HP ProLiant DL580 Generation 4 Server Maintenance and Service Guide

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Audience assumptions

This guide is for an experienced service technician. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

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, refer to 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.nl/services/servicepartners).

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.

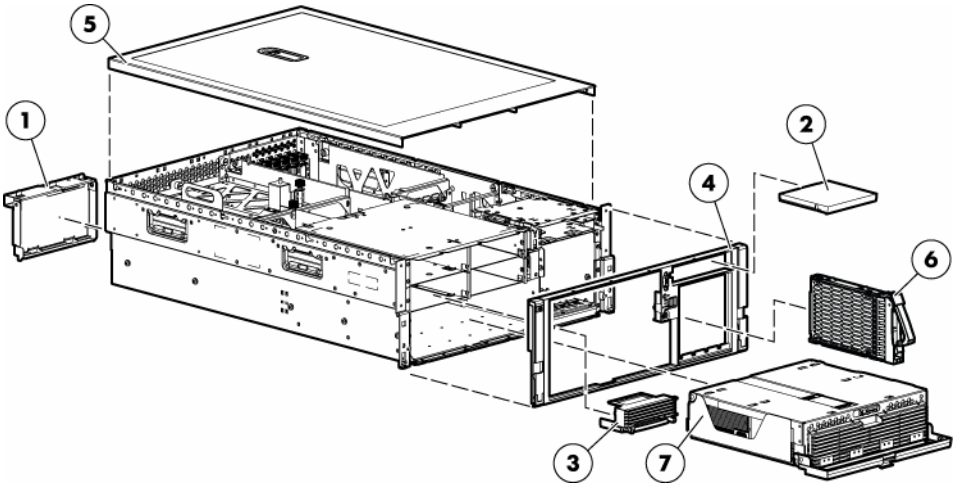
부품 제공 보증 서비스

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



Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
—	Blank kit, ProLiant DL580 G3/G4 Server *	—	385642-001	Mandatory[1]
1	a) Blank, power supply	366450-002	—	Mandatory[1]
2	b) Blank, CD/DVD/diskette	377569-001	—	Mandatory[1]
3	c) Blank, memory board	374278-001	—	Mandatory[1]
4	Bezel, ProLiant DL580 G4 Server	404860-001	411788-001	Mandatory[1]
5	Cover, top, ProLiant DL580 G3/G4 Server	367572-001	376480-001	Mandatory[1]
6	Blank, SAS/SATA hard drive	376383-001	392613-001	Mandatory[1]
7	Processor module assembly	012822-001	410187-001	Optional[2]
—	Plastics kit, ProLiant DL580 G3/G4 Server *	—	376479-001	Mandatory[1]
8	a) Guide, PCA, short (2) *	367597-001	—	Mandatory[1]
9	b) Guide, PCA, tall (2) *	367939-001	—	Mandatory[1]
10	c) Latch, PCI, carbon (2) *	228194-001	—	Mandatory[1]
11	d) Latch, PCI, blue (2) *	228194-002	—	Mandatory[1]
12	e) Retainer, card guide, carbon (2) *	379046-001	—	Mandatory[1]
13	f) Retainer, card guide, blue (2) *	379046-002	—	Mandatory[1]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
14	Return kit, ProLiant DL580 G3/G4 Server *	—	378336-001	Mandatory[1]
15	Tool, Torx, T-15 *	107473-001	199630-001	Mandatory[1]

*Not shown
[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.

[1]Mandatory：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。

[2]Optional：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、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。

[3]No：除外 - 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。

[1]Mandatory: 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。

[2]Optional: 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。

[3]No: 否 — 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”。

[1]Mandatory: 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。

[2]Optional: 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。

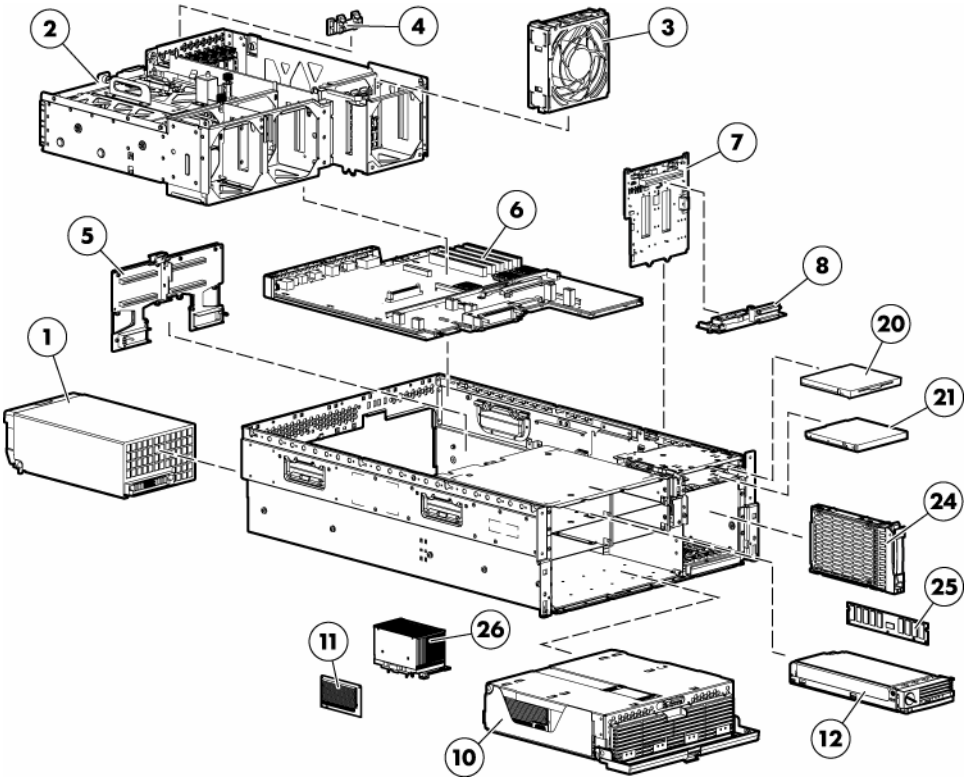
[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 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.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

System components



Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
	System components			
1	Power supply, 910–1300 W	337867-501	406421-001	Mandatory[1]
2	System cage	—	—	No[3]
3	Fan, 120 mm, hot-plug	364517-001	374552-001	Mandatory[1]
	Boards			
4	PCI-X Hot Plug switch board	011077-501	411796-001	Optional[2]
5	Memory backplane, ProLiant DL580 G4 server	012828-001	410189-001	Optional[2]
6	System board, ProLiant DL580 G4 server	012819-001	410186-001	No[3]
7	Media pass-through board	012831-001	410190-001	No[3]
8	Media board (CD/DVD/diskette)	012964-001	411790-001	Optional[2]
9	Power backplane, ProLiant DL580 G4 server *	012110-501	411795-001	Optional[2]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
10	Processor module assembly, ProLiant DL580 G4 server	012822-001	410187-001	Optional[2]
11	PPM, 800 FSB	399859-001	404182-001	Mandatory[1]
12	Memory board, ProLiant DL580 G4 server	012825-001	410188-001	Optional[2]
	SAS parts			
13	Smart Array i400 controller *	012760-002	405832-001	Optional[2]
14	Smart Array cache module, 512 MB *	012764-003	405835-001	Optional[2]
15	Smart Array cache module, 256 MB *	012764-004	405836-001	Optional[2]
16	Smart Array BBWC battery pack *	381573-001	398648-001	Optional[2]
17	Cable, BBWC battery pack to cache module, 24 in *	408658-002	409125-001	Mandatory[1]
18	SAS backplane kit, ProLiant DL580 G4 server *	—	411794-001	Optional[2]
—	SAS backplane board *	012564-501	—	Optional[2]
19	Cable, SAS data *	361316-002	389948-001	Optional[2]
	Media devices			
20	Diskette drive, 3.5 in (optional)	263394-002	399396-001	Mandatory[1]
21	DVD/CD-RW drive	383696-002	399959-001	Mandatory[1]
22	DVD drive, 8/24x (optional) *	395910-001	397928-001	Mandatory[1]
23	DVD+RW drive, 8x (optional) *	395911-001	399402-001	Mandatory[1]
	Hard drives			
24	SAS/SATA Ultra320 Universal Hot-plug Hard Drive	—	—	—
—	72-GB SAS drive, 10,000 rpm (optional) *	375863-004	376597-001	Mandatory[1]
—	36-GB SAS drive, 10,000 rpm (optional) *	375863-001	376596-001	Mandatory[1]
—	60-GB SATA drive, 5,400 rpm (optional) *	390158-002	405419-001	Mandatory[1]
	Memory			

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
25	DIMM, PC2-3200, DDR2	—	—	—
—	512 MB (optional) *	345112-851	413384-001	Mandatory[1]
—	1 GB *	345113-851	413385-001	Mandatory[1]
—	2 GB single rank (optional) *	345114-861	413386-001	Mandatory[1]
—	2 GB dual rank (optional) *	345114-851	413387-001	Mandatory[1]
—	4 GB (optional) *	345115-861	413388-001	Mandatory[1]
	Processor assemblies			
26	Processor assemblies	—	—	—
—	Intel® Xeon™ 3.4-GHz 16M 800-MHz dual-core *	433011-001	433598-001	Optional[2]
—	Intel® Xeon™ 3.2-GHz 8M 800-MHz dual-core*	433012-001	433597-001	Optional[2]
—	Intel® Xeon™ 3.0-GHz 4M 800-MHz dual-core*	433014-001	433596-001	Optional[2]
—	Intel® Xeon™ 2.6-GHz 2M 800-MHz dual-core *	433014-002	433595-001	Optional[2]
—	Intel® Xeon™ 2.83-GHz 2x1M dual-core *	399758-001	403932-001	Optional[2]
—	Intel® Xeon™ 3.00-GHz 2x2M dual-core *	399760-001	403933-001	Optional[2]
27	Processor blanks (two) *	392523-001	406056-001	Mandatory[1]
	Cables			
28	Cable kit, data, ProLiant DL580 G4 server *	—	411789-001	Optional[2]
—	Cable assembly, USB (dual) *	404807-001	—	Optional[2]
—	Cable assembly, video *	392250-002	—	Optional[2]
—	Cable assembly, power (8-pin) *	379196-001	—	Optional[2]
—	Cable assembly, power switch *	367602-001	—	Optional[2]
29	Cable kit *	—	376478-001	Optional[2]
—	Cable assembly, PCI-X Hot Plug *	224999-003	—	Optional[2]
—	Cable assembly, power switch *	367602-001	—	Optional[2]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
	Options			
30	PCI Express x4 mezzanine board *	012450-501	411792-001	Mandatory[1]
31	PCI Express x8 mezzanine board *	012743-501	411793-001	Mandatory[1]
32	PCI-X Hot Plug mezzanine board *	012447-501	411791-001	Mandatory[1]
33	PCI-X Hot Plug basket assembly *	375192-001	393784-001	Mandatory[1]
34	PCI-X Hot Plug switch board *	011077-501	411796-001	Optional[2]
35	x4–x8 PCI Express Bus Expander board *	012772-001	411009-001	Mandatory[1]
	Miscellaneous			
36	Battery, 3V, Lithium *	166899-001	153099-001	Mandatory[1]
37	Power cord, AC line, C14–C19, 6 ft *	287485-002	391097-001	Mandatory[1]
38	Power cord, AC line, 5–15P (optional) *	178968-001	237457-001	Mandatory[1]
39	Rack mount kit, universal *	374503-001	377839-001	Mandatory[1]

*Not shown
[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.

[1]Mandatory：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。

[2]Optional：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、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。

[3]No：除外 - 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。

[1]Mandatory: 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。

[2]Optional: 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。

[3]No: 否 — 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”。

[1]Mandatory: 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。

[2]Optional: 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。

[3]No: 否 — 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」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 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.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

Removal and replacement procedures

Required tools

You need the following items for some procedures:

- Torx T-15 screwdriver (provided with the server ("Rear panel components" on page 82))
- Phillips screwdriver
- Flathead screwdriver
- Diagnostics Utility

Safety considerations

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

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

To prevent electrostatic damage:

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

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 access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Preparation procedures

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

- Extend the server from the rack ("Extending the server from the rack" on page 27).

  If you are performing service procedures in an HP, Compaq branded, telco, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.

  For more information about telco rack solutions, refer to the RackSolutions.com website (http://www.racksolutions.com/hp).
- Power down the server (on page 29).

  If you must remove a server from a rack or a non-hot-plug component from a server, power down the server.
- Remove the server from the rack (on page 29).

  If the rack environment, cabling configuration, or the server location in the rack makes it difficult to service the unit, remove the server from the rack.
- Remove the access panel ("Removing the access panel" on page 29).

  If you are servicing internal components, remove the access panel.
- Remove the system cage ("Removing the system cage" on page 31).

  If you must remove the system board, power backplane, or the BBWC, remove the system cage.

Extending the server from the rack

The design of the server enables you to access several components through the front of the server. Installing or accessing the following components will not require extending the server from the rack:

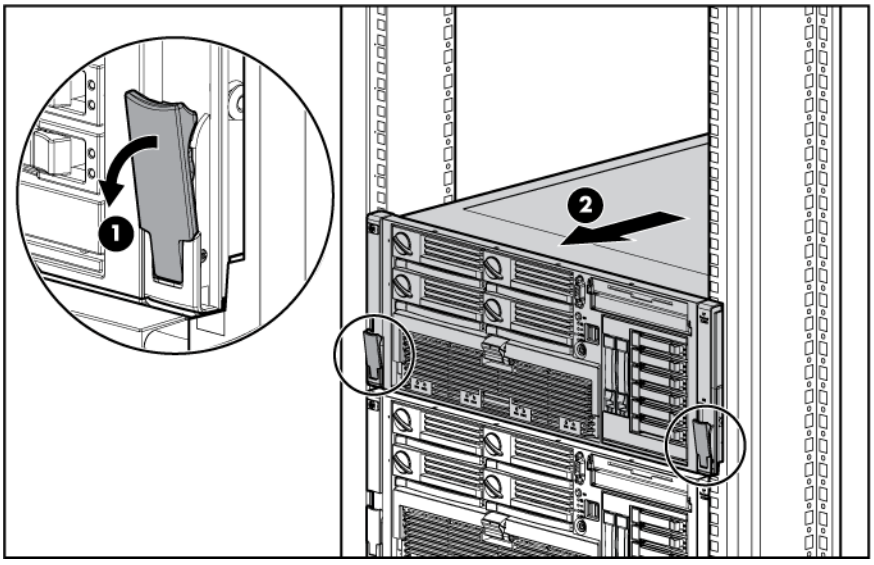
- Processors

- PPMs
- Memory boards
- DIMMs
- DVD drive
- Diskette drive
- Hard drives

To extend the server from the rack:

1. Release the two levers on the lower outside corners of the rack.
2. If the server is in a rack and in the shipping configuration, remove the two shipping screws directly behind the levers.
3. Extend the server on the rack rails until the server rail-release latches engage.

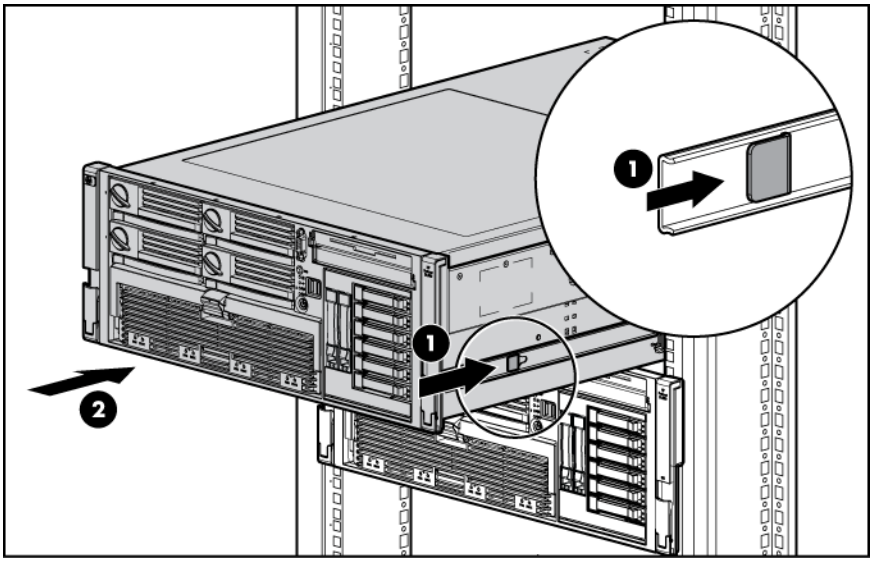
NOTE: The release latches will lock into place when the rails are fully extended.



WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.

WARNING: To reduce the risk of personal injury, be careful when pressing the server rail-release latches and sliding the server into the rack. The sliding rails could pinch your fingers.

4. After performing the installation or maintenance procedure, slide the server back into the rack by pressing the server rail-release latches.



Power down the server

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

IMPORTANT: If installing a hot-plug device, it is not necessary to power down the server.

1. Shut down the OS as directed by the OS documentation.
2. Press the Power On/Standby button to place the server in standby mode. When the server enters standby power mode, the system power LED changes to amber.
3. Disconnect the power cords.

The system is now without power.

Remove the server from the rack

To remove the server from an HP, Compaq branded, telco, or third-party rack:

1. Power down the server (on page 29).
2. Extend the server from the rack ("Extending the server from the rack" on page 27).
3. Disconnect the cabling and remove the server from the rack. For more information, refer to the documentation that ships with the rack mounting option.
4. Place the server on a sturdy, level surface.

Removing the access panel

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

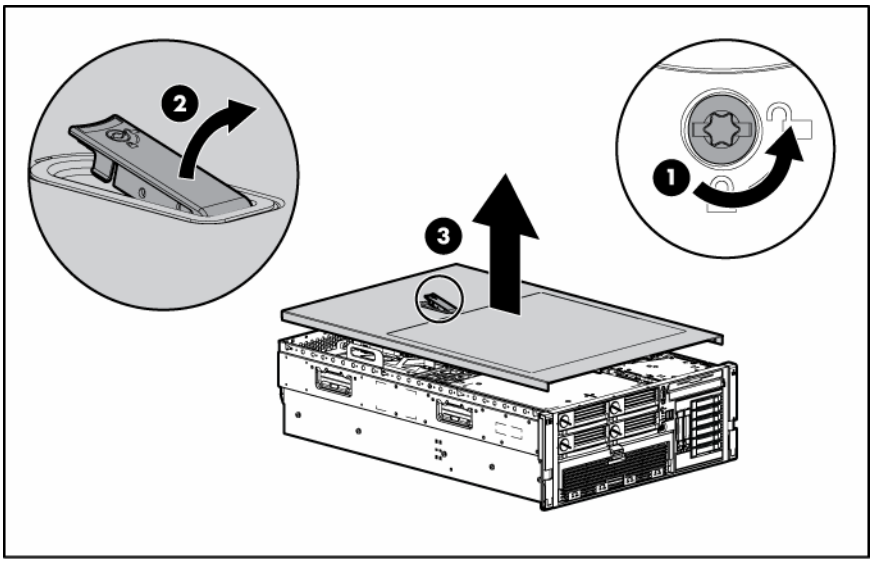
CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

IMPORTANT: When removing the access panel to view the Systems Insight Display LEDs (on page 87), leave the server powered on. The Systems Insight Display LEDs are cleared when the server is powered off.

1. Extend the server from the rack, if applicable ("Extending the server from the rack" on page 27).
2. If the locking latch is locked, use a T-15 Torx screwdriver to unlock the latch.

   NOTE: The T-15 Torx screwdriver is shipped with the server and can be located on the rear panel ("Rear panel components" on page 82).

3. Lift up on the hood latch, and remove the access panel.



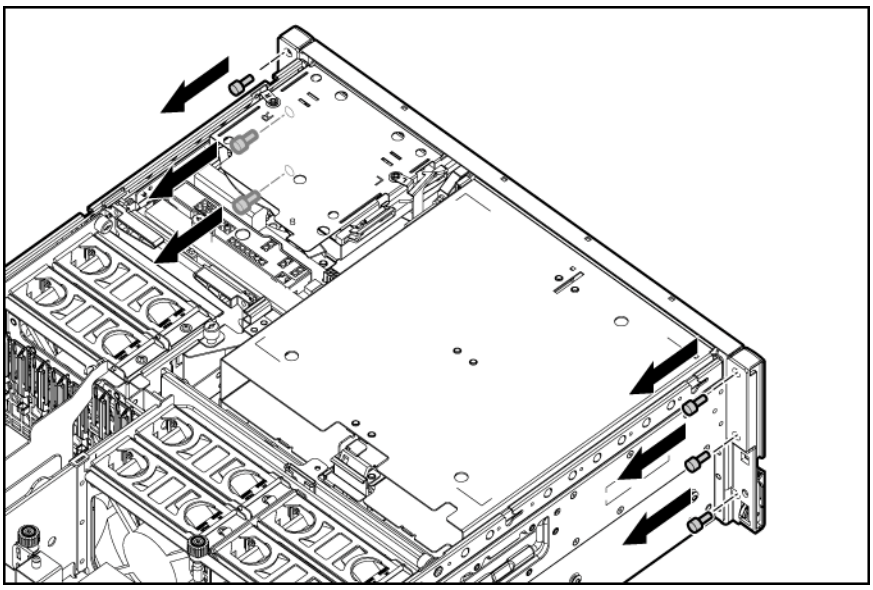
4. After installing hardware options, replace the access panel. Be sure that the panel is securely locked into place before powering up the server.

Removing the front bezel

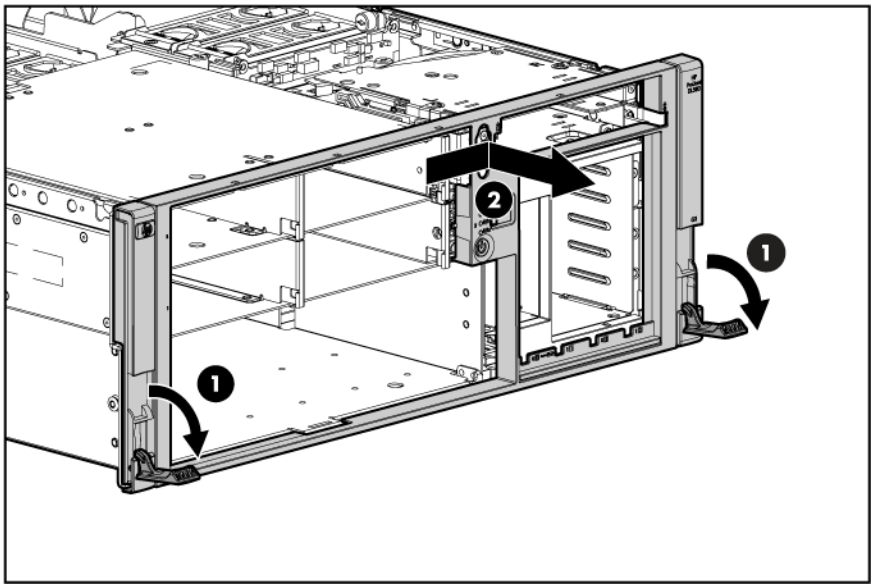
1. Power down the server (on page 29).
2. Extend the server from the rack ("Extending the server from the rack" on page 27).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all memory boards ("Removing a memory board" on page 67, "Removing a memory board (non-hot-plug)" on page 65) and memory board blanks.
5. Remove the processor module ("Removing the processor module" on page 33).
6. Remove all hard drives ("Removing a hot-plug SAS hard drive" on page 54) and hard drive blanks ("Removing a hard drive blank" on page 54).
7. Remove the front bezel ("Removing the front bezel" on page 30).

8. Remove all media drives and media drive blanks ("Removing a diskette, DVD, CD-RW drive or blank" on page 32).
9. Remove the front panel video connector cable.
10. Using the T-15 Torx screwdriver, remove the three screws on each side of the front bezel.

NOTE: The T-15 Torx screwdriver is shipped with the server and can be located on the rear panel ("Rear panel components" on page 82).



11. While holding down the rack locking levers, slide the bezel to the right, and detach the bezel from the server.



To replace the component, reverse the removal procedure.

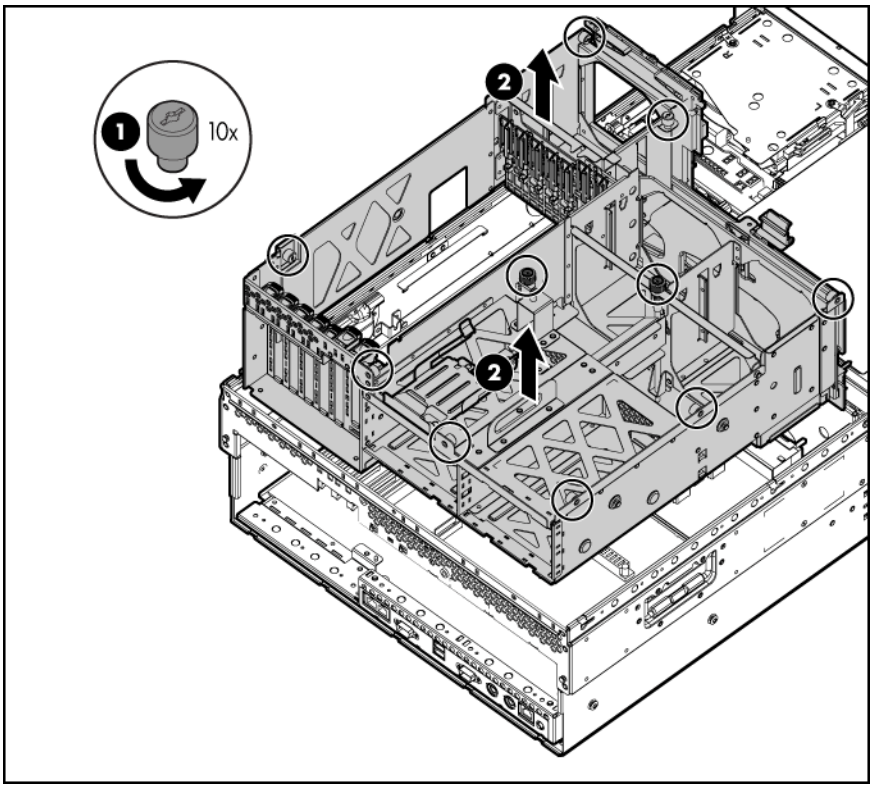
Removing the system cage

Installing or accessing some options in the server might require removing the system cage. See the instructions for each individual option to determine if removing the system cage is necessary.

To remove the system cage:

1. Power down the server (on page 29).
2. Extend the server from the rack, if applicable ("Extending the server from the rack" on page 27).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all hot-plug power supplies ("Removing a redundant hot-plug power supply" on page 56).
5. Remove all system fans ("Replacing hot-plug fans" on page 57).
6. Remove all expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42).
7. Remove the expansion slot cover ("Removing the expansion slot cover" on page 40).
8. Remove the PCI-X Hot Plug basket ("Removing the PCI-X Hot Plug basket" on page 41), if installed.
9. Remove the PCI-X Hot Plug mezzanine ("Removing the PCI-X Hot Plug mezzanine option" on page 43) or the PCI Express mezzanine ("Removing the PCI Express mezzanine option" on page 43), if applicable.
10. Loosen the thumbscrews, and lift the system cage from the server.

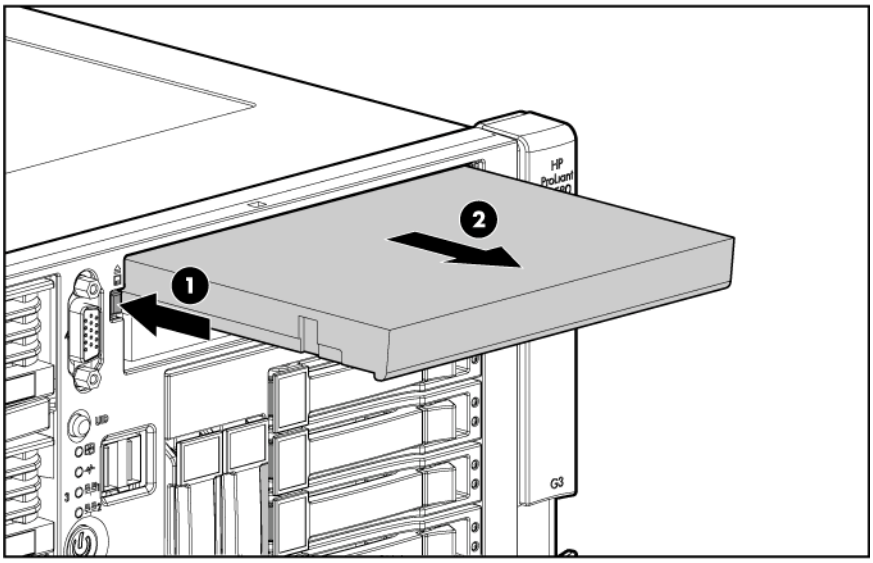
NOTE: The T-15 Torx screwdriver can be used to loosen the thumbscrews. The T-15 Torx screwdriver is shipped with the server and can be located on the rear panel ("Rear panel components" on page 82).



Removing a diskette, DVD, CD-RW drive or blank

1. Power down the server (on page 29).
2. Use the T-15 Torx screwdriver to eject the drive, and pull the drive out of the server.

NOTE: The T-15 Torx screwdriver is shipped with the server and can be located on the rear panel ("Rear panel components" on page 82).



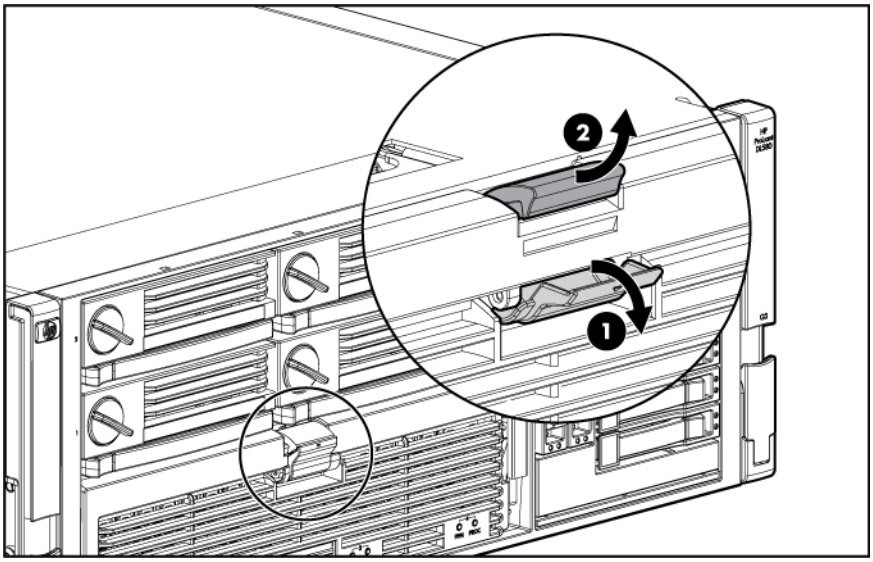
To replace the component, reverse the removal procedure.

Removing the processor module

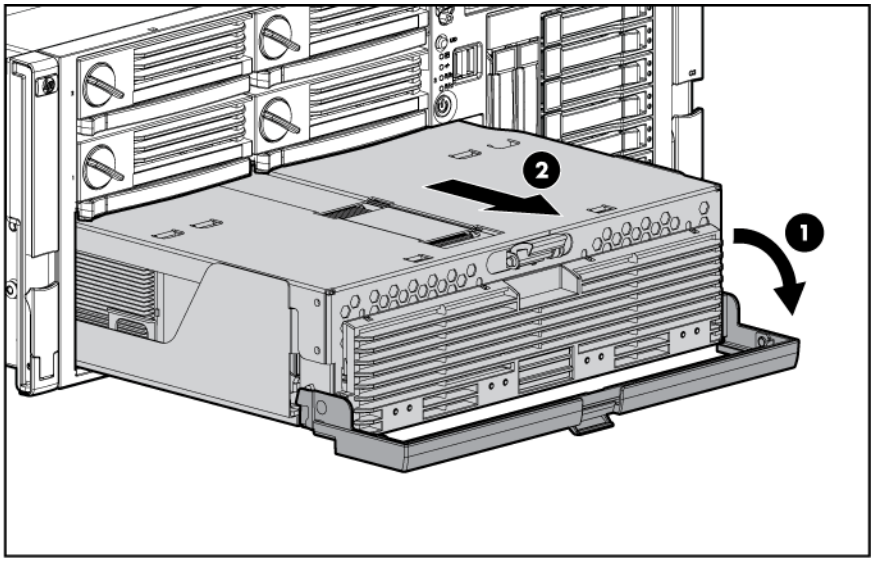
NOTE: Refer the section "Processor module LEDs (on page 81)" for information on the current processor and PPM status.

To remove the processor module:

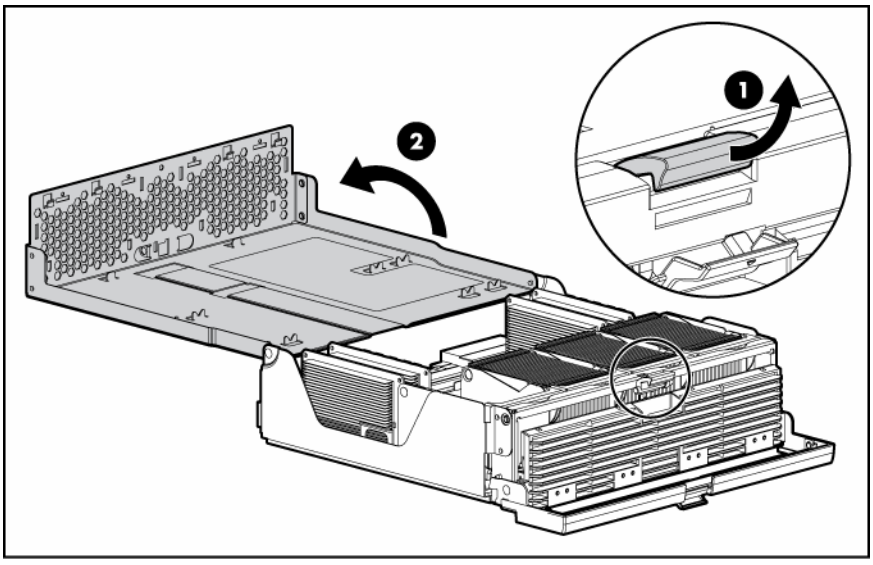
1. Power down the server (on page 29).
2. Release the latches to unlock the processor module.



3. Lower the processor module lever, and pull the module out of the server.



4. Release the latch, and open the cover to expose the processors.



To replace the component, reverse the removal procedure.

Removing a processor or processor blank

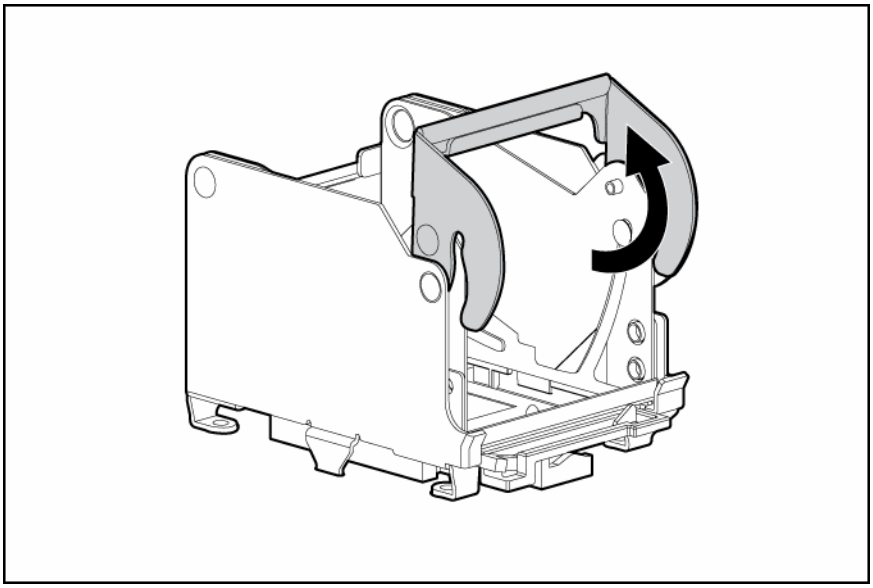
△ **CAUTION:** To prevent thermal instability and damage to the server, do not separate the processor from the heatsink. The processor, heatsink, and retaining clip make up a single assembly.

△ **CAUTION:** To prevent possible server malfunction and damage to the equipment, do not mix single- and dual-core processors or processors with different speeds or cache sizes.

△ **CAUTION:** To prevent thermal damage, do not operate a server with dual-core processors installed unless all processor sockets have either a processor or processor blank installed.

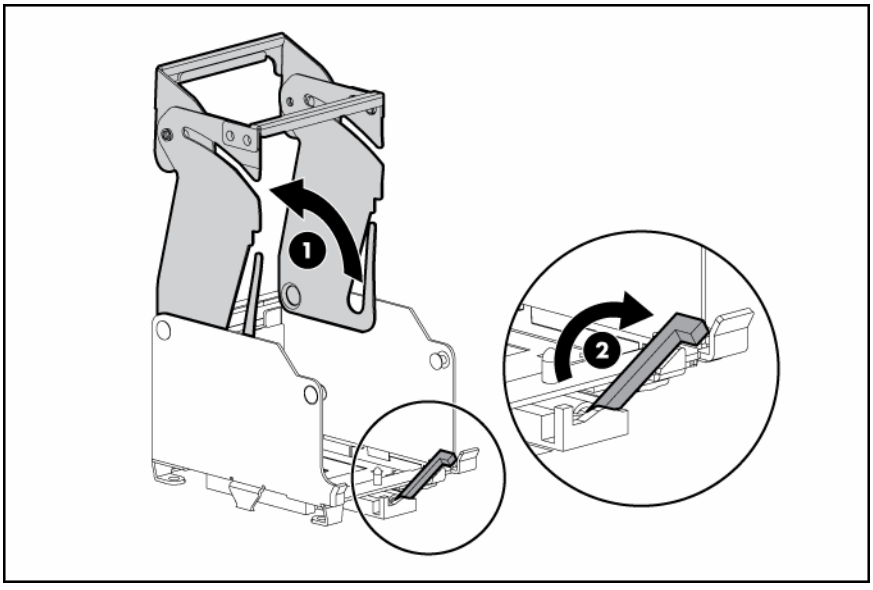
To remove a processor or processor blank:

1. Power down the server (on page 29).
2. Remove the processor module ("Removing the processor module" on page 33).
3. Unlock the processor retaining bracket.



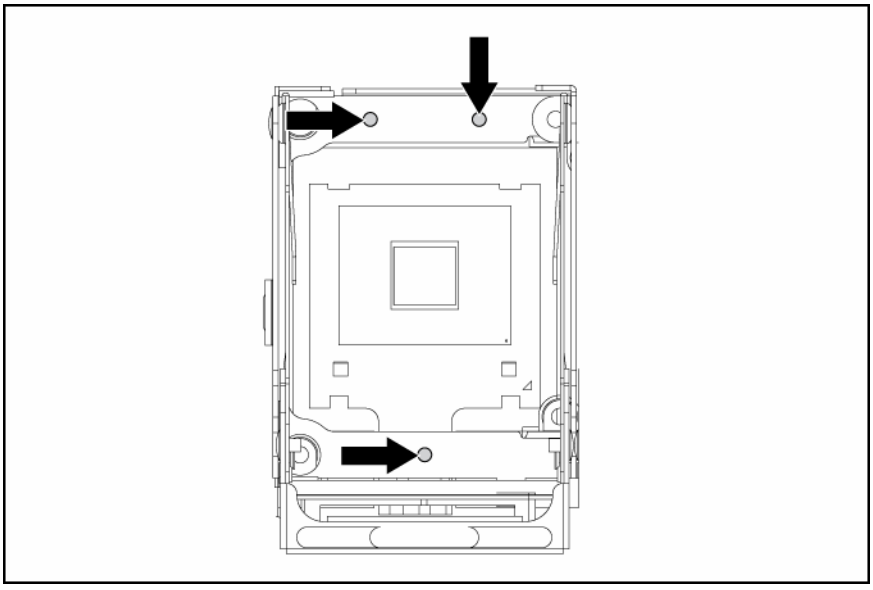
4. Open the processor retaining bracket, and open the processor locking lever.

> **CAUTION:** Failure to completely open the processor locking lever prevents the processor from seating during installation, leading to hardware damage.



5. Remove the processor or processor blank.

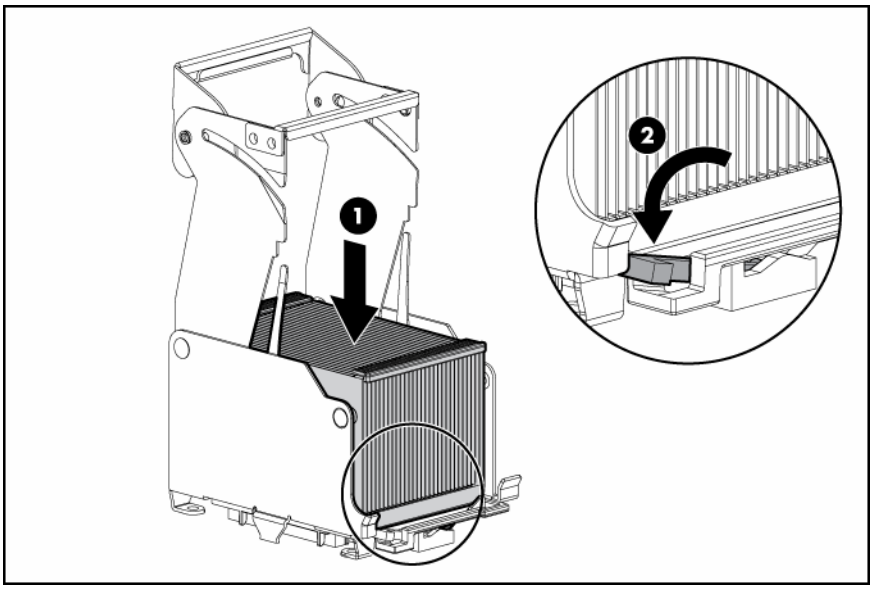
6. Install the replacement processor assembly, if applicable.



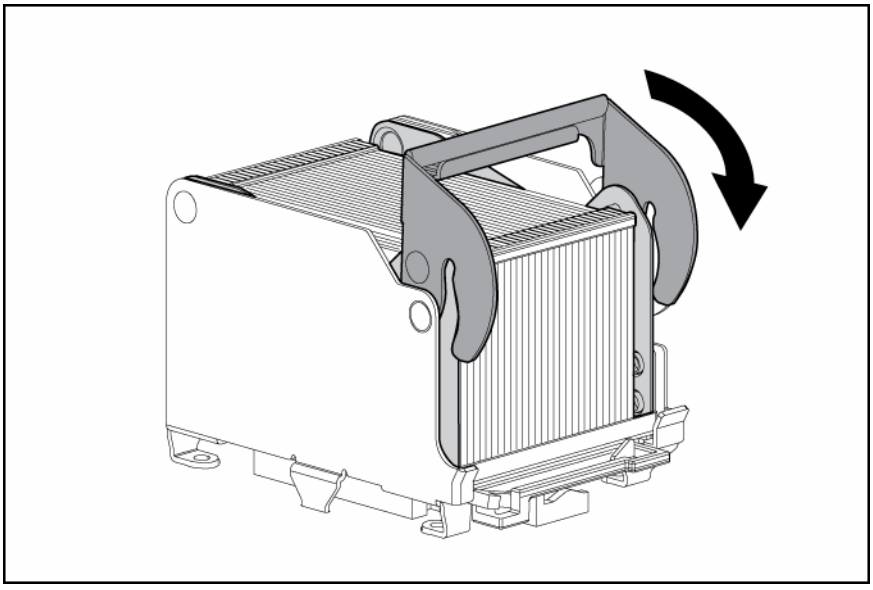
IMPORTANT: Determine the correct processor orientation by observing the guide pins on the base of the processor retaining bracket and the three corresponding guide slots on the processor assembly.

7. Insert the processor assembly into the processor socket, and close the locking lever.

CAUTION: To prevent possible server malfunction or damage to the equipment, be sure to completely close the processor locking lever.



8. Close and lock the processor retaining bracket.



9. Close the cover, and replace the processor module.

Removing a PPM

The server PPMs provide the proper power to each processor. Each PPM must be installed in the correct slot for the processor.

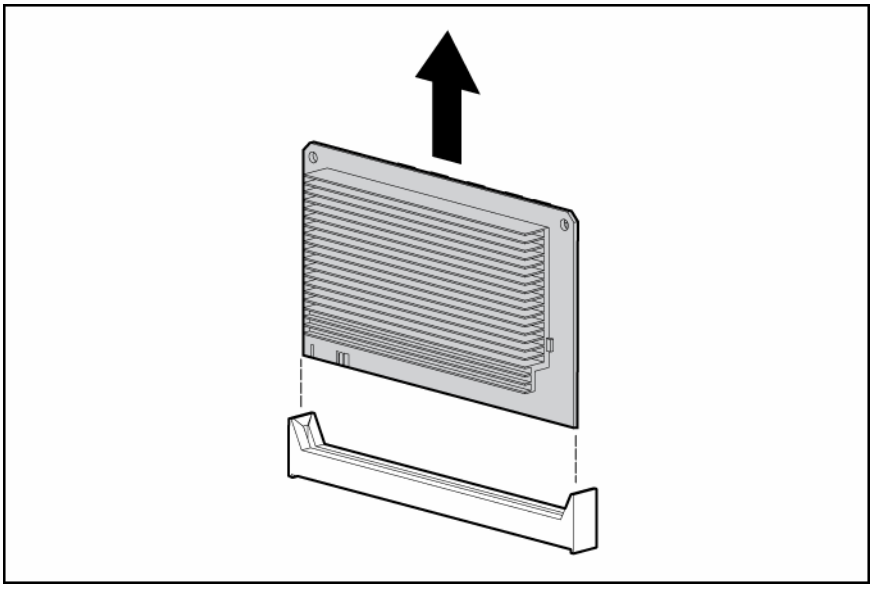
IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

IMPORTANT: Always install a PPM when you install a processor. The system fails to boot if the PPM is missing.

To remove a PPM:

1. Power down the server (on page 29).
2. Remove the processor module ("Removing the processor module" on page 33).

3. Remove the PPM.



IMPORTANT: Always install a PPM when you install a processor. The system fails to boot if the corresponding PPM is missing.

To replace the component, reverse the removal procedure.

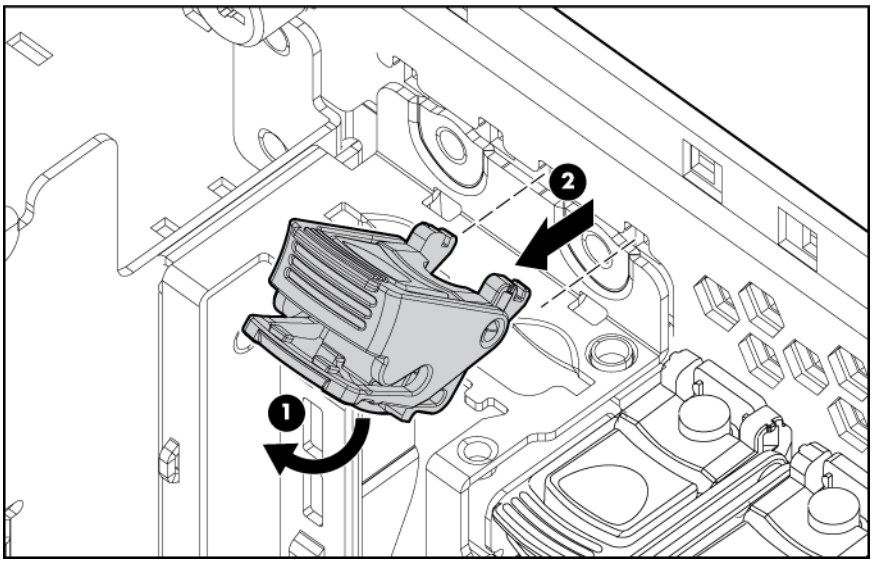
Removing a PCI latch

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

4. Open the latch.
5. Remove the expansion board from the slot, if installed.
6. Remove the expansion slot cover from the slot, if installed ("Removing the expansion slot cover" on page 40).

7. Remove the PCI latch by pushing up on the clear plastic piece of the PCI latch that extends below the chassis under the latch.



To replace the component, reverse the removal procedure.

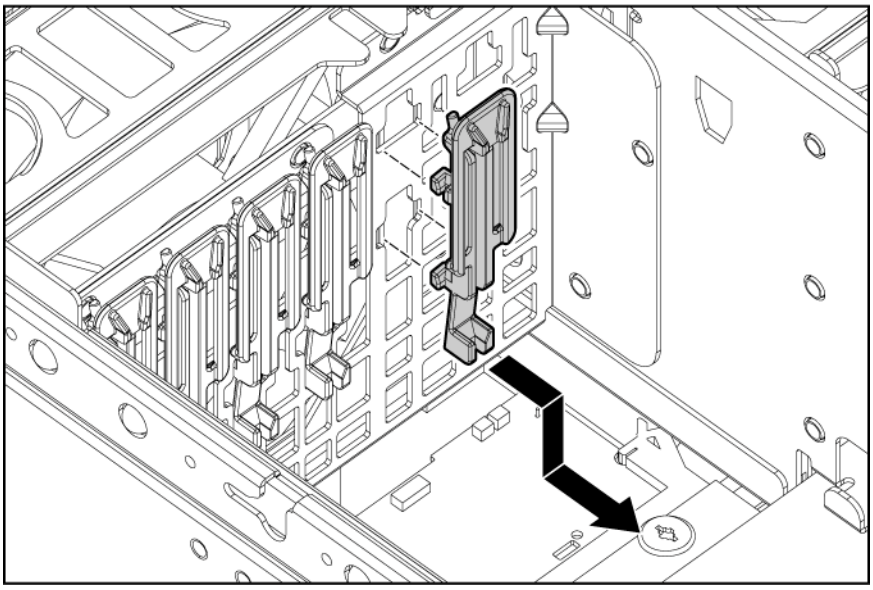
Removing a PCI retaining clip

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).

> △ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

4. Open the PCI latch, and unlock the PCI retaining clip.
5. Remove the expansion board from the slot, if installed.

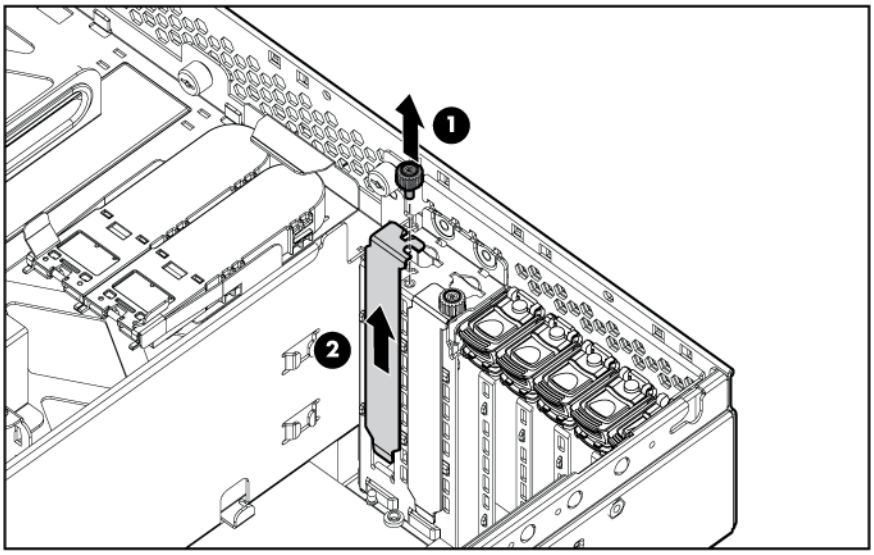
6. Remove the PCI retaining clip.



To replace the component, reverse the removal procedure.

Removing the expansion slot cover

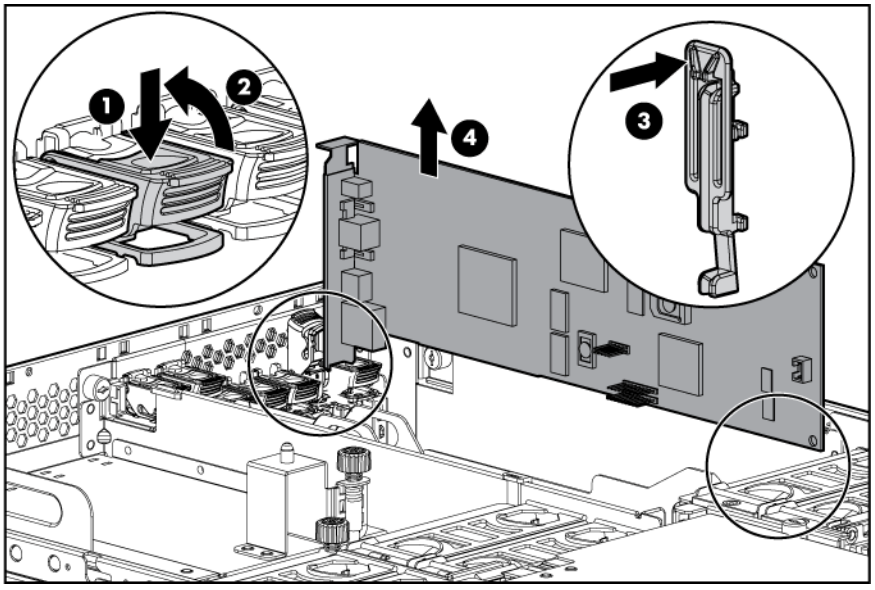
1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove the screw, and remove the expansion slot cover.



△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

Removing a non-hot-plug expansion board

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Disconnect any required internal or external cables from the expansion board.
5. Open the PCI latch.
6. Unlock the retaining clip.
7. Remove the expansion board.



To replace the component, reverse the removal procedure.

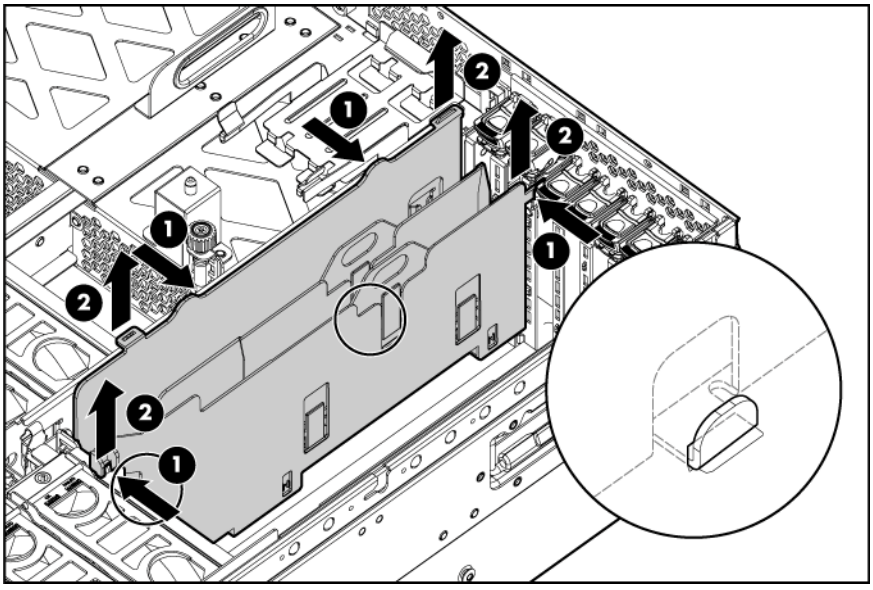
Removing the PCI-X Hot Plug basket

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).

△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

4. Remove the expansion board from the slot, if installed.

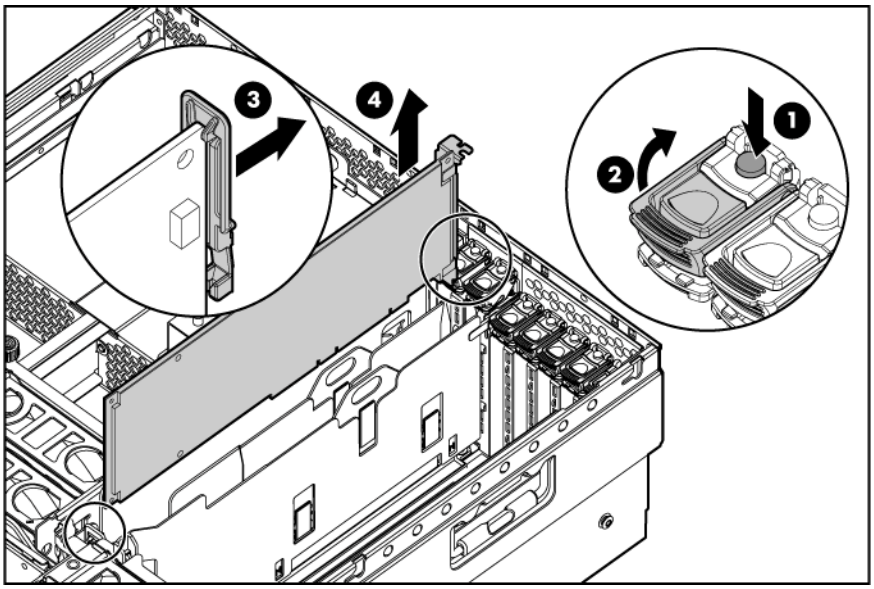
5. Remove the PCI-X Hot Plug basket ("Removing the PCI-X Hot Plug basket" on page 41).



To replace the component, reverse the removal procedure.

Removing a PCI-X Hot Plug expansion board

1. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
2. Remove the access panel ("Removing the access panel" on page 29).
3. Press the PCI-X Hot Plug button to remove power from the slot. When the green power LED on the slot stops flashing, power has been removed from the slot.
4. Unlock the retaining clip (for full-length expansion boards).
5. Open the latch, and remove the board from the server.

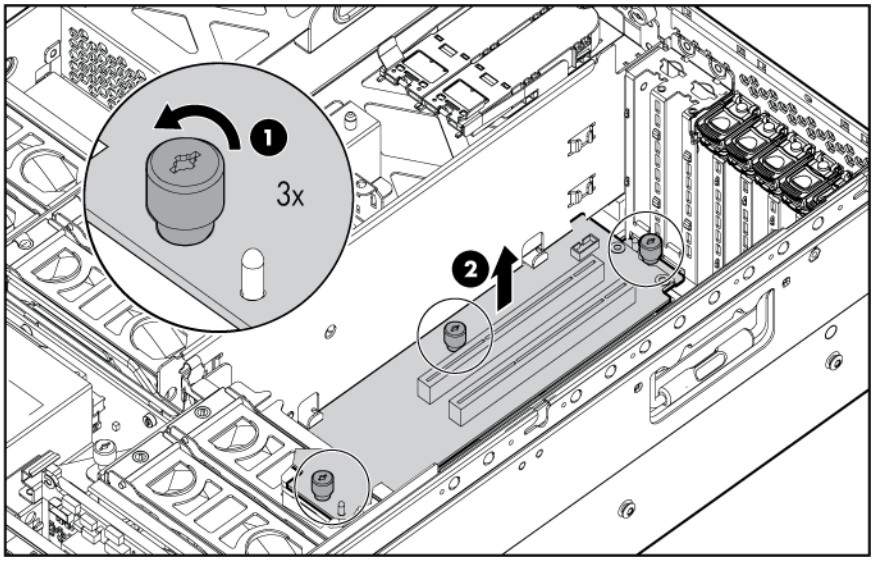


CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

To replace the component, reverse the removal procedure.

Removing the PCI-X Hot Plug mezzanine option

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove the expansion boards from slots 1 and 2.
5. Remove the expansion boards from slots 3 and 4, if installed, to gain access to the mezzanine board.
6. Remove the PCI-X Hot Plug basket ("Removing the PCI-X Hot Plug basket" on page 41).
7. Disconnect the cable from the PCI-X Hot Plug mezzanine board ("PCI-X Hot Plug mezzanine cabling" on page 95).
8. Loosen the thumbscrews, and lift the mezzanine board from the server.



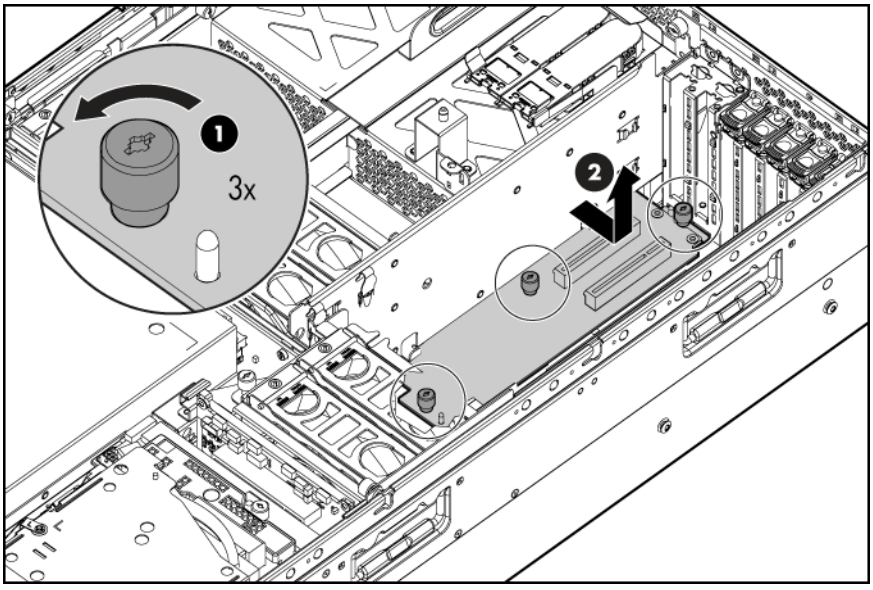
△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

To replace the component, reverse the removal procedure.

Removing the PCI Express mezzanine option

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove the expansion boards from slots 1 and 2.
5. Remove the expansion boards from slots 3 and 4, if installed, to gain access to the mezzanine board.

6. Loosen the thumbscrews, and lift the mezzanine board from the server.



> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all expansion slots have either an expansion slot cover or an expansion board installed.

To replace the component, reverse the removal procedure.

Recovering data from the BBWC

If the server fails, you can recover any data temporarily trapped in the BBWC by using the following procedure.

> **CAUTION:** Before starting this procedure, read the information about protecting against electrostatic discharge ("Preventing electrostatic discharge" on page 26).

1. Perform one of the following:
   - Set up a recovery server station using an identical server model. Do not install any internal drives or BBWC in this server. (This option is preferred.)
   - Find a server that has enough empty drive bays to accommodate all the drives from the failed server and that meets all the other requirements for drive and array migration.
2. Power down the failed server ("Power down the server" on page 29). If any data is trapped in the cache module, the amber LED on the module blinks every 15 seconds.

> **CAUTION:** Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

3. Transfer the hard drives from the failed server to the recovery server station.
4. Remove the BBWC cache module ("Removing the BBWC cache module" on page 46) and battery pack ("Removing the BBWC battery pack" on page 45) from the failed server.
5. Perform one of the following:
   - Install the BBWC into an empty BBWC DIMM socket on the system board of the recovery server.

- Install the BBWC into an empty BBWC DIMM socket on any Smart Array 641 or 642 controller in the recovery server.

6. Power up the recovery server. A 1759 POST message appears, stating that valid data was flushed from the cache. This data is now stored on the drives in the recovery server. You can now transfer the drives (and controller, if one was used) to another server.

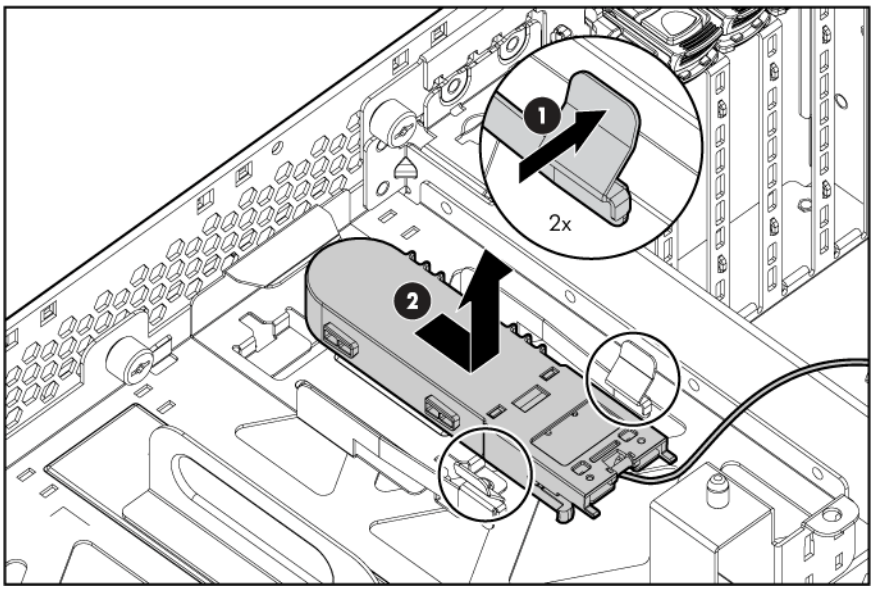
Removing the BBWC battery pack

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).

> **CAUTION:** To prevent a server malfunction or damage to the equipment, do not add or remove the battery pack while an array capacity expansion, RAID level migration, or stripe size migration is in progress.

> **CAUTION:** After the server is powered down, wait 15 seconds and then check the amber LED before unplugging the cable from the cache module. If the amber LED blinks after 15 seconds, do not remove the cable from the cache module. The cache module is backing up data, and data is lost if the cable is detached.

4. Remove the BBWC battery pack ("Removing the BBWC battery pack" on page 45).



5. Disconnect the cable from the cache module only if the battery pack is not being used to recover data from the server or transfer data to another server.

> **CAUTION:** Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

To replace the component, reverse the removal procedure.

IMPORTANT: The battery pack might have a low charge when installed. In this case, a POST error message is displayed when the server is powered up, indicating that the battery pack is temporarily disabled. No action is necessary on your part. The internal circuitry automatically recharges the batteries and enables the battery pack. This process might take up to four hours. During this time, the cache module functions properly, but without the performance advantage of the battery pack.

NOTE: The data protection and the time limit also apply if a power outage occurs. When power is restored to the system, an initialization process writes the preserved data to the hard drives.

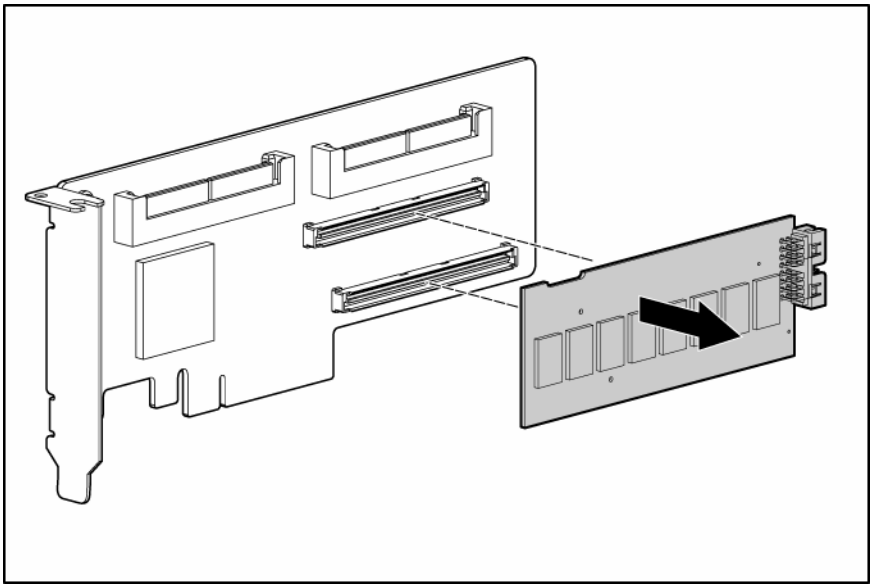
Removing the BBWC cache module

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).

CAUTION: To prevent a server malfunction or damage to the equipment, do not add or remove the battery pack while an array capacity expansion, RAID level migration, or stripe size migration is in progress.

CAUTION: After the server is powered down, wait 15 seconds and then check the amber LED before unplugging the cable from the cache module. If the amber LED blinks after 15 seconds, do not remove the cable from the cache module. The cache module is backing up data, and data is lost if the cable is detached.

4. Remove the BBWC cache module from the controller.



5. Disconnect the cable from the cache module only if the battery pack is not being used to recover data from the server or transfer data to another server.

CAUTION: Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

To replace the component, reverse the removal procedure.

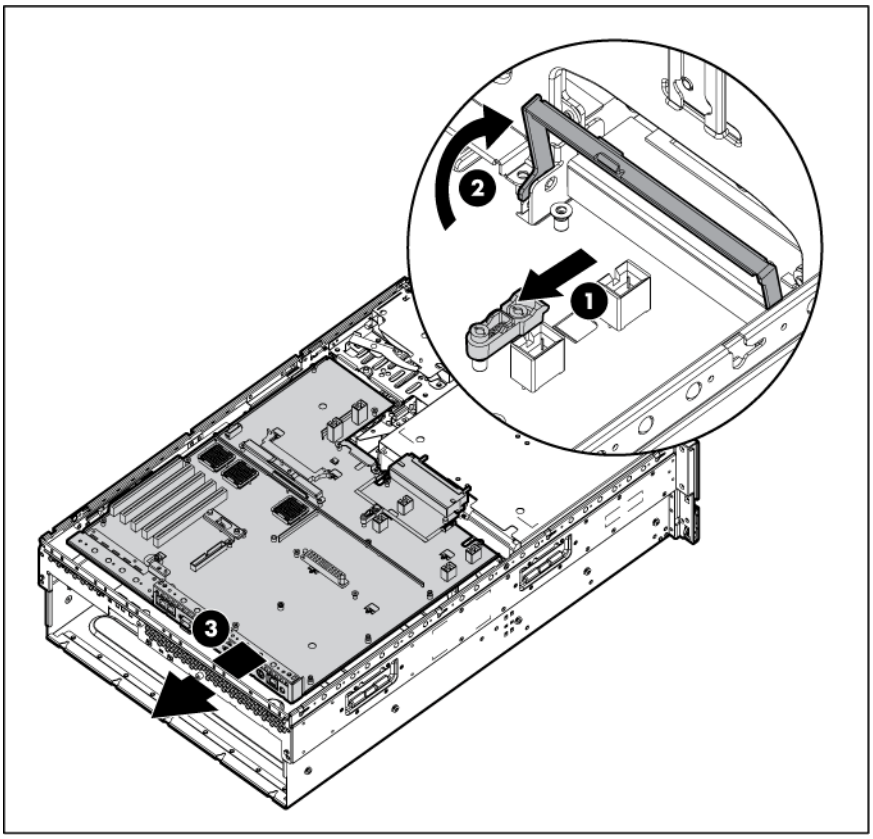
Removing the system board

CAUTION: Only authorized technicians trained by HP should attempt to remove the system board. If you believe the system board requires replacement, contact HP Technical Support before proceeding.

IMPORTANT: HP recommends troubleshooting the system using port 85 codes before replacing the system board. Refer to "Troubleshooting the system using port 85 codes (on page 73)" for a list of codes and troubleshooting procedures.

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all system fans ("Replacing hot-plug fans" on page 57).
5. Remove all expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42).
6. Remove the expansion slot cover ("Removing the expansion slot cover" on page 40).
7. Remove the PCI-X Hot Plug basket ("Removing the PCI-X Hot Plug basket" on page 41), if installed.
8. Disconnect the cable from the PCI-X Hot Plug mezzanine board ("PCI-X Hot Plug mezzanine cabling" on page 95).
9. Remove the system cage ("Removing the system cage" on page 31).
10. Unlock the latch and open the lever.

11. Using the lever, lift the system board slightly, and slide the system board out through the back of the server.



IMPORTANT: If replacing the system board or clearing NVRAM, you must re-enter the server serial number through RBSU ("Re-entering the server serial number and product ID" on page 48).

To replace the component, reverse the removal procedure.

Re-entering the server serial number and product ID

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

1. During the server startup sequence, press the **F9** key to access RBSU.
2. Select the **Advanced Options** menu.
3. Select **Serial Number.** The following warning is displayed:

   ```
   Warning: The serial number should ONLY be modified by qualified service
   personnel. This value should always match the serial number located on
   the chassis.
   ```
4. Press the **Enter** key to clear the warning.
5. Enter the serial number.
6. Select **Product ID.** The following warning is displayed.

   ```
   Warning: The Product ID should ONLY be modified by qualified service
   personnel. This value should always match the Product ID located on the
   chassis.
   ```
7. Enter the product ID and press the **Enter** key.

8. Press the **Escape** key to close the menu.
9. Press the **Escape** key to exit RBSU.
10. Press the **F10** key to confirm exiting RBSU. The server will automatically reboot.

Battery

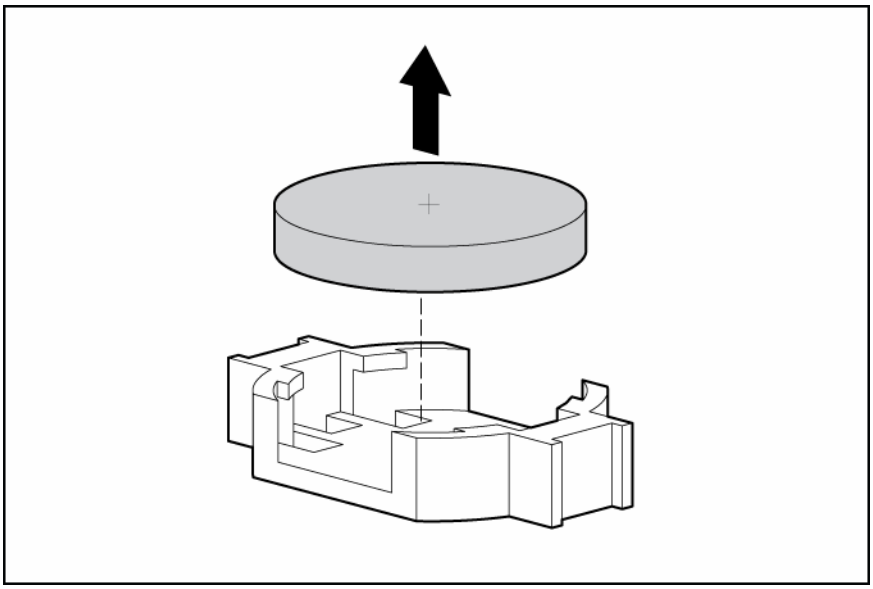
If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.

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

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

To remove the component:

1. Power down the server (on page 29).
2. Extend the server from the rack, if applicable ("Extending the server from the rack" on page 27).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove any hardware that will interfere with accessing the battery.
5. Remove the battery.

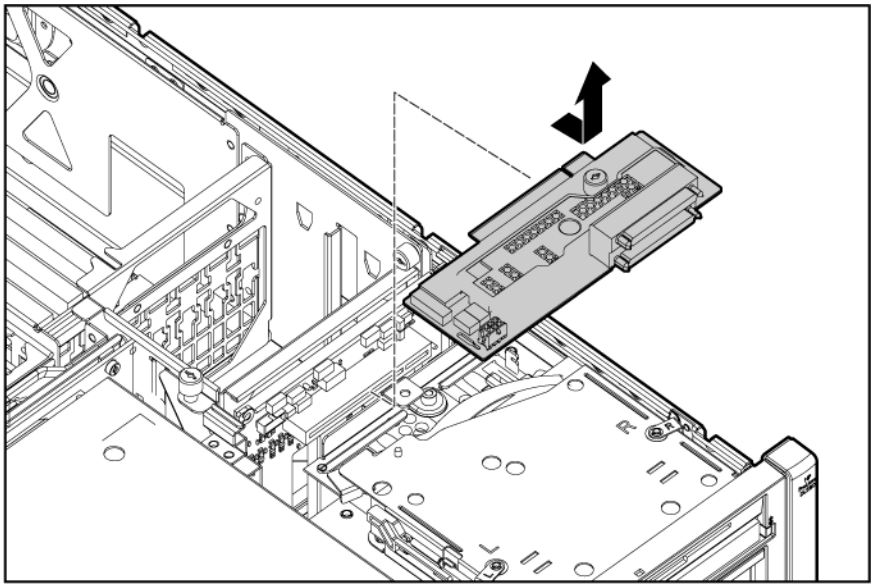


To replace the component, reverse the removal procedure.

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

Removing the media board

1. Power down the server (on page 29).
2. Extend the server from the rack, if applicable ("Extending the server from the rack" on page 27).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all media drives and media drive blanks ("Removing a diskette, DVD, CD-RW drive or blank" on page 32).
5. Disconnect all cabling from the media board.
6. Loosen the thumbscrew, and slide the media board toward the front of the server to disconnect it from the media pass-through board.
7. Lift the media board out of the server.

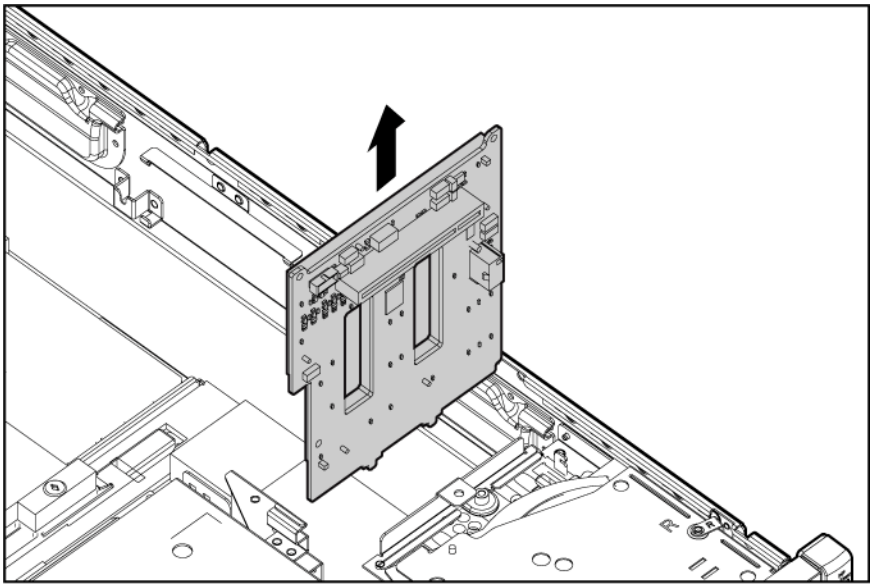


To replace the component, reverse the removal procedure.

Removing the media pass-through board

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all media drives and media drive blanks ("Removing a diskette, DVD, CD-RW drive or blank" on page 32).
5. Disconnect all cabling from the media board.
6. Remove the media board ("Removing the media board" on page 50).
7. Remove all system fans ("Replacing hot-plug fans" on page 57).
8. Remove all expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42).
9. Remove the expansion slot cover ("Removing the expansion slot cover" on page 40).
10. Remove the PCI-X Hot Plug basket ("Removing the PCI-X Hot Plug basket" on page 41), if installed.

11. Disconnect the cable from the PCI-X Hot Plug mezzanine board ("PCI-X Hot Plug mezzanine cabling" on page 95), if installed.
12. Remove the system cage ("Removing the system cage" on page 31).
13. Unlock the latch, and open the lever to move the system board ("Removing the system board" on page 47). Slide the system board towards the back of the server until it disconnects from the media pass-through board.
14. Pull the media pass-through board out of the server.

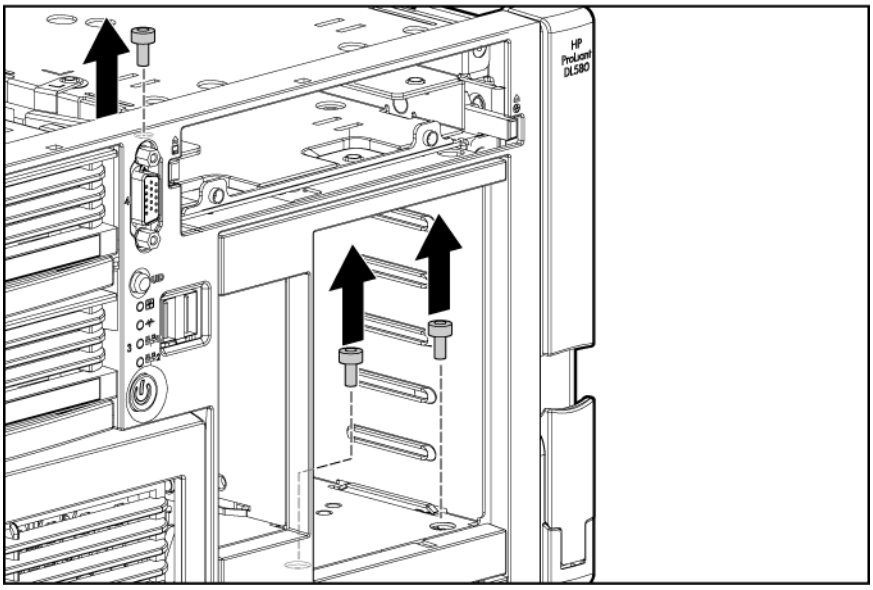


To replace the component, reverse the removal procedure.

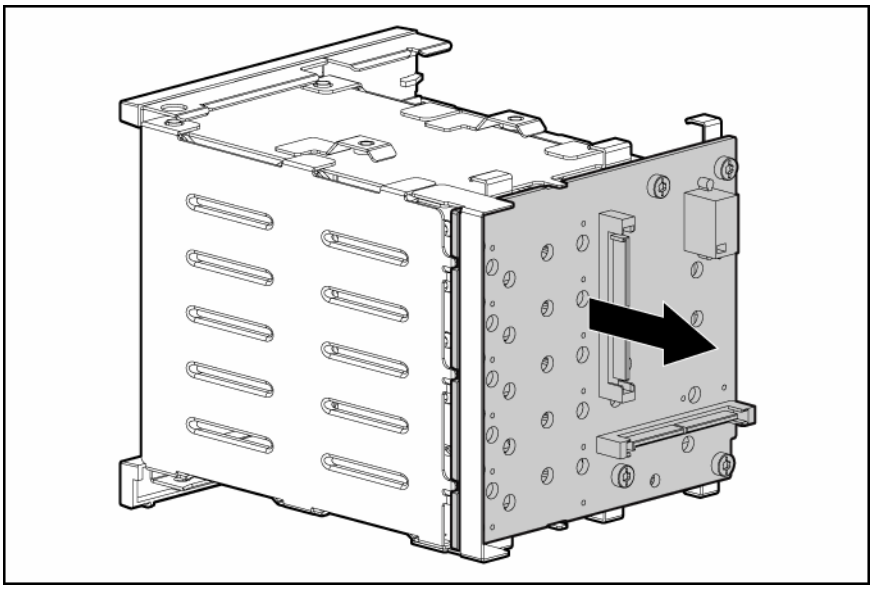
Removing the SAS backplane

1. Power down the server (on page 29).
2. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Removing the access panel" on page 29).
4. Remove all hard drives ("Removing a hot-plug SAS hard drive" on page 54) and hard drive blanks ("Removing a hard drive blank" on page 54).
5. Remove all media drives and media drive blanks ("Removing a diskette, DVD, CD-RW drive or blank" on page 32).

6. Remove the screws securing the SAS hard drive cage.



7. Slowly pull the SAS hard drive cage out of the server until there is enough room to reach behind the SAS hard drive cage.
8. Disconnect all cables from the back of the SAS hard drive cage ("Hot-plug SAS and SATA hard drive cabling" on page 96).
9. Remove the mounting screws, and pull the SAS backplane from the rear of the cage.



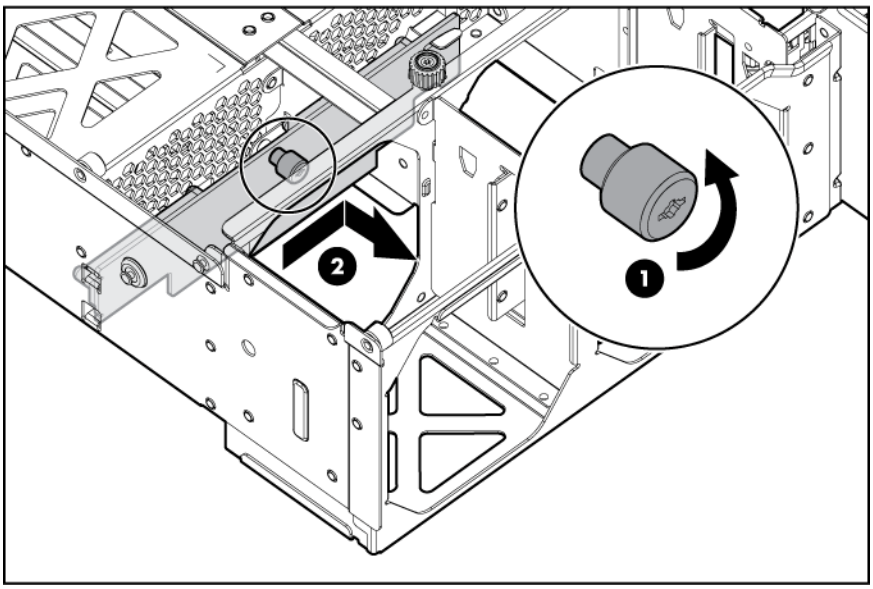
To replace the component, reverse the removal procedure.

Removing the power backplane

1. Power down the server (on page 29).
2. Remove all power supplies ("Removing a redundant hot-plug power supply" on page 56) and power supply blanks ("Removing a power supply blank" on page 55).

NOTE: If you remove or replace the primary hot-plug power supply, use the T-15 Torx screwdriver provided with the server to remove the shipping screw. It is located just under the port-colored plastic handle of the power supply unit.

3. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
4. Remove the access panel ("Removing the access panel" on page 29).
5. Remove the system cage ("Removing the system cage" on page 31).
6. Loosen the thumbscrew, and remove the power backplane from the server.

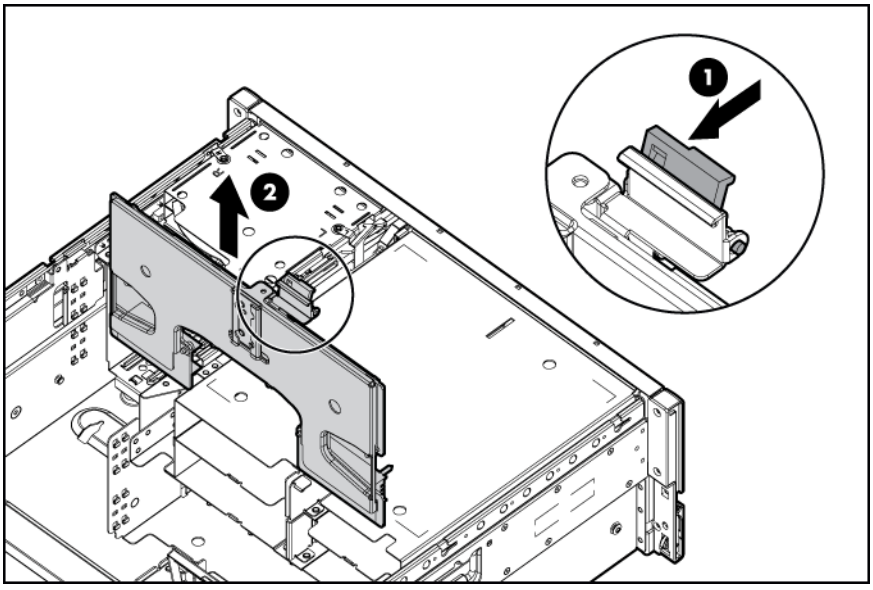


To replace the component, reverse the removal procedure.

Removing the memory backplane

1. Power down the server (on page 29).
2. Remove all memory boards ("Removing a memory board" on page 67, "Removing a memory board (non-hot-plug)" on page 65).
3. Remove the processor module ("Removing the processor module" on page 33).
4. Extend or remove the server from the rack ("Extending the server from the rack" on page 27, "Remove the server from the rack" on page 29).
5. Remove the access panel ("Removing the access panel" on page 29).

6. Open the latch, and lift the memory backplane from the server.

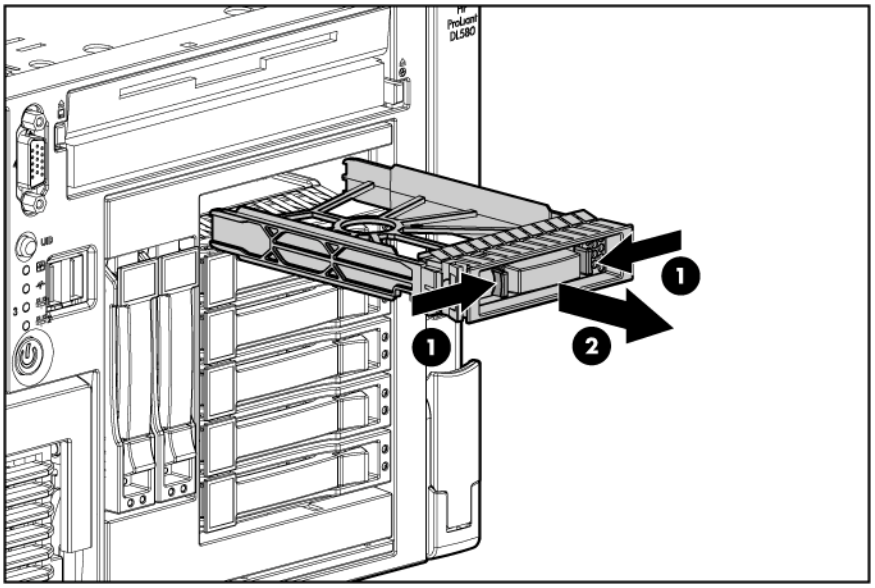


To replace the component, reverse the removal procedure.

Removing a hard drive blank

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

To remove the hard drive blank, squeeze the tabs, and pull the blank out of the server.



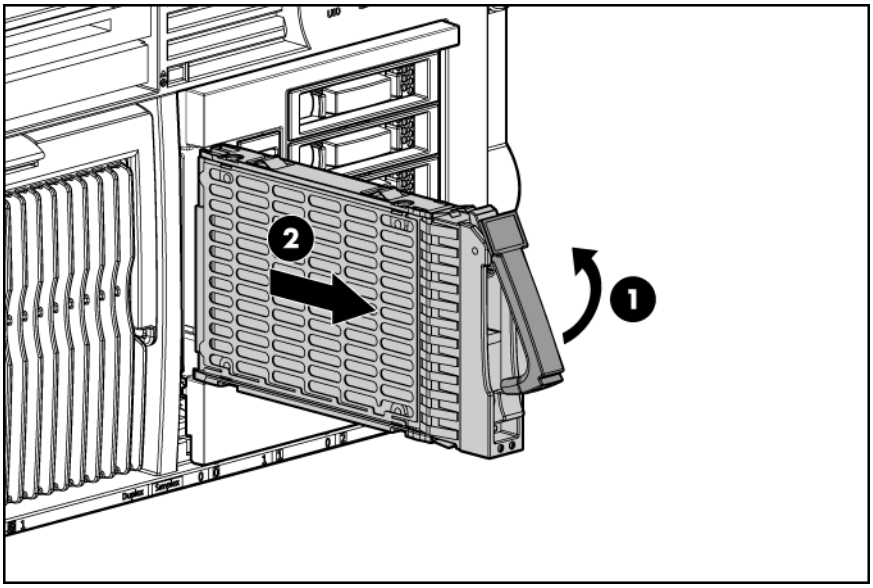
To replace the component, reverse the removal procedure.

Removing a hot-plug SAS hard drive

CAUTION: Always power down the server if the boot partition resides on the drive you are replacing or if you are replacing the only drive in the server.

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

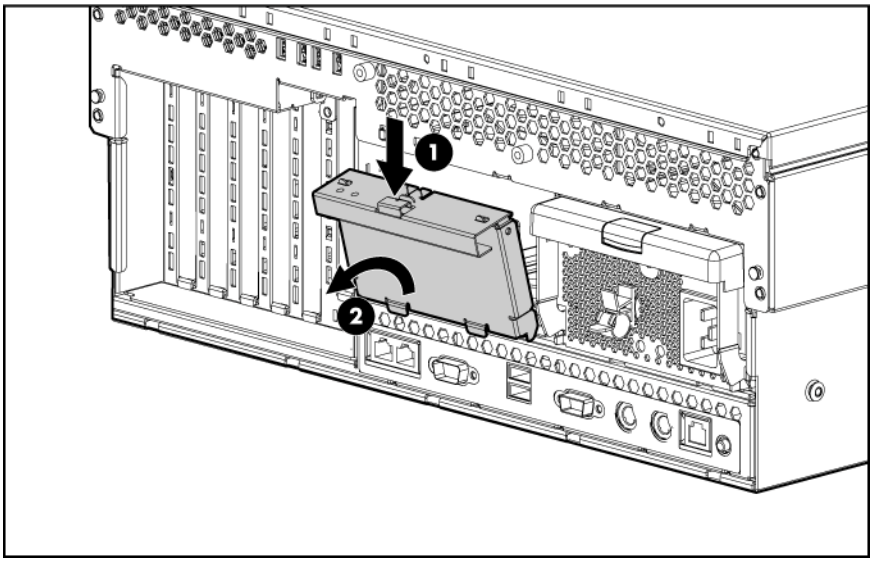
1. Determine the status of the hard drive from the hot-plug hard drive LEDs ("SAS and SATA hard drive LED combinations" on page 91).
2. Back up all server data on the hard drive to be removed.
3. Remove the hard drive.



Removing a power supply blank

NOTE: If you remove or replace the primary hot-plug power supply, use the T-15 Torx screwdriver provided with the server to remove the shipping screw. It is located just under the port-colored plastic handle of the power supply unit.

1. Remove the power supply blank.



To replace the component, reverse the removal procedure.

Removing a redundant hot-plug power supply

WARNING: To reduce the risk of electric shock, do not disassemble the power supply or attempt to repair it. Replace it only with the specified spare part.

CAUTION: If only one power supply is installed, do not remove the power supply unless the server has been powered down. Removing the only operational power supply will cause an immediate power loss.

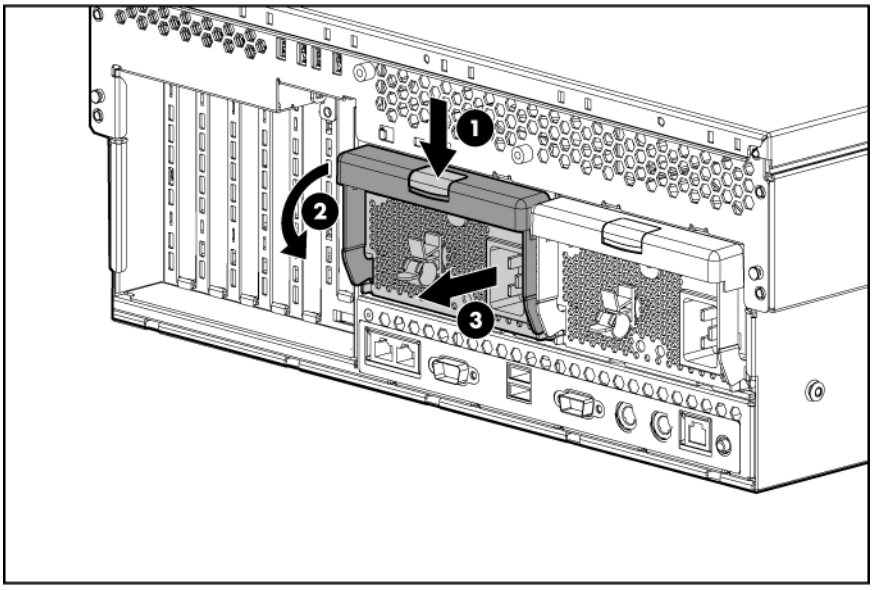
NOTE: If you remove or replace the primary hot-plug power supply, use the T-15 Torx screwdriver provided with the server to remove the shipping screw. It is located just under the port-colored plastic handle of the power supply unit.

NOTE: Refer to the section "Power supply LEDs (on page 84)" for information on the current status of the hot-plug power supply.

1. Disconnect the power cord from the power supply.
2. Remove the shipping screw, if applicable.

NOTE: If you remove or replace the primary hot-plug power supply, use the T-15 Torx screwdriver provided with the server to remove the shipping screw. It is located just under the port-colored plastic handle of the power supply unit.

3. Remove the hot-plug power supply from the server.



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

To replace the component, reverse the removal procedure.

Replacing hot-plug fans

The server supports redundant hot-plug fans ("Fan locations" on page 92) to provide proper airflow to the server if a primary fan fails.

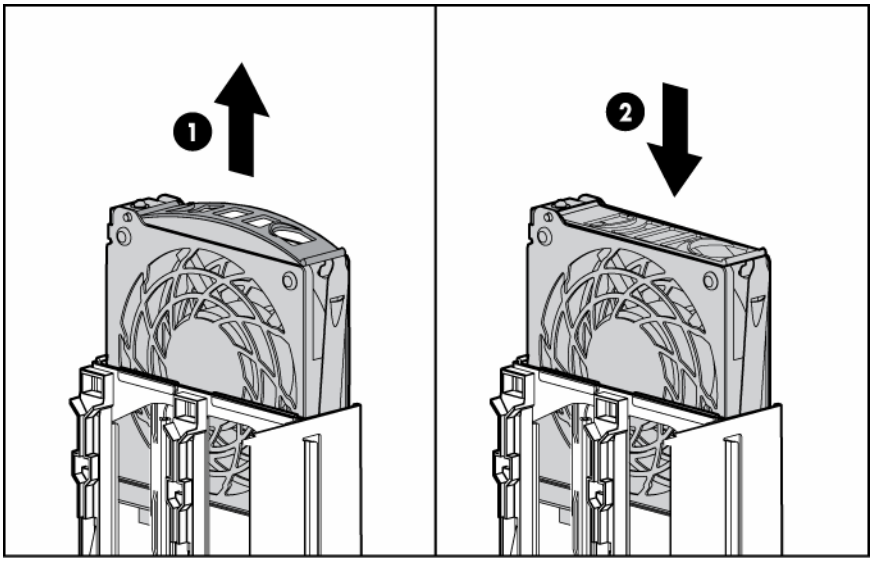
WARNING: To prevent personal injury from hazardous energy:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Do not place tools or metal parts on top of batteries.

IMPORTANT: Remove and replace one fan at a time. If the system detects two fan failures in the same zone, the server shuts down to avoid thermal damage.

1. Extend the server from the rack, if applicable ("Extending the server from the rack" on page 27).
2. Remove the access panel ("Removing the access panel" on page 29).
3. Remove the malfunctioning hot-plug fan from the server.

4. Install the replacement fan.



5. Repeat to replace additional fans as needed.
6. Observe the LED on each installed fan to be sure it is illuminated green ("Hot-plug fan LEDs" on page 94).
7. Observe the internal system health LED on the front panel to be sure it is illuminated green ("Front panel LEDs and buttons" on page 78).

NOTE: If the front panel internal system health LED is not green after you install hot-plug fans, reseat the hot-plug fan or refer to the troubleshooting section.

Memory overview

This server supports up to four memory boards. Each memory board contains four DIMM slots for a total of 16 DIMM slots in the server. Memory can be expanded by installing PC2-3200R Registered DDR2 DRAM DIMMs.

The server supports a host of AMP options to optimize server availability:

- Advanced ECC ("Advanced ECC memory" on page 60)
- Online spare memory (on page 61)
- Hot-plug mirrored memory (dual- and quad-board) ("Hot-plug mirrored memory" on page 61)
- Hot-plug RAID memory (on page 63)

Hot-plug operations can be hot-add or hot-replace. Hot-add makes additional memory resources available to the operating system. Hot-replace allows failed or degraded DIMMs to be replaced while the server is running.

The maximum supported total memory for this server is 64 GB using four memory boards. The maximum supported memory per memory board is 16 GB using four 4-GB DIMMs.

For an overview of single- and dual-rank DIMMs, refer to "Single- and dual-rank DIMMs (on page 59)."

For DIMM slot locations and bank assignments, refer to "DIMM slot locations (on page 89)."

General memory configuration requirements

The following configuration requirements apply regardless of the AMP mode.

- DIMMs must be installed in pairs.
- DIMM pairs within a memory bank must contain DIMMs with the same part number.
- Always populate the DIMMs in sequential order per bank: Bank A and then Bank B.
- Always populate the memory boards in sequential order: Board 1, Board 2, Board 3, and Board 4. Any deviation from this requirement results in the server defaulting to Advanced ECC ("Advanced ECC memory" on page 60) on the next reboot.
- Dual-rank DIMMs ("Single- and dual-rank DIMMs" on page 59) must be populated before single-rank DIMMs (dual-rank DIMMs must be in the lower bank).
- The following table lists all valid combinations of single- and dual-rank DIMM configurations for a memory board. "Single" indicates a bank of single-rank DIMMs. "Dual" indicates a bank of dual-rank DIMMs.

NOTE: A bank contains two DIMMs.

Configuration	Bank A	Bank B
1	Single	—
2	Single	Single
3	Dual	—
4	Dual	Single
5	Dual	Dual

- The server can be configured for any AMP mode in RBSU. RBSU displays a warning message if the selected AMP mode is not supported by the current DIMM configuration. However, if the DIMM configuration at POST does not match the AMP mode selected in RBSU, the server defaults to Advanced ECC ("Advanced ECC memory" on page 60). When this occurs, a message displays during POST and the status LED for the configured AMP mode flashes amber.
- Unpopulated memory boards (those without any installed DIMMs) can be installed in the server for storing extra memory boards.
- If your server contains more than 4 GB of memory, consult your operating system documentation for additional requirements.

Single- and dual-rank DIMMs

PC2-3200 DIMMs can either be single- or dual-rank. While it is not normally important for you to differentiate between these two types of DIMMs, certain DIMM configuration requirements are based on these classifications.

Certain configuration requirements exist with single- and dual-rank DIMMs that allow the architecture to optimize performance. A dual-rank DIMM is similar to having two separate DIMMs on the same module. Although only a single DIMM module, a dual-rank DIMM acts as if it were two separate DIMMs. The primary reason for the existence of dual-rank DIMMs is to provide the largest capacity DIMM given the

current DIMM technology. If the maximum DIMM technology allows for creating 2-GB single-rank DIMMs, a dual-rank DIMM using the same technology would be 4-GB.

Advanced ECC memory

Advanced ECC is the default memory protection mode for this server. In Advanced ECC, the server is protected against correctable memory errors. The server will provide notification if the level of correctable errors exceeds a predefined threshold rate. The server does not fail because of correctable memory errors.

Advanced ECC provides additional protection over Standard ECC in that it is possible to correct certain memory errors that would otherwise be uncorrectable and result in a server failure. Whereas Standard ECC can correct single-bit memory errors, Advanced ECC can correct single-bit memory errors and multi-bit memory errors if all failed bits are on the same DRAM device on the DIMM.

The following guidelines apply to Advanced ECC memory:

- All general memory requirements apply.
- Advanced ECC mode is supported with one to four memory boards.
- Board insertions do not convert the AMP mode while the server is running. A server cannot be converted from Advanced ECC to another AMP mode by inserting a board while the server is running. Board insertions in Advanced ECC are solely for making additional memory resources available to the operating system.
- Advanced ECC is the only mode in which hot-add operations are supported, and is the only mode in which the amount of memory available to the operating system can be increased without a reboot.
- If a memory board (which contains DIMMs) is unlocked while in Advanced ECC mode, audio alarms and visual alerts occur.

The following rules apply to hot-add operations. Hot-add is performed by adding a memory board while the server is running, and the additional memory is made available to the operating system without a reboot.

- Boards must be inserted sequentially.
- Multiple hot-add board insertions can be performed one at a time on the same server. For example, if a server has three empty memory board slots, three hot-add board insertions can be performed.
- If multiple hot-add operations are performed, allow one board insertion operation to complete (as indicated by the memory board LEDs ("Memory board components and LEDs" on page 79) and operating system logs) before inserting another memory board.

△ **CAUTION:** When the memory board locking switch is unlocked in a mode that does not support hot-add or hot-replace capabilities, audio alarms and visual alerts occur. Removing the memory board at this point causes server failure.

To end the audio alarms and visual alerts, move the memory board locking switch back to the locked position. This action does not result in data corruption or server failure.

If removal of a single memory board is required and it is the only memory board, power down the server and make the necessary memory changes.

Online spare memory

Online spare memory provides a higher level of memory protection than Advanced ECC ("Advanced ECC memory" on page 60). With online spare memory, the probability of a server failing because of uncorrectable memory errors is reduced.

In this mode, degraded memory that is receiving a high rate of correctable memory errors is automatically disengaged and a replacement set of memory is used in its place. Because DIMMs that are receiving a high rate of correctable memory errors have an increased probability of receiving an uncorrectable memory error (which results in a server failure), the server experiences higher availability. The degraded memory can be replaced during scheduled downtime and poses no additional risk to the server.

Online spare memory is supported with one to four memory boards installed. On this server, each installed memory board is protected by its own spare memory. No operating system support is required.

The following guidelines apply to online spare memory:

- All general memory requirements apply.
- Online spare memory supports 1, 2, 3, or 4 memory boards.
- Each board must have a valid online spare configuration. No dependencies exist for the configuration between different memory boards.
- Each memory board includes its own online spare bank. All boards will operate in online spare memory mode independently. Each board can failover to its online spare bank independent of the other memory boards. Some boards can be in degraded online spare mode while others are still in operational online spare memory mode.
- The minimum valid online spare configuration for a memory board requires at least one bank of dual-rank DIMMs or two banks of single-rank DIMMs. If the server does not meet these requirements, an error message appears during POST and the server defaults to Advanced ECC ("Advanced ECC memory" on page 60).
- The server automatically configures the optimal online spare solution.
- Hot-plug operations are not supported.

HP recommends the following configurations. These configurations result in optimal use of memory. Other configurations are valid, but do not result in the maximum amount of installed memory being available to the operating system.

- If only single-rank DIMMs are used on a memory board, all DIMMs should be of the same size on that memory board.
- If only dual-rank DIMMs are used on a memory board, all DIMMs should be of the same size on that memory board.
- If a mixture of single- and dual-rank DIMMs are used on a memory board, the dual-rank DIMMs should be twice the size of any single-rank DIMM.

After installing DIMMs, use RBSU to configure the server ("Configuring the memory" on page 63) for online spare memory support.

Hot-plug mirrored memory

Hot-plug mirrored memory provides a higher level of memory protection than either Advanced ECC ("Advanced ECC memory" on page 60) or online spare memory (on page 61). With hot-plug mirrored

memory, the server is protected against uncorrectable memory errors that would otherwise result in server failure. Hot-plug mirrored memory allows the server to keep two copies of all memory data on separate memory boards.

If an uncorrectable error is encountered, the proper data is retrieved from the memory board that did not fail. In addition, hot-plug mirrored memory allows failed or degraded DIMMs to be replaced while the server is running without requiring server downtime. The memory board with the failed DIMMs can be removed, failed DIMMs replaced, and the board re-inserted into the server without any interruption to the operating system.

Hot-plug mirrored memory is supported with either two or four memory boards installed. No operating system support is required.

Hot-plug mirrored memory has two configurations: dual-board and quad-board. Single-board mirrored memory is not supported. For either mode, choose "Mirrored Memory with Advanced ECC" in RBSU.

The following guidelines apply to hot-plug mirrored memory:

- All general memory requirements apply.
- Hot-plug mirrored memory is supported with two or four memory boards.
- Memory boards 1 and 2 are populated for dual-board hot-plug mirrored memory. Boards 1, 2, 3, and 4 are populated for quad-board hot-plug mirrored memory. Any deviation from these guidelines results in the server defaulting to Advanced ECC ("Advanced ECC memory" on page 60).
- Memory boards 1 and 2 form a mirrored pair for dual-board hot-plug mirrored memory. For quad-board hot-plug mirrored memory, memory boards 3 and 4 also form a mirrored pair.
- Memory boards within a mirrored pair must have the same amount of total memory. However, each board of the mirrored pair may have different DIMM configurations as long as they have equal total size. For example, memory boards 1 and 2 could each contain 2 GB of physical memory per board with board 1 containing two 1-GB DIMMs and board 2 containing four 512-MB DIMMs.
- The amount of memory between mirrored pairs can be different in quad-board Hot-Plug Mirrored Memory mode. For example, memory pair 1 (boards 1 and 2) can contain 2 GB each while memory pair 2 (boards 3 and 4) contain 4 GB each.
- In quad-board hot-plug mirrored memory, the two pairs of memory boards operate independently. One of the pairs of memory boards can be degraded while the other pair of memory boards can still be fully mirrored.
- Hot-add operations are not supported. Board removals and insertions in Hot-Plug Mirrored Memory mode are solely for the purpose of hot-replace operations.
- For hot-replace to function properly, the memory board must be re-inserted into the location from which it was removed. If the board is placed into the incorrect slot (for example, if board 2 is removed in dual-board mode and re-inserted into memory slots 3 or 4), a configuration error occurs. Attempting to insert a board into the improper position results in audio alarms and visual alerts.
- Replace only one board at a time. That is, if memory boards 2 and 4 both contain memory errors, remove board 2, correct the error, and replace board 2. Wait for the board status LED to stop flashing before proceeding to board 4.
- If a board is inserted into a valid memory slot but with an invalid DIMM configuration (including too much or too little memory), a DIMM configuration error occurs and a visual alert occurs (refer to Memory Board Components and LEDs (on page 79)).
- If you remove a board while the server is running and do not replace the board, the server defaults to Advanced ECC ("Advanced ECC memory" on page 60) on the next reboot.

Hot-plug RAID memory

Hot-plug RAID memory provides a similar level of memory protection as hot-plug mirrored memory (on page 61) but obtains this protection using less total memory. Hot-plug RAID memory protects the server against uncorrectable memory errors that would otherwise result in a server failure.

Although hot-plug mirrored memory keeps two copies of all memory data, hot-plug RAID memory keeps only one copy of all memory data and additional parity information. If an uncorrectable memory error is encountered, the server can create the proper data using the parity information and the information from the other memory boards that contain no failures. In a hot-plug RAID memory configuration, 25% of the installed memory is not available to the operating system. In a hot-plug mirrored memory configuration, however, 50% of the installed memory is not available to the operating system.

As with hot-plug mirrored memory, hot-plug RAID memory allows failed or degraded DIMMs to be replaced while the server is running without requiring server downtime. The memory board with the failed DIMMs can be removed, failed DIMMs replaced, and the board re-inserted into the server without any interruption to the operating system.

Hot-plug RAID memory is only supported if all four memory boards are installed. No operating system support is required.

The following guidelines apply to hot-plug RAID memory:

- All general memory requirements apply.
- Hot-plug RAID memory is only supported with four memory boards.
- All four memory boards must have the same amount of total memory. However, each board can have different DIMM configurations as long as they have equal total size. Any deviation from this rule results in the server defaulting to Advanced ECC ("Advanced ECC memory" on page 60).
- Hot-replace operations are supported.
- If you remove a board while the server is running and do not replace it, the server defaults to Advanced ECC on the next reboot.

Configuring the memory

Configuring the memory system of the server requires configuring both hardware and software.

To configure the memory:

1. Install the correct amount of memory for the desired AMP mode. For a list of AMP options, refer to "Memory options ("Memory overview" on page 58)." For more information, refer to "General memory configuration requirements (on page 59)."
2. Test the DIMMs for all AMP modes, except Advanced ECC, before configuring the AMP mode in RBSU. The two testing methods are:
   - POST memory test (on page 64)
   - ROM-Based Diagnostics test ("ROM-based diagnostics" on page 64)

   NOTE: If the total amount of memory has changed, the POST memory test will run automatically. Additional memory testing is not necessary.
3. Select the AMP mode ("Selecting the AMP mode" on page 64).

POST memory test

1. Power on the server.
2. Press the **F9** key, when prompted, to enter RBSU.
3. Select **Advanced Options.**
4. Change POST Speed Up to **Disable.**
5. Press any key to return to the RBSU main menu.
6. Press the **F10** key, when prompted, to exit RBSU. The server reboots and tests all memory in the system.
7. Once the memory has been tested, re-enable POST Speed Up for faster system boot, if desired.

ROM-based diagnostics

1. Power up the server.
2. Press the **F10** key, when prompted, to enter the System Maintenance menu.
3. Select **Diagnostics.**
4. Run the **Memory Diagnostics.**
5. After the memory has been tested, exit the utility and reboot.
6. Select the AMP mode ("Selecting the AMP mode" on page 64).

Selecting the AMP mode

1. Upon reboot, press the **F9** key, when prompted, to enter RBSU.
2. Select **System Options.**
3. Select **Advanced Memory Protection.**
4. Select the desired memory mode.
   - Advanced ECC (hot-add enabled)
   - Advanced ECC (hot-add disabled)
   - Online Spare Memory with Advanced ECC
   - Hot-Plug Mirrored Memory with Advanced ECC
   - Hot-Plug RAID Memory with Advanced ECC
5. Press the **Escape** key twice to go back to the main RBSU menu.
6. Press the **F10** key, when prompted, to exit RBSU. The server reboots and tests all memory in the system.

IMPORTANT: To reconfigure the memory mode after initial setup, you must reboot the system, enter RBSU, and select an AMP mode.

Memory boards and DIMMs

Memory board and DIMM removal and replacement procedures can be either hot-replace or non-hot-plug, depending on how the server is configured. Hot-replace enables failed or degraded DIMMs to be replaced while the server is running, and has no operating system requirements.

When the server is configured for hot-plug mirrored memory or hot-plug RAID memory, you can perform a hot-replacement procedure without powering down the server or experiencing server downtime:

1. Remove a memory board ("Removing a memory board" on page 67, "Removing a memory board (non-hot-plug)" on page 65).
2. Replace failed or degraded DIMMs ("Removing DIMMs" on page 68).
3. Reinstall the memory board in the slot from which it was removed.

The replacement procedures in this section apply to both hot-replace and non-hot-plug memory procedures, except as noted.

IMPORTANT: Be sure to power down the server when performing board removal procedures in a server that is not configured for Advanced ECC, hot-plug mirrored memory, or hot-plug RAID memory.

Observe the following warnings when performing a hot-plug replacement procedure.

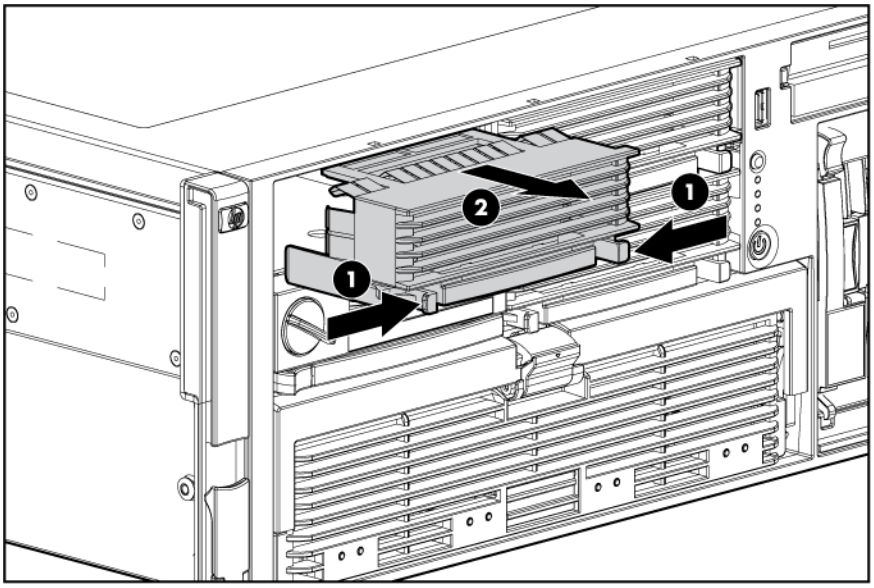
WARNING: Always comply with all electrostatic and thermal guidelines to prevent bodily injury and ensure a properly functioning system when performing hot-plug operations.

WARNING: To prevent personal injury from hazardous energy:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Do not place tools or metal parts on top of batteries.

Removing a memory board blank

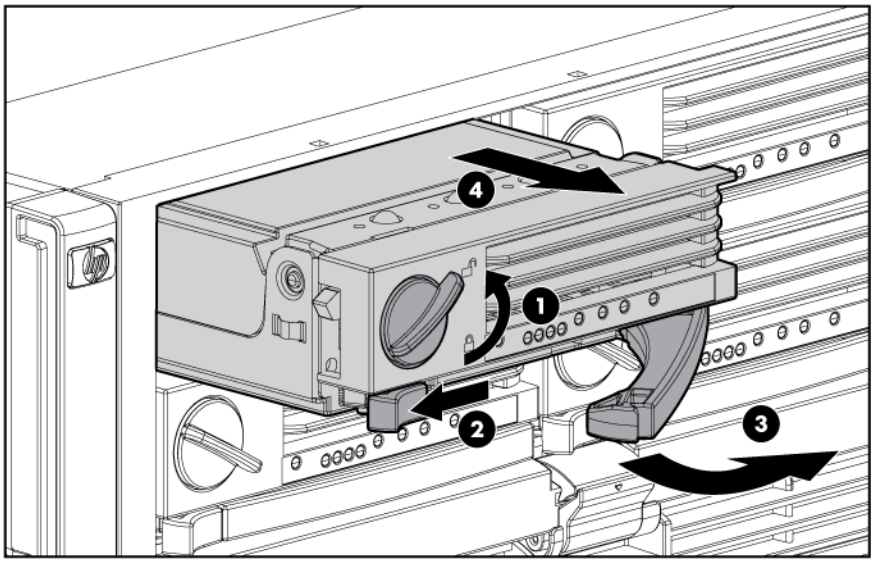
To remove the memory board blank, squeeze the levers and pull the blank out of the server.



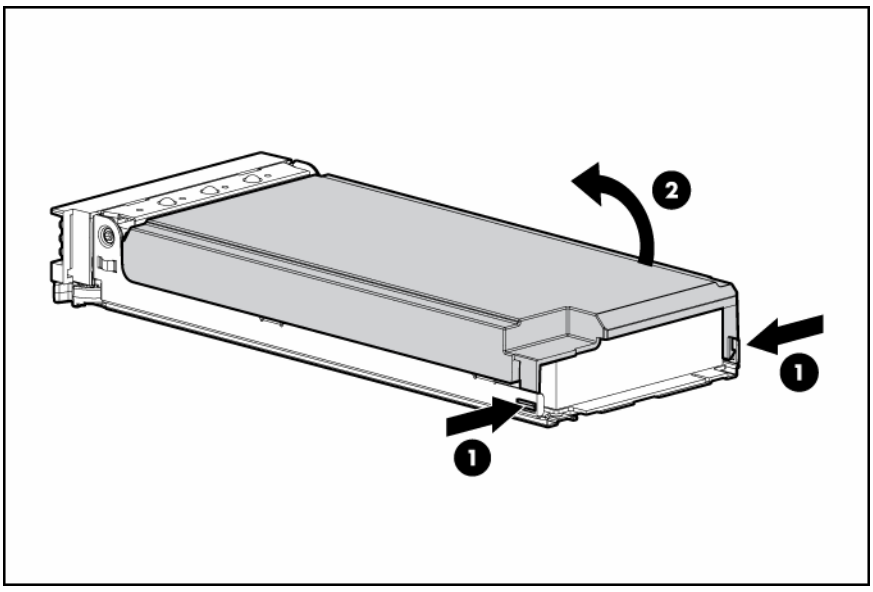
Removing a memory board (non-hot-plug)

1. Power down the server (on page 29).
2. Unlock the locking switch, and open the release latch.

3. Use the ejector lever to pull the memory board out of the server.



4. Open the memory board.



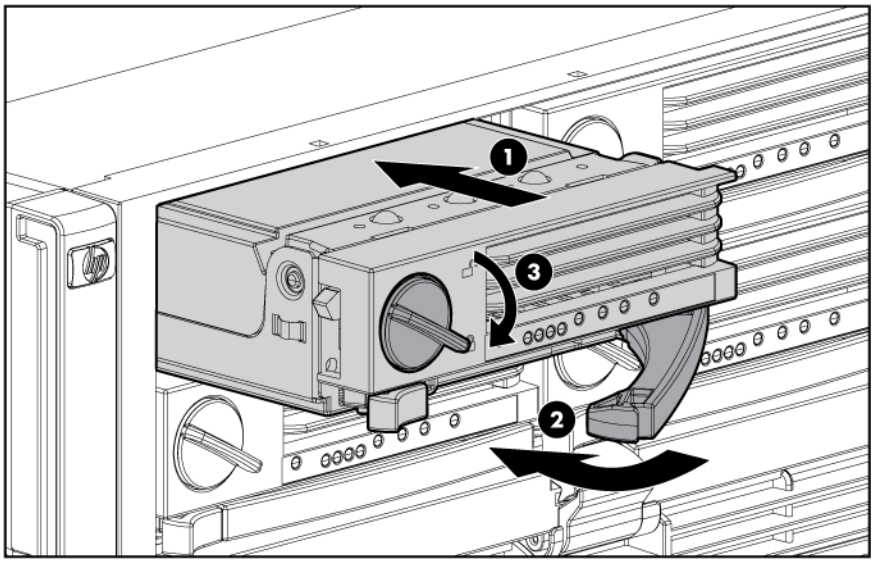
5. Replace the DIMM ("Removing DIMMs" on page 68).

IMPORTANT: Be sure to observe all DIMM installation requirements for the desired memory mode.

6. Close the memory board.

IMPORTANT: Be sure that the locking switch is unlocked. The memory board will not seat in the server if the locking switch is locked.

7. Install the memory board.



8. Close the ejector lever, and lock the locking switch.
9. Power up the server.
10. Reference the memory board LEDs ("Memory board components and LEDs" on page 79) to be sure that the memory board is functioning properly.

Removing a memory board

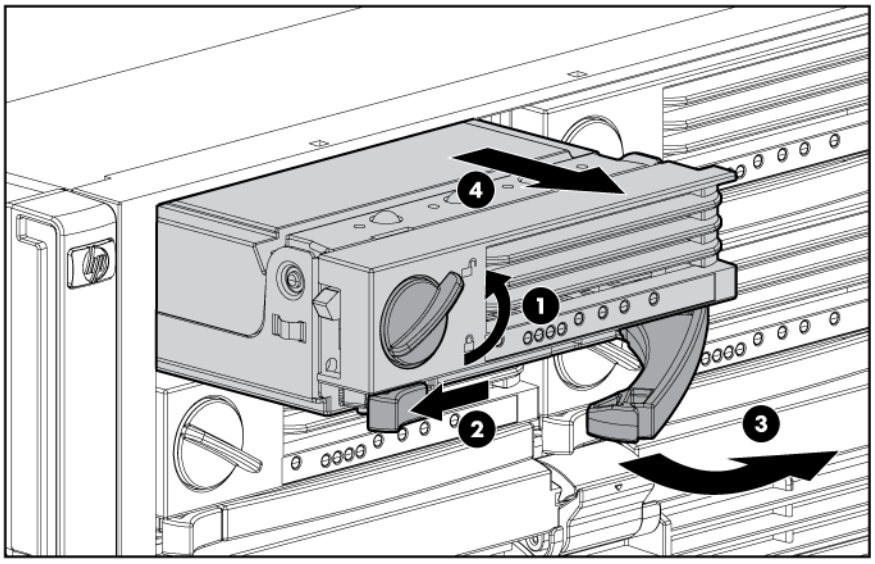
1. Power down the server if the server is not configured for hot-plug RAID memory or hot-plug mirrored memory.

> **CAUTION:** Only memory boards with a green Removable LED can be removed. Do not attempt to remove any memory board with the Removable LED off.

> **CAUTION:** To prevent system failure, do not remove the memory board from the server until the board status LED stops flashing.

2. Unlock the locking switch, and open the release latch.

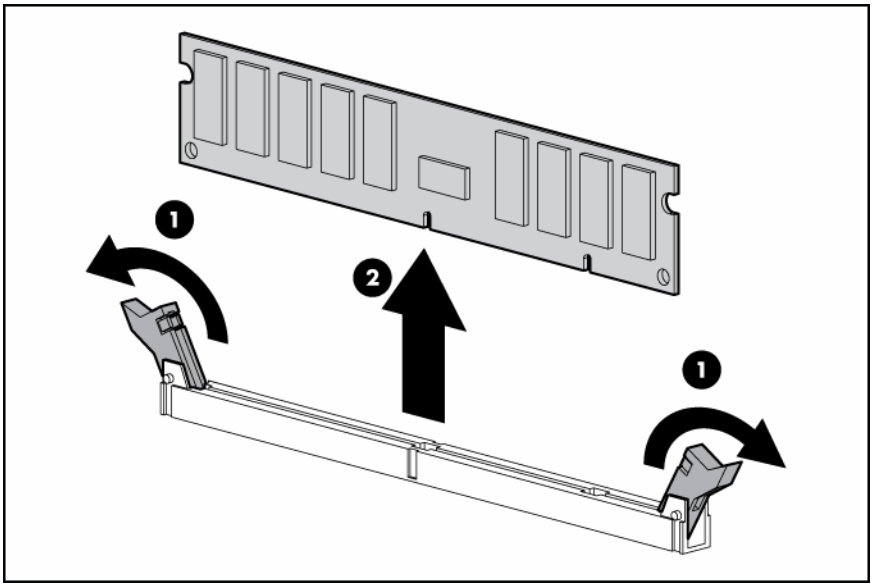
3. Use the ejector lever to pull the memory board out of the server.



NOTE: While the memory board with the failed or degraded DIMM is being replaced, the server continues to read and write from the operational memory board.

Removing DIMMs

1. Remove the memory board using the appropriate hot-replace or non-hot-plug procedure ("Removing a memory board (non-hot-plug)" on page 65).
2. Remove the DIMM.



To replace the component, reverse the removal procedure.

Diagnostic tools

SmartStart software

SmartStart is a collection of software that optimizes single-server setup, providing a simple and consistent way to deploy server configuration. SmartStart has been tested on many ProLiant server products, resulting in proven, reliable configurations.

SmartStart assists the deployment process by performing a wide range of configuration activities, including:

- Configuring hardware using embedded configuration utilities, such as RBSU and ORCA
- Preparing the system for installing "off-the-shelf" versions of leading operating system software
- Installing optimized server drivers, management agents, and utilities automatically with every assisted installation
- Testing server hardware using the Insight Diagnostics Utility ("HP Insight Diagnostics" on page 72)
- Installing software drivers directly from the CD. With systems that have internet connection, the SmartStart Autorun Menu provides access to a complete list of ProLiant system software.
- Enabling access to the Array Configuration Utility, Array Diagnostic Utility, and Erase Utility

SmartStart is included in the HP ProLiant Essentials Foundation Pack. For more information about SmartStart software, refer to the HP ProLiant Essentials Foundation Pack or the HP website (http://h18013.www1.hp.com/products/servers/management/smartstart/index.html).

SmartStart Scripting Toolkit

The SmartStart Scripting Toolkit is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The SmartStart Scripting Toolkit is designed to support ProLiant BL, ML, and DL servers. The toolkit includes a modular set of utilities and important documentation that describes how to apply these new tools to build an automated server deployment process.

Using SmartStart technology, the Scripting Toolkit provides a flexible way to create standard server configuration scripts. These scripts are used to automate many of the manual steps in the server configuration process. This automated server configuration process cuts time from each server deployed, making it possible to scale server deployments to high volumes in a rapid manner.

For more information, and to download the SmartStart Scripting Toolkit, refer to the HP website (http://www.hp.com/servers/sstoolkit).

HP Instant Support Enterprise Edition

ISEE is a proactive remote monitoring and diagnostic tool to help manage your systems and devices, a feature of HP support. ISEE provides continuous hardware event monitoring and automated notification to identify and prevent potential critical problems. Through remote diagnostic scripts and vital system

configuration information collected about your systems, ISEE enables fast restoration of your systems. Install ISEE on your systems to help mitigate risk and prevent potential critical problems.

For more information on ISEE, refer to the HP website (http://www.hp.com/hps/hardware/hw_enterprise.html).

To download HP ISEE, visit the HP website (http://www.hp.com/hps/hardware/hw_downloads.html).

For installation information, refer to the HP ISEE Client Installation and Upgrade Guide (ftp://ftp.hp.com/pub/services/hardware/info/isee_client.pdf).

Option ROM Configuration for Arrays

Before installing an operating system, you can use the ORCA utility to create the first logical drive, assign RAID levels, and establish online spare configurations.

The utility also provides support for the following functions:

- Reconfiguring one or more logical drives
- Viewing the current logical drive configuration
- Deleting a logical drive configuration
- Setting the controller to be the boot controller

If you do not use the utility, ORCA will default to the standard configuration.

For more information regarding array controller configuration, refer to the controller user guide.

For more information regarding the default configurations that ORCA uses, refer to the *HP ROM-Based Setup Utility User Guide* on the Documentation CD.

HP ROM-Based Setup Utility

RBSU is a configuration utility embedded in ProLiant servers that performs a wide range of configuration activities that can include the following:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Language selection

For more information on RBSU, see the *HP ROM-Based Setup Utility User Guide* on the Documentation CD or the HP website (http://www.hp.com/support/smartstart/documentation).

ROMPaq utility

The ROMPaq utility enables you to upgrade the system firmware (BIOS) or Lights-Out 100 firmware. To upgrade the firmware, insert a ROMPaq diskette into the diskette drive or ROMPaq USB Key into an available USB port and boot the system.

The ROMPaq utility checks the system and provides a choice (if more than one exists) of available firmware revisions.

For more information about the ROMPaq utility, see the HP website (http://www.hp.com/go/support).

System Online ROM flash component utility

The Online ROM Flash Component Utility enables system administrators to efficiently upgrade system or controller ROM images across a wide range of servers and array controllers. This tool has the following features:

- Works offline and online
- Supports Microsoft® Windows NT®, Windows® 2000, Windows Server™ 2003, Novell Netware, and Linux operating systems

IMPORTANT: This utility supports operating systems that may not be supported by the server. For operating systems supported by the server, see the HP website (http://www.hp.com/support).

- Integrates with other software maintenance, deployment, and operating system tools
- Automatically checks for hardware, firmware, and operating system dependencies, and installs only the correct ROM upgrades required by each target server

To download the tool and for more information, see the HP website (http://www.hp.com/support).

Integrated Management Log

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

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

- From within HP SIM ("HP Systems Insight Manager" on page 72)
- From within Survey Utility
- From within operating system-specific IML viewers
  - For NetWare: IML Viewer
  - For Windows®: IML Viewer
  - For Linux: IML Viewer Application
- From within the iLO 2 user interface
- From within HP Insight Diagnostics (on page 72)

For more information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack.

Integrated Lights-Out 2 technology

The iLO 2 subsystem is a standard component of selected ProLiant servers that provides server health and remote server manageability. The iLO 2 subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO 2 independent of the host server and its

operating system. The iLO 2 subsystem provides remote access to any authorized network client, sends alerts, and provides other server management functions.

Using iLO 2, you can:

- Remotely power up, power down, or reboot the host server.
- Send alerts from iLO 2 regardless of the state of the host server.
- Access advanced troubleshooting features through the iLO 2 interface.
- Diagnose iLO 2 using HP SIM through a web browser and SNMP alerting.

For more information about iLO 2 features, refer to the iLO 2 documentation on the Documentation CD or on the HP website (http://www.hp.com/servers/lights-out).

Automatic Server Recovery

ASR is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue screen, ABEND, or panic. A system fail-safe timer, the ASR timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server.

ASR increases server availability by restarting the server within a specified time after a system hang or shutdown. At the same time, the HP SIM console notifies you by sending a message to a designated pager number that ASR has restarted the system. You can disable ASR from the HP SIM console or through RBSU.

HP Systems Insight Manager

HP SIM is a web-based application that allows system administrators to accomplish normal administrative tasks from any remote location, using a web browser. HP SIM provides device management capabilities that consolidate and integrate management data from HP and third-party devices.

IMPORTANT: You must install and use HP SIM to benefit from the Pre-Failure Warranty for processors, SAS and SCSI hard drives, and memory modules.

For additional information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack or the HP SIM website (http://www.hp.com/go/hpsim).

HP Insight Diagnostics

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

HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, launch the SmartStart CD.

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

For more information or to download the utility, refer to the HP website (http://www.hp.com/servers/diags).

USB support

HP provides both standard USB support and legacy USB support. Standard support is provided by the operating system through the appropriate USB device drivers. HP provides support for USB devices before the operating system loads through legacy USB support, which is enabled by default in the system ROM. HP hardware supports USB version 1.1 or 2.0, depending on the version of the hardware.

Legacy USB support provides USB functionality in environments where USB support is normally not available. Specifically, HP provides legacy USB functionality for:

- POST
- RBSU
- Diagnostics
- DOS
- Operating environments which do not provide native USB support

For more information on ProLiant USB support, refer to the HP website (http://h18004.www1.hp.com/products/servers/platforms/usb-support.html).

Troubleshooting the system using port 85 codes

For example, if the port 85 code displays "31h," see "Processor-related port 85 codes (on page 73)" for more information.

Port 85 code	Description
3xh	Port 85 codes in this format indicate processor-related errors. See "Processor-related port 85 codes (on page 73)" for more information.
4xh	Port 85 codes in this format indicate memory-related errors. See "Memory-related port 85 codes (on page 74)" for more information.
6xh	Port 85 codes in this format indicate expansion board-related errors. See "Expansion board-related port 85 codes (on page 75)" for more information.
All other codes, including 00h, 01h, and 5xh	Port 85 codes in this range cover several areas. See the section "Miscellaneous port 85 codes (on page 76)" for more information.

Processor-related port 85 codes

Processor-related port 85 codes display in the format 3xh.

IMPORTANT: Reboot the server after completing each numbered step. If the error condition continues, proceed with the next step.

To troubleshoot processor-related error codes:

1. Bring the server to base configuration by removing all components that are not required by the server to complete POST. This process can include removing all:

- Expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42)
- Processors ("Removing a processor or processor blank" on page 34), except the processor installed in socket 1

IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

- PPMs ("Removing a PPM" on page 37), except the PPM installed in slot 1
- DIMMs ("Removing DIMMs" on page 68), except the first bank
- Hard drives ("Removing a hot-plug SAS hard drive" on page 54)
- Peripheral devices

2. Reseat the processor in socket 1.
3. Reseat the remaining processors, rebooting after each installation to identify any failed processors.

IMPORTANT: Populate the processors in the following order: 1, 2, 4, 3.

IMPORTANT: Always install a PPM when you install a processor. The system fails to boot if the PPM is missing.

4. Replace the processor in socket 1.
5. Replace the processor board, if applicable.
6. Replace the system board.

IMPORTANT: If replacing the system board or clearing NVRAM, you must re-enter the server serial number through RBSU ("Re-entering the server serial number and product ID" on page 48).

Memory-related port 85 codes

Memory-related port 85 codes display in the format 4xh.

IMPORTANT: Reboot the server after completing each numbered step. If the error condition continues, proceed with the next step.

To troubleshoot memory-related error codes:

1. Check the memory LEDs ("Memory board components and LEDs" on page 79) for any identified errors or failed DIMMs, and take corrective action.
2. Bring the server to base configuration by removing all components that are not required by the server to complete POST. This process can include removing all:
   - Expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42)
   - Processors ("Removing a processor or processor blank" on page 34), except the processor installed in socket 1

IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

- PPMs ("Removing a PPM" on page 37), except the PPM installed in slot 1
- DIMMs ("Removing DIMMs" on page 68), except the first bank
- Hard drives ("Removing a hot-plug SAS hard drive" on page 54)
- Peripheral devices

3. Reseat the remaining memory boards, rebooting after each installation to isolate any failed memory boards, if applicable.
4. Replace the DIMMs with a remaining bank of memory.
5. Replace the memory board, if applicable.
6. Replace the system board.

IMPORTANT: If replacing the system board or clearing NVRAM, you must re-enter the server serial number through RBSU ("Re-entering the server serial number and product ID" on page 48).

Expansion board-related port 85 codes

Expansion board-related port 85 codes display in the format 6xh.

IMPORTANT: Reboot the server after completing each numbered step. If the error condition continues, proceed with the next step.

To troubleshoot expansion board-related error codes:

1. Reseat all expansion boards.
2. Bring the server to base configuration by removing all components that are not required by the server to complete POST. This process can include removing all:
   - Expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42)
   - Processors ("Removing a processor or processor blank" on page 34), except the processor installed in socket 1

   IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

   - PPMs ("Removing a PPM" on page 37), except the PPM installed in slot 1
   - DIMMs ("Removing DIMMs" on page 68), except the first bank
   - Hard drives ("Removing a hot-plug SAS hard drive" on page 54)
   - Peripheral devices
3. Install the expansion boards one at a time, rebooting between each installation to isolate the failed expansion board.
4. Replace the failed expansion board, if applicable.
5. Replace the PCI riser board, if applicable.
6. Replace the system board.

IMPORTANT: If replacing the system board or clearing NVRAM, you must re-enter the server serial number through RBSU ("Re-entering the server serial number and product ID" on page 48).

Miscellaneous port 85 codes

To troubleshoot all other port 85 codes:

IMPORTANT: Reboot the server after completing each numbered step. If the error condition continues, proceed with the next step.

1. Bring the server to base configuration by removing all components that are not required by the server to complete POST. This process can include removing all:
   - Expansion boards ("Removing a non-hot-plug expansion board" on page 41, "Removing a PCI-X Hot Plug expansion board" on page 42)
   - Processors ("Removing a processor or processor blank" on page 34), except the processor installed in socket 1

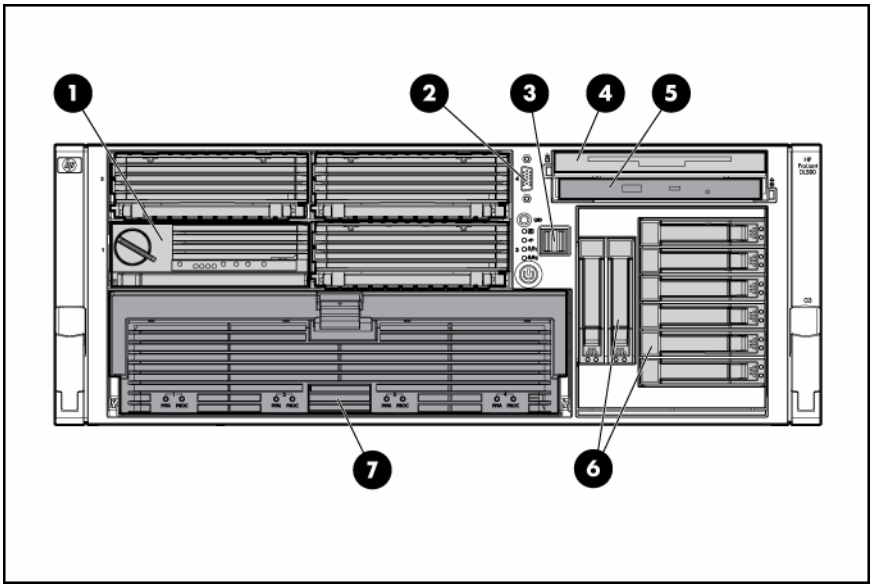
   IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

   - PPMs ("Removing a PPM" on page 37), except the PPM installed in slot 1
   - DIMMs ("Removing DIMMs" on page 68), except the first bank
   - Hard drives ("Removing a hot-plug SAS hard drive" on page 54)
   - Peripheral devices
2. Install each remaining system component, rebooting between each installation to isolate any failed components.
3. Clear the system NVRAM ("System maintenance switch" on page 86).
4. Replace the system board.

IMPORTANT: If replacing the system board or clearing NVRAM, you must re-enter the server serial number through RBSU ("Re-entering the server serial number and product ID" on page 48).

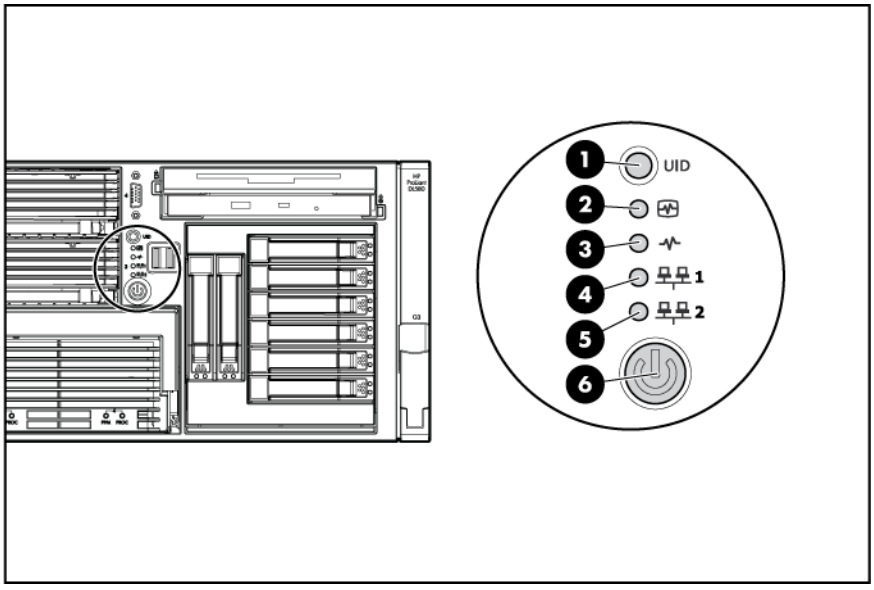
Server component identification

Front panel components



Item	Description
1	Memory board or blank
2	Video connector
3	USB connectors (two)
4	Optional multibay drive or blank
5	DVD/CD-ROM drive
6	Hard drive bay
7	Processor module

Front panel LEDs and buttons



Item	Description	Status
1	UID switch and LED	Blue = Activated Flashing blue = Server being managed remotely Off = Deactivated
2	Internal system health LED	Green = Normal (system on) Flashing amber = System health is degraded Flashing red = System health is critical Off = Normal (system off)
3	External system health LED	Green = Normal (system on) Flashing amber = System health is degraded Flashing red = System health is critical Off = Normal (system off)
4	NIC 1 link/activity LED	Green = Linked to network Flashing green = Linked with activity on the network Off = No network connection
5	NIC 2 link/activity LED	Green = Linked to network Flashing green = Linked with activity on the network Off = No network connection
6	Power on/Standby button and LED	Amber = System has AC power and is in standby mode Green = System has AC power and is turned on Off = System has no AC power

Memory board components and LEDs

Error indicators remain illuminated when the system is powered off so that the status of the LEDs can still be seen. This behavior matches the behavior of all the other error indicators in the server.

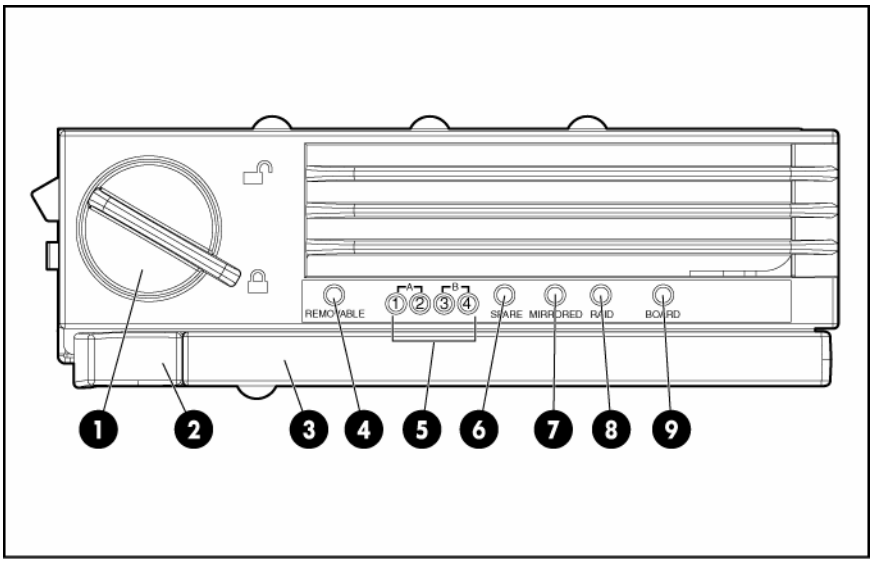
The indicators are only cleared in the following situations:

- If the locking switch is locked after the board is reinstalled
- If the server is rebooted
- If the board is removed from the server

△ **CAUTION:** When the memory board locking switch is unlocked in a mode that does not support hot-add or hot-replace capabilities, audio alarms and visual alerts occur. Removing the memory board at this point causes server failure.

To end the audio alarms and visual alerts, move the memory board locking switch back to the locked position. This action does not result in data corruption or server failure.

If removal of a single memory board is required and it is the only memory board, power down the server and make the necessary memory changes.



Item	Description	Status
1	Locking switch	N/A
2	Release latch	N/A
3	Ejector lever	N/A
4	Removable	Off = Do not remove memory board if server is powered on Green = Memory board can be safely removed
5	DIMM LEDs (1–4)	Off = Normal or DIMM not installed Amber = Uncorrectable error detected or correctable error threshold reached Flashing amber = DIMM configuration error

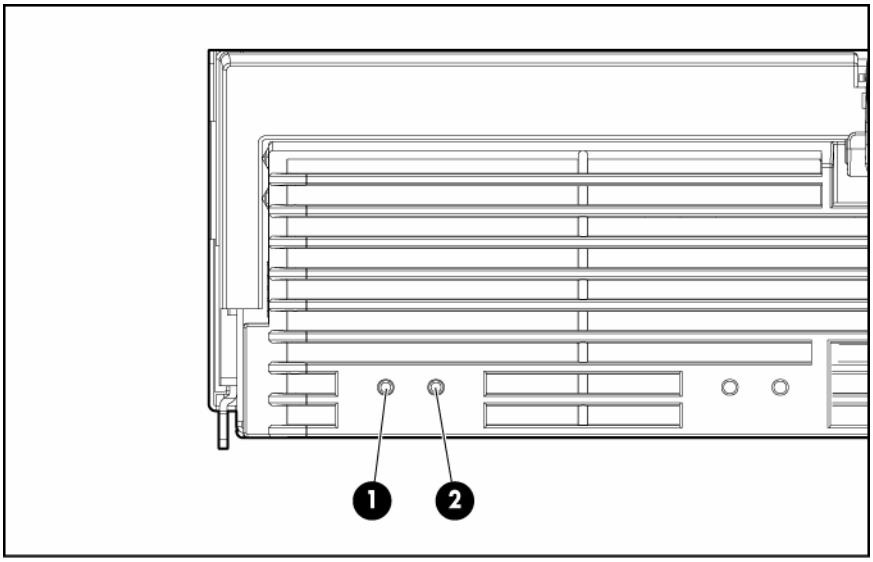
Item	Description	Status
6	Spare	Off = Board not online or board not configured for Online Spare Memory mode Amber = Correctable error threshold reached; server is in degraded Online Spare Memory mode Flashing amber = Memory configuration error* Green = Online Spare Memory mode
7	Mirrored	Off = Board not online or board not configured for Hot-Plug Mirrored Memory mode Amber = Server is in degraded Hot-Plug Mirrored Memory mode Flashing amber = Memory configuration error* Green = Hot-Plug Mirrored Memory mode
8	RAID	Off = Board not online or board not configured for Hot-Plug RAID Memory mode Amber = Server is in degraded Hot-Plug RAID Memory mode Flashing amber = Memory configuration error* Green = Hot-Plug RAID Memory mode
9	Board	Off = Power off or locking switch unlocked Amber = Memory error detected Flashing amber = Memory configuration error* Flashing green = Board is rebuilding Green = Normal

* AMP configuration errors occur when the current memory configuration is not valid for the configured AMP mode:

- If the mode selected is the desired mode, modify the DIMM or board configuration to support the desired mode. For more information, refer to "Memory options ("Memory overview" on page 58)."
- If the mode selected is not the desired mode, run RBSU and change the AMP mode. For more information, refer to the section "HP ROM-Based Setup Utility (on page 70)."

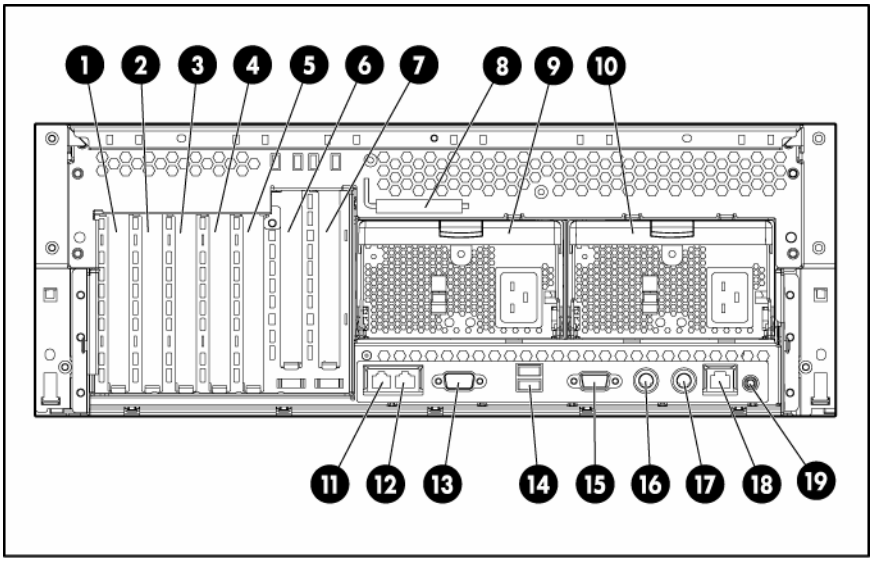
NOTE: If the Spare, Mirrored, and RAID LEDs are off, the server is in Advanced ECC mode. Refer to "HP ROM-Based Setup Utility (on page 70)" for more information.

Processor module LEDs



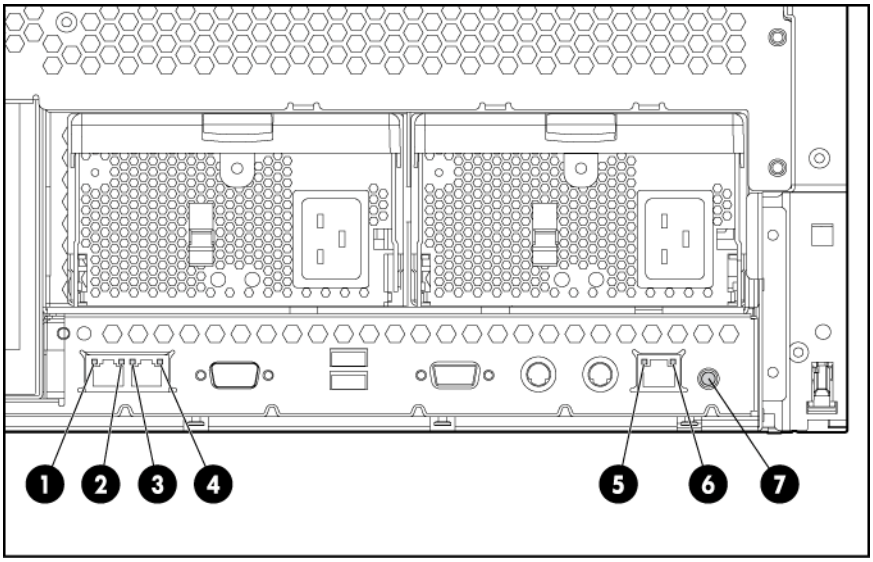
PPM LED (1)	Processor LED (2)	External health LED	Description
Off	Off	Off	One of the following conditions exist: • No AC power present • Normal
Off	Amber	Flashing amber	Pre-failure error threshold exceeded; LEDs will clear after the next reboot
Off	Amber	Flashing red	One or more of the following conditions exist: • The processor was replaced and the LEDs will clear after the next reboot • Processor failed
Off	Flashing amber	Flashing red	Processor configuration error detected
Amber	Off	Flashing red	PPM failed
Flashing amber	Off	Flashing red	One or more of the following conditions exist: • PPM not installed • PPM configuration error detected

Rear panel components



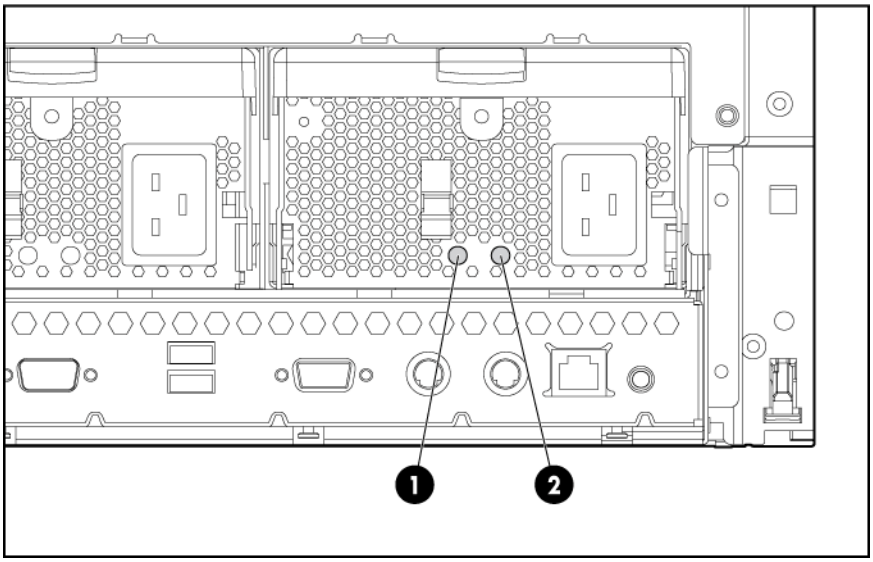
Item	Description	Item	Description
1	PCI Express non-hot-plug expansion slot 7	11	NIC connector 2
2	PCI Express non-hot-plug expansion slot 6	12	NIC connector 1
3	PCI Express non-hot-plug expansion slot 5	13	Serial connector
4	PCI Express non-hot-plug expansion slot 4	14	USB connectors
5	PCI-X non-hot-plug slot 3, 64-bit/133-MHz	15	Video connector
6	Optional PCI-X Hot Plug or optional PCI Express non-hot-plug expansion slot 2	16	Keyboard connector
7	Optional PCI-X Hot Plug or optional PCI Express non-hot-plug expansion slot 1	17	Mouse connector
8	T-15 Torx screwdriver	18	iLO 2 NIC
9	Optional power supply (redundant)	19	UID
10	Power supply (primary)	—	—

Rear panel LEDs and buttons



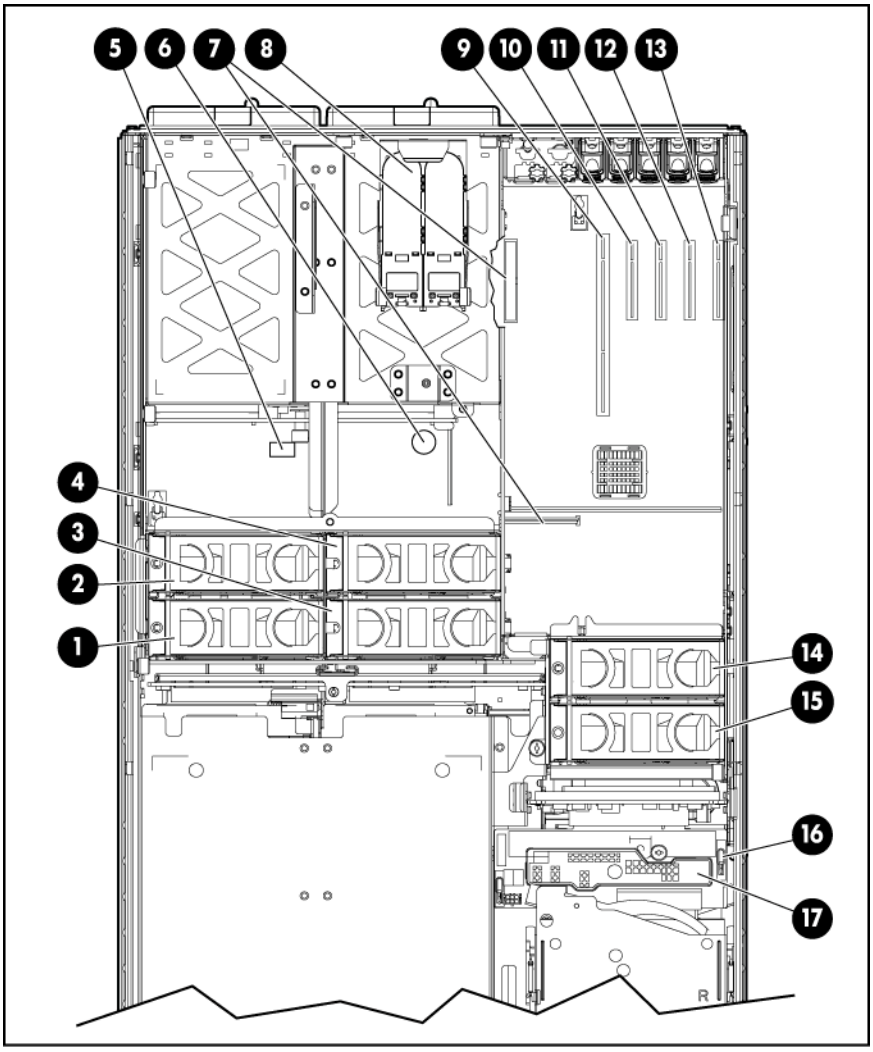
Item	Description	LED color	Status
1	NIC 1 Activity LED	Green	On or flashing = Network activity Off = No network activity
2	NIC 1 Link LED	Green	On = Linked to network Off = Not linked to network
3	NIC 2 Activity LED	Green	On or flashing = Network activity Off = No network activity
4	NIC 2 Link LED	Green	On = Linked to network Off = Not linked to network
5	iLO 2 NIC Activity LED	Green	On or flashing = Network activity Off = No network activity
6	iLO 2 NIC Link LED	Green	On = Linked to network Off = Not linked to network
7	UID LED	Blue	On = Activated Flashing = Server remotely managed Off = Deactivated

Power supply LEDs



Fail LED 1 (amber)	Power LED 2 (green)	Description
Off	Off	No AC power to any power supply
Flashing	Off	Power supply failure (over current)
On	Off	No AC power to this power supply
Off	Flashing	• AC power present • Standby mode
Off	On	Normal

System board components



Item	Description	Item	Description
1	Fan 1	10	PCI Express non-hot-plug expansion slot 4
2	Fan 2	11	PCI Express non-hot-plug expansion slot 5
3	Fan 3	12	PCI Express non-hot-plug expansion slot 6
4	Fan 4	13	PCI Express non-hot-plug expansion slot 7
5	System maintenance switch	14	Fan 6
6	System battery	15	Fan 5

Item	Description	Item	Description
7	Connectors for one of the following: • PCI-X Hot Plug mezzanine option • PCI Express x4 mezzanine option • PCI Express x8 mezzanine option	16	Boot device selector switch (default = FLP TOP)
8	Battery packs and connectors for BBWC (optional)	17	Systems Insight Display
9	PCI-X non-hot-plug expansion slot 3, 64-bit/133-MHz	—	—

System maintenance switch

The system maintenance switch (SW1) is an eight-position switch that is used for system configuration. The default position for all eight positions is Off.

Position	Description	Function
S1	iLO 2 Security	Off = iLO 2 security is enabled On = iLO 2 security is disabled
S2	Configuration lock	Off = System configuration can be changed On = System configuration is locked
S3	Reserved	Reserved
S4	Reserved	Reserved
S5	Password protection override	Off = No function On = Clears power-on password and administrator password
S6	Invalidate configuration	Off = Normal On = Clears NVRAM
S7	Reserved	Reserved
S8	Reserved	Reserved

Boot device selector switch

The boot device selector switch setting determines the device access order of the multibay drives in the server. The default setting for the boot device selector switch is FLP TOP.

When the boot device selector switch is set to FLP TOP, the optical drive in the bottom bay is designated as the primary optical drive. The diskette drive in the top bay is bootable. The server cannot boot from a diskette drive in the bottom bay when the boot device selector switch is set to FLP TOP.

When the boot device selector switch is set to FLP BOT, the optical drive in the top bay is designated as the primary optical drive. The diskette drive in the bottom bay is bootable. The server cannot boot from a diskette drive in the top bay when the boot device selector switch is set to FLP BOT.

NOTE: If two optical drives are installed in the server, the server will first attempt to boot from the primary optical drive ("Boot device selector switch" on page 86). The boot device selector switch setting determines which drive is the primary optical drive.

Switch setting	Description
FLP TOP (default)	Diskette drive in top bay is bootable Primary optical drive in bottom bay is bootable
FLP BOT	Primary optical drive in top bay is bootable Diskette drive in bottom bay is bootable

Setting the switch to view port 85 codes

To change the display on the Systems Insight Display to view port 84 and 85 codes ("Troubleshooting the system using port 85 codes" on page 73):

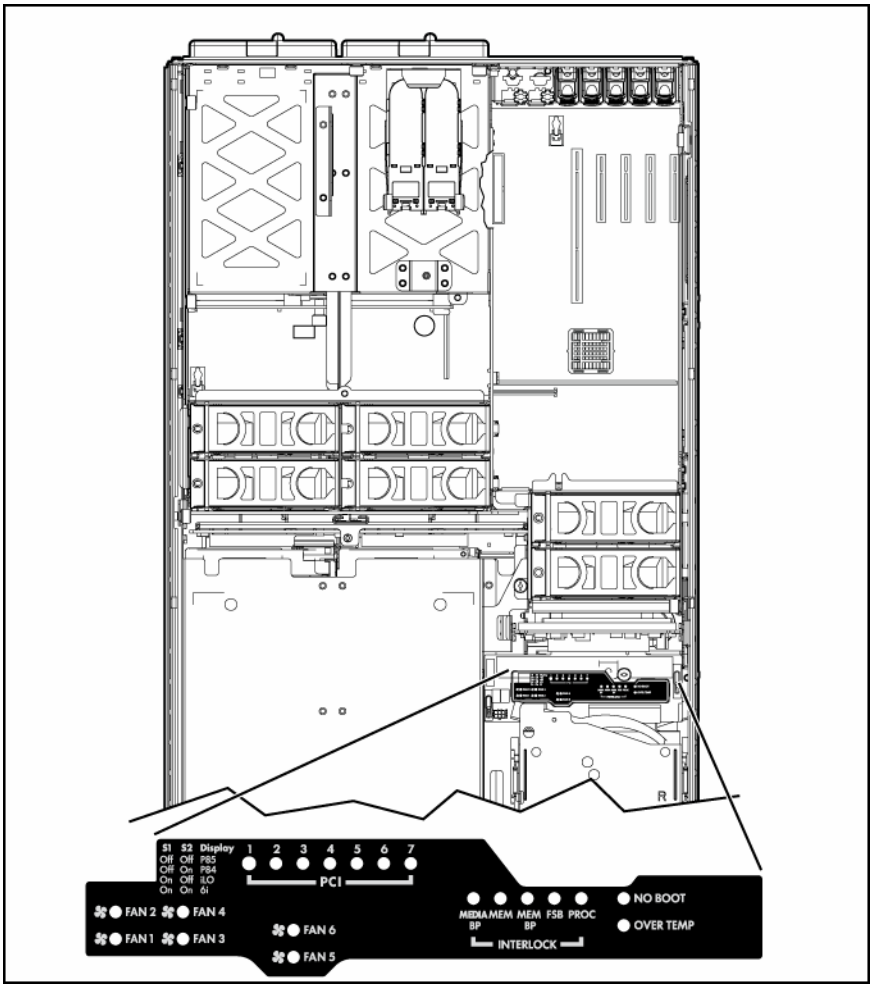
1. Extend the server from the rack ("Extending the server from the rack" on page 27).
2. Remove the access panel ("Removing the access panel" on page 29).
3. Locate the switch on the Systems Insight Display.
4. Set the switch to the P85 position to view port 85 codes.

Systems Insight Display LEDs

The front panel health LEDs indicate only the current hardware status. In some situations, HP SIM might report server status differently than the health LEDs because the software tracks more system attributes.

The amber Systems Insight Display LEDs are located on the media board. In normal operations, all of the LEDs are off unless one of the components fails.

NOTE: The system management driver must be installed for the internal health LED to provide pre-failure and warranty conditions.

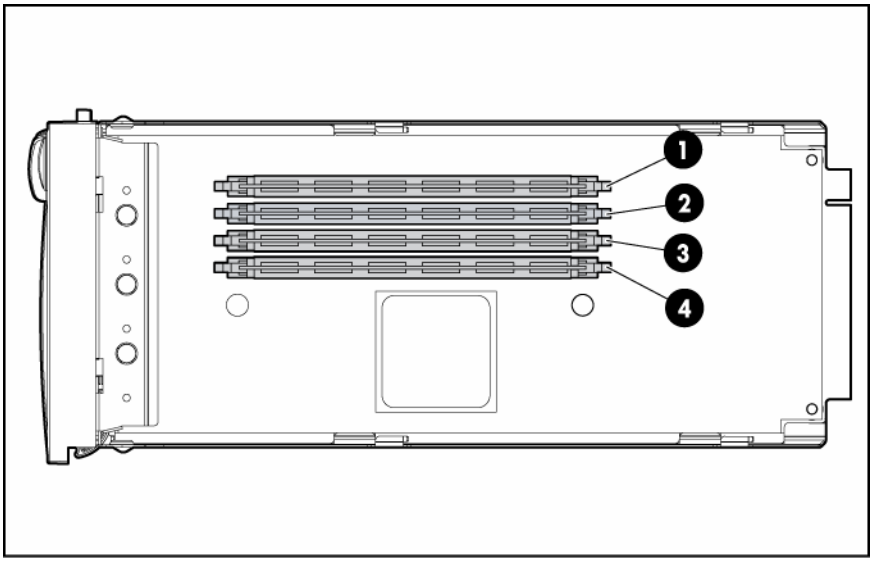


LED	Description
Fan X	One or more of the following conditions exist: • A fan is missing or not properly installed. • A fan failed.
PCI X	One or more of the following conditions exist: • A PCI address parity error was detected on the numbered PCI slot. • A PCI data parity error was detected on the numbered PCI slot.
MEDIA BP	The media backplane is missing or not properly installed.
MEM	A memory board is not properly installed.
MEM BP	A memory backplane is missing or not properly installed.
FSB	One or more of the following conditions exist: • A processor or PPM is missing or not properly installed. • An FSB configuration error was detected.
PROC	A processor is missing or not properly installed.
OVER TEMP	The internal temperature has exceeded operating levels.
NO BOOT	A "no boot" condition was detected.
P84	Switch set to display port 84 codes.

LED	Description
P85	Switch set to display port 85 codes ("Troubleshooting the system using port 85 codes" on page 73).

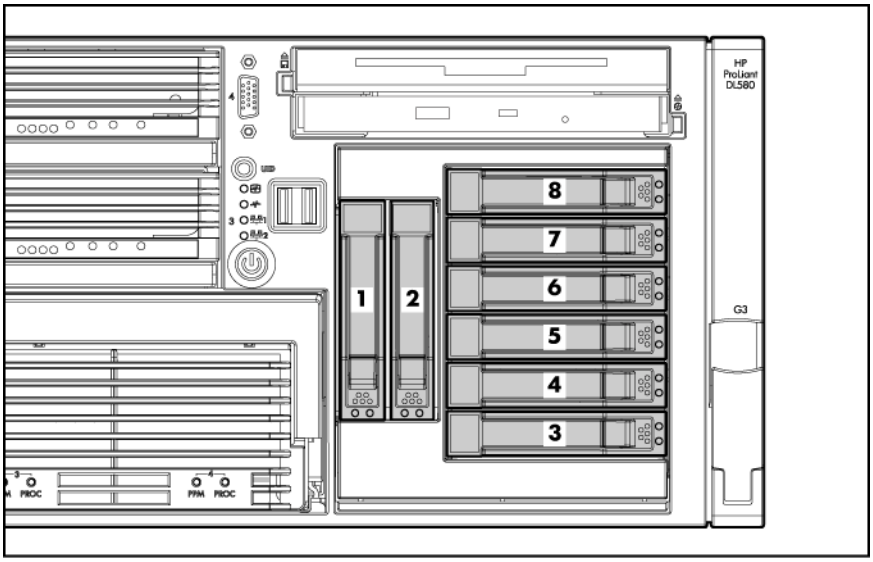
See the *HP ProLiant DL580 Generation 4 Maintenance and Service Guide* on the Documentation CD for more information. about troubleshooting using port 85 codes.

DIMM slot locations



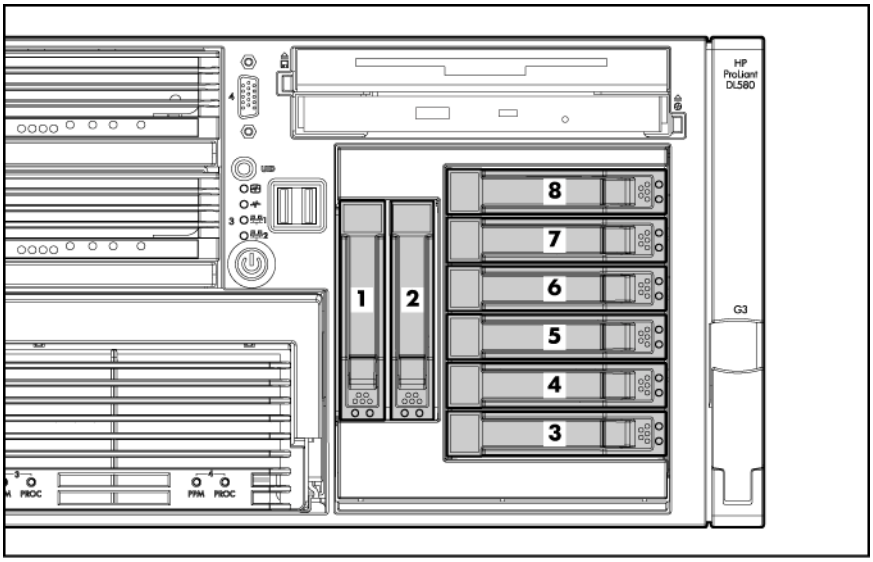
Item	Description	Bank
1	DIMM slot 1	A
2	DIMM slot 2	A
3	DIMM slot 3	B
4	DIMM slot 4	B

SATA or SAS drive numbers



The server supports eight SAS or SATA hot-plug hard drives. See "SAS and SATA hard drive guidelines (on page 90)" for information about installing the hard drives.

SAS and SATA hard drive guidelines

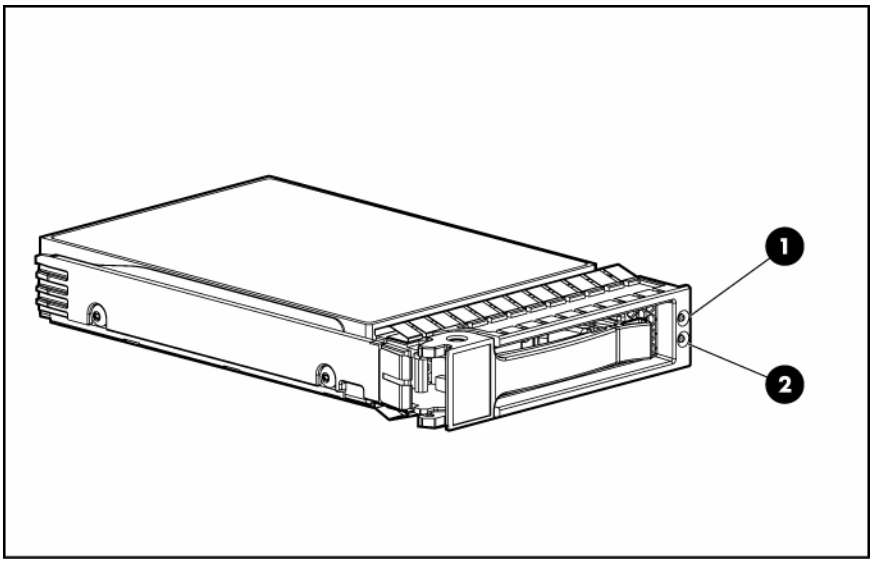


When adding SAS or SATA hard drives to the server, observe the following general guidelines:

- The server supports eight SAS or SATA hot-plug hard drives.
- The system automatically sets all drive numbers.
- If only one hard drive is used, install it in the bay with the lowest number.
- Hard drives must be SFF types.
- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together in the same drive array.

NOTE: ACU does not support mixing SAS and SATA drives in the same logical volume.

SATA or SAS hard drive LEDs



Item	LED description	Status
1	Fault/UID status	Amber = Drive failure Flashing amber = Fault-process activity Blue = Unit identification is active Off = No fault-process activity
2	Online/Activity status	Green = Drive activity Flashing green = High activity on the drive or drive is being configured as part of an array Off = No drive activity

SAS and SATA hard drive LED combinations

Online/activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive; it also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive is operating normally, and it has been selected by a management application.
On	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online, but it is not active currently.

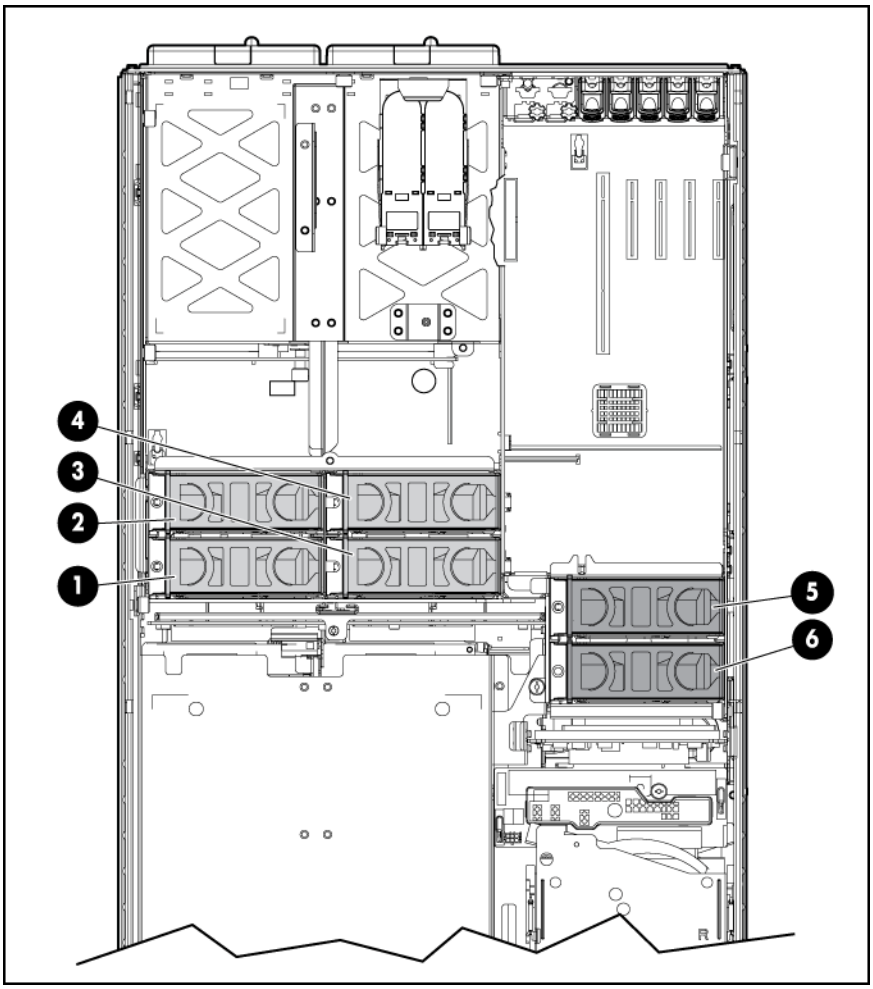
Online/activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
Flashing regularly (1 Hz)	Amber, flashing regularly (1 Hz)	**Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.** The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not replace the drive until the expansion or migration is complete.
Flashing regularly (1 Hz)	Off	**Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.** The drive is rebuilding, or it is part of an array that is undergoing capacity expansion or stripe migration.
Flashing irregularly	Amber, flashing regularly (1 Hz)	The drive is active, but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing irregularly	Off	The drive is active, and it is operating normally.
Off	Steadily amber	A critical fault condition has been identified for this drive, and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

Fan locations

The server is shipped with six system fans. Each fan is hot-swappable and independently controlled. The fans are distributed into two zones to control thermal conditions within the server.

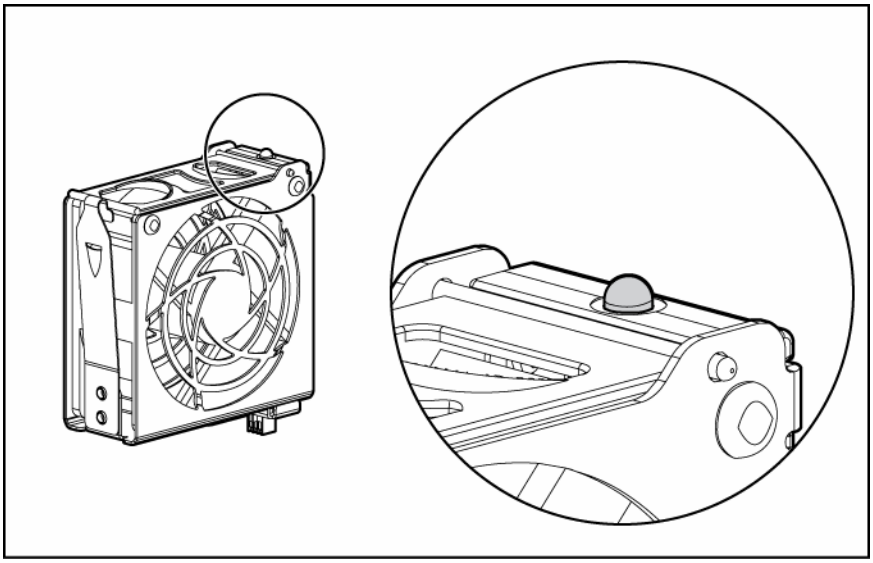
- Zone 1 contains four fans (three, plus one redundant) to control the temperature in the processor module area.
- Zone 2 contains two fans (one, plus one redundant) to control the temperature in the hard drive bay area.

This fan configuration allows the server to continue operating in non-redundant mode if a single fan fails in either zone. If the system detects two fan failures in the same zone, the server shuts down to avoid thermal damage.



Item	Description	Zone
1	Fan 1	1
2	Fan 2	1
3	Fan 3	1
4	Fan 4	1
5	Fan 6	2
6	Fan 5	2

Hot-plug fan LEDs



Status
Green = Operating normally
Amber = Failed
Off = No power

Server cabling

Storage device cabling guidelines

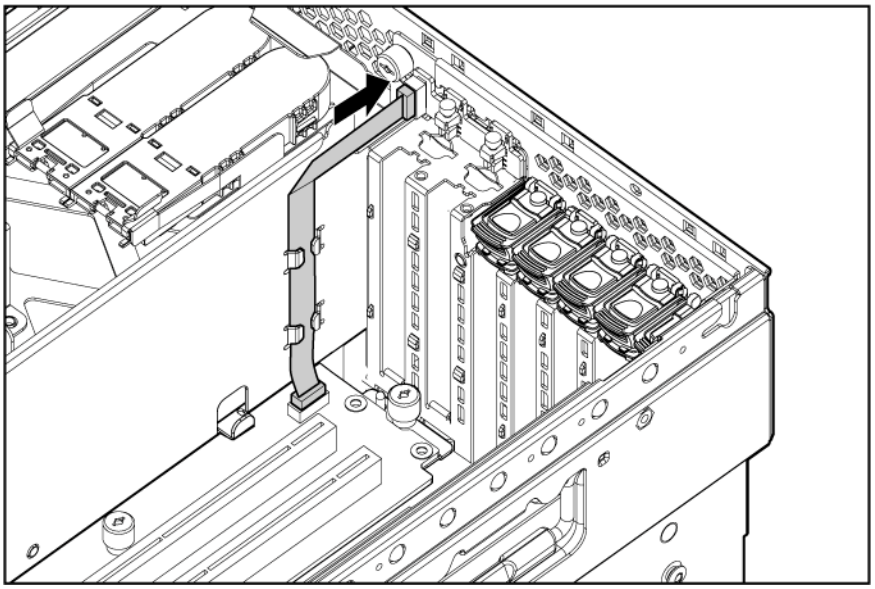
CAUTION: To prevent damage to the equipment, be sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before installing devices.

CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

PCI-X Hot Plug mezzanine cabling

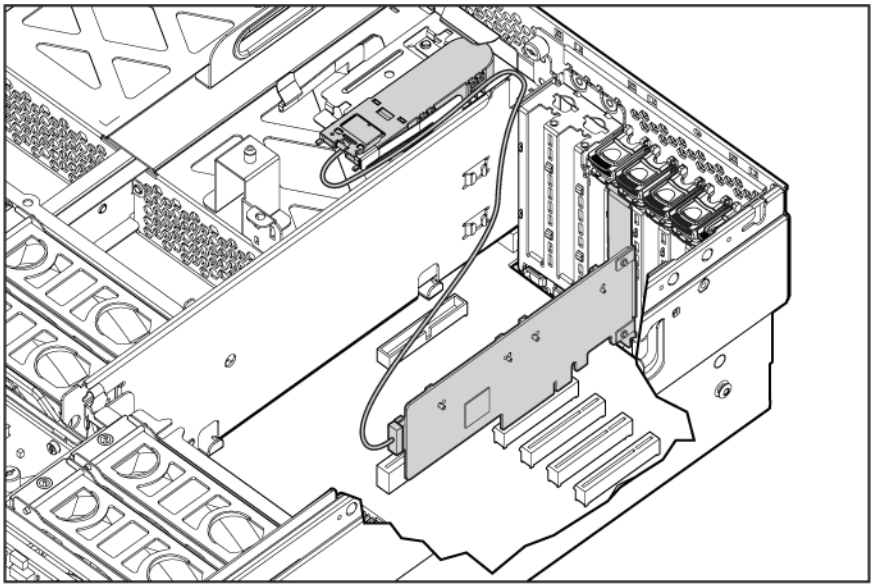
The server supports an optional PCI-X Hot Plug mezzanine board that provides hot-plug capability for two expansion slots. A ribbon cable connects the PCI-X Hot Plug button to the PCI-X Hot Plug mezzanine board.

CAUTION: When routing cables, always be sure that the cables are not in a position where they can be pinched or crimped.



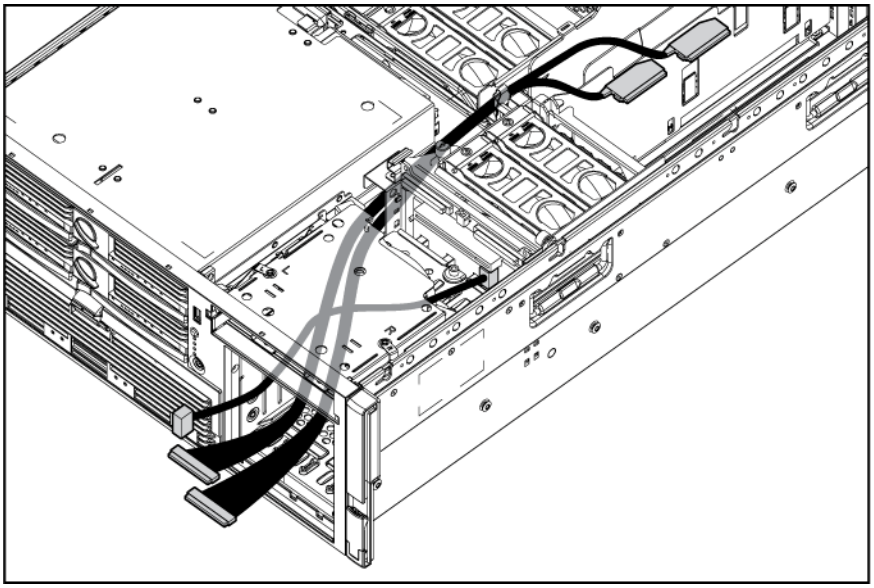
BBWC cabling

CAUTION: When routing cables, always be sure that the cables are not in a position where they can be pinched or crimped.

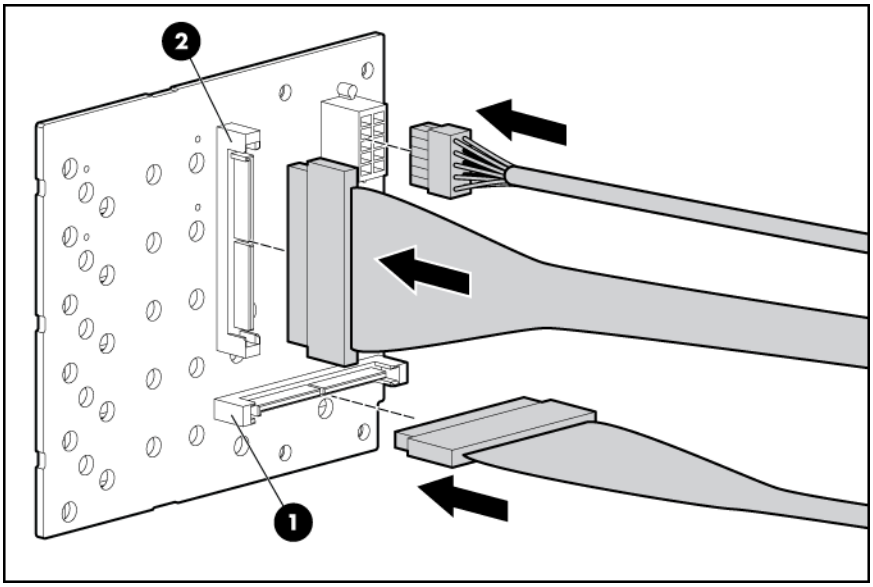


Hot-plug SAS and SATA hard drive cabling

△ **CAUTION:** When routing cables, always be sure that the cables are not in a position where they can be pinched or crimped.

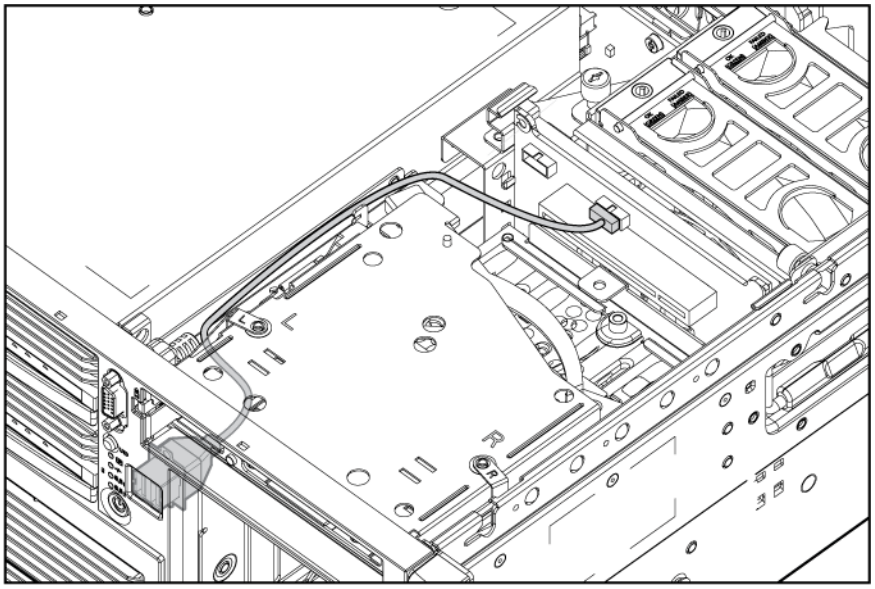


NOTE: Port 1 supports hard drives 1 through 4. Port 2 supports hard drives 5 through 8. If you are using a single cable SAS controller, connect the cable to port 1.

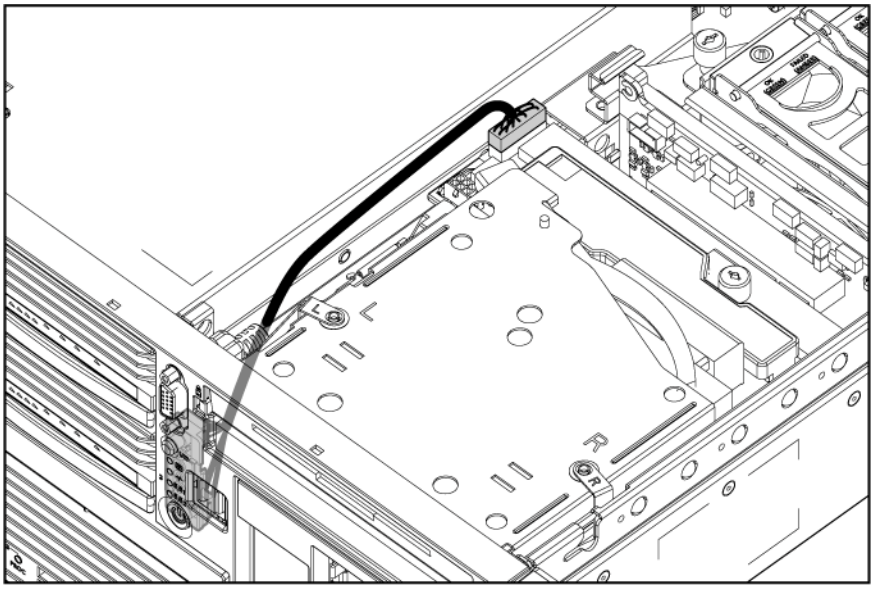


Front panel USB connector cable assembly

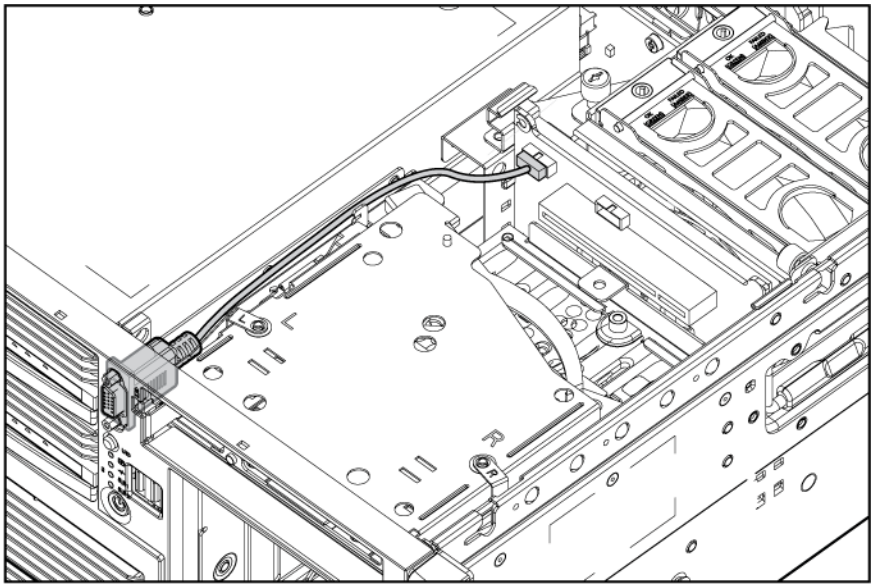
The USB cable connects the front panel USB connector to the media backplane.



Power switch cable assembly



Front panel video connector cabling



Specifications

Environmental specifications

Specification	Value
Temperature range*	
Operating	10°C to 35°C (50°F to 95°F)
Shipping	-40°C to 70°C (-40°F to 158°F)
Maximum wet bulb temperature	28°C (82.4°F)
Relative humidity (noncondensing)**	
Operating	10% to 90%
Non-operating	5% to 95%

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 300 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed.
** Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Server specifications

Specification	Value
Dimension	—
Height	17.6 cm (6.94 in)
Depth	67.3 cm (26.5 in)
Width	46.3 cm (19.0 in)
Weight (maximum)	47.6 kg (105 lb)
Weight (no drives installed)	36.3 kg (80 lb)
Input requirement	—
Rated input voltage	100–127 VAC 200–240 VAC
Rated input frequency	50–60 Hz
Rated input current	@ 100 VAC–12A @ 200 VAC–8A
Rated input power	@100 VAC–1161 W @200 VAC–1598 W
BTUs per hour	@100 VAC–3960 BTU @200 VAC–5450 BTU
Power supply output	—

Specification	Value
Power supply output	910 W (low line) 1300 W (high line)

Hot-plug power supply calculations

For hot-plug power supply specifications and calculators to determine electrical and heat loading for the server, refer to the HP Enterprise Configurator website (http://h30099.www3.hp.com/configurator/).

Technical support

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
- Product identification number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, see the HP US service locator webpage (http://www.hp.com/service_locator).
- In other locations, see the Contact HP worldwide (in English) webpage (http://welcome.hp.com/country/us/en/wwcontact.html).

For HP technical support:

- In the United States, for contact options see the Contact HP United States webpage (http://welcome.hp.com/country/us/en/contact_us.html). To contact HP by phone:
  - 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, refer to the HP website (http://www.hp.com).
- In other locations, see the Contact HP worldwide (in English) webpage (http://welcome.hp.com/country/us/en/wwcontact.html).

Acronyms and abbreviations

ABEND

abnormal end

ACU

Array Configuration Utility

AMP

Advanced Memory Protection

ASR

Automatic Server Recovery

BBWC

battery-backed write cache

BIOS

Basic Input/Output System

BP

backplane

CSA

Canadian Standards Association

CSR

Customer Self Repair

DDR

double data rate

DDR2

double data rate-2

DIMM

dual inline memory module

DRAM

dynamic random access memory

ECC

error checking and correcting

G4

Generation 4

IEC

International Electrotechnical Commission

iLO

Integrated Lights-Out

IML

Integrated Management Log

ISEE

Instant Support Enterprise Edition

KVM

keyboard, video, and mouse

LED

light-emitting diode

NEMA

National Electrical Manufacturers Association

NFPA

National Fire Protection Association

NIC

network interface controller

NiMH

nickel metal hydride

NVRAM

non-volatile memory

ORCA

Option ROM Configuration for Arrays

OS

operating system

PCI

peripheral component interface

PCI Express

Peripheral Component Interconnect Express

PCI-X

peripheral component interconnect extended

PCIe

peripheral component interconnect express

PDU

power distribution unit

POST

Power-On Self Test

PPM

processor power module

PSP

ProLiant Support Pack

RAID

redundant array of inexpensive (or independent) disks

RBSU

ROM-Based Setup Utility

RDP

Rapid Deployment Pack

ROM

read-only memory

SAS

serial attached SCSI

SATA

serial ATA

SDRAM

synchronous dynamic RAM

SFF

small form-factor

SIM

Systems Insight Manager

SNMP

Simple Network Management Protocol

TMRA

recommended ambient operating temperature

UID

unit identification

UPS

uninterruptible power system

USB

universal serial bus

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