

# HP ProLiant DL385 G6 Server Maintenance and Service Guide



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### **Intended audience**

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.

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# 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 Agréé 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 spedisirà 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 facultativa. 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 garantievoorzieningen 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

período, geralmente cinco (5) dias úteis, retornar ao HP. O componente defeituoso deve ser enviado com a documentação correspondente no material de transporte fornecido. Caso contrário, o HP cobrará o custo do componente substituto e o frete. O cliente pagará o custo do frete para o componente substituto e o frete de retorno. O HP pagará o custo do frete para o componente defeituoso e o frete de retorno.

Entre em contato com um parceiro de serviço para obter mais informações sobre o programa de reparo feito pelo cliente do HP. Informações sobre parceiros de serviço encontram-se no site do HP (<http://www.hp.com/go/selfrepair>).

## Garantia de Serviço "Parts Only"

É possível que a garantia do HP inclua apenas o serviço de garantia "Parts Only". De acordo com as condições da garantia de serviço "Parts Only", o HP fornecerá gratuitamente componentes substitutos.

Para o serviço de garantia "Parts Only", a substituição por componentes de serviço é obrigatória. Se o cliente solicitar a substituição, serão cobrados os custos de frete e mão-de-obra.

## Reparo feito pelo cliente

Os produtos do 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, o HP (ou fornecedores/parceiros de serviço do 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 o HP substitua essas peças, serão cobrados os custos de frete 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 o 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 do HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, o 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 do HP para que um técnico o ajude por telefone. O HP especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida ao HP. Nos casos em que isso for necessário, é preciso enviar a peça com defeito ao 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 contrário, o HP poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, o HP paga todos os custos de frete 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 do HP, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site do 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の修理受付窓口へ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.

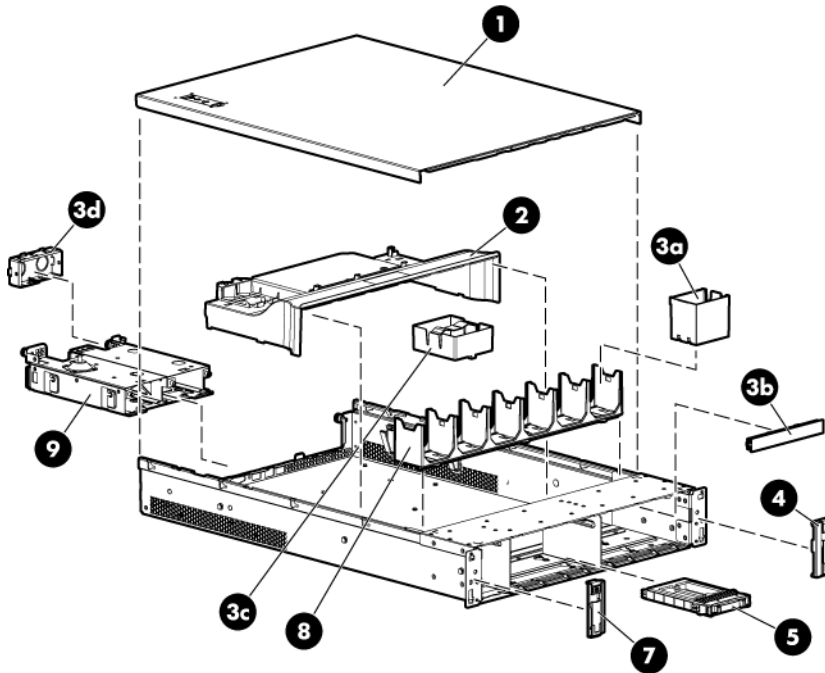
## 부품 제공 보증 서비스

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 5)
1	Access panel	463177-001	507685-001	Mandatory <sup>1</sup>
2	Air baffle	463181-001	496061-001	Mandatory <sup>1</sup>
3	Hardware kit	—	496058-001	Mandatory <sup>1</sup>
	a) Fan blank	507009-001	—	—
	b) Optical blank	505953-001	—	—
	c) Heatsink blank	507010-001	—	—
	d) Power supply blank	499244-001	—	—
	e) PCI expansion slot blank, full-length*	507011-001	—	—
	f) PCI expansion slot blank, short, low-profile*	507012-001	—	—
	g) PCI retainer*	509084-001	—	—
	h) PCI retainer, top*	509085-001	—	—
	i) PCI retainer, end*	509086-001	—	—



Item	Description	Assembly part number	Spare part number	Customer self repair (on page 5)
	j) PCI retainer, removable*	509087-001	—	—
	k) T-10/T-15 Torx screwdriver holder	373134-001	—	—
	l) Power cord retainer clip	352993-001	—	—
4	Front right bezel	507415-001	507689-001	Mandatory <sup>1</sup>
5	Hard drive blank, SFF	376383-002	392613-001	Mandatory <sup>1</sup>
6	Hard drive blank, LFF*	336461-001	389015-001	Mandatory <sup>1</sup>
7	Front left bezel	493297-001	496080-001	Mandatory <sup>1</sup>
8	Fan cage	463180-001	496067-001	Mandatory <sup>1</sup>
9	Power supply cage assembly	463179-001	496063-001	Optional <sup>2</sup>
10	Hard drive blank, slimline interlock*	336461-001	389015-001	Mandatory <sup>1</sup>
11	Return kit, pack box, and cushions*	—	289545-001	Mandatory <sup>1</sup>

\*Not shown

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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".

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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。

<sup>2</sup>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。

<sup>3</sup>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。

<sup>1</sup>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。

<sup>2</sup>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。

<sup>3</sup>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”。

<sup>1</sup>Mandatory: 強制的 — 客戶自行維修所使用的零件是強制的。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。

<sup>2</sup>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，則可能也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。

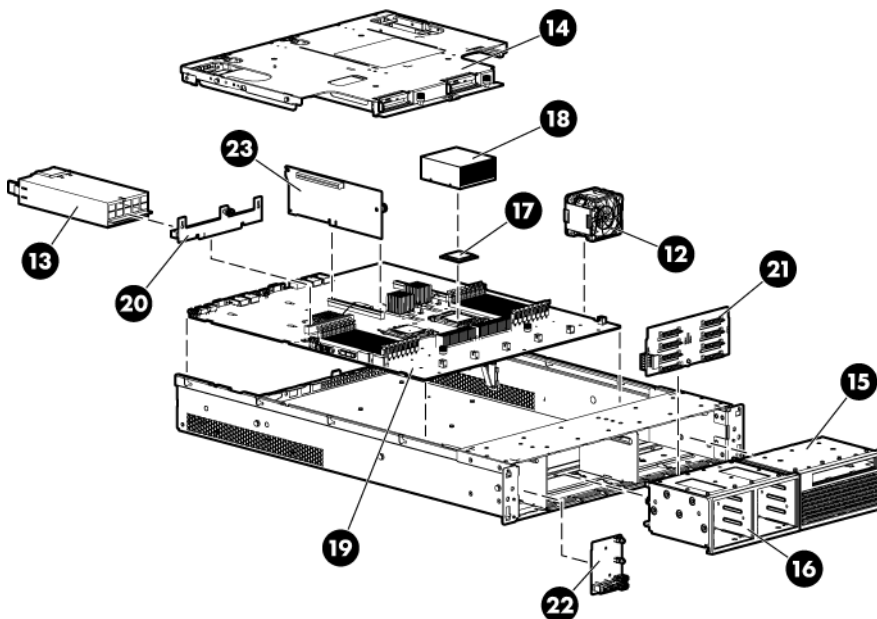
<sup>3</sup>No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

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

<sup>2</sup> 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.

<sup>3</sup> 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 5)
	<b>System components</b>			
12	Hot-plug fan	463172-001	496066-001	Mandatory <sup>1</sup>
13	Hot-plug power supplies	—	—	—
	a) 460 W	499249-001	536404-001	Mandatory <sup>1</sup>
	b) 750 W*	506821-001	511778-001	Mandatory <sup>1</sup>
	c) 1200 W*	490594-001	498152-001	Mandatory <sup>1</sup>
	d) 1200 W DC*	444049-001	451816-001	Mandatory <sup>1</sup>
14	PCI riser cage, with non-hot-plug PCIe riser	463170-001	496060-001	Optional <sup>2</sup>
15	Optical drive cage	463175-001	496076-001	Mandatory <sup>1</sup>
16	Hard drive cage	—	—	—
	a) SFF hard drive cage	463173-001	496074-001	Mandatory <sup>1</sup>
	b) LFF hard drive cage*	463174-001	496075-001	Mandatory <sup>1</sup>
17	Processor	—	—	—
	a) 2.2-GHz, AMD Opteron™ Model 2427**	539717-003	573871-001	Optional <sup>2</sup>
	b) 2.4-GHz, AMD Opteron™ Model 2431* **	539717-002	576388-001	Optional <sup>2</sup>
	c) 2.6-GHz, AMD Opteron™ Model 2435* **	539717-001	573870-001	Optional <sup>2</sup>
	d) 2.1-GHz, AMD Opteron™ Model 2425HE* **	539684-001	572549-001	Optional <sup>2</sup>
18	Processor heatsink, thermal grease, and alcohol pad	469886-001	496064-001	Optional <sup>2</sup>
	<b>Boards</b>			
19	System board assembly	573162-001	577426-001	Optional <sup>2</sup>
20	Power supply backplane	462954-001	496062-001	Optional <sup>2</sup>
21	Hard drive backplane	—	—	—
	a) SAS backplane	451283-001	507690-001	Optional <sup>2</sup>
	b) 6-bay hard drive backplane*	457174-002	577427-001	Optional <sup>2</sup>
22	Systems Insight Display	451281-001	496073-001	Mandatory <sup>1</sup>
23	Controller board	013233-001	462919-001	Mandatory <sup>1</sup>
24	PCI riser boards			
	a) PCI-X*	451279-001	496077-001	Mandatory <sup>1</sup>
	b) PCIe*	451280-001	496078-001	Mandatory <sup>1</sup>
	c) PCI*	488898-001	507691-001	Mandatory <sup>1</sup>
	<b>Memory</b>			
25	DIMMs	—	—	—
	a) 1-GB, PC2-6400 ECC RoHS*	499275-061	501156-001	Mandatory <sup>1</sup>

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 5)
	b) 2-GB, PC2-6400 ECC RoHS*	499276-061	501157-001	Mandatory <sup>1</sup>
	c) 4-GB, PC2-6400 ECC RoHS*	499277-061	501158-001	Mandatory <sup>1</sup>
	d) 8-GB, PC2-5300 registered DDR2*	405478-071	432671-001	Mandatory <sup>1</sup>
	<b>Cables</b>			
26	SAS backplane cable, 83.8 cm (33.0 in)*	463184-001	496070-001	Mandatory <sup>1</sup>
27	SATA cable*	484355-007	579225-001	Mandatory <sup>1</sup>
28	I/O cable*	463182-001	496072-001	Mandatory <sup>1</sup>
29	HD power cable*	463184-002	514217-001	Mandatory <sup>1</sup>
30	AC power cord*	142263-001	142258-001	Mandatory <sup>1</sup>
31	Battery cable, 24 in*	458943-003	488138-001	Mandatory <sup>1</sup>
	<b>Rack mounting hardware</b>			
32	Rack mounting hardware kit*	487267-001	359254-001	Mandatory <sup>1</sup>
33	Rack mounting hardware kit, LFF*	491732-001	574898-001	Optional <sup>2</sup>
34	Rack mounting hardware kit, SFF*	487267-001	574765-001	Optional <sup>2</sup>
	<b>Miscellaneous</b>			
35	Battery, 3.3-V, lithium*	166899-001	153099-001	Mandatory <sup>1</sup>
36	Power supply, 48V*	444049-001	451816-001	Optional <sup>2</sup>
	<b>Options</b>			
37	Hot-plug hard drive*	—	—	—
	a) 36-GB, SAS, 10,000-rpm, 2.5-in	375859-B21	376596-001	Mandatory <sup>1</sup>
	b) 72-GB, SAS, 10,000-rpm, 2.5-in	375861-B21	376597-001	Mandatory <sup>1</sup>
	c) 60-GB SFF SATA hard drive, 5,400-rpm, 1 yr warranty*	379306-B21	382264-001	Mandatory <sup>1</sup>
38	Array controllers	—	—	—
	a) Smart Array E200 Controller*	012891-001	412799-001	Optional <sup>2</sup>
	b) Smart Array E200 Controller cache module, 64-MB*	012970-001	412800-001	Optional <sup>2</sup>
	c) Smart Array E200 Controller cache module, 128-MB*	409248-001	413486-001	Optional <sup>2</sup>
	d) Smart Array P400 Controller*	013159-005	405831-001	Optional <sup>2</sup>
	e) Smart Array P410 Controller*	013233-001	462919-001	Optional <sup>2</sup>
	f) Smart Array P411 Controller*	013233-001	462918-001	Optional <sup>2</sup>
	g) Smart Array P400 Controller cache module, 256-MB*	012764-004	405836-001	Optional <sup>2</sup>
	h) Smart Array P400 Controller cache module, 512-MB*	012764-003	405835-001	Optional <sup>2</sup>
	i) Smart Array P400 Controller battery*	381573-001	398648-001	Optional <sup>2</sup>

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 5)
	j) Smart Array P400 Controller battery cable assembly, 24-in*	408658-002	409125-001	Optional <sup>2</sup>
39	HP Trusted Platform Module*	450168-001	505836-001	No <sup>3</sup>

\*Not shown

\*\*All processors in this HP ProLiant server must have the same cache size, speed, number of cores, and rated maximum power consumption.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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".

<sup>1</sup>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.

<sup>2</sup>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.

<sup>3</sup>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.

<sup>1</sup>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。

<sup>2</sup>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。

<sup>3</sup>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。

<sup>1</sup>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。

<sup>2</sup>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。

<sup>3</sup>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”。

<sup>1</sup>Mandatory: 强制性的 — 客户自行维修所使用的零件是强制性的。如果您要求 HP 更换这些零件，HP 将会向您收取此服务所需的外出费用与劳动成本。

<sup>2</sup>Optional: 選購的 — 客户自行维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。

<sup>3</sup>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」。

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

<sup>2</sup> 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.

<sup>3</sup> 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.

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# Removal and replacement procedures

## Required tools

You need the following items for some procedures:

- T-10/T-15 Torx screwdriver (provided inside the server)
- HP Insight Diagnostics software ("[HP Insight Diagnostics](#)" on page 65)

## 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.
-





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

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**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, you must perform one or more of the following procedures:

- Extend the server from the rack (on page 25).

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 26).

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 27).

If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.

## Extend the server from the rack

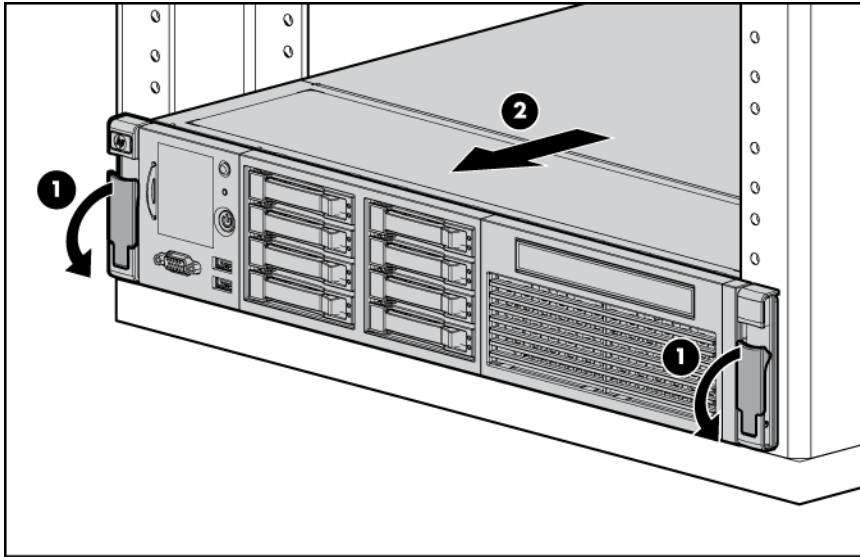
1. Pull down the quick release levers on each side of the server.
2. Extend the server from the rack.



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**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.

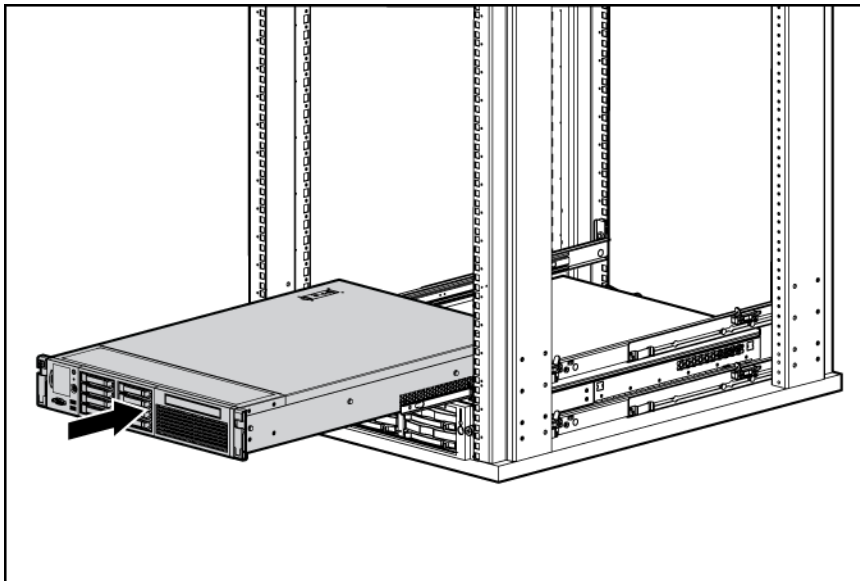
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3. After performing the installation or maintenance procedure, slide the server back into the rack, and then press the server firmly into the rack to secure it in place.



**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.



## 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. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.

---

**NOTE:** If the operating system automatically places the server in Standby mode, omit the next step.

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3. Press the Power On/Standby button to place the server in Standby mode. When the server activates Standby power mode, the system power LED changes to amber.



**IMPORTANT:** Pressing the UID button illuminates the blue UID LEDs on the front and rear panels. In a rack environment, this feature facilitates locating a server when moving between the front and rear of the rack.

---

4. 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:

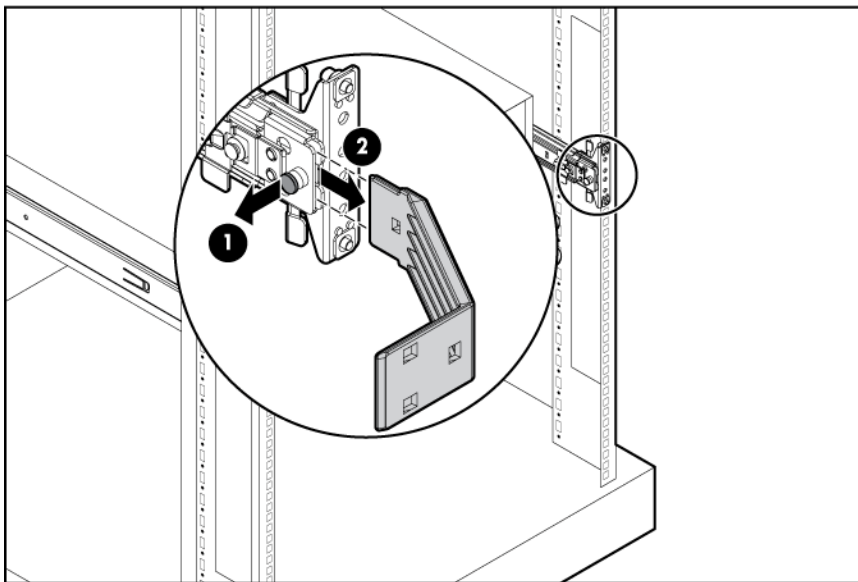
1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Disconnect the cabling and remove the server from the rack. For more information, refer to the documentation that ships with the rack mounting option.
4. Place the server on a sturdy, level surface.

## Access the product rear panel

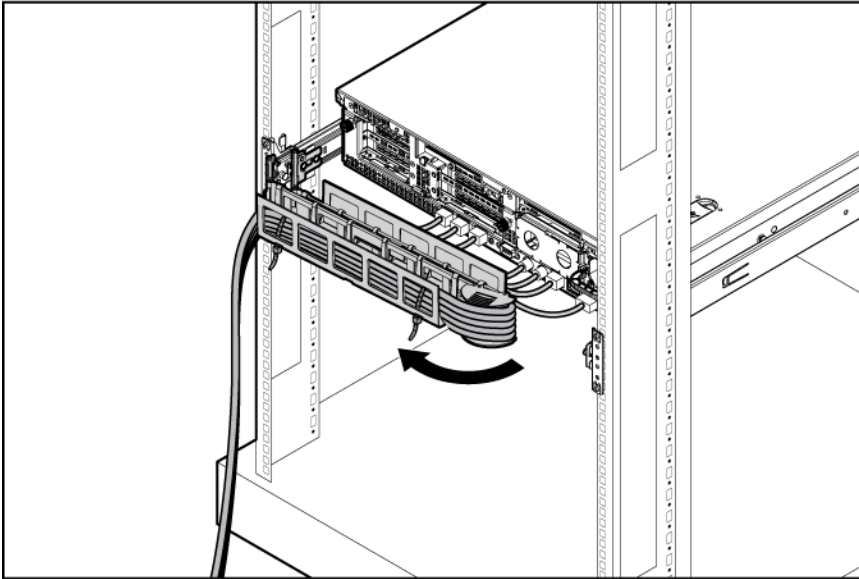
### Cable management arm with left-hand swing

To access the server rear panel:

1. Remove the cable arm retainer.



2. Open the cable management arm.

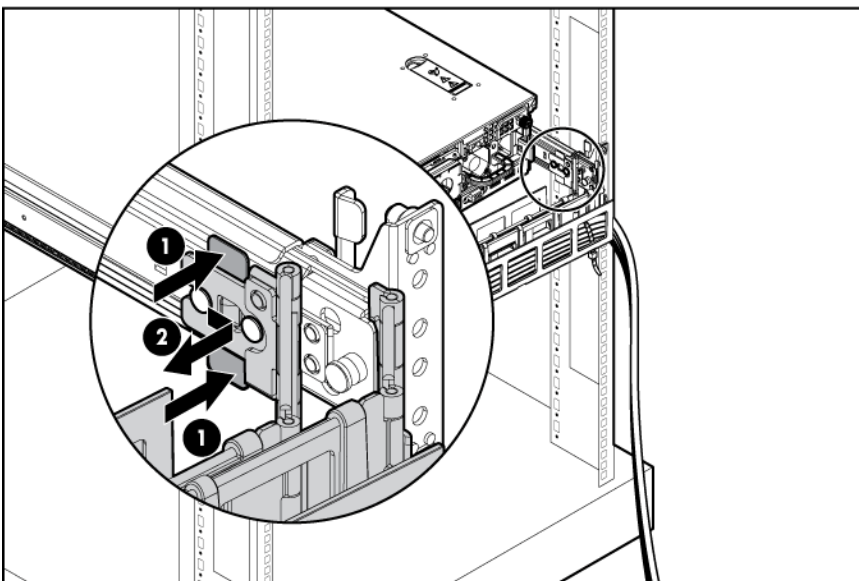


## Cable management arm with right-hand swing

**NOTE:** To access some components, you may need to remove the cable management arm.

To access the product rear panel components, open the cable management arm:

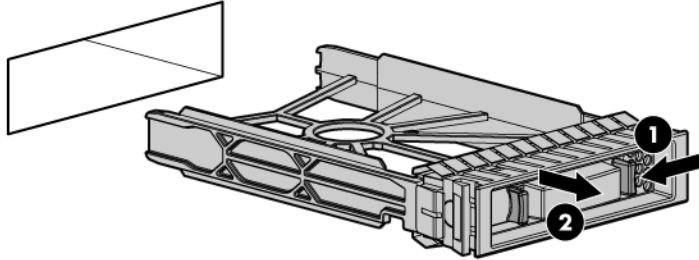
1. Power down the server (on page 26).
2. Swing open the cable management arm.
3. Remove the cables from the cable trough.
4. Remove the cable management arm.



## SAS hard drive blank

- 
- △ **CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.
- 

Remove the component as indicated.



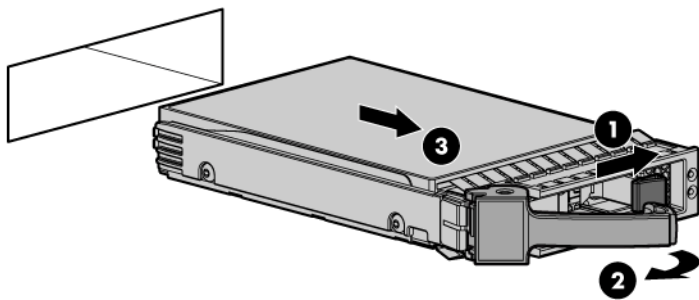
To replace the blank, slide the blank into the bay until it locks into place.

## Hot-plug SAS hard drive

To remove the component:

- 
- △ **CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.
- 

1. Determine the status of the hard drive from the hot-plug SAS hard drive LED combinations ("SAS and SATA hard drive LED combinations" on page 75).
2. Back up all server data on the hard drive.
3. Remove the hard drive.



To replace the component, reverse the removal procedure.

## Power supply blank

To remove the component:

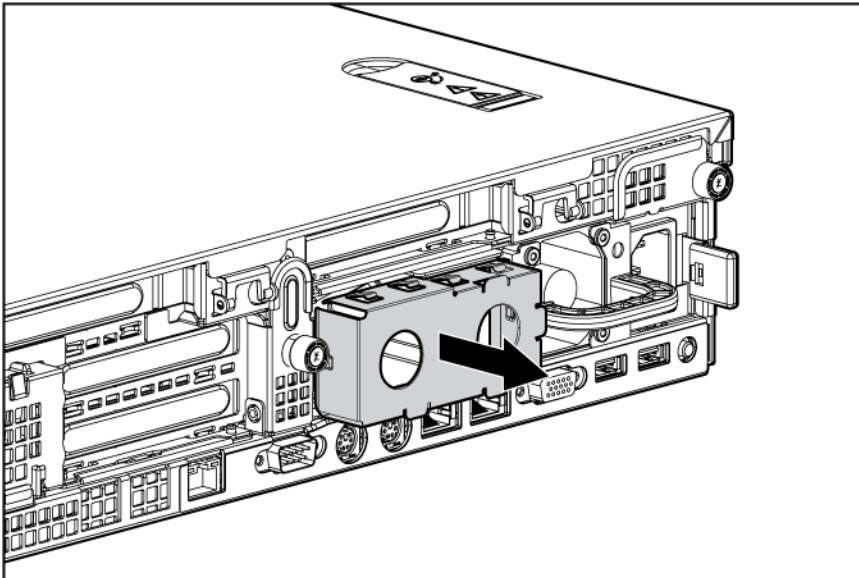
- 
- △ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.
- 

1. Access the product rear panel (on page 27).

2. Remove the power supply blank.



**WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.



To replace the component, reverse the removal procedure.

## Hot-plug power supply



**WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.

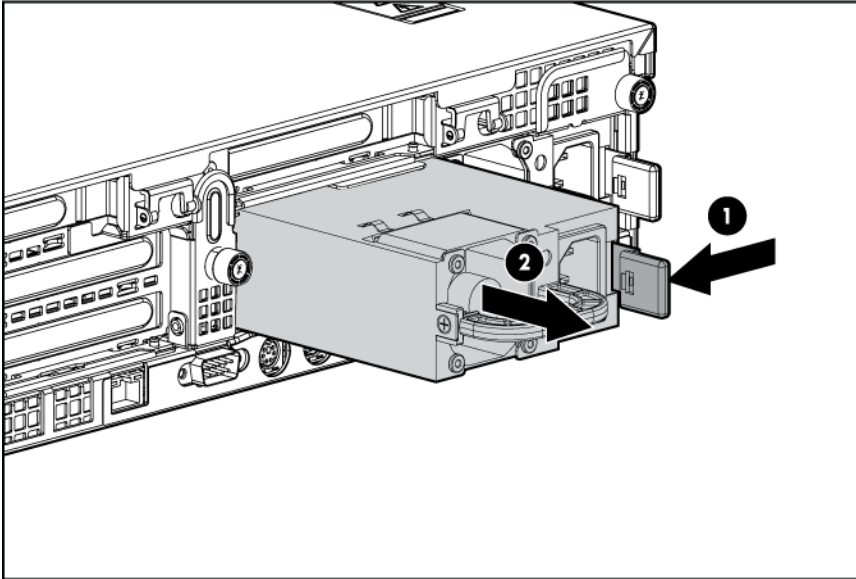


**CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Determine how many hot-plug power supplies are installed:
  - o If only one hot-plug power supply is installed, power down and remove the power cord from the server ("[Power down the server](#)" on page 26).
  - o If more than one hot-plug power supply is installed, continue with the next step.
2. Access the product rear panel (on page 27).
3. Disconnect the power cord from the power supply.

4. Remove the hot-plug power supply.



**WARNING:** To reduce the risk of electric shock or damage to the equipment, do not connect the power cord to the power supply until the power supply is installed.

To replace the component:

1. Slide the hot-plug power supply into the power supply bay.
2. Connect the power cord to the power supply.
3. Install the cable management arm, if removed ("[Access the product rear panel](#)" on page 27).
4. Route the power cord through the cable management arm or power cord anchor.

**NOTE:** If using the power cord anchor, be sure to leave enough slack in the power cord so that the redundant power supply can be removed without disconnecting the power cord from the primary power supply.

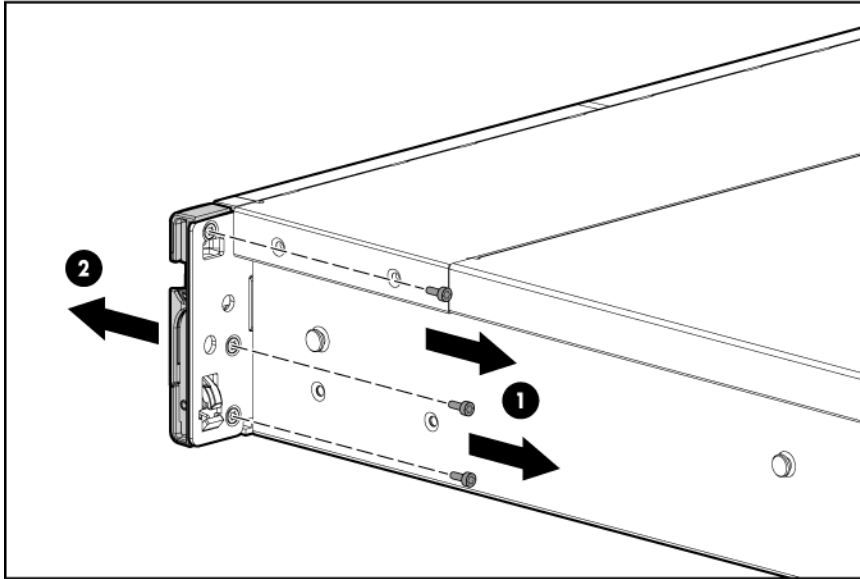
5. Close the cable management arm.
6. Connect the power cord to the power source.
7. Be sure that the power supply LED is green ("[Rear panel LEDs and buttons](#)" on page 71).
8. Be sure that the front panel external health LED is green ("[Front panel LEDs and buttons](#)" on page 67).

## Front right bezel

To remove the component:

1. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).

2. Remove the three T-10 Torx screws, and then detach the front bezel.



To replace the component, reverse the removal procedure.

## 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:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

To remove the component:

1. Power down the server if performing a non-hot-plug installation or maintenance procedure ("[Power down the server](#)" on page 26).
2. Extend the server from the rack (on page 25).
3. Use the T-15 Torx screwdriver attached to the rear of the server to loosen the security screw on the hood latch.
4. Lift up on the hood latch handle, and then remove the access panel.

To replace the component, reverse the removal procedure.

## Optical drive cage

To remove the component:

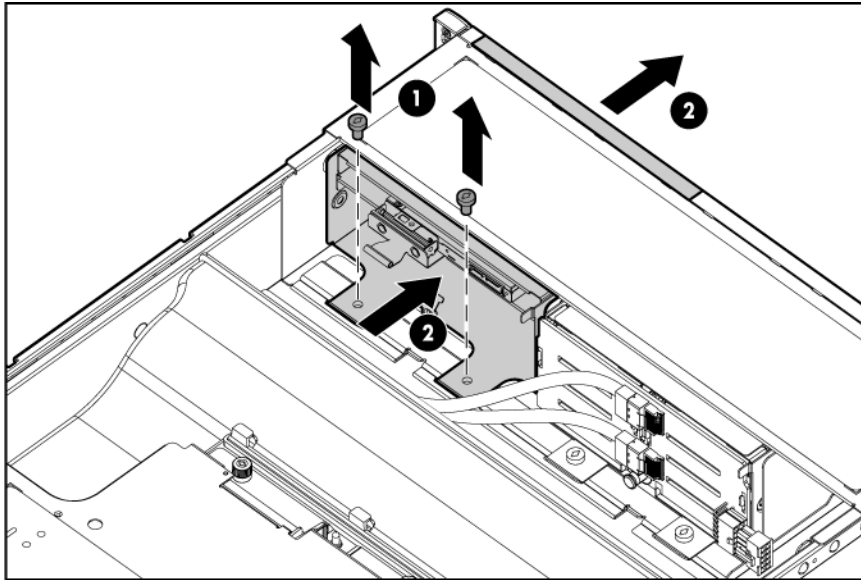


**CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).



3. Remove the access panel ("Access panel" on page 32).
4. Disconnect the cables from the optical drive.
5. Remove the optical drive cage.



To replace the component, reverse the removal procedure.

## Hot-plug fan

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server.

The server shuts down in the following temperature-related scenarios:

- At POST:
  - The BIOS suspends the server for 5 minutes if it detects a cautionary temperature level. If the cautionary temperature level is still detected after 5 minutes, the BIOS performs an orderly shutdown and enters Standby mode.
  - The BIOS performs an orderly shutdown if two or more fans have failed.
  - The server performs an immediate shutdown if it detects a critical temperature level.




---

**IMPORTANT:** An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

---

- In the operating system:
  - The Health Driver performs an orderly shutdown if it detects a cautionary temperature level. If the server detects a critical temperature level before the orderly shutdown occurs, the server performs an immediate shutdown. Additionally, the Health Driver performs an orderly shutdown if more than one fan is failed or removed.
  - When Thermal Shutdown is disabled in RBSU, the server performs an immediate shutdown if it detects a critical temperature level.



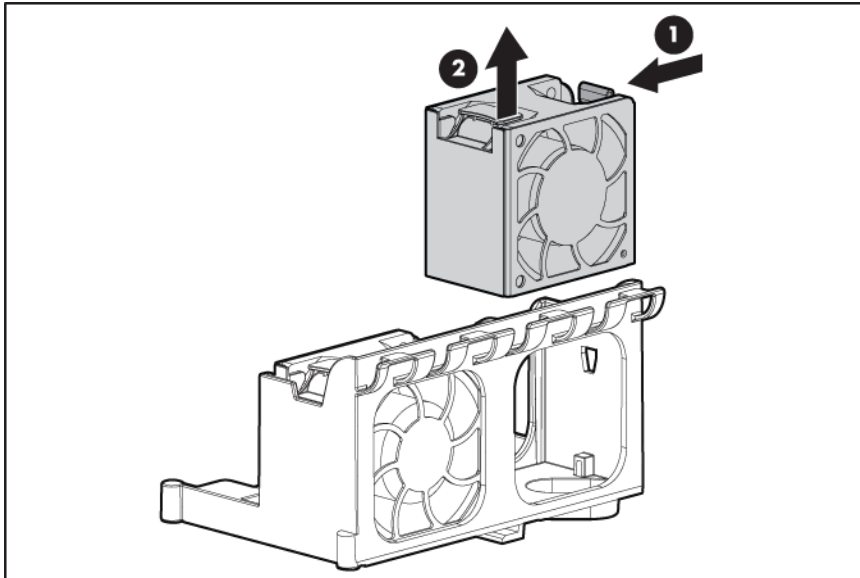

---

**IMPORTANT:** An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

---

To remove the component:

1. Extend or remove the server from the rack ("Extend the server from the rack" on page 25, "Remove the server from the rack" on page 27).
2. Remove the access panel ("Access panel" on page 32).
3. Remove the fan.



**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.

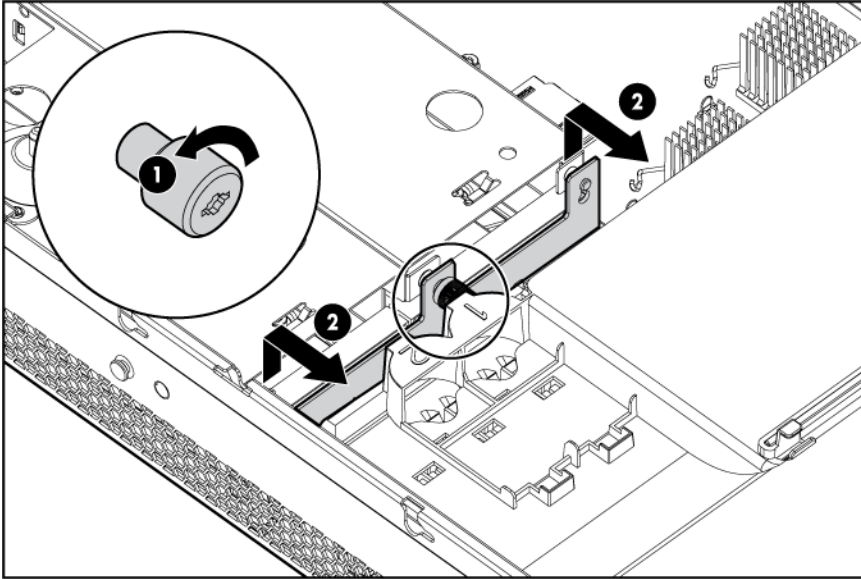
To replace the component, reverse the removal procedure.

## Power supply backplane

To remove the component:

1. Power down the server (on page 26).
2. Remove all power supplies ("Hot-plug power supply" on page 30).
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 25, "Remove the server from the rack" on page 27).
4. Remove the access panel ("Access panel" on page 32).

5. Remove the power supply backplane.

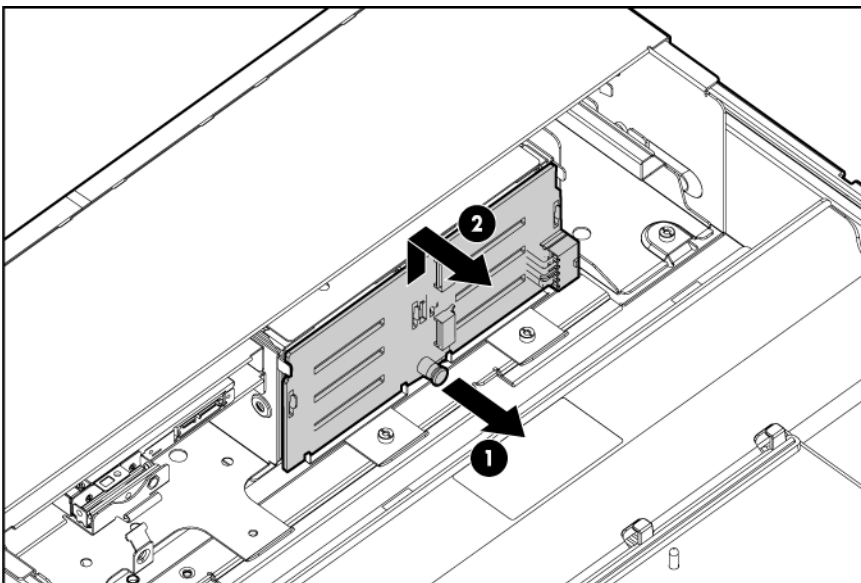


To replace the component, reverse the removal procedure.

## Hard drive backplane

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove all hot-plug hard drives ("[Hot-plug SAS hard drive](#)" on page 29).
5. Disconnect the SAS cable from the hard drive backplane.
6. Remove the hard drive backplane.



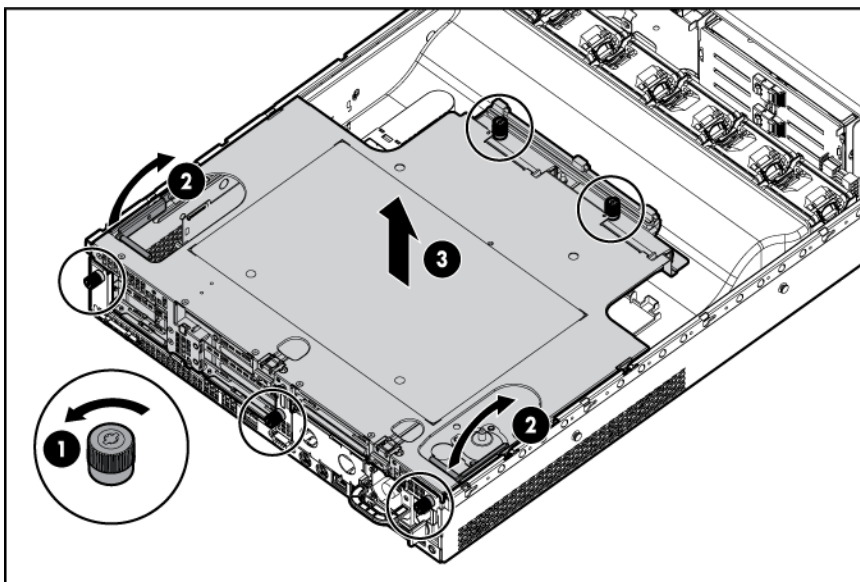
To replace the component, reverse the removal procedure.

## PCI riser cage

To remove the component:

**CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("Access panel" on page 32).
4. Remove the PCI riser cage.



To replace the component, reverse the removal procedure.

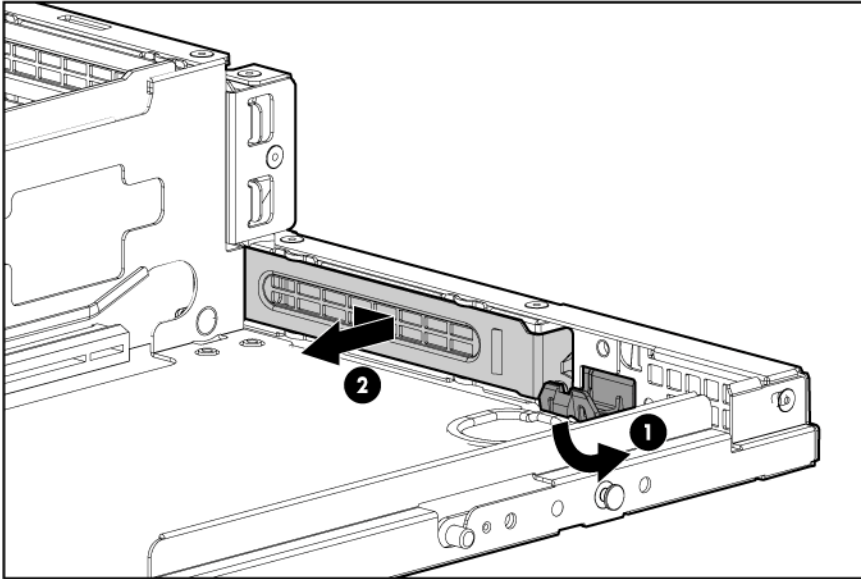
## Expansion slot covers

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

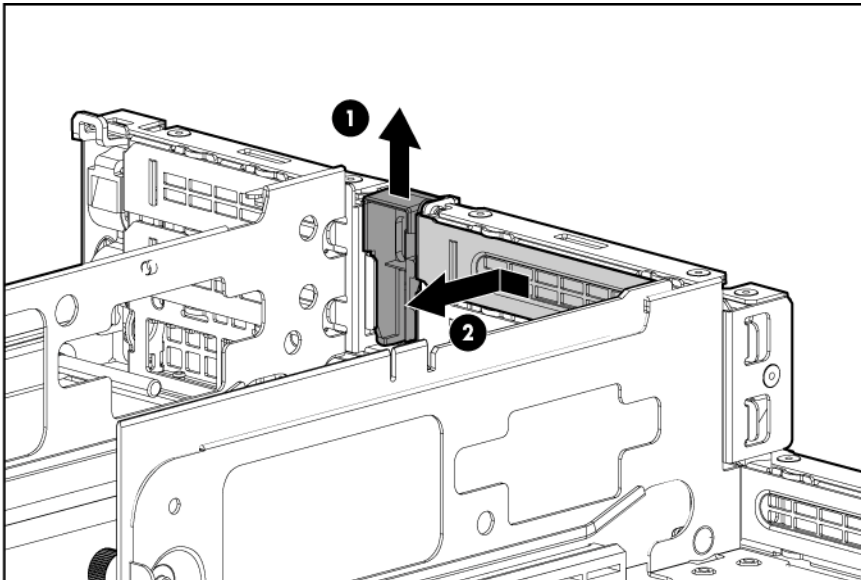
**CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("Access panel" on page 32).
4. Remove the PCI riser cage ("PCI riser cage" on page 36).
5. Remove the expansion slot cover:

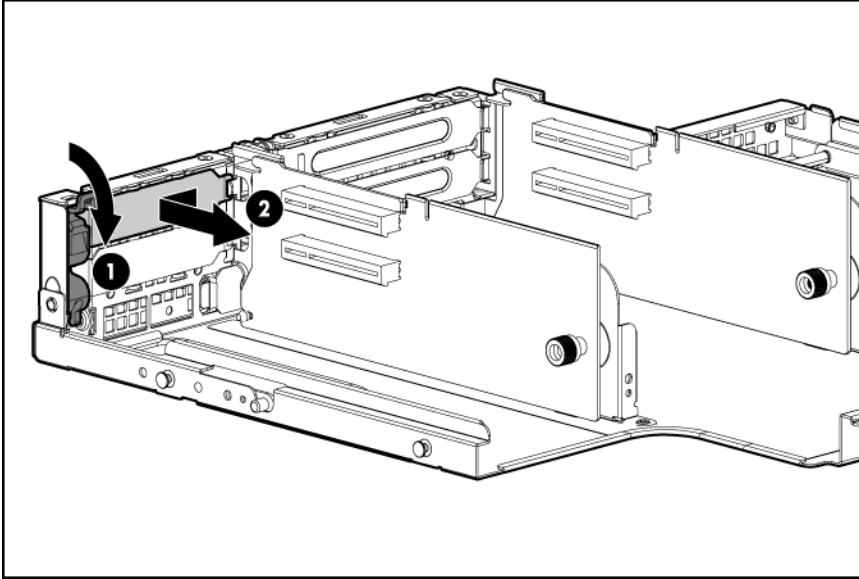
- To remove slot cover 1 or 4, push in on the retainer to release it, and then slide out the cover.



- To remove slot covers 2 and 3, lift up on the latch, remove the latch, and then remove the cover.



- To remove slot covers 5 and 6, push down on the latch, rotate the latch down, and then remove the cover.



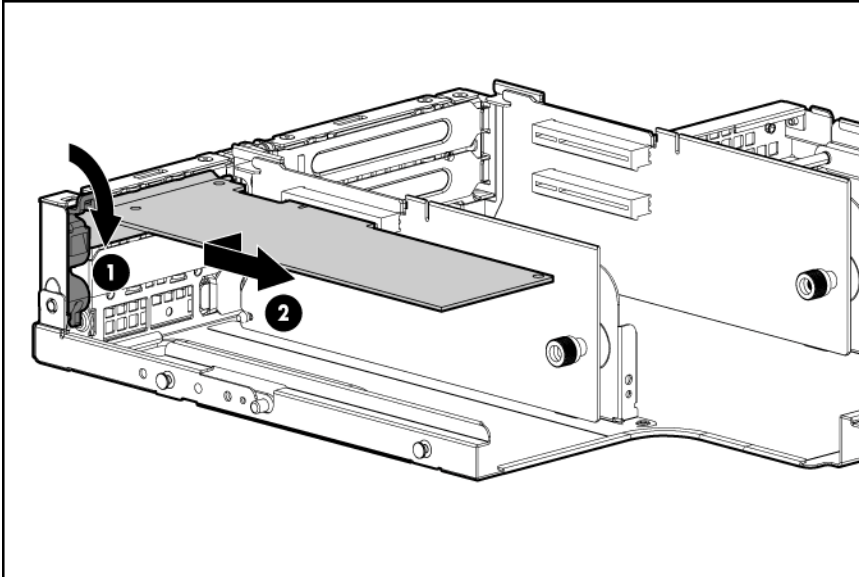
## Expansion boards

### Half-length expansion board

To remove the component:

1. Power down the server (on page [26](#)).
2. Extend the server from the rack (on page [25](#)).
3. Remove the access panel ("[Access panel](#)" on page [32](#)).
4. Disconnect any external cables that are connected to the expansion board.
5. Remove the PCI riser cage ("[PCI riser cage](#)" on page [36](#)).
6. Disconnect any internal cables that are connected to the expansion board.

7. Remove the expansion board.

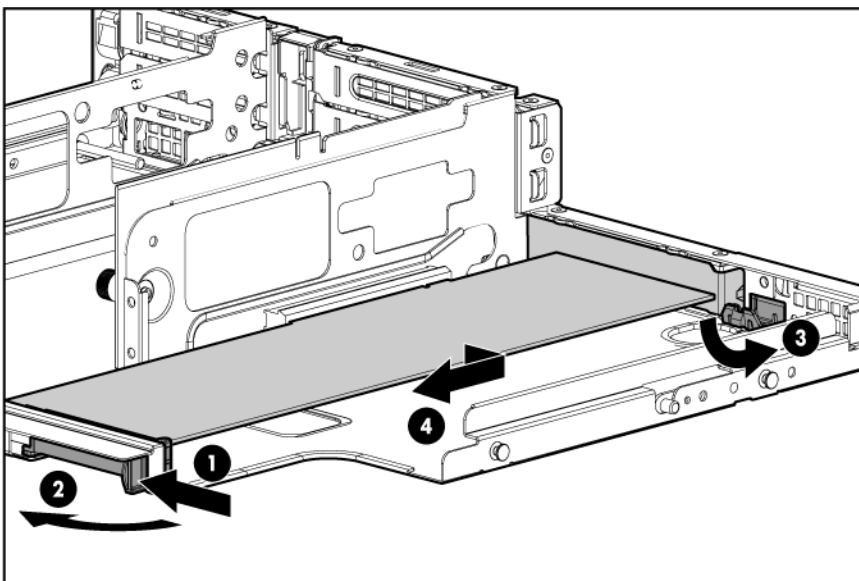


To replace the component, reverse the removal procedure.

## Full-length expansion board

To remove the component:

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("Access panel" on page 32).
4. Disconnect any external cables that are connected to the expansion board.
5. Remove the PCI riser cage ("PCI riser cage" on page 36).
6. Disconnect any internal cables that are connected to the expansion board.
7. Remove the expansion board.



To replace the component, reverse the removal procedure.

## Battery-backed write cache procedures

Two types of procedures are provided for the BBWC option:

- Removal and replacement of failed components:
  - Removing the cache module
  - Removing the battery pack
- Recovery of cached data from a failed server ("[Recovering data from the battery-backed write cache](#)" on page 41)

---

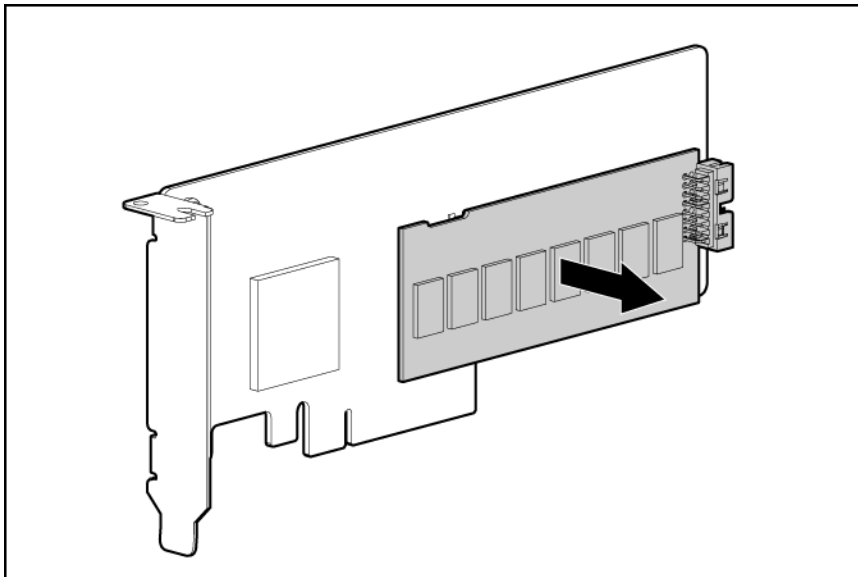
△ **CAUTION:** Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

---

## Removing the cache module

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the controller ("[Full-length expansion board](#)" on page 39, "[Half-length expansion board](#)" on page 38).
6. Remove the cache module.



To replace the component, reverse the removal procedure.

---

△ **CAUTION:** To prevent damage to the cache module during installation, be sure the cache module is fully inserted before pressing down.

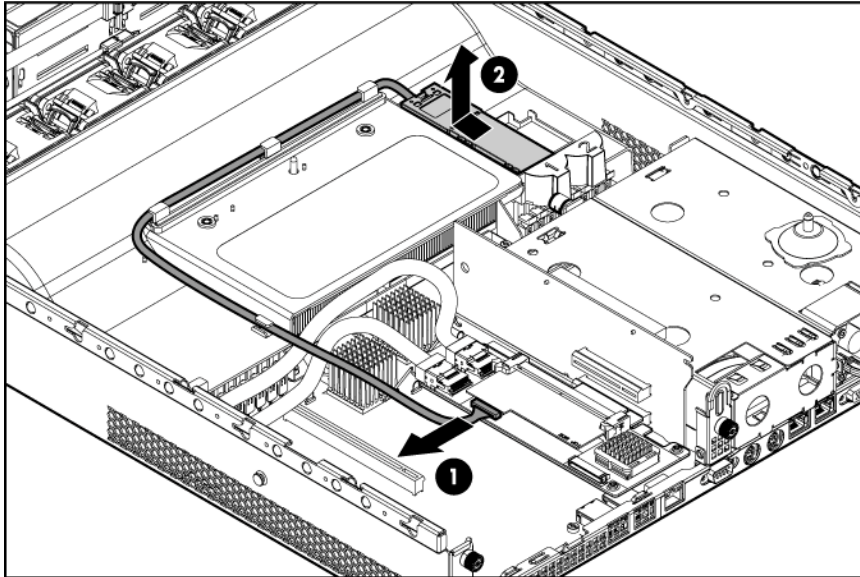
---



## Removing the battery pack

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 25, "Remove the server from the rack" on page 27).
3. Remove the access panel ("Access panel" on page 32).
4. Remove the PCI riser cage ("PCI riser cage" on page 36).
5. Disconnect the cable, and then remove the battery pack.



To replace the component, reverse the removal procedure.

## Recovering data from the battery-backed write cache

If the server fails, use the following procedure to recover data temporarily stored in the BBWC.

**CAUTION:** Before starting this procedure, read the information about protecting against electrostatic discharge ("Preventing electrostatic discharge" on page 24).

1. Perform one of the following:
  - o Set up a recovery server station using an identical server model. Do not install any internal drives or BBWC in this server. (HP recommends this option.)
  - o 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 26). If any data is stored in the cache module, a green LED on the module flashes every 2 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. Perform one of the following:
  - If the array controller has failed, remove the cache module and battery pack from the failed array controller, and install the cache module and battery pack on an array controller in the recovery server.
  - If the server has failed, remove the controller ("[Full-length expansion board](#)" on page 39, "[Half-length expansion board](#)" on page 38), cache module, and battery pack from the failed server, and install the controller, cache module, and battery pack in the recovery server.
5. Power up the recovery server. A 1759 POST message is displayed, 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.

## Air baffle

To remove the component:

---

**CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

---

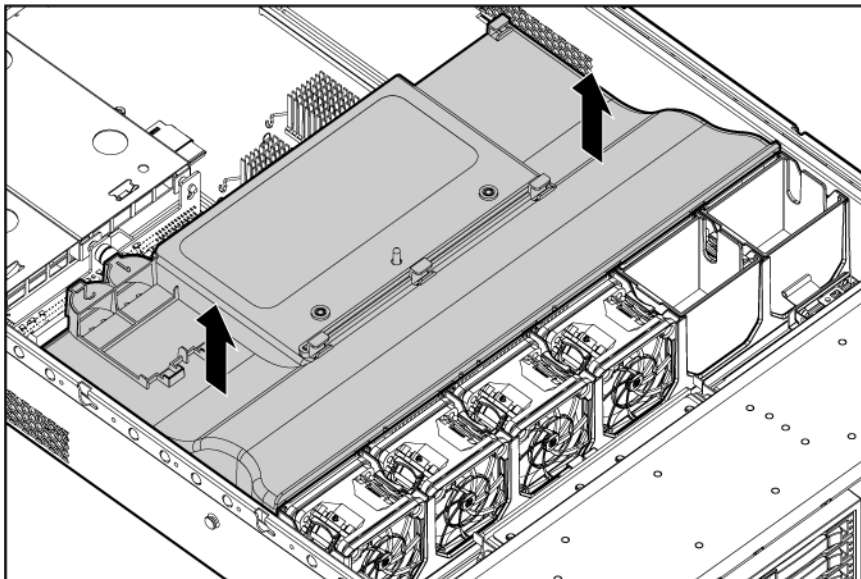
1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).

---

**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.

---

5. Remove the battery pack from the air baffle ("[Removing the battery pack](#)" on page 41).
6. Remove the air baffle.

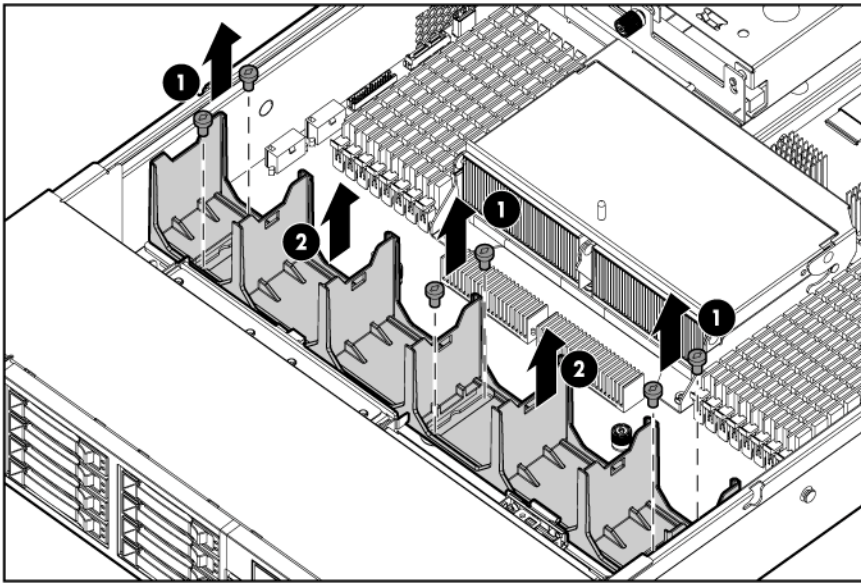


To replace the component, reverse the removal procedure.

# Fan cage

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the air baffle ("[Air baffle](#)" on page 42).
6. Remove the fan blanks.
7. Remove the fans ("[Hot-plug fan](#)" on page 33).
8. Remove the fan cage.



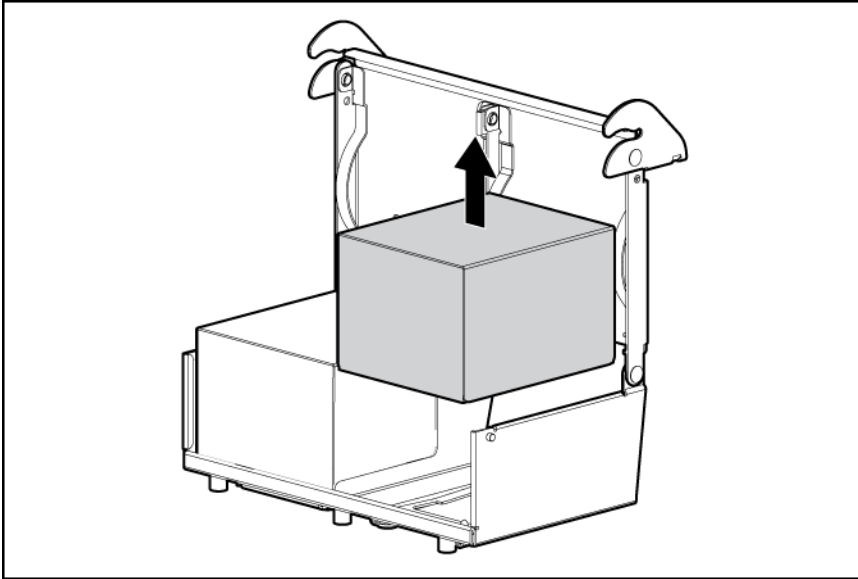
To replace the component, reverse the removal steps and press down on the top of each fan to be sure it is seated properly.

# Heatsink

To remove the heatsink:

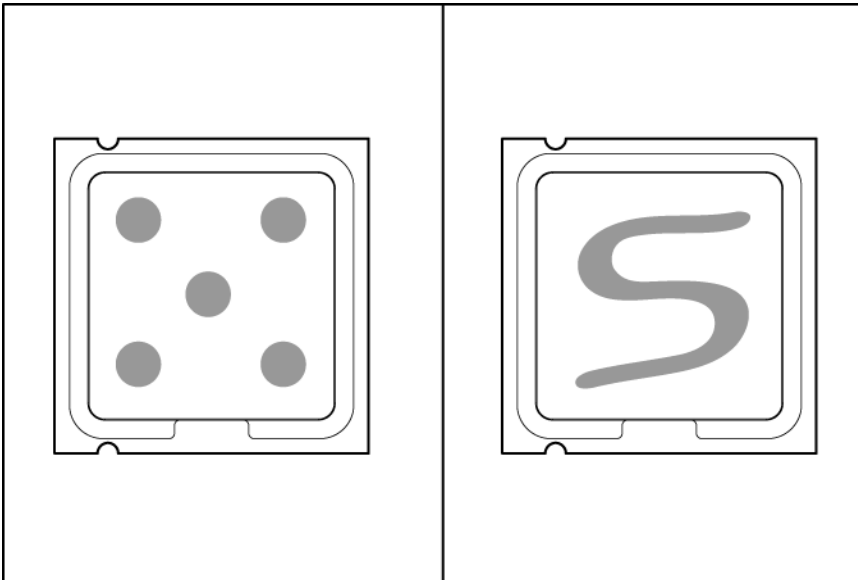
1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the air baffle ("[Air baffle](#)" on page 42).

6. Open the heatsink retaining bracket, and then remove the heatsink.

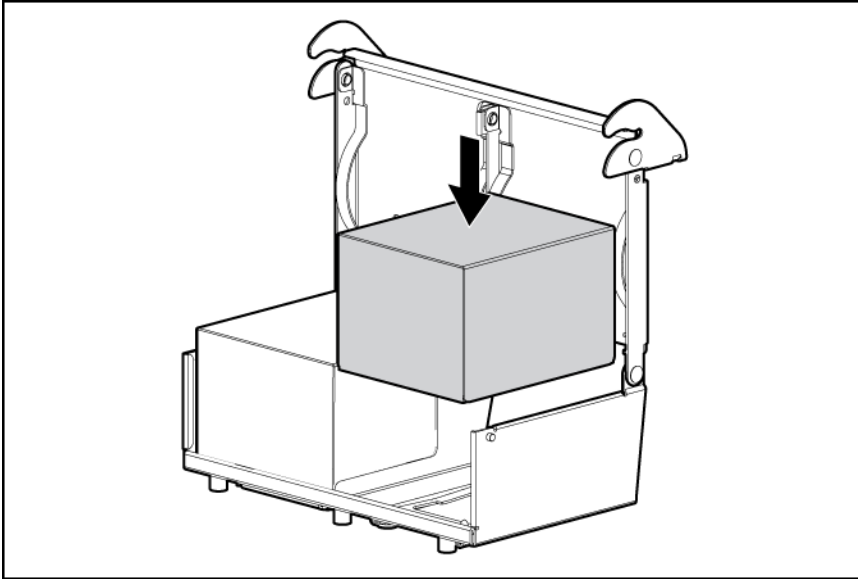


To replace the heatsink:

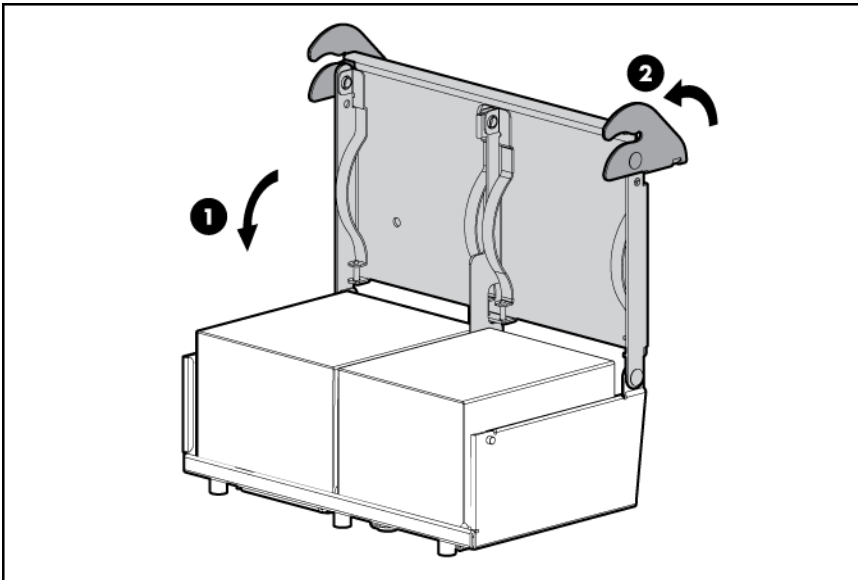
1. Clean the old thermal grease from the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.
2. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:



3. Install the heatsink.



4. Close and lock the heatsink retaining latches.



5. Install the air baffle.
6. Install the PCI riser cage ("PCI riser cage" on page 36).
7. Install the access panel ("Access panel" on page 32).
8. Install the server into the rack.
9. Power up the server.

## Processor

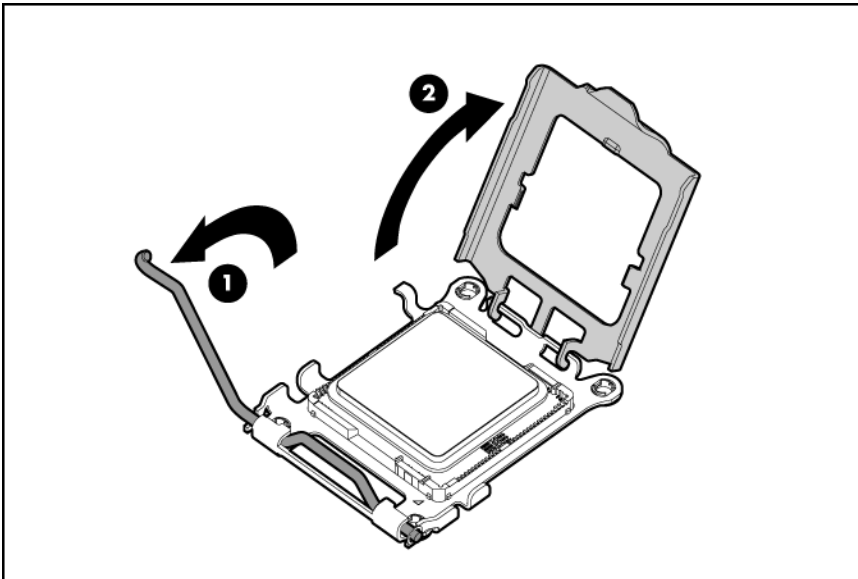


**CAUTION:** To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this server.

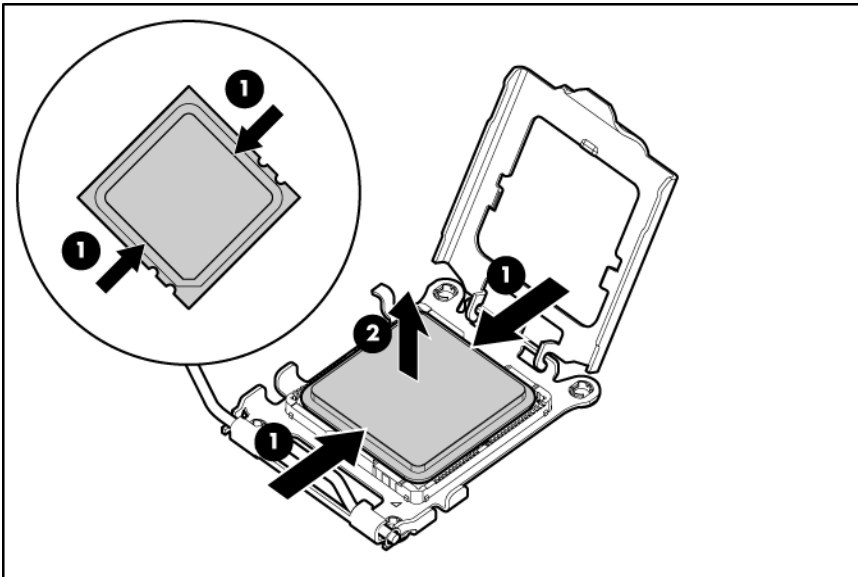
**⚠ CAUTION:** To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

To remove a processor:

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("Access panel" on page 32).
4. Remove the PCI riser cage ("PCI riser cage" on page 36).
5. Remove the air baffle ("Air baffle" on page 42).
6. Remove the heatsink ("Heatsink" on page 43).
7. Open the processor retaining latch and the processor socket retaining bracket.



8. Using your fingers, remove the failed processor.



To replace a processor:


---

△ **CAUTION:** The pins on the processor socket are very fragile. Any damage to them may require replacing the system board.

---

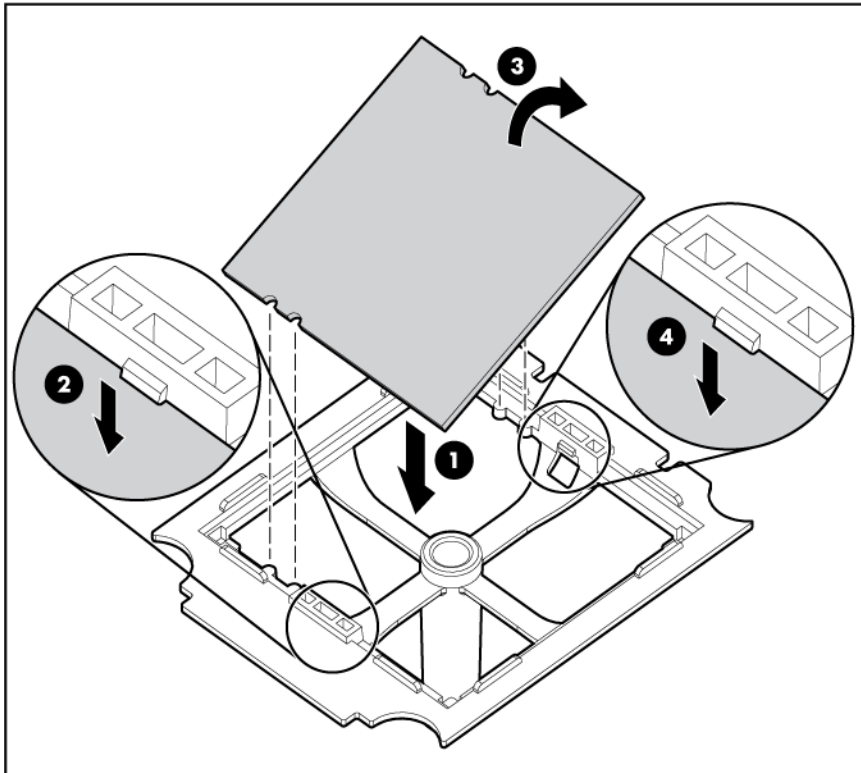
△ **CAUTION:** Failure to completely open the processor locking lever prevents the processor from seating during installation, leading to hardware damage.

---

 **IMPORTANT:** Be sure the processor remains inside the processor installation tool.

---

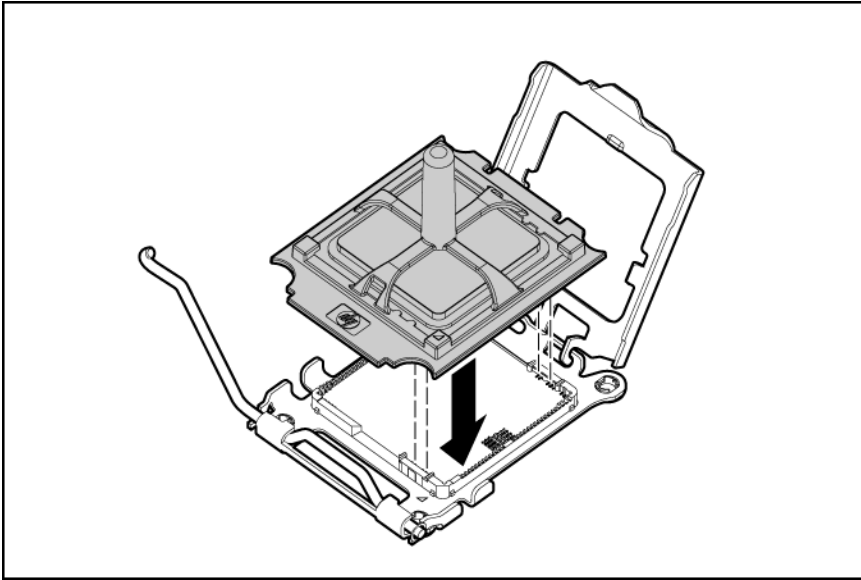
1. If the processor has separated from the installation tool, carefully re-insert the processor in the tool.



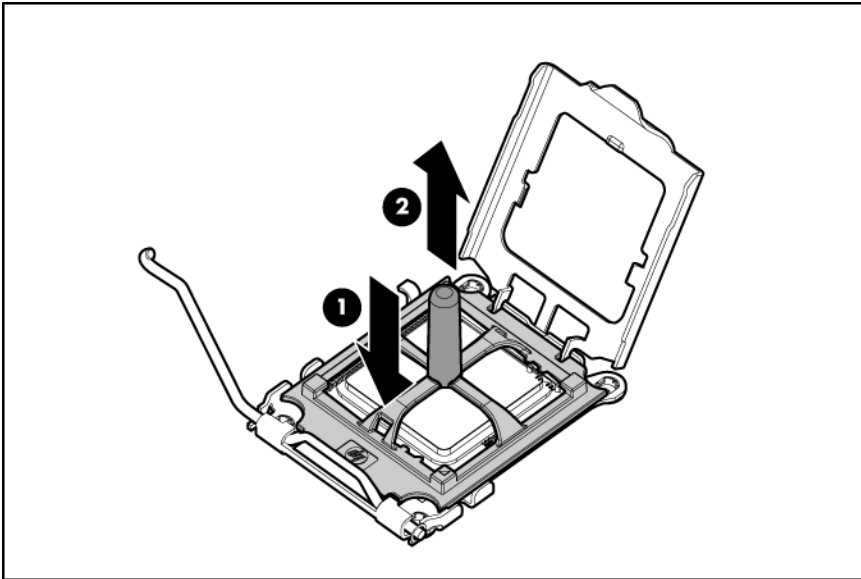
2. Align the processor installation tool with the socket and install the processor.

△ **CAUTION:** The processor is designed to fit one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket.

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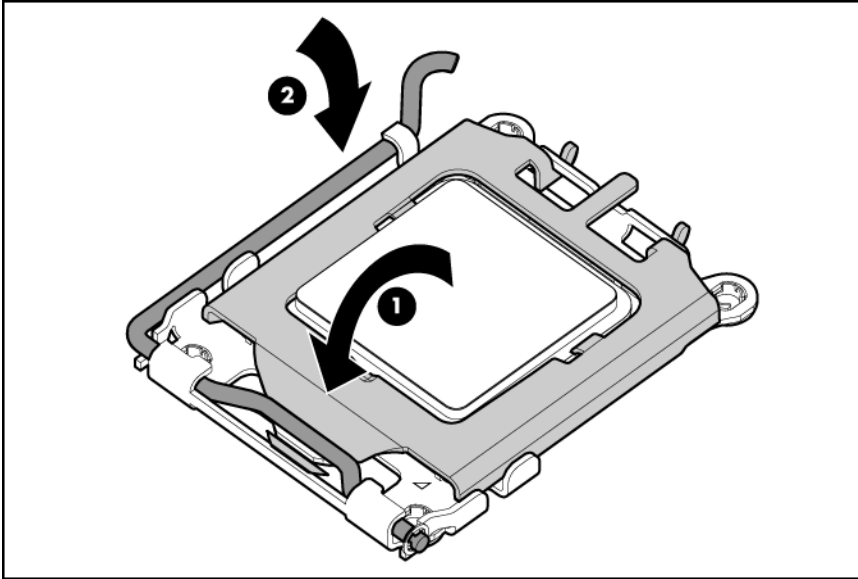


3. Press down firmly until the processor installation tool clicks and separates from the processor, and then remove the processor installation tool.

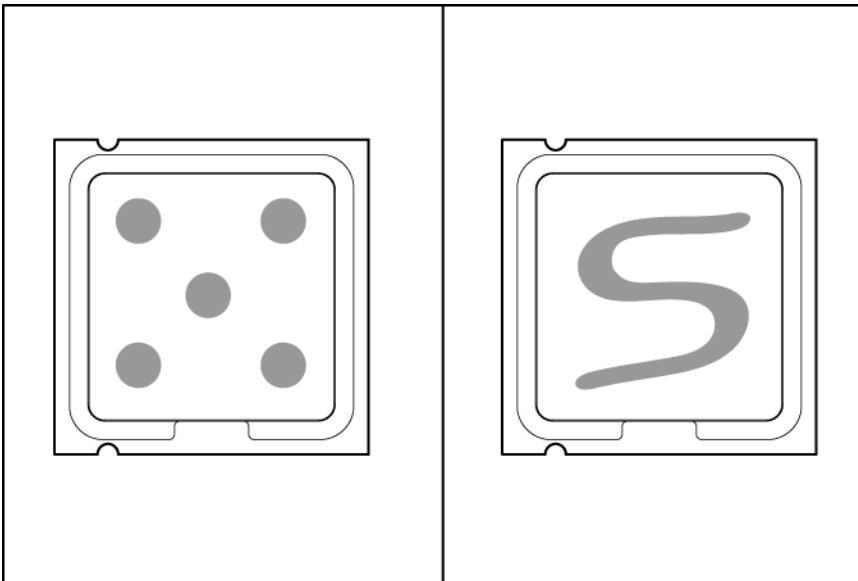




4. Close the processor retaining bracket and the processor retaining latch.



5. Clean the old thermal grease from the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.
6. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:

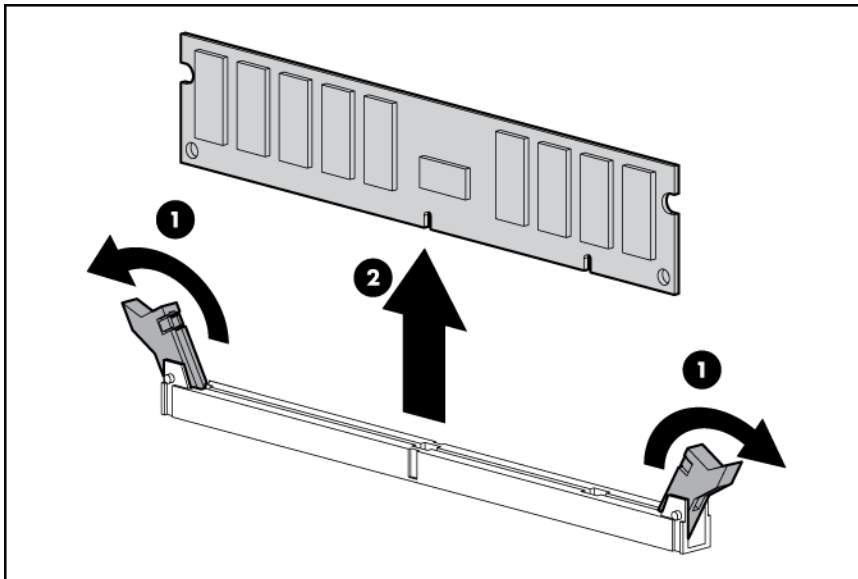


7. Install the heatsink.
8. Close and lock the heatsink retaining latches.
9. Install the air baffle.
10. Install the PCI riser cage ("[PCI riser cage](#)" on page [36](#)).
11. Install the access panel ("[Access panel](#)" on page [32](#)).
12. Install the server into the rack.
13. Power up the server.

# DIMMs

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 25, "Remove the server from the rack" on page 27).
3. Remove the access panel ("Access panel" on page 32).
4. Remove the PCI riser cage ("PCI riser cage" on page 36).
5. Remove the air baffle ("Air baffle" on page 42).
6. Remove the DIMM.



To replace the component, reverse the removal procedure.

## Memory configurations

This server supports 2 GB to 128 GB of Advanced ECC system memory using 1-GB, 2-GB, 4-GB, and 8-GB registered DDR-2 DIMMs across 16 DIMM slots. Depending on the quantity and speed of DIMMs populated, memory bus speeds can be 533-MHz, 667-MHz, or 800-MHz. The memory bus speed is determined by using the following two-step process.

1. The BIOS interrogates each DIMM installed in the system and sets the memory bus speed to the least common denominator of the DIMM speeds detected, regardless of the RBSU menu option selected. For example, with 667-MHz and 800-MHz DIMMs installed, this first step should complete with the memory bus speed set to 667 MHz regardless of how many DIMMs are installed on each processor.
2. With this step, the following RBSU menu option settings determine the actual memory bus speed that is selected.
  - o Menu Option 1 = Auto (default)  
Memory bus speed is determined by the number of DIMMs installed for each processor:
    - Auto Case 1: Four or less DIMMs = 800-MHz memory bus speed provided that all DIMMs detected in step 1 are rated for 800 MHz.

- Auto Case 2: Six DIMMs = 667-MHz memory bus speed provided that all DIMMs detected in step 1 are rated for 667 MHz or greater.
- Auto Case 3: Eight DIMMs = 533-MHz memory bus speed provided that all DIMMs detected in step 1 are rated for 533 MHz or greater.
- Menu Option 2 = 533 MHz
  - Memory bus speed is set to 533 MHz regardless of how many DIMMs are installed provided that all DIMMs detected in step 1 are rated for 533 MHz or greater.

The following rules must be followed when installing DIMMs in this server:

- DIMMs must be installed in pairs while following the population rules listed in the table below.
- DIMMs must be installed in decreasing capacity with the largest DIMMs installed in the banks farthest away from each processor.
- DIMM pairs in a memory bank must have identical HP DIMM part numbers.
- Only HP DIMM part numbers listed in the QuickSpecs for this server should be used in this server.

#### DIMM population order

	Bank A	Bank B	Bank C	Bank D	Bank E	Bank F	Bank G	Bank H
<b>Configuration</b>	<b>1A &amp; 2A</b>	<b>3B &amp; 4B</b>	<b>5C &amp; 6C</b>	<b>7D &amp; 8D</b>	<b>9E &amp; 10E</b>	<b>11F &amp; 12F</b>	<b>13G &amp; 14G</b>	<b>15H &amp; 16H</b>
1 processor	1st	2nd	3rd	4th	—	—	—	—
2 processors	1st	2nd	3rd	4th	1st	2nd	3rd	4th

Advanced ECC memory is the memory protection mode for this server. In Advanced ECC, the server does not fail because of correctable memory errors. The server provides notification if the level of correctable errors exceeds a pre-defined threshold rate. Advanced ECC provides additional protection over standard ECC because 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.

## System 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.



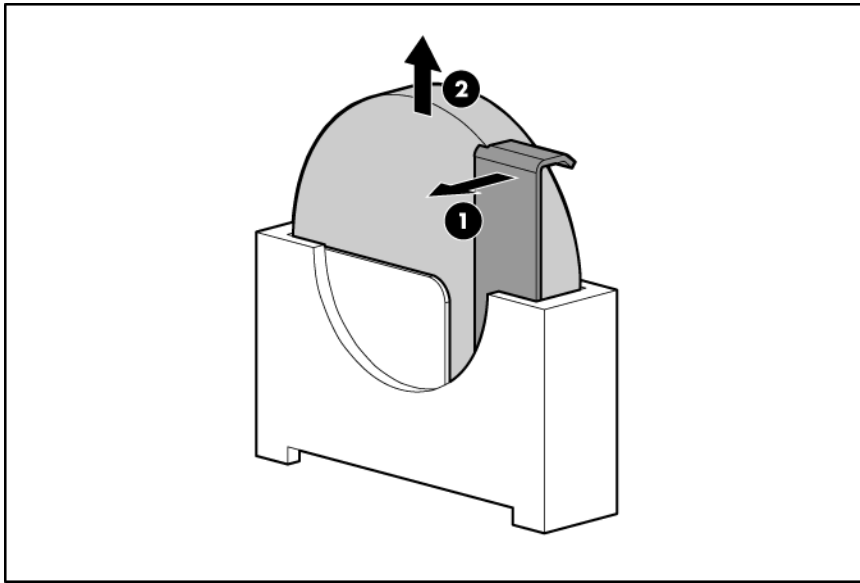
**WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- 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 26).
2. Extend the server from the rack (on page 25).

3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the air baffle ("[Air baffle](#)" on page 42).
6. Remove the battery.



To replace the component, reverse the removal procedure.

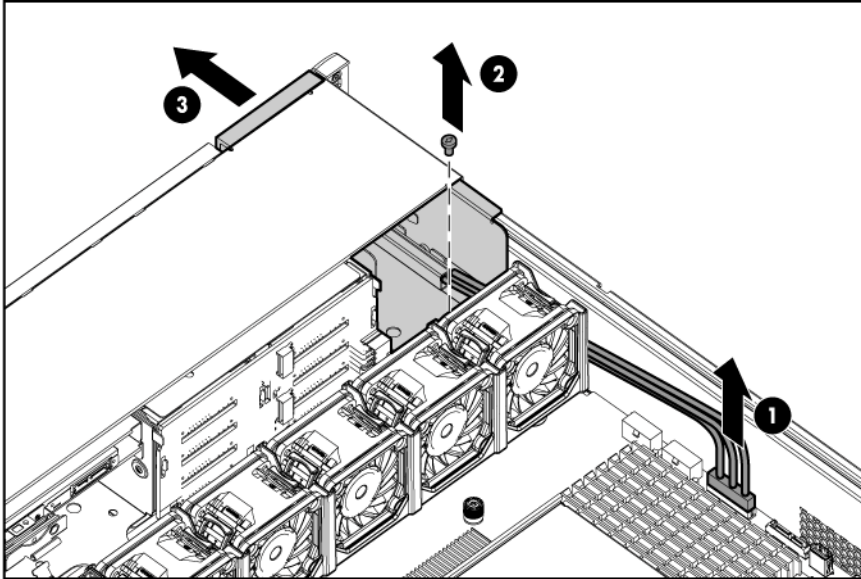
For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

## Systems Insight Display

To remove the component:

1. Power down the server (on page 26).
2. Extend the server from the rack (on page 25).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the air baffle ("[Air baffle](#)" on page 42).
6. Disconnect the Systems Insight Display cable.

7. Remove the Systems Insight Display.



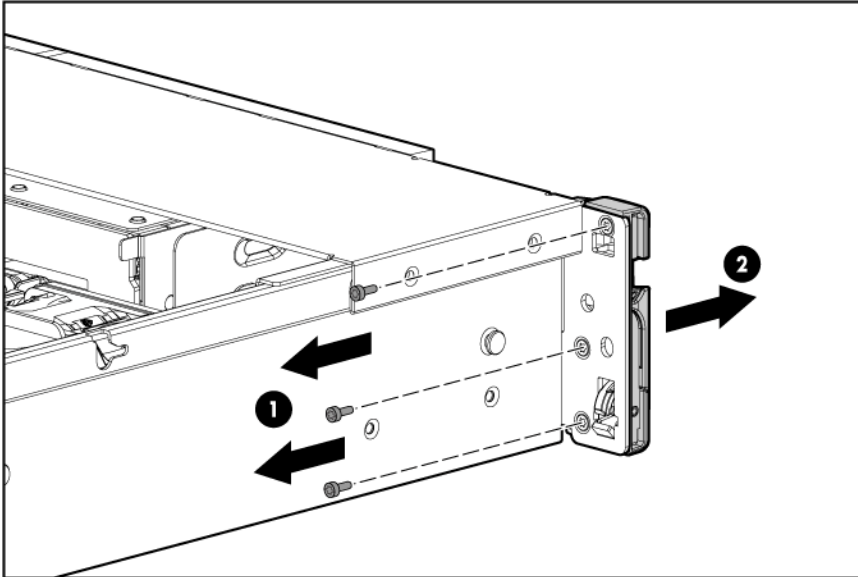
To replace the component, reverse the removal procedure.

## Front left bezel

To remove the component:

1. Power down the server (on page 26).
2. Extend or remove the server from the rack ("[Extend the server from the rack](#)" on page 25, "[Remove the server from the rack](#)" on page 27).
3. Remove the access panel ("[Access panel](#)" on page 32).
4. Remove the PCI riser cage ("[PCI riser cage](#)" on page 36).
5. Remove the air baffle ("[Air baffle](#)" on page 42).
6. Extend or remove the Systems Insight Display ("[Systems Insight Display](#)" on page 52).
7. Disconnect the System Insight Display cable from the system board.

8. Remove the three T-10 Torx screws, and then detach the front bezel.



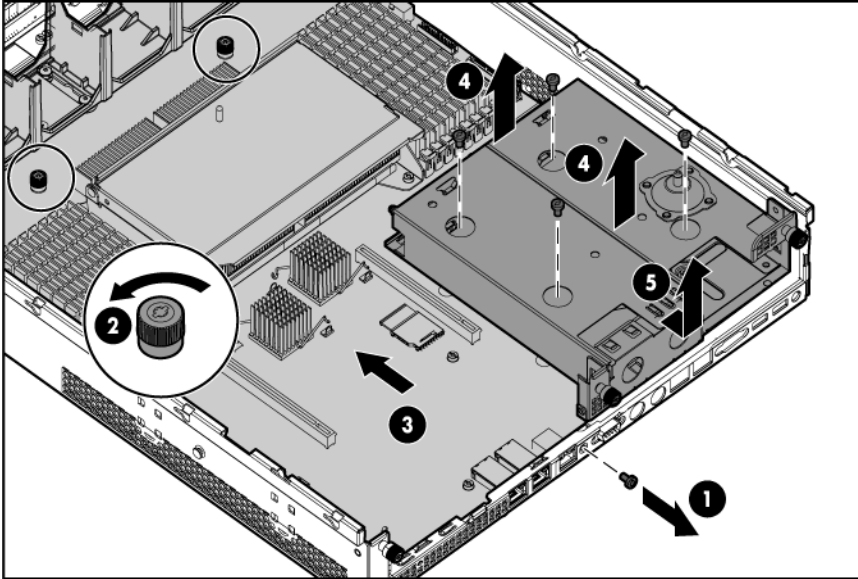
To replace the component, reverse the removal procedure.

## Power supply cage assembly

To remove the component:

1. Power down the server (on page [26](#)).
2. Access the product rear panel (on page [27](#)).
3. Remove all power supplies ("[Hot-plug power supply](#)" on page [30](#)).
4. Remove the server from the rack (on page [27](#)).
5. Remove the access panel ("[Access panel](#)" on page [32](#)).
6. Remove the PCI riser cage ("[PCI riser cage](#)" on page [36](#)).
7. Remove the air baffle ("[Air baffle](#)" on page [42](#)).
8. Remove the power supply backplane ("[Power supply backplane](#)" on page [34](#)).
9. Loosen the system board thumbscrews, and then slide the system board assembly forward.

10. Remove the power supply cage assembly.



To replace the component, reverse the removal procedure.

## System board

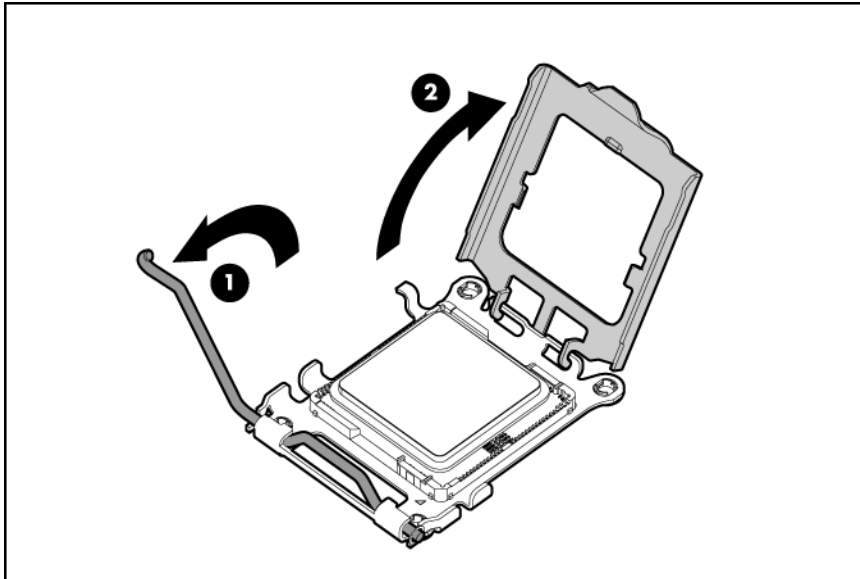
To remove the component:

1. Power down the server (on page 26).
2. Remove all power supplies ("Hot-plug power supply" on page 30).
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 25, "Remove the server from the rack" on page 27).
4. Remove the access panel ("Access panel" on page 32).
5. Remove the PCI riser cage ("PCI riser cage" on page 36).
6. Remove the battery pack ("Removing the battery pack" on page 41).
7. Remove the air baffle ("Air baffle" on page 42).
8. Remove the power supply backplane ("Power supply backplane" on page 34).

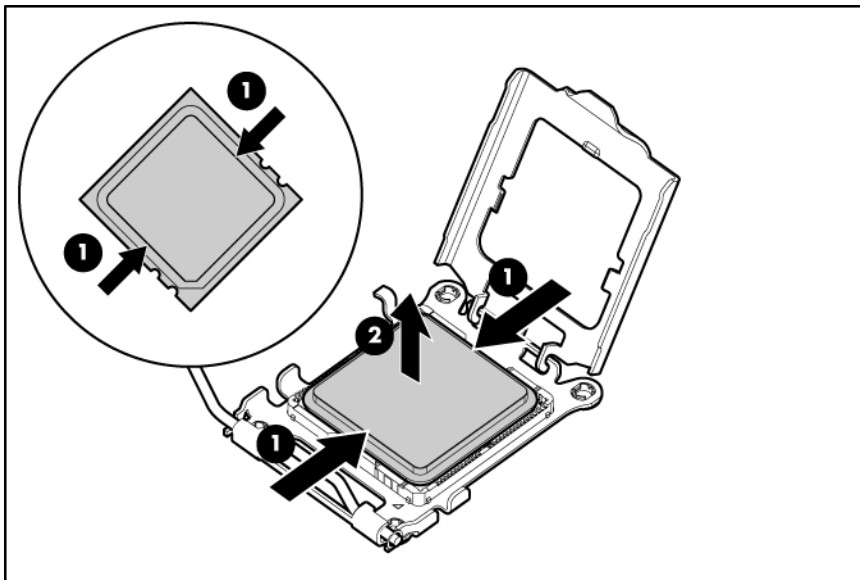
**CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

9. Remove the hot-plug fans from the fan cage ("Hot-plug fan" on page 33).
10. Remove the fan cage ("Fan cage" on page 43).
11. Remove all DIMMs ("DIMMs" on page 50).
12. Remove the heatsink ("Heatsink" on page 43).

13. Open the processor retaining latch and the processor socket retaining bracket.



14. Using your fingers, remove the failed processor.



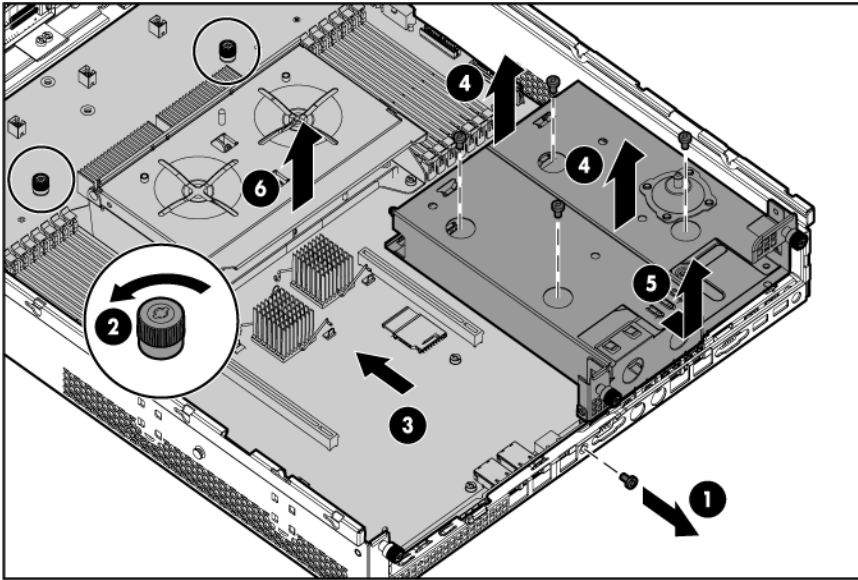
- △ **CAUTION:** To avoid damage to the system board:
- Do not touch the socket contacts.
  - Always install the processor socket cover after removing the processor from the socket.
  - Do not tilt or slide the processor when removing the processor from the socket.

- △ **CAUTION:** To avoid damage to the processor:
- Handle the processor only by the edges.
  - Do not touch the bottom of the processor, especially the contact area.

15. Disconnect all cables connected to the system board.  
16. Remove the retaining screw at the rear of the chassis.  
17. Loosen the system board thumbscrews.




18. Remove the power supply cage assembly ("Power supply cage assembly" on page 54).
19. Remove the failed system board.

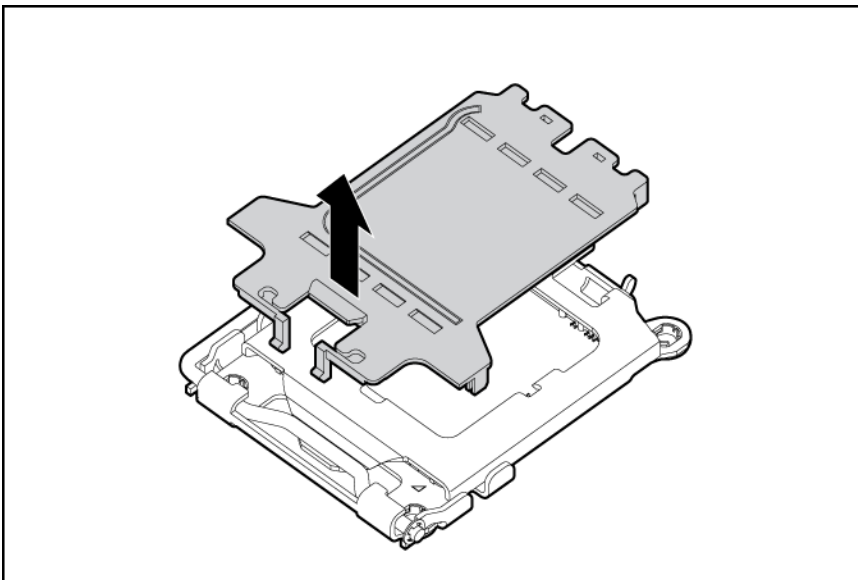


To migrate the processor to the spare system board:

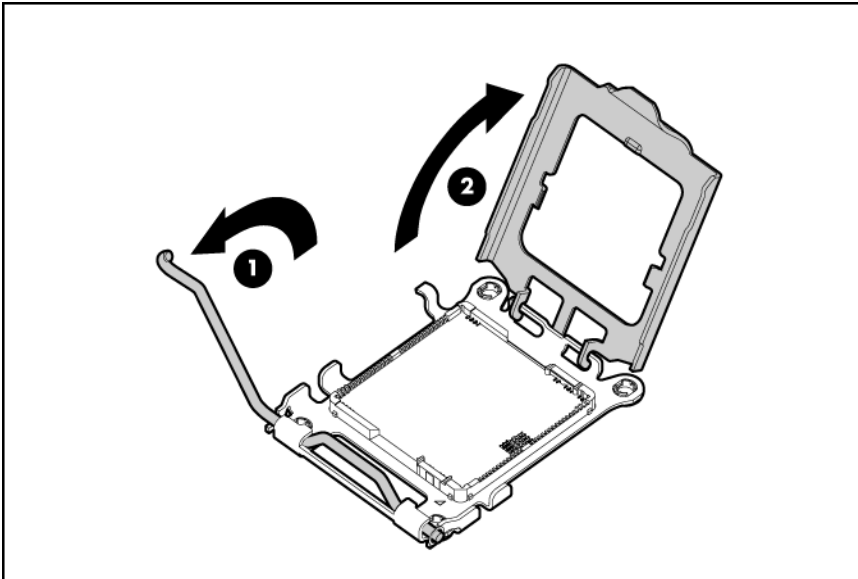
1. Install the spare system board.

 **CAUTION:** The pins on the processor socket are very fragile. Any damage to them may require replacing the system board.

2. Prepare the processor socket on the spare system board:
  - a. Remove the processor socket protective cover.



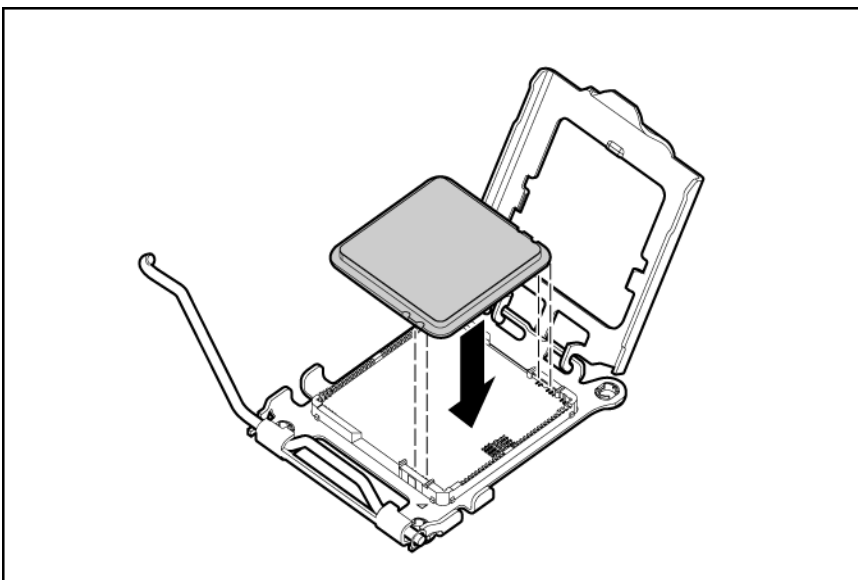
- b. Open the processor retaining latch and the processor socket retaining bracket.



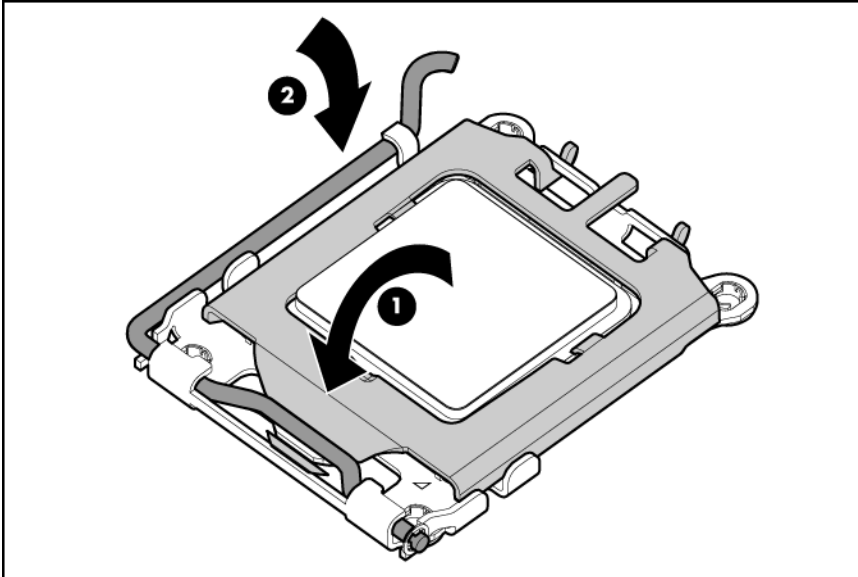
3. Install the processor socket cover onto the processor socket of the failed system board.  
4. Install the processor on the spare system board.

△ **CAUTION:** The processor is designed to fit one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket. Refer to the server hood label for specific instructions.

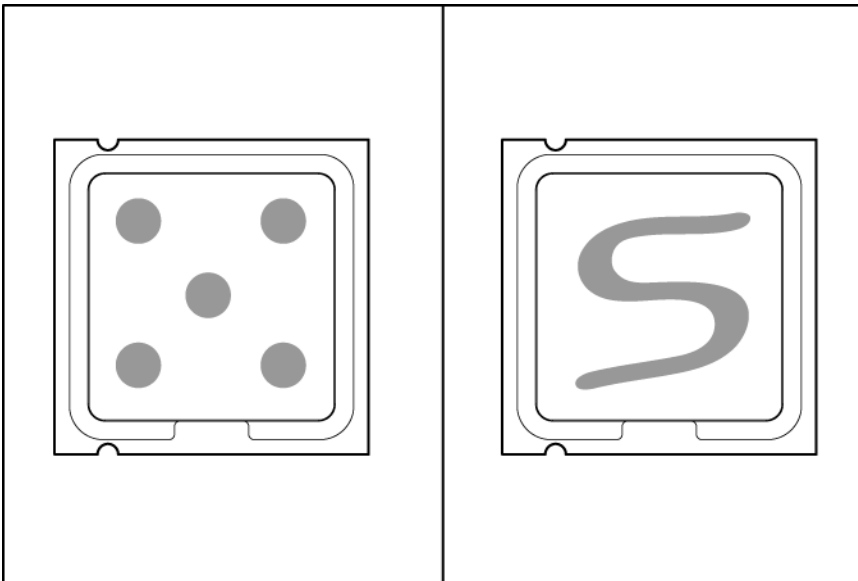
△ **CAUTION:** Always install the processor parallel to the system board to avoid damage to the pins.



5. Close the processor retaining latch and the processor socket retaining bracket.



6. Clean the old thermal grease from the heatsink and the top of the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.
7. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:



8. Install the heatsink ("[Heatsink](#)" on page 43).
9. Install all components removed from the failed system board.
10. Install the access panel ("[Access panel](#)" on page 32).
11. Install the power supplies ("[Hot-plug power supply](#)" on page 30).
12. Power up the server.



**IMPORTANT:** Install all components with the same configuration that was used on the failed system board.

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 **System Options** menu.
3. Select **Serial Number**. The following warning is displayed:  
WARNING! WARNING! WARNING! The serial number is loaded into the system during the manufacturing process and should NOT be modified. This option should only be used by qualified service personnel. This value should always match the serial number sticker located on the chassis.
4. Press the **Enter** key to clear the warning.
5. Enter the serial number and press the **Enter** key.
6. Select **Product ID**.
7. Enter the product ID and press the **Enter** key.
8. Press the **Esc** key to close the menu.
9. Press the **Esc** key to exit RBSU.
10. Press the **F10** key to confirm exiting RBSU. The server will automatically reboot.

## HP Trusted Platform Module

The TPM is not a customer-removable part.



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

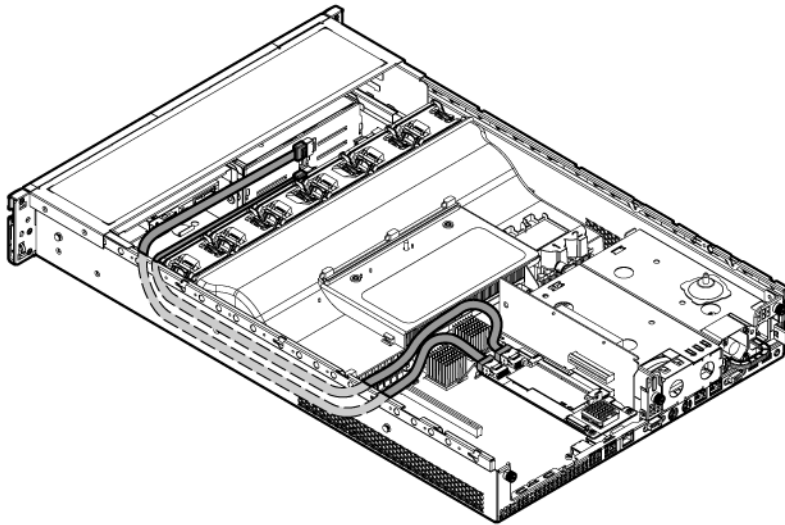
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If you suspect a TPM board failure, leave the TPM installed and remove the system board ("[System board](#)" on page [55](#)). Contact an HP authorized service provider for a replacement system board and TPM board.

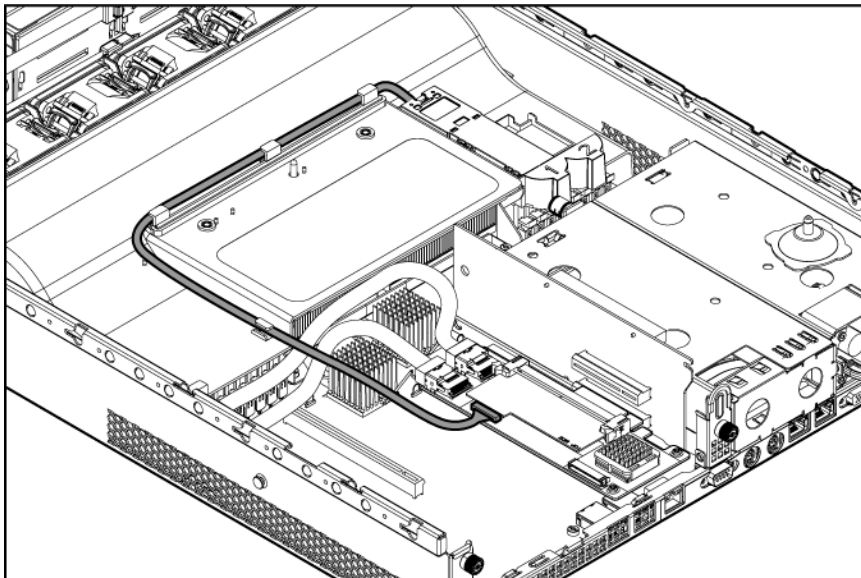
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# Cabling

## SAS hard drive cabling



## Battery cabling for BBWC



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# Diagnostic tools

## Troubleshooting resources

The *HP ProLiant Servers Troubleshooting Guide* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, error message interpretation, issue resolution, and software maintenance on ProLiant servers and server blades. This guide includes problem-specific flowcharts to help you navigate complex troubleshooting processes. To view the guide, select a language:

- English ([http://www.hp.com/support/ProLiant\\_TSG\\_en](http://www.hp.com/support/ProLiant_TSG_en))
- French ([http://www.hp.com/support/ProLiant\\_TSG\\_fr](http://www.hp.com/support/ProLiant_TSG_fr))
- Italian ([http://www.hp.com/support/ProLiant\\_TSG\\_it](http://www.hp.com/support/ProLiant_TSG_it))
- Spanish ([http://www.hp.com/support/ProLiant\\_TSG\\_sp](http://www.hp.com/support/ProLiant_TSG_sp))
- German ([http://www.hp.com/support/ProLiant\\_TSG\\_gr](http://www.hp.com/support/ProLiant_TSG_gr))
- Dutch ([http://www.hp.com/support/ProLiant\\_TSG\\_nl](http://www.hp.com/support/ProLiant_TSG_nl))
- Japanese ([http://www.hp.com/support/ProLiant\\_TSG\\_jp](http://www.hp.com/support/ProLiant_TSG_jp))

## 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.



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

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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>).

# 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 62)
- 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 65)

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 (which may require an iLO Advanced Pack or iLO Advanced for BladeSystem license), see the iLO 2 documentation on the Documentation CD or on the HP website (<http://www.hp.com/servers/lights-out>).

# 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 ProLiant Essentials Rapid Deployment Pack

The RDP software is the preferred method for rapid, high-volume server deployments. The RDP software integrates two powerful products: Altiris Deployment Solution and the HP ProLiant Integration Module.

The intuitive graphical user interface of the Altiris Deployment Solution console provides simplified point-and-click and drag-and-drop operations that enable you to deploy target servers, including server blades, remotely. It enables you to perform imaging or scripting functions and maintain software images.

For more information about the RDP, refer to the HP ProLiant Essentials Rapid Deployment Pack CD or refer to the HP website (<http://www.hp.com/servers/rdp>).

## 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>).

## 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 65)



- 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>).

## ROMPaq utility

The ROMPaq utility enables you to upgrade the system firmware (BIOS). 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. Online versions of the ROMPaq utility are also available for updating the system firmware.

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




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**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>).

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- 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>).

## 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.

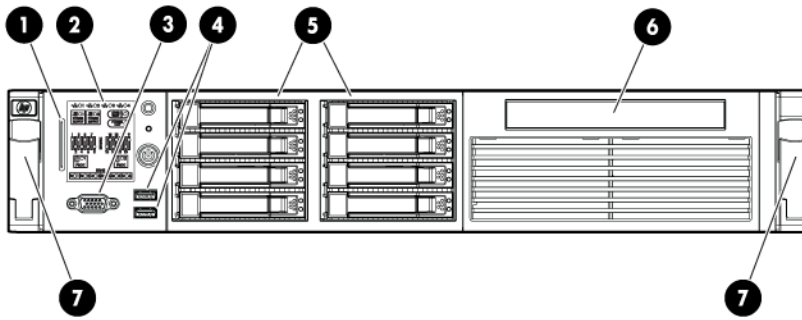
HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, launch the SmartStart CD.

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>).

# Component identification

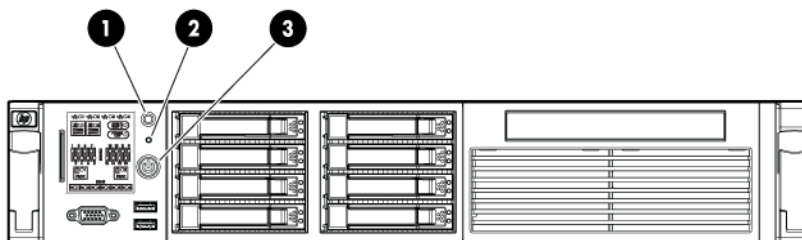
## Front panel components



Item	Description
1	Serial number label
2	Systems Insight Display
3	Video connector
4	USB connectors (2)
5	Hard drive bays
6	SATA optical drive bay
7	Quick release levers (2)

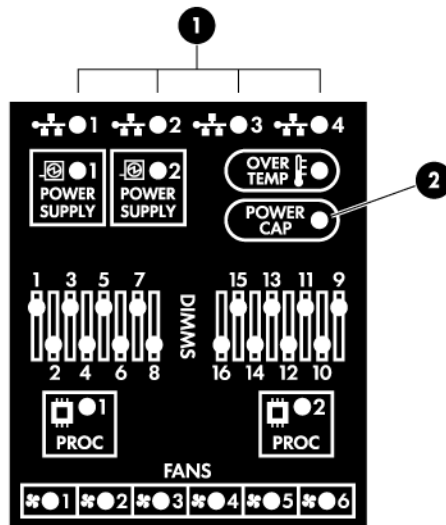
**CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

## Front panel LEDs and buttons



Item	Description	Status
1	UID LED button	Blue = Activated Flashing blue = System being remotely managed Off = Deactivated
2	Health LED	Green = Normal Flashing amber = System degraded. To identify a component in a degraded state, see "Systems Insight Display LEDs (on page 68)." Flashing red = System critical. To identify a component in a critical state, see "Systems Insight Display LEDs (on page 68)."
3	Power On/Standby button and system power LED	Green = System on Amber = System shut down, but power still applied Off = Power cord not attached or power supply failure

## Systems Insight Display LEDs



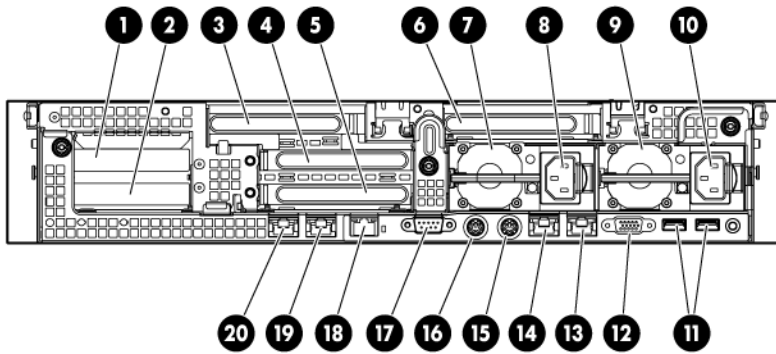
Item	Description	Status
1	NIC LEDs	Off = No link to network Flashing green = Network link and activity Green = Network link
2	Power Cap LED	Off = Server in standby Flashing amber = Power cap exceeded Green = Power cap configured
	All other LEDs	Off = Normal Amber = Failure

# Systems Insight Display LEDs and internal health LED combinations

When the internal health LED on the front panel illuminates either amber or red, the server is experiencing a health event. Combinations of illuminated system LEDs and the internal health LED indicate system status.

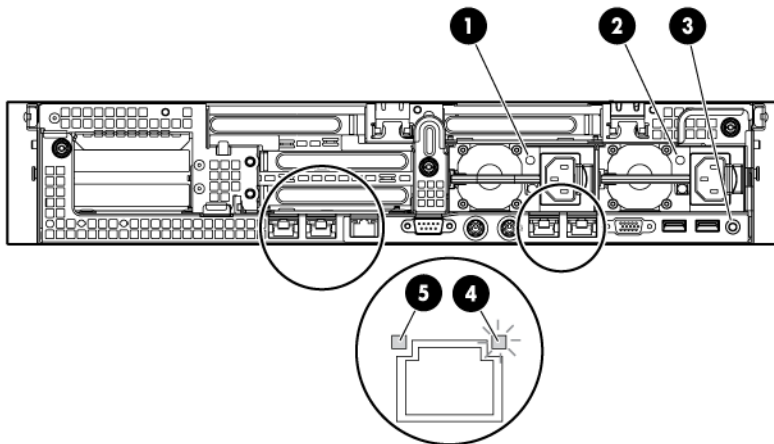
Systems Insight Display LED and color	Internal health LED color	Status
Processor (amber)	Red	One or more of the following conditions may exist: <ul style="list-style-type: none"> <li>• Processor in socket X has failed.</li> <li>• Processor X is not installed in the socket.</li> <li>• Processor X is unsupported.</li> <li>• ROM detects a failed processor during POST</li> </ul>
	Amber	Processor in socket X is in a pre-failure condition.
DIMM (amber)	Red	DIMM in slot X has failed.
	Amber	DIMM in slot X is in a pre-failure condition.
DIMM (amber)	Red	One or more DIMMs have failed. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.
Overtemperature (amber)	Amber	The Health Driver has detected a cautionary temperature level.
	Red	The server has detected a hardware critical temperature level.
Fan (amber)	Amber	One fan is failed or removed.
	Red	Two or more fans have failed or are missing.
Power supply (amber)	Red	Only one power supply installed and power supply in standby. <ul style="list-style-type: none"> <li>• Power supply fault</li> <li>• System board fault</li> </ul>
Power supply (amber)	Amber	Redundant power supply installed and only one power supply is functional. <ul style="list-style-type: none"> <li>• AC power cord not plugged into redundant power supply</li> <li>• Redundant power supply fault</li> </ul>
Power supply (amber)	Amber	Power supply mismatch at POST or power supply mismatch through hot add.

# Rear panel components



Item	Description	Color
1	PCI slot 5	—
2	PCI slot 6	—
3	PCI slot 4	—
4	PCI slot 2	—
5	PCI slot 3	—
6	PCI slot 1	—
7	Power supply 2	—
8	Power supply 2 connector	—
9	Power supply 1	—
10	Power supply 1 connector	—
11	USB connectors (2)	Black
12	Video connector	Blue
13	NIC 1 connector	—
14	NIC 2 connector	—
15	Mouse connector	Green
16	Keyboard connector	Purple
17	Serial connector	—
18	iLO 2 connector	—
19	NIC 3 connector	—
20	NIC 4 connector	—

# Rear panel LEDs and buttons



Item	Description	Status
1	Power supply 2 power LED	Green = Normal Off = System is off or power supply has failed.
2	Power supply 1 power LED	Green = Normal Off = System is off or power supply has failed.
3	UID LED button	Blue = Activated Flashing blue = System being remotely managed Off = Deactivated
4	NIC activity LED	Green = Network activity Flashing green = Network activity Off = No network activity
	iLO 2 link LED*	Green = Network link Off = No network link
5	NIC link LED	Green = Network link Off = No network link
	iLO 2 activity LED*	Green = Network activity Flashing green = Network activity Off = No network activity

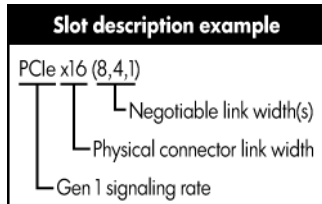
\* iLO 2 LED positions are reversed from the embedded NIC LEDs

# Non-hot-plug PCI riser board slot definitions

Primary (slot - form factor)	Secondary (slot - form factor)	PCIe riser slot description	PCIe x16 riser slot description	PCIe/PCI-X riser slot description
1 - FL/FH	4 - FL/FH	PCIe x16 (8,4,1)	PCIe x16 (16,8,4,1)	PCI-X 64bit/133MHz
2 - HL/FH	5 - LP	PCIe x8 (4,1)	—	PCIe x16 (8,4,1)
3 - HL/FH	6 - LP	PCIe x8 (4,1)	—	PCIe x8 (4,1)

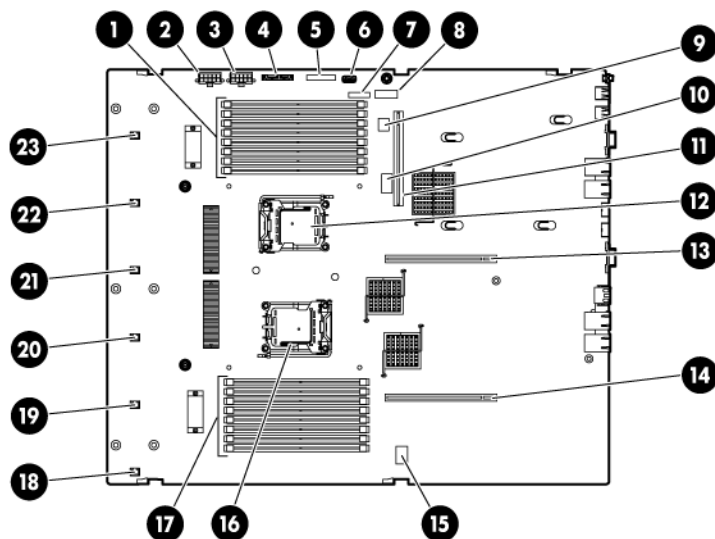
Notes:

- "Primary" denotes the risers are installed in the primary riser connector.
- "Secondary" denotes the risers are installed in the secondary riser connector.
- FL/FH denotes full-length, full-height. HL/FH denotes half-length, full-height. LP denotes low profile.
- The PCIe x16 riser supports a maximum power of 225W with an HP power cable. This cable must be used for PCIe card wattages greater than 75W.



## System board

### System board components



Item	Description
1	Processor 1 DIMM slots
2	Primary SAS power connector
3	Secondary SAS power connector
4	Front I/O connector
5	SATA optical drive connector
6	USB connector
7	System battery connector
8	TPM connector
9	NMI jumper



Item	Description
10	System maintenance switch
11	Power supply backplane connector
12	Processor 1 socket
13	Primary riser connector
14	Secondary riser connector
15	Diagnostic LEDs
16	Processor 2 socket
17	Processor 2 DIMM slots
18	Fan 6 connector
19	Fan 5 connector
20	Fan 4 connector
21	Fan 3 connector
22	Fan 2 connector
23	Fan 1 connector

## System board switches

### System maintenance switch

Position	Default	Function
S1	Off	Off = iLO 2 security is enabled. On = iLO 2 security is disabled.
S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved
S4	Off	Reserved
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6	Off	Off = No function On = ROM reads system configuration as invalid.

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



**CAUTION:** Clearing CMOS and/or NVRAM deletes configuration information. There is an RBSU setting that erases default settings and fixed disk partitions, which causes a loss of data.

### Diagnostic LEDs

Position	Position	Function
S7	S8	Diagnostic LEDs
Off	Off	Port 85
Off	On	Port 84

Position	Position	Function
On	Off	iLO 2

## NMI functionality

An NMI crash dump enables administrators to create crash dump files when a system is hung and not responding to traditional debug mechanisms.

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

To force the OS to invoke the NMI handler and generate a crash dump log, the administrator can do any of the following:

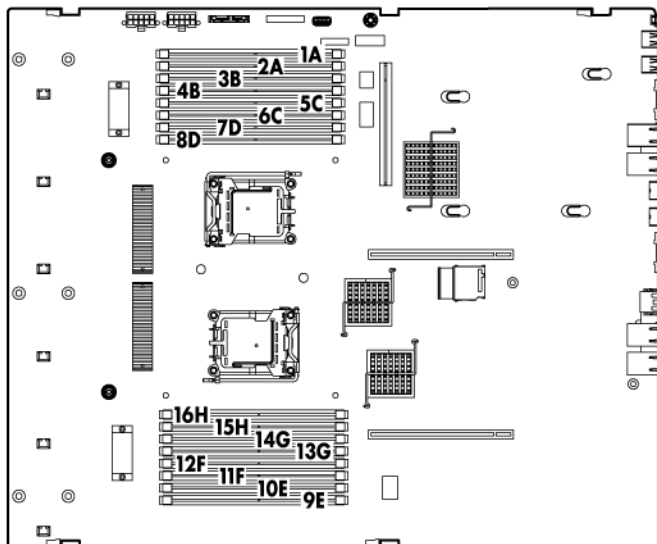
- Short the NMI jumper pins
- Press the NMI switch
- Use the iLO Virtual NMI feature

For additional information, see the whitepaper on the HP website

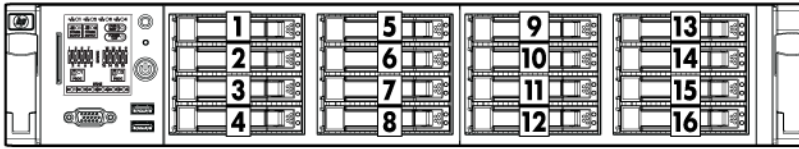
(<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00797875/c00797875.pdf>).

## DIMM slots

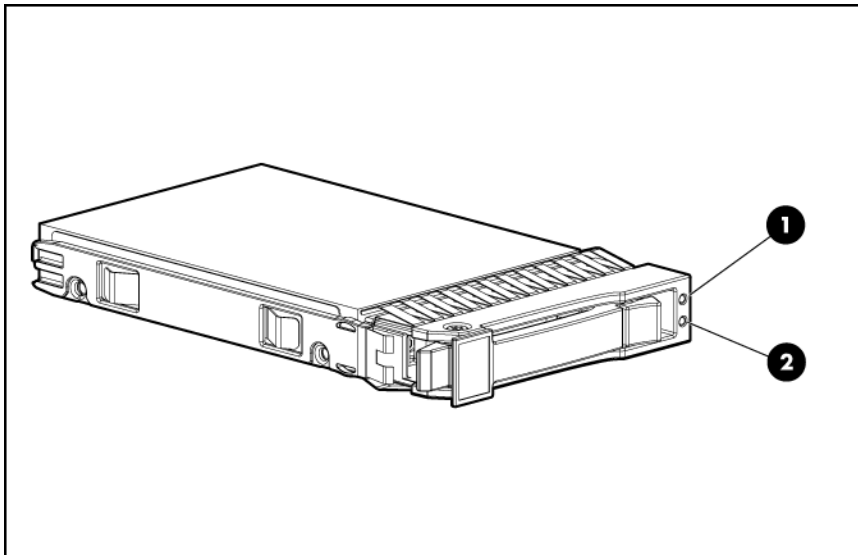
DIMM slots are identified by the numbers 1 through 16 and paired banks are identified by the letters A through H.



# Hard drive numbering



# SAS and SATA hard drive LEDs



Item	Description
1	Fault/UID LED (amber/blue)
2	Online LED (green)

# SAS and SATA hard drive LED combinations

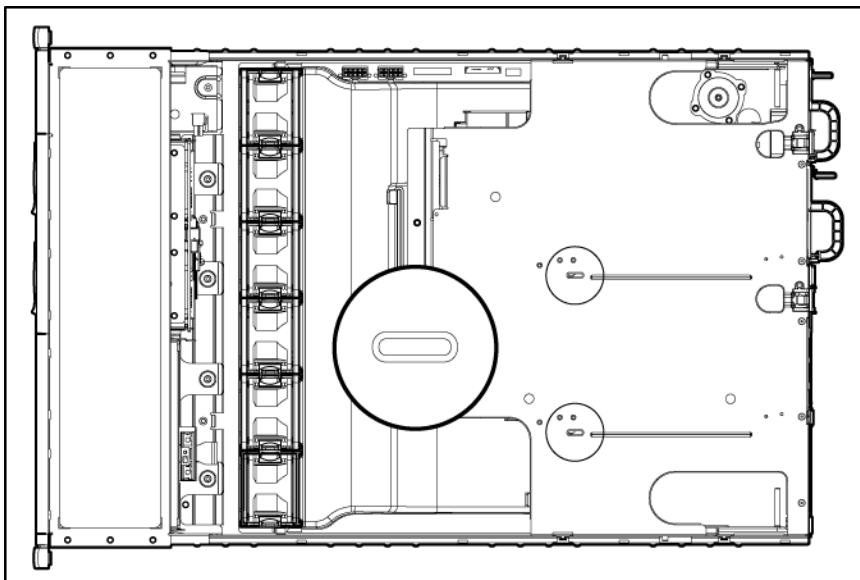
Online/activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive; it also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive 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)	<b>Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.</b> 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	<b>Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.</b> The drive is rebuilding, erasing, 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.

## PCI riser cage LEDs

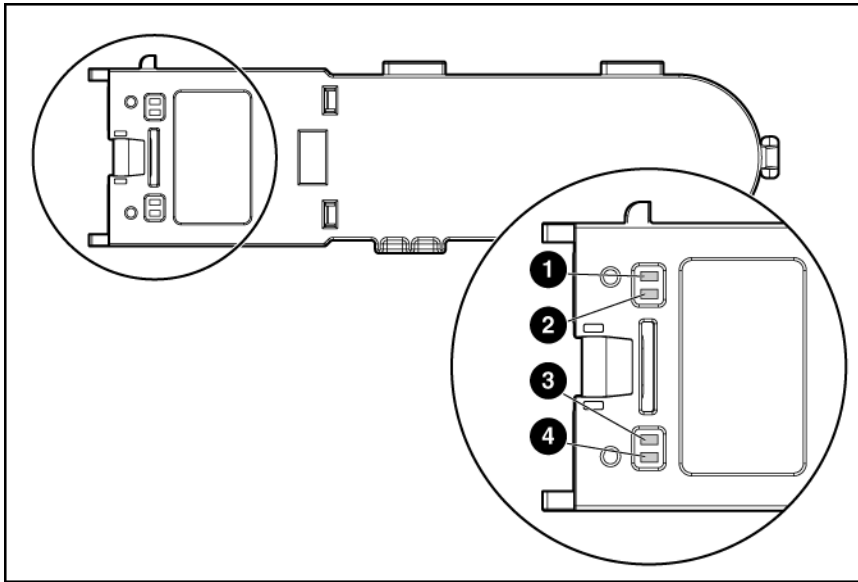


**CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.



<b>Status</b>
On = AC power is connected.
Off = AC power is disconnected.
Missing = Riser is not installed and power might be connected.

## Battery pack LEDs



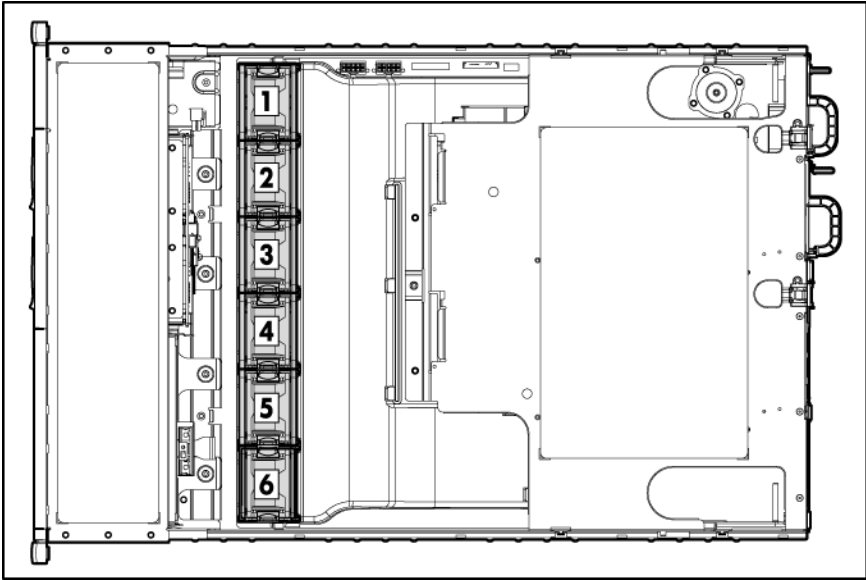
Item ID	Color	Description
1	Green	System Power LED. This LED glows steadily when the system is powered up and 12 V system power is available. This power supply is used to maintain the battery charge and provide supplementary power to the cache microcontroller.
2	Green	Auxiliary Power LED. This LED glows steadily when 3.3V auxiliary voltage is detected. The auxiliary voltage is used to preserve BBWC data and is available any time that the system power cords are connected to a power supply.
3	Amber	Battery Health LED. To interpret the illumination patterns of this LED, see the following table.
4	Green	BBWC Status LED. To interpret the illumination patterns of this LED, see the following table.

LED3 pattern	LED4 pattern	Interpretation
—	One blink every two seconds	The system is powered down, and the cache contains data that has not yet been written to the drives. Restore system power as soon as possible to prevent data loss.  Data preservation time is extended any time that 3.3 V auxiliary power is available, as indicated by LED 2. In the absence of auxiliary power, battery power alone preserves the data. A fully-charged battery can normally preserve data for at least two days.  The battery lifetime also depends on the cache module size. For further information, refer to the controller QuickSpecs on the HP website ( <a href="http://www.hp.com">http://www.hp.com</a> ).
—	Double blink, then pause	The cache microcontroller is waiting for the host controller to communicate.
—	One blink per second	The battery pack is below the minimum charge level and is being charged. Features that require a battery (such as write cache, capacity expansion, stripe size migration, and RAID migration) are temporarily unavailable until charging is complete. The recharge process takes between 15 minutes and two hours, depending on the initial capacity of the battery.
—	Steady glow	The battery pack is fully charged, and posted write data is stored in the cache.
—	Off	The battery pack is fully charged, and there is no posted write data in the cache.
One blink per second	One blink per second	An alternating green and amber blink pattern indicates that the cache microcontroller is executing from within its boot loader and receiving new flash code from the host controller.
Steady glow	—	There is a short circuit across the battery terminals or within the battery pack. BBWC features are disabled until the battery pack is replaced. The life expectancy of a battery pack is typically more than three years.
One blink per second	—	There is an open circuit across the battery terminals or within the battery pack. BBWC features are disabled until the battery pack is replaced. The life expectancy of a battery pack is typically more than three years.

## Hot-plug fans



**CAUTION:** To avoid damage to server components, fan blanks must be installed in fan bays 5 and 6 in a single-processor configuration.



For more information, see "Hot-plug fan operation ("[Hot-plug fan](#)" on page 33)."

# Specifications

## Environmental specifications

Specification	Value
<b>Temperature range*</b>	
Operating	10°C to 35°C (50°F to 95°F)
Shipping	-30°C to 50°C (-22°F to 122°F)
Storage	-30°C to 60°C (-22°F to 140°F)
Maximum wet bulb temperature	28°C (82.4°F)
<b>Relative humidity (noncondensing)**</b>	
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
Height	8.85 cm (3.45 in)
Depth	69.20 cm (27.25 in)
Width	44.54 cm (17.54 in)
Weight (maximum)	27.27 kg (60.12 lb)
Weight (no drives installed)	21.36 kg (47.10 lb)
<b>Input requirements*</b>	
Rated input voltage	100 to 132 VAC 200 to 240 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	6.8 A at 100 VAC 3.4 A at 200 VAC
Rated input power	670 W at 100V AC input 650 W at 200V AC input



BTUs per hour	2285 at 100V to 120V AC input 2217 at 200V to 240V AC input
<b>Power supply output</b>	
Rated steady-state power	For more information, see "Power supply specifications (on page 81)."
Rated peak power	For more information, see "Power supply specifications (on page 81)."

\*The system input requirements are based on measurements using hardware available at the publication of this document. For updated information, see the HP website (<http://www.hp.com/go/proliant-energy-efficient>).

## Power supply specifications

The following specifications provide information on the parameters of the power supplies as they were designed. For more information on configuring power for a specific server, see the HP website (<http://www.hp.com/go/proliant-energy-efficient>).

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

- HP ProLiant 460 W Power Supply

Specification	Value
<b>Input requirements</b>	
Rated input voltage	100V to 120V AC 200V to 240V AC
Rated input frequency	50Hz to 60Hz
Rated input current	5.5A at 100V AC 2.6A at 200V AC
Rated input power	526 W at 100V AC input 505 W at 200V AC input
BTUs per hour	1794 at 100V AC input 1725 at 200V AC input
<b>Power supply output</b>	
Rated steady-state power	460 W at 100V to 120V AC input 460 W at 200V to 240V AC input
Rated peak power	460 W at 100V to 120V AC input 460 W at 200V to 240V AC input

- HP ProLiant 750 W Power Supply

<b>Specification</b>	<b>Value</b>
<b>Input requirements</b>	
Rated input voltage	100V to 120V AC 200V to 240V AC
Rated input frequency	50Hz to 60Hz
Rated input current	8.9A at 100V AC 4.3A at 200V AC
Rated input power	857 W at 100V AC input 824 W at 200V AC input
BTUs per hour	2925 at 100V AC input 2812 at 200V AC input
<b>Power supply output</b>	
Rated steady-state power	750 W at 100V to 120V AC input 750 W at 200V to 240V AC input
Rated peak power	750 W at 100V to 120V AC input 750 W at 200V to 240V AC input

- HP ProLiant 1200 W Power Supply

<b>Specification</b>	<b>Value</b>
<b>Input requirements</b>	
Rated input voltage	100V to 120V AC 200V to 240V AC
Rated input frequency	50 Hz to 60 Hz
Rated input current	10A at 100V AC 4.9A at 200V AC
Rated input power	930 W at 100V AC input 1348 W at 200V AC input
BTUs per hour	3530 at 120V AC input 4600 at 200V to 240V AC input
<b>Power supply output</b>	
Rated steady-state power	800 W at 100V AC input 900 W at 120V AC input 1200 W at 200V to 240V AC input

Rated peak power	800 W at 100V AC input 900 W at 120V AC input 1200 W at 200V to 240V AC input
------------------	---

- HP ProLiant 1200 W DC Power Supply

Specification	Value
<b>Input requirements</b>	
Rated input voltage	-36V to -72V DC -48V DC, nominal input
Rated input frequency	Not applicable
Rated input current	38A at -36V DC 19A at -72V DC 28A at -48V DC, nominal input
Rated input power	1380 W at -36V DC input 1365 W at -72V DC input 1350 W at -48V DC, nominal input
BTUs per hour	4713 at -36V DC input 4662 at -72V DC input 4610 at -48V DC, nominal input
<b>Power supply output</b>	
Rated steady-state power	1200 W
Rated peak power	1200 W

## 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/>).

## CD-ROM drive specifications

Specification	Value
Disk formats	CD-ROM (modes 1 and 2); mixed mode (audio and data combined); CD-DA; Photo CD (single/multiple-session), CD-XA ready; CDi ready
Capacity	550 MB (mode 1, 12 cm) 640 MB (mode 2, 12 cm)
Block size	2368, 2352 bytes (mode 0) 2352, 2340, 2336, 2048 bytes (mode 1) 2352, 2340, 2336, 2048 bytes (mode 2)
<b>Dimensions</b>	

Specification	Value
Height	12.7 mm (0.50 in)
Depth	132.08 mm (5.20 in)
Width	132.08 mm (5.20 in)
Weight	0.34 kg (0.75 lb)
<b>Data transfer rate</b>	
Sustained	150 KB/s (sustained 1X), 1500/3600 KB/s (10X to 24X)
Burst	16.6 MB/s
<b>Access times (typical)</b>	
Full stroke	300 ms
Random	140 ms
Diameter	12 cm, 8 cm (4.70 in, 3.15 in)
Thickness	1.2 mm (0.05 in)
Track pitch	1.6 $\mu\text{m}$ ( $6.3 \times 10^{-7}$ in)
Cache/buffer	128 KB
Startup time	< 10 s
Stop time	< 5 s (single); < 30 s (multisession)
<b>Laser parameters</b>	
Type	Semiconductor laser GaAs
Wave length	700 $\pm$ 25 nm
Divergence angle	53.5° $\pm$ 1.5°
Output power	0.14 mW
<b>Operating conditions</b>	
Temperature	5°C to 55°C (41°F to 131°F)
Humidity	10% to 80%

## DVD-ROM drive specifications

Specification	Value
Disk formats	DVD (single and double layer), DVD-5, DVD-9, DVD-10, DVD-R, CD-ROM Mode 1 & 2, CD-DA, CD-XA (Mode 2, Form 1 & 2), CD-I (Mode 2, Form 1 & 2), CD-I ready, CD-Bridge, CD-R, PhotoCD (single and multi-session)
Capacity	4.7 GB (DVD-5), 8.5 GB (DVD-9), 9.4 GB (DVD10), 550 Mb (Mode 1, 12 cm), 640 Mb (Mode 2, 12 cm), 180 Mb (8 cm)
Block size	2352 bytes (mode 0) 2352, 2340, 2336, 2048 bytes (mode 1) 2352, 2340, 2336, 2048 bytes (mode 2) 2048 bytes (DVD)
<b>Dimensions</b>	
Height	12.7 mm (0.50 in)
Depth	132.08 mm (5.20 in)

Specification	Value
Width	132.08 mm (5.20 in)
Weight	0.34 kg (0.75 lb)
<b>Data transfer rate</b>	
Sustained	4463 - 10,800 KB/s (8X CAV DVD mode), 150 KB/s (sustained 1X CD-ROM), 1552 3600 KB/s (24X CAV CD-ROM)
Burst	16.6 MB/s with DMA support
<b>Access times (typical)</b>	
Full stroke	<200 ms CD <300 ms DVD
Random	<110 ms CD <180 ms DVD
Diameter	12 cm, 8 cm (4.70 in, 3.15 in)
Thickness	1.2 mm (0.05 in)
Track pitch	0.74 $\mu\text{m}$ ( $3.15 \times 10^{-7}$ in) DVD-ROM 1.6 $\mu\text{m}$ ( $6.3 \times 10^{-7}$ in) CD-ROM
Cache/buffer	128 KB
Startup time	< 15 s
Stop time	< 5 s (single); < 30 s (multisession)
<b>Laser parameters</b>	
Type	Semiconductor laser GaAs
Wave length	700 $\pm$ 25 nm
Divergence angle	53.5° $\pm$ 1.5°
Output power	0.14 mW
<b>Operating conditions</b>	
Temperature	5°C to 55°C (41°F to 131°F)
Humidity	10% to 80%

## SAS and SATA hard drive specifications

Item	36-GB SAS drive	72-GB SAS drive	60-GB SATA drive
Capacity	36,420 MB	73,408 MB	60,022 MB
Height	15 mm	15 mm	9 mm
Interface	SAS	SAS	Serial ATA
Transfer rate	3 GB/sec	3 GB/sec	1.5 GB/sec
Rotational speed	10,000 rpm	10,000 rpm	5,400 rpm
Bytes per sector	512	512	512
Logical blocks	71,132,960	143,374,737	117,231,408
Operating temperature	10°C to 35°C (50°F to 95°F)	10°C to 35°C (50°F to 95°F)	10°C to 35°C (50°F to 95°F)

---

# Acronyms and abbreviations

## ABEND

abnormal end

## ASR

Automatic Server Recovery

## BBWC

battery-backed write cache

## DDR

double data rate

## iLO 2

Integrated Lights-Out 2

## IML

Integrated Management Log

## NMI

non-maskable interrupt

## NVRAM

non-volatile memory

## ORCA

Option ROM Configuration for Arrays

## PCI-X

peripheral component interconnect extended

## PCIe

peripheral component interconnect express

## POST

Power-On Self Test

## RBSU

ROM-Based Setup Utility

## RDP

Rapid Deployment Pack

## SAS

serial attached SCSI

## SATA

serial ATA

## TPM

trusted platform module

## UID

unit identification

## USB

universal serial bus

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