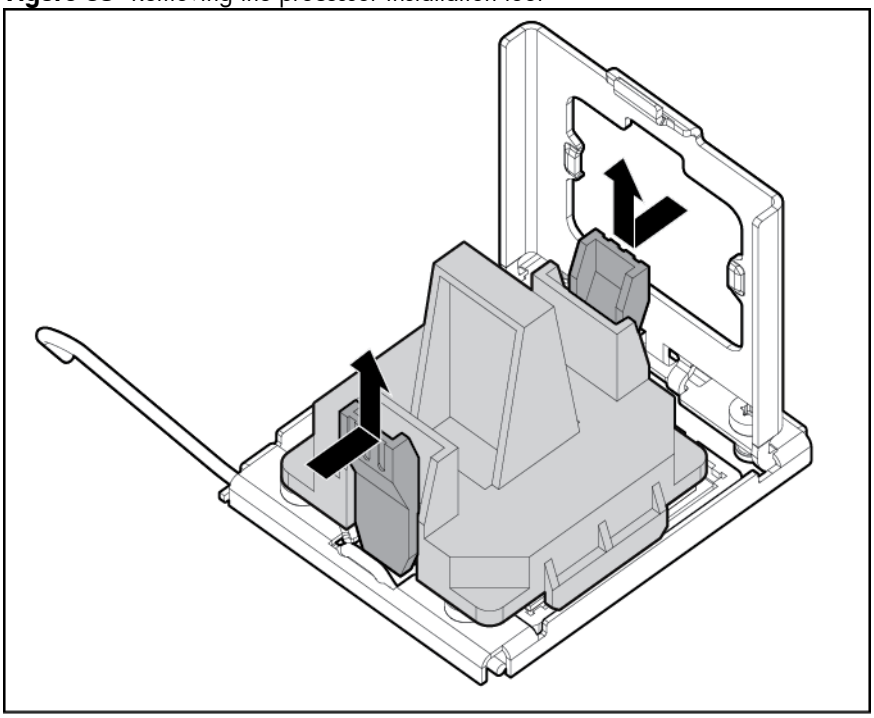


△ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board:

- Never install or remove a processor without using the processor installation tool.
- Do not touch the processor socket contacts.
- Do not tilt or slide the processor when lowering the processor into the socket.

3. Press and hold the tabs on the processor installation tool to separate it from the processor, and then remove the tool.

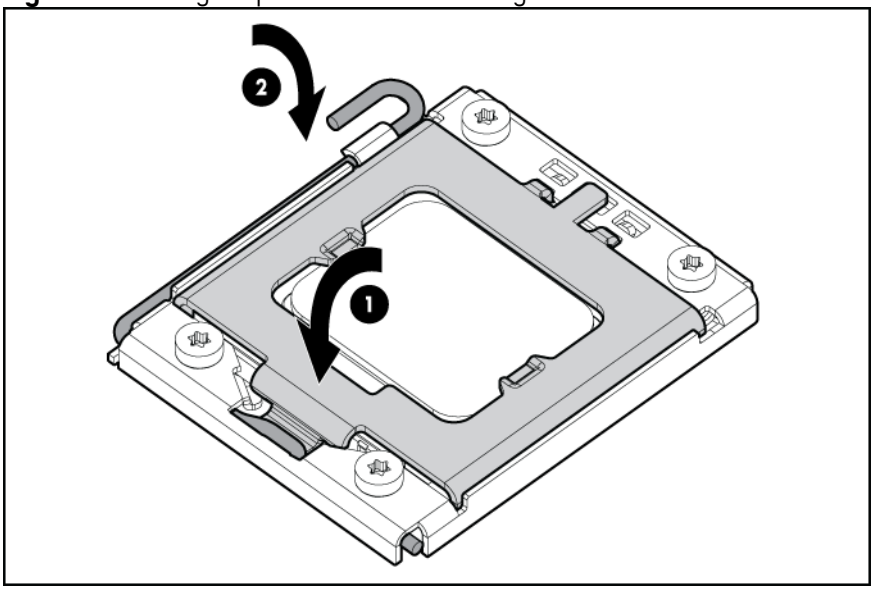
Figure 35 Removing the processor installation tool



4. Close the processor socket retaining bracket and the processor locking lever.

CAUTION: Be sure to close the processor socket retaining bracket before closing the processor locking lever. The lever should close without resistance. Forcing the lever closed can damage the processor and socket, requiring system board replacement.

Figure 36 Closing the processor socket retaining bracket

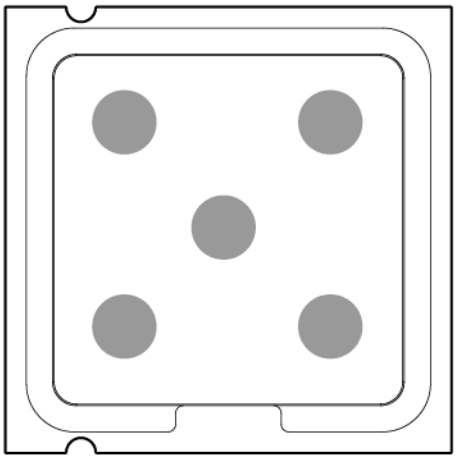


CAUTION: To allow heat sink to draw as much heat as possible from the processor base, there must be good contact between the heat sink base and the top of the processor. To ensure good contact, you must apply thermal interface material.

To apply the thermal grease compound:

1. Use a clean cloth dipped in rubbing alcohol to clean the contact surface on the heat sink and the new processor. Wipe the contact surfaces several times to make sure that no particles or dust contaminants are evident.
2. Apply all the grease to the top of the processor in the following pattern to insure even distribution.

Figure 37 Applying grease



CAUTION: HP recommends using Shin-Etsu X-23-7783D thermal grease compound for your HP ProLiant DL170e G6 server.

CAUTION: Never touch the bottom of the processor; any contaminant could prevent the mounting pads from making contact with the socket.

CAUTION: Applying too much grease creates a gap between the contact surfaces, significantly reducing the ability of the heat sink to draw out heat. Installing the heat sink with excessive grease can also cause the grease to spread over the processor pins or the system board base, which can cause electrical shorts that damage the system.

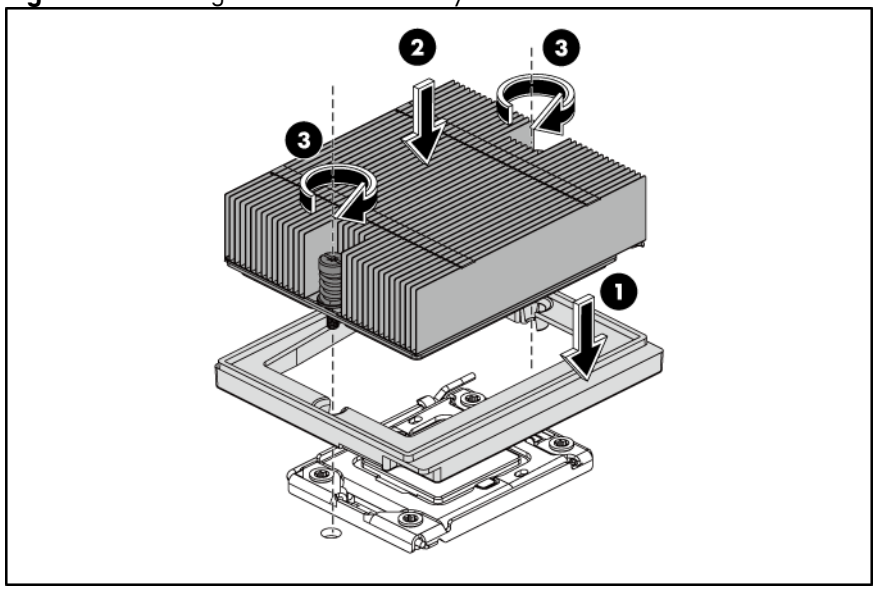
To install the heat sink:

△ **CAUTION:** To prevent overheating or a possible system crash, use only a heat sink model specified for the HP ProLiant server.

1. Put the heat sink frame on the processor socket.
2. Properly align the heat sink spring-loaded screws to the system board mounting holes.
3. Tighten the spring-loaded screws clockwise to secure the heat sink connection to the system board.

△ **CAUTION:** To prevent the heat sink from tilting to one side during installation and removal procedures, use a diagonally opposite pattern (an "X" pattern) when loosening and tightening the two spring-loaded screws. Do not over tighten the heat sink's spring-loaded screws to prevent them from breaking off. A maximum torque of 4 in-lb is set for the system.

Figure 38 Installing the heat sink assembly



NOTE: For 2U node, the 2U bottom plastic air baffle should be reinstalled after the heat sinks are installed. For detailed information, see Figure 91.

Memory

HP ProLiant DL170e G6 server has sixty-four DIMM slots that support up to 512 GB maximum system memory.

You must adhere to the following guidelines when adding or replacing memory modules:

- Up to 192GB, using PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when populated at 2 DIMMs per Channel in 12 slots
- Up to 128GB, using PC3-10600R DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated in 16 slots
- Up to 48GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1333MHz when populated at 2 DIMMs per Channel in 12 slots
- Sixteen DIMMs, eight DIMM sockets per processor, three per first two channels and third channel with only two
- Supported configuration:
  - One DIMM per processor: 8A for processor 1; 8A for processor 2
  - Three DIMMs per processor: 8A, 5B, 2C for processor 1; 8A, 5B, 2C for processor 2
  - Six DIMMs per processor: 8A, 5B, 2C, 7D, 4E, 1F for processor 1; 8A, 5B, 2C, 7D, 4E, 1F for processor 2
  - DIMM population order processor socket 1: 8A, 5B, 2C, 7D, 4E, 1F, 6G, 3H
  - DIMM population order processor socket 2: 8A, 5B, 2C, 7D, 4E, 1F, 6G, 3H

Figure 39 Population order of DIMM sockets

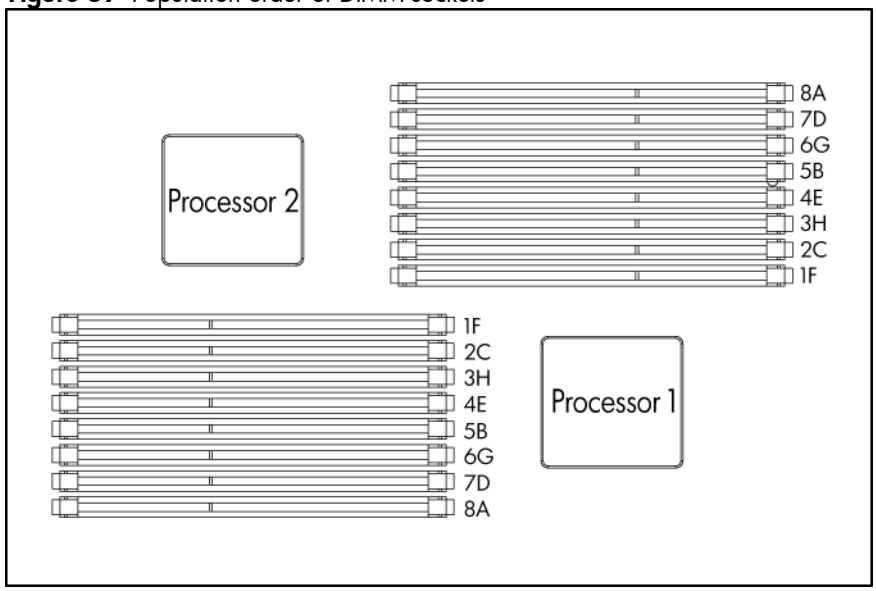
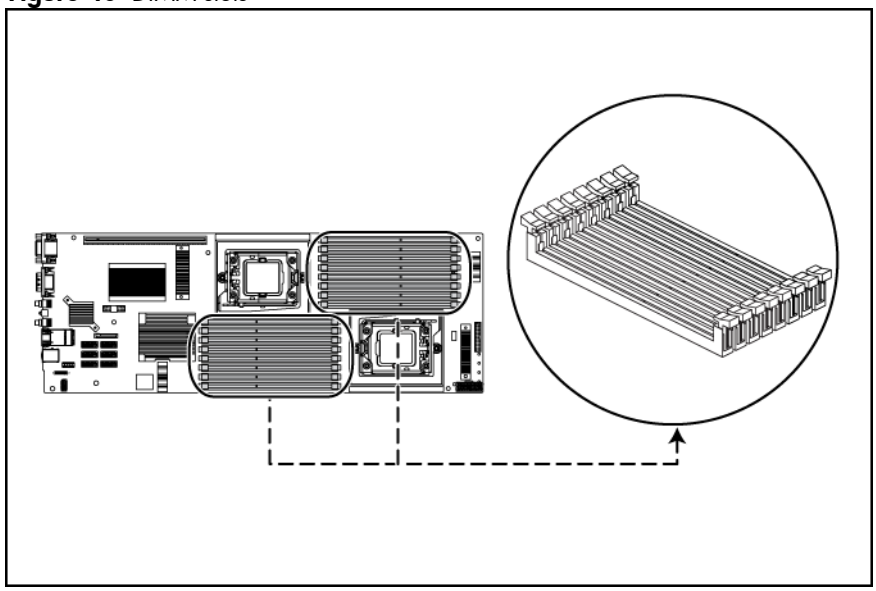


Figure 40 DIMM slots



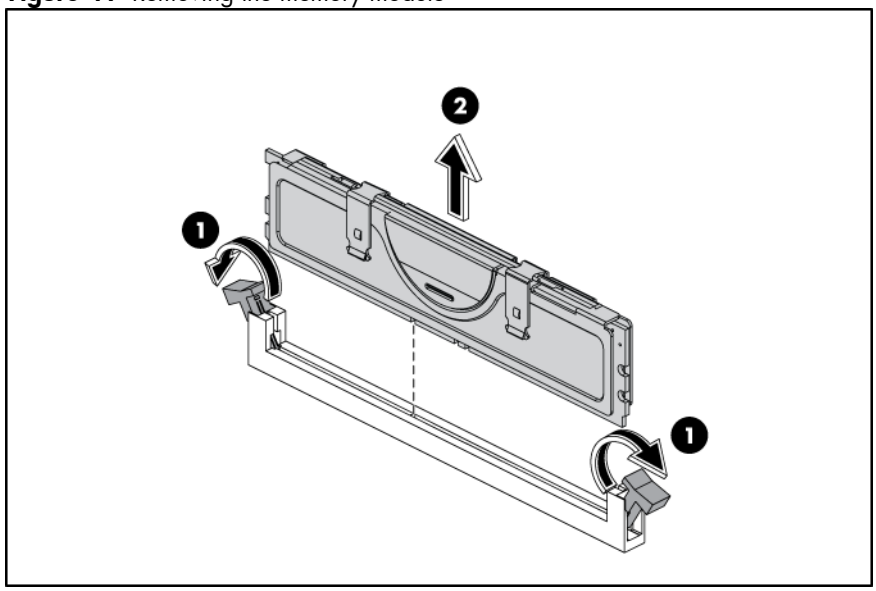
NOTE: Before removing and replacing memory modules, see Removal and replacement procedures for more information.

NOTE: For 2U node, before removing or installing the memory, remove the 2U bottom plastic air baffle first. For detailed information, see Figure 86.

To remove the memory module:

1. Completely open the holding clips securing the memory module.
2. Gently pull the memory module upward to remove it from the slot.

Figure 41 Removing the memory module

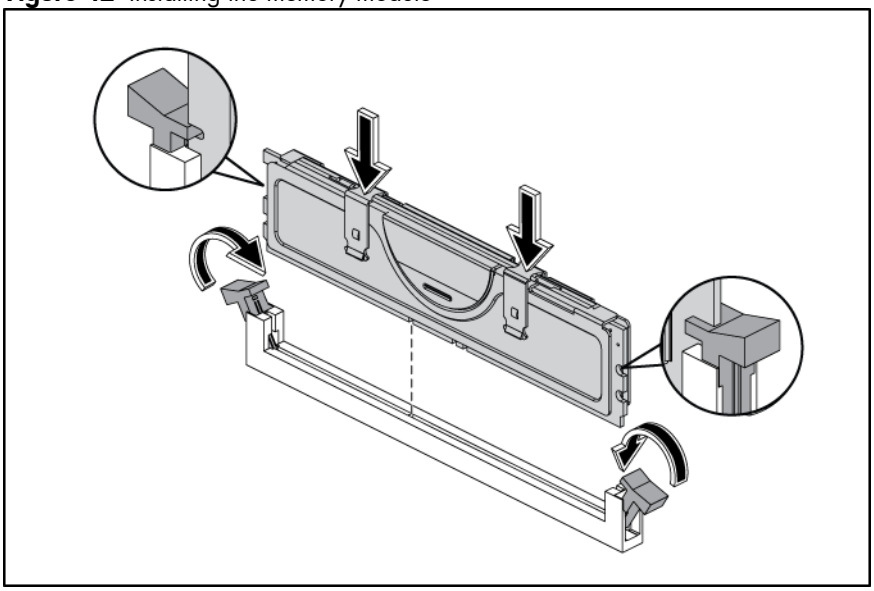


CAUTION: Place the memory module on a static-dissipating work surface or inside of an anti-static bag.

To install the memory module:

1. Align the notch on the bottom edge of the memory module with the keyed surface of the DIMM slot and then fully press the memory module into the slot until the holding clips snap back in place.

Figure 42 Installing the memory module



CAUTION: The DIMM slots are structured to ensure proper installation. If you insert a DIMM but it does not fit easily into the slot, you may have inserted it incorrectly. Reverse the orientation of the DIMM and insert it again.

CAUTION: The DIMM blanks should be installed in any empty slot location for thermal reasons.

PCI Expansion Cards

The HP ProLiant DL170e G6 server supports the following node configurations:

- 4x1U nodes
- 2x2U nodes

The different types of node support the following PCIe cage and PCIe riser card configurations:

- 1U node: 1U PCIe cage, 1U riser card
- 2U node: 2U PCIe cage, 2U riser card

The riser card attached to the PCIe cage converts the functionality of the system board expansion slots to the slot positioned at a 90° angle from the system board.

Figure 43 1U PCIe cage location

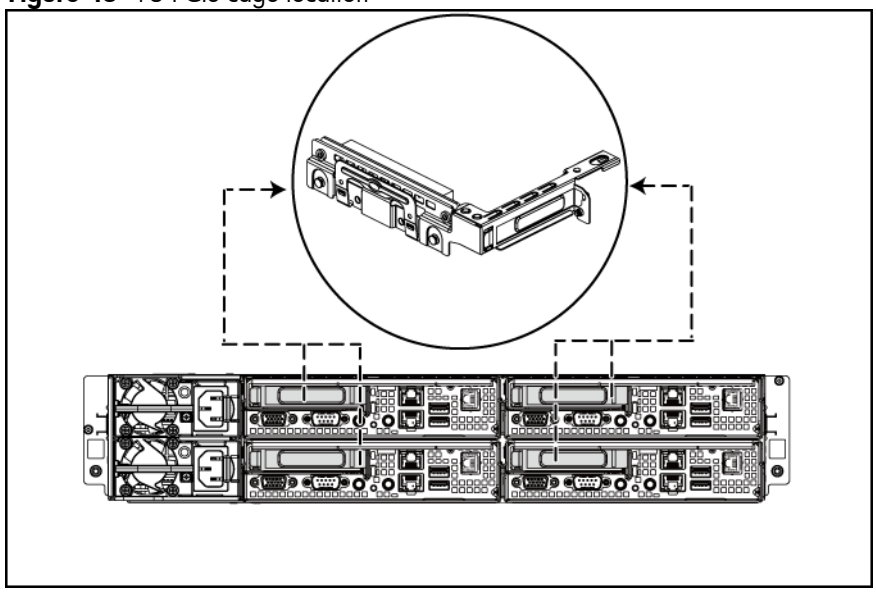
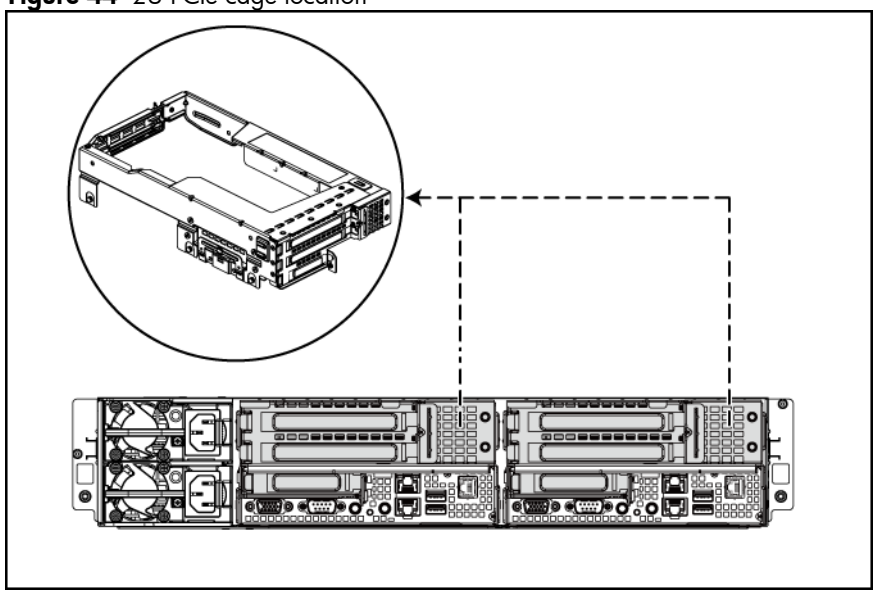


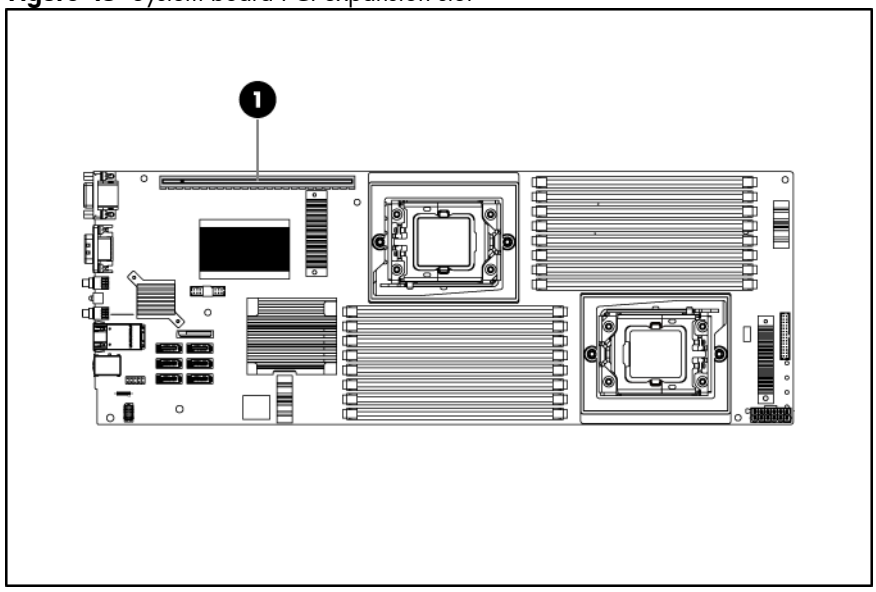
Figure 44 2U PCIe cage location



System board PCI expansion slot

There is one PCI-E 2.0 x8 expansion slot on the system board.

Figure 45 System board PCI expansion slot

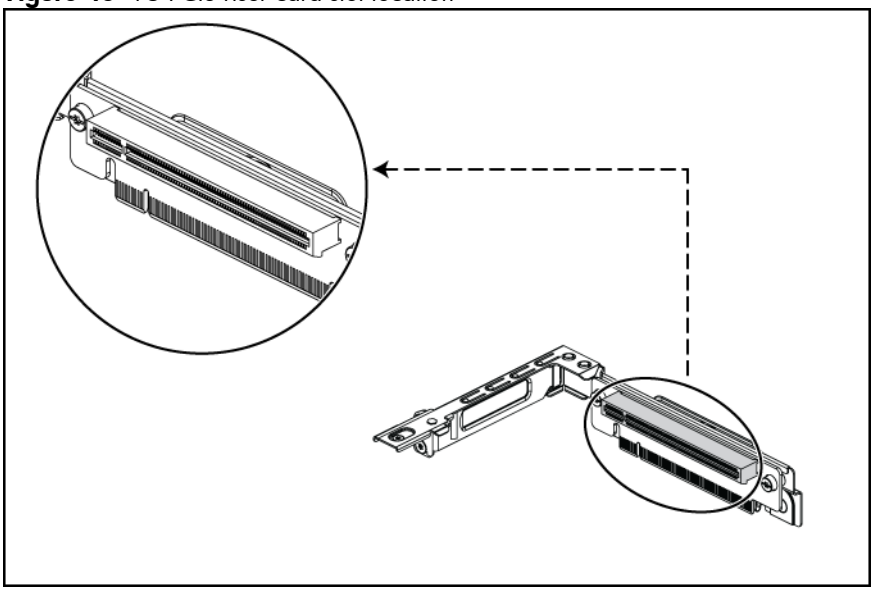


Item	Component Designator	Component	Function
1	J24	PCIe slot	Supports X16 PCIe Riser Cards

The PCI Expansion slot on the system board supports the following riser cards:

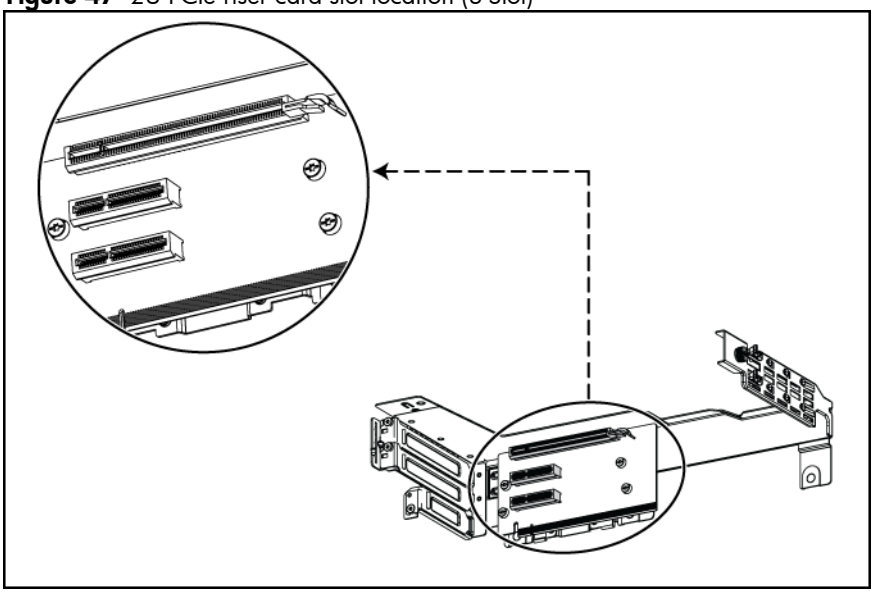
- 1U PCIe riser card: 1 x16 slot
- 2U PCIe riser cards:
  - 2-slot: 1 x16 slot, 1 x8 slot
  - 3-slot: 3 x8 slots
  - 3-slot: 1 x16 slot, 2 x4 slots

Figure 46 1U PCIe riser card slot location



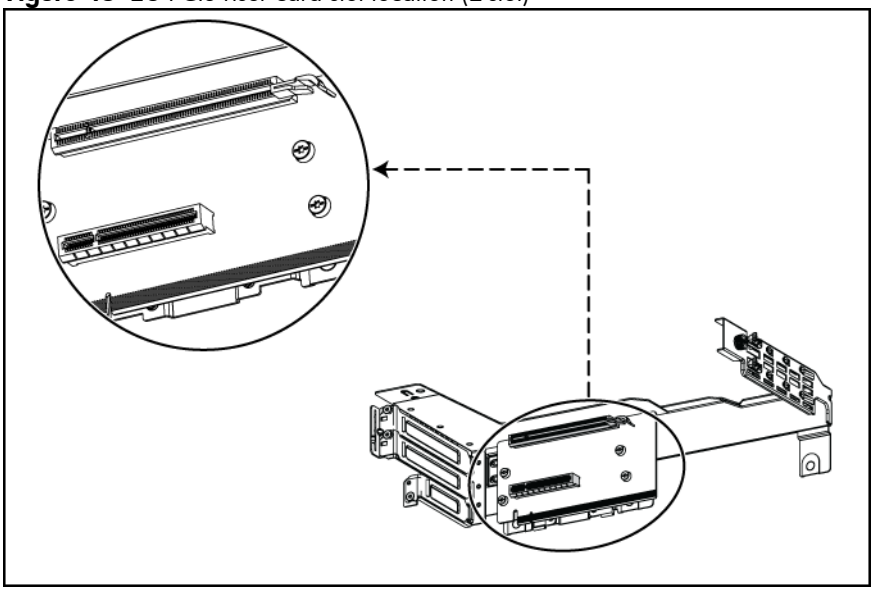
- Single-slot 1U PCIe riser card (1 x16 slot)

Figure 47 2U PCIe riser card slot location (3-Slot)



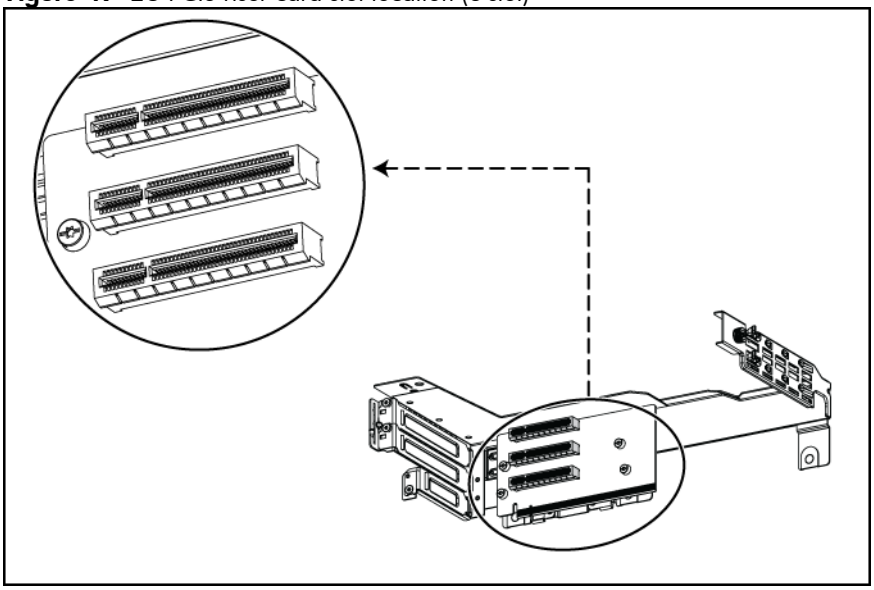
- Three-slot 2U PCIe riser card (1 x16 slot, 2 x4 slots)

Figure 48 2U PCIe riser card slot location (2-slot)



- Double-slot 2U PCIe riser card (1 x16 slot, 1 x8 slot)

Figure 49 2U PCIe riser card slot location (3-slot)



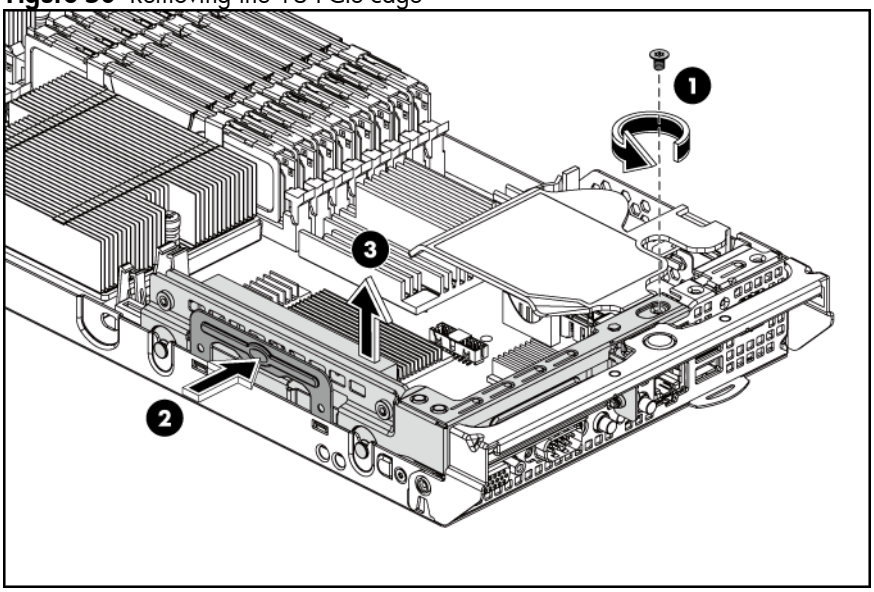
- Three-slot 2U PCIe riser card (3 x8 slots)

Removing the PCIe cages

To remove the 1U PCIe cage from a 1U node:

1. Loosen the screw on the top side of the system board tray to release the 1U PCIe cage from the system board tray.
2. Push the locking tab to release the 1U PCIe cage from the system board tray.
3. Lift the 1U PCIe cage away from the system board.

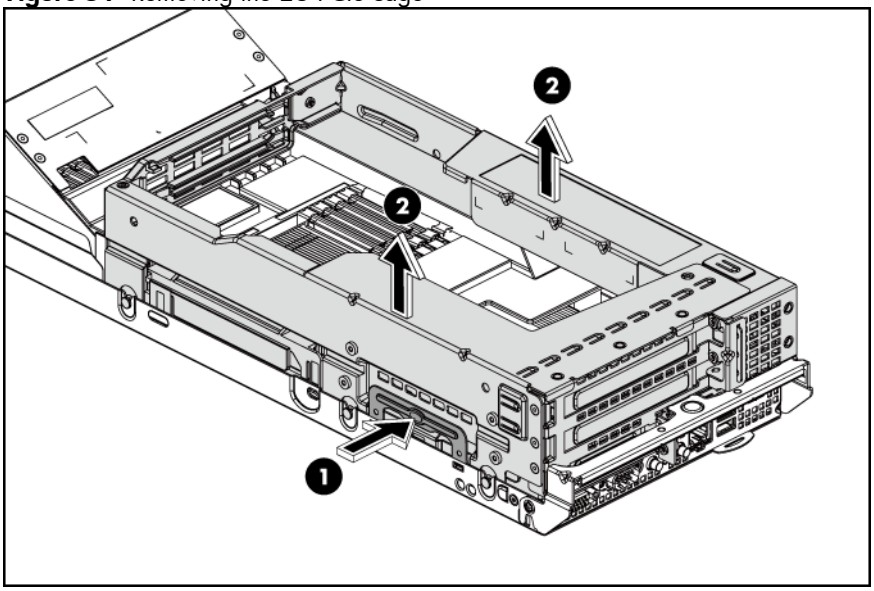
Figure 50 Removing the 1U PCIe cage



To remove the 2U PCIe cage from a 2U node:

1. Push the locking tab to release the 2U PCIe cage from the system board tray.
2. Lift the 2U PCIe cage away from the system board.

Figure 51 Removing the 2U PCIe cage

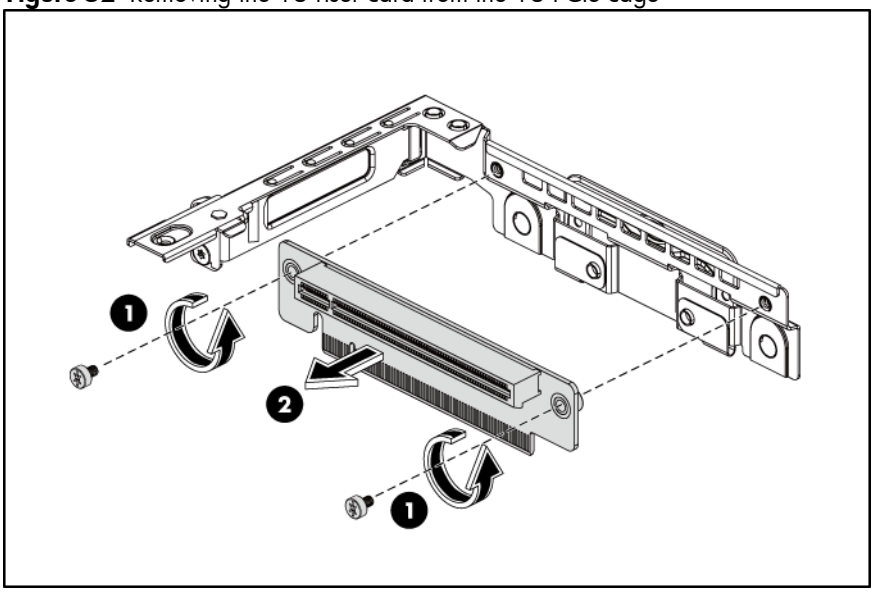


Removing the PCIe riser cards

To remove the 1U riser card from the 1U PCIe cage:

1. Loosen the 2 screws that secure the 1U riser card to the 1U PCIe cage.
2. Remove the 1U riser card away from the 1U PCIe cage.

Figure 52 Removing the 1U riser card from the 1U PCIe cage

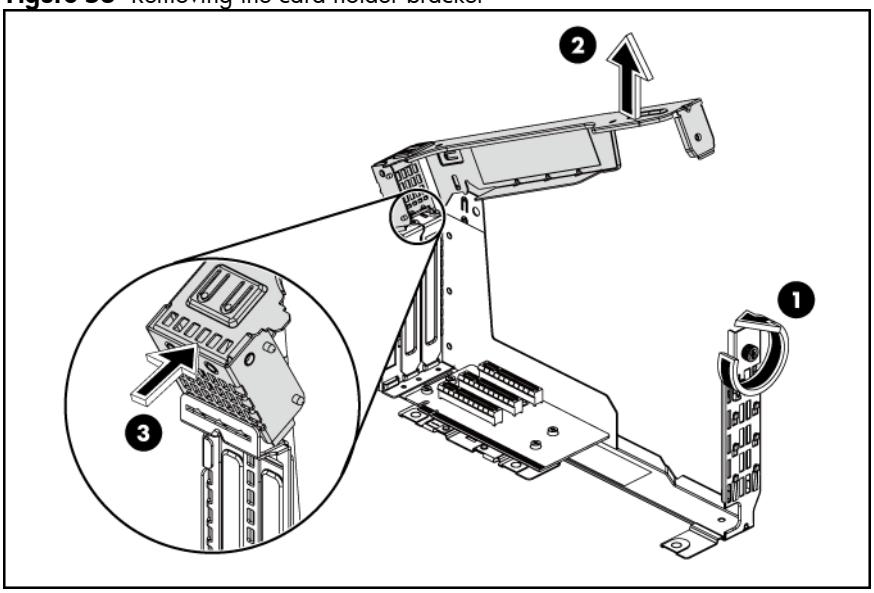


To remove the 2U riser card from the 2U PCIe cage:

The following removing procedure uses the 3x8-slot 2U riser card as example.

1. Loosen the thumbscrew that secures the card holder bracket to the 2U PCIe cage.
2. Lift and route one end of the card holder bracket away from the 2U PCIe cage.
3. Remove the other end of the card holder bracket away from the slot of the 2U PCIe cage.

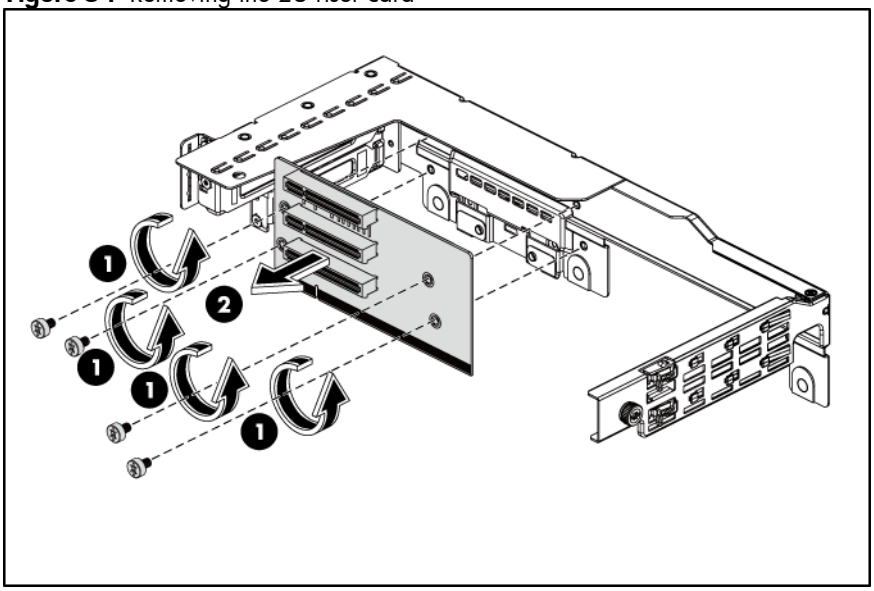
Figure 53 Removing the card holder bracket



4. Loosen the 4 screws that secure the 2U riser card to the 2U PCIe cage.

5. Remove the 2U riser card away from the 2U PCIe cage.

Figure 54 Removing the 2U riser card

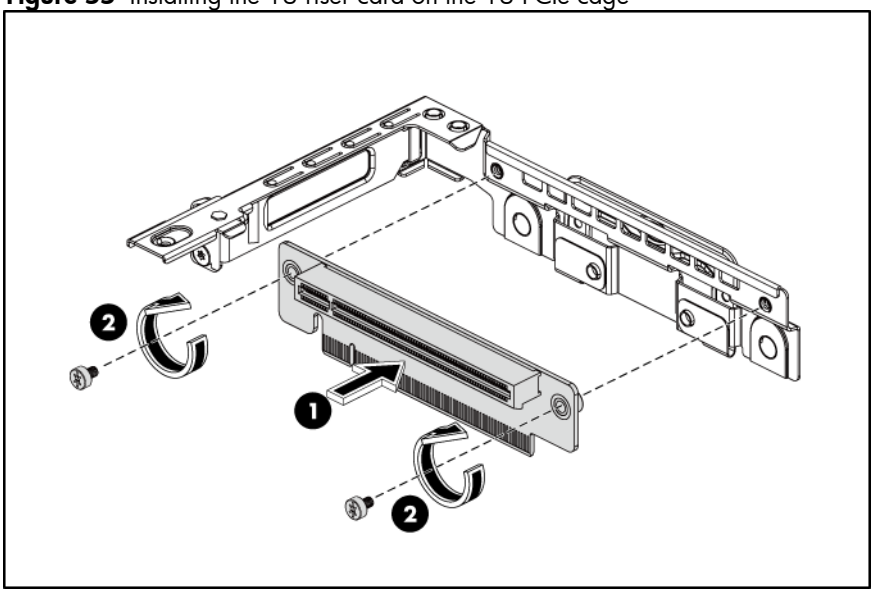


Reinstalling the PCIe riser cards

To install the 1U riser card on a 1U PCIe cage:

1. Align the two riser card mounting holes to the corresponding screw stand-offs on the PCIe cage.
2. Tighten the 2 screws that secure the riser card to the PCIe cage.

Figure 55 Installing the 1U riser card on the 1U PCIe cage

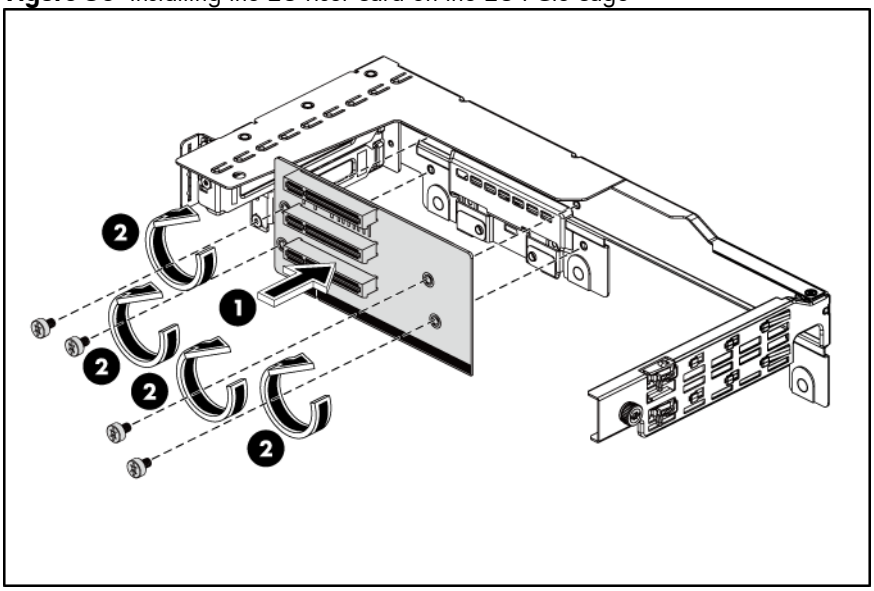


To install the 2U riser card on a 2U PCIe cage:

The following installing procedure uses the 3 x8-slot 2U riser card as example.

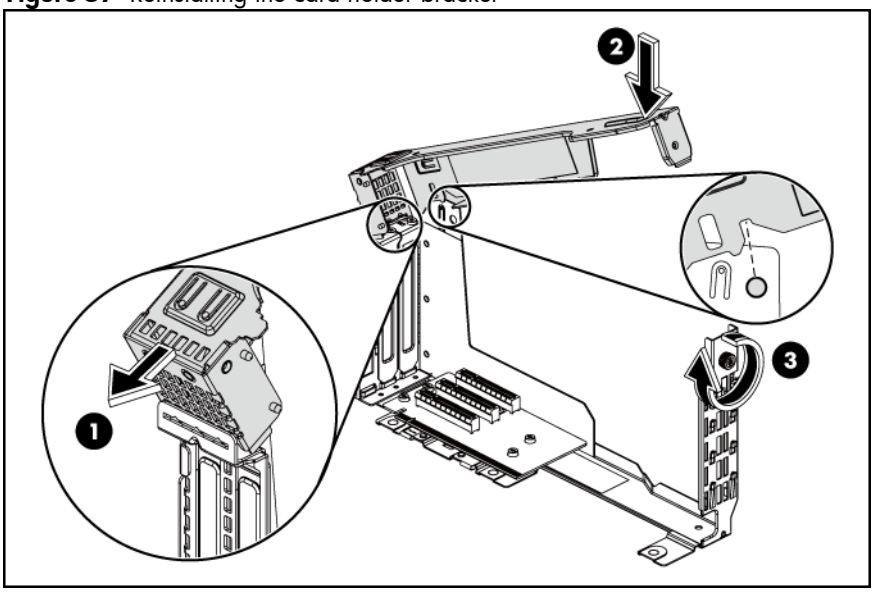
1. Align the four riser card mounting holes to the corresponding screw stand-offs on the 2U PCIe cage.
2. Tighten the 4 screws that secure the riser card to the 2U PCIe cage.

Figure 56 Installing the 2U riser card on the 2U PCIe cage



3. Align one end of the card holder bracket into the slot of the 2U PCIe cage.
4. Route the card holder bracket down to attach it. Make sure that the stand–off on the 2U PCIe cage is aligned to the slot on the card holder bracket.
5. Tighten the thumbscrew to secure the card holder bracket to the 2U PCIe cage.

Figure 57 Reinstalling the card holder bracket



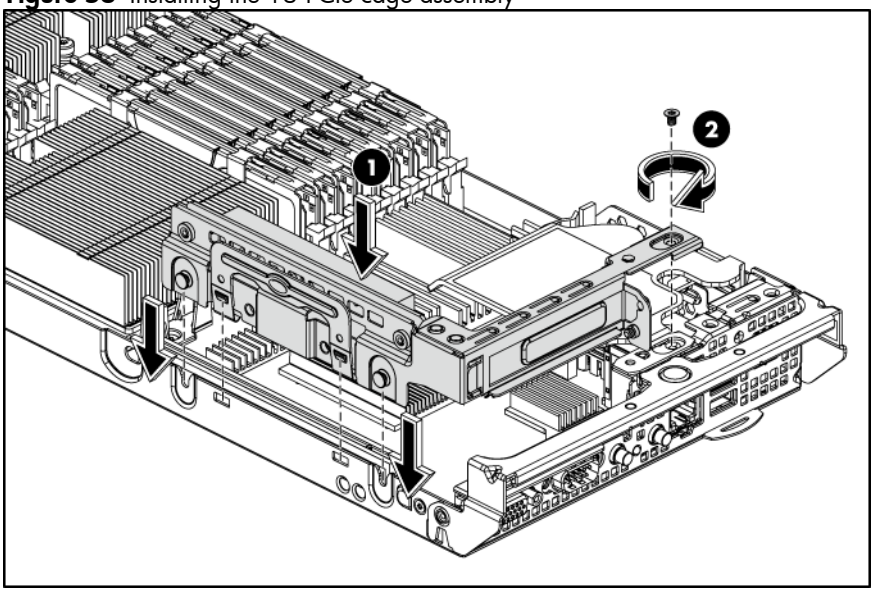
Reinstalling the PCIe cage assemblies

To install the 1U PCIe cage assembly:

1. Align the 1U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 1U PCIe cage assembly are located in the corresponding slots on the system board tray.

2. Install the screw on the top side of the system board tray to secure the 1U PCIe cage assembly to the system board tray.

Figure 58 Installing the 1U PCIe cage assembly

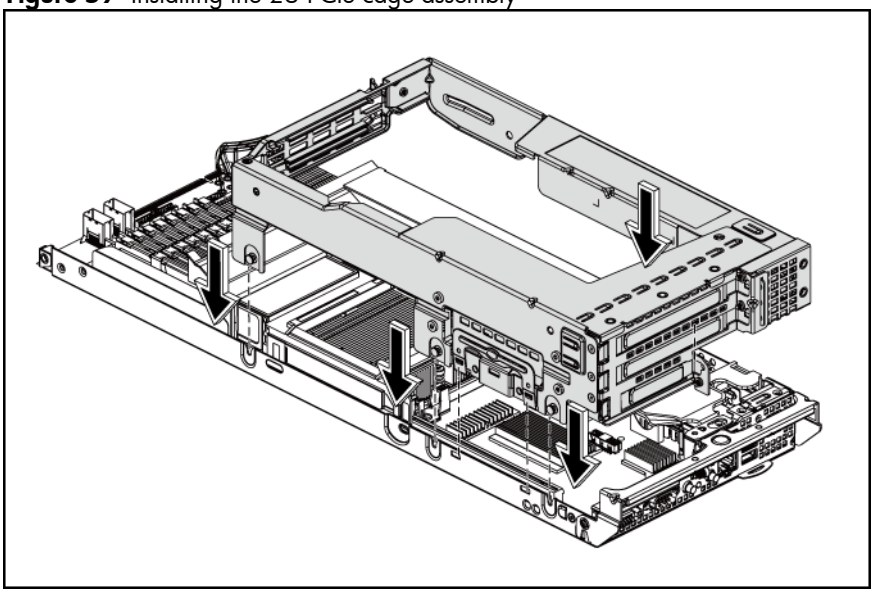


To install the 2U PCIe cage assembly:

Before installing the 2U PCIe cage assembly, you need to install the 2U bottom plastic air baffle. For detailed installation information, see Figure 91.

1. Align the 2U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 2U PCIe cage assembly are located in the corresponding slots on the system board tray, and that the tab is aligned to the slot.

Figure 59 Installing the 2U PCIe cage assembly



Smart Array Controller Boards

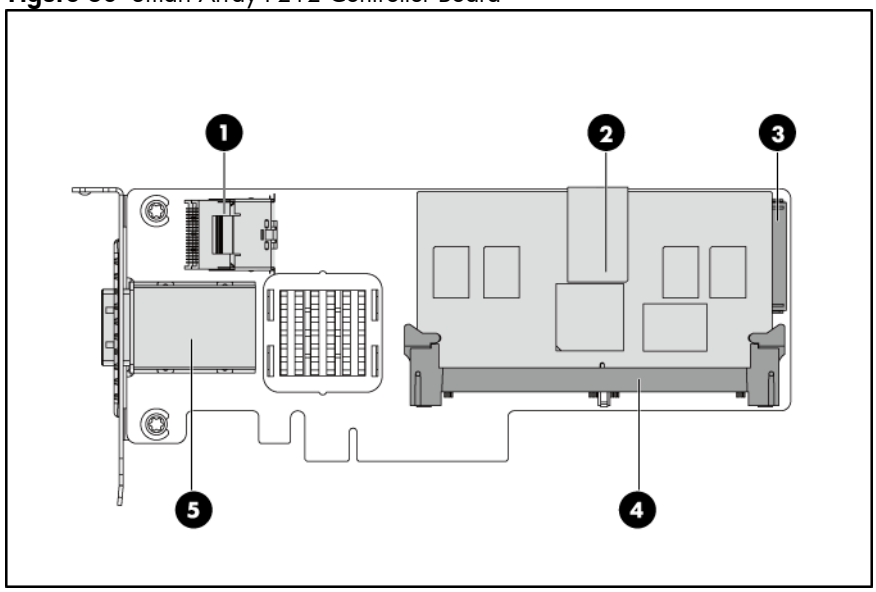
Each system board can support the smart array P212 or P410 controller boards. The smart array P212 or P410 controller boards are optional for the shipment.

The two kinds of smart array controller boards are supported in the following configurations:

- P212: supported for system with 16 or 24 SFF HDD configurations
- P410: supported for system with 8 or 12 LFF, and 16 or 24 SFF HDD configurations

Smart Array P212 Controller Board

Figure 60 Smart Array P212 Controller Board



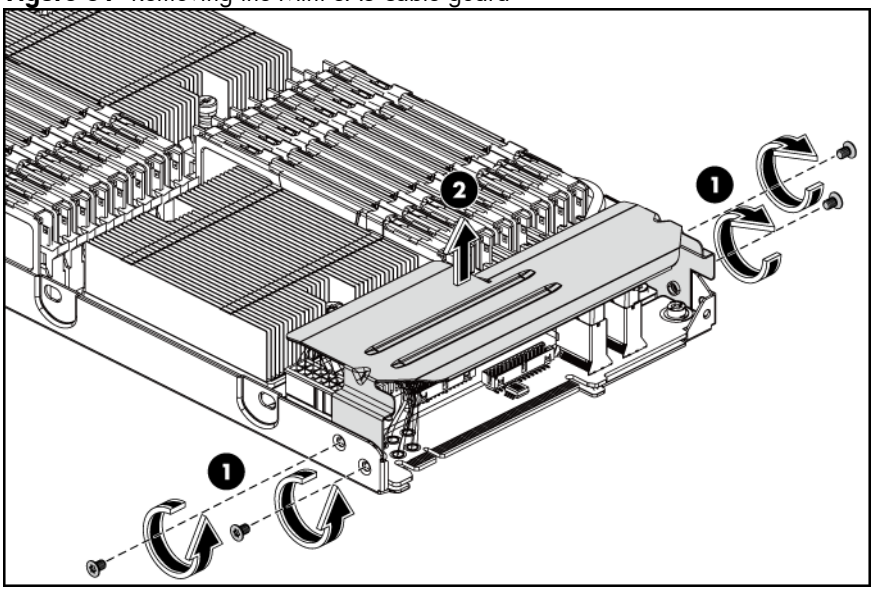
Item	Description
1	Mini SAS connector
2	DDR2 Mini-DIMM cache module
3	Debug connector
4	244-pin Mini-DIMM connector
5	Expander connector

Removing the smart array P212 controller board

To remove the smart array P212 controller board from the 1U node:

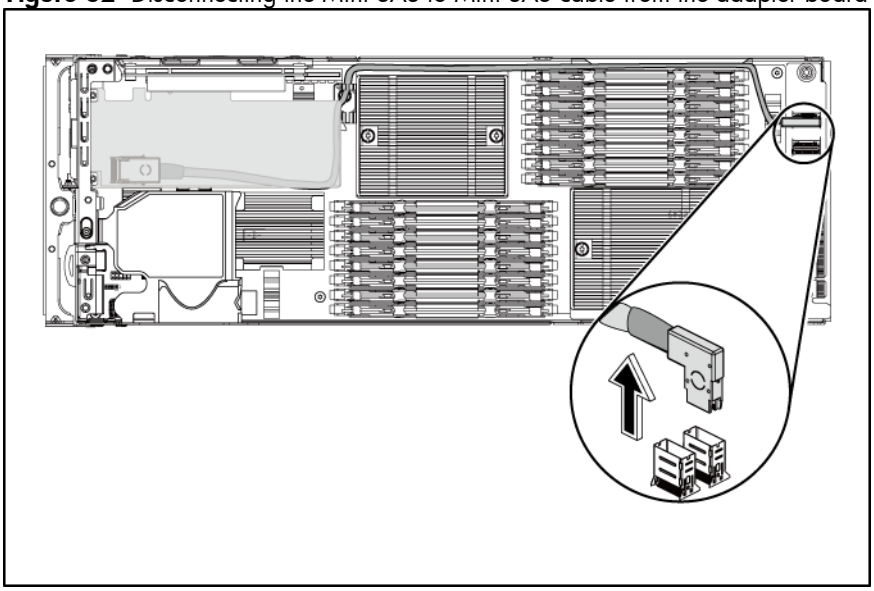
1. Loosen and remove the 4 screws to release the Mini SAS cable guard from the system board tray.
2. Remove the Mini SAS cable guard from the system board tray.

Figure 61 Removing the Mini SAS cable guard



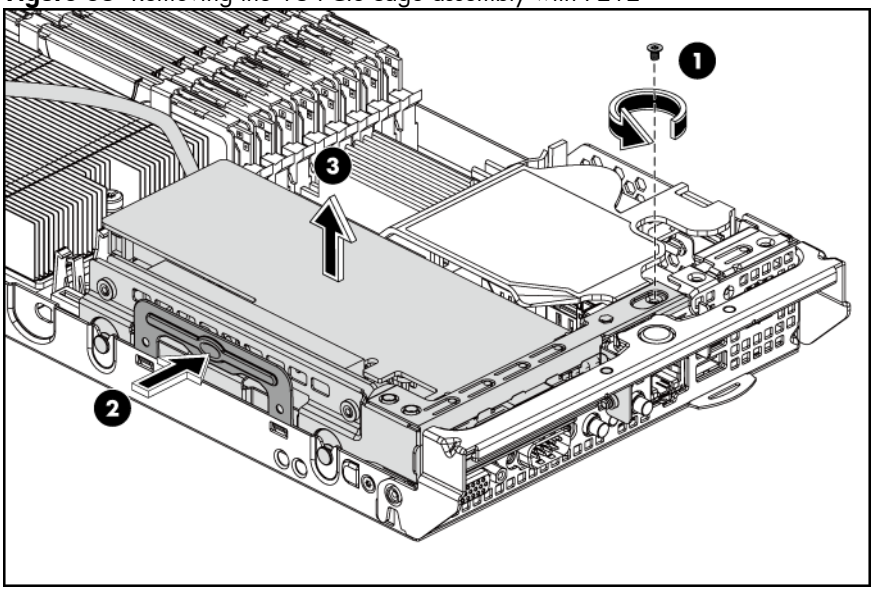
3. Disconnect the Mini SAS to Mini SAS cable from the Mini SAS connector 1 on the adapter card.

Figure 62 Disconnecting the Mini SAS to Mini SAS cable from the adapter board



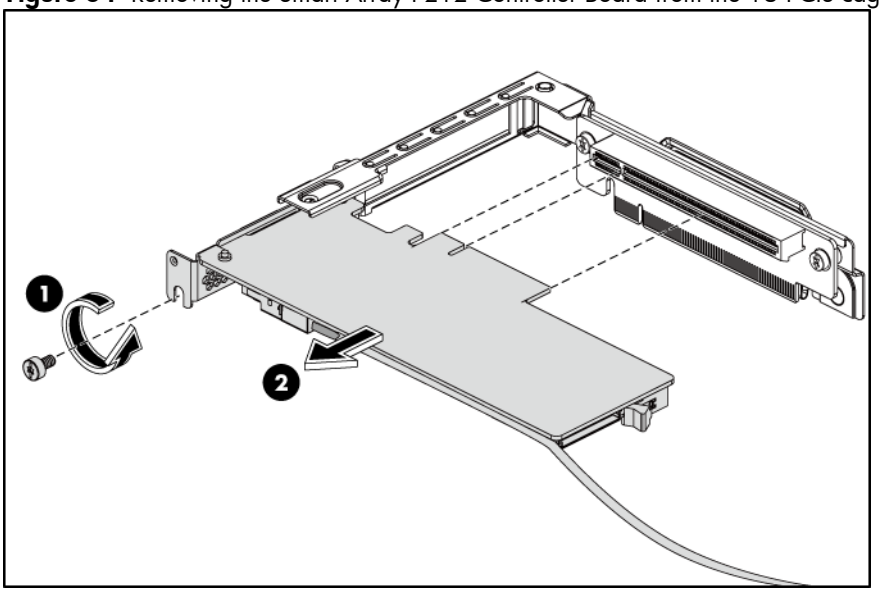
4. Loosen and remove the screw on the top side of the system board tray to release the 1U PCIe cage assembly from the system board tray.
5. Push the locking tabs to release the 1U PCIe cage assembly from the system board tray.
6. Lift the 1U PCIe cage assembly away from the system board tray.

Figure 63 Removing the 1U PCIe cage assembly with P212



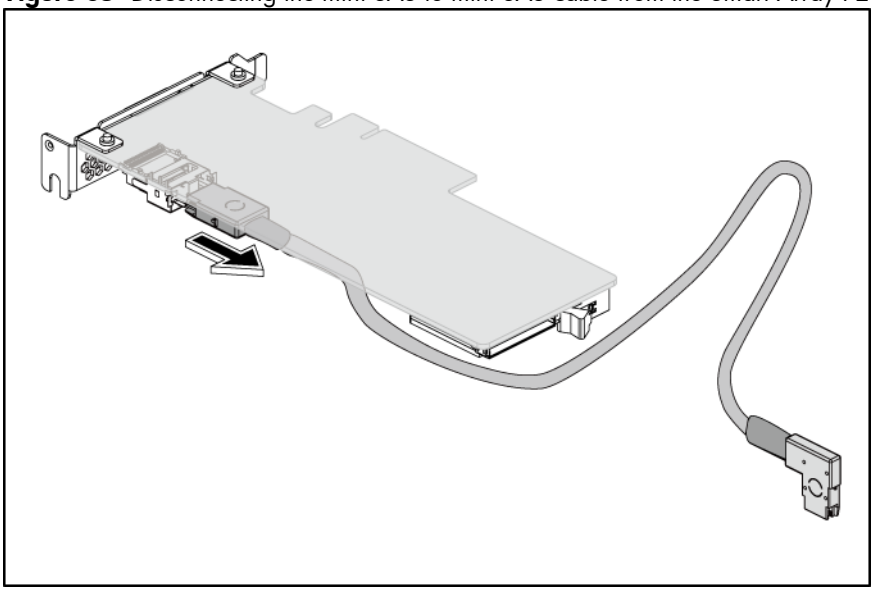
7. Loosen and remove the screw to release the smart array P212 controller board from the 1U PCIe cage.
8. Unplug the smart array P212 controller board from the 1U PCIe cage.

Figure 64 Removing the Smart Array P212 Controller Board from the 1U PCIe cage



9. Disconnect the Mini SAS to Mini SAS cable from the smart array P212 controller board.

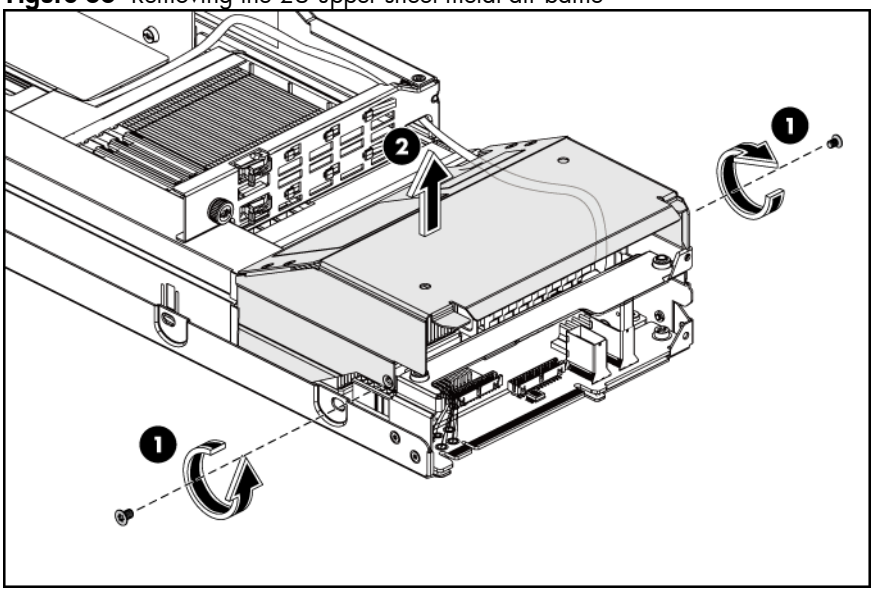
Figure 65 Disconnecting the mini SAS to mini SAS cable from the Smart Array P212 Controller Board



To remove the smart array P212 controller board from the 2U node:

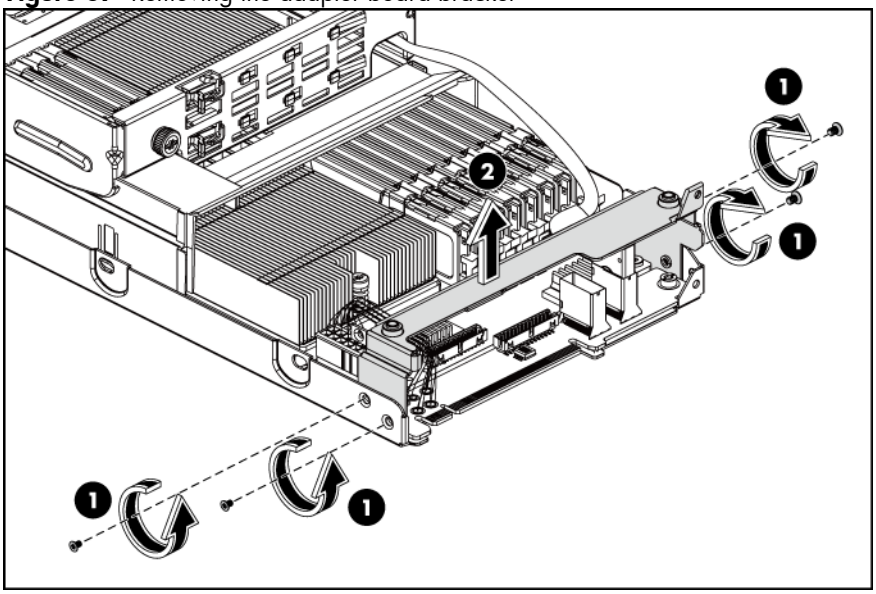
1. Loosen and remove the 2 screws to release the 2U upper sheet metal air baffle from the adapter board bracket.
2. Lift the 2U upper sheet metal air baffle away from the system board tray.

Figure 66 Removing the 2U upper sheet metal air baffle



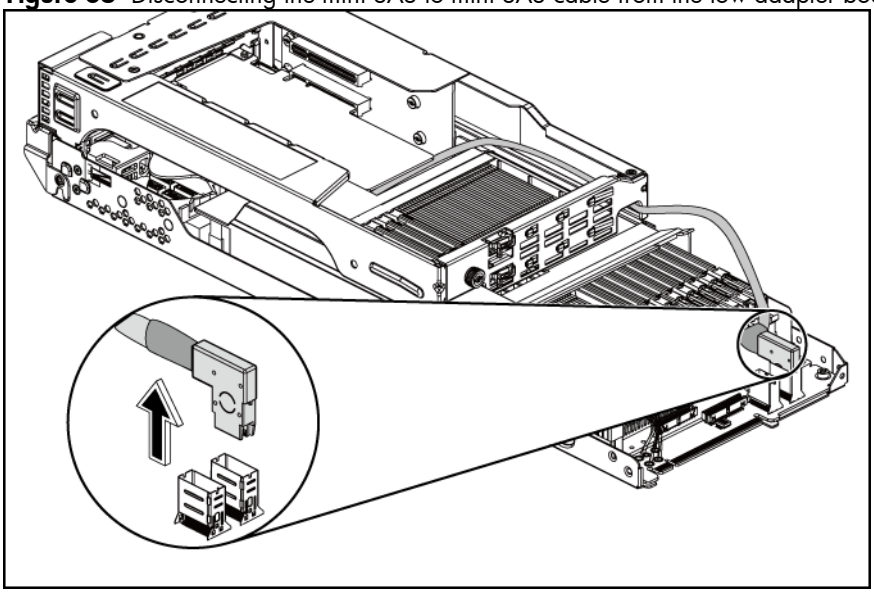
3. Loosen and remove the 4 screws to release the adapter board bracket from the system board tray.
4. Lift the adapter board bracket away from the system board tray.

Figure 67 Removing the adapter board bracket



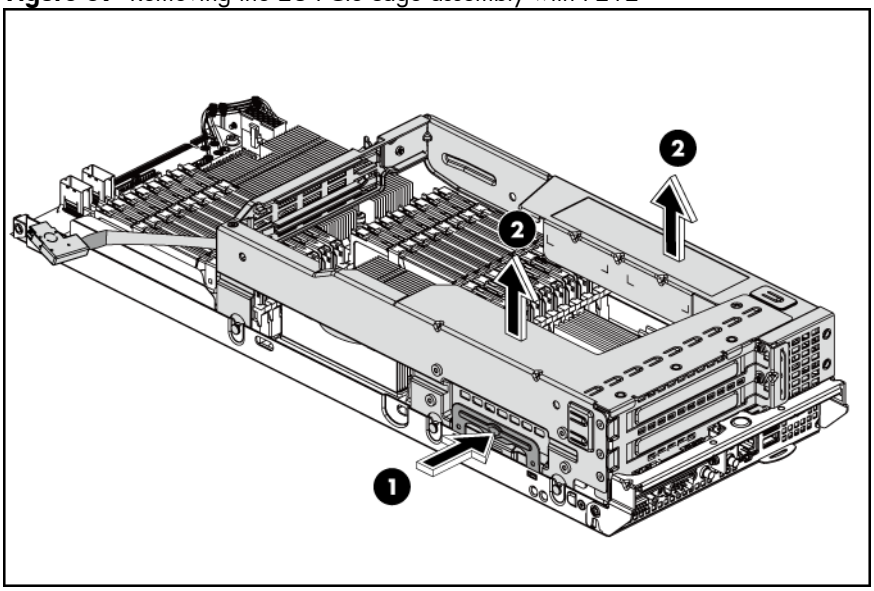
5. Disconnect the Mini SAS to Mini SAS cable from the Mini SAS connector 1 on the low adapter board.

Figure 68 Disconnecting the mini SAS to mini SAS cable from the low adapter board



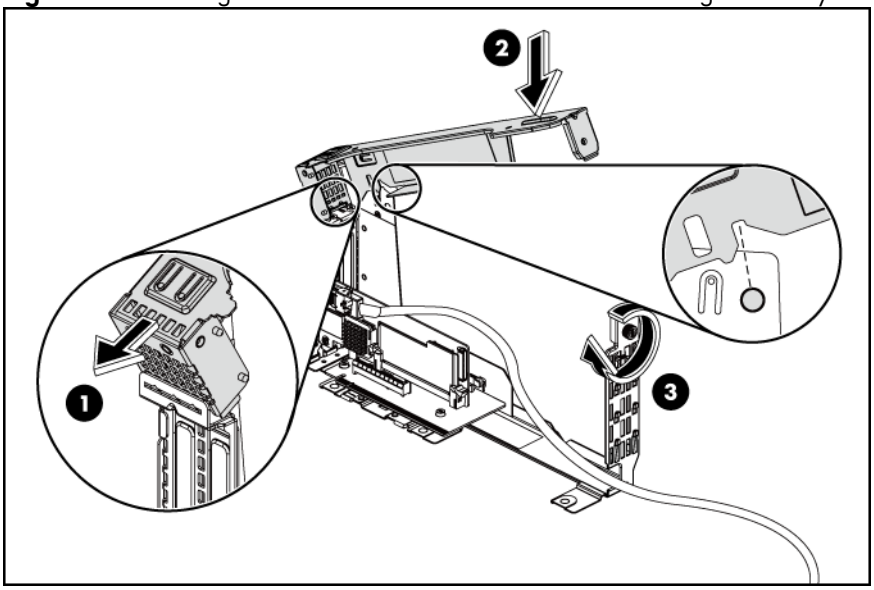
6. Push the locking tab to release the 2U PCIe cage assembly from the system board tray.
7. Lift the 2U PCIe cage assembly away from the system board tray.

Figure 69 Removing the 2U PCIe cage assembly with P212



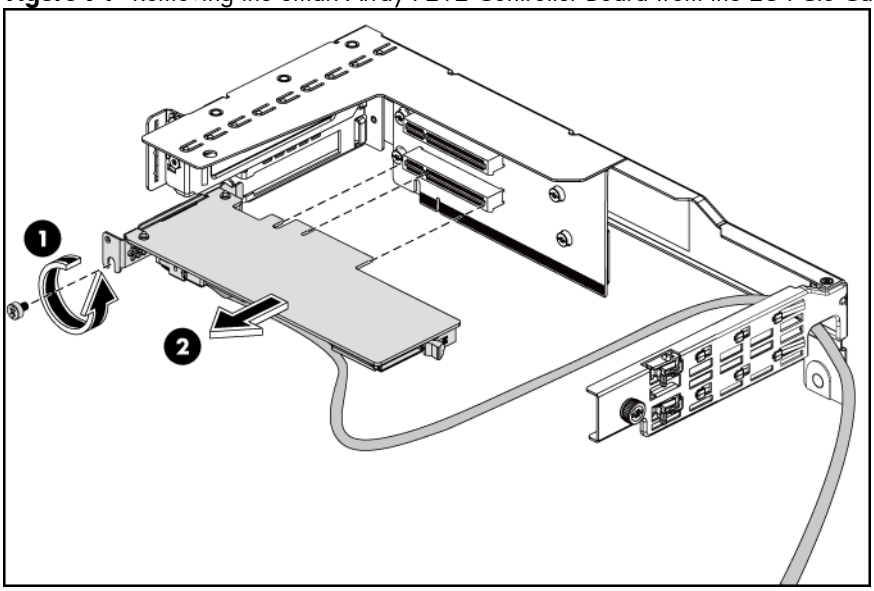
8. Loosen the thumbscrew that secures the card holder bracket to the 2U PCIe cage assembly.
9. Lift and route one end of the card holder bracket away from the 2U PCIe cage assembly.
10. Remove the other end of the card holder bracket away from the slot of the 2U PCIe cage assembly.

Figure 70 Removing the card holder bracket from the 2U PCIe cage assembly with P212



11. Loosen and remove the screw to release the smart array P212 controller board from the 2U PCIe cage.
12. Unplug the smart array P212 controller board from the 2U PCIe cage.

Figure 71 Removing the Smart Array P212 Controller Board from the 2U PCIe Cage



13. Disconnect the Mini SAS to Mini SAS cable from the smart array P212 controller board as shown in Figure 65.

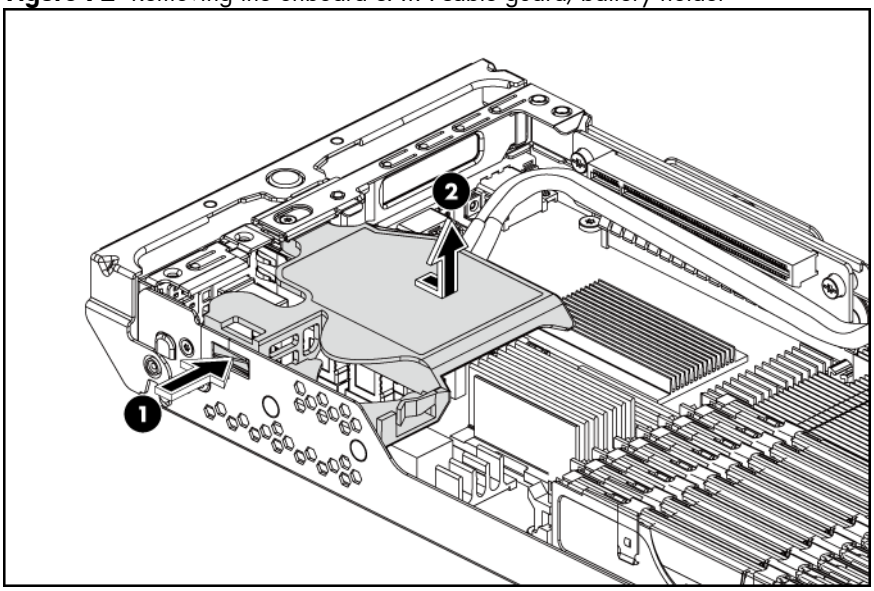
Installing the smart array P212 card

To install the smart array P212 controller board on the 1U node:

1. Press the tab to release the onboard SATA cable guard/battery holder from the system board tray.
2. Move the onboard SATA cable guard/battery holder in the direction as shown in figure below, and lift it away from the system board.

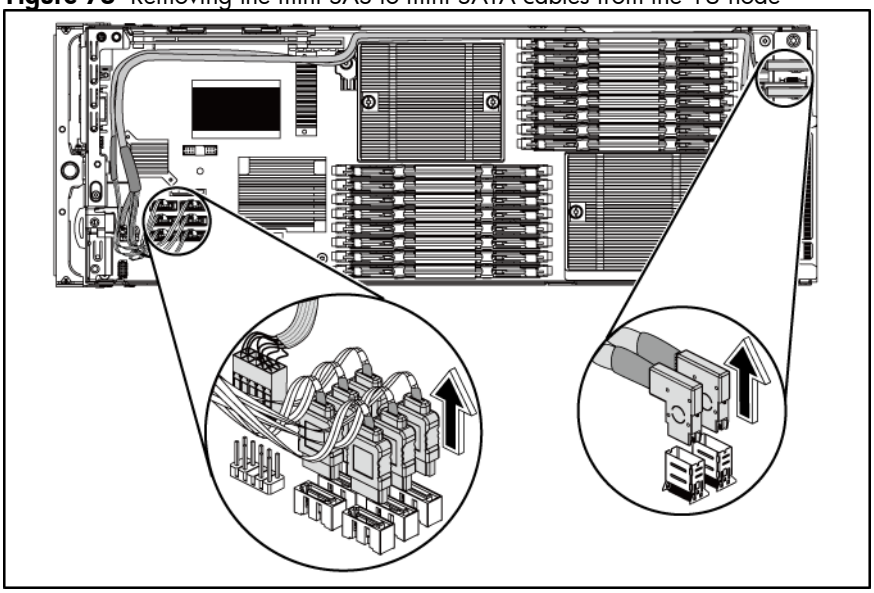
NOTE: Before removing the onboard SATA cable guard/battery holder from the chassis, remove the super-capacitor pack and cable if installed. See the section of "Super-capacitor Pack" for reference.

Figure 72 Removing the onboard SATA cable guard/battery holder



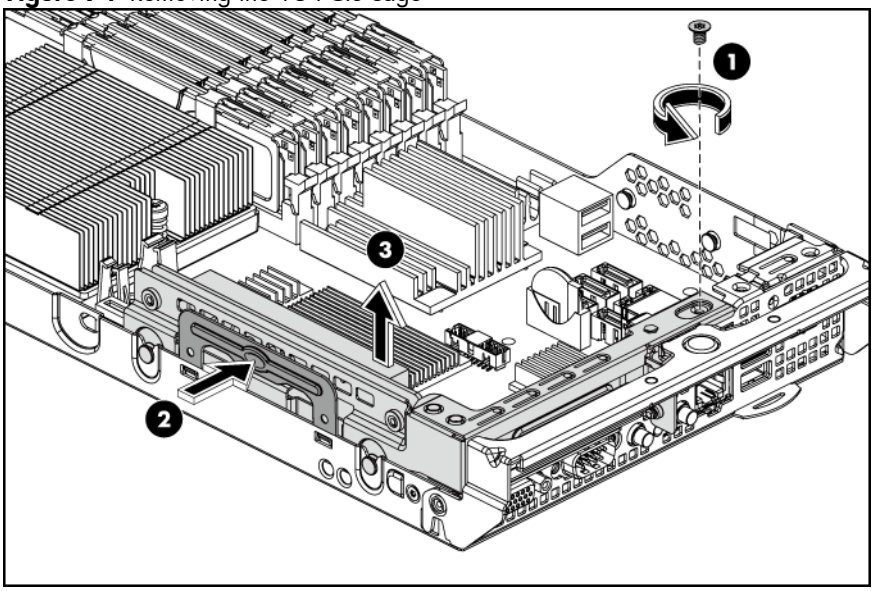
3. Remove the Mini SAS cable guard from the system board tray as Figure 61.
4. Unplug the Mini SAS to Mini SATA cables from the adapter board and the system board.

Figure 73 Removing the mini SAS to mini SATA cables from the 1U node



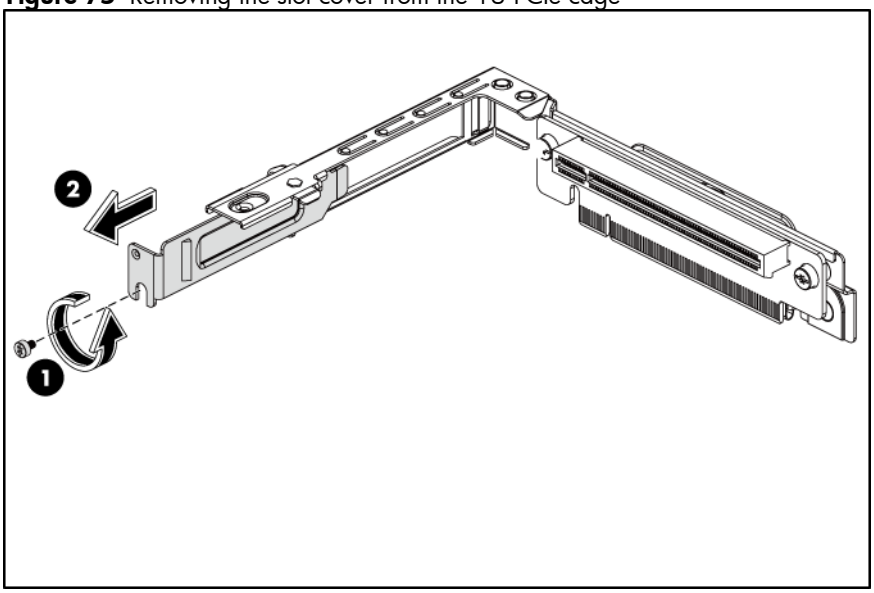
5. Loosen the screw on the top side of the system board tray to release the 1U PCIe cage from the system board tray.
6. Push the locking tab to release the 1U PCIe cage from the system board tray.
7. Lift the 1U PCIe cage away from the system board.

Figure 74 Removing the 1U PCIe cage



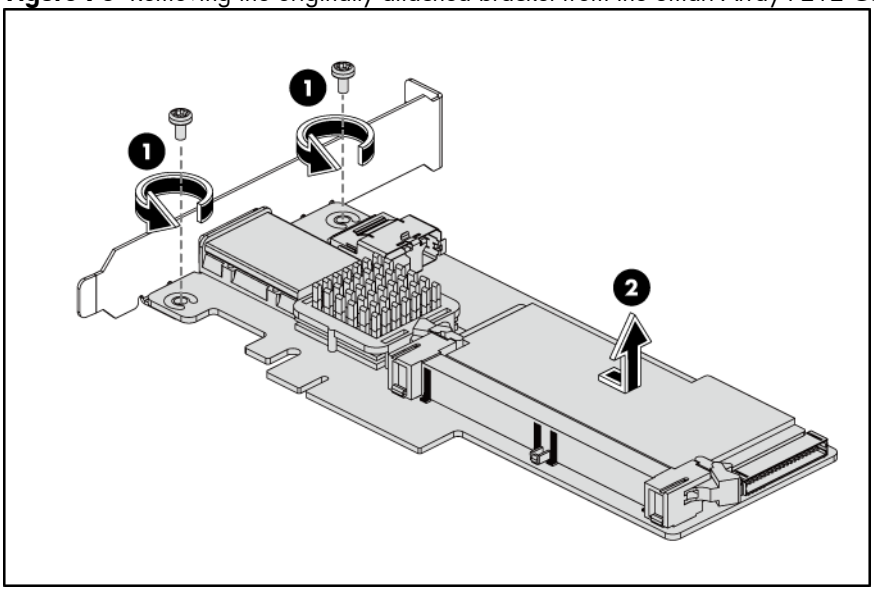
8. Loosen and remove the screw on the slot cover from the 1U PCIe cage.
9. Remove the slot cover from the 1U PCIe cage.

Figure 75 Removing the slot cover from the 1U PCIe cage



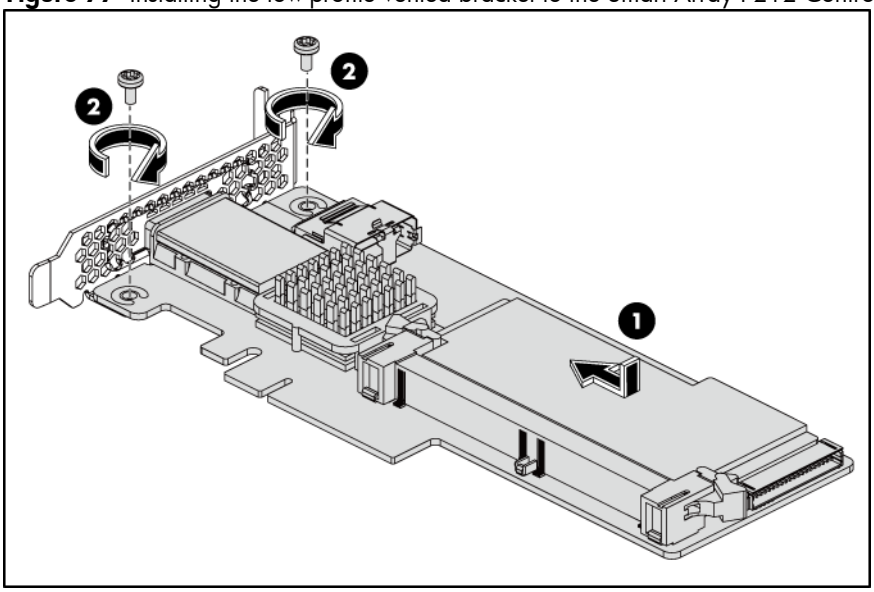
10. Loosen and remove the 2 screws to release the smart array P212 controller board from the originally attached bracket.
11. Unplug and remove the smart array P212 controller board from the originally attached bracket.

Figure 76 Removing the originally attached bracket from the Smart Array P212 Controller Board



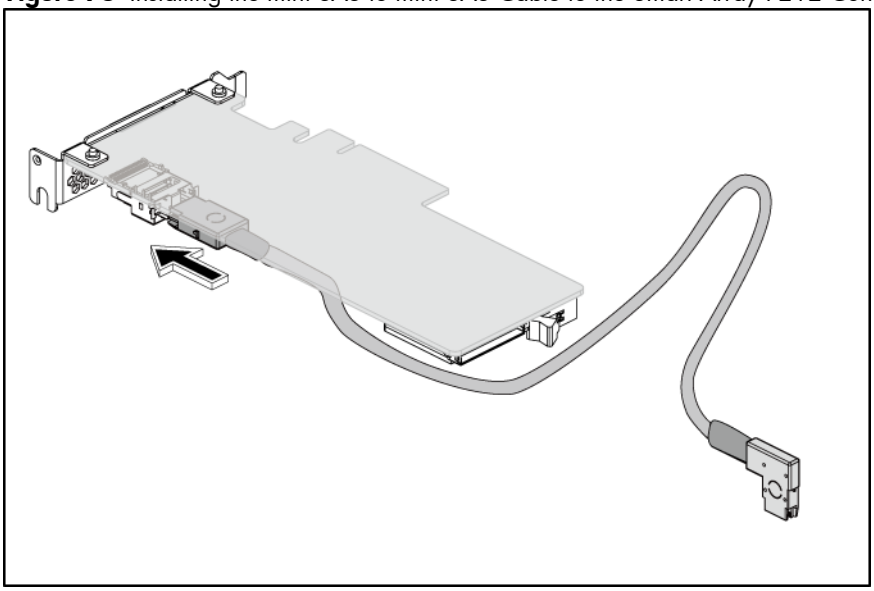
12. Install the low-profile vented bracket on the smart array P212 controller board.
    a. Insert the smart array P212 controller board to the matching slot on the low-profile vented bracket. Make sure the smart array P212 controller board is aligned to the bracket by the 2 screw holes.
    b. Install the 2 screws to install the low-profile vented bracket to smart array P212 controller board.

Figure 77 Installing the low-profile vented bracket to the Smart Array P212 Controller Board



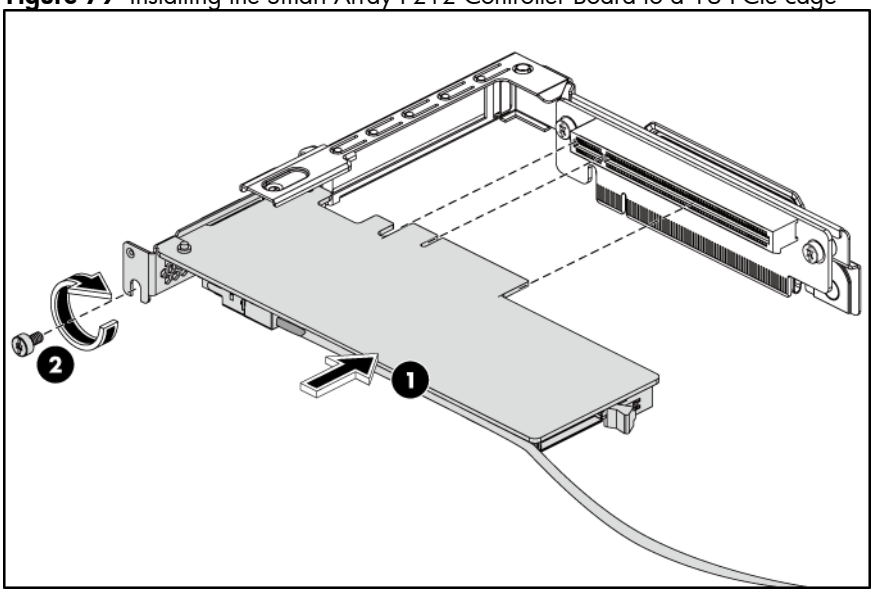
13. Install the Mini SAS to Mini SAS cable to the Mini SAS connector J6 on the smart array P212 controller board.

Figure 78 Installing the mini SAS to mini SAS Cable to the Smart Array P212 Controller Board



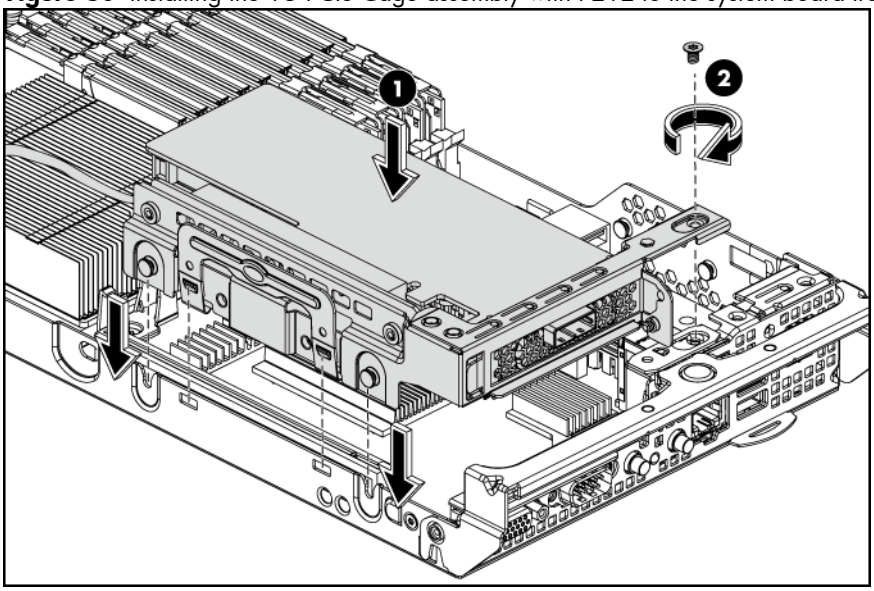
14. Align and install the smart array P212 controller board to the connector on the 1U riser card.
15. Install the screw to secure the smart array P212 controller board to the 1U PCIe cage.

Figure 79 Installing the Smart Array P212 Controller Board to a 1U PCIe cage



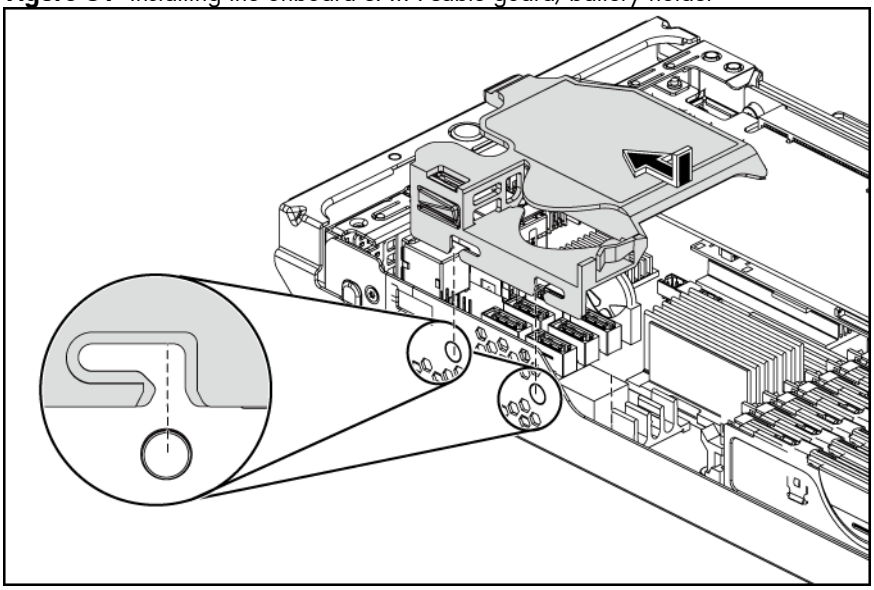
16. Align the 1U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 1U PCIe cage assembly are located in the corresponding slots on the system board tray.
17. Install the screw on the top side of the system board tray to secure the 1U PCIe cage assembly to the system board tray.

Figure 80 Installing the 1U PCIe Cage assembly with P212 to the system board tray



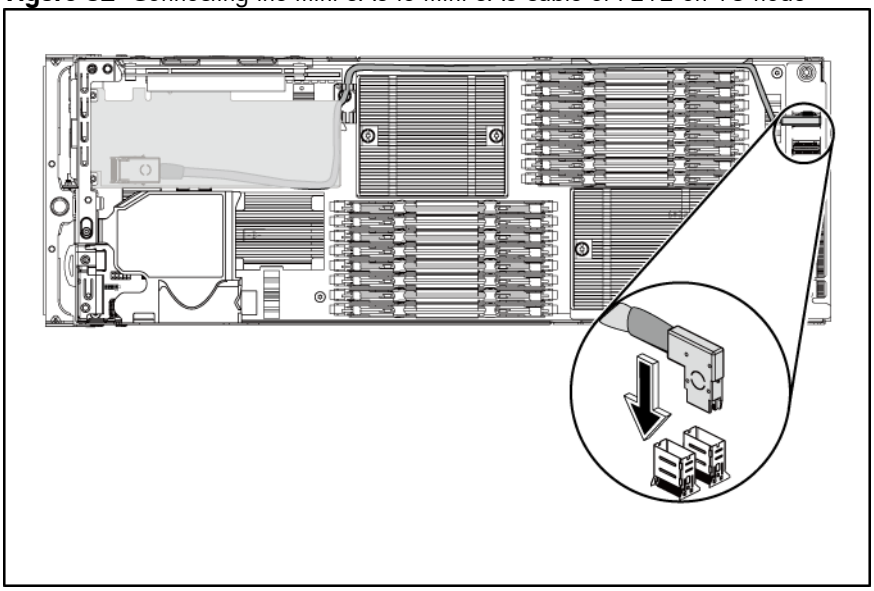
18. Align the onboard SATA cable guard/battery holder to the stand-offs on the system board tray and install it in the direction as shown below. Make sure the tab is inserted to the slot.

Figure 81 Installing the onboard SATA cable guard/battery holder



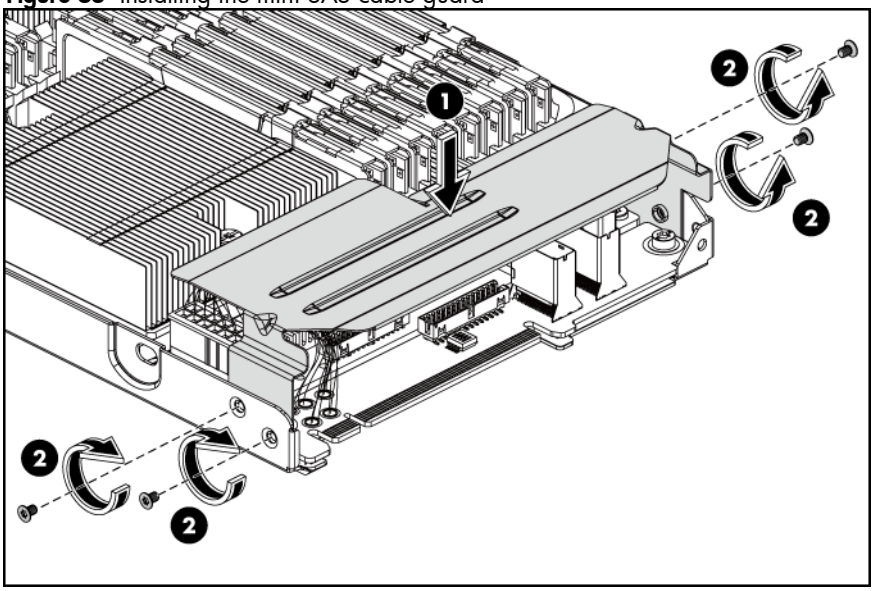
19. Route the Mini SAS to Mini SAS cable through the onboard cable holder and along the side of the system board tray as shown in the following figure.
20. Connect the Mini SAS to Mini SAS cable to the Mini SAS connector 1 on the adapter card.

Figure 82 Connecting the mini SAS to mini SAS cable of P212 on 1U node



21. Align the Mini SAS cable guard to the system board tray by the 4 screw holes.
22. Install the 4 screws to install the Mini SAS cable guard to the system board tray.

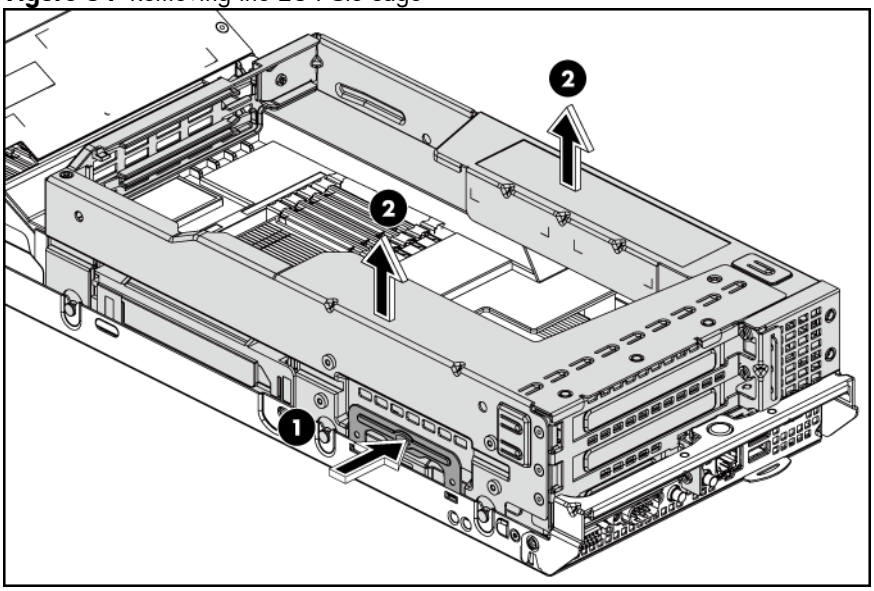
Figure 83 Installing the mini SAS cable guard



To install the smart array P212 controller board on a 2U node:

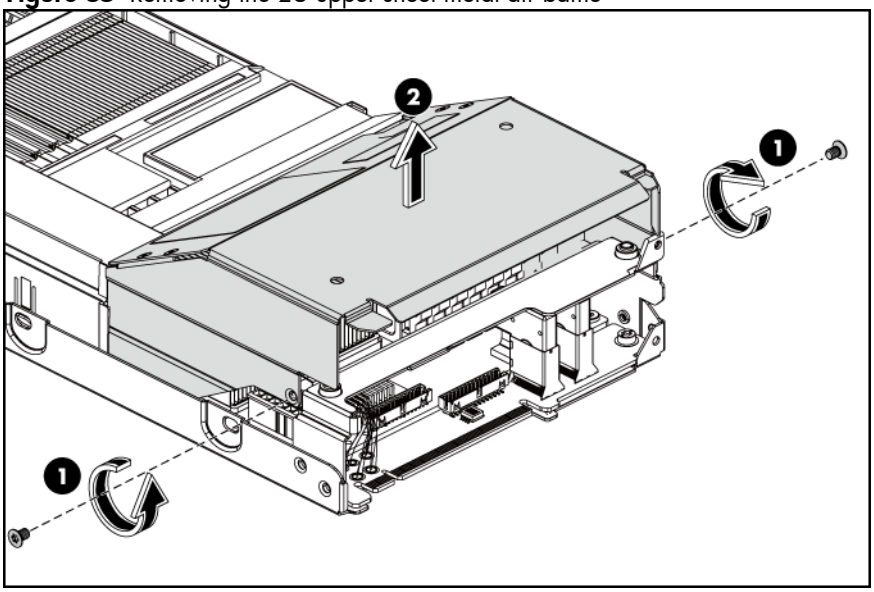
1. Push the locking tab to release the 2U PCIe cage from the system board tray.
2. Lift the 2U PCIe cage away from the system board.

Figure 84 Removing the 2U PCIe cage



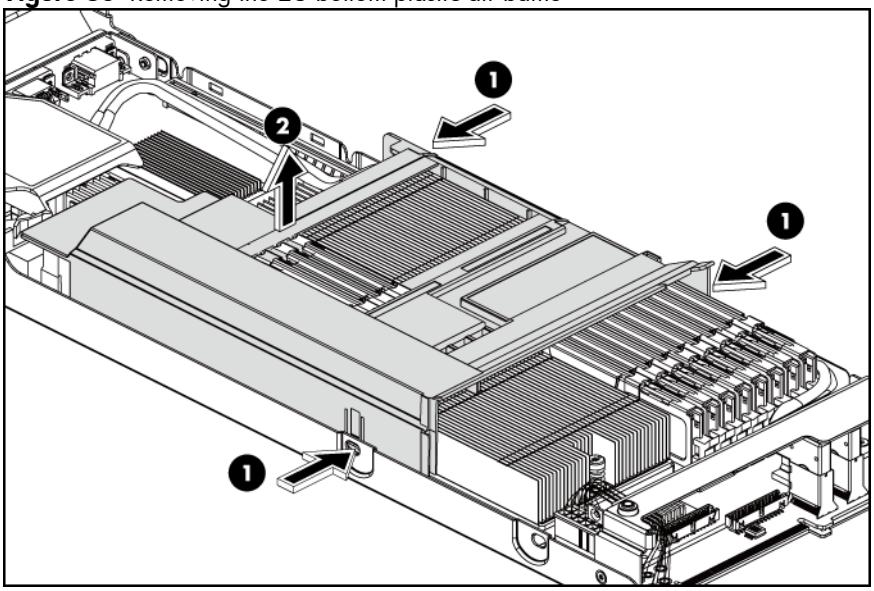
3. Loosen the 2 screws to release the 2U upper sheet metal air baffle from the adapter board bracket.
4. Remove the 2U upper sheet metal air baffle from the system board tray.

Figure 85 Removing the 2U upper sheet metal air baffle



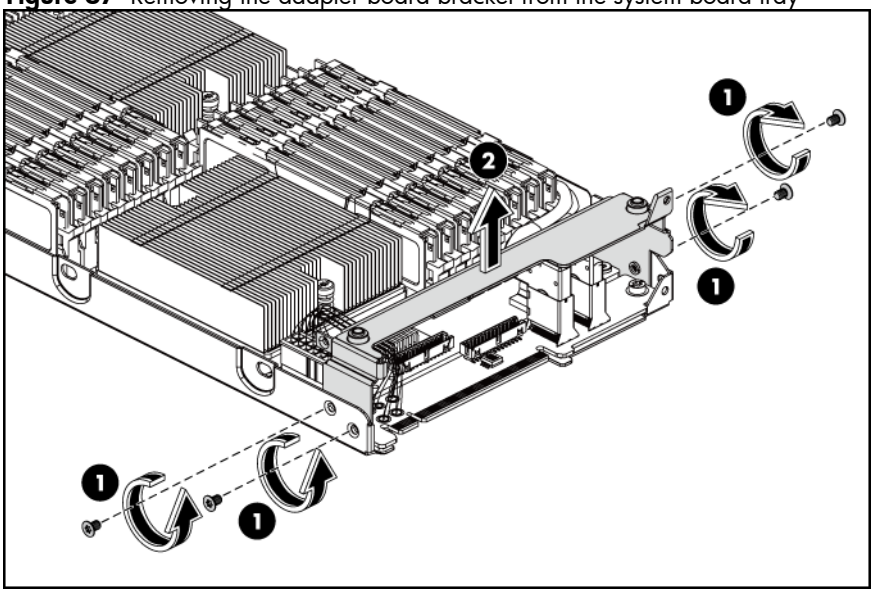
5. Push the locking tabs to release the 2U bottom plastic air baffle from the system board tray.
6. Lift the 2U bottom plastic air baffle away from the system board.

Figure 86 Removing the 2U bottom plastic air baffle



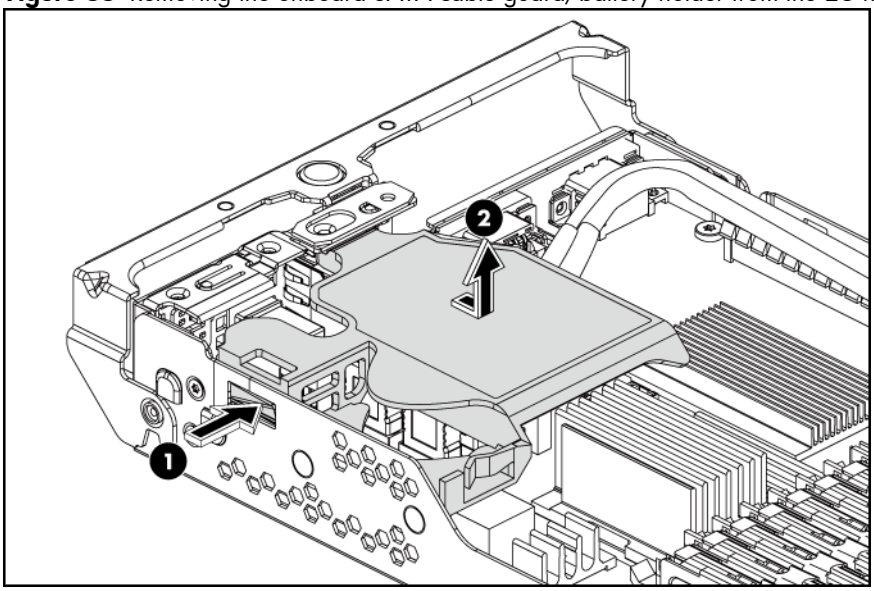
7. Loosen the 4 screws to release the adapter board bracket from the system board tray.
8. Remove the adapter board bracket from the system board tray.

Figure 87 Removing the adapter board bracket from the system board tray



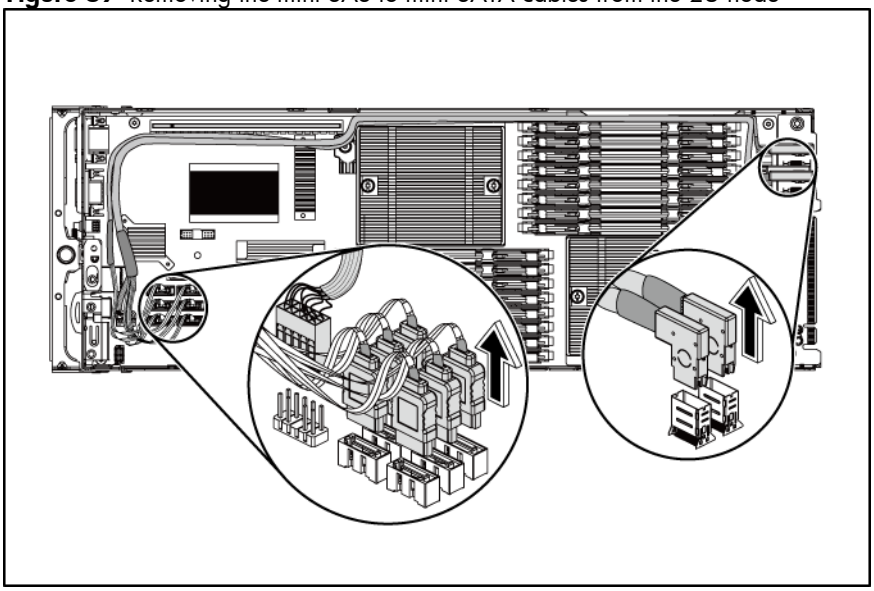
9. Press the tab to release the onboard SATA cable guard/battery holder from the system board tray.
10. Move the onboard SATA cable guard/battery holder in the direction as shown in the following figure, and lift it away from the system board.

Figure 88 Removing the onboard SATA cable guard/battery holder from the 2U node



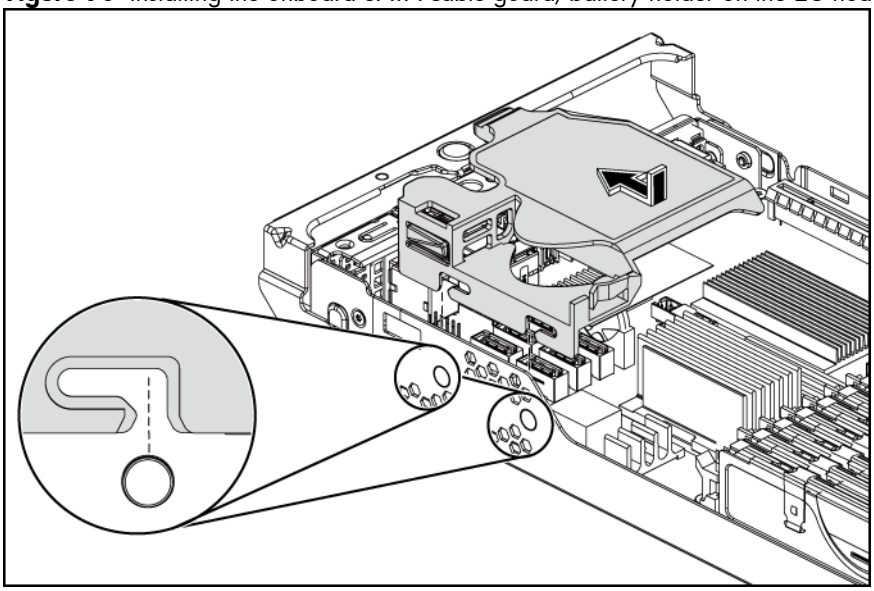
11. Unplug the Mini SAS to Mini SATA cables from the adapter board and the system board.

Figure 89 Removing the mini SAS to mini SATA cables from the 2U node



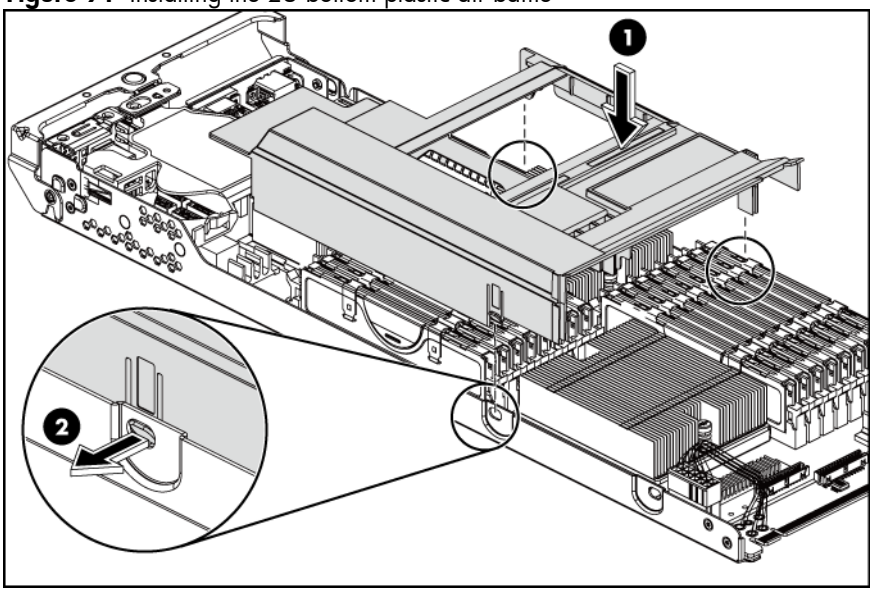
12. Align the onboard SATA cable guard/battery holder to the stand–offs on the system board tray and install it in the direction as shown below. Make sure the tab is inserted to the slot.

Figure 90 Installing the onboard SATA cable guard/battery holder on the 2U node



13. Align the 2U bottom plastic air baffle to the system board. Make sure the tab is aligned to the slot.
14. Put the tabs of the 2U bottom plastic air baffle in the slots of the system board tray.

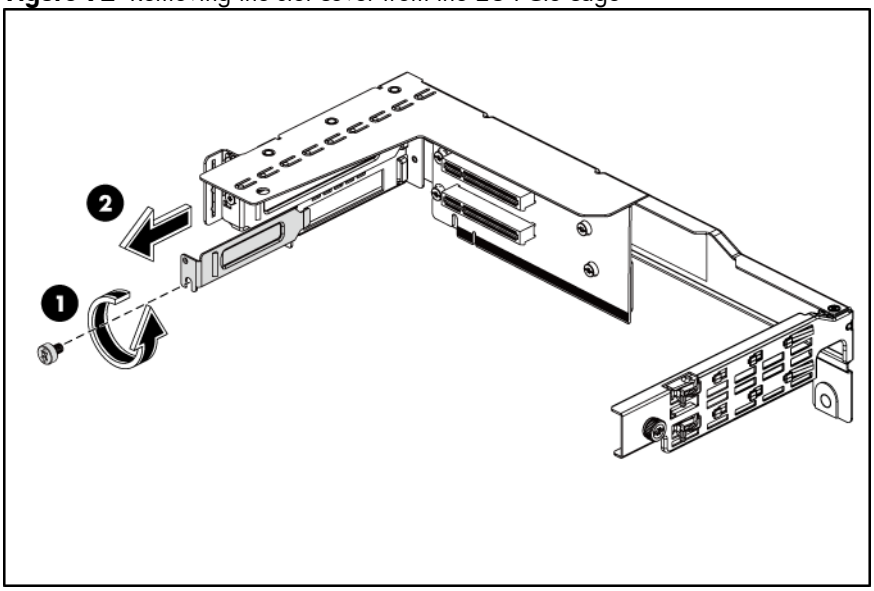
Figure 91 Installing the 2U bottom plastic air baffle



15. Remove the card holder bracket away from the 2U PCIe cage as Figure 53.
16. Loosen and remove the screw to release the slot cover from the 2U PCIe cage.
17. Remove slot cover from the 2U PCIe cage.

    In this document, we remove the low-profile slot cover of the 2U PCIe cage as example since the primary location for the smart array P212 controller board on the 2U riser card should always be the lowest connector (the low-profile connector).

Figure 92 Removing the slot cover from the 2U PCIe cage



18. Remove the originally attached bracket from the smart array P212 controller board (for removing methods of the originally attached bracket, see the Figure 76 in this document).
19. Install the low-profile vented bracket on the smart array P212 controller board (for installation methods of the low-profile vented bracket, see the Figure 77 in this document).

    There are two types of vented brackets for the smart array P212 controller board: low-profile and full-height. The low-profile vented bracket is for the smart array P212 controller board to be installed on the low-profile riser card connector. The full-height vented bracket is for smart array P212 controller board installed on the full-height riser card connector.

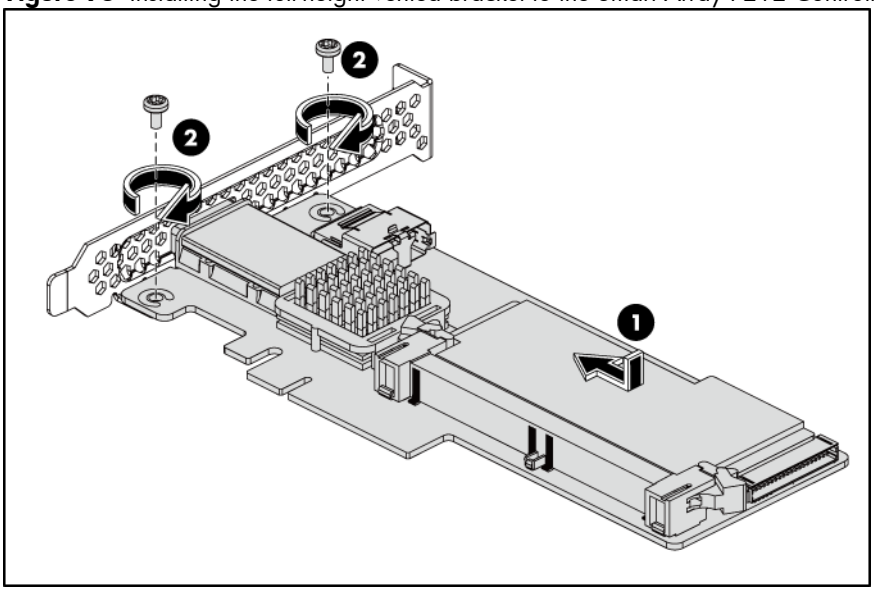
    In this document we install the low-profile vented bracket for P212 as example since the primary location for P212 on the riser card should always be the lowest connector (the low-profile connector).

    However, the following installation methods of the full-height vented bracket can be taken as reference when you install P212 installed on the full-height riser card connector:

    a. Insert the smart array P212 controller board to the matching slot on the full-height vented bracket. Make sure the smart array P212 controller board is aligned to the full-height vented bracket by the 2 screw holes.

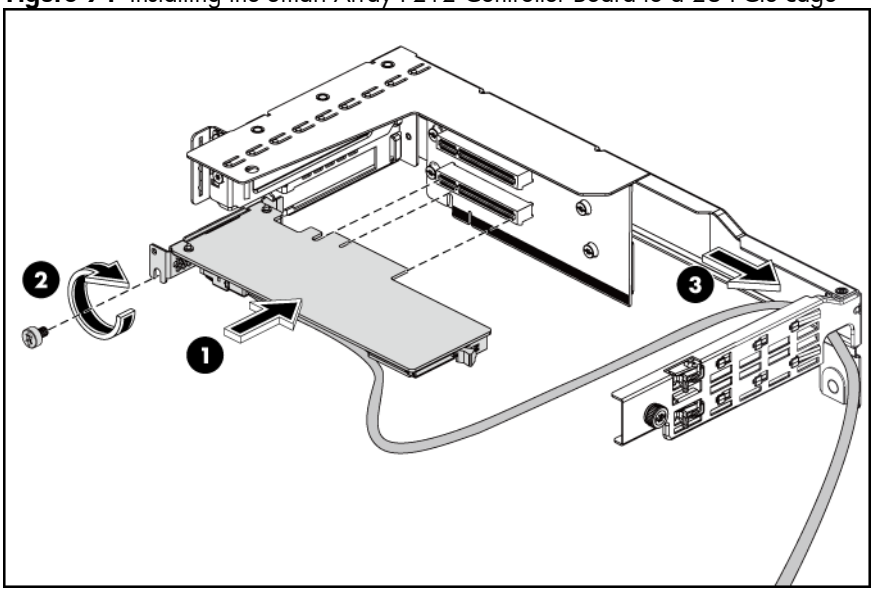
    b. Install the 2 screws to install the full-height vented bracket to smart array P212 controller board.

Figure 93 Installing the full-height vented bracket to the Smart Array P212 Controller Board



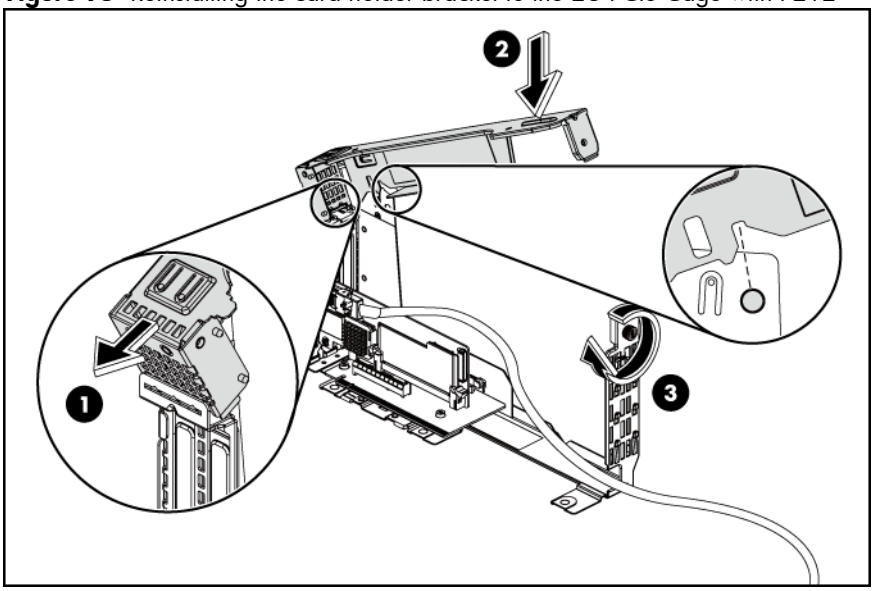
20. Install the Mini SAS to Mini SAS cable to the Mini SAS connector J6 on the smart array P212 controller board as shown in Figure 78.
21. Align and install the smart array P212 controller board with its matching connector.
22. Install the screw to secure the smart array P212 controller board to the 2U PCIe cage.
23. Route the Mini SAS to Mini SAS cable through the hole of the 2U PCIe cage as shown in the following figure.

Figure 94 Installing the Smart Array P212 Controller Board to a 2U PCIe cage



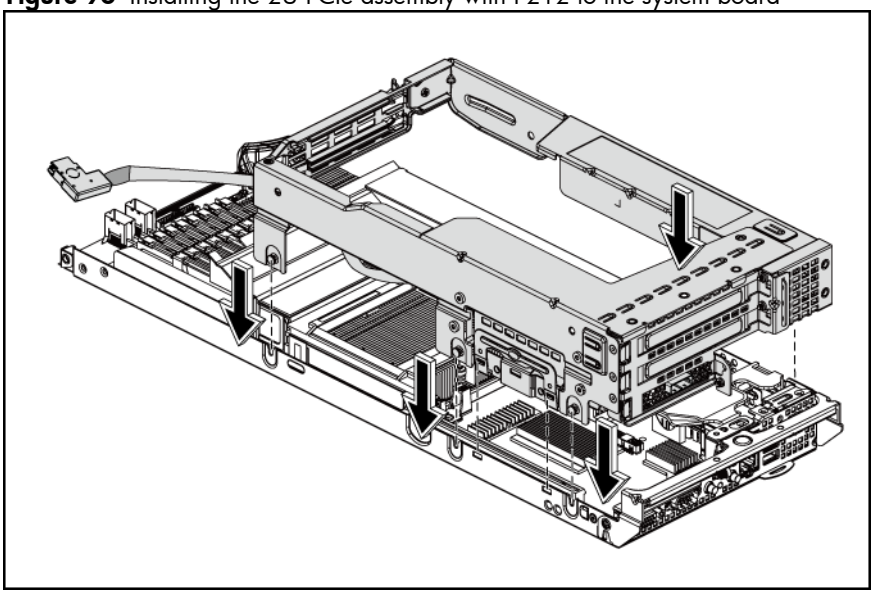
24. Align one end of the card holder bracket into the slot of the 2U PCIe cage.
25. Route the card holder bracket down to attach it. Make sure that the stand–off on the 2U PCIe cage is aligned to the slot on the card holder bracket.
26. Tighten the thumbscrew to secure the card holder bracket to the 2U PCIe cage.

Figure 95 Reinstalling the card holder bracket to the 2U PCIe Cage with P212



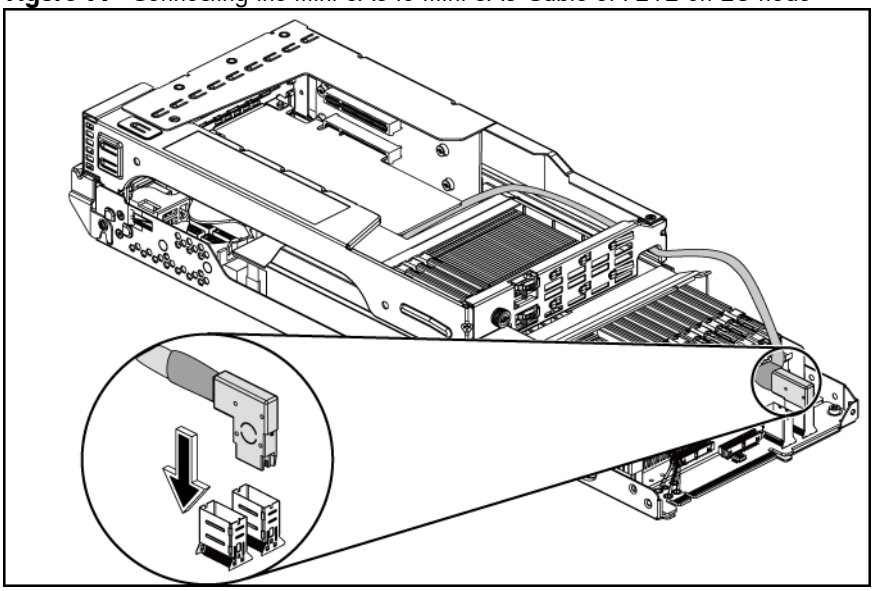
27. Align the 2U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 2U PCIe cage assembly are located in the corresponding slots on the system board tray, and that the tab is aligned to the slot.

Figure 96 Installing the 2U PCIe assembly with P212 to the system board



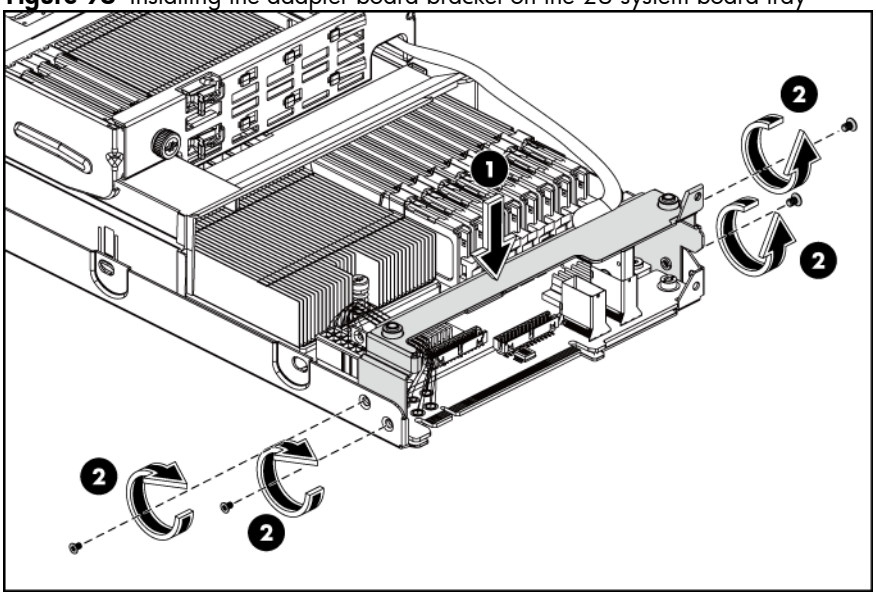
28. Route the Mini SAS to Mini SAS cable and install it to the Mini SAS connector 1 on the low adapter board.

Figure 97 Connecting the mini SAS to mini SAS Cable of P212 on 2U node



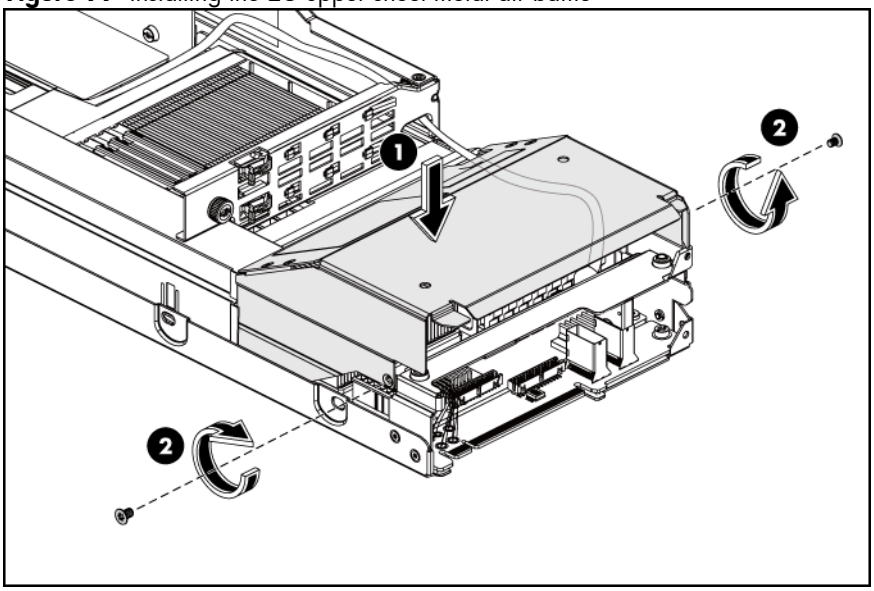
29. Align the adapter board bracket to the system board tray by the 4 screw holes.
30. Install the 4 screws to install the adapter board bracket on the system board tray.

Figure 98 Installing the adapter board bracket on the 2U system board tray



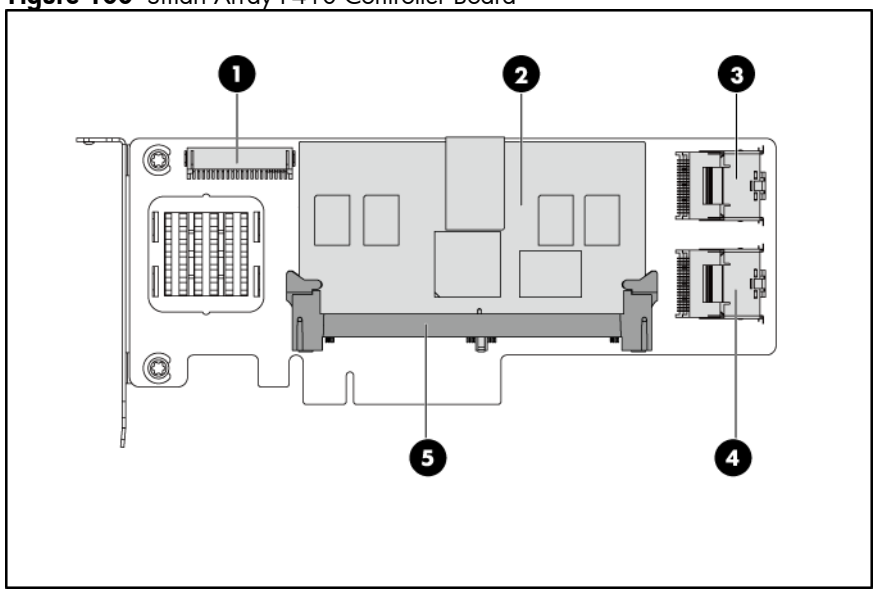
31. Align the 2U upper sheet metal air baffle to the adapter board bracket by the 2 screw holes. Make sure that the Mini SAS to Mini SAS cable pass through the open hole of the 2U upper sheet metal air baffle.
32. Install the 2 screws to install the 2U upper sheet metal air baffle on the adapter board bracket.

Figure 99 Installing the 2U upper sheet metal air baffle



Smart array P410 controller board

Figure 100 Smart Array P410 Controller Board



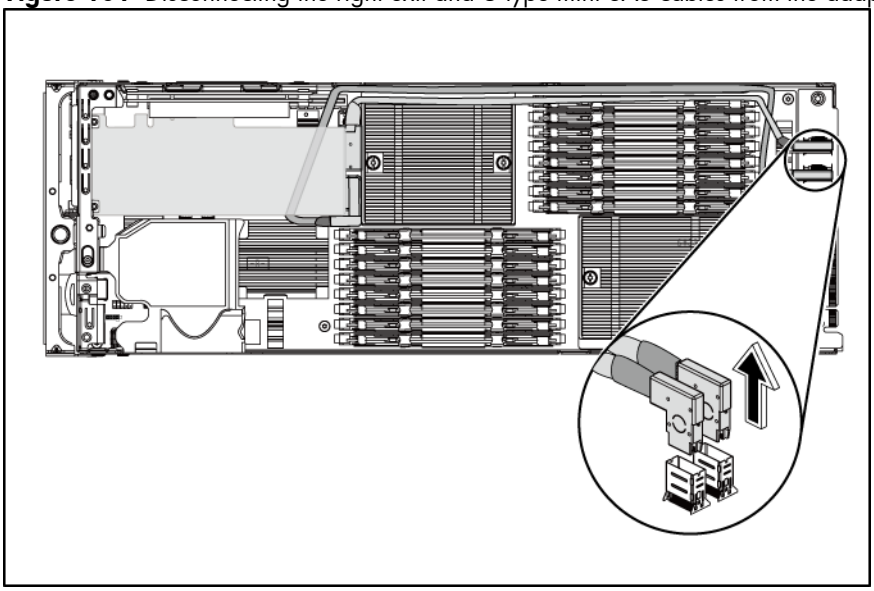
Item	Description
1	Debug connector
2	DDR2 Mini-DIMM cache module
3	Mini SAS connector 2
4	Mini SAS connector 1
5	244-pin Mini-DIMM connector

Removing the smart array P410 controller board

To remove the smart array P410 controller board from the 1U node:

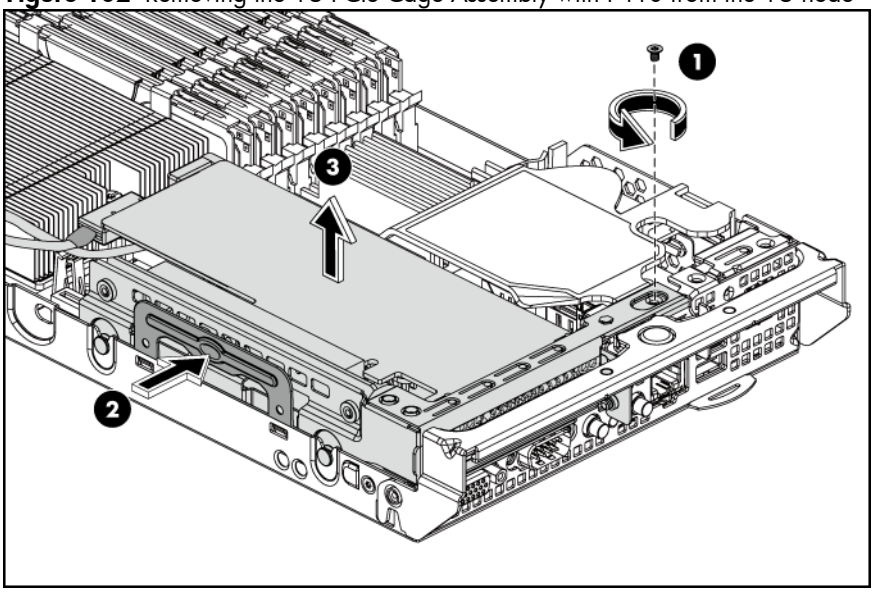
1. Remove the Mini SAS cable guard from the system board tray as shown in Figure 61.
2. Disconnect the Right Exit and U Type Mini SAS to Mini SAS cables from the Mini SAS connectors on the adapter card.

Figure 101 Disconnecting the right exit and U type mini SAS cables from the adapter board



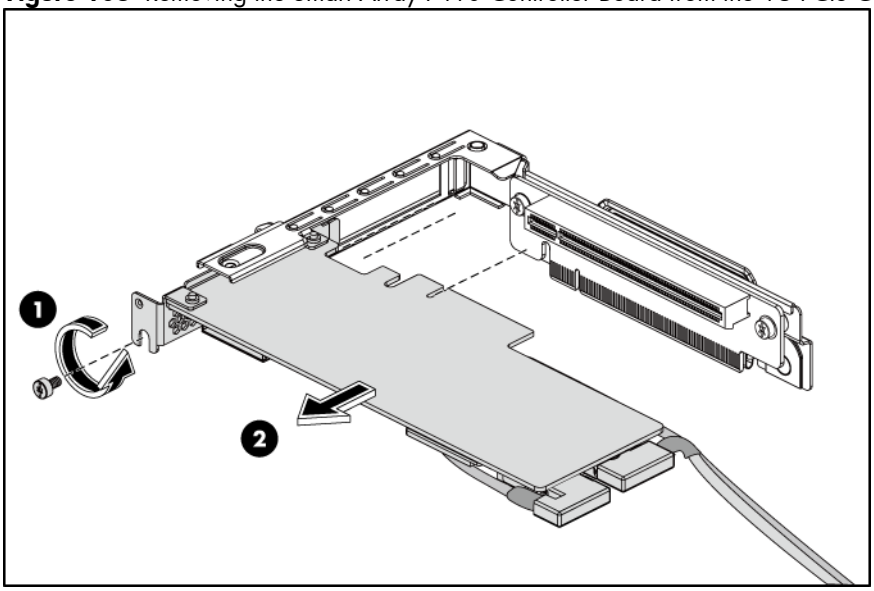
3. Loosen and remove the screw on the top side of the system board tray to release the 1U PCIe cage assembly from the system board tray.
4. Push the locking tabs to release the 1U PCIe cage assembly from the system board tray.

Figure 102 Removing the 1U PCIe Cage Assembly with P410 from the 1U node



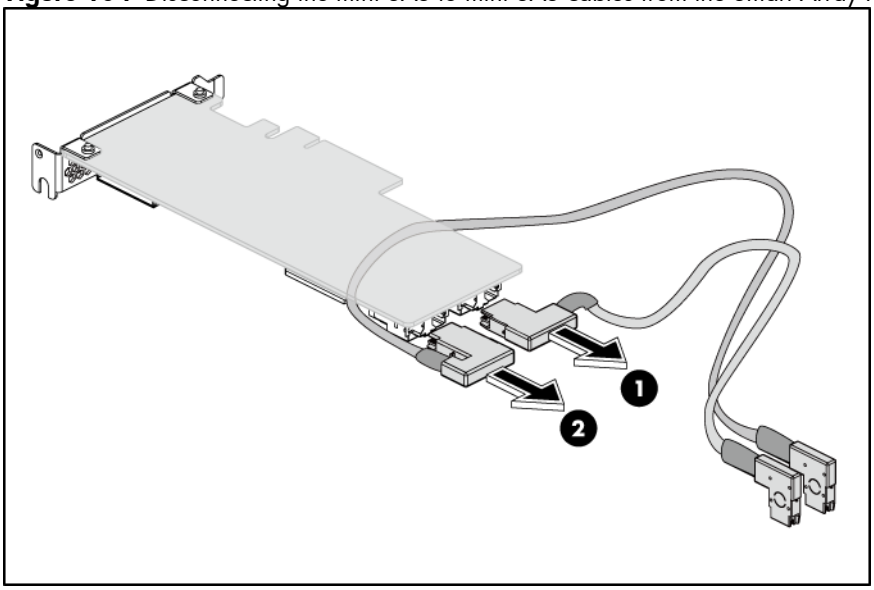
5. Loosen and remove the screw to release the smart array P410 controller board from the 1U PCIe cage.
6. Unplug the smart array P410 controller board from the 1U PCIe cage.

Figure 103 Removing the Smart Array P410 Controller Board from the 1U PCIe Cage



7. Disconnect the Right Exit and U Type Mini SAS to Mini SAS cables from the smart array P410 controller board.

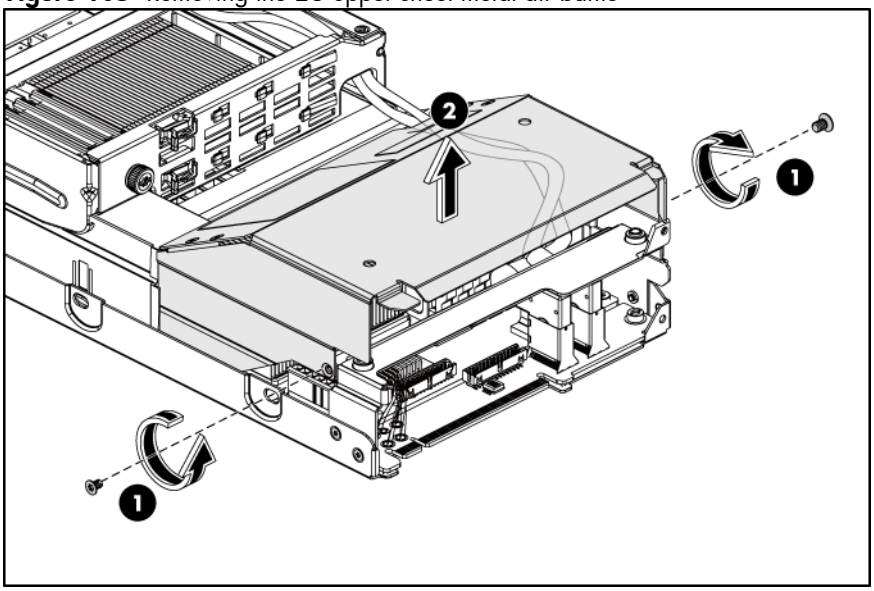
Figure 104 Disconnecting the mini SAS to mini SAS cables from the Smart Array P410 Controller Board



To remove the smart array P410 controller board from the 2U node:

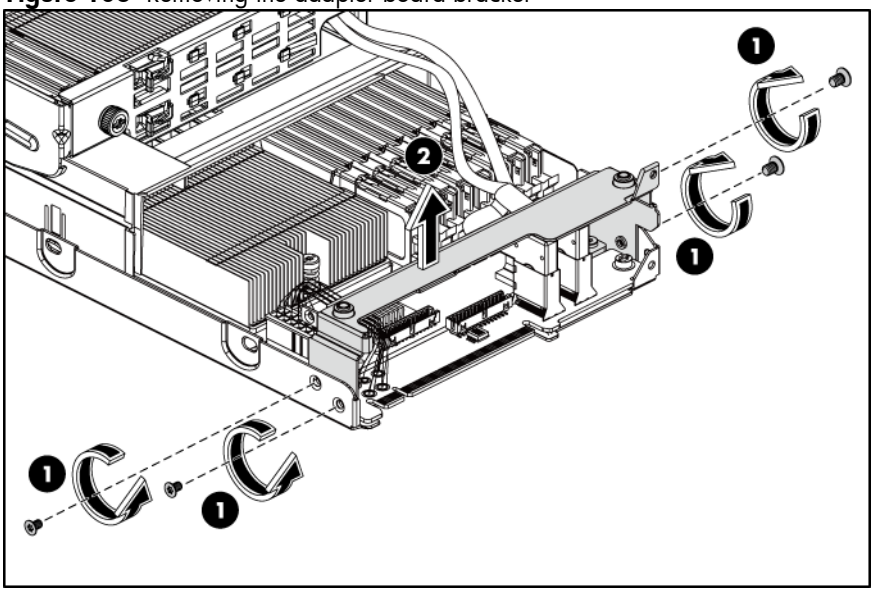
1. Loosen and remove the 2 screws to release the 2U upper sheet metal air baffle from the adapter board bracket.
2. Lift the 2U upper sheet metal air baffle from the system board tray.

Figure 105 Removing the 2U upper sheet metal air baffle



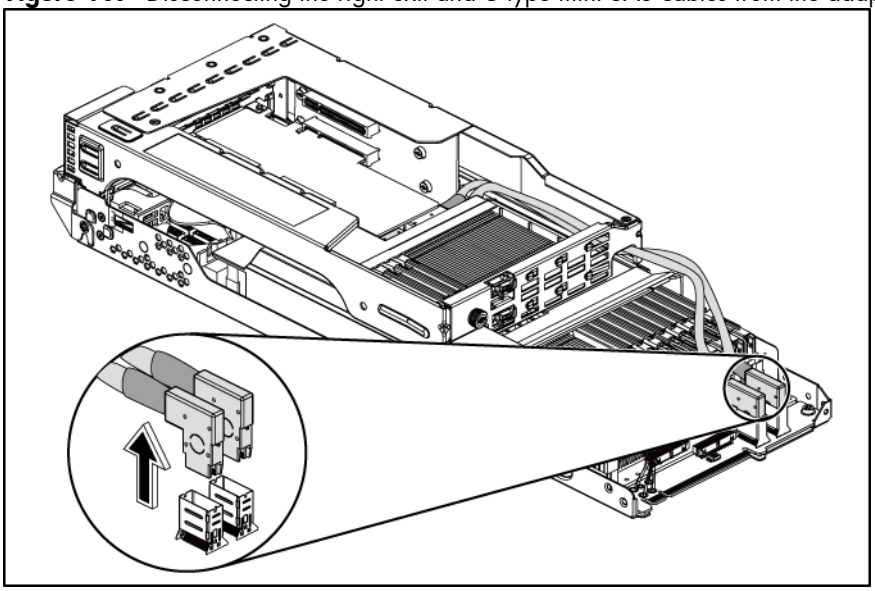
3. Loosen and remove the 4 screws to release the adapter board bracket from the system board tray.
4. Lift the adapter board bracket from the system board tray.

Figure 106 Removing the adapter board bracket



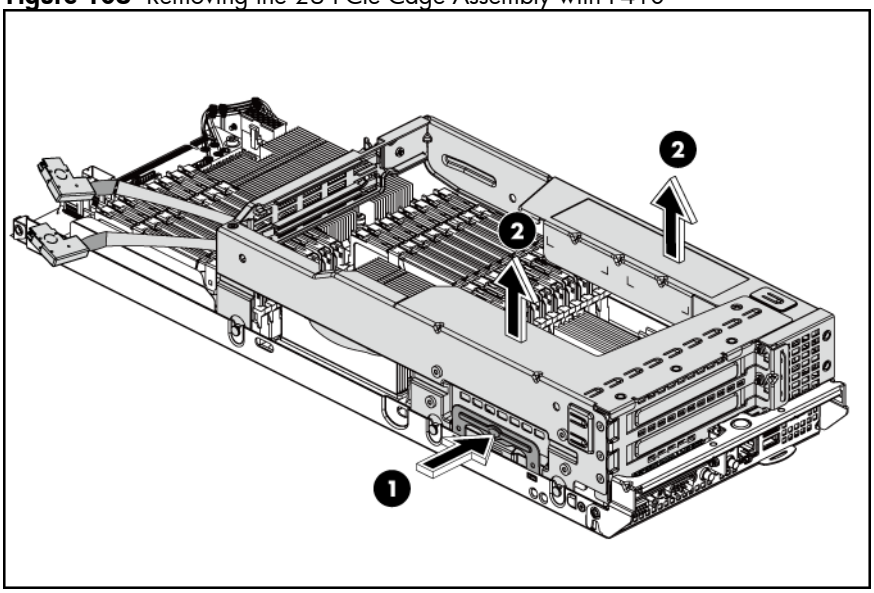
5. Disconnect the Right Exit and U Type Mini SAS to Mini SAS cables from the Mini SAS connectors on the adapter board.

Figure 107 Disconnecting the right exit and U type mini SAS cables from the adapter board



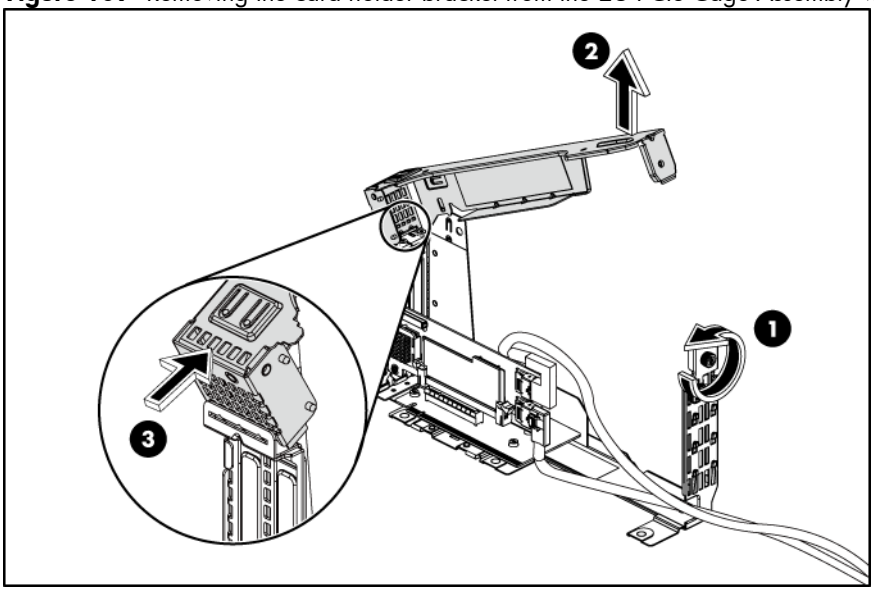
6. Push the locking tabs to release the 2U PCIe cage assembly from the system board tray.
7. Lift the 2U PCIe cage assembly from the system board tray.

Figure 108 Removing the 2U PCIe Cage Assembly with P410



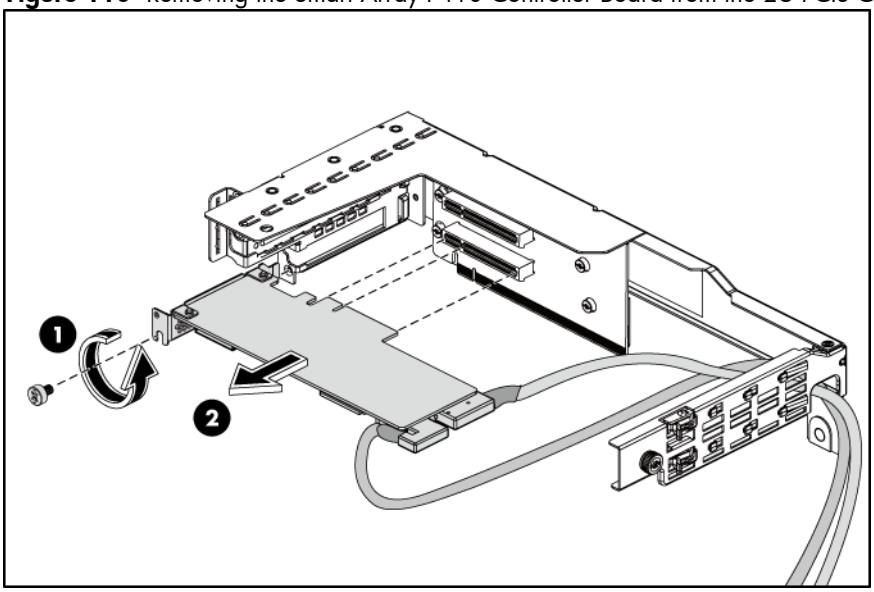
8. Loosen the thumbscrew that secures the card holder bracket to the 2U PCIe cage assembly.
9. Lift and route one end of the card holder bracket away from the 2U PCIe cage assembly.
10. Remove the other end of the card holder bracket away from the slot of the 2U PCIe cage assembly.

Figure 109 Removing the card holder bracket from the 2U PCIe Cage Assembly with P410



11. Loosen and remove the screw to release the smart array P410 controller board from the 2U PCIe cage.
12. Unplug the smart array P410 controller board from the 2U PCIe cage.

Figure 110 Removing the Smart Array P410 Controller Board from the 2U PCIe Cage



13. Disconnect the Right Exit and U Type Mini SAS to Mini SAS cables from the smart array P410 controller board as shown in Figure 104.

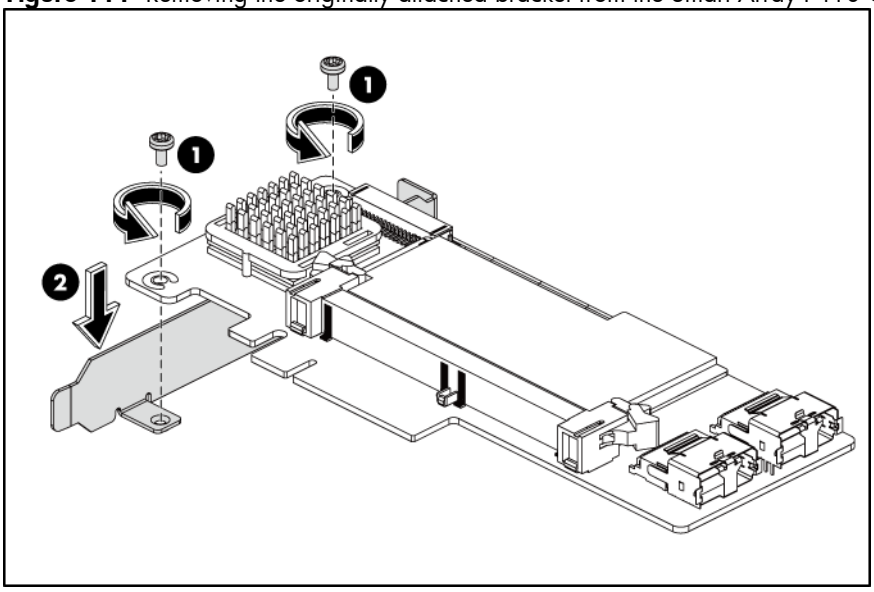
Installing the smart array P410 controller board

To install the smart array P410 controller board on a 1U node:

1. Remove the onboard SATA cable guard/battery holder from the system board tray as shown in Figure 72.
2. Remove the Mini SAS cable guard from the system board tray as shown in Figure 61.

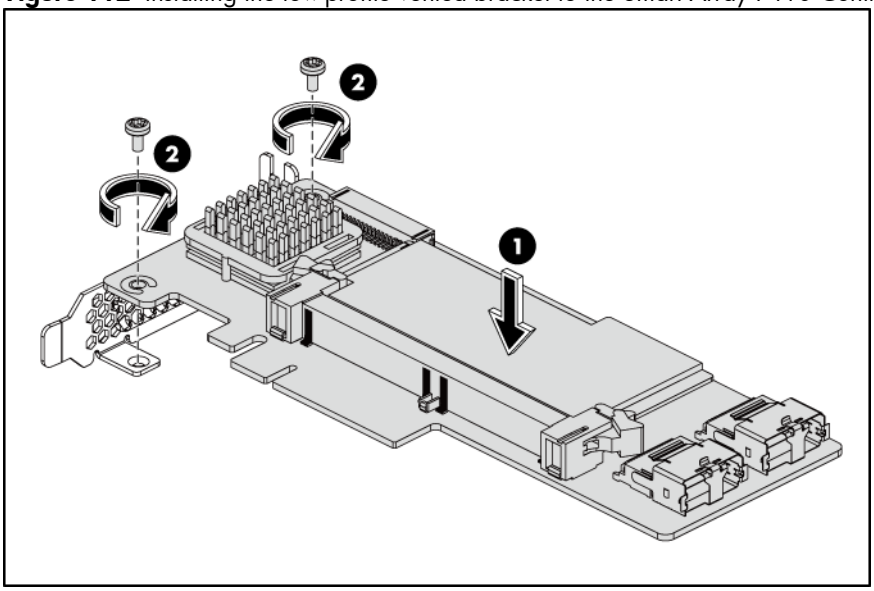
3. Unplug the Mini SAS to Mini SATA cables from the adapter board and the system board as shown in Figure 73.
4. Remove the 1U PCIe cage away from the system board as shown in Figure 74.
5. Remove the slot cover from the 1U PCIe cage as shown in Figure 75.
6. Loosen the two screws to release the originally attached bracket from the smart array P410 controller board.
7. Remove the originally attached bracket from the smart array P410 controller board.

Figure 111 Removing the originally attached bracket from the Smart Array P410 Controller Board



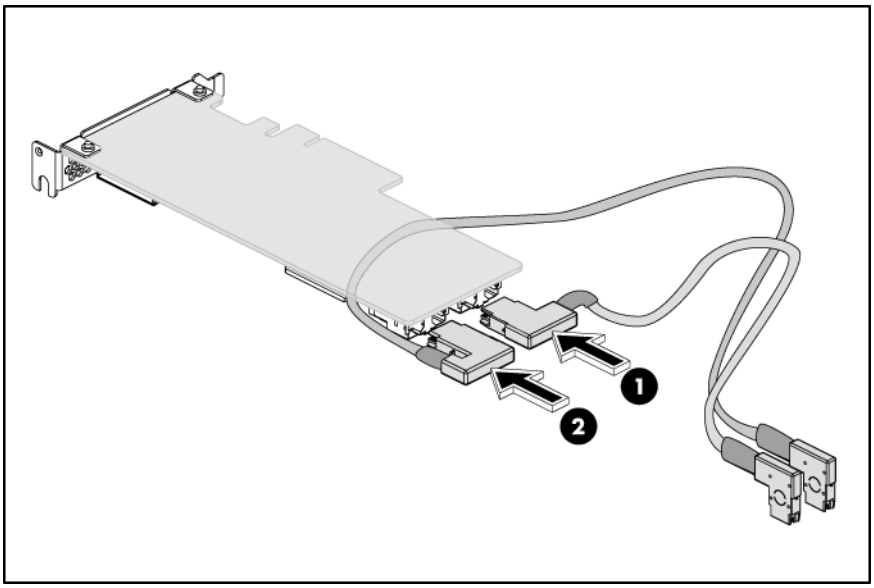
8. Install the low-profile vented bracket on the smart array P410 controller board.
   a. Align the smart array P410 controller board to the low-profile vented bracket by the two screw holes.
   b. Install the 2 screws to install the low-profile vented bracket to the smart array P410 controller board.

Figure 112 Installing the low-profile vented bracket to the Smart Array P410 Controller Board



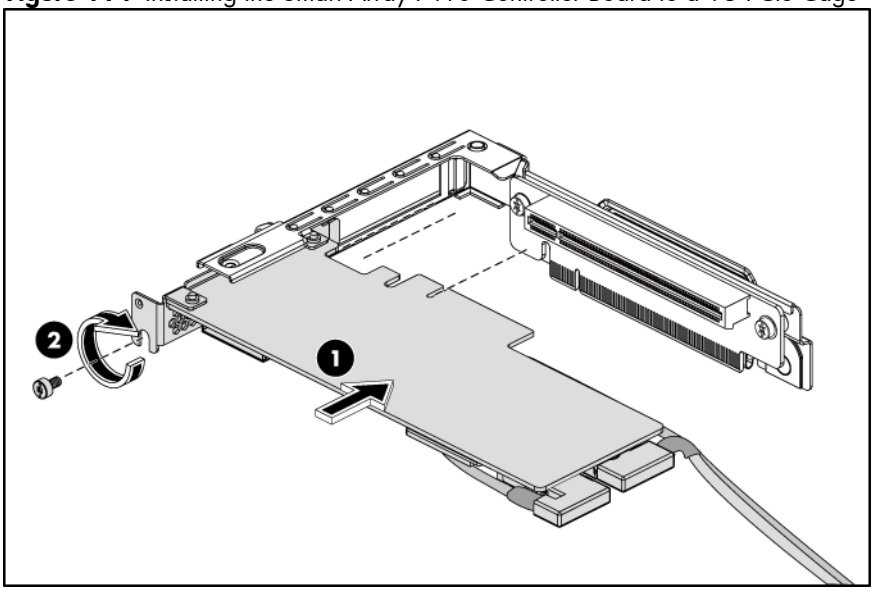
9. Install the Right Exit Mini SAS to Mini SAS cable to the Mini SAS connector J6 on the smart array P410 controller board.
10. Install the U Type Mini SAS to Mini SAS cable to the Mini SAS connector J5 on the smart array P410 controller board and the Mini SAS connector J4 on the adapter card.

Figure 113 Installing the right exit and U type mini SAS to mini SAS cables to the Smart Array P410 Controller Board



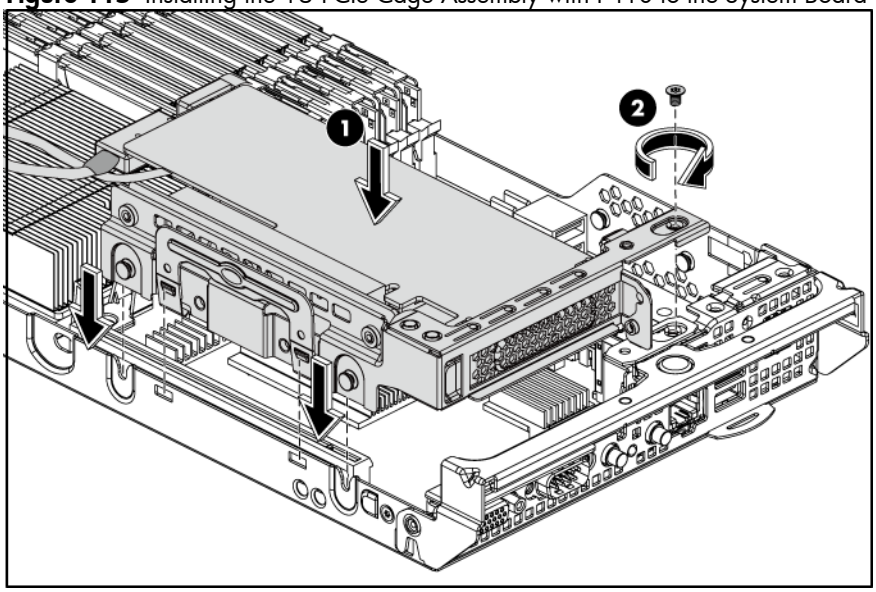
11. Align and install the smart array P410 controller board to the connector on the 1U riser card.
12. Install the screw to secure the smart array P410 controller board to the 1U PCIe cage by the vented sheet metal bracket.

Figure 114 Installing the Smart Array P410 Controller Board to a 1U PCIe Cage



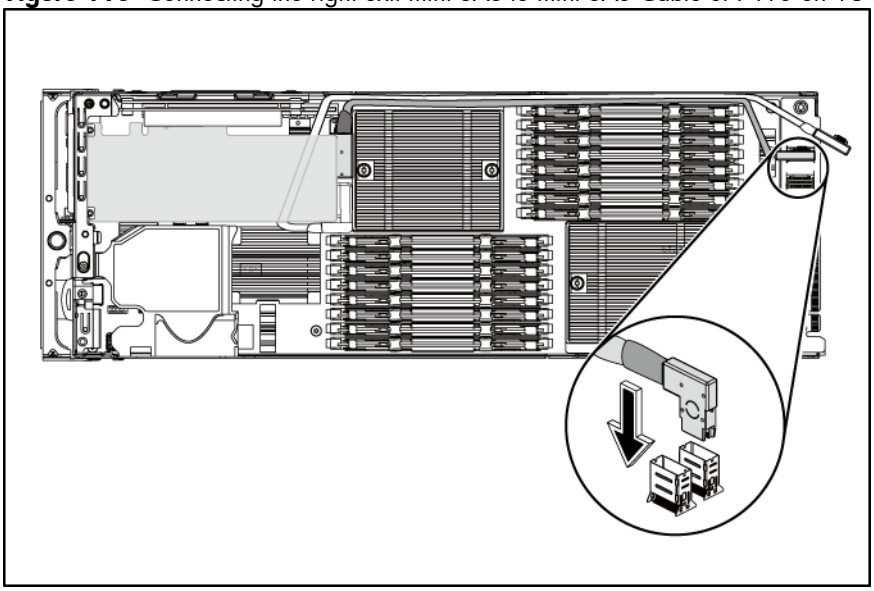
13. Align the 1U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 1U PCIe cage assembly are located in the corresponding slots on the system board tray.
14. Install the screw on the top side of the system board tray to secure the 1U PCIe cage assembly to the system board tray.

Figure 115 Installing the 1U PCIe Cage Assembly with P410 to the System Board



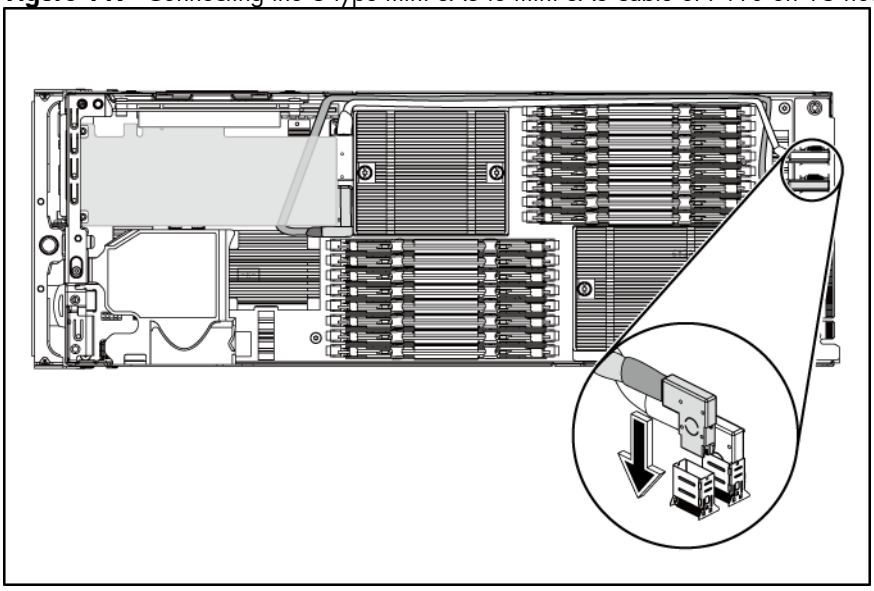
15. Install the onboard SATA cable guard/battery holder as shown in Figure 81.
16. Route the Right Exit and U Type Mini SAS to Mini SAS cables along the side of the system board tray as shown in figure below.
17. Connect the Right Exit Mini SAS to Mini SAS cable to the Mini SAS connector 1 on the adapter card.

Figure 116 Connecting the right exit mini SAS to mini SAS Cable of P410 on 1U node



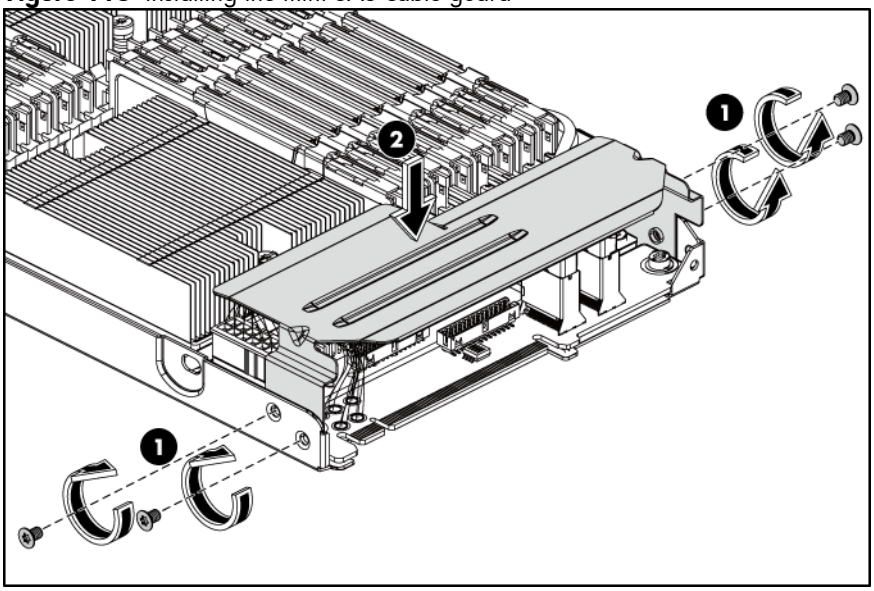
18. Connect the U Type Mini SAS to Mini SAS cable to the Mini SAS connector 2 on the adapter card.

Figure 117 Connecting the U type mini SAS to mini SAS cable of P410 on 1U node



19. Align the Mini SAS cable guard to the system board tray by the 4 screw holes.
20. Install the 4 screws to install the Mini SAS cable guard to the system board tray.

Figure 118 Installing the mini SAS cable guard



To install the smart array P410 controller board on a 2U node:

1. Remove the 2U PCIe cage away from the system board as shown in Figure 84.
2. Remove the 2U upper sheet metal air baffle from the system board tray as shown in Figure 85.
3. Remove the 2U bottom plastic air baffle away from the system board as shown in Figure 86.
4. Remove the adapter board bracket from the system board tray as shown in Figure 87.
5. Remove the onboard SATA cable guard/battery holder from the system board as shown in Figure 88.
6. Unplug the Mini SAS to Mini SATA cables from the adapter board and the system board as shown in Figure 89.
7. Install the onboard SATA cable guard/battery holder on the system board tray as shown in Figure 90.
8. Install the 2U bottom plastic air baffle to the system board tray as shown in Figure 91.
9. Remove the card holder bracket away from the 2U PCIe cage as shown in Figure 109.
10. Remove the PCIe slot cover from the 2U PCIe cage as shown in Figure 92.
11. Remove the originally attached bracket from the smart array P410 controller board as shown in Figure 111.
12. Install the low-profile vented bracket on the smart array P410 controller board as shown in Figure 112 .

    There are two types of vented brackets for the smart array P410 controller board: low-profile and full-height.

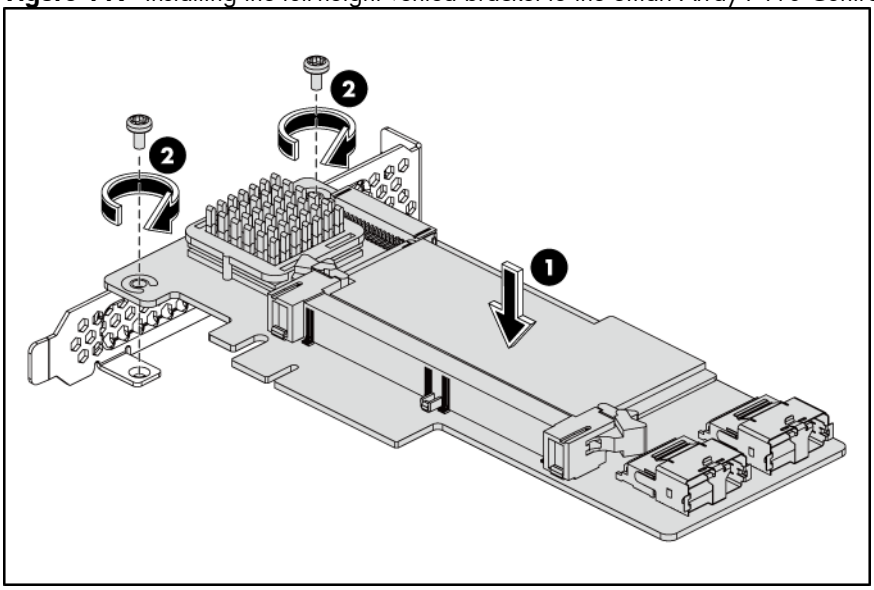
    The low-profile vented bracket is for the smart array P410 controller board to be installed on the low-profile riser card connector. The full-height vented bracket is for smart array P410 controller board installed on the full-height riser card connector.

    In this document, we install the low-profile vented bracket for P410 as example since the primary location for P410 on the 2U riser card should always be the lowest connector (the low-profile connector).

    However, the following installation methods of the full-height vented bracket can be taken as reference when you install P410 installed on the full-height riser card connector:

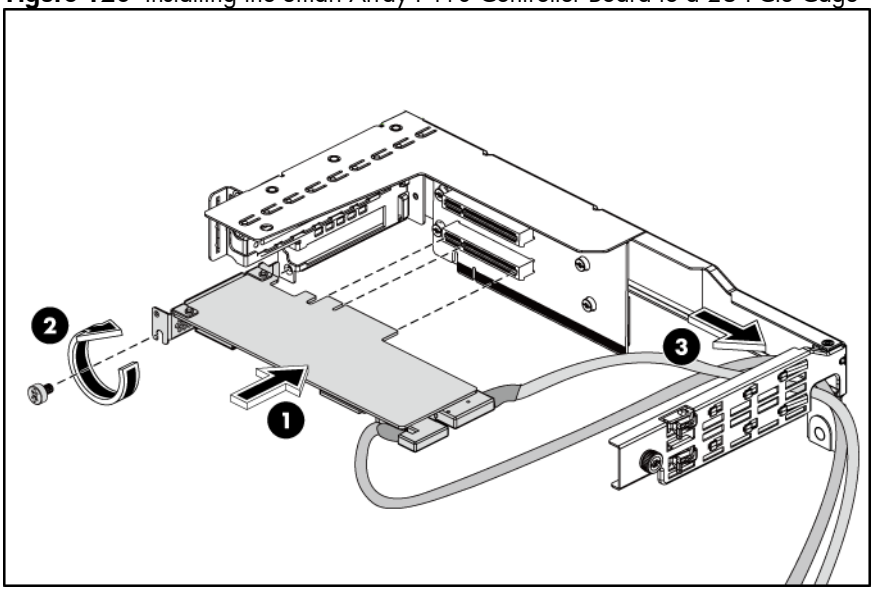
a. Align the smart array P410 controller board to the full-height vented bracket by the two screw holes.
b. Install the 2 screws to install the full-height vented bracket to the smart array P410 controller board.

Figure 119 Installing the full-height vented bracket to the Smart Array P410 Controller Board



13. Install the Right Exit and U Type Mini SAS to Mini SAS cables to the smart array P410 controller board as shown in Figure 113.
14. Align and install the smart array P410 controller board with its matching connector on the 2U riser card.
15. Install the screw to secure the smart array P410 controller board to the 2U PCIe cage.
16. Route the Right Exit and U Type Mini SAS to Mini SAS cables through the hole of the 2U PCIe cage as shown in figure below.

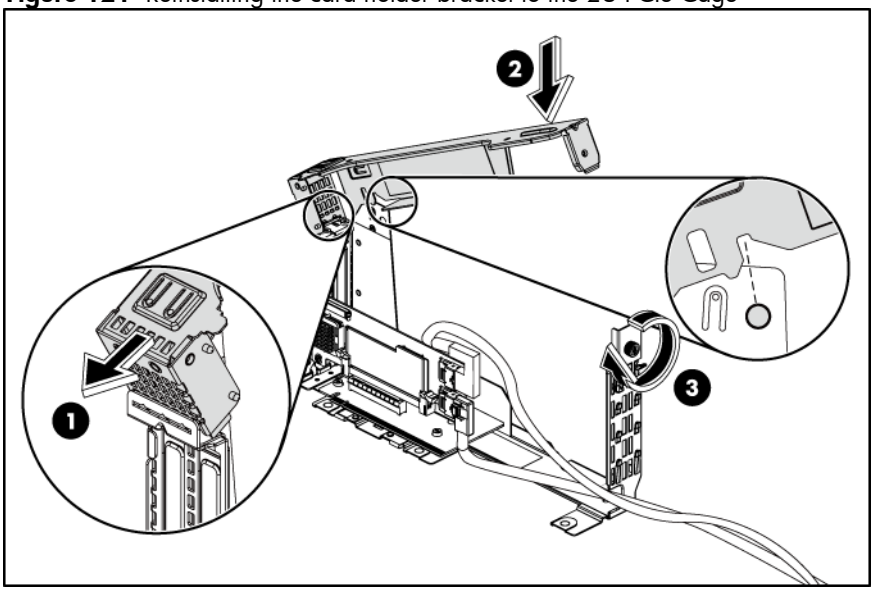
Figure 120 Installing the Smart Array P410 Controller Board to a 2U PCIe Cage



17. Align one end of the card holder bracket into the slot of the 2U PCIe cage.
18. Route the card holder bracket down to attach it. Make sure that the stand–off on the PCIe cage is aligned to the slot on the card holder bracket.

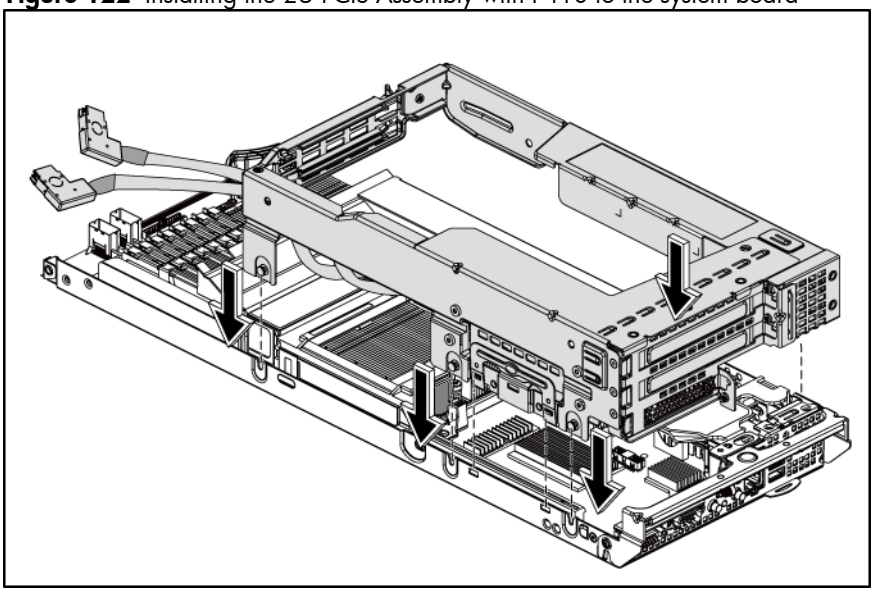
19. Tighten the thumbscrew to secure the card holder bracket to the 2U PCIe cage.

Figure 121 Reinstalling the card holder bracket to the 2U PCIe Cage



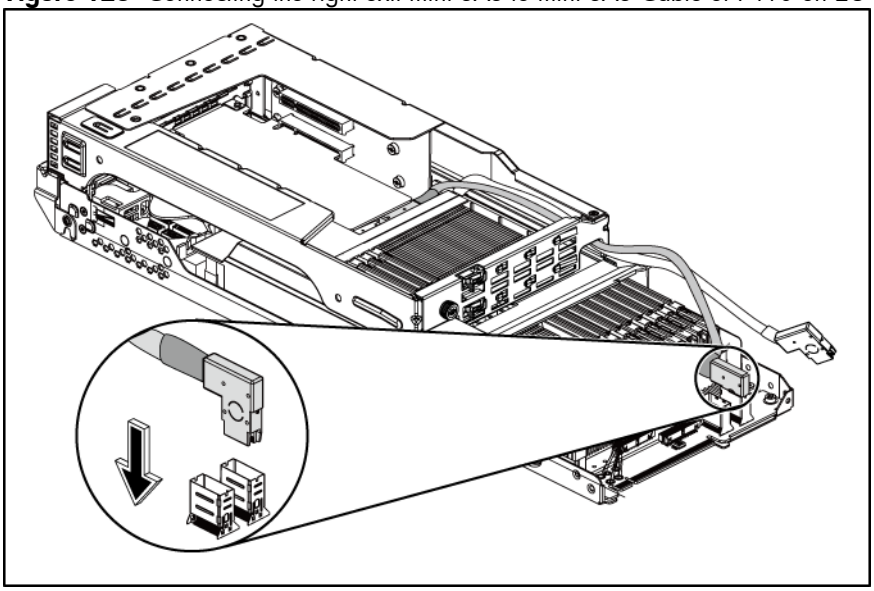
20. Align the 2U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 2U PCIe cage assembly are located in the corresponding slots on the system board tray, and that the tab is aligned to the slot.

Figure 122 Installing the 2U PCIe Assembly with P410 to the system board



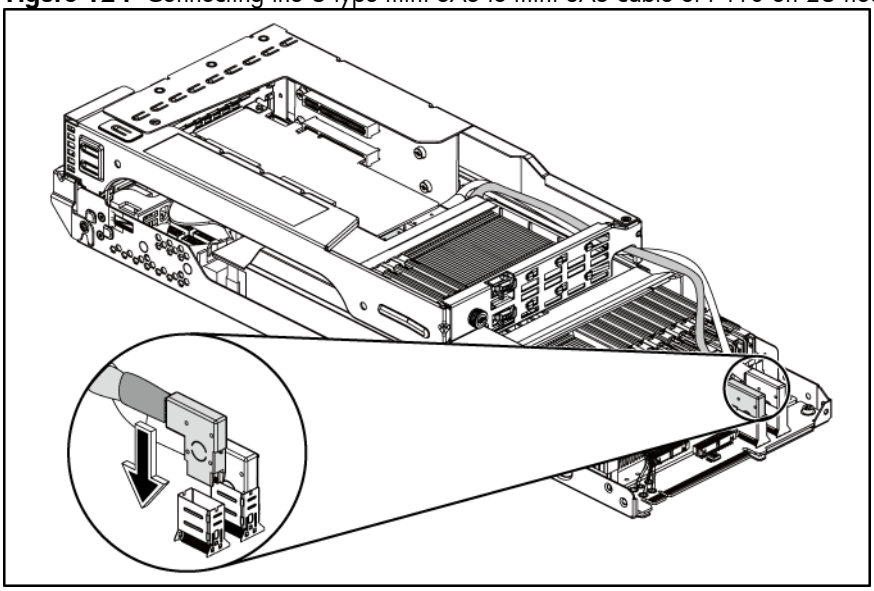
21. Route the Right Exit Mini SAS to Mini SAS cable and install it to the Mini SAS connector 1 on the low adapter card.

Figure 123 Connecting the right exit mini SAS to mini SAS Cable of P410 on 2U node



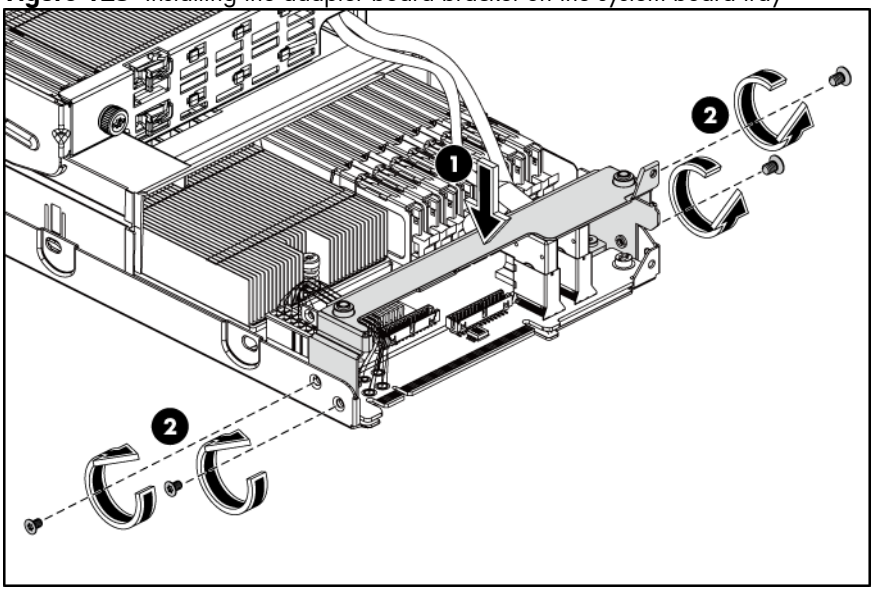
22. Route the U Type Mini SAS to Mini SAS cable and install it to the Mini SAS connector 2 on the low adapter card.

Figure 124 Connecting the U type mini SAS to mini SAS cable of P410 on 2U node



23. Align the adapter board bracket to the system board tray by the 4 screw holes.
24. Install the 4 screws to install the adapter board bracket on the system board tray.

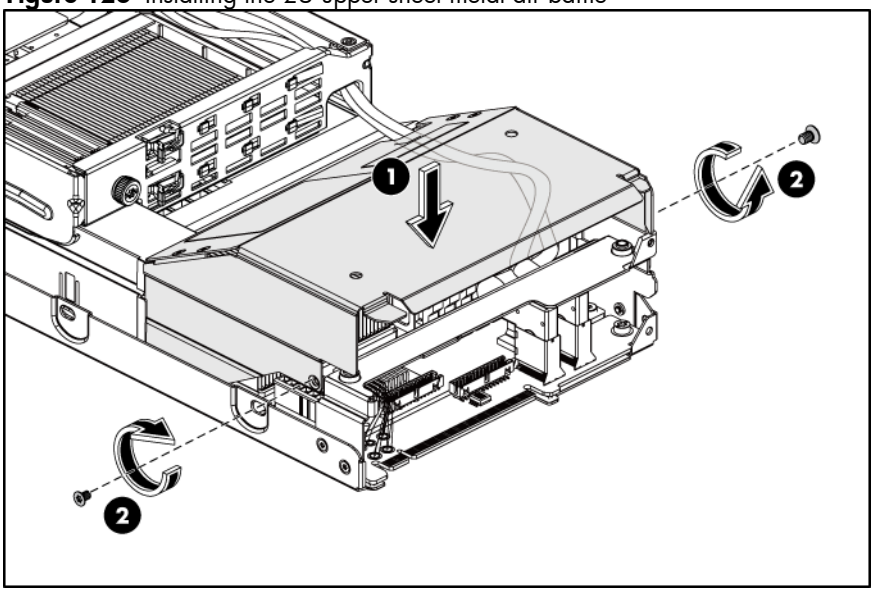
Figure 125 Installing the adapter board bracket on the system board tray



NOTE: When two smart array P410 controller boards are installed in the 2U PCIe cage assembly, an additional adapter board needs to be installed on the adapter board bracket as shown in Figure 138. This provides a location for the additional smart array P410 controller board cables to plug into.

25. Align the 2U upper sheet metal air baffle to the adapter board bracket by the 2 screw holes. Make sure that the U Type and Right Exit Mini SAS to Mini SAS cables pass through the open hole of the 2U upper sheet metal air baffle.
26. Install the 2 screws to install the 2U upper sheet metal air baffle on the adapter board bracket.

Figure 126 Installing the 2U upper sheet metal air baffle



DDR2 Mini-DIMM Cache Module

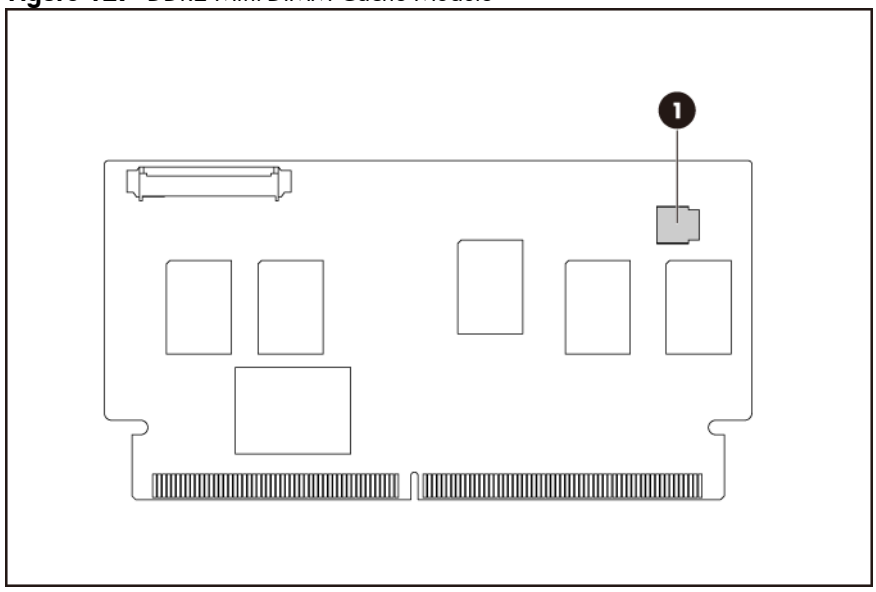
The DDR2 Mini-DIMM cache module is specifically designed for the smart array controller boards. It is a new write-caching solution using NAND flash and super-capacitors instead of batteries. When a panic power loss occurs, the on-board FPGA copies data trapped in the DRAM to the on-board NAND flash devices for indefinite data retention. The super-capacitors supply the energy needed to power the cache module system when performing the data movement (backup) operation.

When the system power is present, the FPGA on the DDR2 Mini-DIMM cache module is in its idle state. When the system power is lost, the FPGA assumes control of the bus and begins moving data from the DRAMs to the non-volatile flash memory. Upon the next power up, the FPGA then restores the cache by moving data from the flash memory to the DRAMs.

The DDR2 Mini-DIMM cache module is connected to the 244-pin Mini-DIMM connector on the smart array controller boards as shown in Figure 60 and Figure 100.

The following figure shows the cache module.

Figure 127 DDR2 Mini-DIMM Cache Module



Item	Description	Function
1	Super-capacitor connector	Connection with the cable of the super-capacitor pack

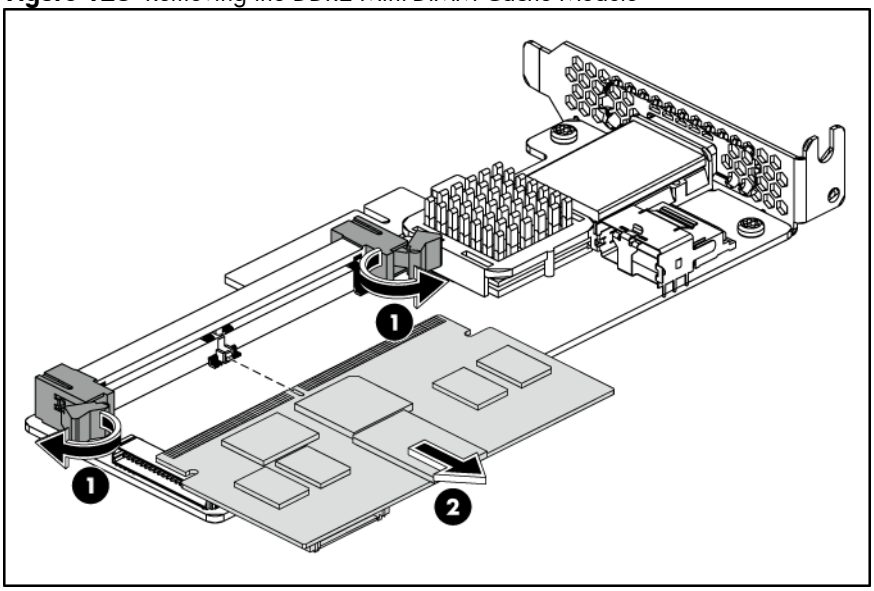
NOTE: The following removing and reinstalling procedures use the smart array P212 controller board as example to describe how to remove and install the DDR2 Mini-DIMM cache module from/to the smart array controller board. The smart array P410 controller board shares the same procedures with P212 regarding the operation procedures of this cache module.

To remove the DDR2 Mini-DIMM cache module:

The removal of the cache module is performed after the smart array controller board is detached from the PCIe cage. For detailed information about removing the smart array controller board, see the removal procedures in Smart Array Controller Boards.

1. Completely open the holding clips securing the cache module.
2. Gently pull the cache module outward to remove it from the slot.

Figure 128 Removing the DDR2 Mini-DIMM Cache Module

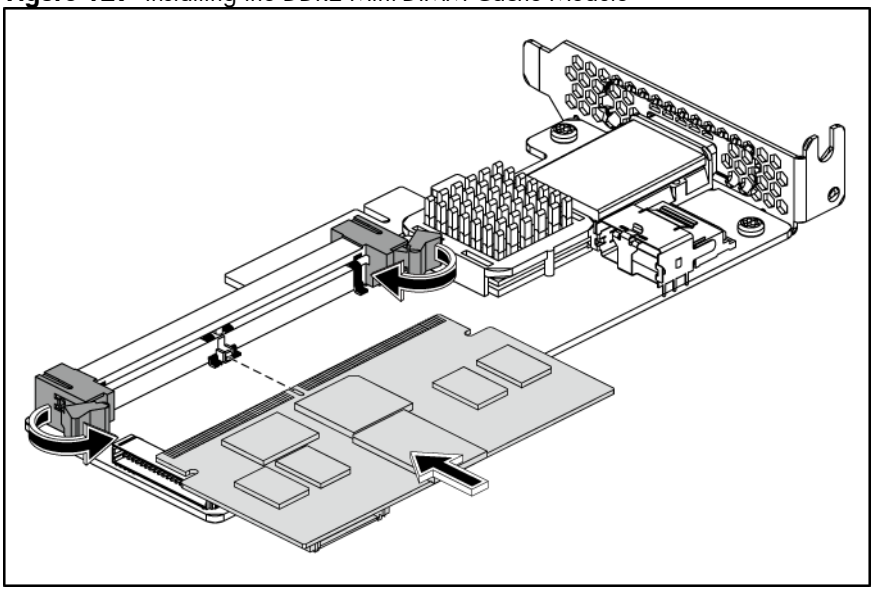


To install the DDR2 Mini-DIMM cache module:

The installing of the cache module is performed before the smart array controller board is installed on the PCIe cage. For detailed information about installing the smart array controller board, see the installing procedures in Smart Array Controller Boards.

1. Align the notch on the bottom edge of the cache module with the keyed surface of the DDR2 Mini-DIMM slot on the smart array controller board, and then fully press the cache module into the slot until the holding clips snap back in place.

Figure 129 Installing the DDR2 Mini-DIMM Cache Module

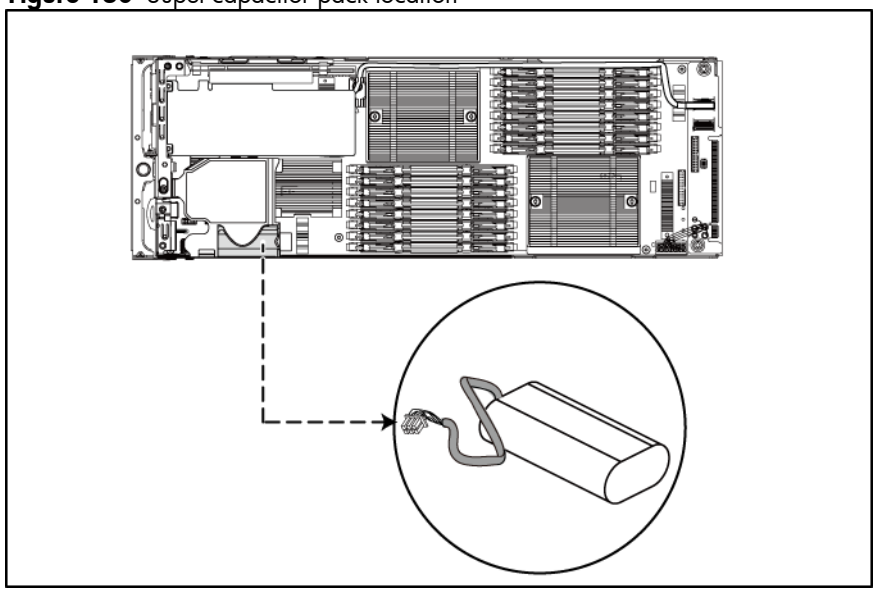


Super-capacitor Pack

The super-capacitor pack is located on the onboard SATA cable guard/battery holder. Two super-capacitors are housed in the off-board pack. These super-capacitors provide the DDR2 Mini-DIMM cache module a temporary power source when system power is lost.

The super-capacitor pack is connected to the DDR2 Mini-DIMM cache module through the super-capacitor connector on the cache module.

Figure 130 Super-capacitor pack location



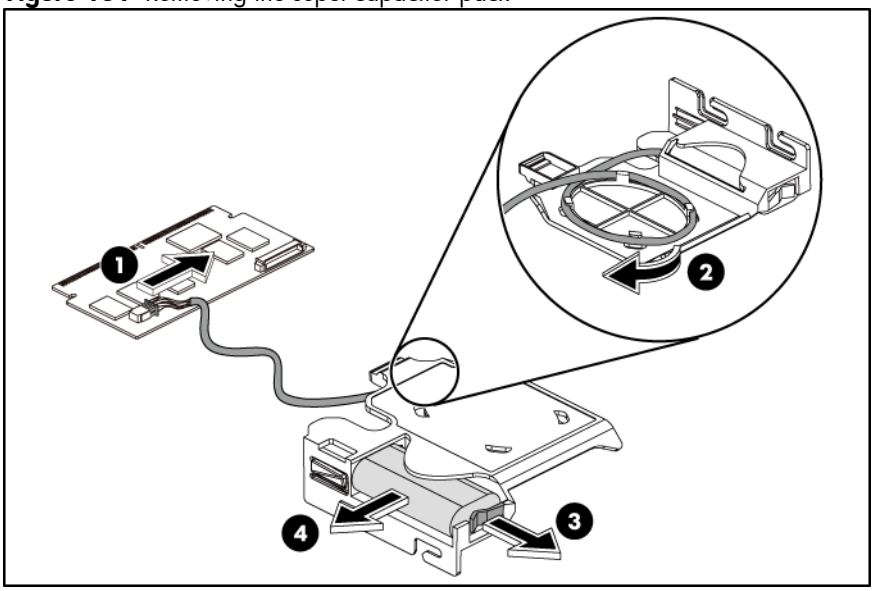
To remove the super-capacitor pack:

△ **CAUTION:** Be careful with detaching the cable that connects the super-capacitor pack to the DDR2 Mini-DIMM cache module. Detaching the cable causes any unsaved data in the DDR2 Mini-DIMM cache module to be lost. Disconnect the cable from the cache module only if the super-capacitor pack is not being used to recover data from the server or transfer data to another server.

1. Disconnect the super-capacitor pack cable from the super-capacitor connector on the DDR2 Mini-DIMM cache module.

   To remove the onboard SATA cable guard/battery holder from the chassis, see Figure 72.
2. Release the super-capacitor pack cable from the tabs on the under–side of the onboard SATA cable guard/battery holder.
3. Press the tab to loosen the super-capacitor pack.
4. Remove the super-capacitor pack from the onboard SATA cable guard/battery holder.

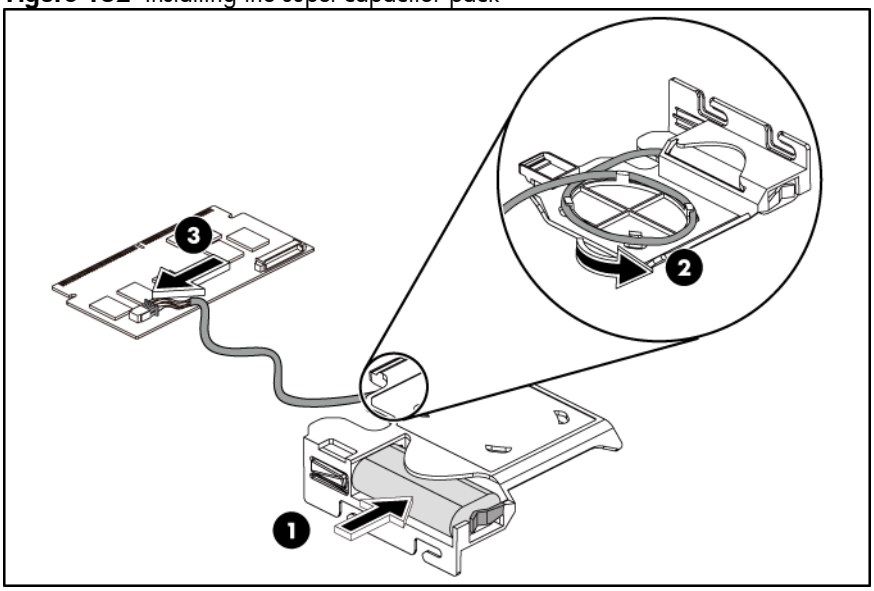
Figure 131 Removing the super-capacitor pack



To install the super-capacitor pack:

1. Route the super-capacitor pack cable through the opening on the onboard SATA cable guard/battery holder and push the super-capacitor pack into position until it is secured by the latch.
2. Route any excess cable around tabs on the under–side of the onboard SATA cable guard/battery holder.
3. Connect the super-capacitor pack cable to the super-capacitor connector on the DDR2 Mini-DIMM cache module.

Figure 132 Installing the super-capacitor pack



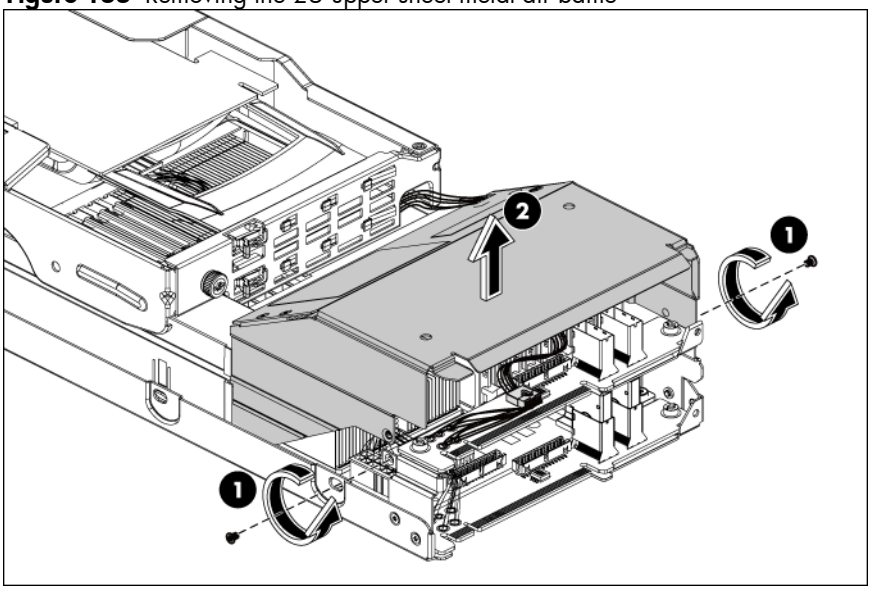
GPU Card

The GPU card can be installed in the 2U node by attaching it to the adapter bracket.

To remove the GPU card from a 2U node:

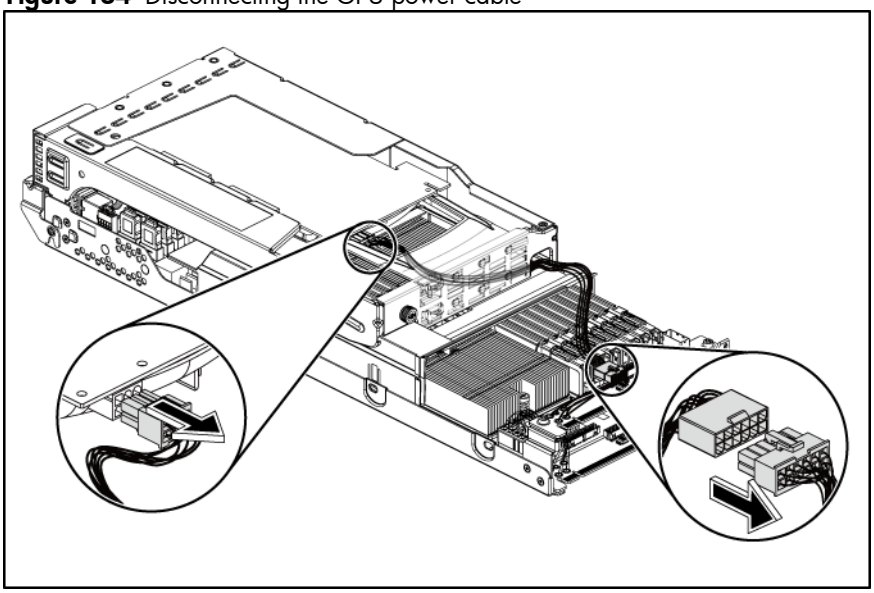
1. Loosen and remove the 2 screws to release the 2U upper sheet metal air baffle from the adapter board bracket.
2. Lift the 2U upper sheet metal air baffle from the system board tray.

Figure 133 Removing the 2U upper sheet metal air baffle



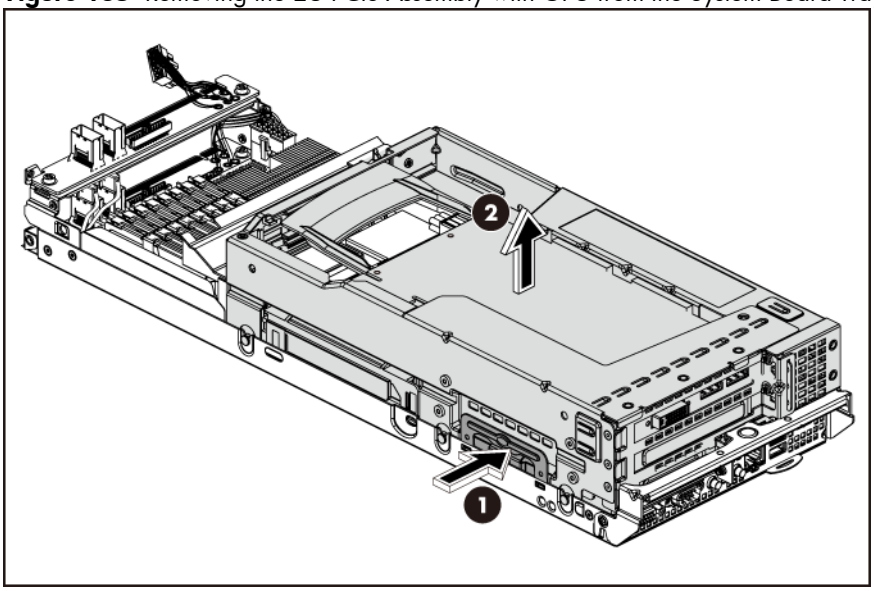
3. Disconnect the GPU power cable from the power connector on the top adapter board and the power connector(s) on the GPU card.

Figure 134 Disconnecting the GPU power cable



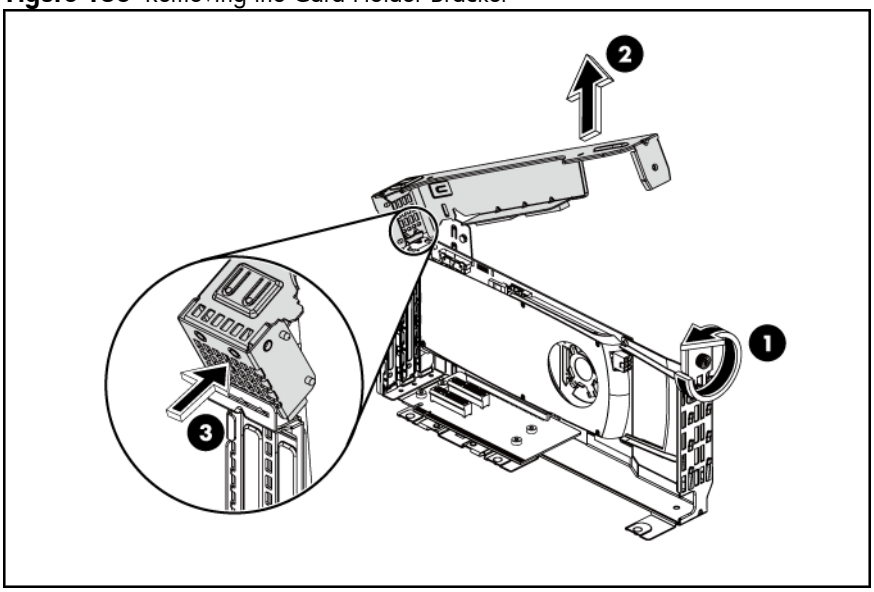
4. Push the locking tab to release the 2U PCIe assembly from the system board tray.
5. Lift the 2U PCIe assembly away from the system board.

Figure 135 Removing the 2U PCIe Assembly with GPU from the System Board Tray



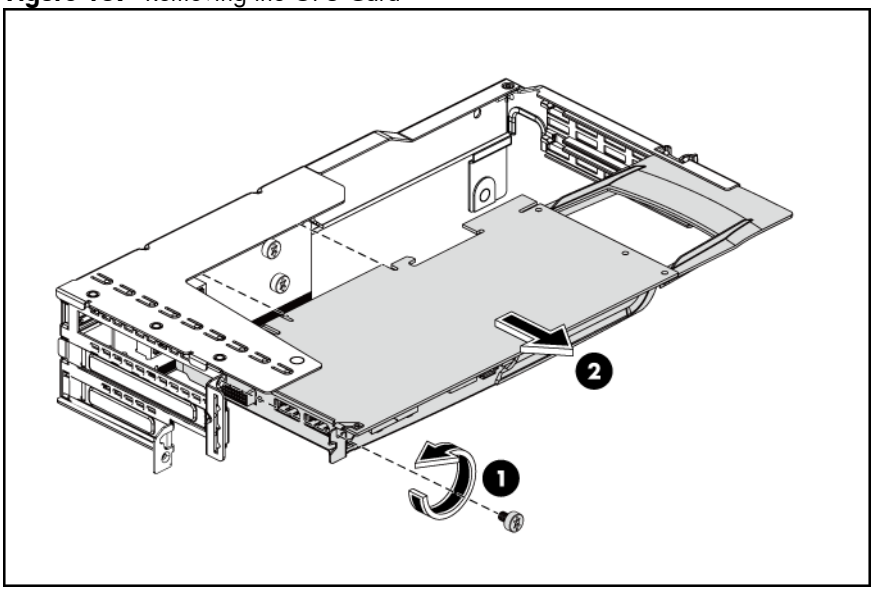
6. Loosen the thumbscrew that secures the card holder bracket to the 2U PCIe cage assembly.
7. Lift and route one end of the card holder bracket away from the 2U PCIe cage assembly.
8. Remove the other end of the card holder bracket away from the slot of the 2U PCIe cage assembly.

Figure 136 Removing the Card Holder Bracket



9. Loosen and remove the screw to release the GPU card from the 2U PCIe cage.
10. Unplug the GPU card from the 2U PCIe cage.

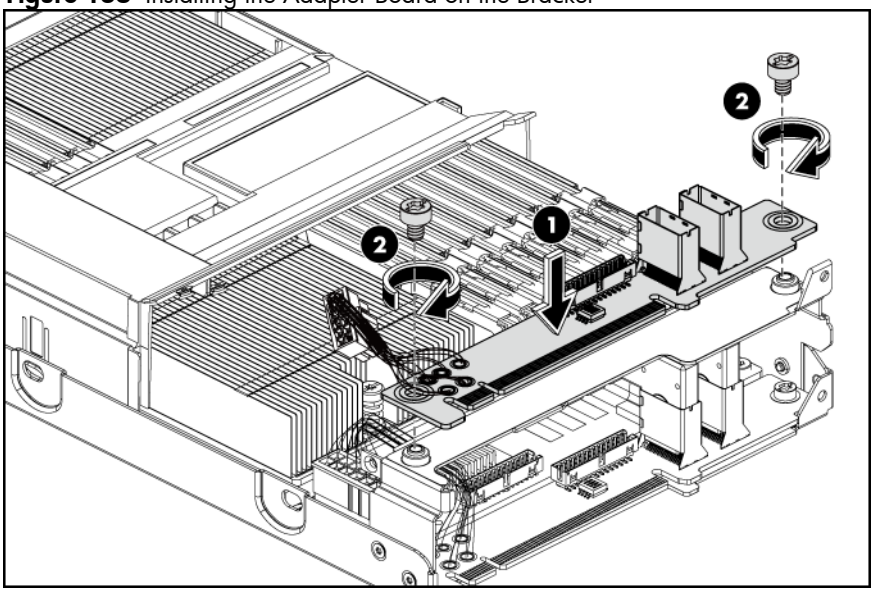
Figure 137 Removing the GPU Card



To install the GPU adapter board on the 2U node:

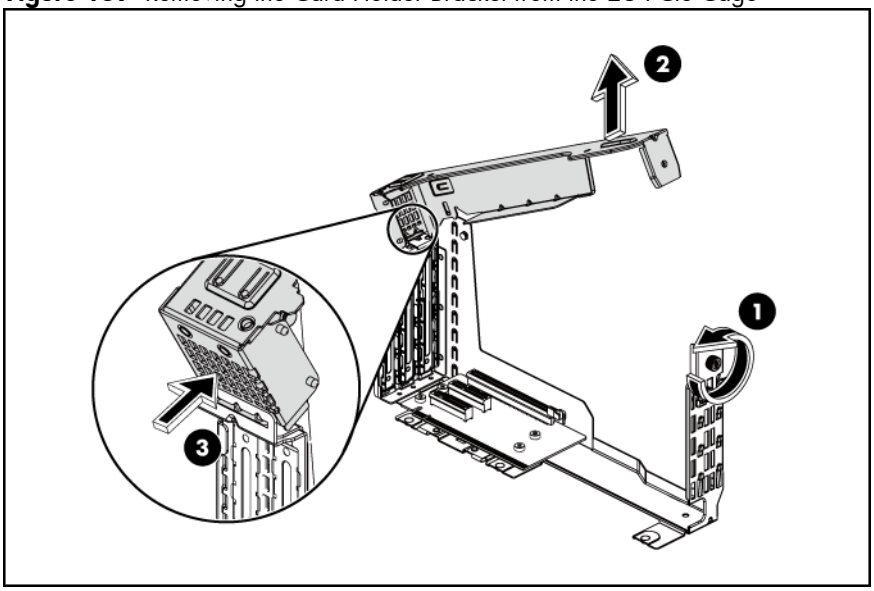
1. Remove the 2U PCIe cage away from the system board tray as shown in Figure 84.
2. Remove the 2U upper sheet metal air baffle from the system board tray as shown in Figure 85.
3. Align the adapter board to the bracket by the two screw holes.
4. Install the adapter board on the bracket with two screws.

Figure 138 Installing the Adapter Board on the Bracket



5. Install the GPU. There are two types of GPU: one is with single slot and the other is with double slots. The following installation process uses the single-slot GPU as an example:
   a. Loosen the thumbscrew that secures the card holder bracket to the 2U PCIe cage.
   b. Lift and route one end of the card holder bracket away from the 2U PCIe cage.
   c. Remove the other end of the card holder bracket away from the slot of the 2U PCIe cage.

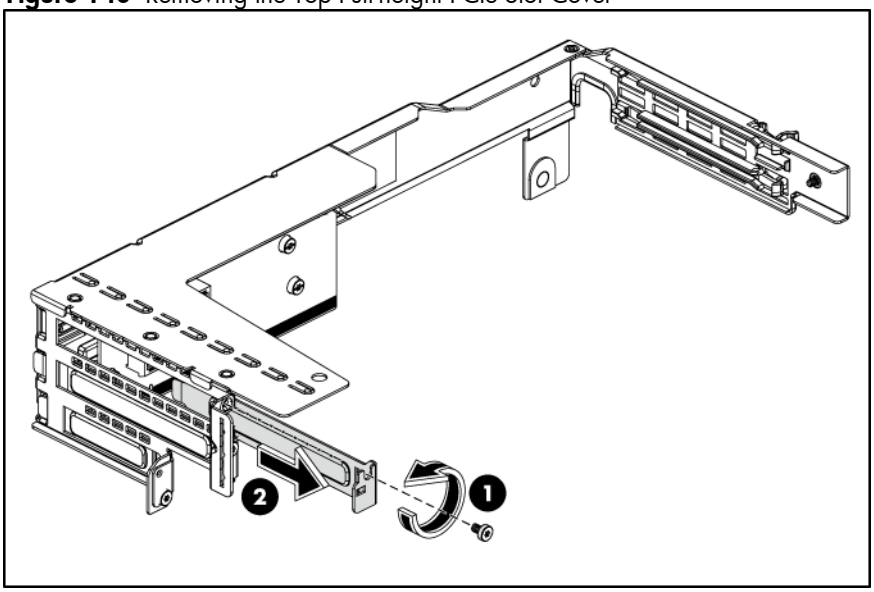
Figure 139 Removing the Card Holder Bracket from the 2U PCIe Cage



d. Loosen and remove the screw to release the top full-height PCIe slot cover from the 2U PCIe cage.

e. Remove the top full-height PCIe slot cover from the 2U PCIe cage.

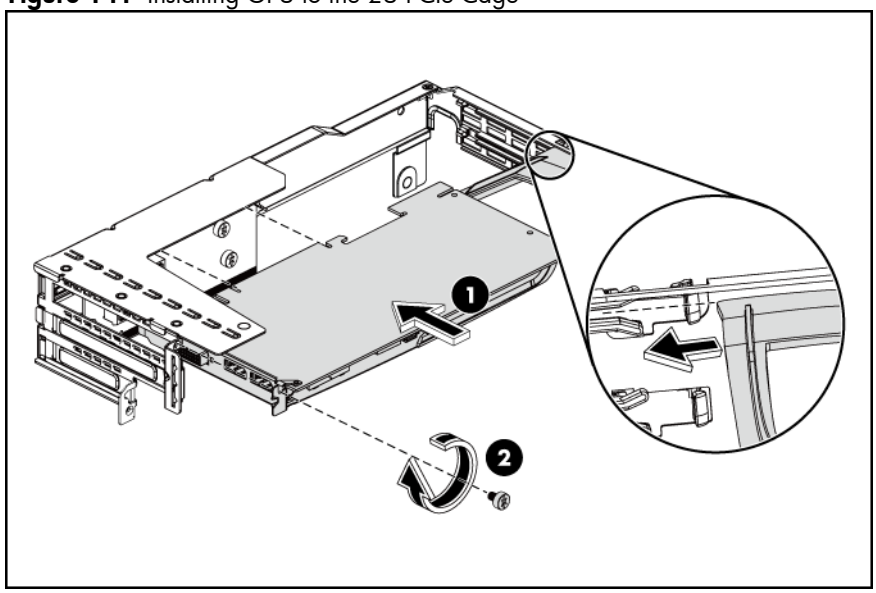
Figure 140 Removing the Top Full-height PCIe Slot Cover



f. Slide the GPU board into the slot, aligning GPU with its matching connector.

g. Install the screw to secure GPU to the 2U PCIe cage.

Figure 141 Installing GPU to the 2U PCIe Cage

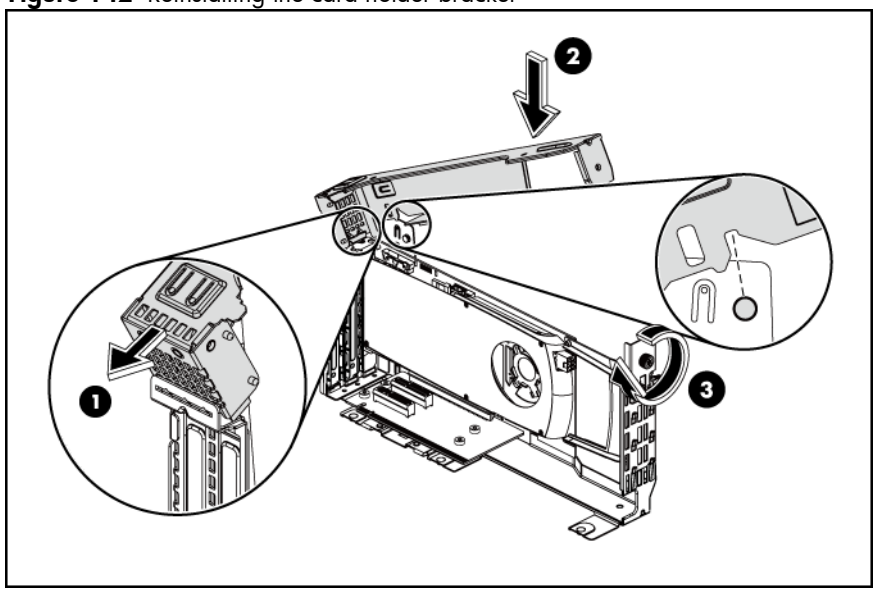


h. Align end of the card holder bracket into the slot of the 2U PCIe cage.

i. Route the card holder bracket down to attach it. Make sure that the stand–off on the 2U PCIe cage is aligned to the slot on the card holder bracket.

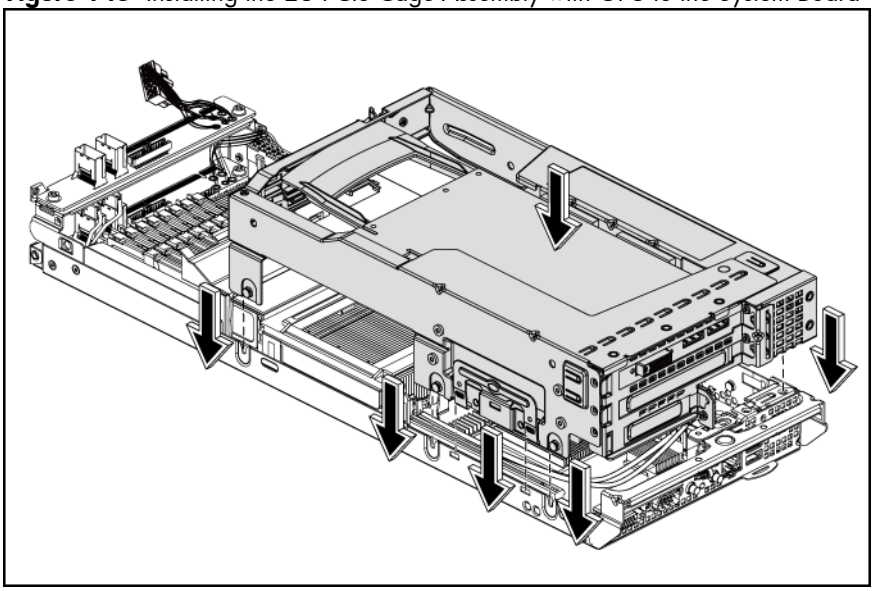
j. Tighten the thumbscrew to secure the card holder bracket to the 2U PCIe cage.

Figure 142 Reinstalling the card holder bracket



k. Align the 2U PCIe cage assembly to the system board tray, and then press it down to ensure full connection to the system board. Make sure that the spools on the sides of the 2U PCIe cage assembly are located in the corresponding slots on the system board tray, and that the tab is aligned to the slot.

Figure 143 Installing the 2U PCIe Cage Assembly with GPU to the System Board



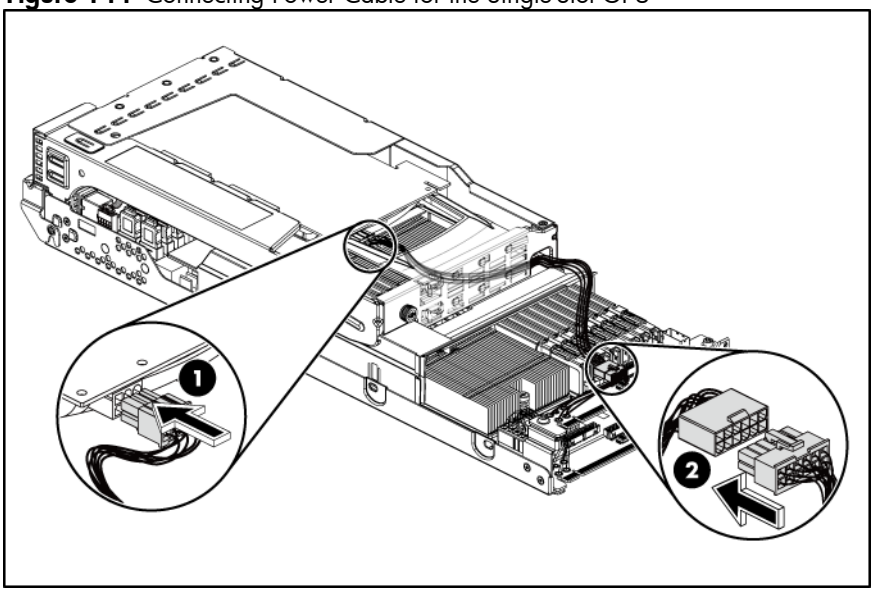
6. Connect the GPU power cables.

   To connect the single-slot GPU power cables:

   a. Route the GPU power cable through the hole on the right side of the 2U PCIe cage assembly and along the rear wall as shown in figure below.
   b. Connect the 2x3 pin GPU power cable connector to the 2x3 pin power connector on the single-slot GPU.
   c. Connect the 2x6 pin GPU power cable connector to the 2x6 pin power connector on the top adapter board.

NOTE: The 2x6 pin power connector of the bottom adapter board is to be connected to the 2x6 pin power connector on the system board.

Figure 144 Connecting Power Cable for the Single-Slot GPU

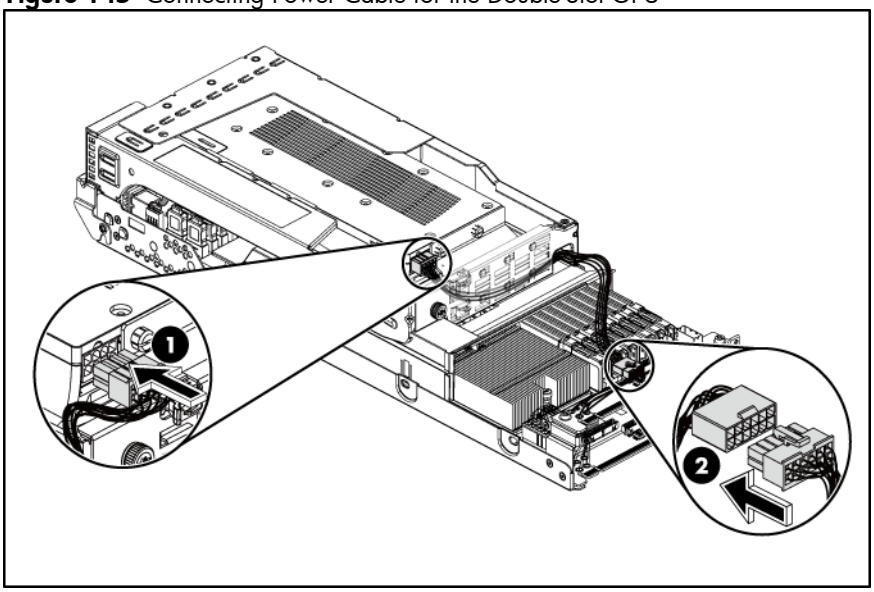


To connect the double-slot GPU power cables:

a. Route the GPU power cable through the hole on the right side of the 2U PCIe cage assembly and along the rear wall as shown in figure below.

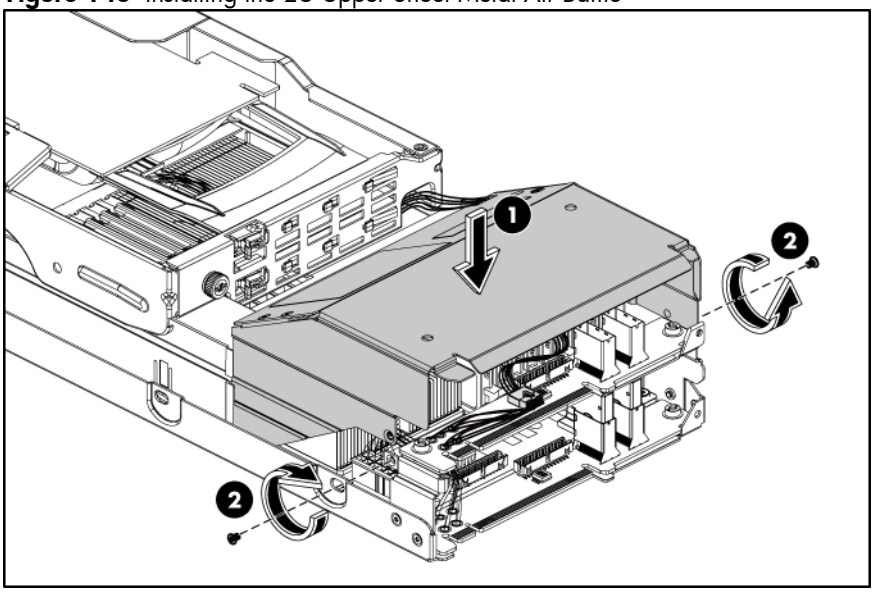
b. Connect the 2x4 pin GPU power cable connector to the 2x4 pin power connector on the double-slot GPU.
c. Connect the 2x6 pin GPU power cable connector to the 2x6 pin power connector on the top adapter board.

Figure 145 Connecting Power Cable for the Double-Slot GPU



7. Install the 2U upper sheet metal air baffle on the adapter board bracket.
   a. Align the 2U upper sheet metal air baffle to the adapter board bracket by the 2 screw holes. Make sure that the GPU power cable passes through the open hole of the 2U upper sheet metal air baffle.
   b. Install and tighten the 2 screws to install the 2U upper sheet metal air baffle on the adapter board bracket.

Figure 146 Installing the 2U Upper Sheet Metal Air Baffle

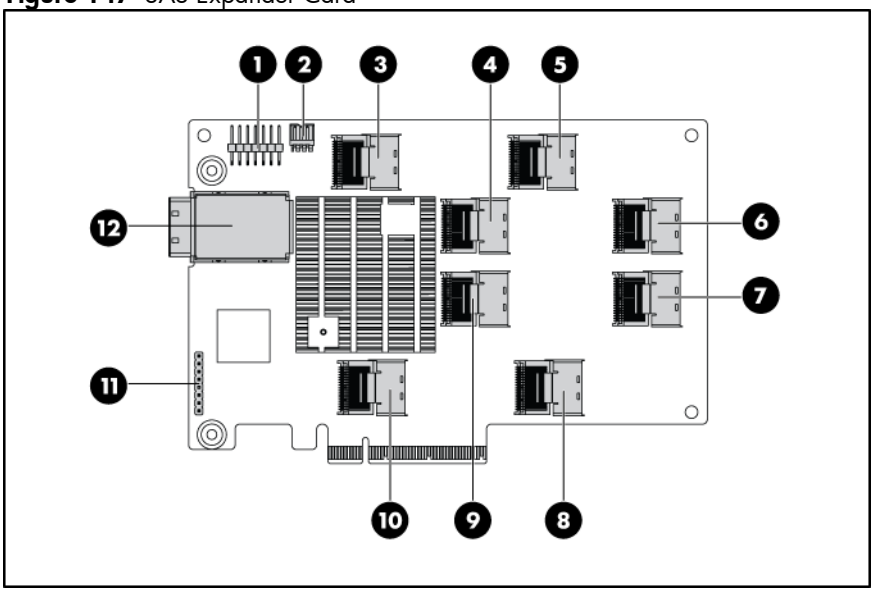


SAS Expander Card

In HP ProLiant DL170e G6 server, a SAS expander card can be configured together with a smart array P410 controller board for accommodation of external SAS/SATA devices.

One of the two 2U riser cards as shown in Figure 48 and Figure 49 can be used for the combination configuration of the SAS expander card and the smart array P410 controller board. In the following description of this section, the 2U riser card shown in Figure 49 is used for your reference.

Figure 147 SAS Expander Card



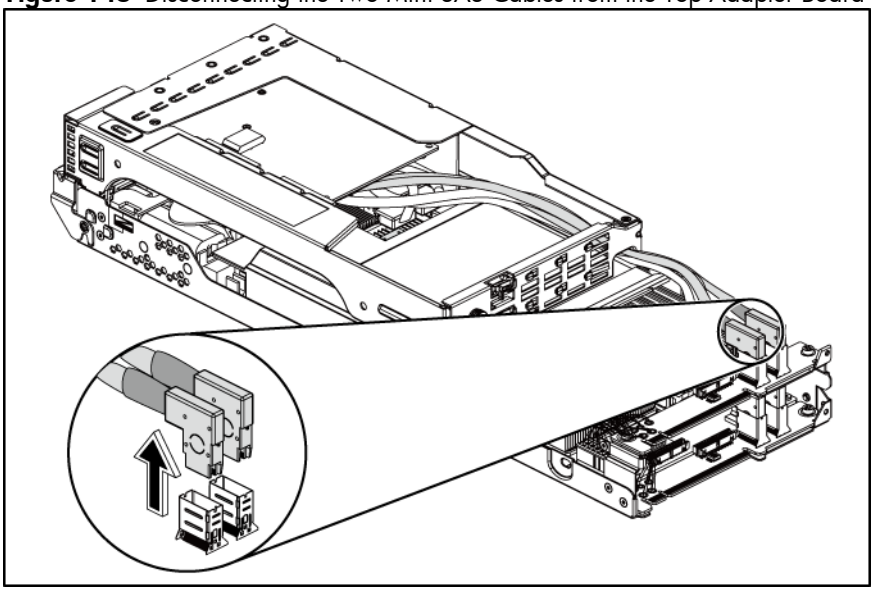
Item	Description
1	PMC8020 programmer connector
2	RS232 debug connector
3	Mini SAS connector 2
4	Mini SAS connector 4
5	Mini SAS connector 3
6	Mini SAS connector 5
7	Mini SAS connector 7
8	Mini SAS connector 9
9	Mini SAS connector 6
10	Mini SAS connector 8
11	CPLD programmer connector
12	External SAS/SATA port

Removing the SAS expander card

1. Remove the 2U upper sheet metal air baffle from the chassis as shown in Figure 105.

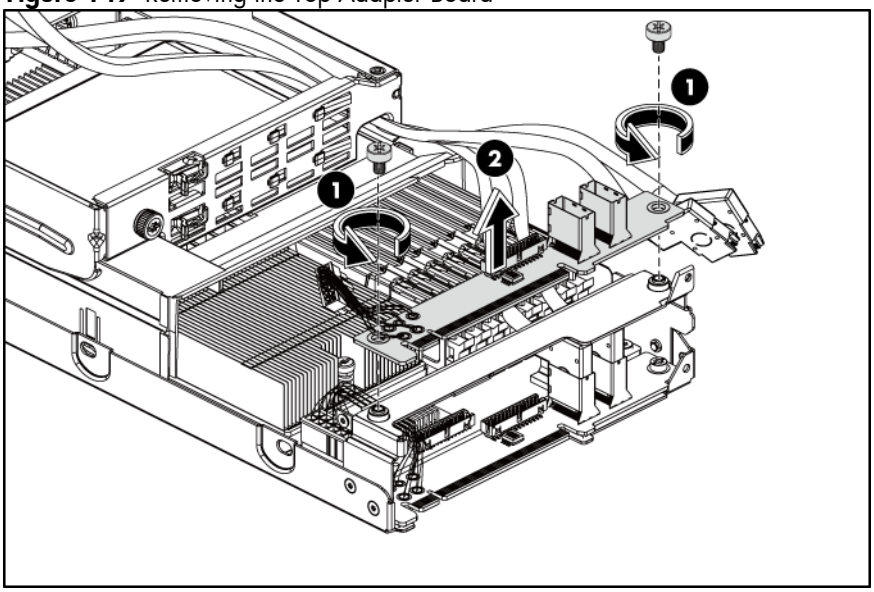
2. Disconnect the two Mini SAS to Mini SAS cables from the top adapter board.

Figure 148 Disconnecting the Two Mini SAS Cables from the Top Adapter Board



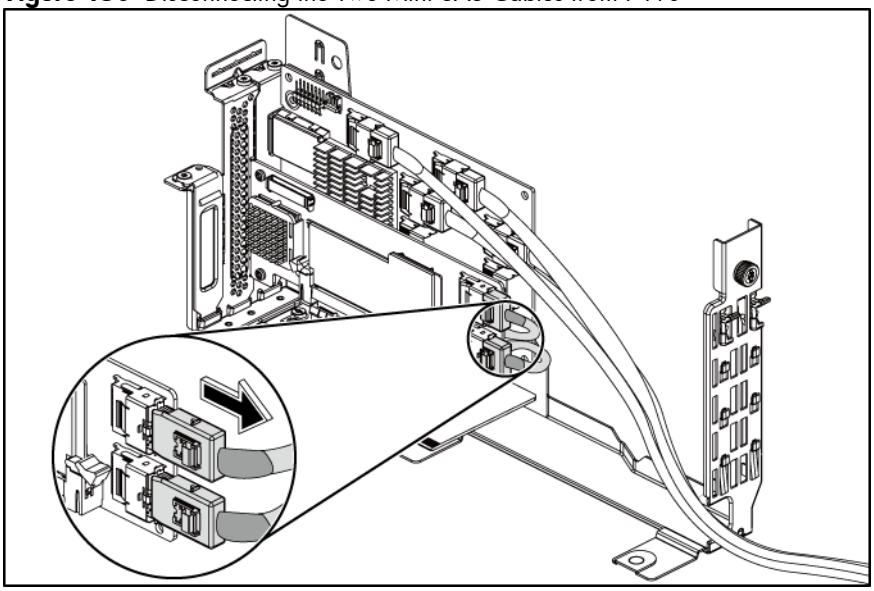
3. Remove the 2 screws to release the top adapter board from the adapter board bracket.
4. Remove the top adapter board away from the adapter board bracket.

Figure 149 Removing the Top Adapter Board



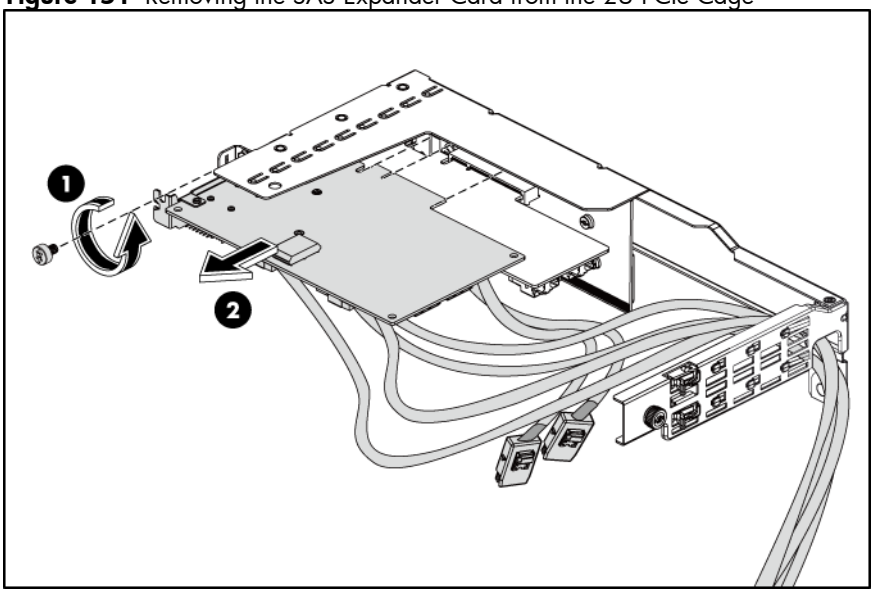
5. Remove the adapter board bracket from the chassis as shown in Figure 106.
6. Remove the other two Mini SAS to Mini SAS cables from the bottom adapter board as shown in Figure 107.
7. Remove the 2U PCIe cage assembly from the chassis as shown in Figure 108.
8. Remove the card holder bracket from the 2U PCIe cage assembly as shown in Figure 109.
9. Disconnect the two Mini SAS cables from the smart array P410 controller board.

Figure 150 Disconnecting the Two Mini SAS Cables from P410



10. Remove the screw to release the SAS expander card from the 2U PCIe cage.
11. Remove the SAS expander card from the 2U PCIe cage.

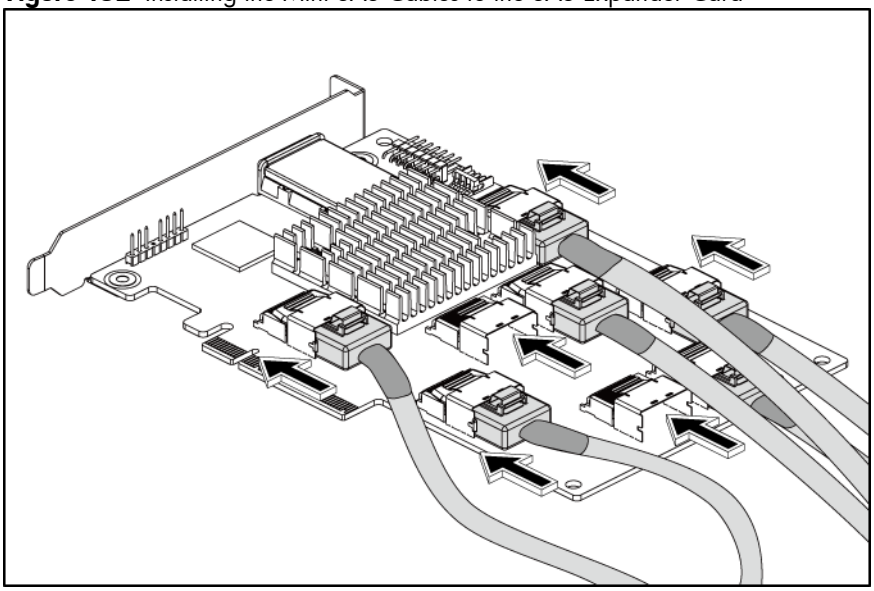
Figure 151 Removing the SAS Expander Card from the 2U PCIe Cage



Installing the SAS expander card

1. Install the four Mini SAS to Mini SAS cables (used for smart array P212 controller board) to the Mini SAS connectors 2, 3, 4 and 5 on the SAS expander card.
2. Install the two Mini SAS to Mini SAS cables for connection between SAS expander card and P410 to the Mini SAS connectors 8 and 9 on the SAS expander card.

Figure 152 Installing the Mini SAS Cables to the SAS Expander Card

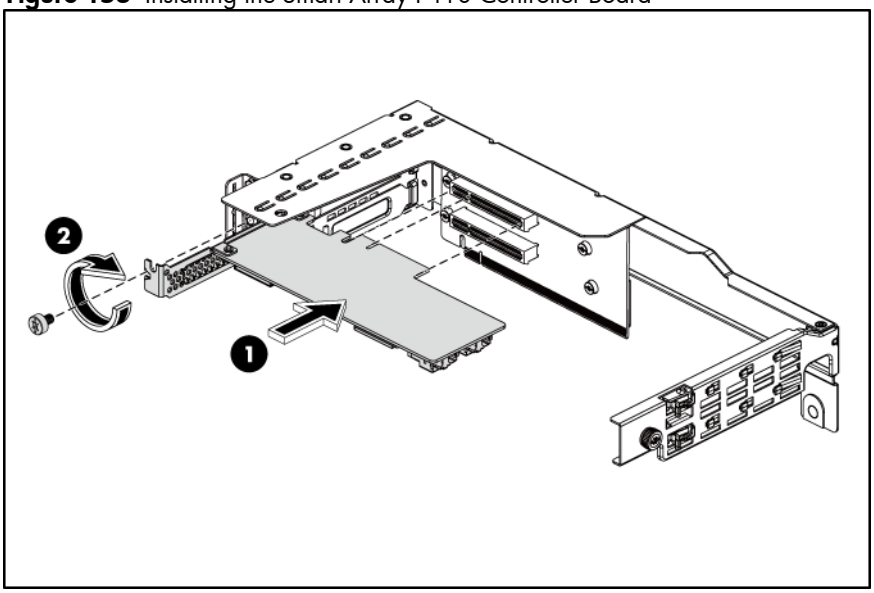


3. Install the smart array P410 controller board to the second slot on the 2U riser card of the 2U PCIe cage.

   See the "Installing the smart array P410 controller board" section on page 122 for more information.

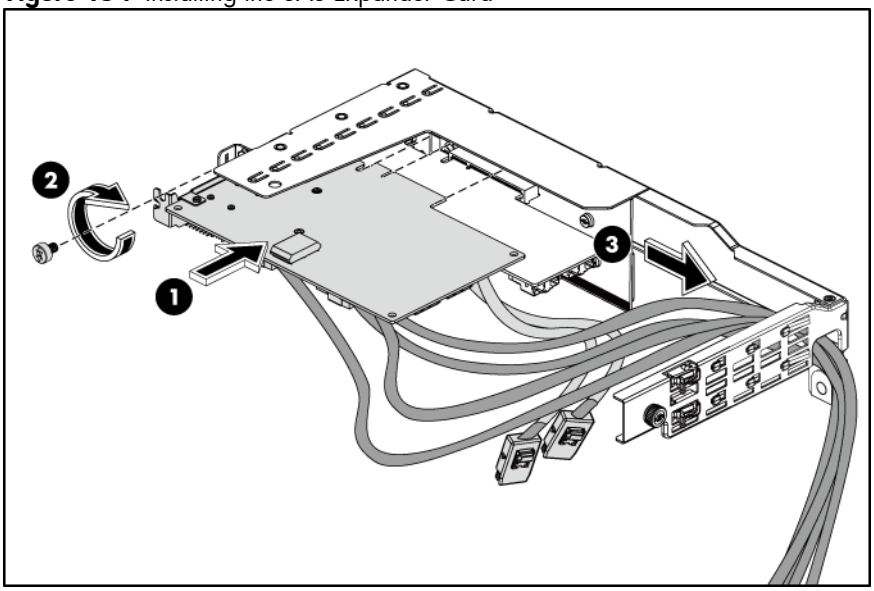
4. Install the screw to secure the smart array P410 controller board to the 2U PCIe cage.

Figure 153 Installing the Smart Array P410 Controller Board



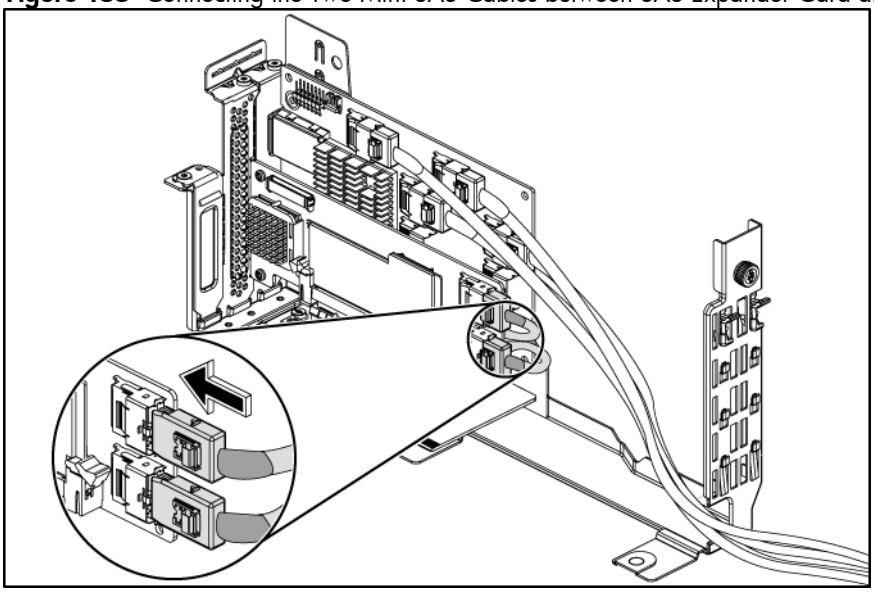
5. Install the SAS expander card in the top first slot on the 2U riser card of the 2U PCIe cage.
6. Install the screw to secure the SAS expander card to the 2U PCIe cage.
7. Route the 4 long Mini SAS to Mini SAS cables through the hole of the 2U PCIe cage as shown in figure below.

Figure 154 Installing the SAS Expander Card



8. Connect the two short Mini SAS to Mini SAS cables between the SAS expander card and the smart array P410 controller board: Mini SAS connector 8 on the SAS expander card with Mini SAS connector 1 on P410, and Mini SAS connector 9 on the SAS expander card with Mini SAS connector 2 on P410.

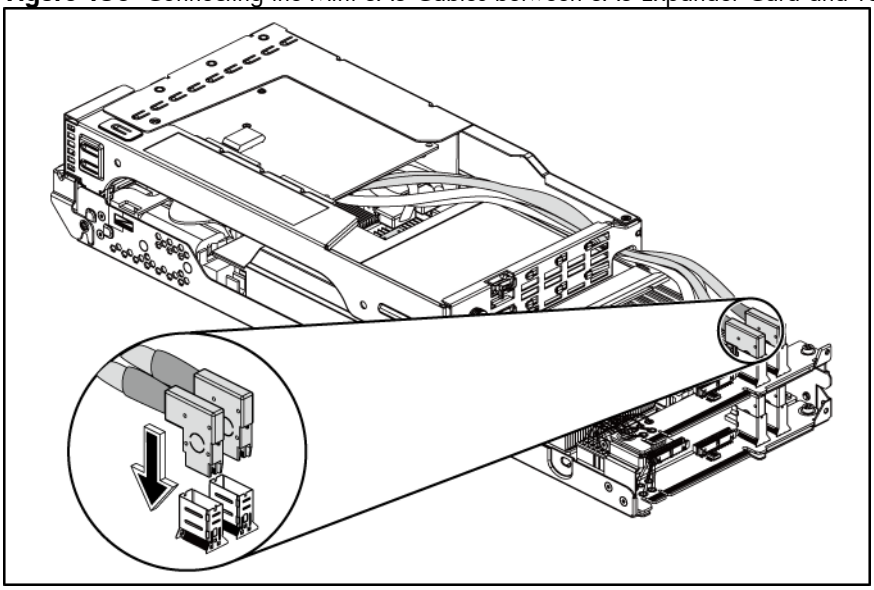
Figure 155 Connecting the Two Mini SAS Cables between SAS Expander Card and P410



9. Install the card holder bracket to the 2U PCIe cage as shown in Figure 121.
10. Install the 2U PCIe cage assembly to the chassis as shown in Figure 122.
11. Connect the Mini SAS to Mini SAS cables from the Mini SAS connectors 2 and 3 on the SAS expander card to the Mini SAS connectors 1 and 2 on the bottom adapter board respectively as shown in Figure 123 and Figure 124.
12. Install the adapter board bracket to the chassis as shown in Figure 125.
13. Install the top adapter board to the adapter board bracket as shown in Figure 138.

14. Connect the Mini SAS to Mini SAS cables from the Mini SAS connectors 4 and 5 on the SAS expander card to the Mini SAS connectors 1 and 2 on the top adapter board respectively.

Figure 156 Connecting the Mini SAS Cables between SAS Expander Card and Top Adapter Board

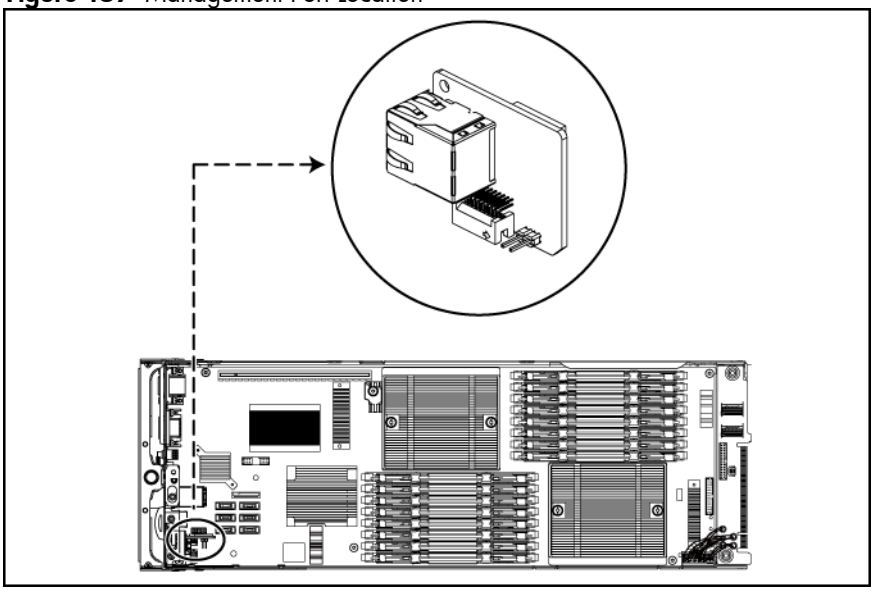


15. Install the 2U upper sheet metal air baffle as shown in Figure 126.

Dedicated management port (L0100i) (Optional)

Each system board can support a dedicated management port. The management port is optional for the shipment.

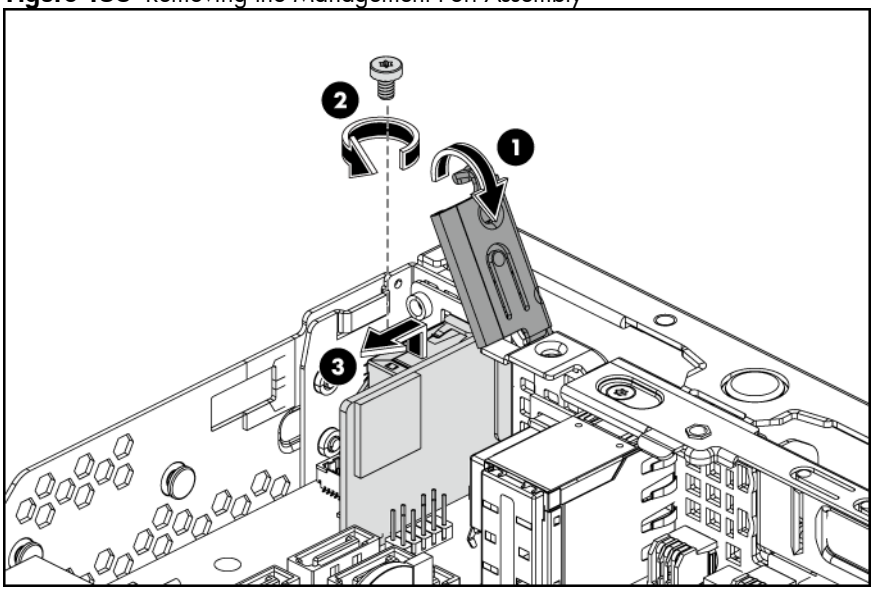
Figure 157 Management Port Location



To remove the management port:

1. Route up the management port bracket on the rear end of the system board tray.
2. Loosen the screw that secures the management port assembly to the system board tray.
3. Unplug the management port assembly from the system board and remove it away from the opening on the I/O shield.

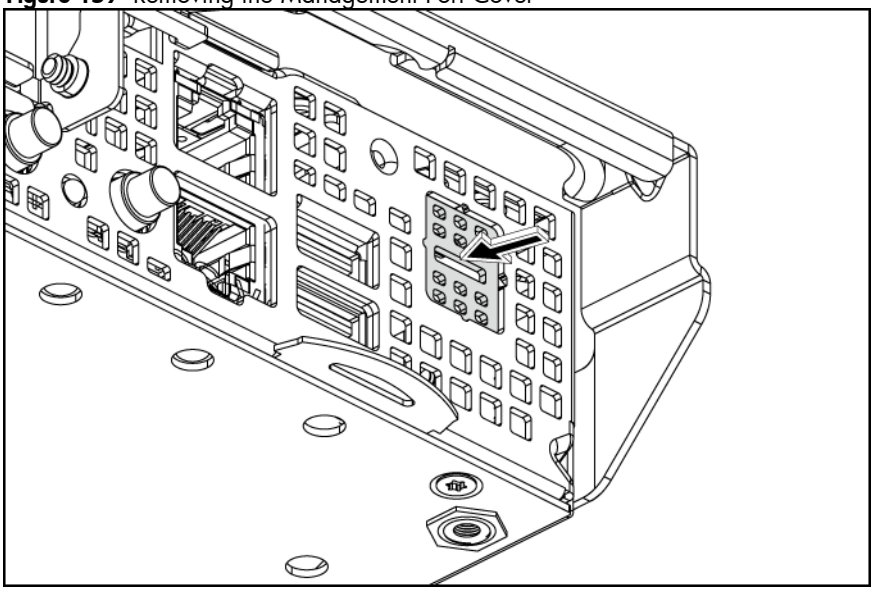
Figure 158 Removing the Management Port Assembly



To install the management port:

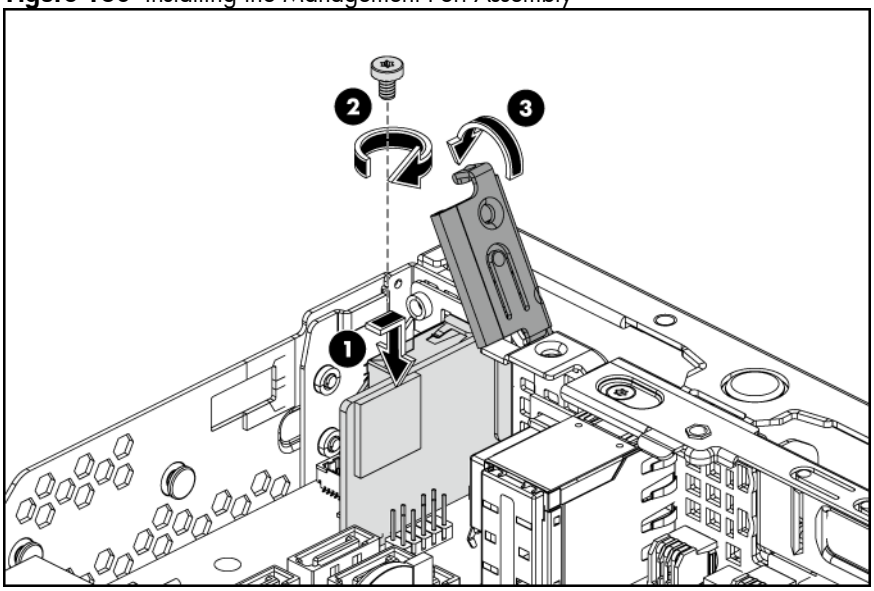
1. Remove the management port cover with a slotted screwdriver.

Figure 159 Removing the Management Port Cover



2. Insert the management port assembly into the opening on the I/O shield and plug the management port in the dedicated management port on the system board. Make sure the management port assembly is aligned to the system board tray by the screw hole.
3. Tighten the screw that secures the management port assembly to the system board tray.
4. Press down the management bracket on the rear end of the system board tray.

Figure 160 Installing the Management Port Assembly

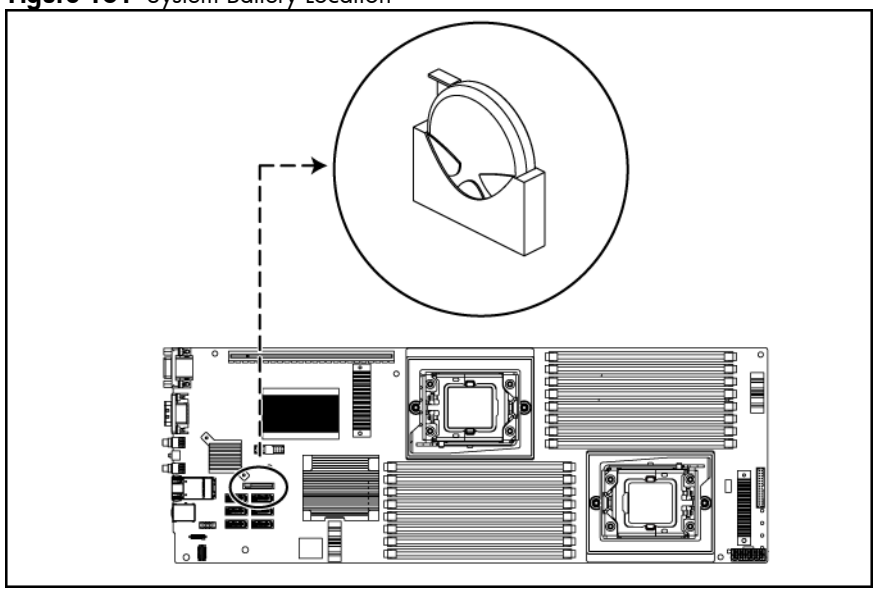


System battery

The server uses nonvolatile memory that requires a system battery to retain system information when power is removed.

This 3 V lithium coin cell battery is located on the system board.

Figure 161 System Battery Location



WARNING: Note the following reminders when replacing the system battery:

- Replace the system battery with the same type as the system battery recommended by HP. Use of another system battery may present a risk of fire or explosion.
- A risk of fire and chemical burn exists if the system battery is not handled properly. Do not disassemble, crush, puncture, or short external contacts, or expose the system battery to temperatures higher than 60°C (140°F).
- Do not dispose of used system battery in water or fire. Dispose of used system battery according to manufacturer's instructions.

CAUTION: Loss of BIOS settings occurs when the system battery is removed. You must reconfigure BIOS settings whenever you replace the system battery.

NOTE: If the server no longer automatically displays the correct date and time, you may need to replace the system battery. Under normal usage, system battery life is five to ten years.

To replace the system battery:

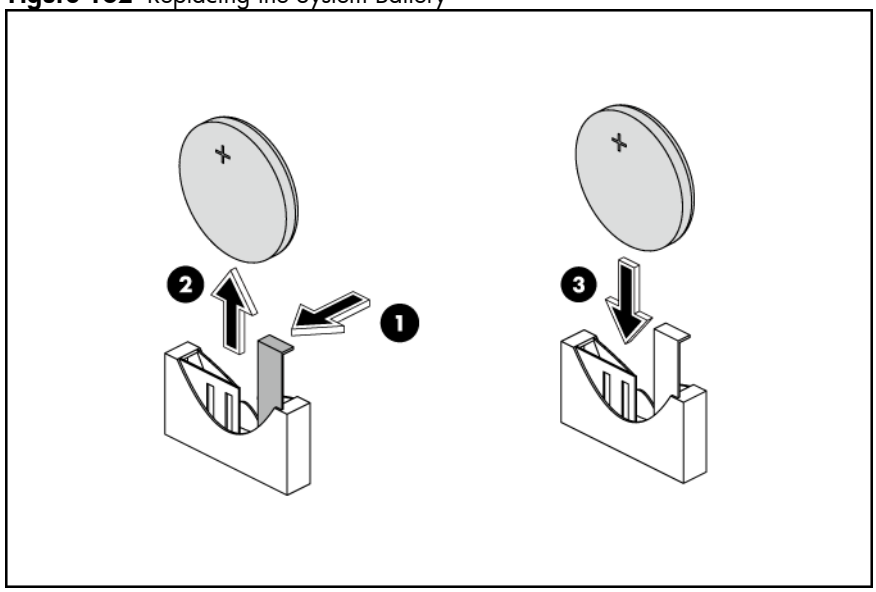
1. Power down the node.
2. Disconnect the power cord(s).
3. Unplug the node from the chassis and place it on a flat surface.

NOTE: If the expansion board is installed to the PCIe cage, remove the PCIe cage before releasing the battery. See the “Removing the PCIe cages” section in this chapter for detailed procedures.

4. Release the battery from its holder by squeezing the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out.

5. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery.

Figure 162 Replacing the System Battery

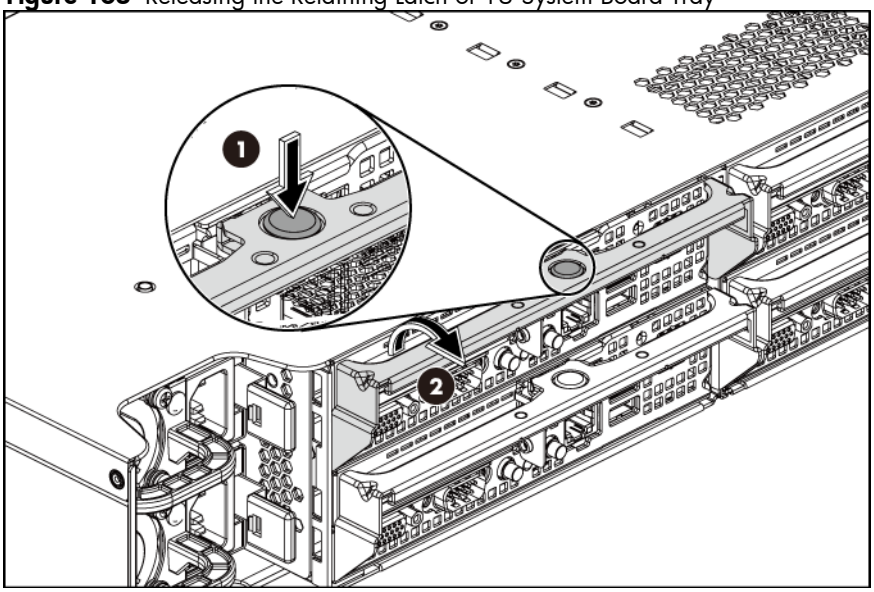


System board removal and replacement procedure

To remove the 1U system board:

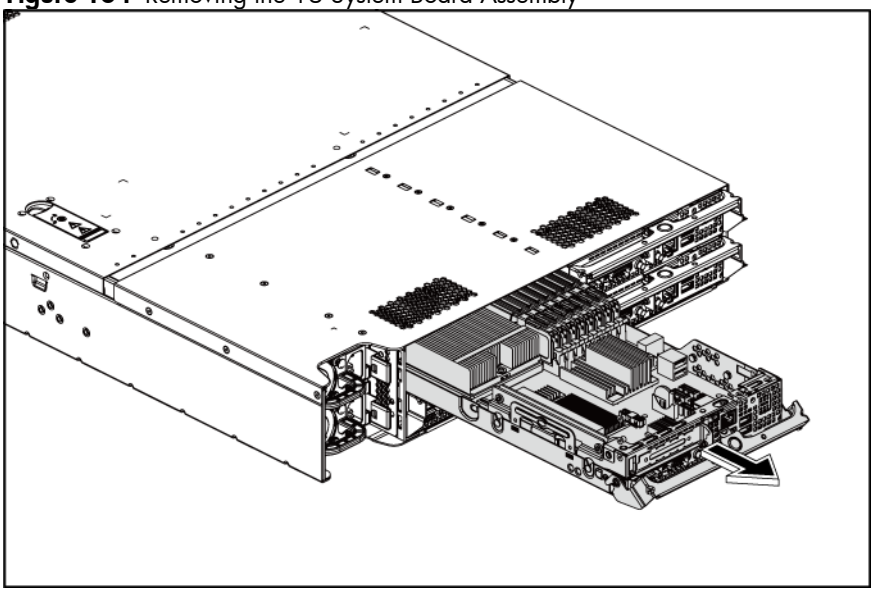
1. Power off the node.
2. Disconnect all external cables.
3. Press the release button to release the retaining latch from the 1U system board tray.
4. Route the handle of the system board tray downwards to release the 1U system board tray from the server chassis.

Figure 163 Releasing the Retaining Latch of 1U System Board Tray



5. Slide the 1U system board assembly out of the chassis.

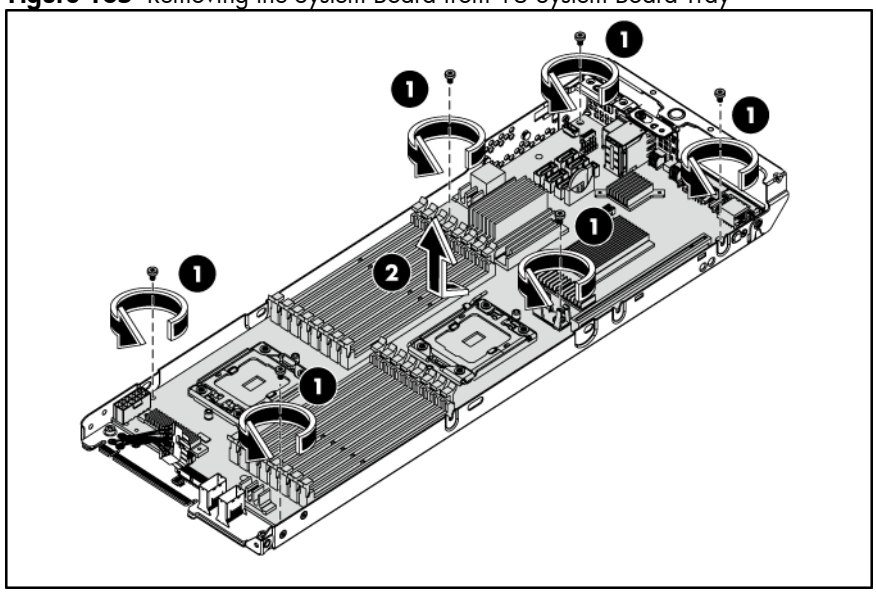
Figure 164 Removing the 1U System Board Assembly



6. Remove the 1U PCIe assembly as shown in Figure 74.
7. Remove all necessary cables from the system board.

8. Remove all processors and memory modules. See the sections of Processor and Memory for details.
9. Loosen the 6 screws that secure the system board to the 1U system board tray.
10. Slide the system board in the direction as shown in the figure below, and remove it out of the chassis.

Figure 165 Removing the System Board from 1U System Board Tray

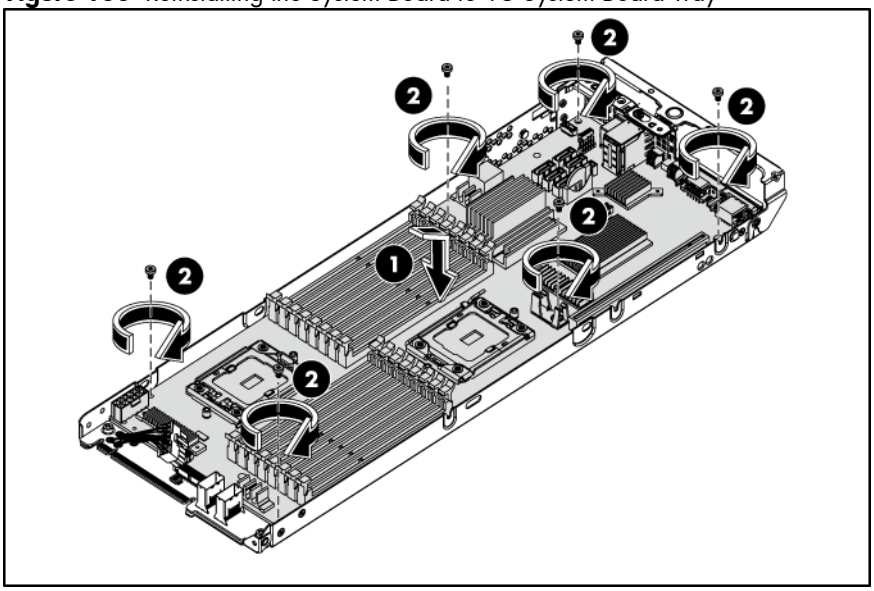


⚠ **WARNING:** Wherever a node is removed from the server, a node blank should be installed to prevent improper cooling and thermal shutdown.

To install the 1U system board:

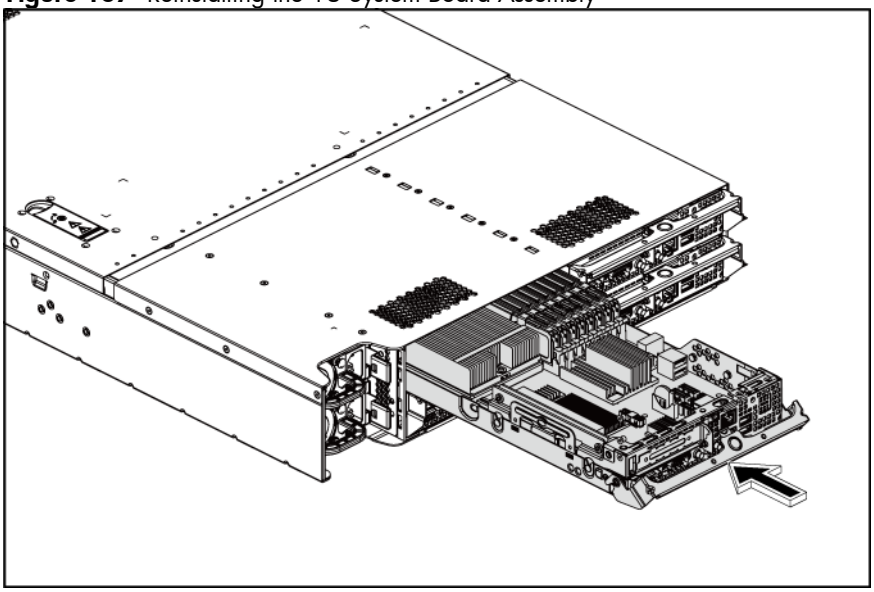
1. Align the system board I/O connectors to their openings and route down the other side of the system board into place. The screw holes on the 1U system board tray should align with the system board.
2. Fasten the 6 screws that secure the system board to the 1U system board tray.

Figure 166 Reinstalling the System Board to 1U System Board Tray



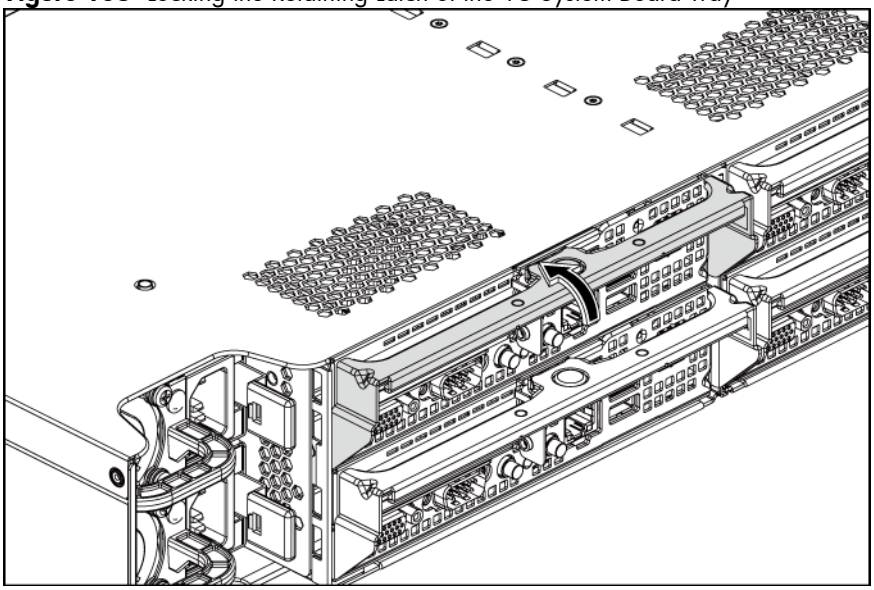
3. Install all removed cables to the system board.
4. Install the processors and memory modules. See the sections of Processor and Memory for details.
5. Install the 1U PCIe assembly as shown in Figure 80.
6. Slide the 1U system board assembly into the chassis.

Figure 167 Reinstalling the 1U System Board Assembly



7. Route the handle of the 1U system board tray upwards until it snaps into place and locks the retaining latch.

Figure 168 Locking the Retaining Latch of the 1U System Board Tray



8. Plug all external cables.
9. Power on the node.

NOTE: When the system board is replaced, it is important to ensure the System Serial Number is updated to the original Serial Number. See the Setup Utility section in HP ProLiant DL170e G6 Server Software Configuration Guide on the HP website (**http://www.hp.com/**) to input the correct System Serial Number and Asset Tag information. Also you can input all the other customer specific setup requirements that are required.

The 2U node shares the same procedures with 1U node for system board replacement except for the operation of 2U air baffles.

- During the removing procedure of the system board, the 2U PCIe cage air baffles should be removed before the system board is removed from the 2U system board tray.
- The 2U air baffles should be installed before the system board is installed on the 2U system board tray.

To remove the 2U system board:

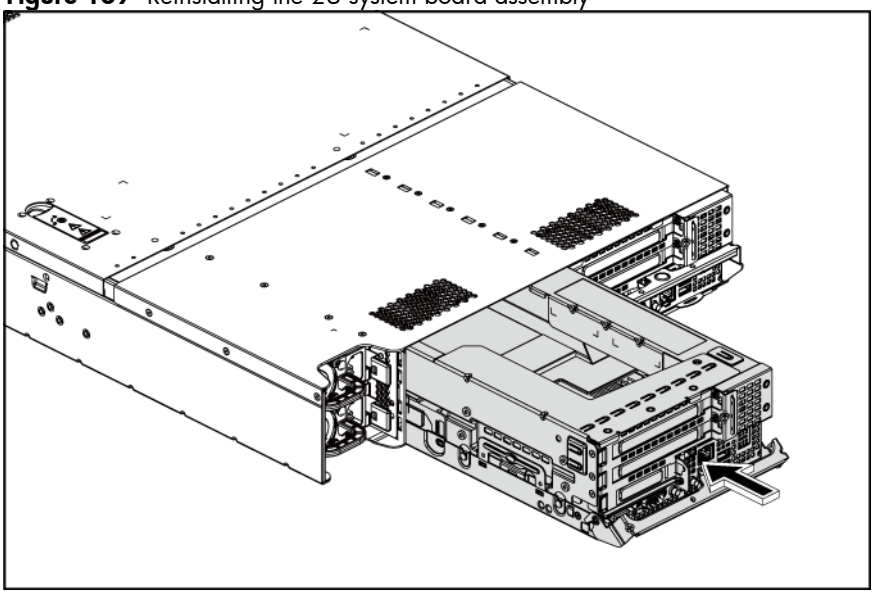
1. Power off the node.
2. Disconnect all external cables.
3. Release the retaining latch and handle of the 2U system board tray as shown in Figure 163.
4. Slide the 2U system board assembly out of the chassis.
5. Remove the 2U upper sheet metal air baffle as shown in Figure 66.
6. Remove the 2U PCIe assembly as shown in Figure 69.
7. Remove the 2U bottom plastic air baffle as shown in Figure 86.
8. Remove the processors and memory modules. See the sections of Processor and Memory for details.
9. Remove all necessary cables from the system board.
10. Remove the system board from the 2U system board tray as shown in Figure 165.

NOTE: Two 1U node blanks are needed when a 2U system board is removed from the system.

To install the 2U system board:

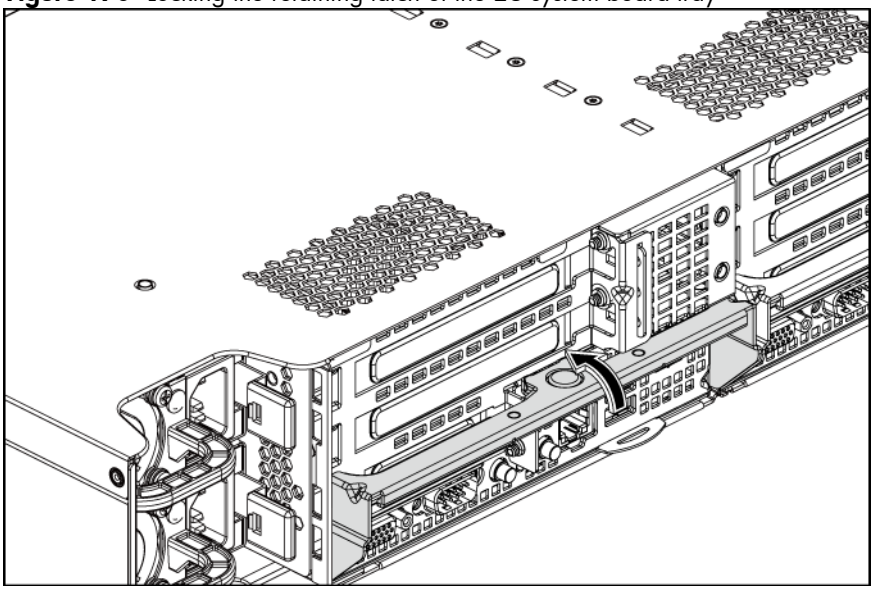
1. Install the system board to the 2U system board tray as shown in Figure 166.
2. Install the processors and memory modules. See the sections of Processor and Memory for details.
3. Install all removed cables to the system board.
4. Install the 2U bottom air baffle as shown in Figure 91.
5. Install the 2U PCIe assembly as shown in Figure 96.
6. Install the 2U upper metal sheet air baffle as shown in Figure 99.
7. Slide the system board assembly into the chassis.

Figure 169 Reinstalling the 2U system board assembly



8. Route the handle of the 2U system board tray upwards until it snaps into place and locks the retaining latch.

Figure 170 Locking the retaining latch of the 2U system board tray



Node blank

The server node blank should be installed when a node bay in the server is not populated with a node, so as to prevent improper cooling and thermal shutdown.

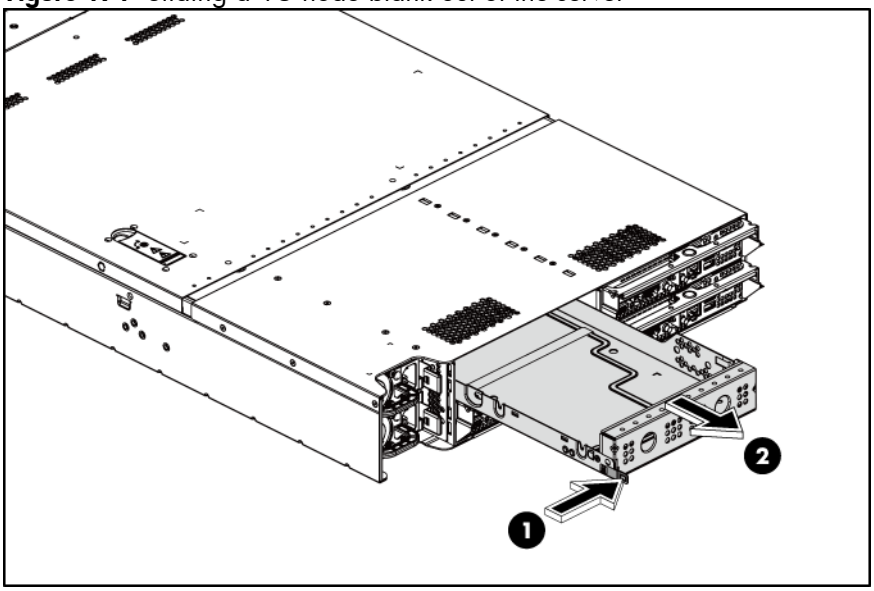
⚠ **WARNING:** Failure to install a node blank wherever a node is removed from the server could result in the server shutting down.

The following replacement procedures of the node blank use the 1U node as examples.

To remove the node blank:

1. Press the locking latch on the node blank to release the node blank from the server.
2. Simultaneously unplug the node blank from the midplane, and slide it out of the server, using the hole(s) on the node blank.

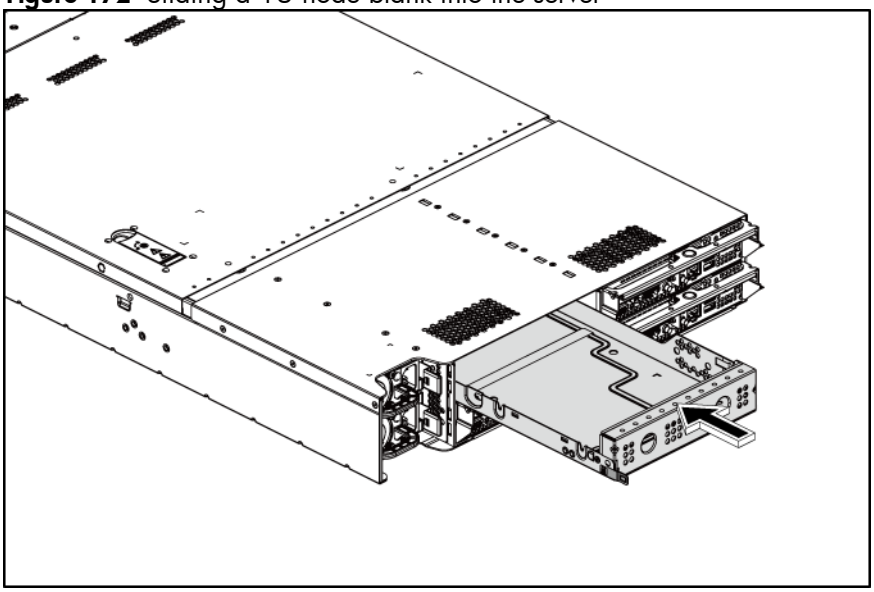
Figure 171 Sliding a 1U node blank out of the server



To install the node blank:

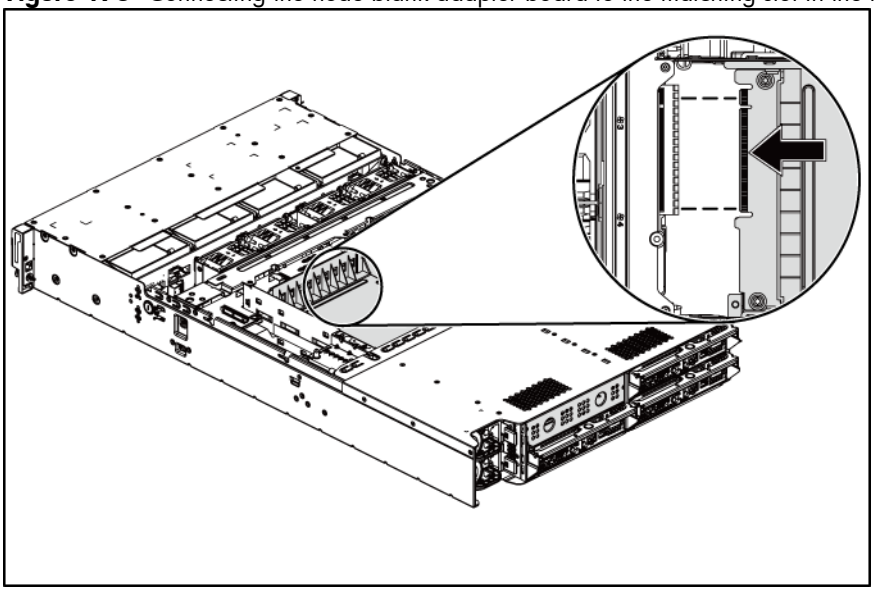
1. If present, remove the 1U hot-plug system board tray from the server as shown in Figure 163 and Figure 164.
2. Slide the 1U node blank into the server, using the two holes at the rear end of the node blank.

Figure 172 Sliding a 1U node blank into the server



3. Fully install the 1U node blank until it snaps into place. Make sure the node blank adapter board at the front end of the node blank is properly connected to the matching slot in the midplane.

Figure 173 Connecting the node blank adapter board to the matching slot in the midplane

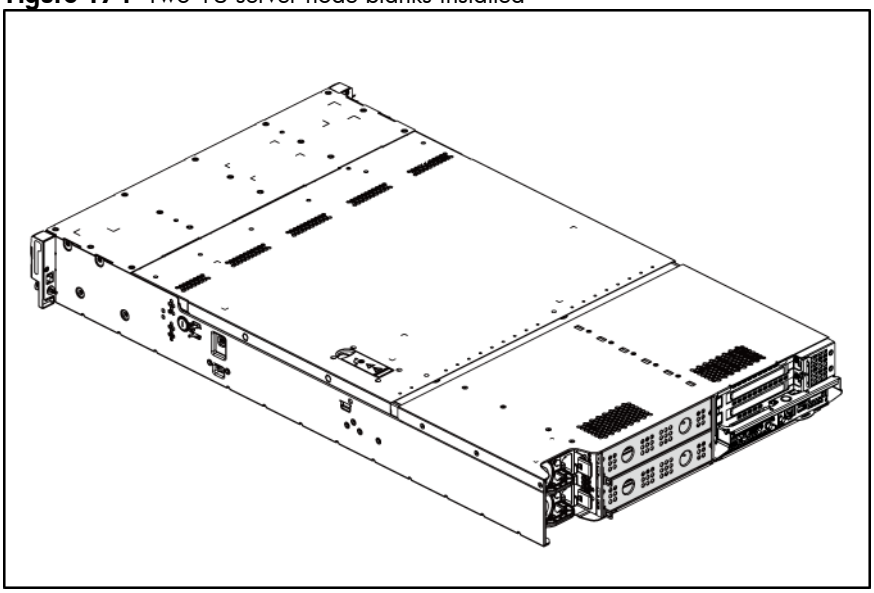


NOTE: The system top cover is opened in the previous figure only for the purpose of showing the inside clearly. In actual operation, it is not necessary to open the top cover when you remove or install a node or a node blank for the hot-plug characteristics of the node and the node blank.

For 2U node, the removal of the 2U system board tray shares the same steps as the 1U node. And two 1U node blanks need to be installed when a 2U node is removed away from the server.

1. Follow the steps for removing a 1U hot-plug node to remove a 2U hot-plug node from the chassis.
2. Follow the steps for installing a 1U server node blank to install two 1U server node blanks in place of the 2U hot-plug node removed from the chassis.

Figure 174 Two 1U server node blanks installed

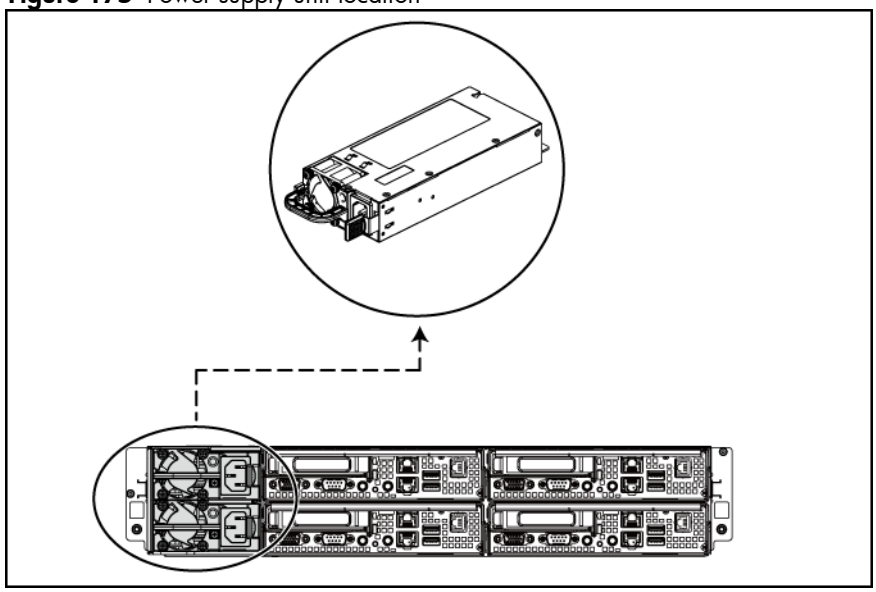


Power supply unit (PSU)

Located on the rear panel of the server power supply is a standard autoranging1200 W PSU with power factor correction (PFC) function.

The following figure of power supply unit location uses the 4-node system as example. The 2-node system shares the same power supply unit location.

Figure 175 Power supply unit location



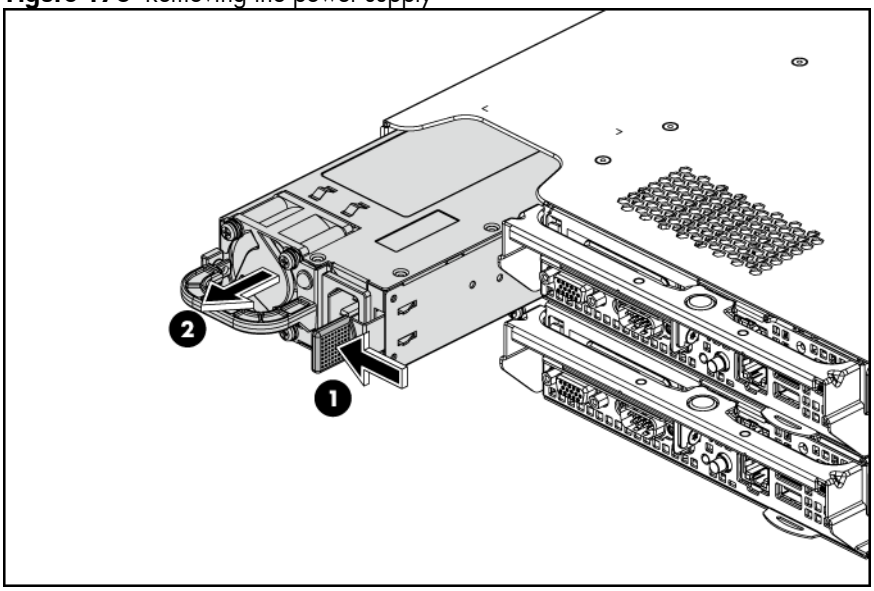
⚠ **WARNING:** Take note of the following reminders to reduce the risk of personal injury from electric shock hazards and/or damage to the equipment.

- Installation of power supply units should be referred to individuals who are qualified to service server systems and are trained to deal with equipment capability of generating hazardous energy levels.
- DO **not** open the power supply unit. There are no serviceable parts inside it.

To remove the power supply:

1. Press the tab.
2. Slide the power supply out of the power supply bay.

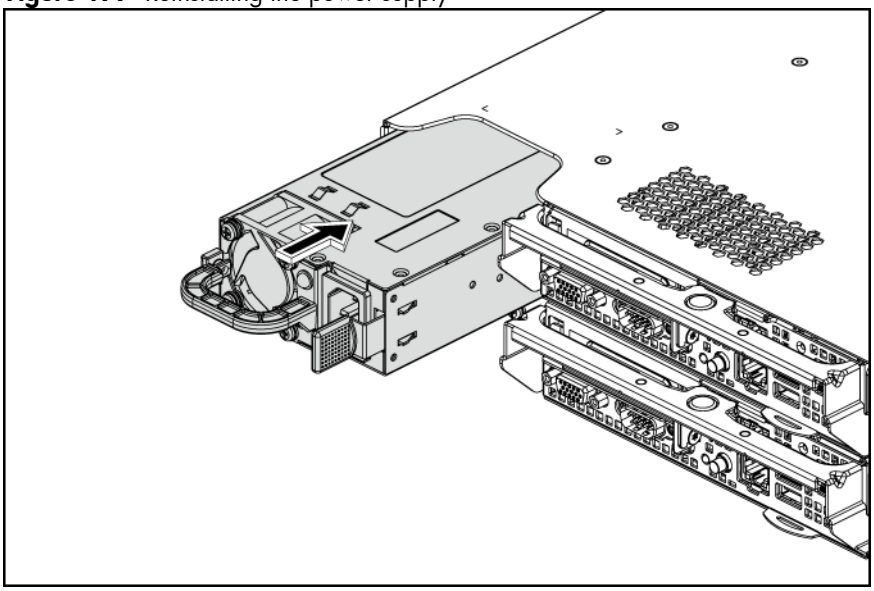
Figure 176 Removing the power supply



To install the power supply:

1. Align the power supply cage connector with the open power supply bay and slide the power supply into the chassis.

Figure 177 Reinstalling the power supply



Power bus bar system

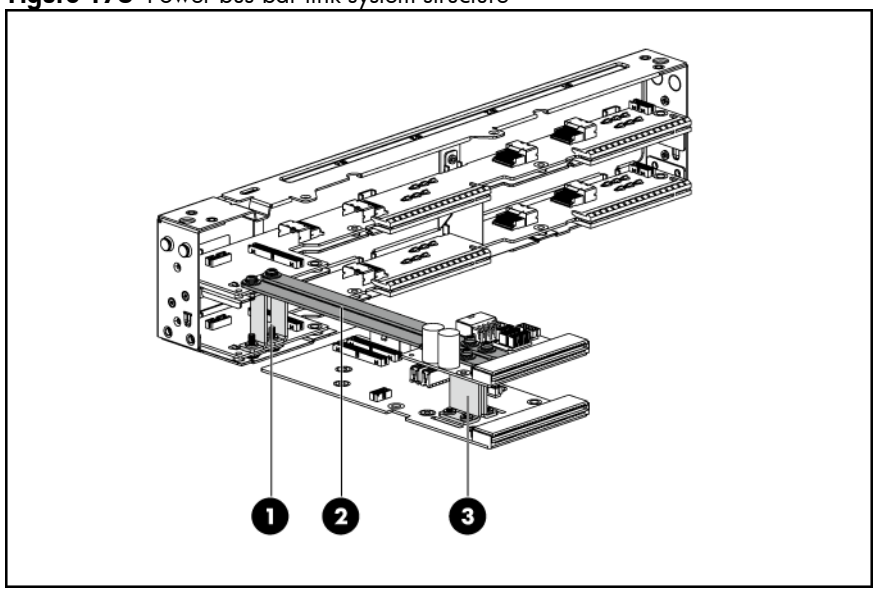
The HP ProLiant DL170e G6 server uses the copper power bus bar system for power transferring, which efficiently reduces the power loss during the power transferring process from the power supply units to the system boards.

The power bus bar link system consists of the following elements:

- Big C bus bar pair: Transfer power from the bottom power backplane to the top power backplane
- Bus bar links: Transfer power from the top power backplane to the top midplane
- Small C bus bar pair: Transfer power from the top midplane to the bottom midplane

The following figure shows the power bus bar link system structure with reference to the top/bottom power backplanes and top/bottom midplanes:

Figure 178 Power bus bar link system structure



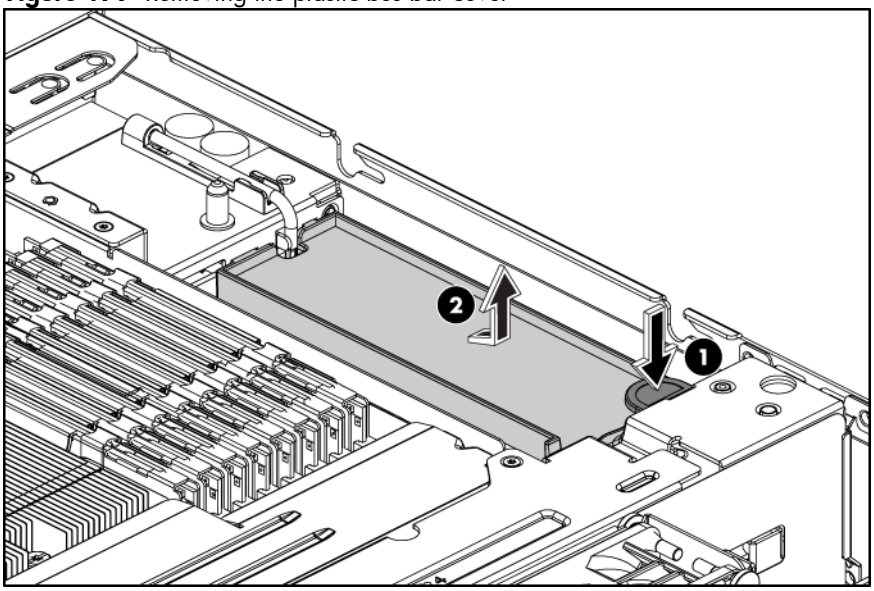
Item	Description
1	Small C bus bar pair (between the top midplane and the bottom midplane)
2	Bus bar links (between the top midplane and the top power backplane)
3	Big C bus bar pair (between the top power backplane and the bottom power backplane)

To remove the bus bar links:

Before removing the bus bar links, take steps as described in the section of "Pre-installation procedure".

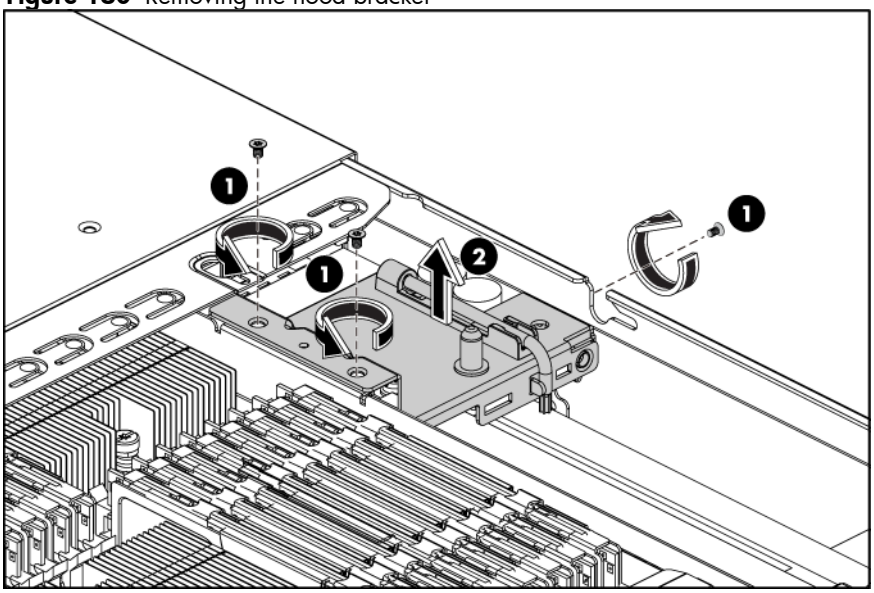
1. Remove the power supply units as described in the section of "To remove the power supply".
2. Press the semi-circle shaped end of the plastic bus bar cover to release the bus bar cover from the midplane assembly.
3. Route up the semi-circle shaped end of the plastic bus bar cover and remove it from the hood bracket.

Figure 179 Removing the plastic bus bar cover



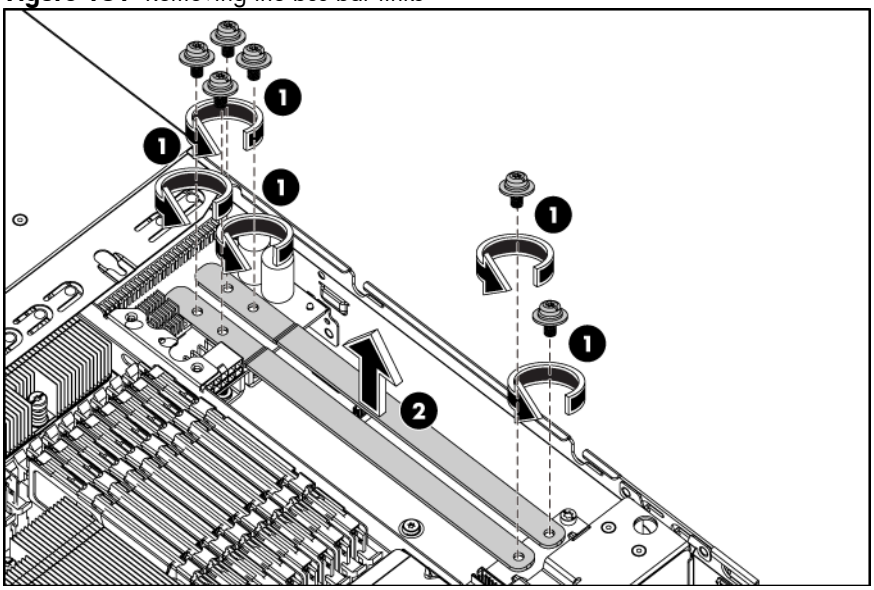
4. Loosen the 3 screws to release the hood bracket from the system tray.
5. Remove the hood bracket from the system tray.

Figure 180 Removing the hood bracket



6. Loosen the 6 screws that secure the bus bar links to the top power backplane and the top midplane.
7. Remove the bus bar links from the top power backplane and top midplane.

Figure 181 Removing the bus bar links

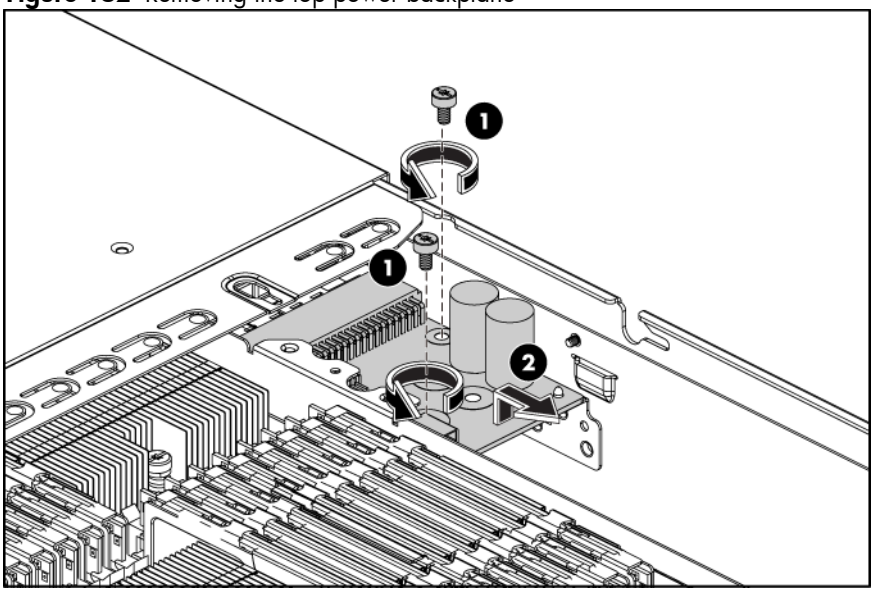


To remove the big C bus bar pair:

After the bus bar links are removed from the chassis, the big C bus bar pair can be removed as follows:

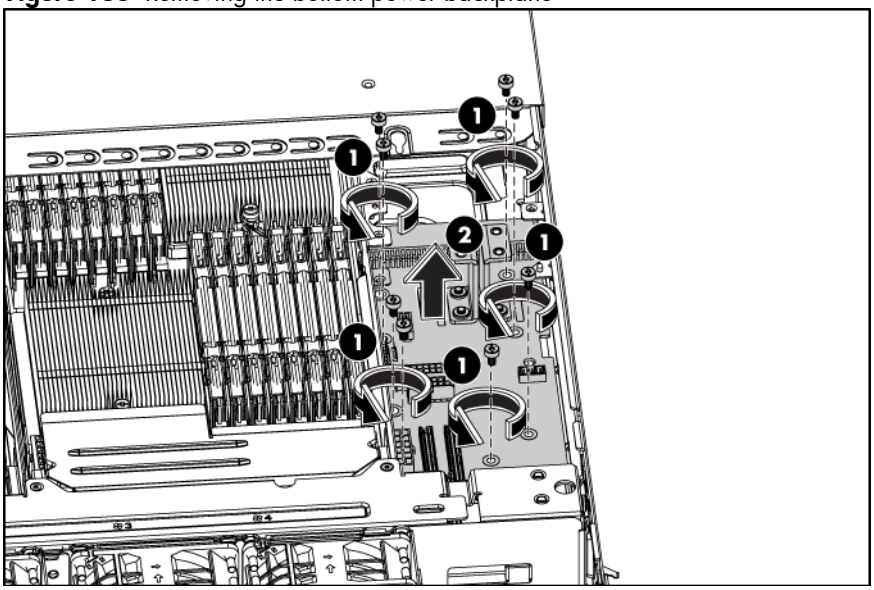
1. Remove all connected cables from the power backplanes.
2. Loosen the 2 screws that secure the top power backplane to the system tray.
3. Detach the top power backplane from the stand-off on the system tray and remove it from the system tray.

Figure 182 Removing the top power backplane



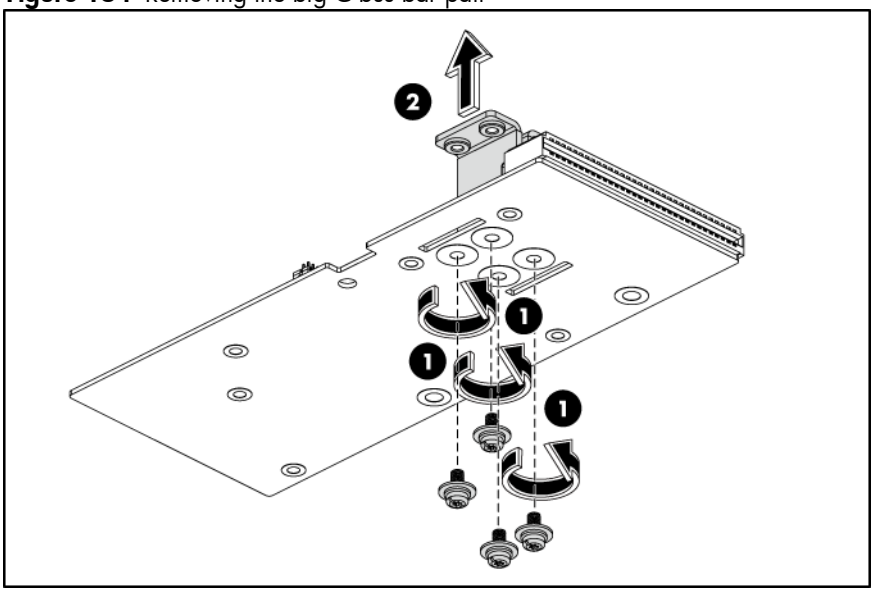
4. Loosen the 8 screws that secure the bottom power backplane to the system tray.
5. Lift up the end of the bottom power backplane at 45 degree angle and remove it from the system tray.

Figure 183 Removing the bottom power backplane



6. Loosen the 4 screws that secure the big C bus bar pair to the bottom power backplane.
7. Remove the big C bus bar pair from the bottom power backplane.

Figure 184 Removing the big C bus bar pair

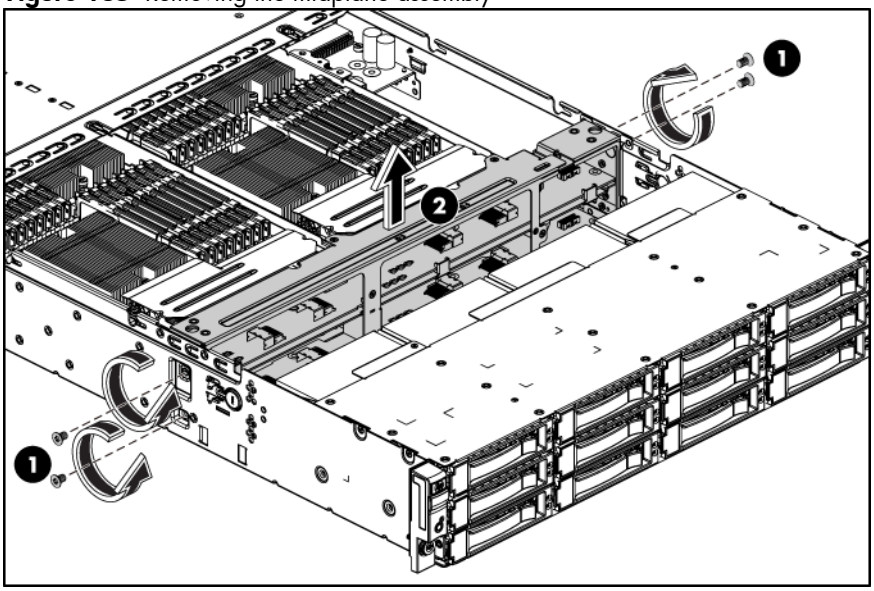


To remove the small C bus bar pair:

After the bus bar links are removed from the chassis, the small C bus bar pair can be removed as follows:

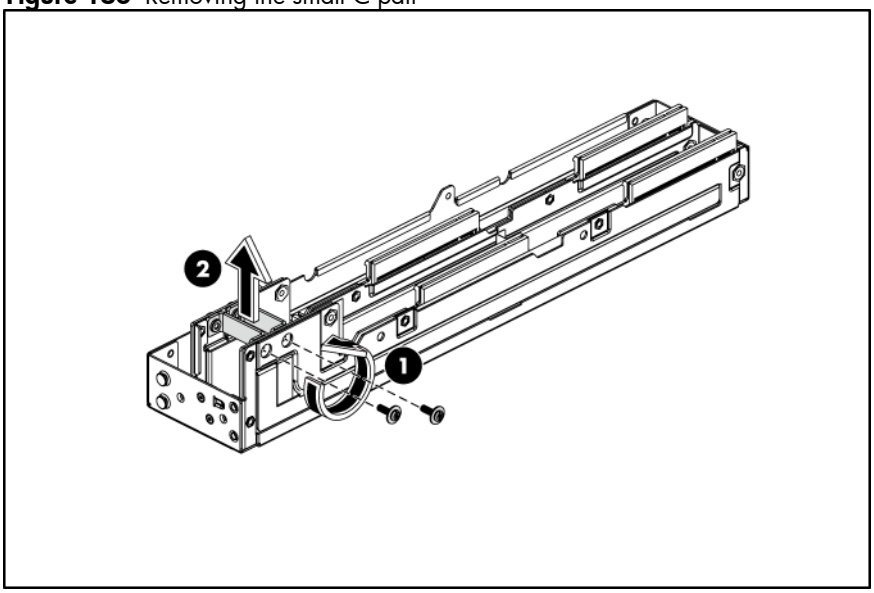
1. Remove the fan cage from the chassis as shown in Figure 25.
2. Remove all cables from the midplanes.
3. Loosen the 4 screws that secure the midplane assembly to the chassis.
4. Lift out the midplane assembly from the chassis.

Figure 185 Removing the midplane assembly



5. Loosen the 2 screws that link the small C bus bar pair to the bottom midplane.
6. Remove the small C bus bar pair from the bottom midplane.

Figure 186 Removing the small C pair

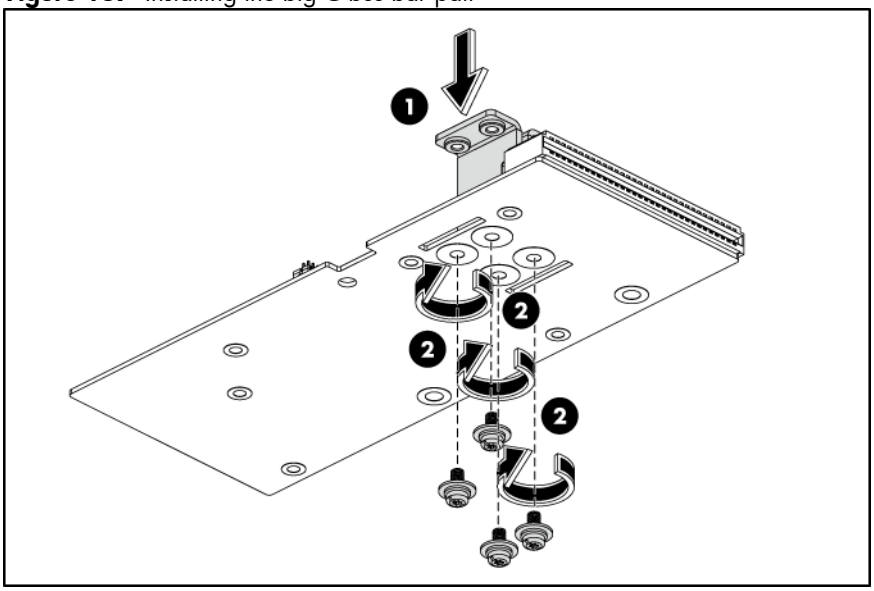


To install the big C bus bar pair:

1. Align the big C bus bar pair to the 4 screw holes on the bottom power backplane.
2. From the bottom side of the bottom power backplane, install the 4 screws to secure the big C bus bar pair to the bottom power backplane.

NOTE: Install the screws with strength of 10~30 in/lbs. You can use T10/T15 wrench or hand-tighten plus 1/4 turn.

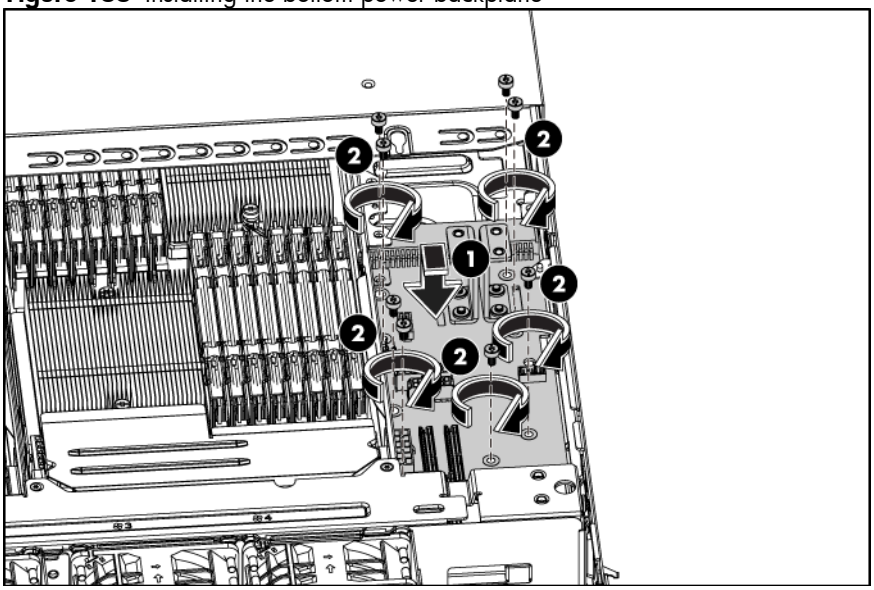
Figure 187 Installing the big C bus bar pair



3. Handle the bottom power backplane at 45 degree angle, and put the rear end down under through the top power backplane bracket to put it in place on the system tray. Route the other end down to the system tray. Make sure that it is aligned to the 8 screw holes on the system tray.
4. Install the 8 screws to secure the bottom power backplane to the system tray.

NOTE: Install the screws with strength of 10~30 in/lbs. You can use T10/T15 wrench or hand-tighten plus 1/4 turn.

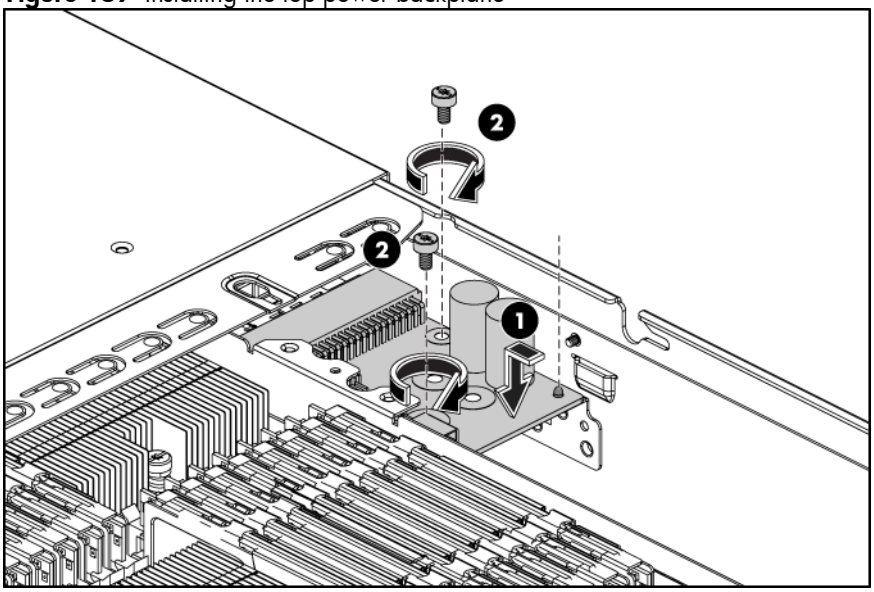
Figure 188 Installing the bottom power backplane



5. Align the top power backplane to the 2 screw holes on the top power backplane bracket. Make sure that the stand-off on the top power backplane bracket is inserted through the hole on the top power backplane.
6. Install the 2 screws to secure the top power backplane to the top power backplane bracket.

NOTE: Install the screws with strength of 10~30 in/lbs. You can use T10/T15 wrench or hand-tighten plus 1/4 turn.

Figure 189 Installing the top power backplane



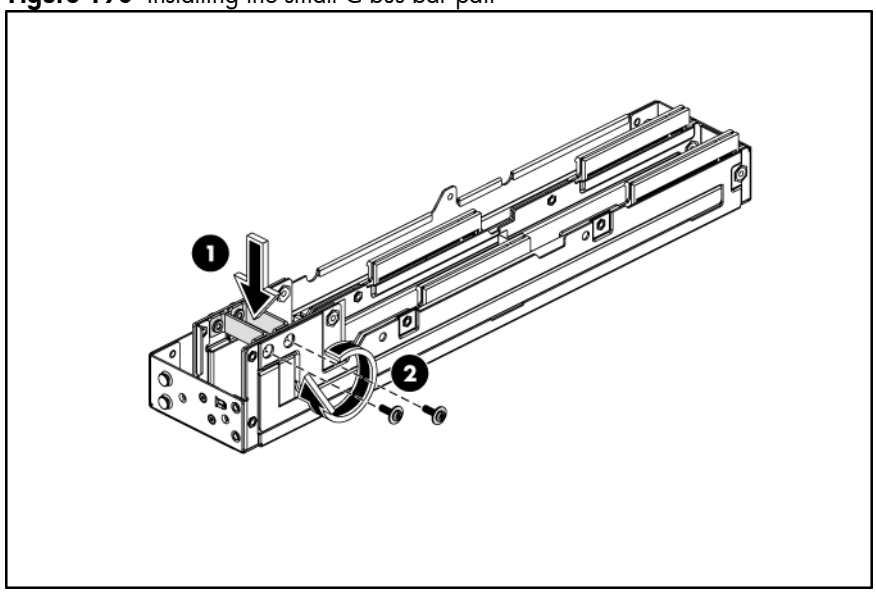
7. Install all removed cables to the power backplanes.

To install the small C bus bar pair:

1. Align the small C pair to the 2 screw holes on the bottom midplane and the top midplane.
2. From the outside of the bottom of the midplane cage, put the 2 screws through the screw holes on the midplane cage, the bottom midplane and the small C bus bar pair. Install the 2 screws to link and secure the small C bus bar pair to the bottom midplane and the midplane cage.

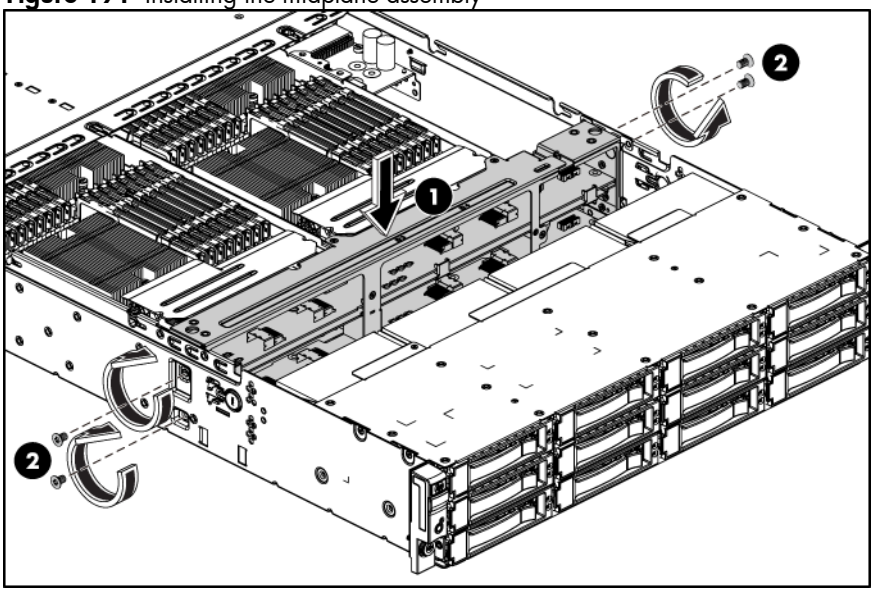
NOTE: Install the screws with strength of 10~30 in/lbs. You can use T10/T15 wrench or hand-tighten plus 1/4 turn.

Figure 190 Installing the small C bus bar pair



3. Align the midplane assembly to the 4 screw holes on the chassis.
4. Install the 4 screws to secure the midplane assembly to the chassis.

Figure 191 Installing the midplane assembly



5. Install all removed cables to the midplanes.
6. Install the fan cage. For details, see Figure 27.

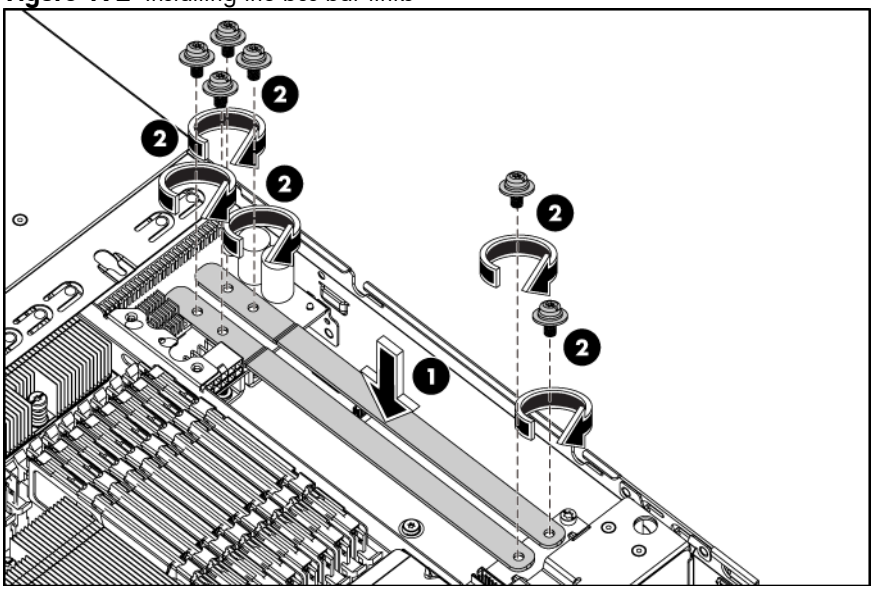
To install the bus bar links:

After the big C and small C bus bar pairs are installed in the chassis, the bus bar links can be installed as follows:

1. Align the bus bar links to the 6 screw holes on the top power backplane and the top midplane.
2. Install the 6 screws to secure and link the bus bar links to the top power backplane (and the big C bus bar pair) and the top midplane (and the small C bus bar pair).

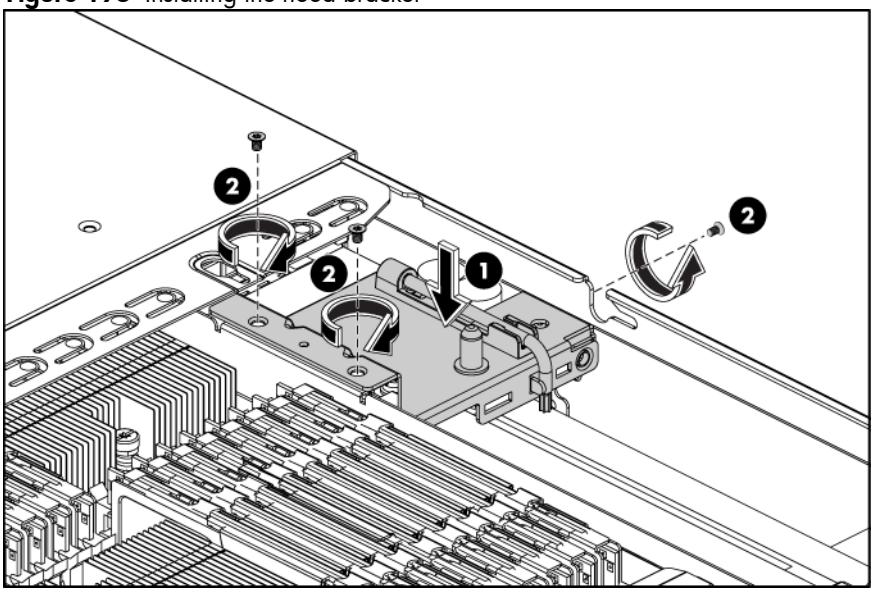
NOTE: Install the screws with strength of 10~30 in/lbs. You can use T10/T15 wrench or hand-tighten plus 1/4 turn.

Figure 192 Installing the bus bar links



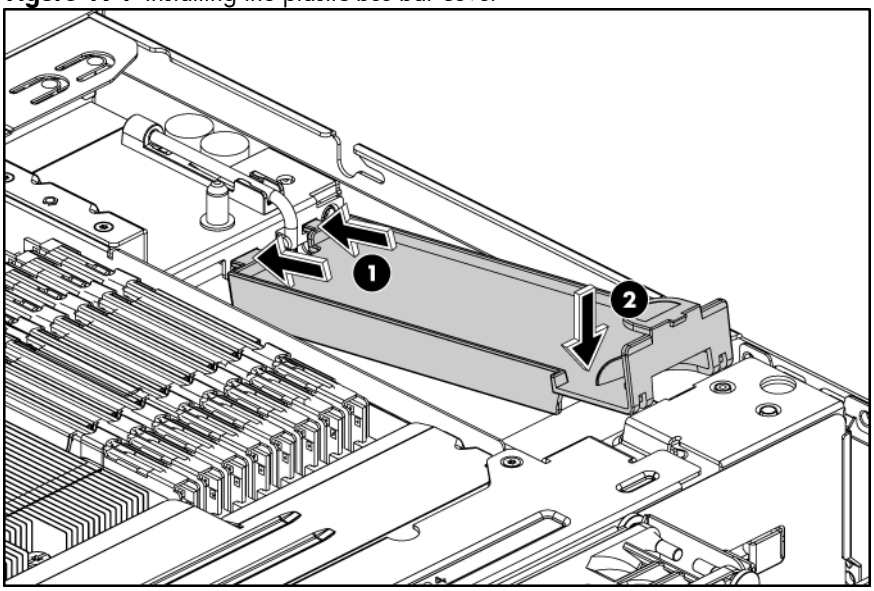
3. Align the hood bracket to the 3 screw holes on the system tray.
4. Install the 3 screws to secure the hood bracket to the system tray.

Figure 193 Installing the hood bracket



5. Install one end of the plastic bus bar cover to the 2 slots on the hood bracket.
6. Route down the other end, and press it below the semi-circle shaped part until the tab snaps into the slot on the midplane assembly.

Figure 194 Installing the plastic bus bar cover



7. Install the power supply units as shown in Figure 177 in the section of "To install the power supply".
8. Take the steps as described in the section of "Post-installation instructions" before restarting the system.

Midplane assembly

To remove the midplane assembly:

1. Remove the fan cage as shown in Figure 25.
2. Remove the bus bar links from the top midplane. For details, see the section of Power bus bar system.
3. Remove cables from the midplanes.
4. Remove the midplane assembly from the chassis as shown in Figure 185.
5. Remove the small C pair from the bottom midplane as shown in Figure 186.

To install the midplane:

1. Install the small C pair as shown in Figure 190.
2. Install the midplane assembly in the chassis as shown in Figure 191.
3. Install all removed cables to the midplanes.
4. Install the fan cage as shown in Figure 27.

Connectors, switches, and LEDs

This chapter contains illustrations and tables identifying and describing the connectors, switches, buttons, and LED indicators located on the front panel, rear panel, system board and hard drives of the HP ProLiant DL170e G6 server.

Connectors and components

Front panel components

The following figures use the 12-LFF-HDD configuration as example. Your server many look different in the hard drive configuration.

Figure 195 Front panel components / 4 node

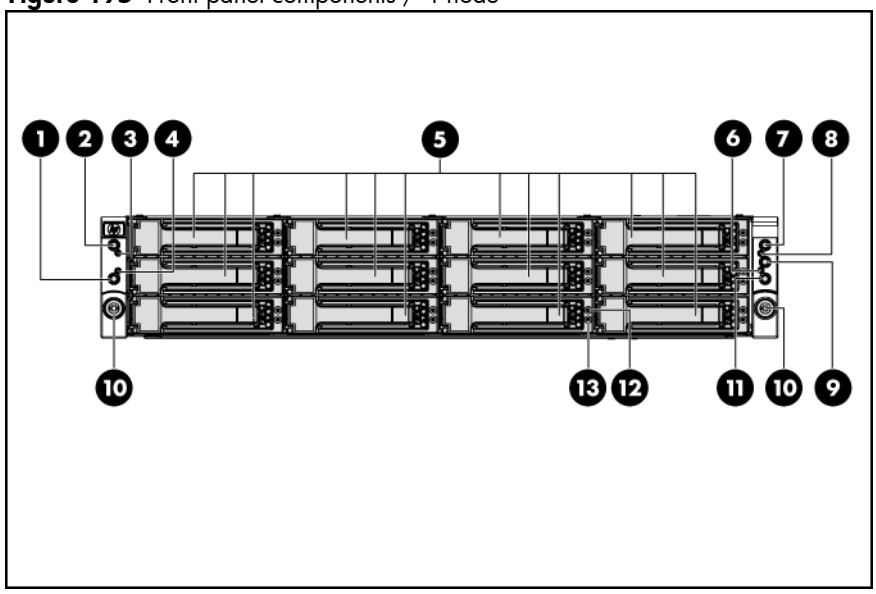
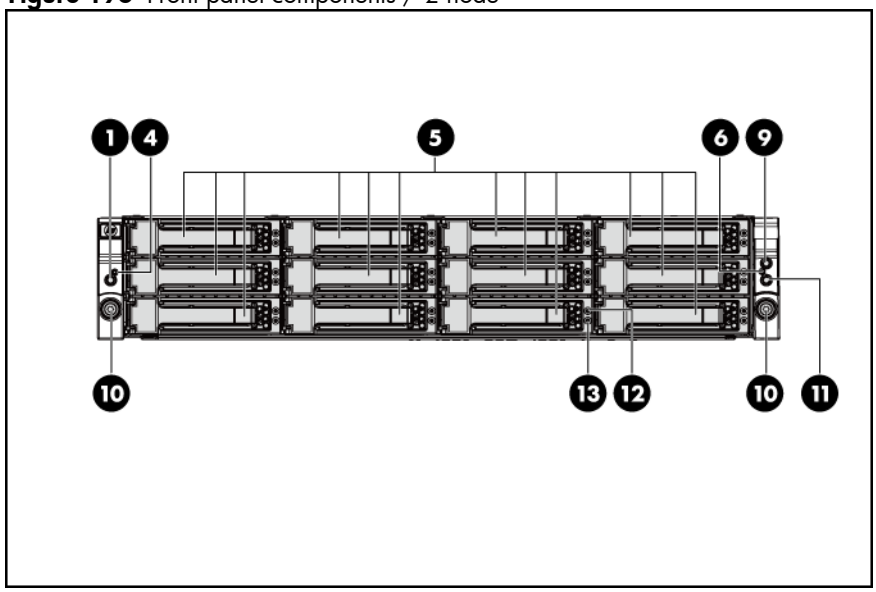


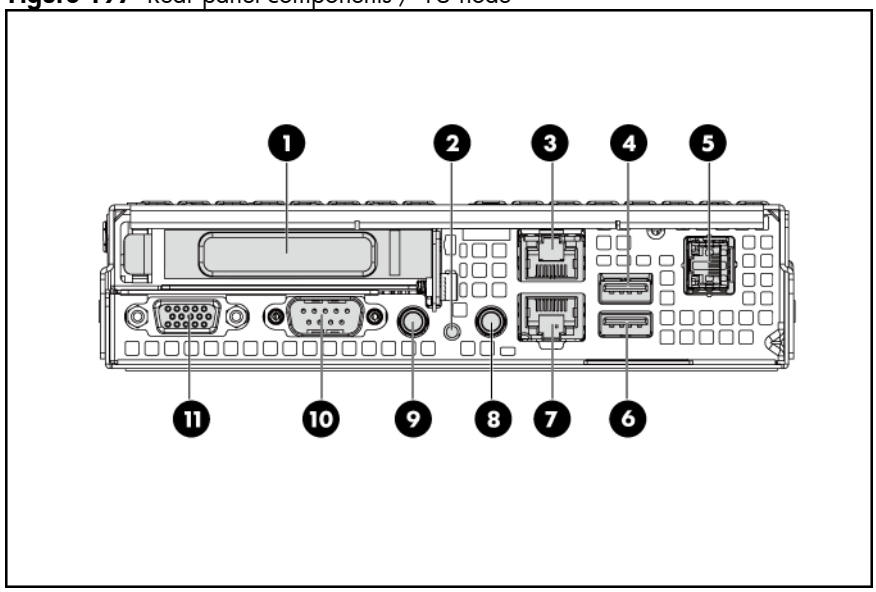
Figure 196 Front panel components / 2 node



Item	Description
1	Power button/LED for node 1
2	Power button/LED for node 2
3	Health LED for node 2
4	Health LED for node 1
5	Hard disk drive bays
6	Health LED for node 3
7	Power button/LED for node 4
8	Health LED for node 4
9	Chassis UID button/LED
10	Thumbscrews for the rack mounting
11	Power button/LED for node 3
12	Hard disk drive (HDD) fault/UID LED
13	Hard disk drive (HDD) online LED

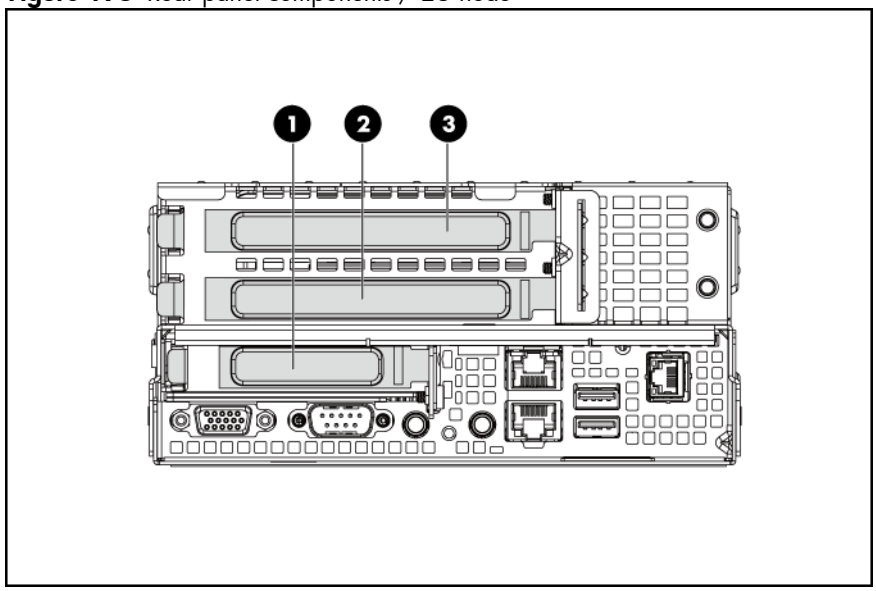
Rear panel components

Figure 197 Rear panel components / 1U node



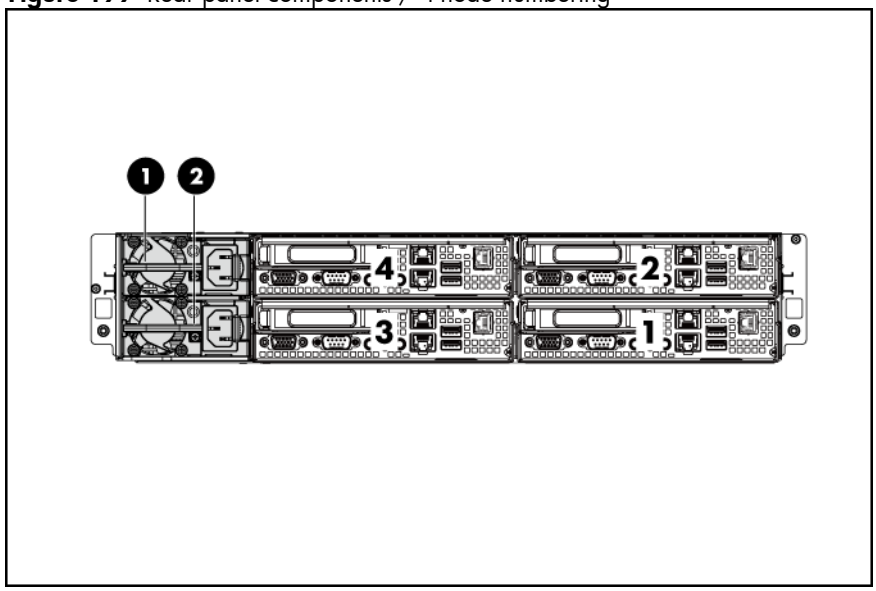
Item	Description
1	PCIe Gen2 low-profile expansion card slot
2	Server health LED
3	Shared 1GbE NIC2/Management Port (L0100i)
4	USB 2.0 port 1
5	Dedicated Management Port (L0100i) (Optional)
6	USB 2.0 port 0
7	1GbE NIC1 port
8	Server power button
9	Server UID LED button
10	Serial port
11	VGA port

Figure 198 Rear panel components / 2U node



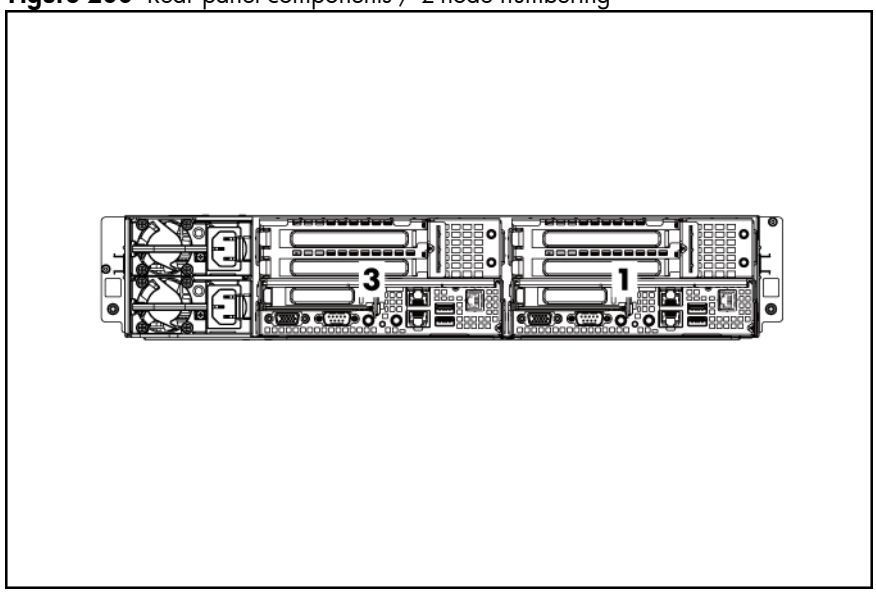
Item	Description
1	PCIe Gen2 low-profile expansion card slot
2	PCIe Gen2 full-height, half-length expansion card slot
3	PCIe Gen2 full-height, full-length expansion card slot

Figure 199 Rear panel components / 4-node numbering



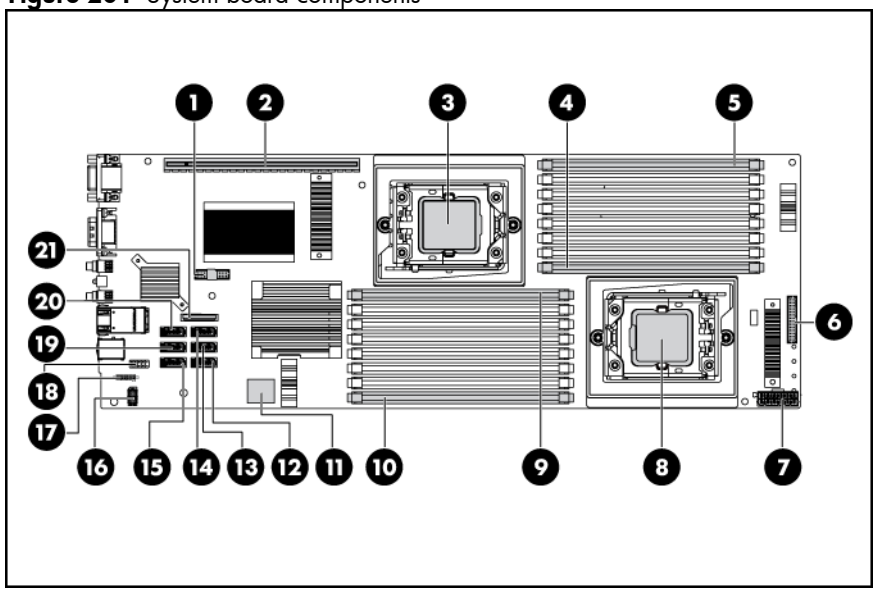
Item	Description
1	Power supply 2
2	Power supply 1

Figure 200 Rear panel components / 2-node numbering



System board components

Figure 201 System board components



Item	Designator	Description
1	J57	TPM connector (Optional)
2	J24	Riser connector
3	XU2	Processor 2
4	J8	Processor 2 DIMM slot 1F
5	J1	Processor 2 DIMM slot 8A
6	J42	RPS connector
7	J36	Power connector
8	XU1	Processor 1
9	J17	Processor 1 DIMM slot 1F
10	J10	Processor 1 DIMM slot 8A
11	J38	Internal USB 2.0 port
12	J32	SATA 0 connector
13	J9	SATA 1 connector
14	J18	SATA 2 connector
15	J19	SATA 3 connector
16	CR1~CR9	Diagnostic LEDs
17	J49	Dedicated Management Port (L0100i) (Optional)
18	J39	SGPIO connector

Item	Designator	Description
19	J22	SATA 4 connector
20	J25	SATA 5 connector
21	XBT1	Battery

CAUTION: The TPM is not a customer-removable part.

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 an HP authorized service provider for a replacement system board and TPM board.

Jumpers

Table 20 describes the jumper settings.

Table 20 System Configuration Switch Settings

Jumper	Description	Pin 1-2 (default)	Pin 2-3
J50	Password	Password Reset	
J45	Chassis ID	Default Setting	Clear CMOS

LED indicators

This section contains illustration and descriptions of internal and external status LED indicators located on the:

- Front panel
- Rear panel

These LED indicators aid in problem diagnosis by indicating the status of system components and operations of the server.

Front panel LED indicators

The front panel LED indicators allow constant monitoring of basic system functions while the server is operating.

Power, system heath and UID LED indicators

The power and system status of the server is indicated by the LEDs on the front panel.

NOTE: The following figures use the 12 LFF HDD drive configuration as examples. Your server might look different.

Figure 202 Power LED indicator location /4-node

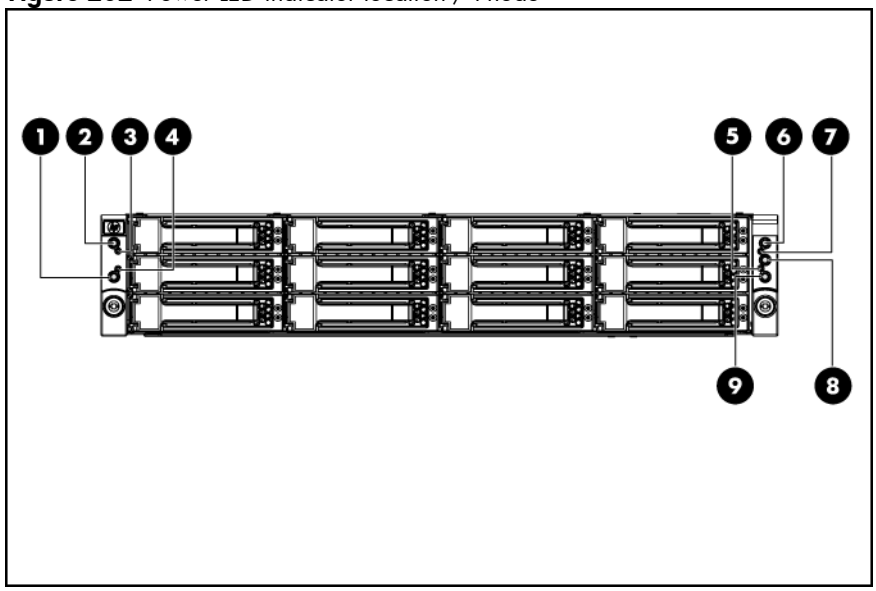


Figure 203 Power LED indicator location /2-node

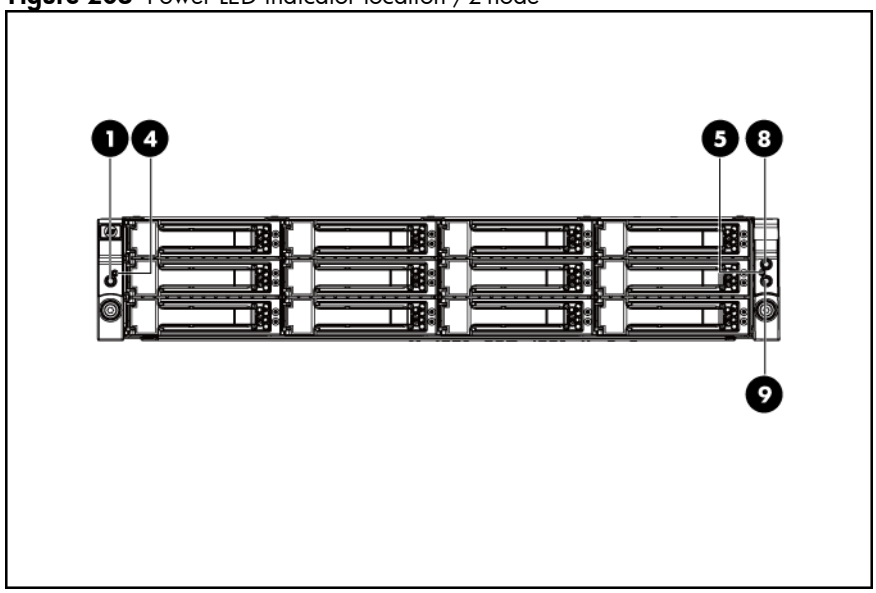


Table 21 Power/System Health LED Indicator Status

Item	LED indicator	Status	Description
1	Power LED indicator for node	Steady green	The system is on.
		Steady amber	The node is system off or in hibernation with A/C power.

Table 21 Power/System Health LED Indicator Status

Item	LED indicator	Status	Description
	1	Off	The node is system off without A/C power.
2	Power LED indicator for node 2	Steady green	The system is on.
		Steady amber	The node is system off or in hibernation with A/C power.
		Off	The node is system off without A/C power.
3	Health LED indicator for node 2	Flashing red	Critical event happens to the server. See SEL for details.
		Flashing amber	The system is in degraded status. See SEL for details.
		Steady green	The system is operating normally.
		Off	System is off and there is no failure prior to system power off.
4	Health LED indicator for node 1	Flashing red	Critical event happens to the server. See SEL for details.
		Flashing amber	The system is in degraded status. See SEL for details.
		Steady green	The system is operating normally.
		Off	System is off and there is no failure prior to system power off.
5	Health LED indicator for node 3	Flashing red	Critical event happens to the server. See SEL for details.
		Flashing amber	The system is in degraded status. See SEL for details.
		Steady green	The system is operating normally.
		Off	System is off and there is no failure prior to system power off.
6	Power LED indicator for node 4	Steady green	The system is on.
		Steady amber	The node is system off or in hibernation with A/C power.
		Off	The node is system off without A/C power.
7	Health LED indicator for node 4	Flashing red	Critical event happens to the server. See SEL for details.
		Flashing amber	The system is in degraded status. See SEL for details.
		Steady green	The system is operating normally.
		Off	System is off and there is no failure prior to system power off.
8	System UID LED indicator	Steady blue	Identification
		Flashing blue	The system is being remotely managed.
		Off	The system is off.
9	Power LED indicator for node 3	Steady green	The system is on.
		Steady amber	The node is system off or in hibernation with A/C power.
		Off	The node is system off without A/C power.

Hard drive activity LED indicator

The status of hard drives installed in the server is indicated by the hard drive activity LED indicators located on the HDD. The following figure uses the 12 LFF HDD and 4-node configuration as example.

Figure 204 Hard drive activity LED indicators

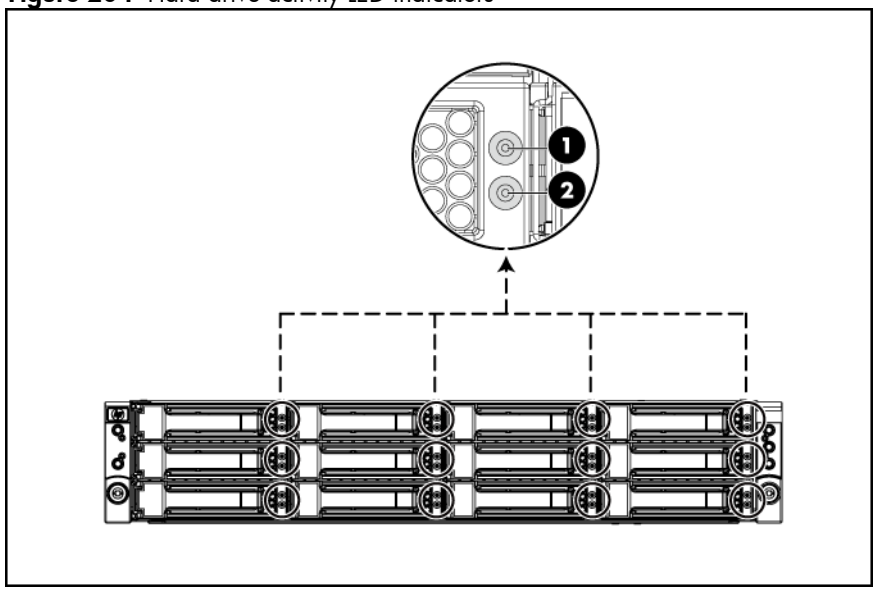


Table 22 Hard Drive LED Indicator Status

Item	LED indicator	Status	Description
1	Drive Online/Error LED indicator	Off	• The drive is not in a failed state. • The drive is not selected (unit identification).
		Solid blue	• The drive is not in a failed state. • The drive is selected (unit identification).
		Solid amber	• The drive is in a failed state. • The drive is not selected.
		Flashing amber @ 1 Hz 50% duty cycle	• The drive is in a predictive failure state. • The drive is not in a failed state. • The drive is not selected.
		Flashing amber/blue @ 1 Hz 50% duty cycle	• The drive is in a failed or predictive failure state. • The drive is selected.
2	Drive activity LED indicator	Forced off (override drive activity output)	• The drive is not a member of any RAID volumes; or the drive is configured but is in a replacement or failed state for at least one volume that it is a member of; or the drive is a spare drive that is inactive or has been activated but has not been rebuilt. • The drive is not rebuilding. • The drive is not a member of a volume undergoing capacity expansion or RAID migration.

Table 22 Hard Drive LED Indicator Status

Item	LED indicator	Status	Description
		Solid green	• The drive is a member of a RAID volume. • The drive is not an inactive spare drive. • The drive is not in a replacement or failed state for any volumes that it is a member of. • The drive is not currently performing any I/O activity.
		Flashing green during a drive activity (if command is outstanding continually the indicator is forced to flash at 4 Hz 50% duty cycle instead of solid off)	• The drive is currently performing an I/O activity. • The drive is a member of a RAID volume. • The drive is not in a replacement or failed state for any volumes that it is a member of (drive is online). • The drive is not rebuilding. • The drive is not a member of a volume undergoing capacity expansion or RAID migration.
		Flashing green @ 1 Hz 50% duty cycle (override drive activity output)	• The drive is rebuilding. • The drive is a member of a volume undergoing capacity expansion or RAID migration.

Rear panel LED indicators

The LAN port on the rear panel has two LED indicators that allow monitoring of network activity.

Figure 205 LAN LED indicator location

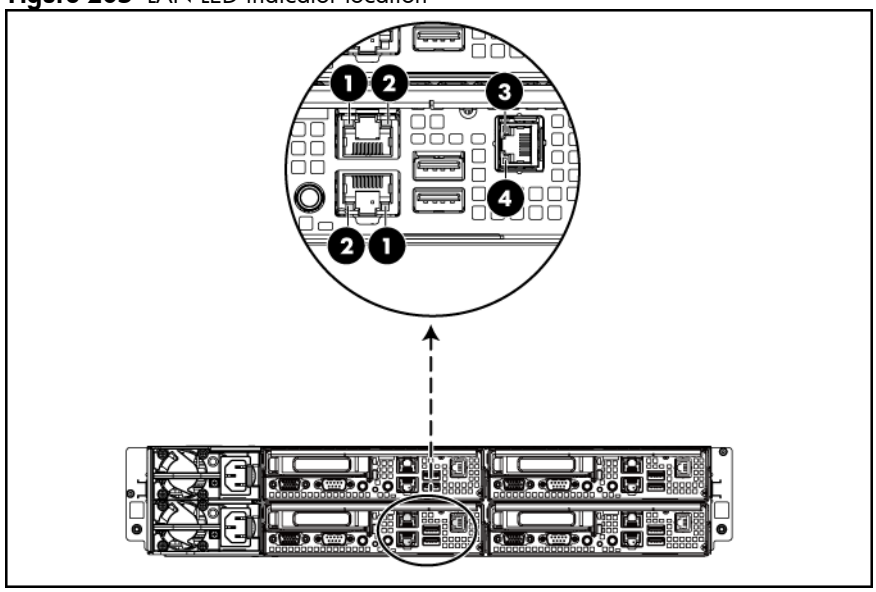


Table 23 LAN LED Indicator Status

Item	Component		Status	Description
1	LAN network speed LED indicator	10/100 speed	Steady green	The LAN connection is using 100Mbps link.
			Off	The LAN connection is using 10Mbps link.
		GbE speed	Steady amber	The LAN connection is using 1Gbps link.
			Flashing amber	The LAN connection is using 1Gbps link for port identification.
			Steady green	The LAN connection is using 100Mbps link.
			Flashing green	The LAN connection is using 10Mbps/100 Mbps link for port identification.
			Off	The LAN connection is using 10Mbps link.
2	LAN activity status LED indicator		Steady green	The LAN connection is normal and no access is going on.
			Flashing green	Ongoing network data activity.
			Off	No network data activity or no connection.
3	Management port link LED indicator (option)		Steady green	Linking at 100 Mbps speed.
			Off	No connection or linking at 10 Mbps speed.
4	Management port activity LED indicator (option)		Flashing amber	LAN is active.

Diagnostic tools and setup utilities

The server uses BIOS to boot up the system. BIOS software is a ROM-based firmware that allows reliability, manageability, and connectivity for server platforms. This software contains a set of programs permanently stored in an EEPROM chipset located on the system board. These programs assist in managing, initializing, and testing the hardware devices installed on the computer.

For detailed descriptions and instructions about the BIOS setup utility, see the relevant sections in HP ProLiant DL170e G6 Server Software Configuration Guide on the HP website (**http://www.hp.com/**).

Physical and operating specifications

This chapter provides physical and operating specifications for the HP ProLiant DL170e G6 server. Specifications include:

System unit

Table 24 Hardware Specifications

Item	Components
Processor socket	Intel 1366 FCLGA
Processor	Intel Nehalem Series processors, 60W, 80W and 95W
Chipset	Intel® Tylersburg 36D/Intel® 82801JIR (ICH10R)
Hardware monitoring device	IPMI 2.0 compliant with Server Engine Pilot II
Gigabit Ethernet controller	Intel 82576
Memory controller	Intel®Tylersburg36D
SATA and IDE controllers	Intel ICH10R
Embedded video controller	ServerEngines VGA core integrated into Pilot II
I/O subsystem	PCIE x24 links slot. For • x16 1U riser • x16, x4, x4 2U riser • x8, x8, x8 2U riser • x16, x8 2U riser
Memory	Six REG DDR3 800/1066/1333 MHz DIMM slots with ECC, Support RDIMM and UDIMM
Default media storage	SAS/SATA hard drive
Optional media storage	• 8 bays hot-plug LFF HDD cage for SAS or SATA drives. • 12 bays hot-plug LFF HDD cage for SAS or SATA drives. • 16 bays hot-plug SFF HDD cage for SAS or SATA drives. • 24 bays hot-plug SFF HDD cage for SAS or SATA drives.
I/O ports	USB 2.0 ports (two rear-mounted ports one internal connector on the system board), video port, serial port, two GbE port, power on/off button

Table 24 Hardware Specifications

Item	Components
Status LED indicators Front panel	• Power/system health status • UID status
Rear panel	• NIC activity • LAN activity • LAN link status • Power/system health status • UID status
System board	• Auxiliary power indicators
Power supply unit (PSU)	1200 W redundant, power supply
Thermal solution	Four system fans

Table 25 Physical Dimensions

Item	Description
System board platform	ATX (Advanced Technology Extended)
System board dimension	17.935x6.5 in.
Server dimensions (H x W x D) (with bezel)	3.44 x 17.64 x 28.91 in. (8.74 x 44.81 x 73.43 cm)
Server weight (approximate)	Maximum (all hard drives, power supplies, and processors installed) 82.00 lb (37.19 kg) Minimum (one hard drive, power supply, and processor installed) 40.00 lb (18.14 kg)

Table 26 Environmental Specifications

Item	Description
Thermal output (maximum operating)	392 W/hr
System inlet temperature Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
System inlet temperature Non-operating	40° to 140° F (-40° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
Relative humidity (non-condensing) Operating	10% to 85% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.

Table 26 Environmental Specifications

Item	Description
Relative humidity (non-condensing) Non-operating	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
Altitude Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
Altitude Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
Acoustic noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). Idle LWAd 7.7 LpAm 52.36dBA Operating LWAd 7.7 LpAm 52.60dBA
Emissions classification (EMC) FCC rating Normative standards	Class A CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

Table 27 Hot-Plug Power Supply Specifications

Item	Description
Dimensions (H x W x D)	38.5 mm x 86.4 mm x 190.5 mm (1.5 in. x 3.4 in. x 7.5 in.)
Weight (approximate)	1.1 kg
Input requirements: Rated line voltage (per power supply)	90 to 140 VAC 180 to 264 VAC
Rated input frequency	47 to 63 Hz
Rated input current	7.31 A at 115 VAC 3.6 A at 230 VAC
BTU rating	N/A
Rated input power	855 W (at 100 VAC) 840.72 W (at 200 VAC)
Operational Input Voltage Range (Vrms)	90 VAC to 264 VAC full range

NOTE: Power Specifications: To review typical system power ratings use the Power Advisor tool which is available for download at the following URL: http://www.hp.com/go/hppoweradvisor

Index