

AW Distributed Applications - Enterprise Server™

AW Server 3.2 Pre-Installation Manual

Class A



AW Server

English

UDI: (01)00840682102384(10)AWS3D2E003D4

Download

Client for Windows
Version 3.2 Ext. 3.4

Download

Client for Universal Viewer
Version 3.2 Ext. 3.4

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System Requirements
Processor: Intel® Core™2 Duo processor @2.33GHz or Pentium® processor 4 @3GHz minimum (or equivalent)
Memory: 1024 MB minimum
Disk drive: 250MB free space available
Screen resolution: 1024H x 768V minimum with full color (24 bit) (1280H x 1024V or more recommended)
Network card: 100 Mbps minimum (1000 Mbps recommended)
Internet connection: Customer-provided IPSEC VPN, for internet/WAN operation
Mouse: Two or three-button mouse. Two button mouse with scroll wheel suggested for best use of functions.

Operating systems:
Windows® 7 SP1 32bit and 64bit
Windows® 8.1 32bit and 64bit
Windows® 10 32bit and 64bit
Certain GE consoles are also supported. See the corresponding console User Guides for further details.

Browsers:
Internet Explorer® 10.x, 11.x
Firefox®
Chrome®
Browser security settings: Javascript® enabled

Client Checker Tool

Launch

Operator Manuals

AW Server/3D Viewer/2D Viewer/Volume Viewer

Open

Configuration

Service and Administrative Tools

Launch

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Revision 7

US English

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警告 (ZH-CN)	本维修手册仅提供英文版本。 <ul style="list-style-type: none">• 如果客户的维修服务人员需要非英文版本，则客户需自行提供翻译服务。• 未详细阅读和完全理解本维修手册之前，不得进行维修。• 忽略本警告可能对维修服务人员、操作人员或患者造成电击、机械伤害或其他形式的伤害。

警告 (ZH-HK)	<p>本服務手冊僅提供英文版本。</p> <ul style="list-style-type: none"> • 倘若客戶的服務供應商需要英文以外之服務手冊，客戶有責任提供翻譯服務。 • 除非已參閱本服務手冊及明白其內容，否則切勿嘗試維修設備。 • 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他之危險。
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UPOZORENJE (HR)	<p>Ovaj servisni priručnik dostupan je na engleskom jeziku.</p> <ul style="list-style-type: none"> • Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod. • Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik. • Zanimarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.
VÝSTRAHA (CS)	<p>Tento provozní návod existuje pouze v anglickém jazyce.</p> <ul style="list-style-type: none"> • V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka. • Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah. • V případě nedodržování této výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.
ADVARSEL (DA)	<p>Denne servicemanual findes kun på engelsk.</p> <ul style="list-style-type: none"> • Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse. • Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual. • Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for tekniker, operatøren eller patienten.
WAARSCHU WING (NL)	<p>Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.</p> <ul style="list-style-type: none"> • Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan. • Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is. • Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.
WARNING (EN)	<p>This service manual is available in English only.</p> <ul style="list-style-type: none"> • If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services. • Do not attempt to service the equipment unless this service manual has been consulted and is understood. • Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.
HOIATUS (ET)	<p>See teenindusjuhend on saadaval ainult inglise keeles.</p> <ul style="list-style-type: none"> • Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest. • Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist. • Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.
VAROITUS	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p>

(FI)	<ul style="list-style-type: none"> Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla. Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen. Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.
ATTENTION (FR)	<p>Ce manuel d'installation et de maintenance est disponible uniquement en anglais.</p> <ul style="list-style-type: none"> Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire. Ne pas tenter d'intervenir sur les équipements tant que ce manuel d'installation et de maintenance n'a pas été consulté et compris. Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.
WARNUNG (DE)	<p>Diese Serviceanleitung existiert nur in englischer Sprache.</p> <ul style="list-style-type: none"> Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen. Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben. Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.
ΠΡΟΕΙΔΟΠΟΙ ΗΣΗ (EL)	<p>Το παρόν εγχειρίδιο σέρβις διατίθεται στα αγγλικά μόνο.</p> <ul style="list-style-type: none"> Εάν το άτομο παροχής σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει υπηρεσίες μετάφρασης. Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό εκτός εάν έχετε συμβουλευτεί και έχετε κατανοήσει το παρόν εγχειρίδιο σέρβις. Εάν δεν λάβετε υπόψη την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στο άτομο παροχής σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.
FIGYELMEZTE TÉS (HU)	<p>Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.</p> <ul style="list-style-type: none"> Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése. Ne próbálja elkezdni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték. Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.
ADVÖRUN (IS)	<p>Þessi þjónustuhandbók er aðeins fáanleg á ensku.</p> <ul style="list-style-type: none"> Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu. Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin. Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.
AVVERTENZA (IT)	<p>Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.</p> <ul style="list-style-type: none"> Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione. Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto. Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.
警告 (JA)	<p>このサービスマニュアルには英語版しかありません。</p> <ul style="list-style-type: none"> サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。

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경고 (KO)	<p>본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.</p> <ul style="list-style-type: none"> 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다. 본 서비스 매뉴얼을 참조하여 숙지하지 않은 이상 해당 장비를 수리하려고 시도하지 마십시오. 본 경고 사항에 유의하지 않으면 전기 쇼크, 기계적 위험, 또는 기타 위험으로 인해 서비스 제공자, 사용자 또는 환자에게 부상을 입힐 수 있습니다.
BRĪDINĀJUMS (LV)	<p>Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.</p> <ul style="list-style-type: none"> Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu. Neveiciet aprikojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas. Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.
ĮSPĖJIMAS (LT)	<p>Šis eksploatavimo vadovas yra tik anglų kalba.</p> <ul style="list-style-type: none"> Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas. Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo. Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.
ADVARSEL (NO)	<p>Denne servicehåndboken finnes bare på engelsk.</p> <ul style="list-style-type: none"> Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse. Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått. Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.
OSTRZEŻENIE (PL)	<p>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</p> <ul style="list-style-type: none"> Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta. Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go. Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.
ATENÇÃO (PT-BR)	<p>Este manual de assistência técnica encontra-se disponível unicamente em inglês.</p> <ul style="list-style-type: none"> Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução. Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.
ATENÇÃO (PT-PT)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none"> Se qualquer outro serviço de assistência técnica solicitar este manual noutra idioma, é da responsabilidade do cliente fornecer os serviços de tradução. Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. O não cumprimento deste aviso pode colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.
ATENȚIE	<p>Acest manual de service este disponibil doar în limba engleză.</p>

(RO)	<ul style="list-style-type: none"> • Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere. • Nu încercați să reparați echipamentul decât ulterior consultării și înțelegerii acestui manual de service. • Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.
ОСТОРОЖНО ! (RU)	<p>Данное руководство по техническому обслуживанию представлено только на английском языке.</p> <ul style="list-style-type: none"> • Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует самостоятельно обеспечить перевод. • Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения. • Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.
UPOZORENJE (SR)	<p>Ovo servisno uputstvo je dostupno samo na engleskom jeziku.</p> <ul style="list-style-type: none"> • Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge. • Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo. • Zanimarivanje ovog upozorenja može dovesti do povređivanja serviser, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.
UPOZORNENIE (SK)	<p>Tento návod na obsluhu je k dispozícii len v angličtine.</p> <ul style="list-style-type: none"> • Ak zákazníkovi poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka. • Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obsluhu a neporozumiete mu. • Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.
ATENCION (ES)	<p>Este manual de servicio sólo existe en inglés.</p> <ul style="list-style-type: none"> • Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual. • No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio. • La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.
VARNING (SV)	<p>Den här servicehandboken finns bara tillgänglig på engelska.</p> <ul style="list-style-type: none"> • Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster. • Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken. • Om du inte tar hänsyn till den här varningen kan det resultera i skador på serviceteknikern, operatören eller patienten till följd av elektriska stötar, mekaniska faror eller andra faror.
OPOZORILO (SL)	<p>Ta servisni priročnik je na voljo samo v angleškem jeziku.</p> <ul style="list-style-type: none"> • Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod. • Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli. • Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.
DİKKAT (TR)	<p>Bu servis kılavuzunun sadece ingilizcesi mevcuttur.</p> <ul style="list-style-type: none"> • Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer. • Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz. • Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

Damage in Transportation

All packages should be closely examined at time of delivery. If damage is apparent write "Damage In Shipment" on ALL copies of the freight or express bill BEFORE delivery is accepted or "signed for" by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery.

The following process is for North America only (US + Can)

Note damage on the carrier's delivery paperwork

Take pictures of damage

For Equipment damage: Follow Process & Complete Damage / Loss Claim Form

Timing: No more than 7 days after delivery

For Property damage: Complete Delivery Incident Form

Timing: No more than 2 days after delivery

Email with supporting pictures and all paperwork to @HEALTH Claims-Traffic (Claims-Traffic@med.ge.com) or Fax to 262.312.1183 Att: Claims.

Delivery issues: Complete Delivery Incident Form

Timing: No more than 2 days after delivery

Omissions & Errors

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the GEHC *TrackWise* Process to report all omissions, errors, and defects in this publication.

Electrical Contractors

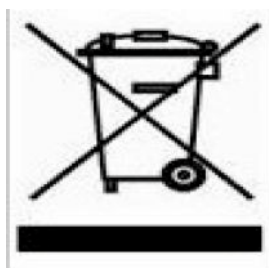
Certified Electrical Contractor Statement

All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors.

Other connections between pieces of electrical equipment, calibrations, and testing shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

WEEE Directive



This logo applied on GEHC hardware marks it as WEEE compliant according to the EU WEEE directive

(2012/19/EU).

This information (product disassembly instructions) is posted on the Hewlett Packard web site at:

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdata/disassemblyservers.html>

These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment

Revision History

Engineering revisions and master for this document are archived in the MyWorkshop system as **DOC1723456**.

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1	2	5719441-1EN Rev1	October 6, 2015	Initial release after Hii review DOC1744927 rev1
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Chapter 1 Introduction

1.1 Overview

NOTE

This pre-installation manual is created for the forward production Physical AW server (HPE ProLiant DL360 Gen9 Server/HPE ProLiant DL360 Gen10 Server) and for the **Virtual AW server**.

For installed based physical servers, refer to the corresponding sections in [A.3 Physical AW Server - Installed Base on page 69](#).

The AW Server product functions in a Client / Service relationship, where end-users connect to the server over a customer supplied network using customer supplied client PC's meeting minimum specifications.

The "system" (e.g. client pc, network, and AW Server software) allows for networking, selection, processing, and filming of multimodality DICOM images.

The AW Server is available in a variety of configurations, a turnkey solution including hardware and software, or a software only solution where the AW Server software can be virtualized on customer provided hardware meeting minimum specifications.

AW Server turnkey offerings include two different hardware solutions for each server families. The differences between the two offerings are basically the size of disk capacity, memory, cpu, and network interfaces.

In addition to supporting multiple hardware configurations, the AW Server also supports the concept of Slice count, where Slice count is the number of slices that can be analyzed by the AW Server among all actively connected client users. To better understand the concept of Slice count please see the below table relating to Slice count configurations.

Table 1-1 Slice count configurations

Hardware Model	Number of Cores	RAM	Slice Count
HPE ProLiant DL360 Gen9 Server (Low Tier)	20	64GB	40,000
HPE ProLiant DL360 Gen9 Server (High Tier)	32	256GB	80,000
HPE ProLiant DL360 Gen10 Server (Low Tier)	20	96GB	40,000
HPE ProLiant DL360 Gen10 Server (High Tier)	36	384GB	80,000
Virtual Machine (L)	8	24GB	8,000
Virtual Machine (XL)	24	64GB	40,000

The AW Server product hosts an array of clinical applications, supporting simultaneous utilization of these applications using a software license strategy. There are node locked licenses as well as floating licenses that are used to enable the use of clinical applications. Applications are a purchased option, and are required to be installed, licensed and activated in order for client user access.

Node lock license are locked to the AW Server, and can not float or be shared, and example of node lock license is the Platform License Key, where this software key enables the usage of the AW Server.

Floating licenses (e.g. shared licenses) concept is where a clinical application and its license(s) are shared amongst the client users. An example of floating license may be an application named Volume Viewer. Where multiple instances of Volume Viewer are active amongst the connected client users.

Floating license software manager may be configured within the AW Server software, or externally on a customer provided computer. The floating manager software (internal or external) provides software key to the client user to enable the application in a floating license configuration, when the client user is finished and closes the application the key is provided back to the floating license manager. The concept is similar to seats, where there is a number of application seats available for client user to access and use a clinical application.

1.2 List of Tasks and Responsibilities

The below tables are an overview of the tasks and responsibilities of the Customer IT Admin and the GEHC FE, upstream of the installation.

They allow Customer/FE to prepare the AW Server installation in the best possible way.

The list of tasks and responsibilities of the Customer IT Admin are described in section [1.3 Responsibility of Purchaser/Customer on page 4](#).

The list of tasks and responsibilities of the GEHC FE are described in section [1.4 Responsibility of Vendor / GEHC on page 6](#).

Table 1-2 List of Tasks and Responsibilities for a Virtual AW Server

Main task	Task or requirement	Responsible	When
Host hardware preparation	Customer supplies hardware to host the Virtual Machine(s).	Customer IT Admin	Pre-Installation
	GEHC FE supplies the minimum hardware and network requirements on page 18 that the host should support.	GEHC FE	Pre-Installation
	Customer installs the Hypervisor to manage the Virtual Machine(s). Refer to Hypervisor Installation in the AW Server 3.2 Installation and Service Manual 5719443-1EN section A.6.1.	Customer IT Admin	Pre-Installation
Virtual Machine resources	GEHC FE supplies the minimum VM resources characteristics to host a Low Tier Virtual AW Server on page 19 .	GEHC FE	Pre-Installation
	GEHC FE supplies the minimum VM resources characteristics to host a High Tier Virtual AW Server on page 19 .	GEHC FE	Pre-Installation
	GEHC FE supplies the minimum VM resources characteristics to host an integrated Virtual AW Server on page 19 .	GEHC FE	Pre-Installation
	GEHC FE supplies the minimum VM resources characteristics for the images data disk for non-integrated Virtual AW Server on page 20 .	GEHC FE	Pre-Installation
	GEHC FE supplies the minimum VM resources characteristics to host two HAPS Virtual Machines on page 21 in case of cluster configuration.	GEHC FE	Pre-Installation
Site Pre-install Specifications	GEHC FE supplies the minimum site infrastructure and administrative requirements	GEHC FE	Pre-Installation

Main task	Task or requirement	Responsible	When
	on page 22 needed prior to installing the AW server.		
	GEHC FE supplies the minimum requirements the customer computer should meet on page 24 prior to installing the AW server Client.	GEHC FE	Pre-Installation
Site-readiness survey	GEHC FE completes the site readiness checklist with the help of the customer, to ensure that the site infrastructure and administrative requirements are met before AW Server installation on site (see Virtual AW Server case on page 37 and Virtual AW Server Site-readiness survey on page 41).	GEHC FE / Customer IT Admin	Pre-Installation
	GEHC FE completes the site readiness checklist on page 44 with the help of the customer, to ensure that the customer PC requirements are met before AW Server Client installation.	GEHC FE / Customer IT Admin	Pre-Installation
Remote connectivity	Customer provides Broadband connection to support InSite access functionality.	Customer IT Admin	Pre-Installation
Security and Privacy	GEHC FE asks the customer to define new passwords on page 25 that follow the new password strength rules. Those new passwords will be set at installation time.	GEHC FE / Customer IT Admin	Pre-Installation
Hypervisor configuration	Customer allocates resources on the Hypervisor for the guests Virtual Machines hosting the AW Server(s). Refer to Job Card IST001AB - Hypervisor Configuration on page 47 .	Customer IT Admin / GEHC FE	Pre-Installation
Software Kit	GEHC FE delivers the Software Kit on page 10 with the OS and the AW Server media.	GEHC FE	Pre-Installation
Virtual Machine creation	Customer creates the Virtual Machine(s) from the OVF Template delivered in the Software Kit. Note: Do not forget to create the images data disk for non-integrated Virtual AW Server. Refer to Job Card IST001B - Virtual Machine creation on page 57 .	Customer IT Admin / GEHC FE	Pre-Installation / Installation

Table 1-3 List of Tasks and Responsibilities for a Physical AW Server

Main Task	Task or requirement	Responsible	When
Physical server description	GEHC supplies the HP DL360 based physical server on page 11 and an optional rack to the customer.	GEHC FE	Pre-Installation
Site Pre-install Specifications	Customer supplies a local to rack the physical server, electrical outlets to power it and network connection outlets to connect it (see Desk, Chair and Electrical Wall Outlets Supplying on page 5).	Customer IT Admin	Pre-Installation
	GEHC FE supplies the hardware installation prior to installing the physical server (see HP DL360 Low Tier Hardware installation requirements on page 21 , HP DL360 High Tier Hardware installation requirements on page 22).	GEHC FE	Pre-Installation
	GEHC FE supplies the network requirements on page 22 prior to installing the physical server.	GEHC FE	Pre-Installation

Main Task	Task or requirement	Responsible	When
	GEHC FE supplies the environmental on page 27 , structural on page 29 , electrical on page 30 and air cooling on page 31 requirements of the room intended to host the physical server prior to installing it.	GEHC FE	Pre-Installation
	GEHC FE informs the customer on the equipment needed to handle the physical server on page 31 prior to installing it.	GEHC FE	Pre-Installation
	GEHC FE supplies the dimensions, weights and floor loading characteristics on page 33 of the physical server prior to installing it.	GEHC FE	Pre-Installation
	GEHC FE supplies the mounting on page 35 and shipping on page 35 requirements of the physical server prior to installing it.	GEHC FE	Pre-Installation
	GEHC FE supplies the minimum requirements the customer computer should meet on page 24 prior to installing the AW server Client.	GEHC FE	Pre-Installation
Site-readiness survey	GEHC FE completes the site readiness checklist with the help of the customer, to ensure that the site infrastructure and administrative requirements are met before AW Server installation on site (see DL360 High & Low Tier servers case on page 37 and Physical AW servers Site-readiness survey on page 38).	GEHC FE / Customer IT Admin	Pre-Installation
	GEHC FE completes the site readiness checklist on page 44 with the help of the customer, to ensure that the customer PC requirements are met before AW Server Client installation.	GEHC FE / Customer IT Admin	Pre-Installation
Remote connectivity	Customer provides Broadband connection to support InSite access functionality.	Customer IT Admin	Pre-Installation
Security and Privacy	GEHC FE asks the customer to define new passwords on page 25 that follow the new password strength rules. Those new passwords will be set at installation time.	GEHC FE / Customer IT Admin	Pre-Installation
Software Kit	GEHC FE delivers the Software Kit on page 10 with the OS and the AW Server media.	GEHC FE	Pre-Installation

1.3 Responsibility of Purchaser/Customer

1.3.1 Server Local Provision and Management

AW Server 3.2 can be installed either on a GEHC supplied hardware or on a Virtual Machine (VM) hosted on a customer's supplied hardware.

NOTICE

The AW server hardware supplied by GE HealthCare shall be installed in a server local/ data center (Low and High Tier: HPE ProLiant DL360 Gen9 Server and HPE ProLiant DL360 Gen10 Server). If the AW server hardware supplied by GE HealthCare is to be installed in the exam or control room, then it shall not be directly or indirectly in contact with the patient. AW server shall be located outside the Patient Environment (1.5m around the patient table) based on EN 60601-1 and ANSI/AAMI ES60601-1).

1.3.2 Summary of Customer IT Admin responsibilities

Customer should receive a Product Data Sheet from sales representative, during pre-installation meetings, to define product specifications of server and client PC requirements.

The customer IT Admin is responsible for:

- Server local provision and management, consistent with the requirements stated in this manual.
- Deploying client software (apart from the first, single site client installation)
- Maintaining the customers' own PCs (Hardware, Operating System, Displays...) and Network (Hardware & Software) connection between these PCs and the AW Server to always meet the defined minimum specifications.

NOTE

The minimum required specifications should be explained to the customer's IT department, since they are responsible for solving problems related to network and/or client performance issues.

- To identify and retain an AW Server point person at their sites who will be trained by GE to install (or reinstall or uninstall) future AW Server clients and use the GE provided troubleshooting tools to maintain the clients.
- Installation and maintenance of the customer-supplied Hypervisor, in case of virtual AW Server installation.
- Allocating resources on the Hypervisor.
- Contacting VMware Support (ESXi) for all Hypervisor-related issues.
- Maintaining DICOM nodes
- Maintaining DICOM printers
- User management (inc AD integration, group creation, etc)
- Audit log repository
- Remote Connectivity (see below)

1.3.3 Desk, Chair and Electrical Wall Outlets Supplying

The customer is responsible for providing:

- Free rack slots in the Servers room for the HPE ProLiant DL360 Gen9 Server/HPE ProLiant DL360 Gen10 Server rackable units and electrical outlets (and UPS if applicable).
- Network connection outlets (see [4.5 Environmental for HPE DL360 servers on page 46](#) for details)

1.3.4 Local or National Code Compliance

The customer is responsible for locating the server in compliance with any local or national codes.

1.3.5 Remote access Connection

Customer is responsible for providing and maintaining an appropriate Broadband connection at the site that GE Healthcare may use to provide remote diagnostic service for the products. Eligible products include an uptime commitment during the warranty period, provided that the Customer maintains a Broadband connection in accordance with GE Healthcare specifications and allows GE Healthcare to remotely monitor performance of the products via this connection.

GE Healthcare will provide details of this uptime commitment for eligible products.

WARNING

AW Server should always be run over the hospital VPN (virtual private network) if accessing from any external network. Running it on the open internet without proper network security measures (such as enterprise firewall) could lead to patient privacy issues. The management of the VPN is under the strict responsibility of the hospital.

1.3.6 InSite connection

- AW Server 3.2 is delivered with the basic software, ready to support InSite access functionality.
- InSite functionalities can directly be accessible through the "Broadband connection", if available for your site Image source system.

1.4 Responsibility of Vendor / GEHC

1.4.1 Responsibility of HPE Vendor - HPE DL360 Low Tier servers

The Vendor is responsible for delivering to GEHC the HPE ProLiant DL360 Gen9 Server and HPE ProLiant DL360 Gen10 Server hardware, with the RAID and the iLO Service Processor's login credentials properly configured.

The hardware break-fix process is under the full responsibility of GEHC.

1.4.2 Responsibility of HPE Vendor - HPE DL360 High Tier servers

The Vendor is responsible for delivering to GEHC, the HPE ProLiant DL360 Gen9 Server and HPE ProLiant DL360 Gen10 Server High Tier, with the BIOS, RAID and the iLO Service Processor's login credentials properly configured.

NOTICE

The hardware installation responsibility for the HPE High Tier server and accessories (UPS, etc ..) is transferred from HPE to GEHC. The Vendor (HPE) is no longer responsible for physically installing the server and accessories at the customer's facilities. Responsibility goes to GEHC FE. This transfer includes the pre-installation visit and Site survey completion responsibility transfer from HPE to GE.

1.4.3 GEHC delivered Physical Hardware

1.4.3.1 Installation Workflow

- Site readiness survey is managed by the GEHC Project Manager
- The Hardware is factory preloaded with OS, AW Server Platform and Applications software. Hardware installation is performed by the GEHC FE.
- GEHC FE then configures the server on-site.
- GEHC FE generates licenses on-site, using the eLicense tool.
- GEHC FE configures integration with the Universal Viewer using CPACS or PACS IW back end.
- GEHC FE configures integration with Enterprise Archive (EA) back end, for DICOM Direct Connect.

1.4.3.2 Maintenance Roles

The GEHC FE is responsible for:

- Troubleshooting all problems with the AW Server.
- Resolving all software-related problems.
- Managing (not executing) server maintenance.
- CA certificates

The equipment vendor (HP) is responsible for:

- Resolving all hardware problems for High Tier AW Servers, according to the warranty / break fix model

The customer IT Admin is responsible for:

- Server locale provision and management, consistent with the requirements stated in this manual.
- Provide VM host system meeting the requirements.
- Deploying client software (apart from the first, single site client installation)
- Maintaining the customers' own PCs (Hardware, Operating System, Displays...) and Network (Hardware & Software) connection between these PCs and the AW Server to always meet the defined minimum specifications.

NOTE

The minimum required specifications should be explained to the customer's IT department, since they are responsible for providing VM host system meeting the requirements, and solving problems related to network and/or client performance issues.

- To identify and retain an AW Server point person at their sites who will be trained by GE to install / reinstall / uninstall future AW Server clients and use the GE provided troubleshooting tools to maintain the clients.
- Complete GE provided diagnostic task checklist prior to contacting GE service and send client error reports to GE Service when reporting any issues
- Maintaining DICOM nodes
- Maintaining DICOM printers (not used in some configurations)
- User management (inc AD integration, group creation, etc). (Not used by EDS)
- Audit log repository
- Remote Connectivity. If applicable, Customer is responsible for providing and maintaining an appropriate Broadband connection at the site that GE Healthcare may use to provide remote diagnostic service for the products. Eligible products include an uptime commitment during the warranty period, provided Customer maintains a Broadband connection in accordance with GE Healthcare specifications and allows GE Healthcare to remotely monitor performance of the products via this connection. GE Healthcare will provide details of this uptime commitment for eligible products.

1.4.4 "Virtual AW Server" on Customer-supplied Physical Server

The Vendor and customer responsibilities for installation and maintenance are defined in the customer's contract, but should take into account the Pre-installation requirements defined in this manual. GEHC is responsible for installation of AW Server 3.2 and application software on hardware that has been installed and configured to these specifications.

AW Server 3.2 is VMWare Ready and can be installed in the following hypervisor environments:

- VMware vSphere Hypervisor 5.5 (ESXi 5.0)
- VMware vSphere Hypervisor 5.5 (ESXi 5.1)
- VMware vSphere Hypervisor 5.5 (ESXi 5.5)
- VMware vSphere Hypervisor 6.0 (ESXi 6.0)
- VMware vSphere Hypervisor 6.5 (ESXi 6.5)
- VMware vSphere Hypervisor 6.7 (ESXi 6.7)

NOTE

Hyperthreading needs to be turned off on the Hypervisor to optimize the performances of the AW Server and the 3D applications. Indeed, the software is optimized for CPU settings with Intel Xeon architecture and without hyperthreading. So, it is recommended to deactivate the Hyperthreading on AW Server. Therefore, it is not appropriate to have other customer's VMs running on the same Hypervisor, if these other VMs require Hyperthreading to be activated, otherwise it could impact the AW Server performances.

1.4.4.1 The customer IT Admin is responsible for

(in addition to responsibilities defined in previous section, where applicable):

- Allocating resources on a server. These must correspond to the minimum specifications for a virtual AW Server, in term of disk space, memory available and CPU cores.
- Providing the virtualization layer and loading the OS for AW server, from a template delivered by GEHC.
- Installation of the template may be done by a GEHC FE under customer IT Admin responsibility.
- Contacting VMware support (ESXi) for all Hypervisor-related issues. (The support of the Hypervisor is the under the full responsibility of the virtualization platform supplier(s).)
- Managing their own Service contract with the server hardware supplier.

Cluster mode (Scalability):

In addition to the requirements listed above, the customer is responsible for supplying the "Private AW Server network" for a cluster of AW Servers VM nodes, compatible with the following requirements:

- **Two additional nodes (HAPS - High Availability Preferences Sharing) shall be installed to host the Shared Preferences between all AW Servers within the Cluster.**
- All AW Server / HAPS nodes shall connected to the same AW Server Private LAN
- UDP broadcast shall be allowed on this LAN
- The LAN speed shall be 1Gbps
- The LAN Latency shall be less than 10ms

NOTICE

AW Server software is considered "out of GE warranty" and indeed non serviceable until customer validates return to service of server with virtualization layer prerequisites.

1.4.4.2 The GEHC FE is responsible for

- Delivering to the IT Admin the media containing the OS template to create the Virtual Machine corresponding to the AW Server's requirements, as well as the instructions for creating the VM.

- Loading and configuring the AW Server Platform SW, as well as installing the Advanced applications,
- Installing one Client

NOTE

The GE Service representative will install AW Server Client software on one Client PC for the purposes of demonstration. It is the customer responsibility to install AW Server client software on Client PC's within the facility. Microsoft Installer, or currently known as Windows Installer is a file format used for the installation, maintenance and removal of software on Microsoft Windows based systems. **The AW Server client software is MSI compatible.** The AW Server client software can be deployed over the facilities network using MSI technologies. It is the customer's responsibility to configure and manage the deployment of the AW Server Client software. The AW Server client MSI is located on the AW Server SW & Docs media in client directory. Please see your GE Service representative for additional details.

1.4.5 "Virtual AW Server" in Edison HealthLink environment

Edison HealthLink is the host environment that hosts the AW Server Virtual Machine. It allows console users to do advanced processing with AW Applications remotely from the CT/MR Console.

The AW Server in DICOM Direct Connect integration mode can run on the Edison HealthLink environment and retrieves the data from the CT/MR Console database.

The AW Server client is integrated within the CT Console Client. For the MR Console, the AW Server client is installed on a customer desktop/laptop.

1.4.6 "Virtual AW Server" in CT Nano-Cloud environment

CT Nano-Cloud is a simplified version of the Edison HealthLink. In this case the AW Server VM is hosted by the CT Console OS. AW Server is streaming the exam data from the CT via DICOM Direct Connect to the application running on the AW Server.

Refer to CT documentation for full description.

1.4.7 AW Server Client Software Deployment on Windows PC

The GE Service representative will install AW Server Client software on one Client PC for the purposes of demonstration. It is the customer responsibility to install AW Server client software on Client PC's within the facility.

- Microsoft Installer, or currently known as Windows Installer is a file format used for the installation, maintenance and removal of software on Microsoft Windows based systems.
- The AW Server client software is MSI compatible.
- The AW Server client software can be deployed over the facilities network using MSI technologies. It is the customer's responsibility to configure and manage the deployment of the AW Server Client software.
- The AW Server client MSI is located on the AW Server SW & Docs media in client directory.
- Please see your GE Service representative for additional details.

1.4.8 Site Readiness Survey

When an order is entered, the GEHC Project Installation Manager initiates the site readiness survey and actions.

The Project Installation Manager makes contact with the site IT or infrastructure operatives and verifies the site readiness, and or drives the processes to get the site ready.

When the pre-installation work is complete, and the site is ready for the installation, the GEHC Project Installation Manager schedules the physical delivery & installation.

- the physical delivery & installation for AW Server hardware
- the software installation for virtualized AW Server

1.5 Product identification



1.5.1 Software Kit

This section describes the content of the Software Kit.

This section describes the content of the Software Kit. Refer to the following tables to know which media you need to install, upgrade or update a Physical AW Server or a Virtual AW Server.




Table 1-4 Physical AW Server

Media name	Part Number	Type	Content	Purpose
Operating System AWS3.2_OS Rev 5.1 for AW Server 3.2	5720621		OS Helios	Upgrade/Update: OS loading for the Physical AW Server
AW Server 3.2 Ext. 3.4 SW and Docs	5720631		AWS software	Upgrade/Update: AWS loading for the Physical AW Server

NOTE

The Physical AW Servers are preloaded by Manufacturing with OS and AW Server software. So there is no media for initial installation.

Table 1-5 Virtual AW Server

Media name	Part Number	Type	Content	Purpose
Operating System Template AWS3.2_OS Rev 5.1 for Virtual AW Server 3.2	5720625		OVF template: OS Helios	Initial installation: Virtual Machine creation and OS loading for the Virtual AW Server




Media name	Part Number	Type	Content	Purpose
AW Server 3.2 Ext. 3.4 SW and Docs for Virtual Machine	5720634		AWS software	Initial installation & Upgrade/Update: AWS loading for the Virtual AW Server
Operating System AWS3.2_OS Rev 5.1 for Virtual AW Server 3.2	5720635		OS Helios	Upgrade/Update: OS loading for the Virtual AW Server
AW Server 3.2 Ext. 3.4 SW and Docs for Virtual Machine	5818084		<ul style="list-style-type: none"> qcow2 image template: OS Helios + AWS software Kindler manifest: Describes Virtual Machine characteristics 	Initial installation & Upgrade/Update: Virtual Machine creation and OS + AWS loading for the Virtual AW Server on the CT/MR Console Environment (Edison HealthLink or CT Nano-Cloud)

Table 1-6 Media common to Physical and Virtual AW Server




Media name	Part Number	Type	Content	Purpose
AW Server 3.2 User Docs	5720636		AWS user documentation	User documentation for AW Server
AW Server Demo Exams	5694797		Demo Exams	To test that applications can run after installation

Table 1-7 Other

Media name	Part Number	Type	Content	Purpose
Open Source SW for AW Server 3.2	5720637		Open source license agreements	Compliance with open source license terms

1.5.2 HPE DL360 based AW Servers

NOTICE

The hardware installation responsibility for the HPE High Tier server and accessories (UPS, etc..) is transferred from HPE to GEHC. The Vendor (HPE) is no longer responsible for physically installing the High Tier server and accessories at the customer's facilities.

- This section is performed and completed by the GEHC FE(s). The GEHC FE is responsible for the physical installation of the server and the UPS (if applicable) in the servers room of the site.
- Two FEs are necessary for the physical installation, and depending on the configuration (installation in a customer's supplied rack upper slots), a lifting tool such as the Genie Lift (5417996 : Genie Load Lifter - available from the Pool of Tools) may be necessary
- The High Tier server offering is based on the HPE ProLiant DL360 Gen9 Server or HPE ProLiant DL360 Gen10 Server.
- The Low Tier server offering is based on a "lighter" version of the HPE ProLiant DL360 Gen9 Server or HPE ProLiant DL360 Gen10 Server.

- The High Tier server and its accessories can be installed either into a customer's supplied rack or into a GEHC supplied "standalone" rack. The optional standalone rack can be ordered to insert the server, the Network switch, the KVM, the PDU and the UPS.

There are site infrastructure and administrative requirements that must be met before the physical installation begins – network drops, IPA configurability, gateway administration, DNS, security, LDAP/Active Directory information, data center access, space/hardware, and so on... From a SERVICE PLAN standpoint – the CRITICAL SERVICE REQUIREMENT is the “Site Ready?” piece. If the checklist is not satisfied (site not ready), the installation should not start.

When an order is entered, the GEHC Project Installation Manager contacts the GEHC local Service organization (FE) who initiates the site readiness survey through a site visit, in order to complete the Site-readiness checklist given at chapter 4 of this manual.

The primary data points that must be acquired by the GEHC sales/quote are: Customer Contact information for site and IT and does the site have a Data Center?

The GEHC local Service organization (FE) makes contact with the site IT or infrastructure operatives and verifies the site readiness, and or drives the processes to get the site ready.

When the pre-installation work is complete, and the site is ready for the installation, the GEHC Project Installation Manager schedules the physical delivery & installation.

NOTICE

For the installation of AW Server hardware, it is mandatory to connect input devices, for the initial installation and set-up (at least until the iLO is configured): either a KVM (the KVM is an accessory for EDS configurations) or the following set of devices: a keyboard, a monitor, a mouse.

NOTICE

There are site infrastructure and administrative requirements that must be met before the physical installation begins – network drops, gateway administration, DNS, security, LDAP/Active Directory information, data center access, space/hardware, and so on... From a SERVICE PLAN standpoint, the CRITICAL SERVICE REQUIREMENT is the “Site Ready?” piece. If the checklist is not satisfied (site not ready), the installation should not start.

1.5.2.1 The HPE ProLiant DL360 Gen10 Server Low tier and High tier

The HPE ProLiant DL360 Gen10 Server based AW system contains the main parts as follows:

- The HPE ProLiant DL360 Gen10 Server:
 - Has 2 redundant 500W power supplies
 - The **Low Tier** server has 96GB RAM
 - The **High Tier** server has 384GB RAM
 - Is equipped with 1 (one) internal CD/DVD drive
 - Has 2 × 300GB SAS HDD system disks (on the right)
 - The **Low Tier** server has 6 × 600GB SAS HDD image disks (on the left)
 - The **High Tier** server has 6 × 1.8TB SAS HDD image disks (on the left)
- **NOTE**

No external DAS is needed for the image filesystem. The image filesystem disks are part of the server hardware
- One **KVM** (keyboard, mouse and monitor) - optional

- One **PDU** (Power Distribution Unit) - optional
- Cables for KVM and cables for PDU - optional
- Power cables, and network cables

Figure 1-1 HPE ProLiant DL360 Gen10 Server front view



NOTE

The same accessories can be used for HPE ProLiant DL360 Gen10 Server Low Tier and High Tier.

1.5.2.2 The HPE ProLiant DL360 Gen9 Server Low Tier and High Tier

The HPE ProLiant DL360 Gen9 Server based AW system contains the main parts as follows:

- The HPE ProLiant DL360 Gen9 Server:
 - Has 2 redundant 500W power supplies
 - The **Low Tier** has 64GB RAM
 - The **High Tier** has 256GB RAM
 - Is equipped with 1 (one) internal CD/DVD drive
 - Has 2 × 300GB SAS HDD system disks (on the right)
 - The **Low Tier** server has 6 × 600GB SAS HDD image disks (on the left)
 - The **High Tier** server has 6 × 1.8TB SAS HDD image disks (on the left)
- **NOTE**

No external DAS is needed for the image filesystem. The image filesystem disks are part of the server hardware
- One **KVM** (keyboard, mouse and monitor) - optional
- One **PDU** (Power Distribution Unit) - optional
- One **Network switch** - optional
- Cables for KVM and cables for PDU - optional
- Power cables, and network cables

Figure 1-2 HPE ProLiant DL360 Gen9 Server front view



NOTE

The same accessories can be used for HPE ProLiant DL360 Gen9 Server Low Tier and High Tier.

1.5.2.3 HPE R/T3000 UPS option

If the site does not have a power conditioner, a UPS shall be ordered.

- HPE R/T3000 UPS
- Power cables and USB or Serial command cable

Figure 1-3 HPE R/T3000 UPS



The UPS shall be installed at the same time (in the same rack space) as the AW server by the GEHC installation Engineer (FE) during the "initial" server installation.

The GEHC installation Engineer (FE) is also responsible to ensure that the automatic shutdown feature of the UPS is operational.

- At least one of the HPE ProLiant DL360 Gen10 Server/HPE ProLiant DL360 Gen9 Server shall be connected to the UPS. The other power supplies of the HPE ProLiant DL360 Gen10 Server/HPE ProLiant DL360 Gen9 Server shall be connected to the power line.
- The optional switch shall also be connected to one of the UPS outputs.
- In the case of GEHC supplied rack, the KVM power cord can also be connected to one of the free outputs of the 220V International UPS, that has 6 outputs. For US and Japan, it shall be connected to the PDU (Power distribution Unit) as the 110V UPS is only provided with 4 outputs.

NOTE

If the product installation is part of an upgrade of the current physical server, the current UPS can be kept.

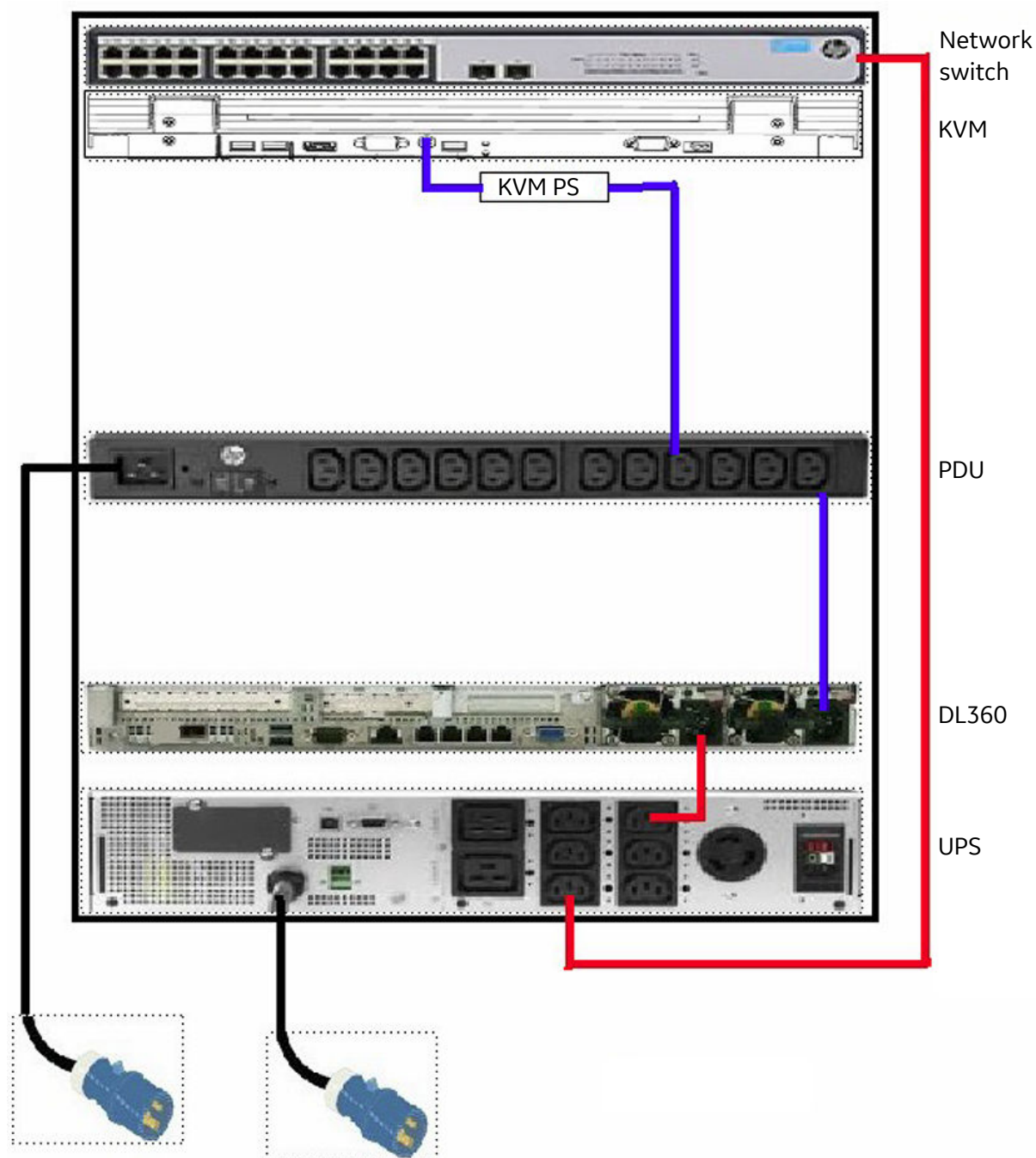
1.5.2.4 GEHC optional rack

The following illustrations show the installation of the HPE ProLiant DL360 Gen10 Server/HPE ProLiant DL360 Gen9 Server and the optional accessories into the GEHC supplied standalone rack.

For installation into a customer's supplied rack you need to consider adapting to the customer's rack configuration (number of available power connectors on the UPS and on the PDU).

The HPE ProLiant DL360 Gen10 Server/HPE ProLiant DL360 Gen9 Server is 1 rack unit (1U) high and has an attached disks array for the image filesystem. Therefore, it can be placed at the most convenient slot, for example just above the UPS.

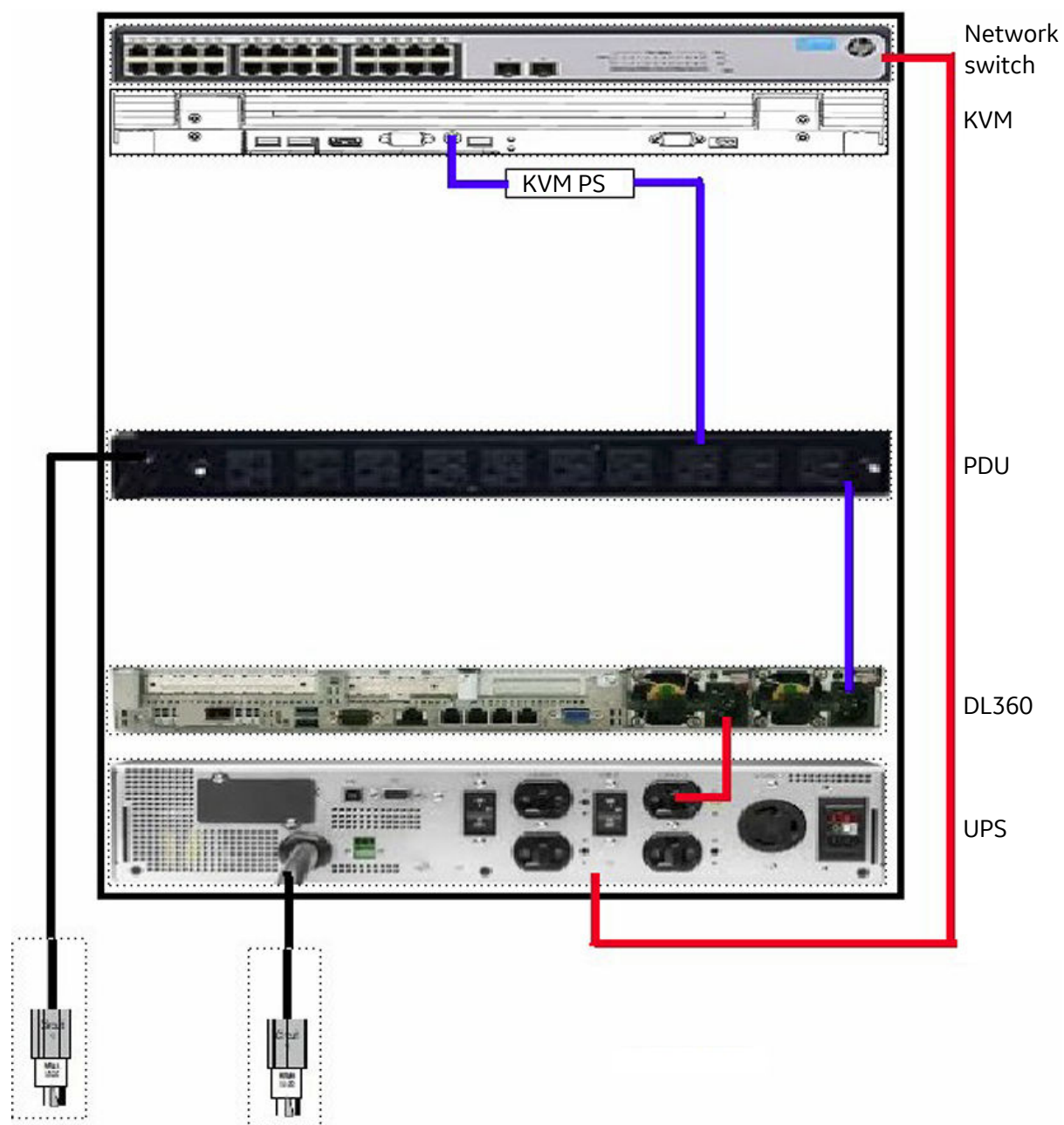
Figure 1-4 HPE DL360 servers International High Voltage 220/240V configuration (Rear view)



NOTE

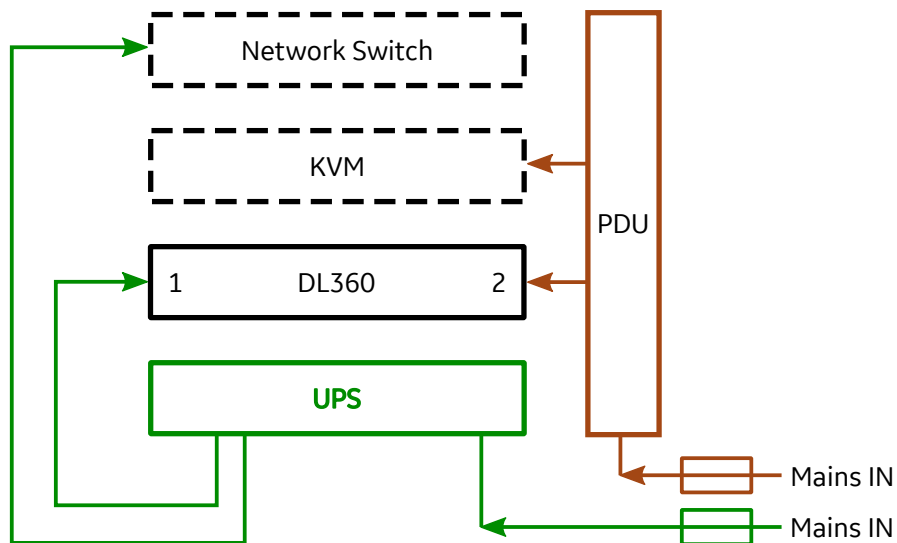
Use two cables with IEC309 international plugs or two cables with local country plugs

Figure 1-5 HPE DL360 servers Japan & North America Low Voltage 100/120 V configuration (Rear view)



1.5.2.5 Recommended power connection

Figure 1-6 DL360 Power line connection schematics - recommended



NOTICE

The DL360 server has 2 (two) redundant power supplies and takes 1 rack unit (1U).

1.5.2.6 KVM option or keyboard, mouse and Landscape monitor

- The Low Tier server is delivered with a keyboard, a mouse and a LCC portrait monitor.



- The High Tier server is delivered with an optional KVM unit (1U) to be placed into the rack.

Figure 1-8 LCD8500 KVM with screen fold down



NOTE

If the product installation is part of an upgrade of the current physical server, you can keep the current KVM.

1.5.2.7 Hardware upgrades

Hardware upgrade currently consists on replacing the complete hardware and sending the older hardware back to the nearest Recycling Center (see Service Manual for address details).

It is mandatory to wipe out all patient data prior to send back the equipment.

From the Pool of Tools, order part number **5534806 - Disk management Tool**, to wipe out the hard disks prior to ship back the system.

Always refer to Service Note SNAW3037 - Disk Wipe Service Note

NOTE

A software tool is planned to blank disks in addition to the physical disk wipe suitcase.

1.5.2.8 EDS - Hardware upgrade for Seamless Integration

AW Server 2.0 / AW Server 3.0 upgrades to AW Server 3.2 Seamless Integration will consist on a complete **upgrade to Virtual hardware**. The GEHC delivered HP hardware is not longer supported for AW Server 3.2 Seamless integration with the Universal Viewer.

Only virtual hardware is supported with the AW Server 3.2 release / Seamless integration.

1.5.3 Virtual AW Server**1.5.3.1 Customer-supplied Host**

The AW Server is "VMware ready", meaning it can be installed on different server hardware, not only GE supplied hardware. In this case, the hardware is supplied by the customer, and VMware vSphere Hypervisor 5 or 6 (ESXi 5.0, 5.1, 5.5, 6.0, 6.5, 6.7) must be installed on it. "VMware host" or "VMware hypervisor" refers to a customer-supplied server hardware with VMware ESXi installed on it.

In this configuration there are no fixed hardware specifications. Instead, the customer-supplied hardware

for each server must comply with the following minimum hardware requirements:

NOTE

Additional provision may be required to assure an adequately redundant solution for sites

Physical hardware requirements	<ul style="list-style-type: none"> Intel Xeon CPUs supporting: <ul style="list-style-type: none"> SSE 4.1 instructions. AVX-512 instruction set (this one is recommended (but not mandatory) for better performance of the applications). 2 Ethernet devices (minimum 1Gb/s) Data store to store all VM data with thick provisioning, including provision for Windows and VM swap files (70GB). Data store to store images (2TB max ESXi 5.0 / 5.1 - 6TB max ESXi >= 5.5) 8 physical CPU cores (Low Tier VM) or 24 physical CPU cores (high tier VM) Enough RAM to satisfy virtual RAM requirements without RAM over commit (RAM specification for VM depends on integration mode, see table in section 1.3.3.4)
Network requirements for server	<ul style="list-style-type: none"> The physical server must support a sustained aggregate upload bandwidth of 800 Mbps and sustained aggregate download bandwidth of 800Mbps across one or more Ethernet interfaces.

The AW Server itself will run in a Virtual Machine. The Virtual Machine is an isolated computing environment, running on an hypervisor. A Virtual Machine is similar to a server, except that it does not have direct access to the hardware. The hypervisor provides the CPU, memory, storage and network resources that virtual machines use.

Before installing the AW Server in a Virtual Machine, it is the responsibility of the customer to check if the host can provide the following resources to the VM, as a minimum.

NOTE

For Scalability (virtual AW Servers in cluster), two additional nodes (HASP - High Availability Preferences Sharing) shall be created part of the cluster, to host the Shared Preferences between all AW Servers within the Cluster.

NOTICE

For all virtual AW Server or HAPS server configurations, the site IT admin shall give full permissions on each created virtual machine to host a virtual AW Server or HAPS server. In order to achieve this, the IT admin shall create a GE Service account to administrate the AW Server and HAPS VMs.

1.5.3.2 Low Tier Virtual Machine characteristics

Hosted OS requirements (virtual hardware resources)	Minimum resources to run each AW Server Node: <ul style="list-style-type: none"> • processor: 8 vCPUs • disk: one 70GB virtual HDD • memory: RAM depends on integration mode, see table in section 3-3-4 • network: Ethernet adapter(s) depend on integration mode, see table in section 1.5.3.4 Virtual Machine characteristics per integration mode on page 19 • disk for images: Refer to section 1.5.3.5 Virtual Machine - disk for images characteristics on page 20
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1.5.3.3 High Tier Virtual Machine characteristics

Hosted OS requirements (virtual hardware resources)	Minimum resources to run each AW Server Node: <ul style="list-style-type: none"> • processor: 24 vCPUs • disk: one 70GB virtual HDD • memory: 64GB • network: 2 * Ethernet • disk for images: Refer to section 1.5.3.5 Virtual Machine - disk for images characteristics on page 20
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1.5.3.4 Virtual Machine characteristics per integration mode

Minimum resources to run each AW Server Node:

Processor	Virtual HDD	RAM	NIC	Slice count license	No-Integ	Hybrid	Seamless	DICOM Direct Connect (DDC)	DDC in Edison Health Link	DDC in CT Nano-Cloud
8 vCPUs	70GB**	24 GB	1	8K slices (SdC_Server_Two_S eats)	X	X				

Process or	Virtual HDD	RAM	NIC	Slice count license	No-Integ	Hybrid	Seamless	DICOM Direct Connect (DDC)	DDC in Edison Health Link	DDC in CT Nano-Cloud
8 vCPUs	70GB	24/32 GB*	2	16K slices (SdC_Server_Four_Seats)			X			
8 vCPUs	70GB	64 GB	1	40K slices (SdC_Low_Tier_Premium)				X	X	X
24 vCPUs	70GB**	64 GB	1	40K slices (SdC_Server_Eight_Seats)	X	X				
8 vCPUs	70GB**	12 GB	2	4K slices (Sdc_Nano_4K)						X
8 vCPUs	70GB**	26 GB	2	12K slices (Sdc_Nano_12K)						X
8 vCPUs	70GB**	32 GB	2	16K slices (Sdc_Nano_16K)						X

*For Seamless integration 32GB RAM is recommended.

**For No-Integ and Hybrid integration, an additional disk for image/backup is required: At least 100GB.

1.5.3.5 Virtual Machine - disk for images characteristics

The non-integrated virtual AW Server (standalone AW Server) needs to host its own image database. Therefore it is necessary to have a second virtual hard disk for images.

Hosted OS requirements (virtual hardware resources)	Minimum resources to run each AW Server Node: disk: one 2TB (max) virtual HDD (ESXi 5.0 / ESXi 5.1) OR disk: one 6TB (max) virtual HDD (ESXi >= 5.5)
---	--

NOTE

The system resources available to the virtual environment are verified by the AW Server platform software during installation (and at each subsequent OS boot) to ensure that they meet the minimum specification described above. For detailed network requirements, see [1.6.4 Requirements for Virtual AW Server on page 22](#) Requirements for Virtual AW Server.

NOTE

Hyperthreading must not be activated in the BIOS of the underlying physical hardware.

NOTE

As the host, the Virtual Machine shall support the SSE 4.1 instructions. If it is not the case, it could lead to Applications start failure. You shall configure the hypervisor EVC mode to a level which supports SSE 4.1 instruction. Site's IT admin assistance might be needed to change VM configuration to a AWS compatible level.

NOTE

SSE4 stand for "Streaming SIMD Extensions 4", and SIMD stands for "Single Instruction Multiple Data".

1.5.4 AW Servers in Cluster Configuration (Scalability)

Cluster AW Servers configuration is only supported for the Seamless Integration with the UV (Universal Viewer) and for the DICOM Direct Connect Integration with PACS/VNA.

The virtualized AW Server option is scalable for large enterprise customers. Up to 30 VMs (i.e. instances of the AW Server) may be configured to work together as processing nodes in a “cluster”. As users log onto Universal Viewer or the AW Server client, they are assigned to the “less-busy” nodes in the cluster.

- Each node must have at least the minimum configuration.
- An NTP server must be available, and specified in the configuration of each AW Server or HAPS server in a given cluster.
- Each node allows a maximum of 16K slices processed concurrently. This translates into approximately 4 concurrent typical users per node. Adding additional users will reduce performance due to vCPU and bandwidth limitations.

NOTE

VNA stands for “Vendor Neutral Archive”. It is a DICOM images archiving system

1.5.4.1 AW Server Low Tier Virtual Machine characteristics

See section [1.5.3.2 Low Tier Virtual Machine characteristics on page 19](#)

1.5.4.2 HAPS Virtual Machine characteristics

Hosted OS requirements (virtual hardware resources)	Minimum resources to run an AW Server Node: <ul style="list-style-type: none"> • processor: 1 vCPUs • disk: one 40GB (minimum) virtual HDD - current is 70GB • memory: 4GB • network: 2 * Ethernet
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1.6 Site Pre-installation Specifications

This document describes various site requirements to successfully install and use AW Server product. It is the responsibility of the customer to ensure these requirements are met and necessary information provided to installers prior to installation of the product.

1.6.1 HPE DL360 Low Tier Hardware installation requirements

Power	3 × wall standard power outlets
HPE ProLiant DL360 Gen9 Server Cooling	Maximum for 500 W Power Supply: <ul style="list-style-type: none"> • 1979 BTU/hr (at 100 VAC), • 1911 BTU/hr (at 200 VAC)
HPE ProLiant DL360 Gen10 Server Cooling	Maximum for 800 W Power Supply: <ul style="list-style-type: none"> • 3067 BTU/hr (at 100 VAC) • 2958 BTU/hr (at 200 VAC) • 2949 BTU/hr (at 240 VAC)

1.6.2 HPE DL360 High Tier Hardware installation requirements

Customer's supplied rack	
Power	<ul style="list-style-type: none"> 20 Amp clean circuit in cabinet with minimum 2 receptacles used with standard 3 prong plugs
Cooling	<ul style="list-style-type: none"> Same requirements as for Low Tier (See above).
Rack	<ul style="list-style-type: none"> 2 to 4 rack units required in standard 19" 4 post rack (IEC 60927)-includes Server and UPS. <ul style="list-style-type: none"> 1 rack unit : DL360 server OR 2 rack units : HPE R/T3000 G5 UPS 1 rack unit : KVM Need 32.5" rack depth from inside of front door to rear door. Front and rear mounting posts must be at least 18" apart. Require at least 36" front and rear maintenance clearance.
UPS required to avoid data corruption during power outages (may be purchased from GE)	

1.6.3 Common Network requirements for Server

IP address	<ul style="list-style-type: none"> 2 static IP addresses recommended for optimal performance : <ul style="list-style-type: none"> 1 IP address for the server 1 IP address for the iLO service processor
Bandwidth	<ul style="list-style-type: none"> 1 Gbps (or more) recommended for LAN client access 801.11g recommended for wireless clients. The HP DL360 high tier servers have two 10Gb/s ports. When possible, it is recommended to use such capability. Average bandwidth usage per client [22;1 compression]: 2–3 Mbps 1Gbps for the iLO processor
Ports required to be accessible on the server	<ul style="list-style-type: none"> 80 - required for thin client access 443 – required for thin client access 4006 – required for DICOM transfers 4010 - required for DICOM Direct Connect (Virtual Server only) 17767 – required to access floating licenses from AW workstations Following ports are for Remote Service and are available only from GEHC OLC <ul style="list-style-type: none"> 22 – ssh 162 – snmptrap (Physical Server only) <p>NOTE</p> <p>For full details of the inbound and outbound ports required, see the checklist in Chapter 4.</p>
Remote Service	<ul style="list-style-type: none"> Site to Site VPN connectivity with GEHC Online Center required

1.6.4 Requirements for Virtual AW Server

If the customer supplies their own virtualization (host) server, to host AW Server, each computing node must meet the following minimum specification.

Additional provision may be required to assure an adequately redundant solution for sites with particular high availability requirements, for example additional network cards.

NOTE

The system resources available to the virtual environment are verified by the AW Server platform software during runtime to ensure that they meet the minimum specification described above.

NOTICE

Hyperthreading needs to be turned off on the Hypervisor to optimize the performances of the AW Server and the 3D applications. Indeed, the software is optimized for CPU settings with Intel Xeon architecture and without hyperthreading. So, it is recommended to deactivate the Hyperthreading on AW Server. Therefore, it is not appropriate to have other customer's VMs running on the same Hypervisor, if these other VMs require Hyperthreading to be activated, otherwise it could impact the AW Server performances.

NOTE

Each AW Server Virtual Machine requires one physical network port fully dedicated to this Virtual Machine, i.e. not shared with other VMs. This network port needs to be connected to the Hospital Network and will be used for AW Server/Clients communication as well as Service Tools access

Physical hardware (host) minimum requirements	<p>For both types of Virtual Machines:</p> <ul style="list-style-type: none"> Intel Xeon CPUs supporting: <ul style="list-style-type: none"> SSE 4.1 instructions. AVX-512 instruction set (this one is recommended (but not mandatory) for better performance of the applications). 1 Ethernet port (minimum 1Gb/s) data store to store all VM data with thick provisioning enough RAM to satisfy VM RAM requirements without RAM overcommit <p>For Low Tier Virtual Machine:</p> <ul style="list-style-type: none"> 8 physical CPU cores <p>For High Tier Virtual Machine:</p> <ul style="list-style-type: none"> 24 physical CPU cores
Virtual Machine (hosted) minimum requirements	<p>For each Low Tier Virtual Machine:</p> <ul style="list-style-type: none"> processor: 8 vCPUs storage: one 70GB virtual disk + one virtual disk (min 100GB, recommended: 1-1.5TB) memory: RAM depends on integration mode, see table in section 1.5.3.4 Virtual Machine characteristics per integration mode on page 19. network: Ethernet adapter(s) depend on integration mode, see table in section 1.5.3.4 Virtual Machine characteristics per integration mode on page 19. <p>For each High Tier Virtual Machine:</p> <ul style="list-style-type: none"> processor: 24 vCPUs storage: one 70GB virtual disk + one virtual disk (min 100GB, recommended: 2TB on ESXi 5.1 and 5.0, 6TB on ESXi >= 5.5) memory: 64GB network: 2 * virtual Ethernet adapters
Supported hypervisor environments	<p>A compatible version of AW Server shall be installed on one of the following environments (or later release validated for backwards compatibility):</p> <ul style="list-style-type: none"> VMware vSphere Hypervisor 5.5 (ESXi 5.0) VMware vSphere Hypervisor 5.5 (ESXi 5.1) VMware vSphere Hypervisor 5.5 (ESXi 5.5) VMware vSphere Hypervisor 6.0 (ESXi 6.0)

	<ul style="list-style-type: none"> • VMware vSphere Hypervisor 6.5 (ESXi 6.5) • VMware vSphere Hypervisor 6.7 (ESXi 6.7)
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NOTE

As the host, the hosted OS shall support the SSE 4.1 instructions. Refer to the “Notes” at the end of Section [1.5.3 Virtual AW Server on page 18](#).

1.6.5 Server Administration

Day to day server administration needs to be performed by customer IT. This includes monitoring server health page and fault indicators, database maintenance and user management. Network and client PC troubleshooting is the responsibility of the customer.

1.6.6 Client Requirements

1.6.6.1 Client PC Requirements

Although the client can run on PC's meeting minimum specifications described below, optimal performance requires faster PC's. In general, faster CPU speeds result in better interactive performance.

Hardware requirements	<ul style="list-style-type: none"> • Processor: Core2Duo @2.33GHz or Pentium™ 4 @3GHz minimum (or equivalent) • Memory: 1024 MB minimum • Disk drive: 250MB free space available • Screen resolution: 1024H × 768V minimum with full color (32 bit) (1280H × 1024V or more recommended) • Network card: 100 Mbps minimum (1000 Mbps recommended) • Internet connection: Customer-provided IPSEC VPN, for internet/WAN operation • Mouse: Two or three-button mouse. Two button mouse with scroll wheel suggested for best use of functions • Only one Ethernet card shall be configured on the PC
OS	<ul style="list-style-type: none"> • Windows® 10 32bit and 64bit
Privileges	<ul style="list-style-type: none"> • Administrative access required for client software install on the PC • The AW Server Client shall be able to write on the following: <ul style="list-style-type: none"> • %APPDATA%, %USERPROFILE%\ .solo • Files: any files that may appear in the %USERPROFILE% directory (such as .AWTruststore and .solo1ock...). • The Anti-virus running on the PC shall authorize execution of the AW Server client. <p>NOTE</p> <p>Refer to chapter 4, section 4.4 for the list of executables that shall be put on the white list of the Anti-virus.</p>
International	<p>AW Server supports only clients with the following keyboard locale layouts:</p> <ul style="list-style-type: none"> • Denmark (dk) • Germany (de) • Finland (fi) • France (fr) • Italy (it) • Netherlands (nl) • Norway (no) • Portugal (pt)

	<ul style="list-style-type: none"> Spain (es) Sweden (sw) United States (us) United Kingdom (uk) French Canadian
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1.6.6.2 Linux Client Requirements

The Linux Client is supported for certain GE consoles. See the corresponding console User Guides for further details

1.6.6.3 Mac Client Requirements

AWS Client is not currently supported, but can run on the following Apple Macintosh configuration:

HARDWARE	see PC Client Requirements above
OS	Mac OS with Parallels Desktop running Windows OS Compatible client
Privileges	Administrative access required for client software install

1.6.6.4 Browser Requirements

The following Internet browsers are supported to access web user interface:

- Internet Explorer 10.0.x, 11.x
- Firefox
- Chrome

NOTE

The AW Server platform includes a Client Checker Tool which validates client configurations to ensure that they meet the minimum monitor and hardware specification, so that images can be displayed at diagnostic quality. (This Java tool is available from the Service Tools from an installed server; make sure that you run the version of the tool that corresponds to the installed version of the server platform.)

1.6.7 Security & Privacy

Audit trails	<ul style="list-style-type: none"> TCP, BSD Syslog, Reliable Syslog transport to 3rd party audit repositories Supports Enterprise Audit Trail (EAT) to provide patient access tracking.
Single Sign on integration	<ul style="list-style-type: none"> Supports local user authentication and local user accounts Supports Enterprise Authentication, Authorization and Audit (EA3) to provide user authentication service. Supports enterprise authentication using MS Active Directory, Novell eDirectory 8.7.1 Requires NTP configuration for enterprise authentication. For systems configured in Full or Seamless integration, authentication is done by the PACS.
Groups & Access	<ul style="list-style-type: none"> AW Server supports the following 4 access groups: <ul style="list-style-type: none"> Service – access to administrative and GE service / management tools Admin* – access to administrative tools – user / database / network management Standard* – read access to all exams in server database and all installed applications

	<ul style="list-style-type: none">• Limited* – (However, this is not available with Universal Viewer integration)
Service password	<ul style="list-style-type: none">• Preset password at install = can be modified on request (must be communicated to GE Healthcare Service Personnel if done)

*Starting from AW Server 3.2 Ext.3.2 release, the platform installer requires the following default password for local users to be changed during installation: admin, limited and standard.

You must define before the installation new passwords that follow the new password strength rules:

- Must be 15 characters min.
- Must contain 1 digit
- Must contain 1 upper-case letter
- Must contain 1 lower-case letter
- Must contain 1 special character
- May contain the system ID with at least 1 more character
- Must not be blank or left as the default
- Must not be made up solely of dictionary words
- Must not contain 3 consecutive identical characters
- Must not contain a blank space
- Must not include your logon name
- Should not be the same value at different sites

Chapter 2 Room Requirements

2.1 Environmental Requirements/Limitations

2.1.1 Room Climate and Altitude

The room environment where the server and accessories are located must be maintained (during workdays, holidays and weekends) as specified in the following table.

Table 2-1 Environmental requirements/limitations

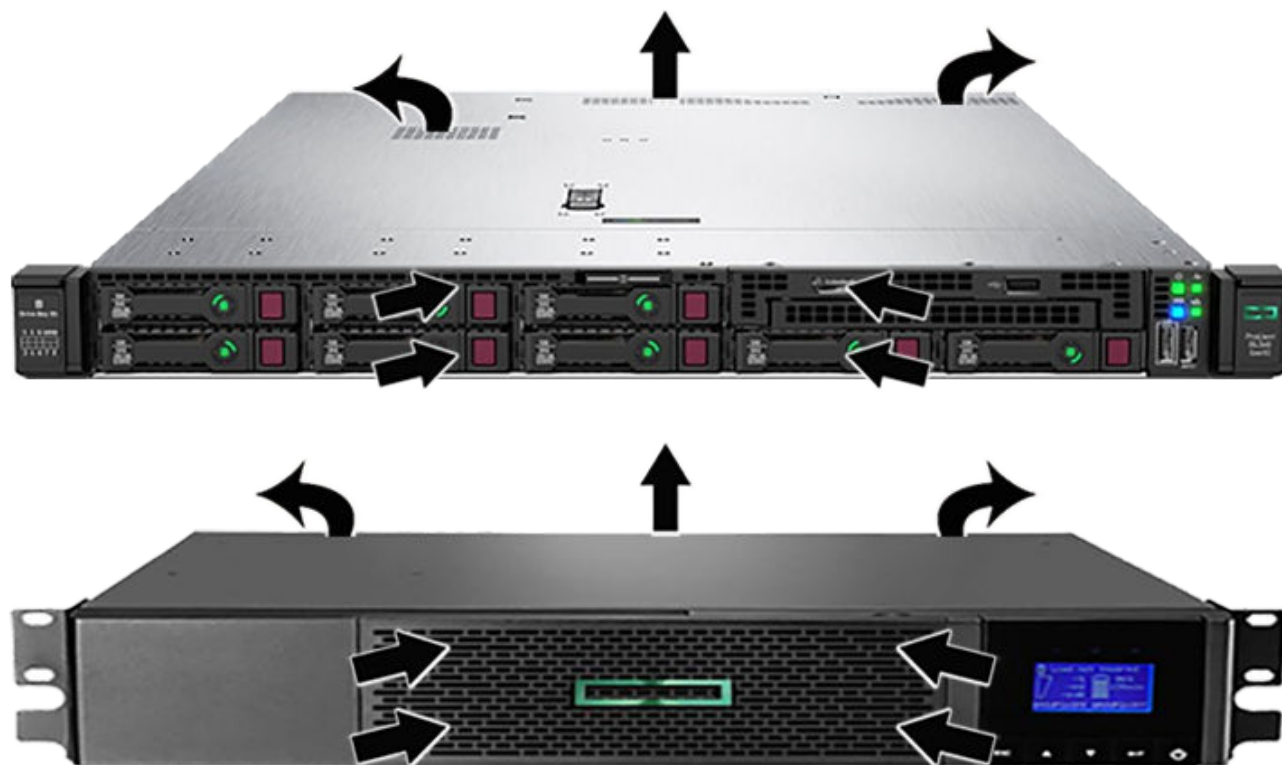
PRODUCT/ COMPONENT	HUMIDITY (1)				TEMPERATURE				ALTITUDE (4)			
	Operating (2)		Non-operating (2)		Operating (3)		Non-operating (3)		Operating		Non-operating	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
HPE ProLiant DL360 Gen10 Server	8%	90 %	5%	95 %	10°C +50°F	+35°C +95°F	-30°C 22°F	+60°C +140°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HPE ProLiant DL360 Gen9 Server	8%	90 %	5%	95 %	10°C +50°F	+35°C +95°F	-30°C 22°F	+60°C +140°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HPE R/T3000 G5 UPS	20 %	90 %	10%	90 %	0°C +32°F	+40°C +104°F	-15°C 5°F	+50°C +122°F	0 ft 0m	6,562ft 2000m	0 ft 0m	49,212ft 15000m
Notes: (1) Non-condensing (2) At 35°C (95°F) with a gradient < 30% Relative Humidity/hr (3) At 20% Relative Humidity (4) Relative to sea level												

2.1.2 Equipment heat output

- A well ventilated or air-conditioned work area to avoid overheating.
- A dust free work area (as much as possible).

2.1.2.1 HPE ProLiant DL360 Gen10 Server

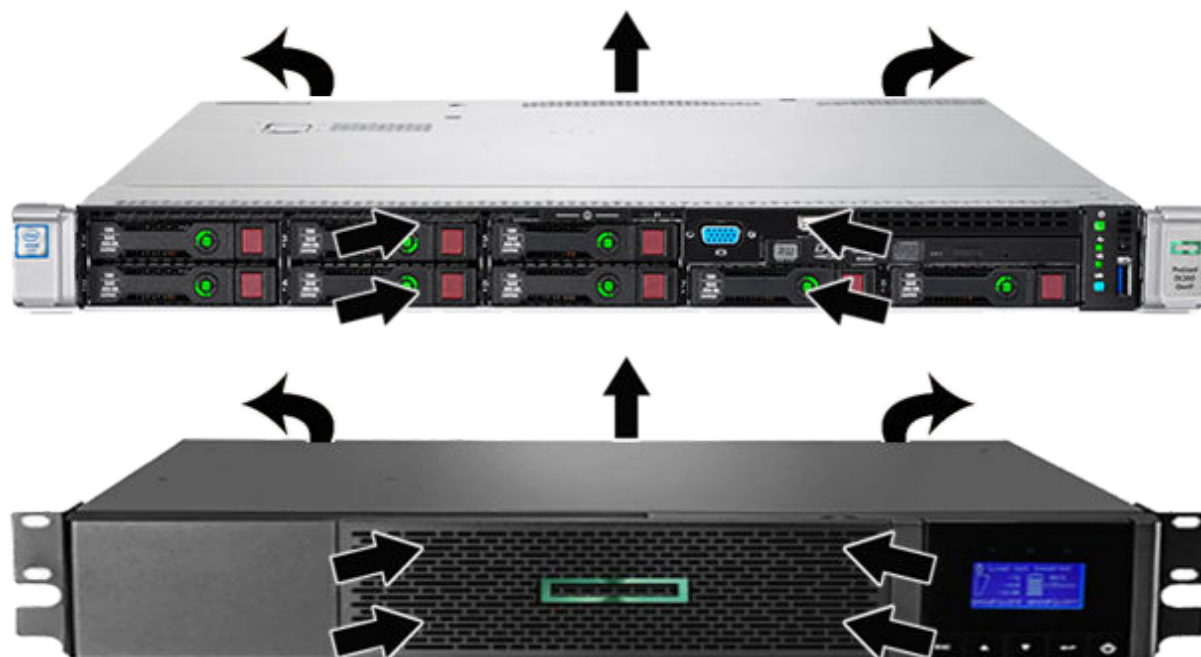
Figure 2-1 Air flow of the HPE ProLiant DL360 Gen10 Server with HPE R/T3000 UPS



HPE rack-mount servers: The server and the UPS (if applicable) shall be placed into a rack in the hospital's servers room. When you place the unit in the rack, make sure that objects do not block the vents on either side of the unit.

2.1.2.2 HPE ProLiant DL360 Gen9 Server

Figure 2-2 Air flow of the HPE ProLiant DL360 Gen9 Server with HPE R/T3000 UPS



HPE rack-mount servers : The server and the UPS (if applicable) shall be placed into a rack in the hospital's servers room. When you place the unit in the rack, make sure that objects do not block the vents on either side of the unit.

2.1.2.3 Heat output

Table 2-2 Heat output for basic product and accessories of HP DL360 servers configurations

PRODUCT/ COMPONENT	HEAT OUTPUT
HPE ProLiant DL360 Gen10 Server	Maximum for 800 W Power Supply: 3067 BTU/hr (at 100 VAC), 2958 BTU/hr (at 200 VAC) 2949 BTU/hr (at 240 VAC)
HPE ProLiant DL360 Gen9 Server	Maximum for 500 W Power Supply: 1979 BTU/hr (at 100 VAC), 1911 BTU/hr (at 200 VAC)
HPE R/T3000 UPS	540 BTU/h (0.15 KW) on-line 1138 BTU/h (0.33 KW) on battery

2.1.3 Additional environmental requirements/limitations

The HP DL360 server is installed in a dedicated IT server room, provided by the costumer, separated from the patient environment. Therefore, electromagnetic standards and regulations for medical devices do not apply.

2.1.4 Audible noise

Table 2-3 Audible noise

PRODUCT/COMPONENT	In Use	In Stand-By
HPE ProLiant DL360 Gen10 Server	45 dB	36 dB
HPE ProLiant DL360 Gen9 Server	46 dB	37 dB
HPE R/T3000 G5 UPS	40 dB	45 dB
Note 1: At 25°C (77°F) ambient		

2.2 Structural Requirements

2.2.1 Minimum door size requirements

Access through a door opening at least 0.6 m (25 inches) wide and at least normal height of 2 m (78.75 inches) is required.

2.2.2 Desk or table size

2.2.2.1 Rack-mount server

The rack-mounted server and the UPS (if applicable) must be placed in a rack inside the servers room, or any appropriate local.

2.3 Electrical Requirements

2.3.1 Line voltage specifications

Table 2-4 Line requirements

PRODUCT/ COMPONENT	VOLTAGE (AC)			FREQUENCY (Hz)				CURRENT	
	Nominal	Min	Max	Nominal	Min	Max	Dev. Max Rate	Momentary	Continuous
HPE ProLiant DL360 Gen10 Server	100 240	100 200	127 240	50/60	50	60	-	-	10A at 100 V 6A at 240 V
HPE ProLiant DL360 Gen9 Server	100 240	100 200	120 240	50/60	47	63	-	-	10A at 100 V 6A at 240 V
HPE R/T3000 UPS Low Voltage (US/JPN)	120	100	127	50/60	47	63	-	-	30A at 100 V max
HPE R/T3000 UPS High Voltage (International)	220	200	240	50/60	47	63	-	-	16A at 240 V max
Landscape LCD monitor	100 240	90 216	110 264	50/60	47	63	-	-	100V: 0.65A 240V: 0.30A
KVM	100 240	90 216	110 264	50/60	47	63	-	-	<36W

2.3.2 Line frequency specification

50 Hz or 60 Hz nominal with a frequency range of 47 to 66 Hz for the Basic product.

2.3.3 Fuse/circuit-breaker specifications

If electrical wall outlets are protected from the building distribution network by fused circuit breakers, no additional protective part is required.

2.3.4 Electrical outlets

Various power cords are provided with each AW server configuration in order to match the localization.

2.3.4.1 HPE DL360 servers

Two to three outlets (20A US and Japan 110V - 16A International 220V) are needed inside the rack (without the PDU option) to install the HPE DL360 server and KVM (and the UPS if applicable) in the servers room.

2.3.4.2 Power cords

The power cords should be plugged on separated power distribution outlets, coming from the same power distribution panel.

- Power cords are delivered with the appropriate plug for most of the EEC countries.
- For other countries, the corrected plug must be fitted.
- Other Power cords available: See [3.4.1 HPE DL360 High Tier servers, UPS and accessories on page 35](#).

2.3.5 Power conditioning

To minimize malfunctions and loss of images, all parts of the system could be protected by a building uninterrupted power line or by an adequate power conditioning system supplied locally by the customer.

2.4 Air Cooling Requirements

Refer to [2.1 Environmental Requirements/Limitations on page 27](#).

2.4.1 HPE DL360 servers

The HPE High Tier server shall be installed into a rack in a dedicated servers room, or dedicated local with air conditioning.

2.5 Tools and Test Equipment

2.5.1 HP DL360 server tools

CAUTION



The weight of the HP DL360 servers is within the limit fixed by EHS specifications. However, to handle it and place it into the rails into the rack may be difficult to achieve by one person only. Two persons are strongly recommended for this operation.

- Transport trolley
- **5417996** : Genie Load Lifter - available from the Pool of Tools
- Standard FE tools case
- Torx bits or drivers (T15 to T30) are necessary to install the hardware



2.5.2 Test equipment

No test equipment is necessary

2.5.3 Customer-supplied Server

Only Virtualized installation can be done on customer systems.

The virtualization solution must be provided by the vendor.

Chapter 3 Physical Characteristics

3.1 Introduction

This chapter provides product information and illustrations showing dimensions, weight, floor loading, and access areas for servicing and cabling. The floor loading (weight/area) is calculated from the approximate component weights and should be considered as a minimal loading.

3.2 Dimensions, Weights and Floor loading

Table 3-1 Dimensions, Weights and Floor loading

Product/ Component	Dimensions			Weight	Floor loading	
	Depth mm (inch)	Width mm (inch)	Height mm (inch)	Kg (lbs)	Weight/ Area	Load Pattern (for drawing)
HPE ProLiant DL360 Gen10 Server	750 (29.5)	435 (17.1)	43.2 (1.7)	16.78 (37)	Place in the rack (1U)	
HPE ProLiant DL360 Gen9 Server	750 (29.5)	435 (17.1)	43.2 (1.7)	15.3 (33.3)	Place in the rack (1U)	
HPE R/T3000 G5 UPS	647 (25.5)	441 (17.4)	86.2 (3.4)	39.5 (87.2)	Place in the rack (2U)	
KVM option (fold down)	423 (16.6)	432 (16.9)	4.23 (1.68)	4.54 (10)	Place in the rack (1U)	
Network switch option	96.5 (3.8)	156 (6.14)	24.5 (0.96)	0.34 (0.74)	Place in the rack (0.5U)	
Stand-alone rack	1108.2 (43.63)	603 (23.74)	726.5 (28.6)	82 (180)	Static 1360.8Kg (3000lbs) Rolling 1134Kg (2500lbs)	

Figure 3-1 HPE DL360 servers

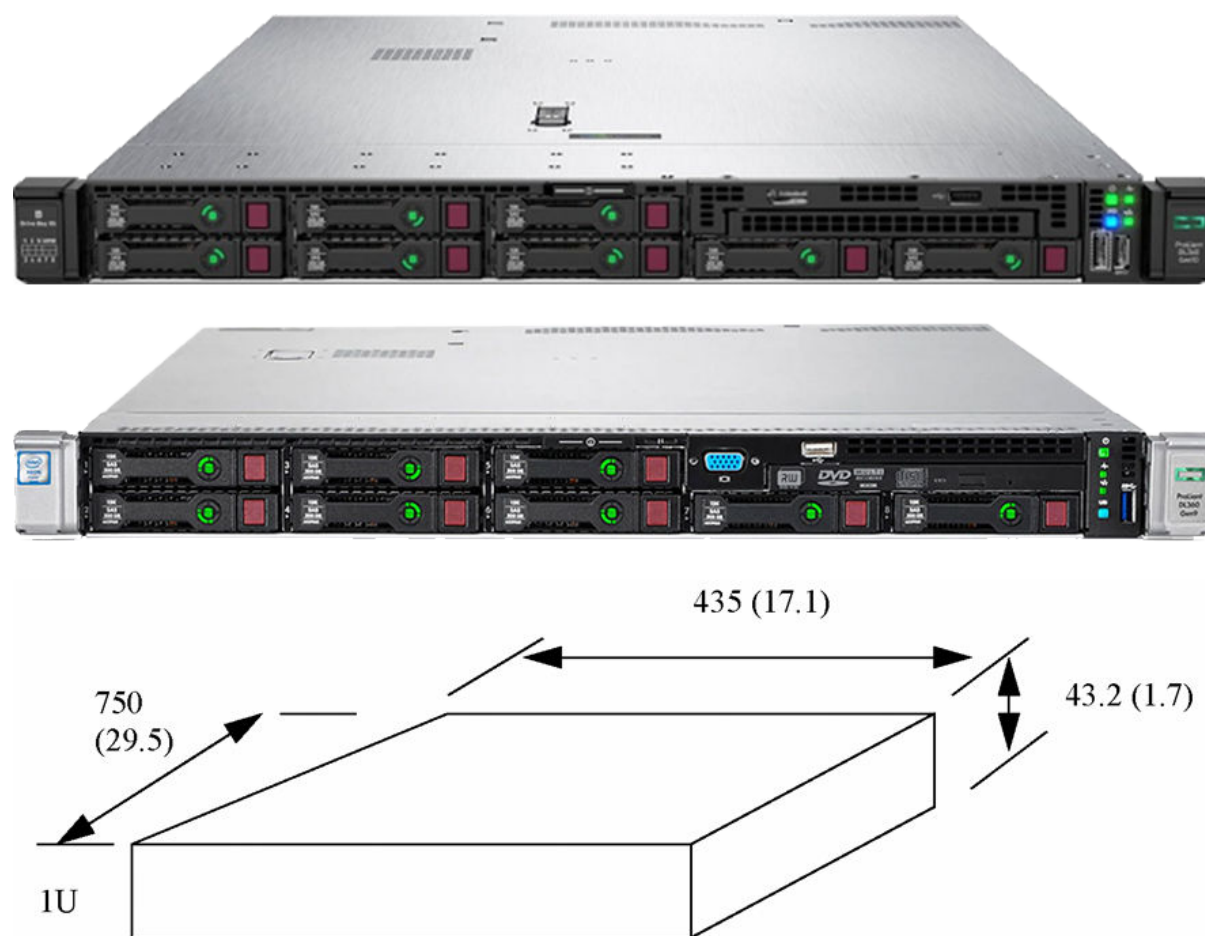


Figure 3-2 HPE R/T3000 G5 UPS

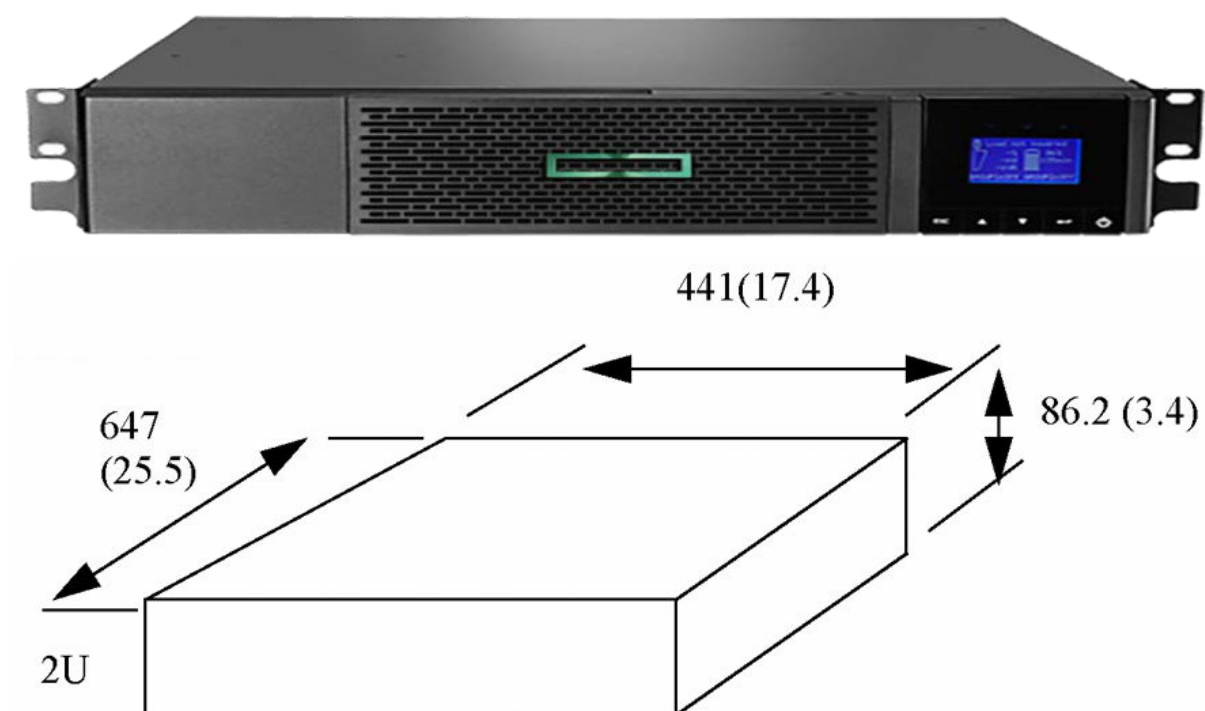
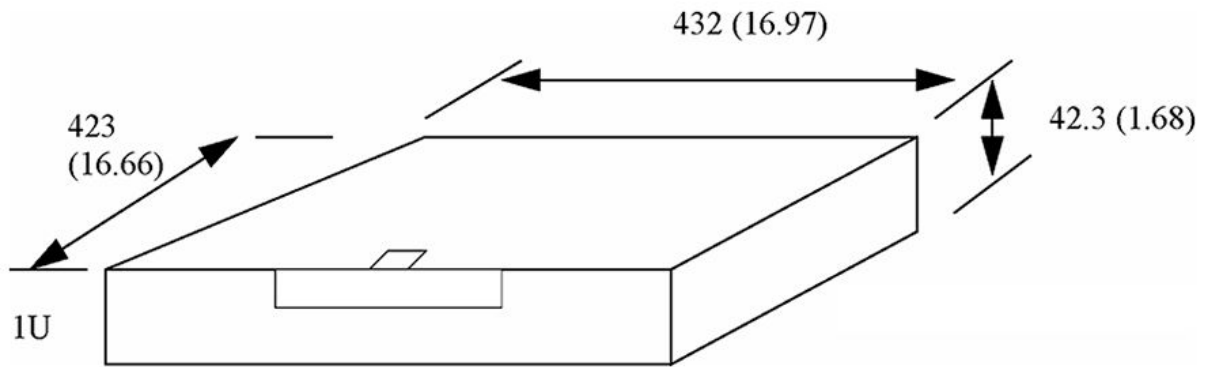


Figure 3-3 KVM option (fold down)

3.3 Mounting Requirements

HPE DL360 servers (Low Tier and High Tier):

Mounting requirements are defined in the AW Server 3.2 Hardware Installation Manual 5719442-1EN for the server as well as for the HPE R/T3000 UPS and accessories.

3.4 Shipping

3.4.1 HPE DL360 High Tier servers, UPS and accessories

Shipping, handling and physical installation are under GEHC responsibility

PRODUCT/ COMPONENT	Height×Width×Depth	Weight	Method of shipment
HPE ProLiant DL360 Gen10 Server	Shipment, handling and Installation are under GEHC responsibility	16.8 Kg 37 lbs	Carton on pallet
HPE ProLiant DL360 Gen9 Server	Shipment, handling and Installation are under GEHC responsibility	15.3 Kg 33.3 lbs	Carton on pallet
PDU kit US/Japan	Shipment, handling and Installation are under GEHC responsibility	5.4 Kg 12 lbs	Carton on pallet
PDU kit International	Shipment, handling and Installation are under GEHC responsibility	9.5 Kg 21 lbs	Carton on pallet
HPE R/T3000 G5 UPS parts	Shipment, handling and Installation are under GEHC responsibility	54.7 Kg 120.5 lbs	Carton on pallet
Standalone rack	Shipment, handling and Installation are under GEHC responsibility	145Kg 320 lbs	Carton on pallet

3.4.1.1 Standalone rack shipment

The UPS and PDU devices are fitted with a "C20" connector so they need one "C19" power cord each.



- US and Japan shipments: 2 x C19 to US power cord delivered
- Brazil shipment : 2 x C19 to European and 2 x C19 to Brazil power cord delivered
- China shipment : 2 x C19 to European and 2 x C19 to China power cord delivered
- Other countries : 2 x C19 to European and 2 x C19 to UK power cord delivered

NOTE

A country power cord has been created that offers IEC309. International IEC320 plugs are available with p/n or cat# M81501PS: HT Server Power Cord IEC 309 - IEC 320/C19 - 230V - 16A.

If none of the shipped cables fit your needs, you can order from your local stores, or from an HP distributor the appropriate C19 to local plug power cords as defined in next section.

Note that it is recommended to use cat# M81501PS.

3.4.1.2 Country specific C19 Power Cords

The data in this section is given for information only. Check with the local distributor the technical details of the appropriate power cords available on the given country.

HP Part number	Country	Input Plug	Output Plug	Length	Power	Quantity
AF593A	U.S./Canada/ Mexico	IEC C19	NEMA L6-20P	12ft (3.6m)	20A, 250V	1
AF584	CHINA	IEC C19	GB1002	8.2ft (2.5m)	16A, 250V	1
AF576A	South Korean	IEC C19	CEE7-VII	12ft (3.6m)	16A, 250V	1
AF576A	Europe/Russia	IEC C19	CEE7-VII	12ft (3.6m)	16A, 250V	1
AF580A	Italy/Chile	IEC C19	CEI 23-50	12ft (3.6m)	16A, 250V	1
E7806A	Worldwide	IEC C19	Stripped ends	15ft (4.5m)	16A, 250V	1

Chapter 4 Pre-Installation (Site readiness)

4.1 Overview

There are site infrastructure and administrative requirements that must be met before the physical installation begins – network drops, IPA configurability, gateway administration, DNS, security, LDAP/Active Directory information, data center access, rack space/hardware, and so on...

From a SERVICE PLAN standpoint – the CRITICAL SERVICE REQUIREMENT is the “Site Ready” piece. If the checklist is not satisfied (site not ready), the installation should not start.

DL360 High & Low Tier servers case

This section is performed and completed by GEHC.

There are site infrastructure and administrative requirements that must be met before the physical installation begins – network drops, IPA configurability, gateway administration, DNS, security, LDAP/Active Directory information, data center access, space/hardware, and so on...

From a SERVICE PLAN standpoint – the CRITICAL SERVICE REQUIREMENT is the “Site Ready?” piece. If the checklist is not satisfied (site not ready), the installation should not start.

When an order is entered, the GEHC Project Installation Manager contacts the GEHC FE and initiates the site readiness survey and actions. The primary data points that must be acquired by the GEHC sales/quote are: Customer, Contact information for site and IT and does the site have a Data Center?

The GEHC Project Installation Manager makes contact with the site IT or infrastructure operatives and verifies the site readiness, and or drives the processes to get the site ready.

When the pre-installation work is complete, and the site is ready for the installation, the GEHC Project Installation Manager schedules the physical delivery & installation.

HP High Tier servers: see [4.2 Physical AW servers Site-readiness survey on page 38](#).

Virtual AW Server case

AW Server 3.2 platform software can be installed in a virtual environment (hypervisor) on a Customer-supplied physical server.

Site Readiness Survey is managed by the GEHC Project Manager, however:

The customer IT Admin is responsible for:

- Server locale provision and management, consistent with the requirements stated in this manual.
- Providing the appropriate server hardware and the VMware 5.x to 6.x layer.
- Allocating resources on the server. These must correspond to the minimum specifications for the virtual AW Server(s), in term of disk space, memory available and CPU cores.
- Creating the virtual machines and loading the OS for AW server, from a template delivered by GEHC.
- Providing appropriate permissions to administrate each Virtual Machine created for hosting the AW Server or HAPS (High Availability Preferences Sharing) servers (if applicable - Scalability only).

See Overview for high level instructions.

See also [4.3 Virtual AW Server Site-readiness survey on page 41](#).

NOTE

Installation of the template may be done by a GEHC FE under customer IT Admin responsibility.

- Defining and managing their own Service contract with the server hardware supplier.

NOTE

AW Server software is considered "out of GE warranty" and indeed non-serviceable until the customer validates return to service of server with virtualization layer prerequisites.

- Deploying client software (apart from the first, single site client installation).
- Providing access to an NTP server.
- Maintaining the customers' own PCs (Hardware, Operating System, Displays...) and Network (Hardware & Software) connection between these PCs and the AW Server to always meet the defined minimum specifications.

The GEHC FE is responsible for:

- Providing installation instructions and the OVF Template OS media to the IT administrator, for the AW Server / HAPS server (if applicable) Virtual Machine.
- Providing instructions for service account creation, in order for GE FE to get appropriate permissions for administration of the VMs hosting the AW Servers (and HAPS servers if applicable).
- Loading and configuring the AW Server Platform SW (or HAPS platform SW if applicable), as well as installing the Advanced applications, configuring integration and installing one Client.

NOTE

The minimum required specifications for Server, client PCs and network should be explained to the customer's IT department. They are directly responsible for solving problems related to network and/or client performance issues.

4.2 Physical AW servers Site-readiness survey

This checklist ensures that GEHC service can install the GEHC Physical AW Server configuration at the institution.

- Complete and/or verify the information for each section as applicable to this installation.
- Check each item and assess the item as Passed or Failed. If an item fails, work with the customer to define the remediation plan.
 - Section [4.2.1 Site environment preparation on page 39](#) shall be completed by the Installation Specialists (country dependent) and provided to the FE in charge of the installation.
 - Section [4.2.2 Install and network environment preparation on page 40](#) and section [4.4 PC Client Requirements on page 44](#) shall be completed by the FE.
 - The completed checklist shall be stored in the Logbook by the FE.

If a UPS is included in the configuration by GEHC, the FE shall:

- For 100-120V sites, remind the customer to install/provide 1 NEMA L5-30 socket and 1 NEMA L5-20 socket if the UPS is provided.
- For 220-240V sites, remind the customer to install/provide 2 local country sockets compatible with the power cords kits (Chinese, Brazilian, UK, standard Euro or int'l IEC 309 16A).

4.2.1 Site environment preparation

Installation address and GEHC AW Server configuration	PASS / FAIL
<ul style="list-style-type: none"> • Institution Name: • Institution Address: • City: • Zip: • State/Province: • Country • Contact: • Phone 	
Identify GEHC AW Server configuration to install: <ul style="list-style-type: none"> • DL360 (Server) • KVM • Optionally, a UPS - 110V or 220V • Optionally, a PDU - 110V or 220V • Optionally, Rack & Switch If UPS or PDU are provided, confirm that voltage is compatible with the site's voltage	
Rack Requirements	PASS / FAIL
Confirm that the site has either: <ul style="list-style-type: none"> • A rack provided by the customer. • Or a rack provided by GEHC. 	
Confirm that the rack spacing and clearance is appropriate: <ul style="list-style-type: none"> • If the customer rack is used, there shall be: <ul style="list-style-type: none"> • 5 rack units (DL360) required in standard 19" (48cm) 4 post rack (IEC 60927): includes server, UPS and Direct Attached Storage (5.3TB). Minimum is 1U (DL360) for server without UPS, plus 1U for KVM. • at least 32.5" rack depth from inside of front door to rear door • Front and rear mounting posts at least 18" apart For all racks, there shall be at least 48" (1.2m) front and 36" (0.8m) rear maintenance clearance	
Power Requirements	PASS / FAIL
If no rack and no UPS are delivered by GEHC, confirm that the customer rack provides: <ul style="list-style-type: none"> • For 100-120V sites, 5x20 (DL360) amp clean circuits in cabinet with standard US 3 prong plugs • For 200-240V sites, 5xC13 (DL360) clean circuits in cabinet plugs Note: If the customer rack has no internal PDU, use the PDU provided by GEHC and same requirement as for the UPS below with a quantity of 1 socket and 1 power cord.	
If a UPS is provided by GEHC, <ul style="list-style-type: none"> • For 100-120V sites, confirm that the site will provide 1 NEMA L5-30 socket and 1 NEMA L5-20. (Note that these specifications may evolve) • For 220-240V sites, confirm that the site will provide 2 local country sockets. • Confirm that the distance between sockets and UPS (or rack) will be less than 6.5 feet (2m) 	
If no UPS is provided by GEHC, <ul style="list-style-type: none"> • For 220-240V sites, remind the customer to install/provide 2 local country sockets compatible with the power cords kits (Chinese, Brazilian, UK, standard Euro or int'l IEC 309 16A). See list of power cords on AW Server Pre-Installation Manual.	

Installation address and GEHC AW Server configuration	PASS / FAIL
Environment Requirements Confirm that the site air cooling installation can support the server and accessories dissipated heat:	PASS / FAIL / NA
HPE ProLiant DL360 Gen10 Server: <ul style="list-style-type: none"> For 100-120V sites, 1,902 BTU/hour For 200-240V sites, 1,840 BTU/hour 	
HPE ProLiant DL360 Gen9 Server: <ul style="list-style-type: none"> For 100-120V sites, 1,979 BTU/hour For 200-240V sites, 1,911 BTU/hour 	
HPE R/T3000 UPS <ul style="list-style-type: none"> 540 BTU/h (0.15 KW) on-line 1,138 BTU/h (0.33 KW) on battery 	
Confirm that humidity (20%-80%) and temperature 50° to 95°F (10° to 35°C) at the site are appropriate	

4.2.2 Install and network environment preparation

Tooling Requirements	PASS / FAIL
Confirm that you will have an appropriate lifting device such as the Genie lift (see AW Server PIM) and/or help from another FE for the installation	
Ensure that you have a set of Torx bits or drivers (T15 - T30) for the installation and Standard FE tool case	

Hostname and Server Requirements	PASS / FAIL
Designate the AW Server hostname:	
NOTE The length of AW Server hostname is restricted to 16 characters maximum; Only the following characters are supported: [a-z] [A-Z] [0-9], Dash (-) and Underscore (_) ; Backslash (\) is not allowed.	
If applicable, designate the AW Server Domain Name:	
If applicable, designate the AW Server Domain Name Servers (DNS) of the site <ul style="list-style-type: none"> DNS1 Server IP Address: xxx.xxx.xxx.xxx DNS2 Server IP Address: xxx.xxx.xxx.xxx 	
If applicable, designate the NTP Server used to synchronize the time <ul style="list-style-type: none"> NTP Server IP Address: xxx.xxx.xxx.xxx 	
If applicable, designate the SMTP Mail Server of the site <ul style="list-style-type: none"> SMTP Server IP Address: xxx.xxx.xxx.xxx 	
User Account Configuration Requirements	PASS / FAIL
Identify the Primary Contact Name for Enterprise User Account Configuration: If applicable, <ul style="list-style-type: none"> Designate the Active Directory or LDAP Enterprise User Account Configuration Server IP Address or Name: xxx.xxx.xxx.xxx Otherwise the Local User Account Configuration will be applied Note: DNS and NTP configurations are compulsory for AW Server Enterprise User Account Configuration	
Network Requirements	PASS / FAIL

Confirm that there is one Ethernet network plug for Server. Indicate to the customer that a network speed of 1G/s is recommended for Server. Confirm that the network speed is at least 100 Mb/s	
Confirm that there is one Ethernet network plug for iLO. Confirm that the network speed is at least 100 Mb/s Note: iLO will share Server plug if GE provides an Ethernet switch in the order	
Confirm that the distance of the server NIC to the Ethernet network plugs is less than 12 feet (3.5 m)	
Designate the Server IP static address: xxx.xxx.xxx.xxx	
Designate the Server Network Netmask configuration: xxx.xxx.xxx.xxx	
If applicable, designate the Server Gateway IP Address: xxx.xxx.xxx.xxx	
Designate the iLO (service processor) IP static address: xxx.xxx.xxx.xxx	
Designate the iLO Network Netmask configuration: xxx.xxx.xxx.xxx	
If applicable, designate the iLO Gateway IP Address: xxx.xxx.xxx.xxx	
If applicable, designate the GEHC VPN Gateway IP Address: xxx.xxx.xxx.xxx	
Network Requirements	PASS / FAIL
Confirm that inbound port 80/tcp (Internet/Thin Client access) is not blocked	
Confirm that inbound port 443/tcp (HTTPS Secure Internet/Thin Client access) is not blocked	
Confirm that inbound port 2381/tcp & udp (HP Insight) is not blocked. Not currently used but kept for future usage	
Confirm that inbound port 4006/tcp (DICOM transfers) is not blocked	
Confirm that inbound port 4010 is not blocked for DICOM Direct Connect communication and IAN notification for preprocessing (only if AW Server is configured in DDC integration mode)	
Confirm that inbound port 17767/tcp (Floating License from AW Workstations) is not blocked	
Confirm that inbound port 162/udp (SNMP) is not blocked (only if AW Server is installed on physical hardware)	
Confirm that inbound port 22/tcp (SSH Secure Shell) is not blocked Note: The access to this port is on demand and disabled on server by default.	
Confirm that inbound/outbound PING/icmp is not blocked.	
Confirm that outbound ports 25/tcp and 587/tcp (SMTP) are not blocked.	
Optional inbound/outbound port 445/tcp (SMB client - AdvantageSim MD only)	
Optional outbound port 9100/tcp (HP Jetdirect printing - AdvantageSim MD only)	
Confirm that outbound port 443/tcp to GE Service is not blocked. Note: The usage of these ports is required for GE Service connectivity: <ul style="list-style-type: none"> • Standard (150.2.0.0/16) • UK NHSnet (62.130.238.0/24) • UK N3 net (10.190.64.0/24) • Sweden SJUnet (82.136.152.0/24) 	

4.3 Virtual AW Server Site-readiness survey

This checklist ensures that GEHC service can install the Virtual AW Server configuration at the institution.

- Complete and/or verify the information for each section as applicable to this installation.

- Check each item and assess the item as Passed or Failed. If an item fails, work with the customer to define the remediation plan.
 - Section 3.1 shall be completed by the Installation Specialists (country dependent or by the GEHC FE) and provided to the FE in charge of the installation.
 - Section 3.2 and section 4 shall be completed by the FE
 - The completed checklist shall be stored in the Logbook by the FE.

4.3.1 Site environment preparation

Installation address and GEHC AW Server configuration	PASS / FAIL
<ul style="list-style-type: none"> • Institution Name: • Institution Address: • City: • Zip: • State/Province: • Country • Contact: • Phone 	
Power Requirements	PASS / FAIL
Not applicable - Customer hardware	
Environment Requirements	PASS / FAIL
Not applicable - Customer hardware	
AW Server Physical Hardware Requirements	PASS / FAIL
<p>Confirm that the customer's physical server(s) that will host the VM(s) for the virtual AW Server(s) has the following characteristics at minimum, for each Virtual Machine. If several Virtual Machines are hosted on the same host, multiply the specifications below by the number of Virtual Machines:</p> <ul style="list-style-type: none"> • Intel Xeon CPUs supporting: <ul style="list-style-type: none"> • SSE 4.1 instructions. • AVX-512 instruction set (this one is recommended (but not mandatory) for better performance of the applications). • 1 Ethernet device (minimum 1Gb/s) for each virtual AW Server + 1 Ethernet device (minimum 1Gb/s) for each virtual AW Server to be part of a cluster (Scalability). • Data store to store system disks in thick provisioning: 70GB. • Data store to store images: 1TB-1.5TB recommended for Low-Tier VM, 2-6TB recommended for High-Tier VM. • 8 physical CPU cores for Low-Tier VM, 24 CPU cores for high tier VM • Enough RAM to satisfy virtual RAM requirements without RAM over commit: RAM specification for VM depends on integration mode, see table in section 1.5.3.4 Virtual Machine characteristics per integration mode on page 19) 	
HAPS Server Physical Hardware Requirements (Scalability case)	PASS / FAIL
<p>Confirm that the customer's physical server(s) that will host the VM(s) for the virtual HAPS Server(s) has the following characteristics at minimum, for each Virtual Machine. If the two HAPS server Virtual Machines are hosted on the same host, multiply the specifications below by two:</p> <ul style="list-style-type: none"> • Intel Xeon CPUs supporting SSE 4.1 instructions • 2 Ethernet device (minimum 1Gb/s) for each virtual HAPS Server (Scalability). • Data store to store system disks in thick provisioning: 40GB min (typical 70GB). • 1 physical CPU core 	

- 4GB RAM

4.3.2 Install and network environment preparation

Tooling Requirements	PASS / FAIL
Not applicable	

Hostname and Server Requirements	PASS / FAIL
Designate the AW Server hostname: NOTE The length of AW Server hostname is restricted to 16 characters maximum; Only the following characters are supported: [a-z] [A-Z] [0-9], Dash (-) and Underscore (_) ; Backslash (\) is not allowed.	
If applicable, designate the AW Server Domain Name:	
If applicable, designate the AW Server Domain Name Servers (DNS) of the site <ul style="list-style-type: none"> • DNS1 Server IP Address: xxx.xxx.xxx.xxx • DNS2 Server IP Address: xxx.xxx.xxx.xxx 	
If applicable, designate the NTP Server used to synchronize the time <ul style="list-style-type: none"> • NTP Server IP Address: xxx.xxx.xxx.xxx 	
If applicable, designate the SMTP Mail Server of the site <ul style="list-style-type: none"> • SMTP Server IP Address: xxx.xxx.xxx.xxx 	
User Account Configuration Requirements	PASS / FAIL
Identify the Primary Contact Name for Enterprise User Account Configuration: If applicable, <ul style="list-style-type: none"> • Designate the Active Directory or LDAP Enterprise User Account Configuration Server IP Address or Name: xxx.xxx.xxx.xxx Otherwise the Local User Account Configuration will be applied Note: DNS and NTP configurations are compulsory for AW Server Enterprise User Account Configuration	
Network Requirements	PASS / FAIL
Confirm that there is one Ethernet network plug for Server. Indicate to the customer that a network speed of 1G/s is recommended for Server. Confirm that the network speed is at least 100 Mb/s	
Confirm that there is one Ethernet network plug for iLO. Confirm that the network speed is at least 100 Mb/s Note: iLO will share Server plug if GE provides an Ethernet switch in the order	
Confirm that the distance of the server NIC to the Ethernet network plugs is less than 12 feet (3.5 m)	
Designate the Server IP static address: xxx.xxx.xxx.xxx	
Designate the Server Network Netmask configuration: xxx.xxx.xxx.xxx	
If applicable, designate the Server Gateway IP Address: xxx.xxx.xxx.xxx	
Designate the iLO (service processor) IP static address: xxx.xxx.xxx.xxx	
Designate the iLO Network Netmask configuration: xxx.xxx.xxx.xxx	
If applicable, designate the iLO Gateway IP Address: xxx.xxx.xxx.xxx	
If applicable, designate the GEHC VPN Gateway IP Address: xxx.xxx.xxx.xxx	
Network Requirements	PASS / FAIL

Confirm that inbound port 80/tcp (Internet/Thin Client access) is not blocked	
Confirm that inbound port 443/tcp (HTTPS Secure Internet/Thin Client access) is not blocked	
Confirm that inbound port 2381/tcp & udp (HP Insight) is not blocked. Not currently used but kept for future usage	
Confirm that inbound port 4006/tcp (DICOM transfers) is not blocked	
Confirm that inbound port 4010 is not blocked for DICOM Direct Connect communication and IAN notification for preprocessing (only if AW Server is configured in DDC integration mode)	
Confirm that inbound port 17767/tcp (Floating License from AW Workstations) is not blocked	
Confirm that inbound port 162/udp (SNMP) is not blocked (only if AW Server is installed on physical hardware)	
Confirm that inbound port 22/tcp (SSH Secure Shell) is not blocked Note: The access to this port is on demand and disabled on server by default.	
Confirm that inbound/outbound PING/icmp is not blocked.	
Confirm that outbound ports 25/tcp and 587/tcp (SMTP) are not blocked.	
Optional inbound/outbound port 445/tcp (SMB client - AdvantageSim MD only)	
Optional outbound port 9100/tcp (HP Jetdirect printing - AdvantageSim MD only)	
Confirm that outbound port 443/tcp to GE Service is not blocked. Note: The usage of these ports is required for GE Service connectivity: <ul style="list-style-type: none"> Standard (150.2.0.0/16) UK NHSnet (62.130.238.0/24) UK N3 net (10.190.64.0/24) Sweden SJUnet (82.136.152.0/24) 	

"AW Server Private Network" Requirements for Scalability	PASS / FAIL
<p>Confirm that a separate LAN to be used as "Private AW Server network" is available for AW Servers in "cluster mode" with the following characteristics:</p> <ul style="list-style-type: none"> All AW Server and HAPS nodes shall be connected to the same LAN UDP broadcast shall be allowed on this LAN The LAN speed shall be 1Gbps The LAN Latency shall be less than 10ms 	

4.4 PC Client Requirements

NOTICE

Remind the customer that the Site IT Admin designate must be present during the client installation, to learn how the application works and to provide the Administrator password.

Installation address and GEHC AW Server configuration	PASS / FAIL
<p>Confirm that the customer has a Windows PC to install the AW Server client. The PC shall meet the following requirements:</p> <ul style="list-style-type: none"> The Minimum PC requirements for AW Server client are: <ul style="list-style-type: none"> Processor: Core2Duo @2.33GHz or Pentium™ 4 @3GHz minimum (or equivalent) Memory: 1024 MB minimum Disk drive: 250MB free space available 	

<ul style="list-style-type: none"> Screen resolution: 1024H x 768V minimum with full color (24 bit) (1280H x 1024V or more recommended) Network card: 100 Mbps minimum (1000 Mbps recommended) Internet connection: Customer-provided IPSEC VPN, for Internet/WAN operation Mouse: Two or three-button mouse. Two button mouse with scroll wheel suggested for best use of functions. Operating Systems: <ul style="list-style-type: none"> Windows 10™ 32bit, Windows 10™ 64bit Browsers: <ul style="list-style-type: none"> Internet Explorer™ 10.0.x or 11.x Firefox Chrome Browser security settings; Java script™ enabled. Privileges: Administrative access required for client software install 	
Remind the customer that the Site IT admin designate must be present during the client installation to learn how the application works and provide the Administrator password.	
<ul style="list-style-type: none"> PC hardware must have 1G/s Ethernet card (or above) and Network cable cat 5E (or above) If firewall or antivirus are used, the following executables shall be authorized <ul style="list-style-type: none"> Windows users shall be authorized to write in the following: <ul style="list-style-type: none"> Directories: %APPDATA%, %USERPROFILE%\ .solo Files: any files that may appear in the %USERPROFILE% directory (such as .AWEtrust store and .solo1ock...). Windows users shall be authorized to read and execute program files in directory: %PROGRAMFILES(x86)%\GE If Symantec Endpoint Protection is used and AW Server Client has performance issues, configure the following, on "policy level" in Symantec, and in the priority order described in following points: <ul style="list-style-type: none"> Exclude AW Server(s) from the Intrusion Prevention. OR Enable Out-of-band scanning for the group of clients. OR Remove Intrusion Prevention component from the workstations having AW Server Client. <p>NOTE</p> <p>Symantec Endpoint Protection's Intrusion Prevention component intercepts data at the network layer and scans each network packets which might affect the interactive performance of the product negatively.</p>	
Network Requirements	PASS / FAIL
Confirm that inbound port 2001/tcp (used to determine if another AW Server client session is running on the PC) is open on client PC.	
Hospital Infrastructure	PASS / FAIL
Network infrastructure shall be 1Gb/s (or above).	

NOTE

The AW Server platform includes a Client Checker Tool which validates client configurations to ensure that they meet the minimum monitor and hardware specification, so that images can be displayed at diagnostic quality. Java 1.7 minimum is required. This Java tool is available from the Service Tools from an installed server; make sure that you run the version of the tool that corresponds to the installed version of the server platform.

4.5 Environmental for HPE DL360 servers

The **HPE DL360 servers** (Low tier and High tier) must be racked.

- Make sure that the servers room where the AW Server will be installed has a sufficient space to install a rack with front and rear access, or that there is already a rack with sufficient place to install the server and the UPS (if applicable).
- Make sure that the servers room where the AW Server will be installed has a sufficient number of wall outlets (see list below):
 - List of necessary outlets - **NO UPS**:
 - 1 outlet for KVM (monitor)
 - 1 outlet for the Network switch option
 - 2 outlets for the server
 - 1 outlet 16A (220V int'l) or 20A (110V US/Japan) when using the PDU option
 - List of necessary outlets - **With UPS**:
 - 1 outlet for KVM (monitor)
 - 1 outlets for the server
 - 1 outlet for the UPS OR
 - 2 outlets 16A (220V int'l) or 20A (110V US/Japan) when using the PDU option
- Make sure that there are at least TWO operational network connections available.
 - 1Gbps or more for hospital network
 - 1Gbps for iLO Service Processor

Appendix A

A.1 Job Card IST001AB - Hypervisor Configuration

A.1.1 Overview

This section applies to the Hypervisor configuration on a customer's physical server.

It allows installing and configuring the Hypervisor environment for the creation and the management of the virtual machine(s) hosting the virtual AW Server.

All sections are performed and completed by the IT Administrator of the site.

Make sure the physical server has the required characteristics and the minimal resources to support the Virtual AW Server installation, defined in the and summarized below:

Physical server (host) characteristics:

- Intel Xeon CPUs supporting SSE 4.1 instructions
- 2 Ethernet devices (minimum 1Gb/s)
- Data store to store all VM data with thick provisioning, including provision for Windows and VM swap files (70GB).
- Data store to store images (6TB max)
- Enough RAM to satisfy virtual RAM requirements without RAM over commit

NOTE

Hyperthreading needs to be turned off on the Hypervisor to optimize the performances of the AW Server and the 3D applications. Indeed, the software is optimized for CPU settings with Intel Xeon architecture and without hyperthreading. So, it is recommended to deactivate the Hyperthreading on AW Server. Therefore, it is not appropriate to have other customer's VMs running on the same Hypervisor, if these other VMs require Hyperthreading to be activated, otherwise it could impact the AW Server performances.

Virtual Machine (hosted) characteristics:

AWS Low Tier	AWS High Tier	HAPS server
processor: 8 vCPUs	processor: 24 vCPUs	processor: 1 vCPUs
disk: one 70GB vHDD	disk: one 70GB vHDD	disk: one 40GB vHDD
memory: 24GB*	memory: 64GB*	memory: 4GB
network: 2 x Ethernet	network: 2 x Ethernet	network: 2 x Ethernet

*RAM depends on integration mode, see table in [Section 1.5.3.4 Virtual Machine characteristics per integration mode on page 19](#)

NOTE

As the host, the Virtual Machine shall support the SSE 4.1 instructions. If it is not the case, it could lead to Applications start failure.

If not, you shall configure the hypervisor EVC mode to a level which supports SSE 4.1 instruction.

Hypervisor configuration process summary:

1. The IT admin installs, configures and connects to the Hypervisor.

NOTE

Installation and Configuration of the Hypervisor environment for Virtual AW Server is under the Customer's responsibility.

For **VMware** hypervisor (ESXi) it is addressed in Appendix VMware Support VMware Hypervisor Installation Steps.

2. The IT admin allocates the physical network port(s) of the Hypervisor necessary for the virtual AW Server. - [A.1.2 Ethernet ports Allocation on page 48](#)
3. The IT admin creates a "service" account so that the GE FE will be able to administrate the virtual AW Server. - [A.1.3 Create a GEHC service user account on page 52](#)
4. The IT admin makes sure a NTP server is setup for the Hypervisor - See [A.1.4 Setup a NTP server for the Hypervisor on page 56](#)

NOTE

The steps are described for **VMware** hypervisor (ESXi) with **VMware vSphere Web Client**. To have the equivalent steps using **VMware vSphere Client**, refer to Appendix VMware Support. And if needed, refer to VMware documentation for more details.

A.1.2 Ethernet ports Allocation

A.1.2.1 Foreword

Requirement on physical network card

The minimum requirement to install a virtual AW Server is to have one physical network card dedicated to the AW Server VM. This requirement applies to each hypervisor that will host the virtual AW Server.

For a cluster of AW Server VMs, a second physical network card is required on each host.

The Virtual machine containing the virtual AW Server will have 2 virtual network card. This is defined in the settings of the OVF Template.

Requirement on port groups and virtual switch

For the first virtual network card of the VM, the minimum requirement is to have one port group connected to one 1GB/s physical network card. The port group contains only the AW Server Virtual Machine. This way the physical network card is dedicated to the virtual AW Server.

It is also possible to have other Virtual Machines using the same port group. However in this case, it is needed to have the same number of physical network card and of Virtual Machines in the virtual switch.

For the second virtual network card of the VM, there are 2 cases:

- If the VM is part of a cluster (Low-Tier VM only).
- If the VM is not part of a cluster, the second virtual network card can be associated to the same port group as the first virtual network card. Another valid configuration is to associate the second virtual network card to a port group with no physical network card

Resource preparation for Virtual Machine

It is important to check that enough resources are available for the AW Server Virtual Machine:

- CPU (no hyperthreading)
- Memory
- Storage

Also, if several AW Server Virtual Machines are going to be installed, the minimum requirements have to be multiplied by the number of VM.

Also keep in mind that CPU and RAM should not be over committed for the AW Server. The AW Server VMs always need access to the resources described in minimum requirements.

A.1.2.2 Procedure

NOTE

The steps below are provided as an example to configure the network on one single hypervisor with 4 physical network cards that will host one virtual AW Server. For details on the network configuration for more advanced configuration and clusters, refer to the related documentation.

The following example is based on the use of a physical server equipped with a Network controller fitted with 4 Ethernet ports. In our example, the physical server will be used to host Virtual machine(s) (virtual AW Server(s)).

Using bigger physical servers with higher capacity and a greater number of Ethernet controllers and/or Ethernet ports allows hosting of a higher number of virtual machines, however the settings of these servers follow the same philosophy.

Always make sure that the Virtual AW Servers will have the necessary bandwidth.

Necessary Networking Hardware resources:

The virtual AW Server needs two 1GB/s physical network cards (Ethernet port) dedicated only to the AW Server.

The first 1 GB/s physical network card is dedicated to communication with the other hosts on the Hospital network.

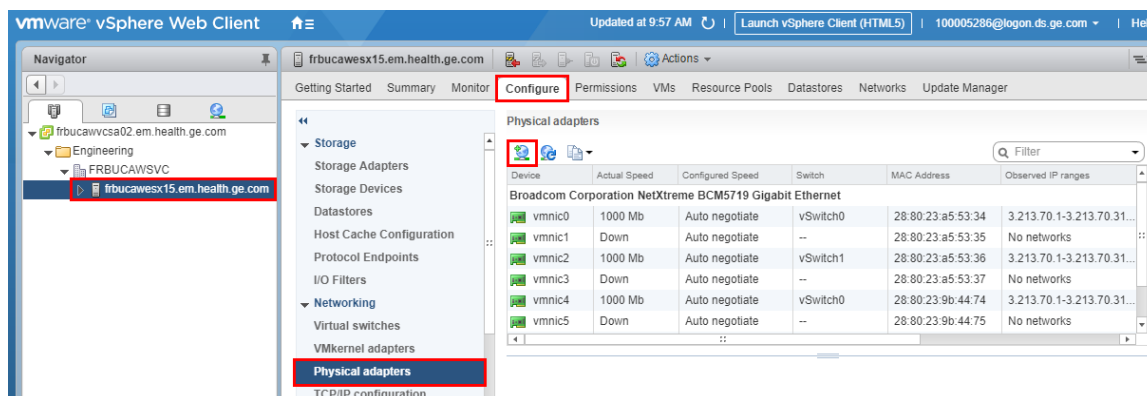
The second 1 GB/s physical network card dedicated to the AW Server is used within a cluster of AW Servers for the private scalability network. It is not used for a single Virtual Machine.


NOTE

It is recommended to use a separate NIC for the Management network of the Hypervisor, in order to ensure that enough bandwidth will be available during template deployment or other similar operations.

Below are the instructions to configure vSphere networking for virtual AW Server(s).

1. Login to the vSphere Web Client:
 - a. Enter the URL for the vSphere Web Client in your web browserinfo:
`https://<client-hostname>/vsphere-client`
 - b. Select **LAUNCH VSPHERE WEB CLIENT (FLEX)**.
 - c. Enter the **administrator** login and password. Check with the IT admin for the login/password.
2. In the *vSphere Web Client* page that displays:



- a. Select the Hypervisor and click on **Configure**.
 - b. Expand **Networking** sub-menu and click on **Physical adapters** to see the available Ethernet ports and their status.
 The *Physical adapters* panel displays. You can read information about the different adapters such as their speed and the virtual switch they are linked to.
 - c. Check how many network cards are available and which one you plan to attribute to the Virtual machines that are going to be created.
 3. Create a virtual switch for the virtual AW Server:
 Virtual switches are entities used by vSphere to link virtual network card of a Virtual Machine to physical network card of the server hardware.
 - a. Click on the  icon.
 The *Add Networking* wizard displays.
 - b. Select the **Virtual Machine Port Group for a Standard Switch** radio button and click on **Next**.
 - c. In the panel that displays, select **New standard switch** radio button and click on **Next**.
 - d. In the panel that displays, click on the **+** icon.
 - e. In the sub-screen that displays, select the next available **Network Adapter** and click on **OK**.

NOTE

In case of private network (see [Step 5](#) below) select a network adapter that is not connected to the hospital network.

 - f. Click on **Next**.

NOTE

In case of private network (see [Step 5](#) below) acknowledge the popup that displays.

 - g. In the panel that displays, type in the **Network label** (AWS3 Hospital Network, for example) and click on **Next**.
 The *Ready to Complete* panel displays.
 - h. Click on **Finish**.
4. Follow the same procedure to setup other Network adapters if needed and create the vSphere standard switches that will be attributed to the Virtual machines (AW Servers) once they have been created.

5. If the AW Server is part of a cluster of virtual AW Servers, an additional network (AW Server Private Network) needs to be configured to ensure communication between the nodes of the cluster.
6. Follow the same procedure to setup the Network adapter for the AW Server Private Network.

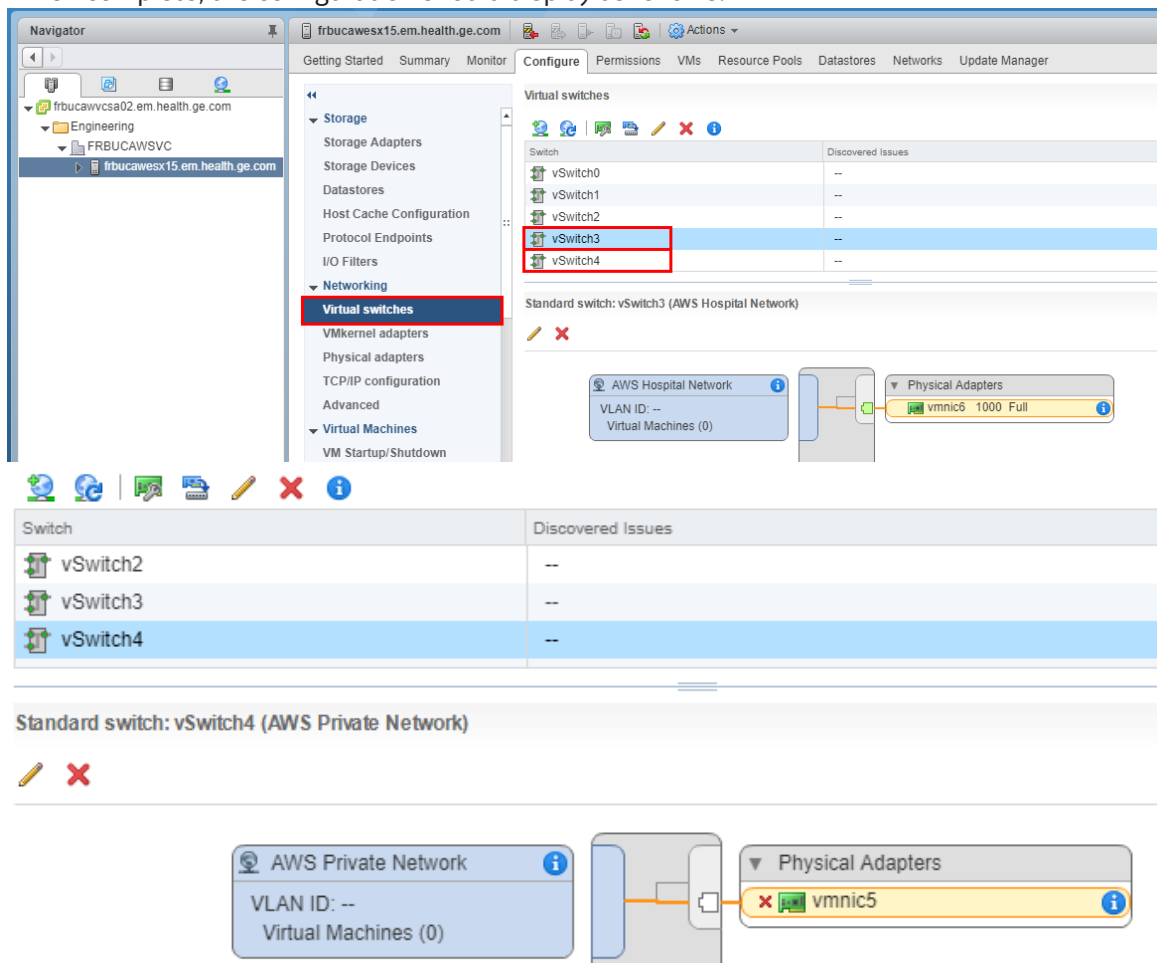
NOTE

Two or more virtual AW Servers hosted on the same physical server can share the same physical Network adapter for the AW Server Private Network.

7. Display the configuration of the virtual switch by clicking on **Virtual switches** then on the switch previously created.

The *Standard switch* panel displays. This view displays the current configurations of the virtual switches for this Hypervisor.

8. When complete, the configuration should display as follows:

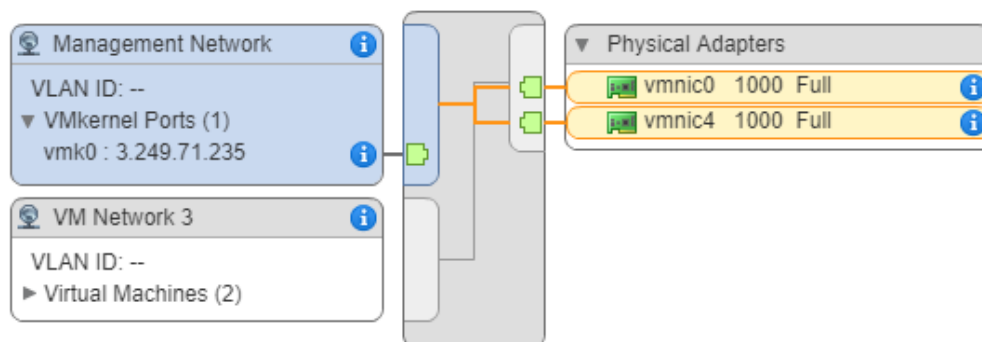


NOTE

In our example above, the virtual network switch `vmnic5` is not connected (red cross) to the Hospital network as it will be used for the AW Server Private network (in case of cluster mode), and therefore separated from the Hospital network (Broadcast is used on the AW Server Private network).

9. There is also a virtual switch that contains the *Management network*. This virtual switch is used to indicate what physical network card is used for communication between the Hypervisor and

the vSphere clients.



It is recommended to keep a dedicated virtual switch for Management Network.

10. Optional: if the *VM Network* displays as linked to the *Management Network*, as in the example above, you need to remove it:
 - a. Select the switch containing the *Management Network*.
 - b. Select the **Management Network** and click on the red cross in the *Standard switch* part of the panel.
 - c. Click on **Yes** to acknowledge the confirmation message that pops up.

This completes the Network ports allocation.

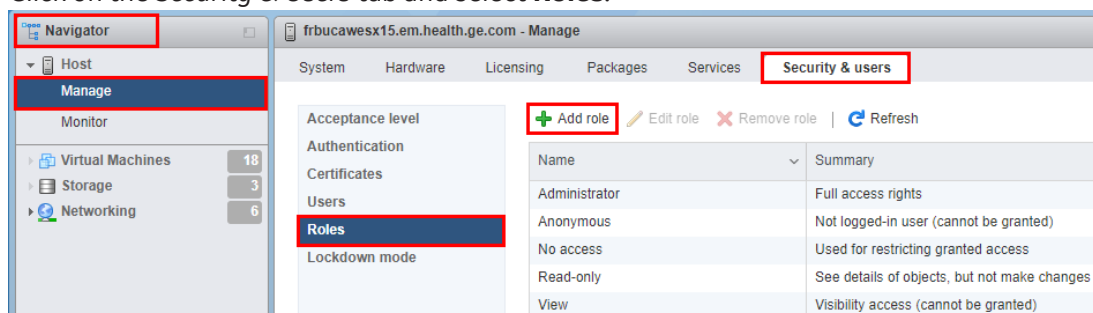
Proceed to [A.1.3 Create a GEHC service user account on page 52](#).

A.1.3 Create a GEHC service user account

In order to allow the GEHC FE to complete the installation of the virtual AW Server (virtual console access, virtual DVD drive usage...), it is needed to provide him/her an "hypervisor" account with the sufficient permissions on the AW Server Virtual Machine.

Below are the steps to configure a role and a local user on one single hypervisor. For more advanced configuration, refer to the related documentation.

1. Connect to the ESXi Web Interface.
In a web browser enter the URL or IP address of the ESXi:
`https://<ESXi URL or IP>/`
The *ESXi Web Interface* login screen displays.
2. Enter the **root** login and password. Check with the IT admin for the password.
The *vSphere Web Client* page displays.
3. Create a GE Service role with appropriate permissions. As a first step, a new GE Service role shall be created with the necessary permissions to administrate a Virtual machine.
 - a. In the *Navigator panel*, expand **Host** and click on **Manage**.
 - b. Click on the *Security & Users* tab and select **Roles**.



- c. Click on the **Add role** icon.

The *Add a role* screen displays.

+ Add a role

Role name (required): **GE Service**

Privileges:

- Root**
 - ☒ **System**
 - ☐ Global
 - ☐ Folder
 - ☐ Datacenter
 - ☒ **Datastore**
 - ☐ Network
 - ☐ DVSwitch
 - ☐ DVPortgroup
 - ☐ Host
 - ☒ **VirtualMachine**
 - ☐ VRMPolicy
 - ☐ Resource

Add **Cancel**

- d. Name the new role **GE Service**.

- e. Give the following permissions by checking the boxes:

- **System**
- **Datastore**
- **Virtual machine**

- f. Click on **Add**.

The new **GE Service** role displays in the list of existing Roles.

4. Create a service user:

- a. In the *Security & Users* tab, select **Users**.

frbucawesx15.em.health.ge.com - Manage

System Hardware Licensing Packages Services **Security & users**

Acceptance level
Authentication
Certificates
Users
Roles
Lockdown mode

Add user Edit user Remove user Refresh

User Name	Description
root	Administrator

- b. Click on the **Add user** icon.

The *Add a user* screen displays.

Add a user

User name (required)	service
Description	
Password (required)
Confirm password (required)

Add **Cancel**

- c. Name the new user **service**.
- d. Type the password twice in the **Password** and **Confirm password** fields
- e. Click on **Add**.

A new user `service` displays in the list of Users.

5. Assign the GE Service role permissions to the service user:
 - a. In the *Navigator* panel, right click on **Manage** and select **Permissions**.

The *Manage permissions* wizard displays.

Manage permissions

Host

Assign users and roles for Host

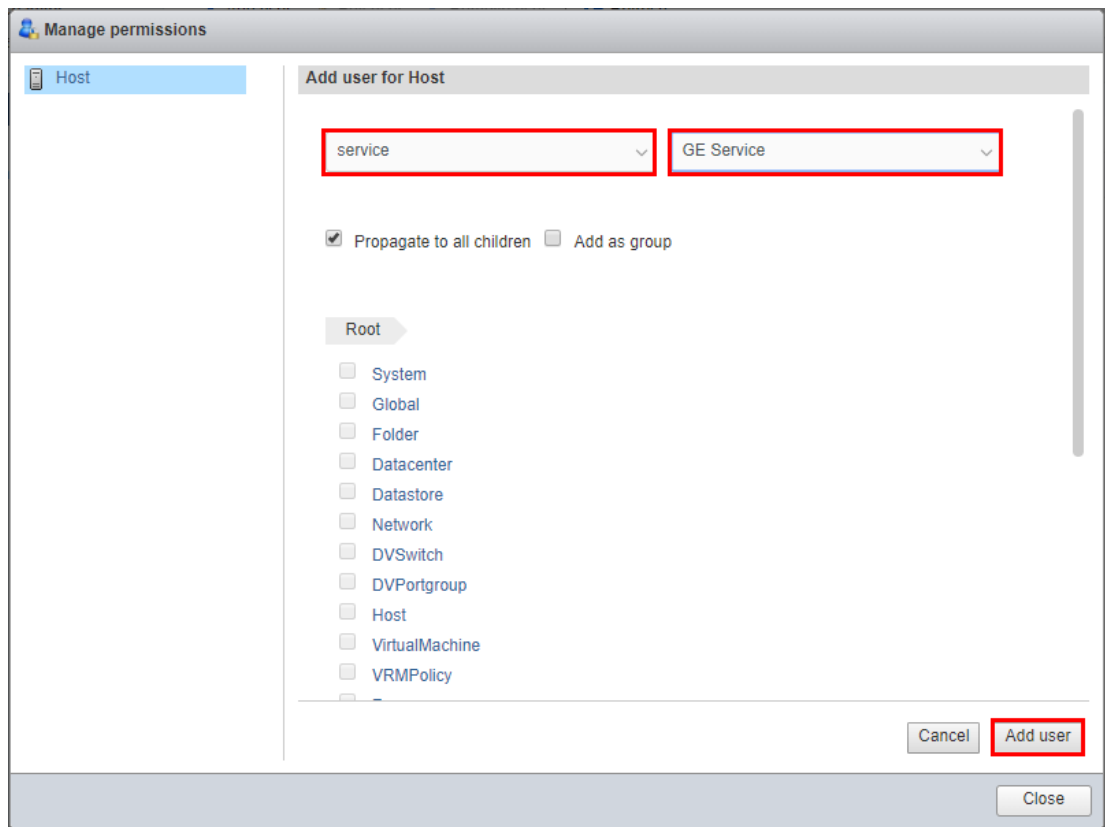
Add user **Remove user** **Assign role**

User ▲	Role ▼
dcui	Administrator
root	Administrator
vpxuser	Administrator

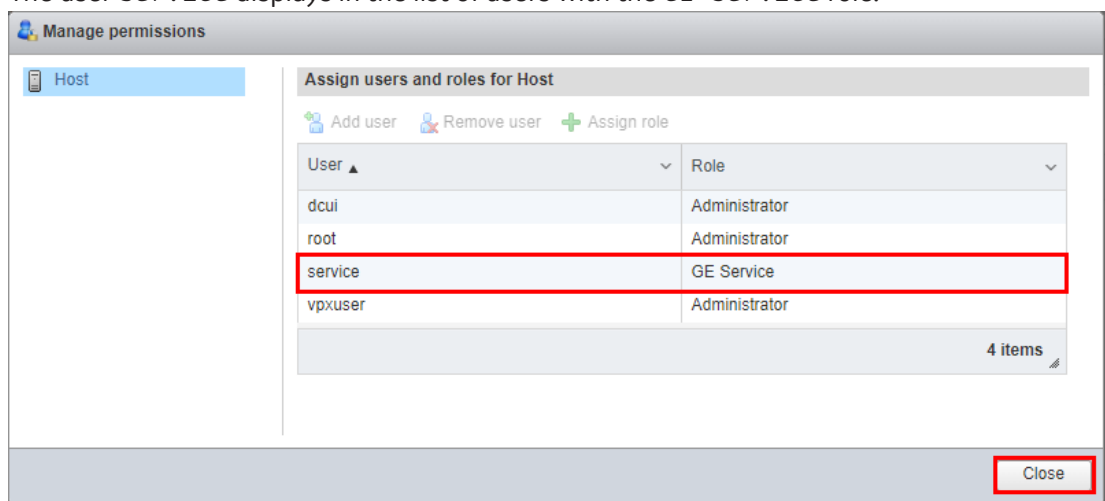
3 items

- b. Click on the **Add user** icon.

The *Add user for Host* panel displays.



- c. On the second drop-down menu, select the newly created **GE Service** role.
- d. Click on the **Add user** button.
- e. The user **service** displays in the list of users with the **GE Service** role.



- f. Click on **Close**.

The service user gets linked to the GE Service role with the appropriate permissions.

6. Logout from ESXi Web Interface and login again with the service user credentials in order to check that the account is operational and addresses the virtual machine created to host the virtual AW Server:

User: **service**

Password: the password you specified in [Step 4.d](#).

This completes the installation of the GE Service account.

Proceed to [A.1.4 Setup a NTP server for the Hypervisor on page 56](#).

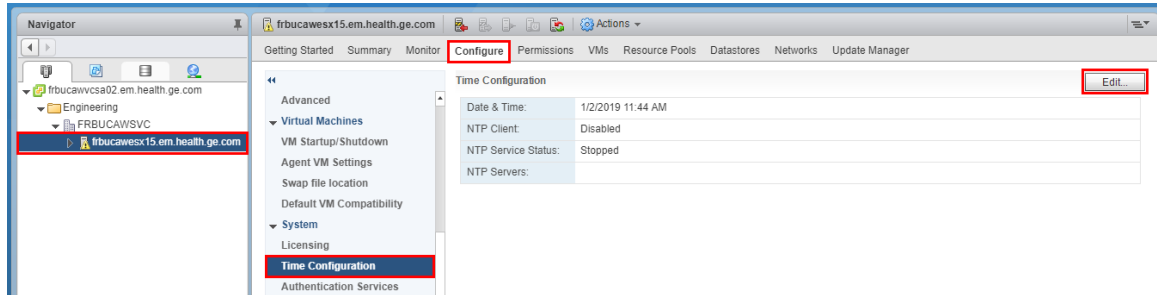
A.1.4 Setup a NTP server for the Hypervisor

It is recommended to configure a NTP server on each Hypervisor that will host the AWS Virtual Machine.

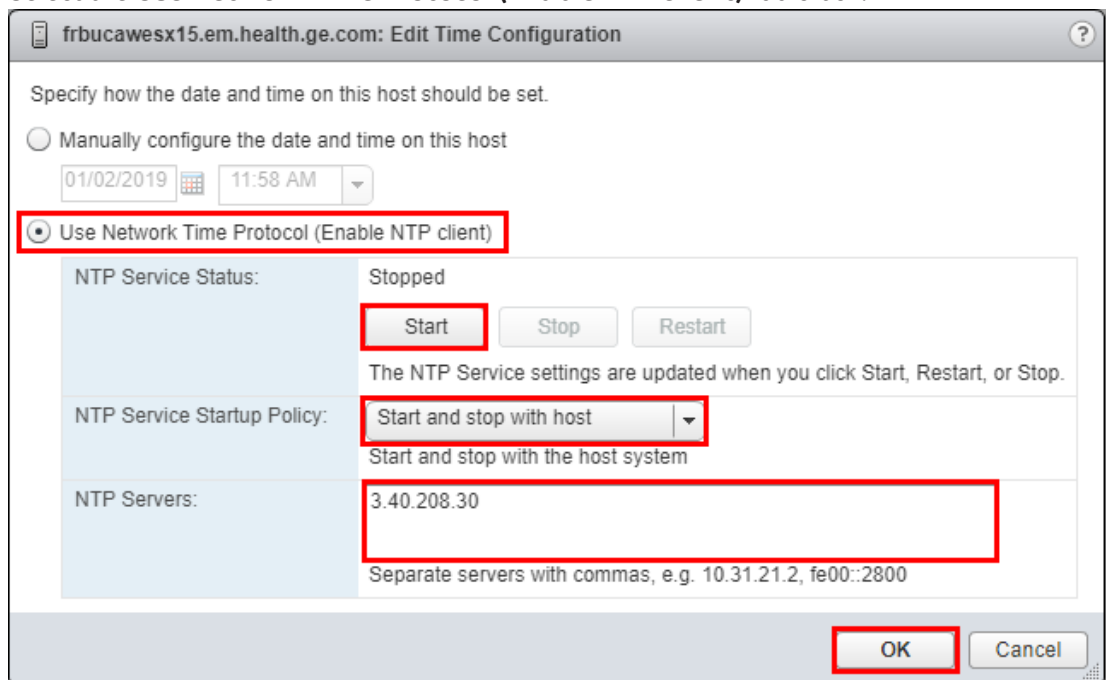
Below are the instructions to configure a NTP server on a single Hypervisor.

The correct time is essential to your Hypervisor, you will need it for a variety of reasons (syslog, iscsi authentication and Security) and your Virtual Clients.

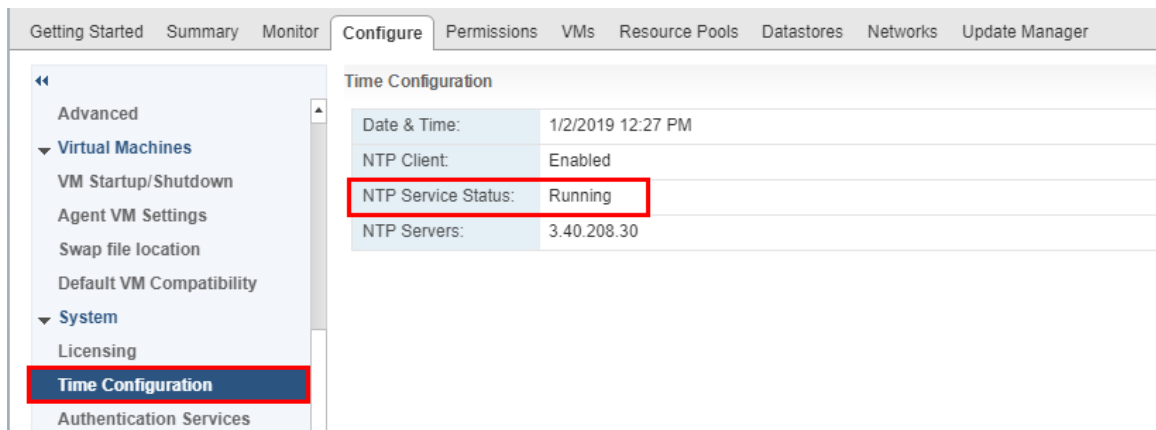
1. Make sure you are logged on the vSphere Web Client as **administrator**.
2. In the main *vSphere Web Client* screen:



- a. Select the Hypervisor and click on the *Configure* tab.
 - b. Expand the **System** sub-menu and click on **Time Configuration**.
 - c. Click on the **Edit** button.
3. Configure and start the NTP server on the *Edit Time Configuration* screen:



- b. In the **NTP Servers** field, enter the site's NTP server name (l.e: ntp.pool.org) or NTP server's IP address.
 - c. Set the **NTP Service Startup Policy** to **Start and stop with host**
 - d. Start the NTP service by clicking on the **Start** button.
 - e. Click on **OK** to complete the NTP server installation.
4. Verify that the NTP service has been started and is running.



- The GEHC FE shall be provided with the IP address of the NTP server that was used, so that he will be able to set it in the Virtual AW Server once installed.

This completes the installation of a NTP server for the Hypervisor.

This completes the Hospital IT Admin Hypervisor installation and configuration steps.

Proceed to [A.2 Job Card IST001B - Virtual Machine creation on page 57](#).

A

A.2 Job Card IST001B - Virtual Machine creation

A.2.1 Overview

NOTE

For the AW Server integrated within the CT/MR Console Environment (Edison HealthLink or CT Nano-Cloud), refer to AW Server Integration in CT/MR Console Environment.

This section applies to the Virtual Machine creation on a customer's physical server.

All sections are performed and completed by the IT Administrator of the site.

Pre-requisite:

The Hypervisor is installed and configured. See section [A.1 Job Card IST001AB - Hypervisor Configuration on page 47](#).

Preliminary Steps:

- The GEHC FE makes sure what type of Virtual AW Server has been purchased by the site and delivers the following information to the IT administrator of the site.
 - Low Tier or High Tier virtual AW Server (needs additional step to upgrade the default Low Tier VM to High Tier VM - See section [A.2.2.2 Steps to upgrade / downgrade a Virtual Machine on page 64](#)).
 - Integrated or Standalone (Non-Integrated) virtual AW Server (Standalone or Hybrid integration AW Server needs additional step to create hard disk for Image data - see section [A.2.2.4 Image data disk creation for Standalone \(Non-Integrated\) virtual AW Server on page 66](#)).
 - AW Server part of a cluster of virtual AW Servers (Scalability).

It is necessary to **also create two VMs** to host the HAPS (Preferences Sharing) servers.

- See section [A.2.2.2 Steps to upgrade / downgrade a Virtual Machine on page 64](#) to downgrade the Low Tier VM to HAPS server VM
- Virtual servers in cluster mode need two dedicated physical network ports (1 for hospital network communication and 1 for AW Server Private network communication)

between the AW Servers and HAPS). See Job Card IST001C - Virtual Servers Cluster Installation Steps for Scalability network setup.

2. The GEHC FE delivers the media necessary for VM creation and OS installation and the media necessary for AW Server installation to the IT administrator of the site.

Prepare the OVF Template software media that will be needed for installation:

Refer to the Software Kit content in section [1.5.1 Software Kit on page 10](#).

NOTE

When installing from electronic files, always refer to AW eDelivery Service Guide 5761599-8EN for detailed instructions.

AW Server VM creation process summary:

NOTE

Hyperthreading needs to be turned off on the Hypervisor to optimize the performances of the AW Server and the 3D applications. Indeed, the software is optimized for CPU settings with Intel Xeon architecture and without hyperthreading. So, it is recommended to deactivate the Hyperthreading on AW Server. Therefore, it is not appropriate to have other customer's VMs running on the same Hypervisor, if these other VMs require Hyperthreading to be activated, otherwise it could impact the AW Server performances.

1. The GE FE gives the site IT administrator, the OVF template software media (**5720xxx** USB key or **5720625** DVD) that is needed for creating the Virtual machine, aimed to host the virtual AW Server.

The GE FE also delivers the following installation instructions to the site IT administrator. The OVF Template creates the Low Tier Virtual machine with the required characteristics to host the virtual AW Server, and loads the Linux OS and the AW Server (in case of USB key) at the same time.

2. The IT admin connects to the Hypervisor.
3. The IT admin installs and configures the Hypervisor environment. See section [A.1 Job Card IST001AB - Hypervisor Configuration on page 47](#).
4. The IT admin loads the OVF template and creates the virtual machine (Low Tier) - Section [A.2.2.1 OS Template \(OVF\) Installation on page 60](#)
5. If the site has purchased a High Tier virtual AW Server, the GE FE notifies the IT admin that section [A.2.2.2 Steps to upgrade / downgrade a Virtual Machine on page 64](#) shall be performed, in order to upgrade the Low Tier VM into a High Tier VM.

If not, proceed to next step.

6. If the site has purchased a virtual AW Server cluster solution, the GE FE notifies the IT admin that, in addition to the AW Servers VMs, two HAPS server VMs shall be created from the Template, and that section [A.2.2.2 Steps to upgrade / downgrade a Virtual Machine on page 64](#) shall be performed, in order to downgrade the Low Tier VM into a HAPS server VM.

If not, proceed to next step.

7. The GE FE notifies the IT admin that section [A.2.2.3 Disconnect the second Network Adapter on page 65](#) shall be performed, so that the second Network Adapter, used to ensure communication between the nodes (virtual AW Server) that are part of a cluster, is not be connected at the **power on**.
8. If the site has purchased a Standalone (Non-Integrated) virtual AW Server, the GE FE notifies the IT admin that section [A.2.2.4 Image data disk creation for Standalone \(Non-Integrated\) virtual AW Server on page 66](#) shall be performed, in order to create a virtual Hard disk to store the image data.

NOTE

The steps are described for **VMware** hypervisor (ESXi) with **VMware vSphere Web Client**. To have the equivalent steps using **VMware vSphere Client**, refer to Appendix VMware Support. And if needed, refer to VMware documentation for more details.

A.2.2 Virtual machine creation

The IT Administrator of the site is responsible for installing, and configuring on-site a fully-functional Virtual machine with the appropriate characteristics for hosting the virtual AW Server. The IT Administrator of the site is also responsible for providing an "hypervisor" account for GE service, so that the GEHC FE is able to administrate (load software, configure, etc..) the virtual machine which will host the virtual AW Server.

Pre-requisite:

Ask the IT administrator of the site for the network parameters necessary for your virtual AW Server and its environment.

- IP address of the Hypervisor.
- IP addresses and netmasks/network prefix to be used for the virtual AW Server.
- IP addresses used for the PACS.
- IP addresses used for the remote hosts (if applicable).
- IP addresses used for the printers (if applicable).

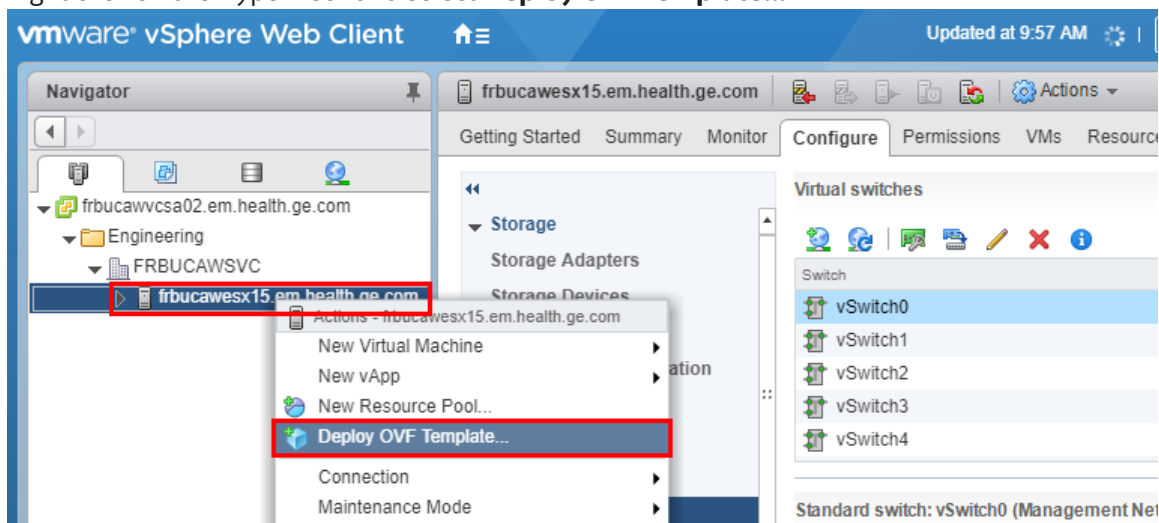
IP address checklist:

Description	IP address	Netmasks / Network prefix	Hostname	AE Title	DICOM Port
Management network (Hypervisor)		N/A	N/A	N/A	N/A
vAW Server eth0 (hospital network)					4006
vAW Server eth1 optional: private network for Cluster of AWS					
PACS (hospital network)		N/A	N/A		
PACS (hospital network) (Storage commitment)		N/A	N/A	N/A	
External License server #1		N/A	N/A	N/A	N/A
External License server #2		N/A	N/A	N/A	N/A
Remote Host #1					
Remote Host #2					
Remote Host #3					
Remote Host #4					
Remote Host #5					
DICOM printer #1					
PostScript printer #1					

A.2.2.1 OS Template (OVF) Installation

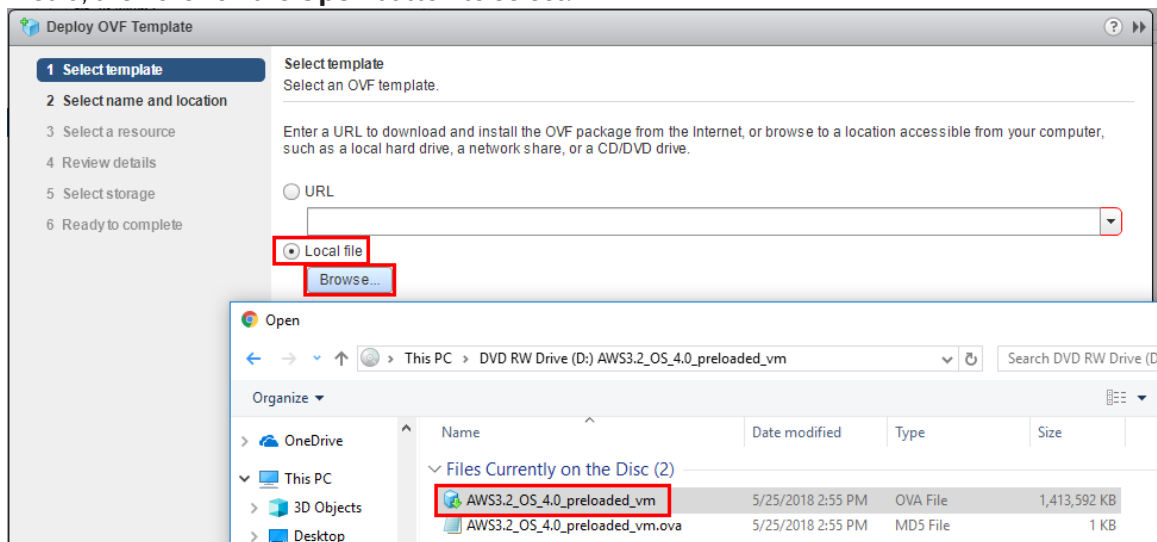
The OVA/OVF Template allows creating a VM (virtual machine) with the required characteristics (virtual memory, number of virtual CPUs, etc...) for the Low Tier AW Server, and install at the same time the Linux OS.

1. Insert the OS Template media into the PC.
2. Make sure you are logged on the vSphere Web Client as **administrator**.
3. Right click on the Hypervisor and select **Deploy OVF Template...**



The *Deploy OVF Template* wizard displays.

4. Select **Local file** and click on the **Browse** button to locate the .ova file from the OVF Template media, then click on the **Open** button to select.



5. Click on **Next**.

NOTE

The identification of the release that you want to install may be different from the one shown in the example.

The *Select name and location* panel displays.

6. Enter a name for the Virtual Machine: i.e: **AWS3_VM01** (for first VM) ; **AWS3_VM02** (for next) , etc.
7. Select the datacenter where you want to deploy the OVF template.
8. Click on **Next**.

The *Select a resource* panel displays.

9. Select the Hypervisor where you want to run the deployed template.
10. Click on **Next**.

The *Review details* panel displays.

Deploy OVF Template

Review details
Verify the template details.

Publisher	No certificate present
Download size	1.3 GB
Size on disk	3.4 GB (thin provisioned) 70.0 GB (thick provisioned)
Description	AW Server 3.2 VM preloaded with AWS3.2_OS_4.0

Back **Next** Finish Cancel

11. Click on **Next**.

The *Select storage* panel displays.

12. AW Server / HAPS server VM creation: Accept the default virtual disk format settings (**Thick Provision Lazy Zeroed**).
13. Select **Show datastores from Storages DRS clusters** check box, to be able to choose individual datastores.
14. Click on **Datastores**.
15. Choose a Datastore that will host the VM (see example below):

Deploy OVF Template

Select storage
Select location to store the files for the deployed template.

Select virtual disk format: Thick provision lazy zeroed

☒ Show datastores from Storage DRS clusters

Filter

Datastores Datastore Clusters

Name	Status	VM storage policy	Capacity	Free
SAN01_vd02_v004	Normal	-	1.86 TB	364.98 GB
SAN02_vd02_v004	Normal	-	1.86 TB	873.11 GB
SAN03_vd02_v004	Warning	-	1.86 TB	462.66 GB

3 Objects Copy

Back **Next** Finish Cancel

NOTE

For information about Disk Format, see: https://pubs.vmware.com/vsphere-50/index.jsp?topic=%2Fcom.vmware.vsphere.storage.doc_50%2FGUID-4C0F4D73-82F2-4B81-8AA7-1D752A8A5AC.html

16. Click on **Next**.

The *Select networks* panel displays. It allows to map the destination network for each source network.

Deploy OVF Template

Select networks
Select a destination network for each source network.

Source Network	Destination Network
VM Hospital Network	AWS3 VM01 Hsp Network
AWS Private Network	VM Private Network

Description - VM Hospital Network
The VM Hospital Network network

IP Allocation Settings
IP protocol: IPv4
IP allocation: Static - Manual

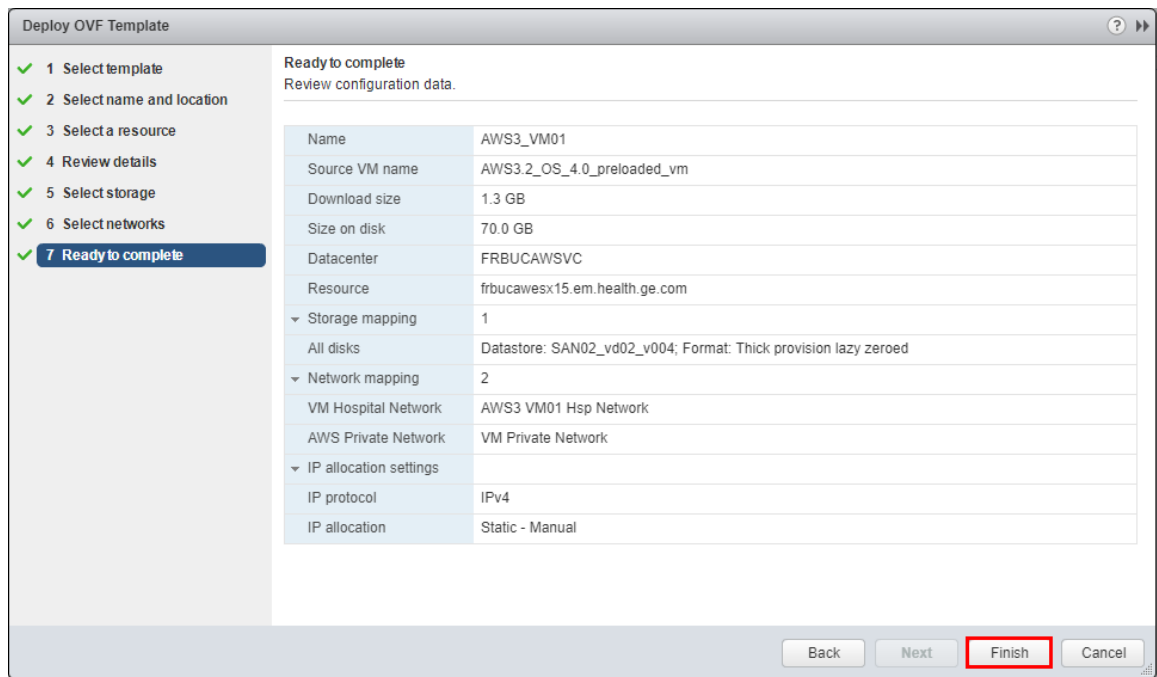
Back **Next** Finish Cancel

17. On the **Hospital Network** line, select the Destination network from the scroll-down menu. The name of the destination network corresponds to the port group you have created or identified in [A.1.2 Ethernet ports Allocation on page 48](#) Section. As a reminder, this port group has to be associated with at least one physical network card dedicated to AW Server VM
18. On the **Private AWS Network** line, select the Destination network from the scroll down menu.
- For a single virtual AW Server, select the same destination network as for Hospital Network. This network will not be used by the VM.
 - Alternatively, you can also associate this second virtual network card to a port group with no physical network card.
 - For a virtual AW Server part of a cluster, select the destination network that corresponds to the virtual switch you created for private network.

19. **NOTE**

You can change these parameters at a later time by editing the VM settings if needed. Click on **Next**.

The *Ready to complete* panel displays with the Virtual Machine details.



Deploy OVF Template

Ready to complete
Review configuration data.

Name	AWS3_VM01
Source VM name	AWS3.2_OS_4.0_preloaded_vm
Download size	1.3 GB
Size on disk	70.0 GB
Datacenter	FRBUCAWSVC
Resource	frbucawesx15.em.health.ge.com
Storage mapping	1
All disks	Datastore: SAN02_vd02_v004; Format: Thick provision lazy zeroed
Network mapping	2
VM Hospital Network	AWS3 VM01 Hsp Network
AWS Private Network	VM Private Network
IP allocation settings	
IP protocol	IPv4
IP allocation	Static - Manual

Back Next **Finish** Cancel

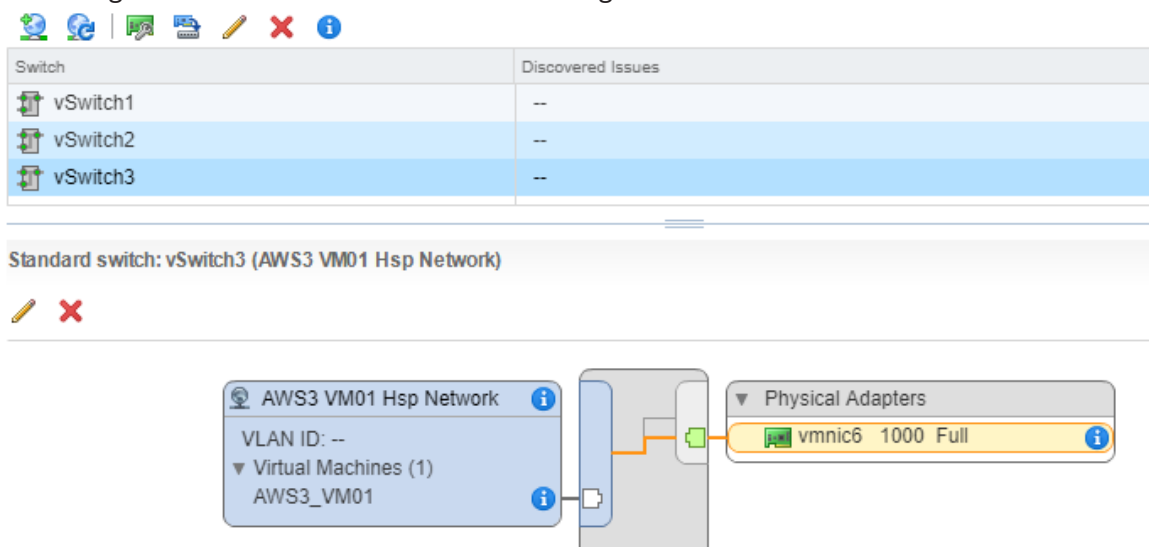
20. Click on **Finish** to accept and start the VM creation.

The *Deploying OVF Template* task appears in the *Recent Tasks* section at the bottom of the page. A status bar lets you know about the deployment progress.

It will take several minutes to complete.

21. After the task status displays as *Completed*, eject the DVD from the drive and store it in a safe place.
22. Check that the Virtual Machine has been associated to the right physical network card:
- Select the Hypervisor if not already done.
 - Click on the *Configure* tab.
 - Expand the **Networking** sub-menu.
 - Click on **Virtual switches**.

The configuration should be similar to the following:



Proceed to section [A.2.2.2 Steps to upgrade / downgrade a Virtual Machine](#) on page 64.

A.2.2.2 Steps to upgrade / downgrade a Virtual Machine

Depending on the type of virtual AW Server purchased by the site you may have to upgrade or downgrade the virtual AW Server.

The upgrade / downgrade of a Virtual Machine consists of updating the VM memory and/or CPU. Refer to [1.5.3.4 Virtual Machine characteristics per integration mode on page 19](#) to update the VM memory and/or CPU to the right values.

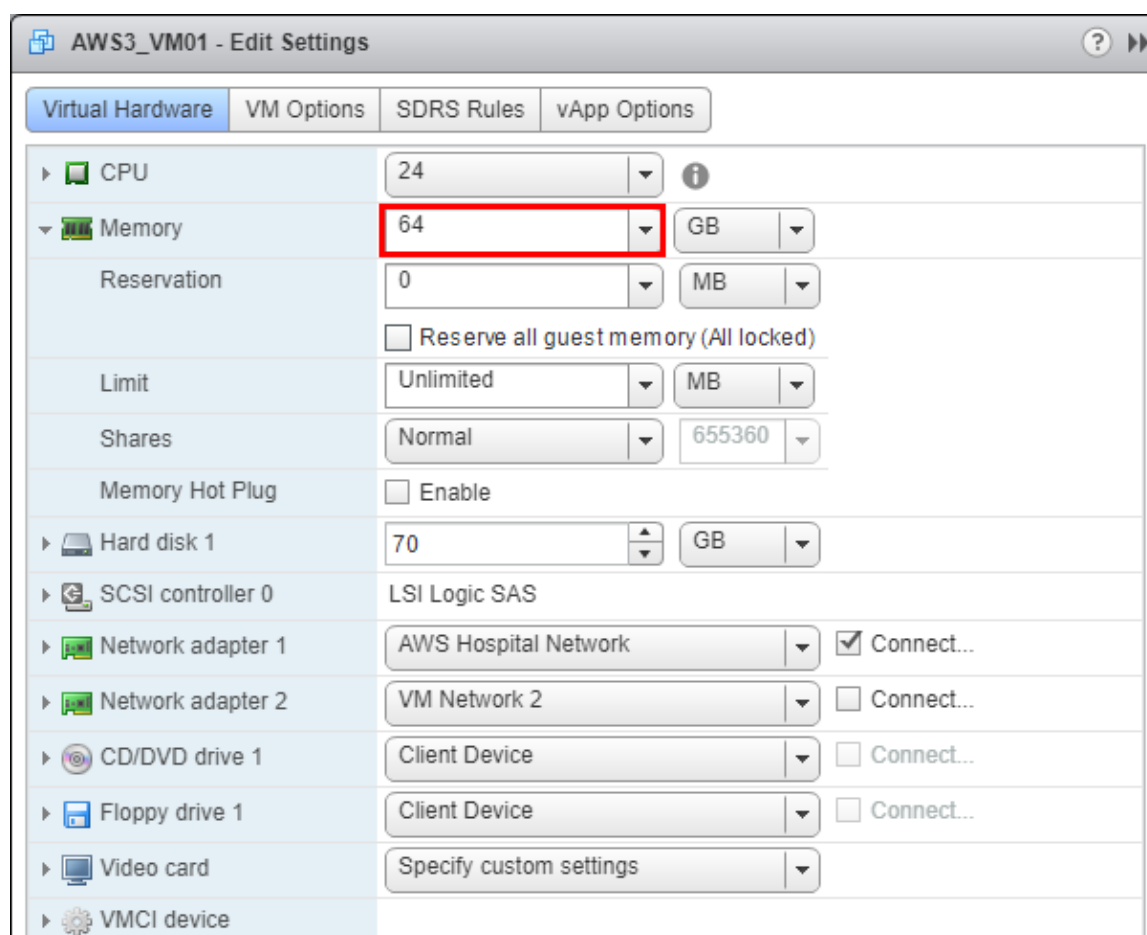
The below steps are performed for the upgrade of a Low tier VM into a High Tier VM. For the downgrade of a VM, the steps are similar.

1. Display the *Edit Settings* panel:

Right click on the Virtual Machine you have created under the Hypervisor, and that you want to upgrade / downgrade, and select **Edit settings**.

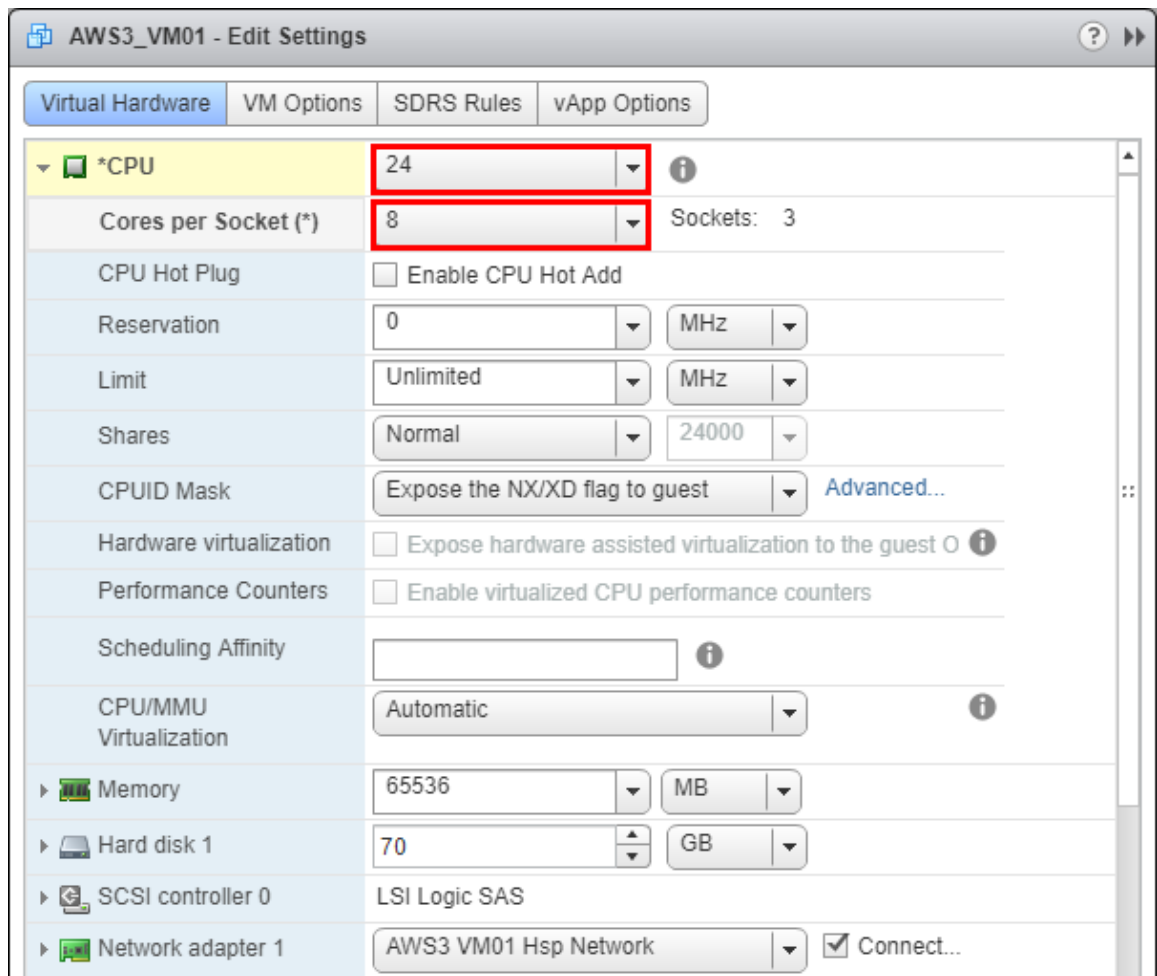
2. Update the VM memory:

In the *Virtual Hardware* tab select **Memory** from the list and set the memory size to 64GB.



3. Update the VM CPU:

In the *Virtual Hardware* tab select **CPU** from the list and set the CPU number to 24.

**NOTE**

To achieve the proper CPU number necessary to set core numbers to 24, select 3 virtual sockets and 8 core per sockets.

4. Click on **OK**.

Proceed to section [A.2.2.3 Disconnect the second Network Adapter on page 65](#).

A.2.2.3 Disconnect the second Network Adapter

A second Network Adapter has been configured. This Network Adapter is used to ensure communication between the nodes (virtual AW Server) that are part of a cluster, through the AW Server Private network.

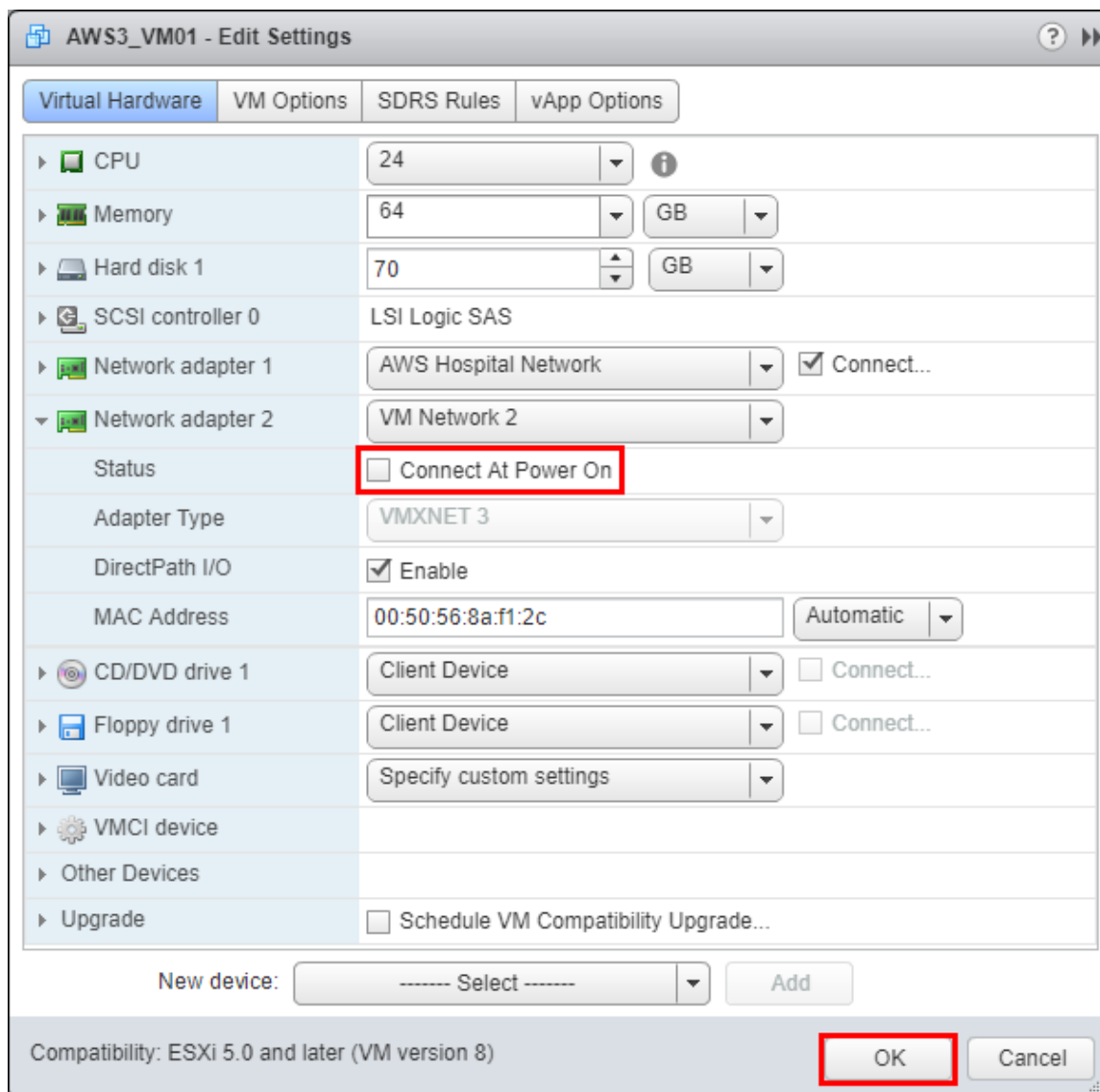
This second Network Adapter should not be connected at the **power on** of the Virtual Machine.

1. Display the *Edit Settings* panel:

Right click on the Virtual Machine and select **Edit settings**.

2. Disconnect the second Network Adapter:

In *Virtual Hardware* tab select **Network adapter 2** from the list and uncheck the **Connect At Power On** check-box.



NOTICE

DO NOT disconnect Adapter 1

3. Click on **OK**.

Proceed to section [A.2.2.4 Image data disk creation for Standalone \(Non-Integrated\) virtual AW Server](#) on page 66.

A.2.2.4 Image data disk creation for Standalone (Non-Integrated) virtual AW Server

Perform this section if the site has purchased a Standalone (Non-Integrated) virtual AW Server. The purpose is to create a virtual hard disk partition to store the image data.

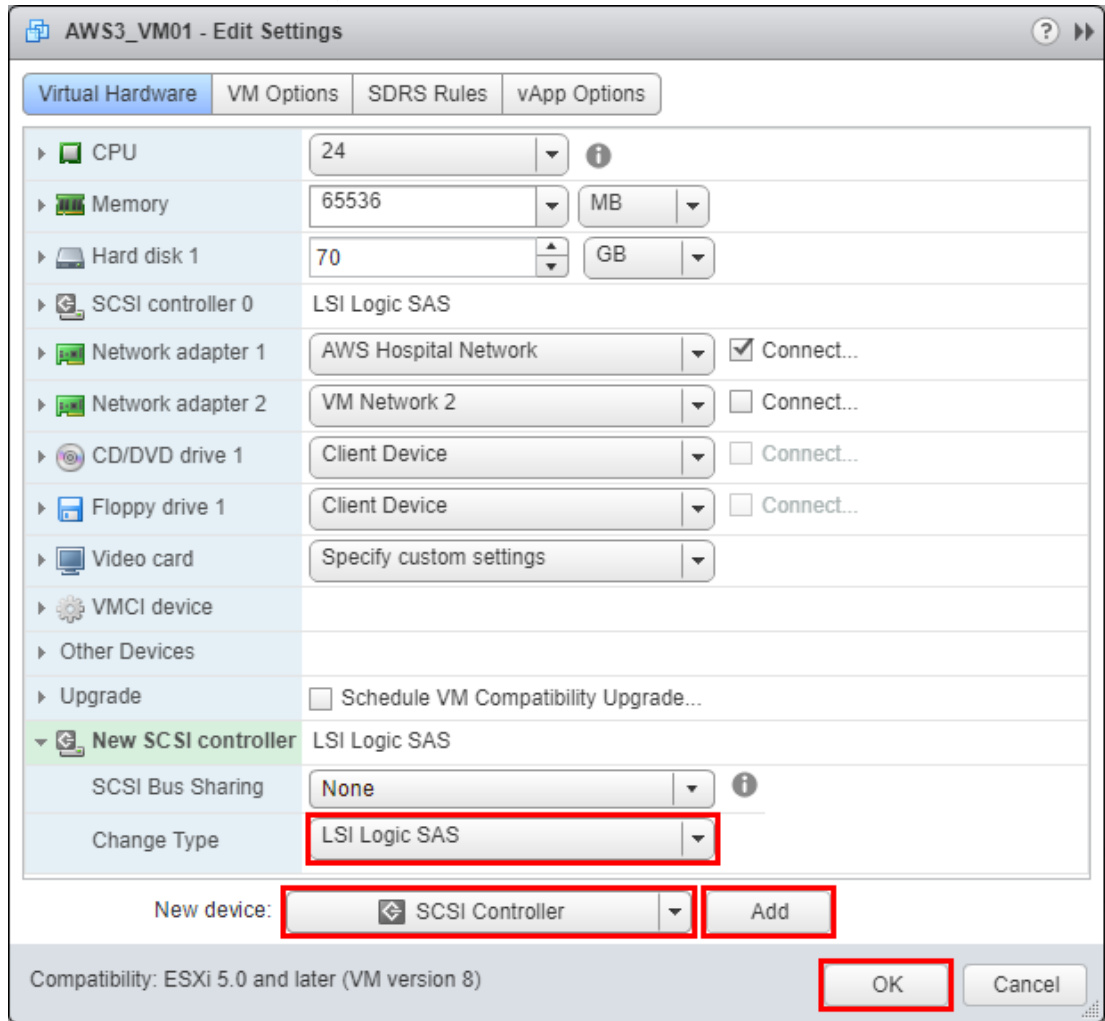
If the site has purchased an "integrated" virtual AW Server, it does not need a disk partition to store image data.

In this case, proceed to Job Card IST002B - Virtual Machine Installation Verification.

1. Create a new SCSI controller. The new image data disk will have a separate SCSI controller.
 - a. Right click on the Virtual machine and select **Edit settings**.

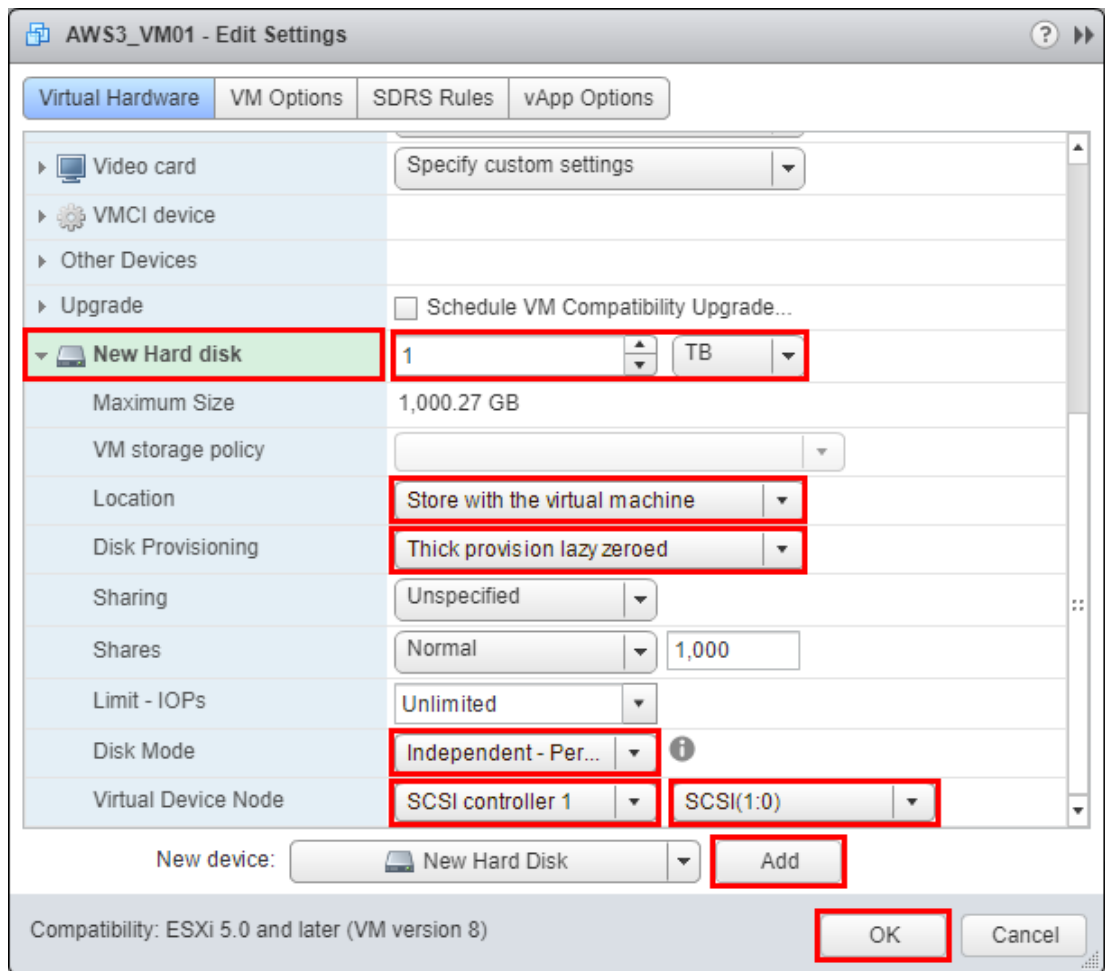
The *Edit Settings* screen displays.

- b. In the *Virtual Hardware* tab, set **New device** to **SCSI Controller** and click on **Add**.



The **New SCSI controller** item appears.

2. Configure the new SCSI controller:
 - a. Expand the **New SCSI controller** item.
 - b. Set **Change Type** of SCSI controller to **LSI Logic SAS**.
 - c. Verify the setting and click on **OK**.
3. Create a new hard disk:
 - a. Right click on the Virtual machine and select **Edit settings**.
 - b. The *Edit Settings* screen displays.
 - c. In the *Virtual Hardware* tab, set **New device** to **New Hard Disk** and click on **Add**.



The **New Hard disk** item appears.

4. Configure the new hard disk:
 - a. Expand the **New Hard disk** item.
 - b. Set the Disk size to:
 - 1TB (minimum recommended size)
 - 6TB (recommended and maximum supported size)
 - c. Set the **Location** of disk image by selecting **Store with the virtual machine** (default setting) or select **Browse** to specify a datastore or datastore cluster (see next step).
 - d. Set **Disk Provisioning** to **Thick Provision Lazy Zeroed** (default setting).
 - e. Set **Disk Mode** to **Independent - Persistent**.
 - f. Set **Virtual Device Node** to **SCSI controller 1** and **SCSI (1:0)**. The image data disk will have a separate SCSI controller.
 - g. Verify the setting and click on **OK**.
 - h. Apply the datastore recommendations in the screen that displays.

NOTE

To help for proper choice see: https://pubs.vmware.com/vsphere-50/index.jsp?topic=%2Fcom.vmware.vsphere.storage.doc_50%2FGUID-4C0F4D73-82F2-4B81-8AA7-1DD752A8A5AC.html.

5. When selecting a different datastore (select **Browse** in **Location**), you will get the following screen:

Select a datastore cluster or datastore

VM storage policy:

☒ Disable Storage DRS for this virtual machine

The following datastores are accessible from the destination resource that you selected. Select the destination datastore for the virtual machine configuration files and all of the virtual disks.

Name	Capacity	Provisioned	Free	Type	Cluster	Storage DRS	Thin Provisioning	Access	Hardware Acceleration
SAN02_vd02_v004	1.86 TB	3.04 TB	882.72 GB	VMFS 5	AWSVC		Supported	Single host	Supported
SAN01_vd02_v004	1.86 TB	1.40 TB	631.03 GB	VMFS 5	AWSVC		Supported	Single host	Supported
SAN03_vd02_v004	1.86 TB	2.84 TB	462.66 GB	VMFS 5	AWSVC		Supported	Single host	Supported

- Select the **Disable Storage DRS for this virtual machine** check box.
 - Select the appropriate datastore.
 - Click on **OK**.
- Right click on the Virtual machine and select **Edit settings**.

In the *Virtual Hardware* tab, now you can see a new SCSI Controller and a new Hard Disk. This completes the installation of the Virtual machine.

Proceed to Job Card IST002B - Virtual Machine Installation Verification.

A

A.3 Physical AW Server - Installed Base

This appendix describes the product identification for Installed Base Physical Servers.

A.3.1 Product identification

A.3.1.1 HPE ProLiant ML350p Gen8 Server based AW Server

A.3.1.1.1 Low Tier installation Check List Process

This section is performed and completed by the GEHC FE.

The low tier server offering is based on the HP ProLiant ML350 G6 Server or on the HPE ProLiant ML350p Gen8 Server.

There are site infrastructure and administrative requirements that must be met before the physical installation begins – network drops, IPA configurability, gateway administration, DNS, security, LDAP/Active Directory information, data center access, space/hardware, and so on... From a SERVICE PLAN standpoint – the CRITICAL SERVICE REQUIREMENT is the “Site Ready?” piece. If the checklist is not satisfied (site not ready), the installation should not start.

When an order is entered, the GEHC Project Installation Manager contacts the **GEHC local Service organization (FE)** who initiates the site readiness survey through a site visit, in order to complete the Site-readiness checklist give at chapter 4 of this manual.

The primary data points that must be acquired by the GEHC sales/quote are: Customer Contact information for site and IT and does the site have a Data Center?

The **GEHC Project Installation Manager** makes contact with the site IT or infrastructure operatives and verifies the site readiness, and or drives the processes to get the site ready..

When the pre-installation work is complete, and the site is ready for the installation, the GEHC Project Installation Manager schedules the physical delivery & installation.

The GEHC FE is responsible for the physical installation of the server on the site.

The server will be delivered with the Linux OS, the AW Server Platform SW and the Applications preloaded by Manufacturing. The GEHC FE will configure the network and server.

No external Image disks array is necessary. The image disks array is part of the ML350 servers.

NOTE

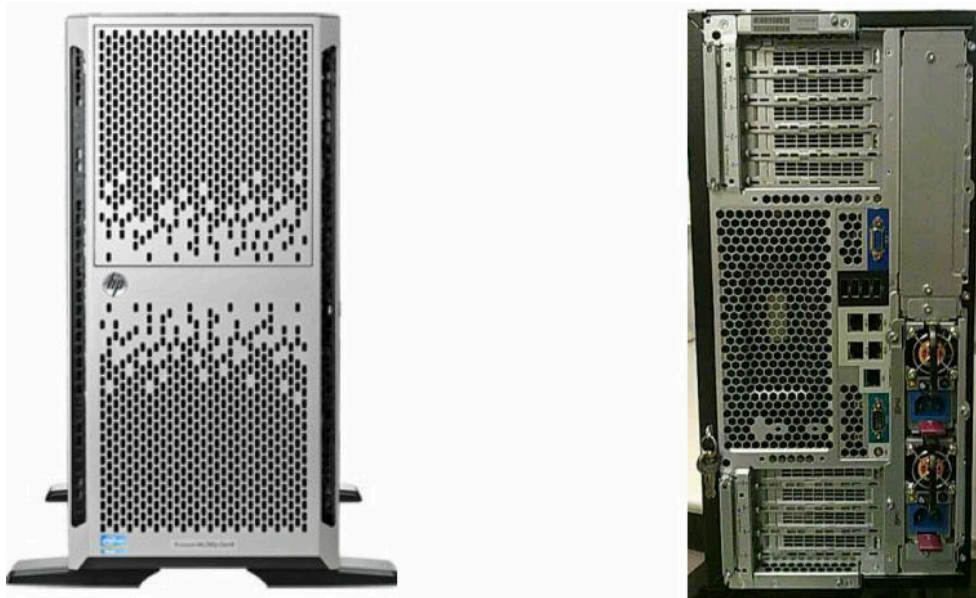
The UPS is not part of the offering for the HP ML350 servers.

A.3.1.1.2 HPE ProLiant ML350p Gen8 Server system

It contains the main parts as follows:

- The HPE ProLiant ML350p Gen8 Server CPU box (including images disks array)
 - 2 × 750W power supply
 - 1 × Mother board with embedded Graphics card, Gbps Network controllers and the iLO Service Processor
 - 2 × E5-2630 six core processors
 - 6 × 500GB SATA 7200rpm HDD
 - Low Tier server Model Type **5474018-2 : 24GB** RAM (6 × 4GB DDR3 DIMM memory modules)
 - OR
 - Low Tier server Model Type: **5474018-32 : 64GB** RAM (**8 × 8GB** DDR3 DIMM memory modules). Forward production starting Q3 2016.
 - 1 × SATA DVD drive
- One USB keyboard and USB mouse (PS2 no longer supported)
- One landscape monitor.
- One VGA cable for monitor.
- Power cables, and network cables

Figure A-1 HPE ProLiant ML350p Gen8 Server Front and Rear views



Two persons are necessary for handling, unpacking and moving the HPE ProLiant ML350p Gen8 Server into place, due to its important weight and size.

64GB memory upgrade kit:

In order to benefit of the latest enhancements brought by the **AW Server 3.2** release, and be able to process an increased number of slices for a Low Tier server (40K slices), HPE ProLiant ML350p Gen8

Server IB sites can order a 40K slices license to be used instead of the original 8K slices license. The site will get in the package 2 kits part number **5727360** (2 × 32GB corresponding to 4 × 8GB DIMM modules) additional memory kit for HPE ProLiant ML350p Gen8 Server. The 64 GB memory kit (2 × 32GB memory kit) shall be installed in place of the existing 24GB memory (6 × 4GB DIMM modules).

Optional racking kit

The HPE ProLiant ML350p Gen8 Server can be put in a standard rack (needs 5U space), thanks to an optional rack kit.

See the physical characteristics at Physical Characteristics.



NOTE

The racking kit has been discontinued by the end of 2015.

A.3.1.1.3 HP ProLiant ML350 G6 Server system

It contains the main parts as follows:

- The HP ProLiant ML350 G6 Server CPU box (including images disks array)
 - 2 × 750W power supply
 - 1 × Mother board with embedded Graphics card, Gbps Network controllers and iLO Service Processor
 - 2 × X5550 G6 quad core processors (updated to six core processors)
 - 6 × 500GB SATA 7200rpm HDD
 - 1 × SATA DVD drive
 - 12GB (6 × 2GB) DDR3 DIMM memory modules

NOTICE

Upgrade to 24GB minimum (or to 64GB) is required for AW Server 3.2 release.

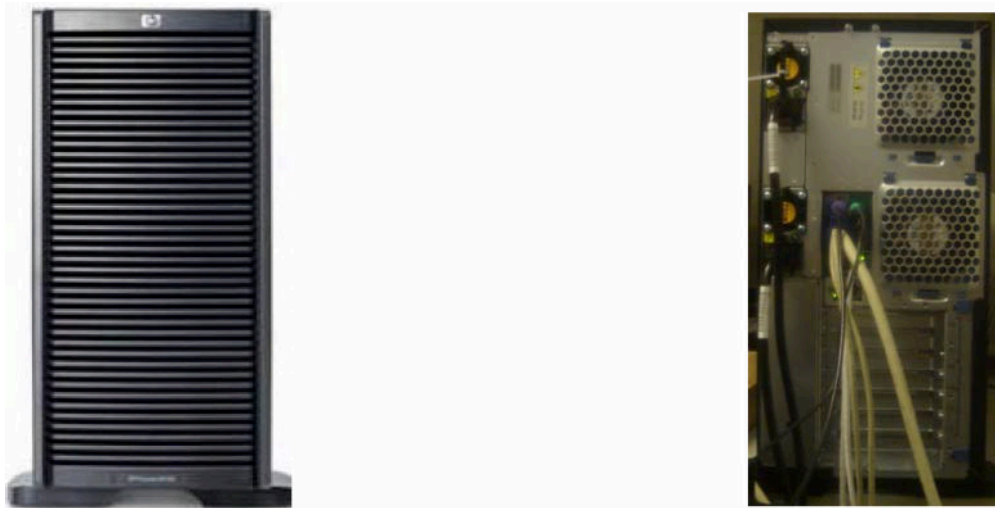
Part number **5620324**: 24GB (6 × 4GB DIMM modules) memory kit shall be supplied and FE shall replace on-site the existing memory (6 × 2GB DIMM modules). **Starting Q2 2016**, the 24GB memory upgrade kit is no longer available, and is replaced by a 64GB memory upgrade kit. Part number **5620324-2**: 64 GB (8 × 8GB DIMM modules) memory kit will be supplied and FE shall replace on-site the existing memory (6 × 2GB DIMM modules).

NOTICE

In order to benefit of the latest enhancements brought by the **AW Server 3.2 Ext.1.0** release, and be able to process an increased number of slices for a Low Tier server (40K slices), IB sites can order a 40K slices license to be used instead of the original 8K slices license. The site will get in the package the 64GB (8 × 8GB DIMM modules) additional memory kit for HPE ProLiant ML350p Gen8 Server part number **5620324-2**. The 64 GB memory kit shall be installed in place of the existing 24GB memory (6 × 4GB DIMM modules).

- One keyboard and mouse (PS2 or USB supported - PS2 delivered with new server ; USB delivered as FRU)
- One landscape monitor
- One VGA cable for monitor
- Power cables, and network cables

Figure A-2 HP ProLiant ML350 G6 Server Front and Rear views



A.3.1.2 HPE ProLiant DL560 Gen8 Server / HPE ProLiant DL580 G7 Server based AW Server

A.3.1.2.1 The HPE ProLiant DL560 Gen8 Server

The HPE ProLiant DL560 Gen8 Server based AW server system contains the main parts as follows:

- The HPE ProLiant DL560 Gen8 Server server.
 - The HPE ProLiant DL560 Gen8 Server has 2 redundant power supplies
 - The HPE ProLiant DL560 Gen8 Server has 64GB RAM (Model Type: **5474017**)
or
 - The HPE ProLiant DL560 Gen8 Server has 256GB RAM - starting March 2016 (Model Type: **5474017-2**)
 - The HPE ProLiant DL560 Gen8 Server has no internal CD/DVD drive. It is delivered with 1 (one) external USB CD/DVD drive
- The HP D2600 DAS or HP D3600 DAS Disks Array System (not used for "Full, Seamless or DICOM Direct Connect" integration).
 - HP D2600 DAS is delivered (if applicable) with the DL560 server Model Type: 5474017

- HP D3600 DAS is delivered (if applicable) with the DL560 server Model Type: 5474017-2

NOTE

An optional 2 meters long data cable is available for the HP D2600 DAS under CAT number **M81501WC** (part number **5610644**) to be used in place of the standard 0.5 meter long cable. Not applicable for the HP D3600 DAS already delivered with a 2 meters long cable.

- One **KVM** (keyboard, mouse and monitor) - optional for EDS
- One **PDU** (Power Distribution Unit) - optional
- One **Network switch** - optional
- Cables for KVM and cables for PDU- optional.
- Power cables, and network cables

A

Figure A-3 HPE ProLiant DL560 Gen8 Server front view



Figure A-4 HP D2600 DAS front view



Figure A-5 HP D3600 DAS front view



A.3.1.2.2 The HPE ProLiant DL580 G7 Server

The HPE ProLiant DL580 G7 Server based AW server system contains the main parts as follows:

- The HPE ProLiant DL580 G7 Server has 4 redundant power supplies
- The HPE ProLiant DL580 G7 Server has 64GB RAM
- The HPE ProLiant DL580 G7 Server server is equipped with 1 (one) internal USB CD/DVD drive
- The HP D2600 DAS disks array and data cable - optional for EDS - DAS is not used for "Full, Seamless or DICOM Direct Connect" integration
- One **KVM** (keyboard, mouse and monitor) - optional for EDS
- One **PDU** (Power Distribution Unit) - optional

- One **Network switch** - optional
- Cables for KVM and cables for PDU- optional.
- Power cables, and network cables

Figure A-6 HPE ProLiant DL580 G7 Server front view



Figure A-7 HP D2600 DAS front view



A.3.1.2.3 HPE R/T3000 UPS option

If the site does not have a power conditioner, a UPS shall be ordered.

- HPE R/T3000 G2 UPS, HPE R/T3000 G4 UPS or HPE R/T3000 G5 UPS
- Power cables and USB or Serial command cable

Figure A-8 HPE R/T3000 G5 UPS front view



Figure A-9 HPE R/T3000 G4 UPS front view



Figure A-10 HPE R/T3000 G2 UPS front view

The UPS shall be installed at the same time (in the same rack space) as the AW server by the GEHC installation Engineer (FE) during the "initial" server installation.

The GEHC installation Engineer (FE) is also responsible to ensure that the automatic shutdown feature of the UPS is operational.

- At least two of the HPE ProLiant DL580 G7 Server, one of the HPE ProLiant DL560 Gen8 Server and one of the DAS redundant power supplies cords shall be connected to the UPS. The other power supplies of the HPE ProLiant DL580 G7 Server / HPE ProLiant DL560 Gen8 Server and the DAS shall be connected to the power line.
- The optional switch shall also be connected to one of the UPS outputs.
- In the case of GEHC supplied rack, the KVM power cord can also be connected to one of the free outputs of the 220V International UPS, that has 6 outputs. For US and Japan, it shall be connected to the PDU (Power distribution Unit) as the 110V UPS is only provided with 4 outputs.

A.3.1.2.4 GEHC optional rack

The following illustrations show the installation of the HPE ProLiant DL580 G7 Server/HPE ProLiant DL560 Gen8 Server, the HP D3600 DAS / HP D2600 DAS and the optional accessories into the GEHC supplied standalone rack.

Installation of the HPE ProLiant DL560 Gen8 Server into the GEHC rack is similar to the installation of the HPE ProLiant DL580 G7 Server. It just lowers the DAS installation by 2 rack units (2U) as the HPE ProLiant DL560 Gen8 Server server is only 2 rack units (2U) high, the HPE ProLiant DL580 G7 Server server being 4 rack units (4U) high.

For installation into a customer's supplied rack you need to consider adapting to the customer's rack configuration (number of available power connectors on the UPS and on the PDU).

Figure A-11 HPE ProLiant DL580 G7 Server (on the left) and HPE ProLiant DL560 Gen8 Server (on the right) Power line connection with the UPS 220V Rear views

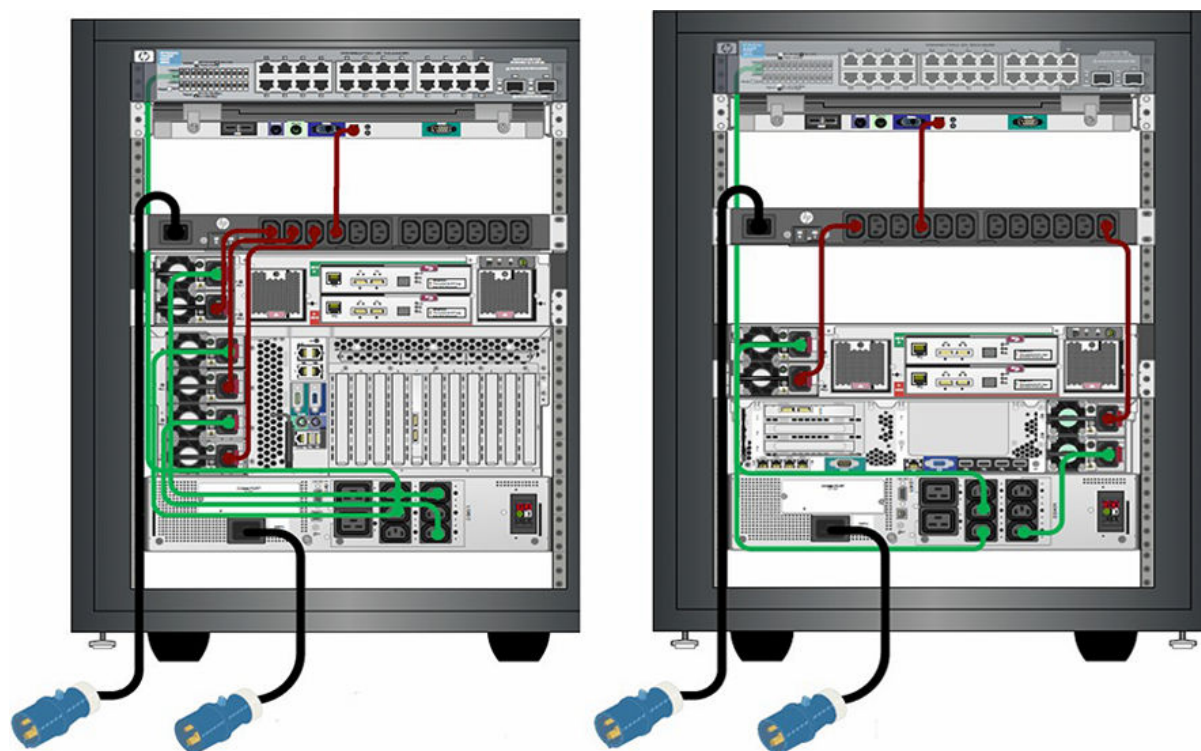
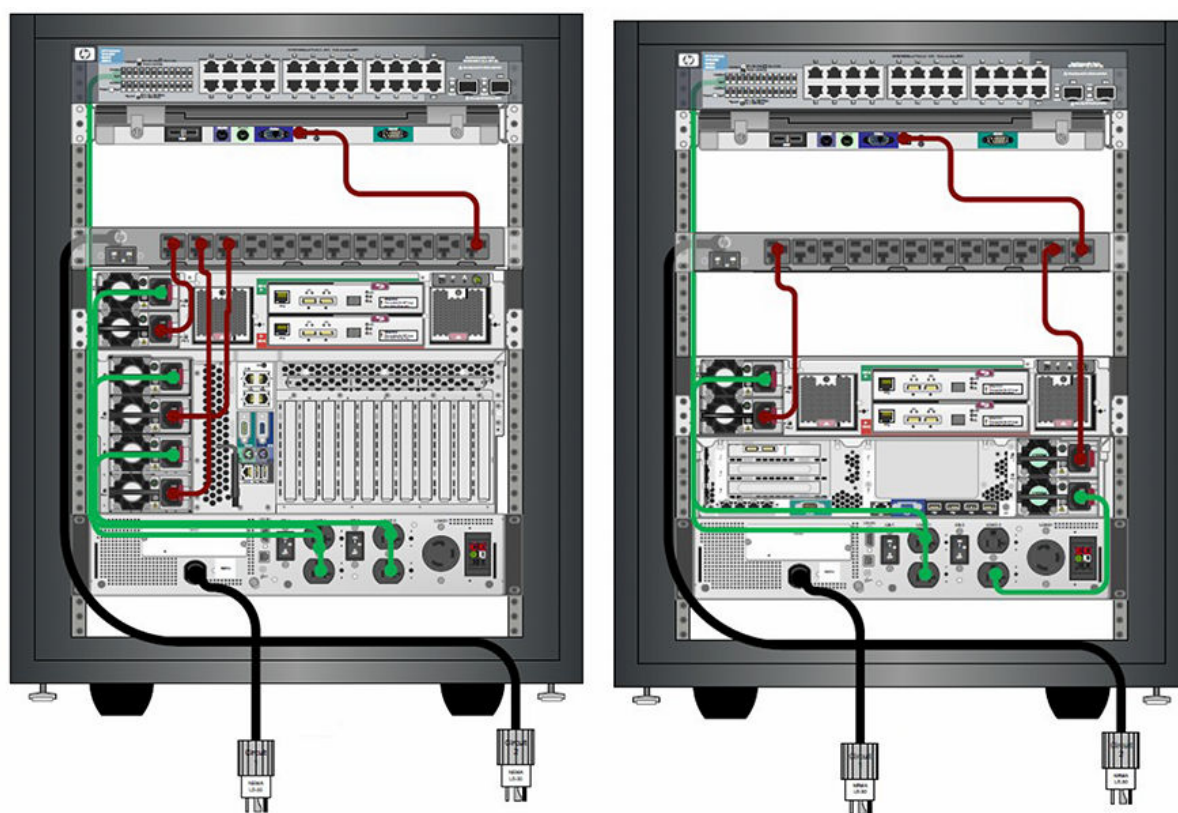


Figure A-12 HPE ProLiant DL580 G7 Server (on the left) / HPE ProLiant DL560 Gen8 Server (on the right) Power line connection with the UPS 110V Rear views



A.3.1.2.5 Recommended power connection

Figure A-13 HPE ProLiant DL580 G7 Server Power line connection schematics - recommended

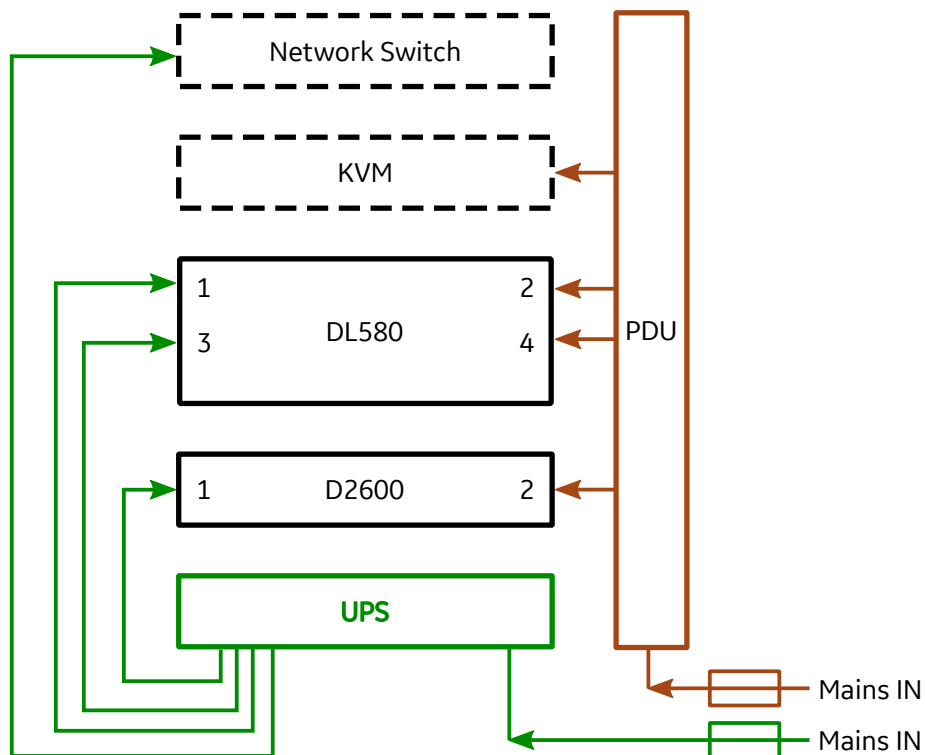
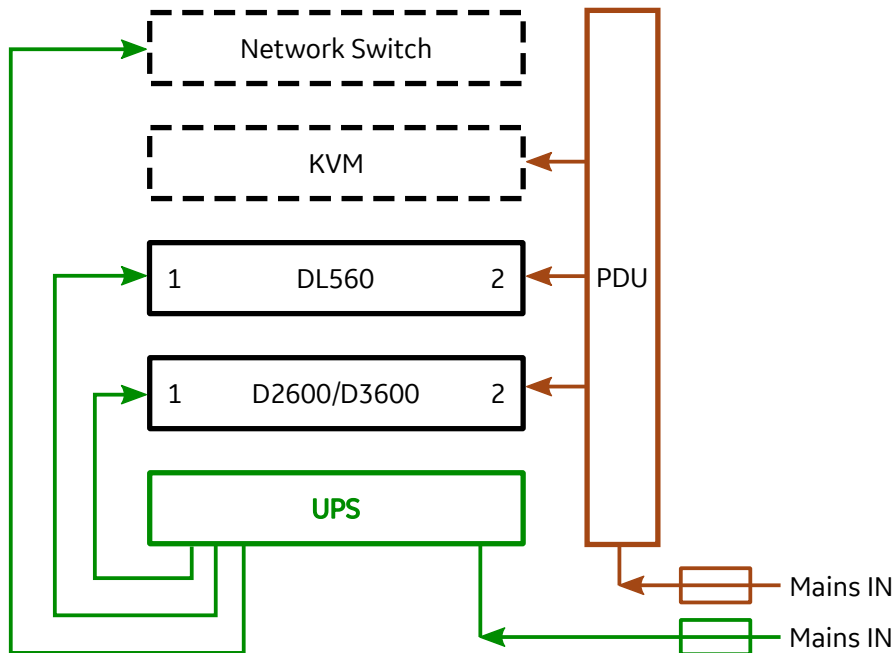


Figure A-14 HPE ProLiant DL560 Gen8 Server Power line connection schematics - recommended



NOTICE

The HPE ProLiant DL580 G7 Server has 4 (four) redundant power supplies and takes 4 rack units (4U). The HPE ProLiant DL560 Gen8 Server has 2 (two) redundant power supplies and takes 2 rack units (2U).

A.3.1.2.6 KVM option or keyboard, mouse and Landscape monitor

- The Low Tier server is delivered with a keyboard, a mouse and a LCC portrait monitor.



- The High Tier server is delivered with an optional KVM unit (1U) to be placed into the rack.

Figure A-16 TFT7600 G2 KVM with screen fold down



Figure A-17 LCD8500 KVM with screen fold down



A.3.1.2.7 HPE ProLiant DL560 Gen8 Server / HPE ProLiant DL580 G7 Server to HP D2600 DAS standalone data cable

An optional 2 meters long data cable is available under CAT number **M81501WC** (part number **5610644**) to be used in place of the standard 0.5 meter long cable.

NOTE

This cable is not necessary (and cannot be used - different connector) with the HP D3600 DAS. The HP D3600 DAS is factory delivered with a 2 meters long cable.

A.3.2 Site Pre-install Specifications

A.3.2.1 HP Low Tier Hardware install requirements

Power	<ul style="list-style-type: none"> 3 x wall standard power outlets
HP ProLiant ML350 G6 Server Cooling	<ul style="list-style-type: none"> 2892 BTU/h In Use (maximum 3530 BTU/h) at 120VAC 2797 BTU/h In Use (maximum 4600 BTU/h) at 240VAC heat dissipation front to rear air-flow
HPE ProLiant ML350p Gen8 Server Cooling	<ul style="list-style-type: none"> 750 W : 2892 BTU/hr (at 120 V ac), 2797 (at 240 V ac) heat dissipation - front to rear air-flow

A.3.2.2 HP High Tier Hardware install requirements

Customer's supplied rack	
Power	<ul style="list-style-type: none"> HPE ProLiant DL580 G7 Server: 20 Amp clean circuit in cabinet with minimum 4 receptacles used with standard 3 prong plugs HPE ProLiant DL560 Gen8 Server: 20 Amp clean circuit in cabinet with minimum 2 receptacles used with standard 3 prong plugs
HPE ProLiant DL580 G7 Server Cooling	<ul style="list-style-type: none"> Maximum 3960 BTU/hr (at 100 V ac), 5450 BTU/hr (200 V ac)
HPE ProLiant DL560 Gen8 Server Cooling	<ul style="list-style-type: none"> Maximum for 1200 W Power Supply: 3530 BTU/hr (at 100 VAC), 4600 BTU/hr (at 200 VAC)
Rack	<ul style="list-style-type: none"> 2 to 8 rack units required in standard 19" 4 post rack (IEC 60927)-includes Server, UPS, and Attached Storage . <ul style="list-style-type: none"> 2 rack units : HPE ProLiant DL560 Gen8 Server server OR 4 rack units : HPE ProLiant DL580 G7 Server server 2 rack units : HP D2600 DAS / HP D3600 DAS 2 rack units : HPE R/T3000 G2 UPS, HPE R/T3000 G4 UPS or HPE R/T3000 G5 UPS 1 rack unit : KVM Need 32.5" rack depth from inside of front door to rear door. Front and rear mounting posts must be at least 18" apart. Require at least 36" front and rear maintenance clearance.
UPS required to avoid data corruption during power outages (may be purchased from GE)	

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A.3.2.3 Network requirements for Server

The network requirements are the same as for the forward production server (see [1.6.3 Common Network requirements for Server on page 22](#)), except for the bandwidth:

Bandwidth	<ul style="list-style-type: none"> 1 Gbps (or more) recommended for LAN client access 801.11g recommended for wireless clients. Average bandwidth usage per client [22;1 compression]: 2–3 Mbps 100Mbps (HPE ProLiant DL580 G7 Server/HPE ProLiant ML350p Gen8 Server) for the iLO service processor 1Gbps (HPE ProLiant DL560 Gen8 Server) for the iLO processor
------------------	---

A.3.3 Room Requirements

A.3.3.1 Environmental Requirements/Limitations

A.3.3.1.1 Room Climate and Altitude

The room environment where the server and accessories are located must be maintained (during workdays, holidays and weekends) as specified in the following table.

If the server is located in the control room (HP ProLiant ML350 G6 Server case), in order to ensure the user comfort while working, the room temperature should be maintained between 65°F (18°C) and 75°F (24°C).

Table A-1 Environmental requirements/limitations

PRODUCT/ COMPONENT	HUMIDITY (1)				TEMPERATURE				ALTITUDE (4)			
	In use (2)		Storage (2)		In use (3)		Storage (3)		In use		Storage	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
HP ProLiant ML350 G6 Server	10 %	90 %	5 %	95 %	+10°C +50°F	+35°C +95°F	-40°C -40°F	+70°C +158°F	0 ft 0m	6,562ft 2000m	0 ft 0m	49,212ft 15000m
HPE ProLiant ML350p Gen8 Server	10 %	90 %	5 %	95 %	+10°C +50°F	+35°C +95°F	-30°C -22°F	+60°C +140°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HPE ProLiant DL580 G7 Server	10 %	90 %	5 %	95 %	10°C +50°F	+35°C +95°F	-30°C- 22°F	+60°C +140°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HPE ProLiant DL560 Gen8 Server	10 %	90 %	5 %	95 %	10°C +50°F	+35°C +95°F	-30°C- 22°F	+60°C +140°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HP D2600 DAS / HP D3600 DAS	10 %	90 %	20 %	95 %	10°C +50°F	+35°C +95°F	-40°C- 40°F	+66°C +150°F	0 ft 0m	10,000ft 3048m	0 ft 0m	30,000ft 9144m
HPE R/T3000 G2 UPS	20 %	80 %	5 %	95 %	10°C +50°F	+40°C +104°F	-20°C- 4°F	+50°C +122°F	0 ft 0m	6,562ft 2000m	0 ft 0m	49,212ft 15000m
HPE R/T3000 G4 UPS	20 %	80 %	5 %	95 %	0°C +32°F	+40°C +104°F	-15°C 5°F	+50°C +122°F	0 ft 0m	6,562ft 2000m	0 ft 0m	49,212ft 15000m
HPE R/T3000 G5 UPS	20 %	90 %	10 %	90 %	0°C +32°F	+40°C +104°F	-15°C 5°F	+50°C +122°F	0 ft 0m	6,562ft 2000m	0 ft 0m	49,212ft 15000m
Notes: (1) Non-condensing (2) At 35°C (95°F) with a gradient < 30% Relative Humidity/hr (3) At 20% Relative Humidity (4) Relative to sea level												

A.3.3.1.2 Equipment heat output

A.3.3.1.2.1 HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server

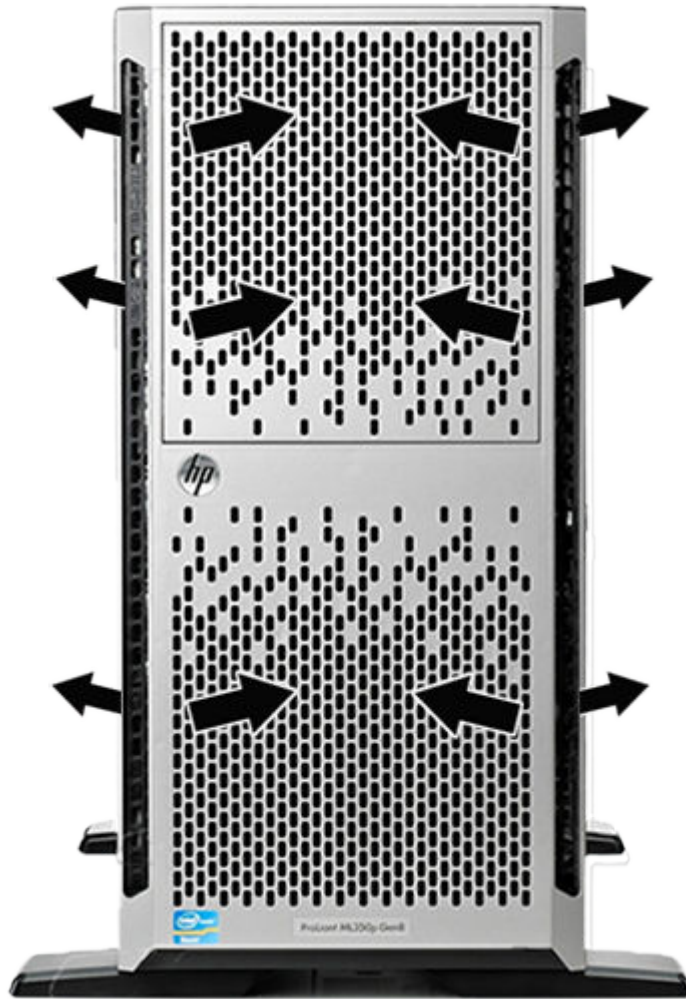
The HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server has vents on its front and back panels for ventilation. Make sure that objects do not block the vents on either side of the unit.

Figure A-17 Air flow of the HP ProLiant ML350 G6 Server



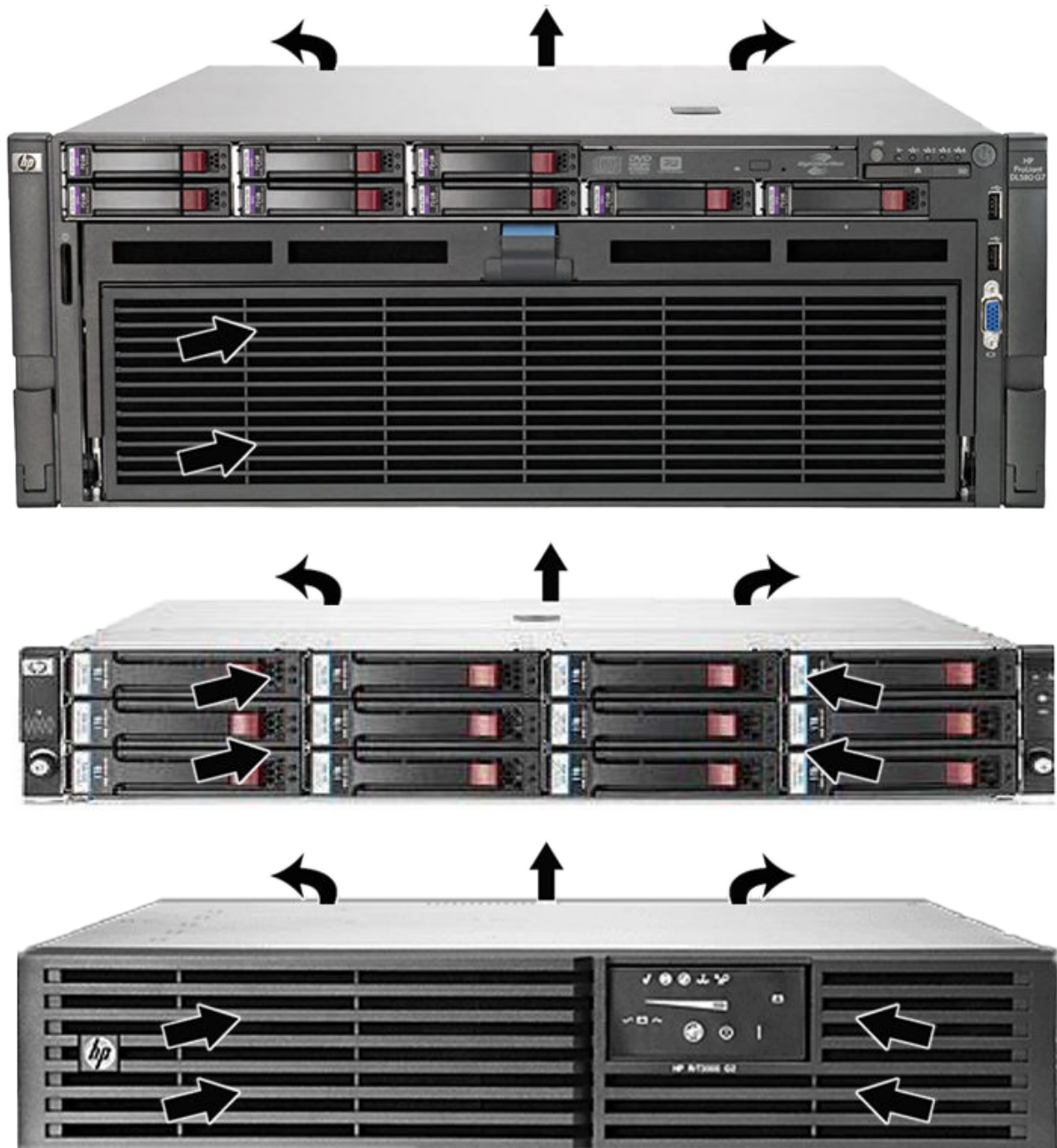
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Figure A-18 Air flow of the HPE ProLiant ML350p Gen8 Server



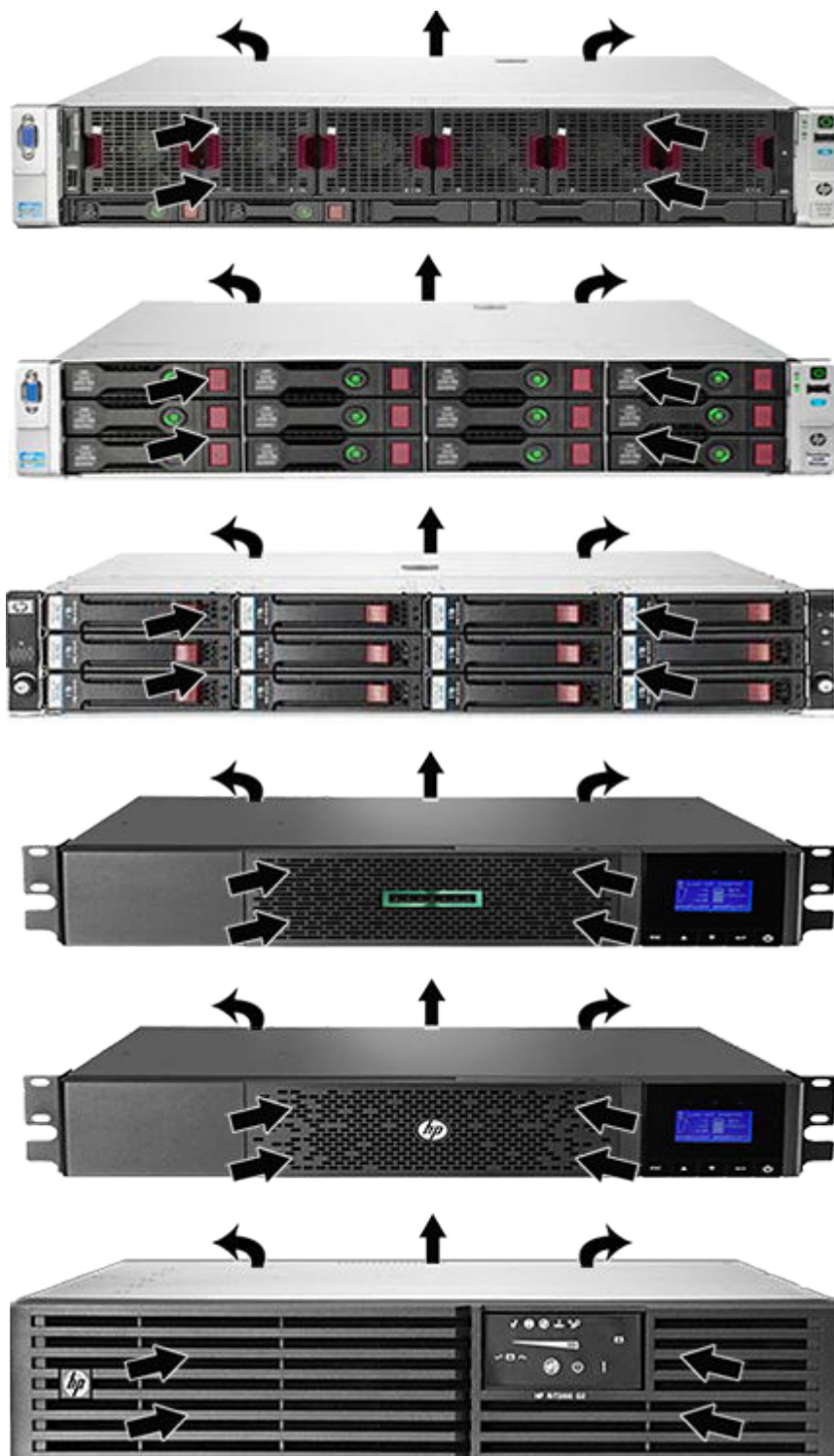
A.3.3.1.2.2 HPE ProLiant DL580 G7 Server

Figure A-19 Air flow of the HPE ProLiant DL580 G7 Server with HP D2600 DAS and HPE R/T3000 G2 UPS (from top to bottom)



A.3.3.1.2.3 HPE ProLiant DL560 Gen8 Server

Figure A-20 Air flow of the HPE ProLiant DL560 Gen8 Server with the HP D3600 DAS, HP D2600 DAS, HPE R/T3000 G5 UPS, HPE R/T3000 G4 UPS, HPE R/T3000 G2 UPS (from top to bottom)



A.3.3.1.2.4 Heat output

Table A-2 Heat output for basic product and Accessories

Product / Component	Heat output
HP ProLiant ML350 G6 Server (at 120 VAC)	Typical 750W 2,892 BTU/h In Use (maximum 3530 BTU/h)
HP ProLiant ML350 G6 Server (at 240 VAC)	Typical 750W 2,797 BTU/h In Use (maximum 4600 BTU/h)
HPE ProLiant ML350p Gen8 Server (at 120 VAC)	Typical 750W 2,892 BTU/h In Use
HPE ProLiant ML350p Gen8 Server (at 240 VAC)	Typical 750W 2,797 BTU/h In Use
HPE ProLiant DL580 G7 Server	Maximum 3,960 BTU/hr (at 100 V ac), 5,450 BTU/hr (at 200 V ac)
HPE ProLiant DL560 Gen8 Server	Maximum for 1200 W Power Supply: 3,530 BTU/hr (at 100 VAC), 4,600 BTU/hr (at 200 VAC)
HP D2600 DAS	Typical 300W 964 BTU/h In Use
HP D3600 DAS	403W max 1,160 BTU/h In Use
HPE R/T3000 UPS	540 BTU/h (0.15 KW) on-line 1,138 BTU/h (0.33 KW) on battery

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A.3.3.1.3 Audible noise

Table A-3 Audible noise

Product/Component	In Use	In Stand-By
HP ProLiant ML350 G6 Server	31 dB (1)	30 dB (1)
HPE ProLiant ML350p Gen8 Server	30 dB (1)	24 dB (1)
HPE ProLiant DL580 G7 Server	68 dB	63 dB
HPE ProLiant DL560 Gen8 Server	50 dB	41 dB
HP D2600 DAS	53dB	53dB
HP D3600 DAS	53dB	53dB
HPE R/T3000 G2 UPS / HPE R/T3000 G4 UPS	50 dB	45 dB
HPE R/T3000 G5 UPS	40 dB	45 dB
Note 1: At 25°C (77°F) ambient		

A.3.3.2 Structural Requirements

A.3.3.2.1 Desk or table size

A.3.3.2.1.1 Low Tier server

HP ProLiant ML350 G6 Server: A large desk or table must be provided by the customer for the system and peripherals. If necessary, the computer box may be placed on the desk.

HPE ProLiant ML350p Gen8 Server: Due to its extended depth, the computer box shall be placed on the floor, or in a rack using the Rack option for the HPE ProLiant ML350p Gen8 Server.

A.3.3.3 Electrical Requirements

A.3.3.3.1 Line voltage specifications

Table A-4 Line requirements

Product/ Component	Voltage			Frequency				Current	
	Nominal Vac	Min Vac	Max Vac	Nominal Hz	Min Hz	Max Hz	Dev. Max Rate	Momentary	Continuous
HP ProLiant ML350 G6 Server	100 240	90 220	118 264	50/60	47	66	-	9.7A 5.9A	7.1A 3.5A
HPE ProLiant ML350p Gen8 Server	100 240	90 220	118 264	50/60	47	66	-	9.7A 5.9A	7.1A 3.5A
HPE ProLiant DL580 G7 Server	100 240	100 200	127 240	50/60	47	63	-	-	12A at 100 V 8A at 240 V
HPE ProLiant DL560 Gen8 Server	100 240	100 200	127 240	50/60	47	63	-	-	12A at 100 V 8A at 240 V
HP D2600 DAS / HP D3600 DAS	100 240	88-	-240	50/60	47	63	-	6A	3A
HPE R/T3000 UPS Low Voltage (US/JPN)	120	100	127	50/60	47	63	-	-	30A at 100 V max
HPE R/T3000 UPS High Voltage (International)	220	200	240	50/60	47	63	-	-	16A at 240 V max
Landscape LCD monitor	100 240	90 216	110 264	50/60	47	63	-	-	100V: 0.65A 240V: 0.30A
KVM	100 240	90 216	110 264	50/60	47	63	-	-	<36W

A.3.3.3.2 Electrical outlets

A.3.3.3.2.1 HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server

Three outlets are needed to install the HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server server and monitor.

A.3.3.3.2.2 HPE ProLiant DL580 G7 Server

Six to seven outlets (20A US and Japan 110V - 16A International 220V) are needed inside the rack (without the PDU option) to install the HPE ProLiant DL580 G7 Server, DAS and KVM (and the UPS if applicable) in the servers room. OR

Two outlets (20A US and Japan 110V - 16A International 220V) are needed to install the HPE ProLiant DL580 G7 Server, DAS and monitor (and the UPS if applicable) in the servers room, thanks to the PDU (Power distribution unit).

A.3.3.3.2.3 HPE ProLiant DL560 Gen8 Server

Four to five outlets (20A US and Japan 110V - 16A International 220V) are needed inside the rack (without the PDU option) to install the HPE ProLiant DL560 Gen8 Server, DAS and KVM (and the UPS if applicable) in the servers room. OR

Two outlets (20A US and Japan 110V - 16A International 220V) are needed to install the HPE ProLiant DL560 Gen8 Server, DAS and monitor (and the UPS if applicable) in the servers room, thanks to the PDU (Power distribution unit).

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A.3.3.4 Air Cooling Requirements

A.3.3.4.1 HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server

The HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server product has no special air conditioning requirements. However, it shall be placed in an open area with no object obstructing the vents.

A.3.3.4.2 HPE ProLiant DL580 G7 Server/HPE ProLiant DL560 Gen8 Server

The HP High Tier server shall be installed into a rack in a dedicated servers room, or dedicated local with air conditioning.

A.3.3.5 Tools and Test Equipment

A.3.3.5.1 HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server tools

CAUTION



The weight of the HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server CPU box is above the limit fixed by EHS specifications. Therefore, it must be handled by two persons and moved into place by means of a transport trolley.

- Transport trolley
- Standard FE tools case

A.3.3.5.2 HPE ProLiant DL580 G7 Server/HPE ProLiant DL560 Gen8 Server tools

CAUTION



The weight of the HPE ProLiant DL580 G7 Server/HPE ProLiant DL560 Gen8 Server, as well as certain of the accessories (UPS, DAS) is above the limit fixed by EHS specifications. Therefore, they must be handled by means of a transport trolley and preferably placed into the rack by means of a lifting tool such as the Genie Load Lifter. Two persons are necessary for this operation.

- Transport trolley
- **5417996** : Genie Load Lifter - available from the Pool of Tools
- Standard FE tools case
- Torx bits or drivers (T15 to T30) are necessary to install the hardware



A.3.4 Physical Characteristics

A.3.4.1 Dimensions, Weights and Floor loading

Product/ Component	Dimensions			Weight	Floor loading	
	Depth mm (inch)	Width mm (inch)	Height mm (inch)		Weight/ Area	Load Pattern (for drawing)
HP ProLiant ML350 G6 Server CPU box (with feet/bezel)	596 (23.46)	21.8 (8.59)	470 (18.5)	31.8 (70)	If placed on the desk, use proper lifting precautions and/or equipment.	
HPE ProLiant ML350p Gen8 Server CPU box (with feet/bezel)	740 (29.13)	21.8 (8.59)	462 (18.2)	37 (81)	Place on the floor OR place in the rack (4U)	
Rack option for HPE ProLiant ML350p Gen8 Server	732 (28.8)	482 (19)	218 (8.58)	-	Place in the rack (5U)	
HPE ProLiant DL580 G7 Server	700 (27.55)	483 (19)	176 (6.94)	30 to 45.4 (66 to 100)	Place in the rack (4U)	
HPE ProLiant DL560 Gen8 Server	749 (29.5)	445 (17.54)	87.4 (3.44)	27.6 (61)	Place in the rack (2U)	
HP D2600 DAS disks array	567 (22.3)	450 (17.99)	87 (3.47)	22.6 (50)	Place in the rack (2U)	

Product/ Component	Dimensions			Weight	Floor loading	
	Depth mm (inch)	Width mm (inch)	Height mm (inch)	Kg (lbs)	Weight/ Area	Load Pattern (for drawing)
HP D3600 DAS disks array	598 (23.54)	448 (17.64)	87 (3.47)	27.2 (60)		Place in the rack (2U)
HPE R/T3000 G2 UPS	635 (25)	445 (17.5)	89 (3.5)	37 (82)		Place in the rack (2U)
HPE R/T3000 G4 UPS	647 (25.5)	441 (17.4)	86.2 (3.4)	39.5 (87.2)		Place in the rack (2U)
HPE R/T3000 G5 UPS	647 (25.5)	441 (17.4)	86.2 (3.4)	39.5 (87.2)		Place in the rack (2U)
KVM option (fold down)	423 (16.6)	432 (16.9)	4.23 (1.68)	4.54 (10)		Place in the rack (1U)
Network switch option	96.5 (3.8)	156 (6.14)	24.5 (0.96)	0.34 (0.74)		Place in the rack (0.5U)
Stand-alone rack	1108.2 (43.63)	603 (23.74)	726.5 (28.6)	82 (180)		Static 1360.8Kg (3000lbs) Rolling 1134Kg (2500lbs)

Figure A-21 Dimensions of the HP ProLiant ML350 G6 Server

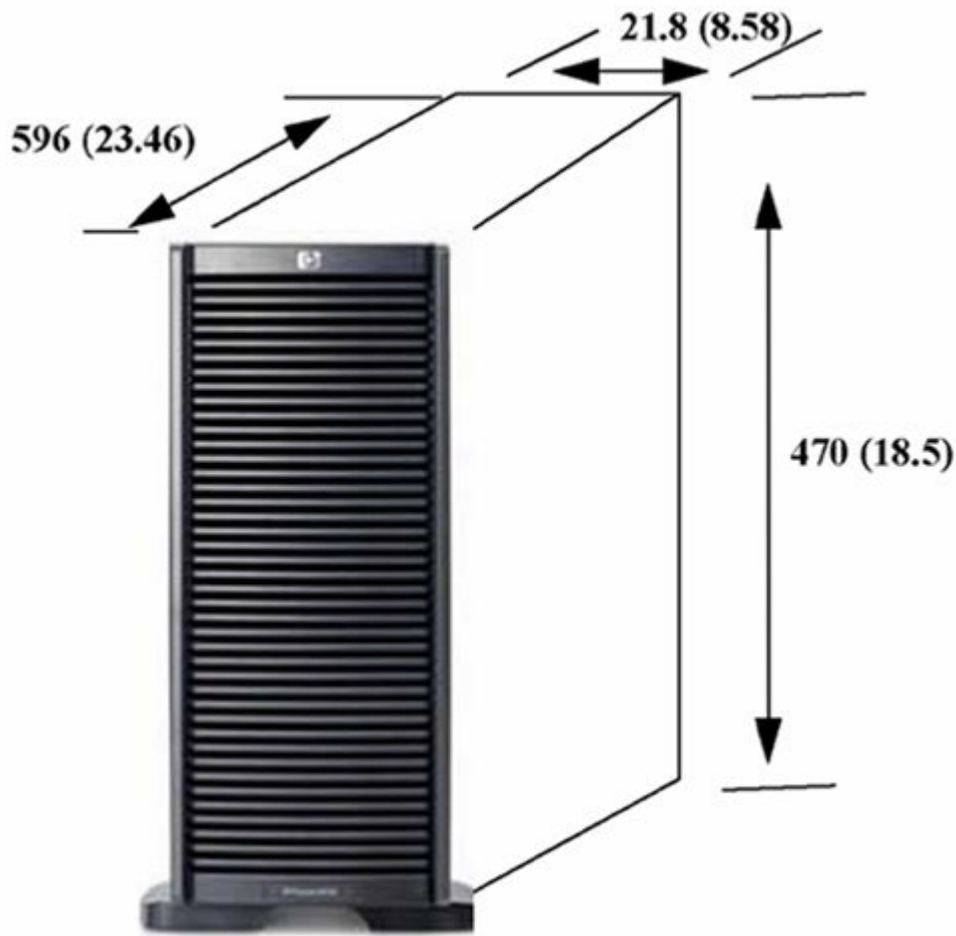


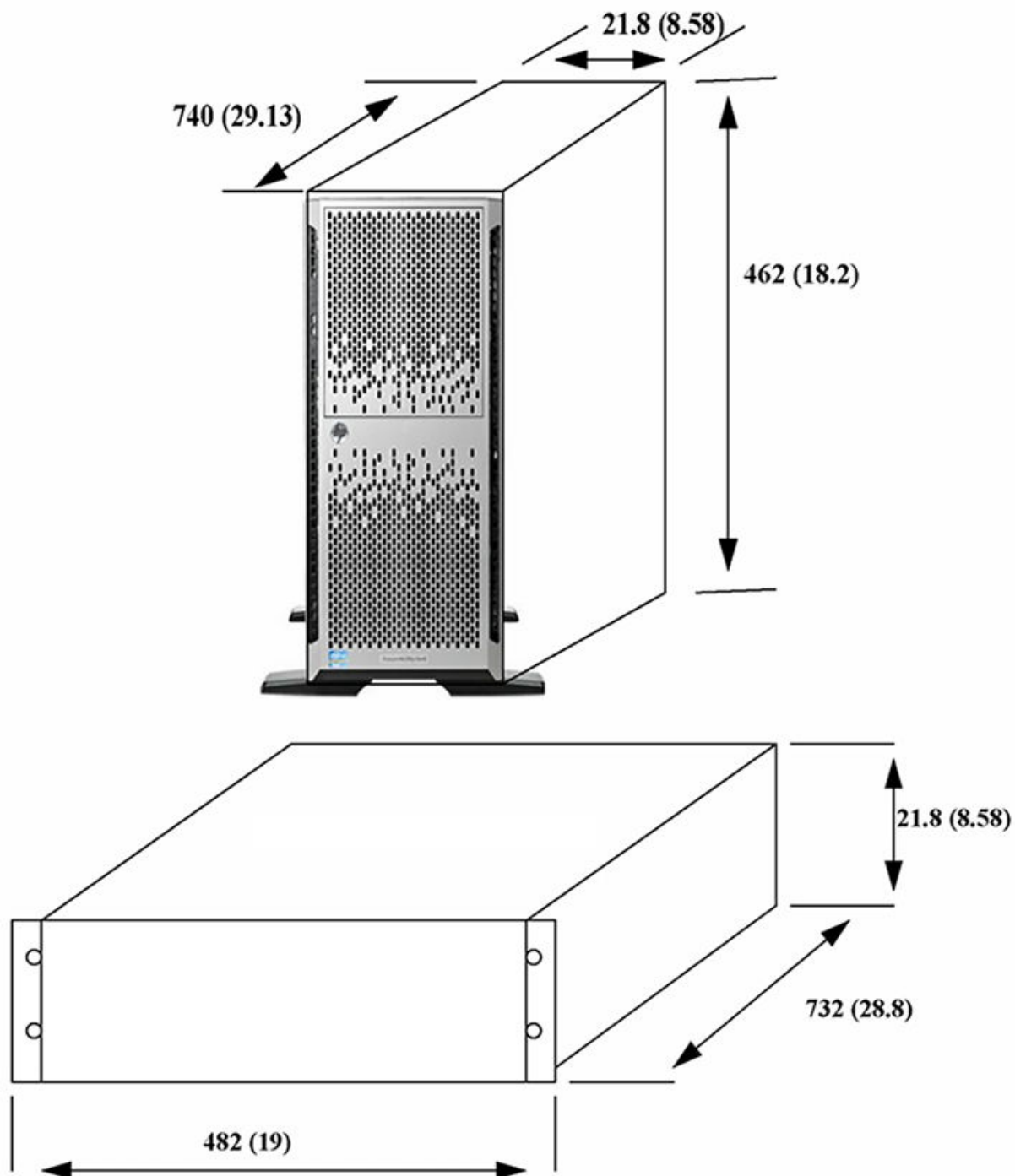
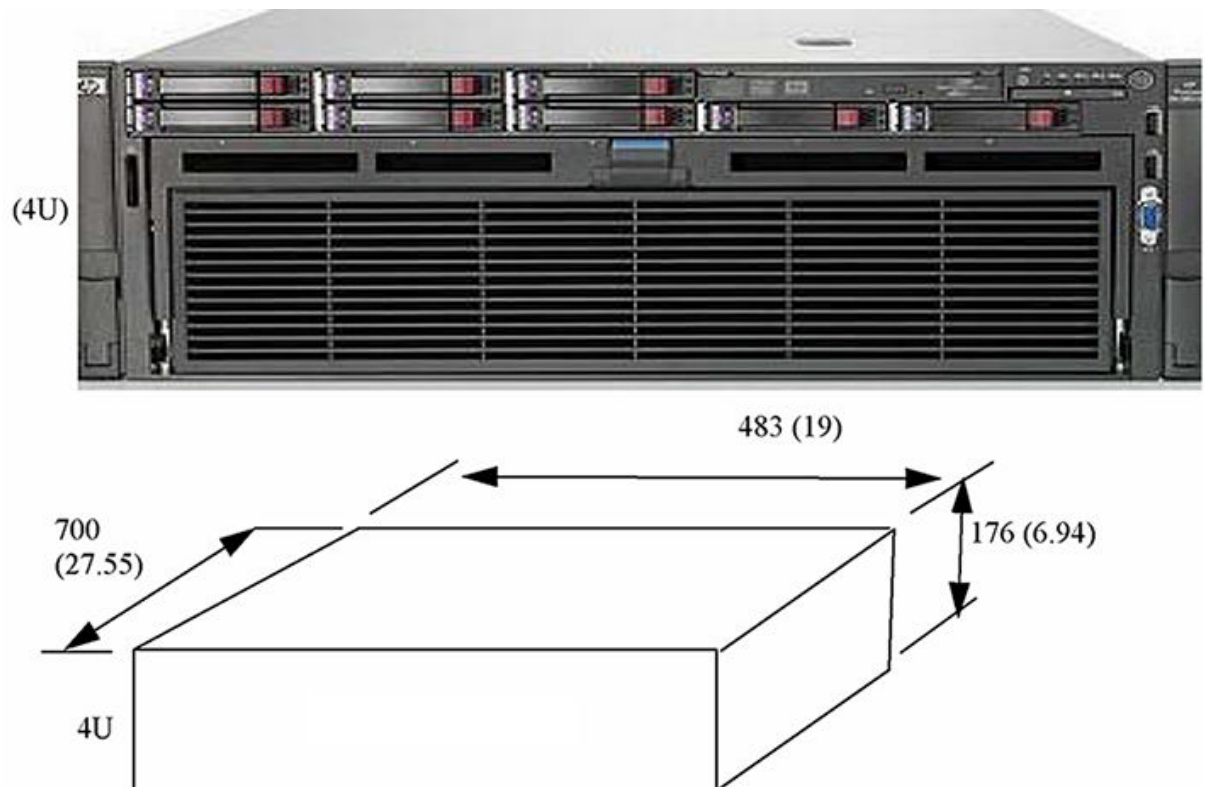
Figure A-22 Dimensions of the HPE ProLiant ML350p Gen8 Server and rack option

Figure A-23 Dimensions of the HPE ProLiant DL580 G7 Server

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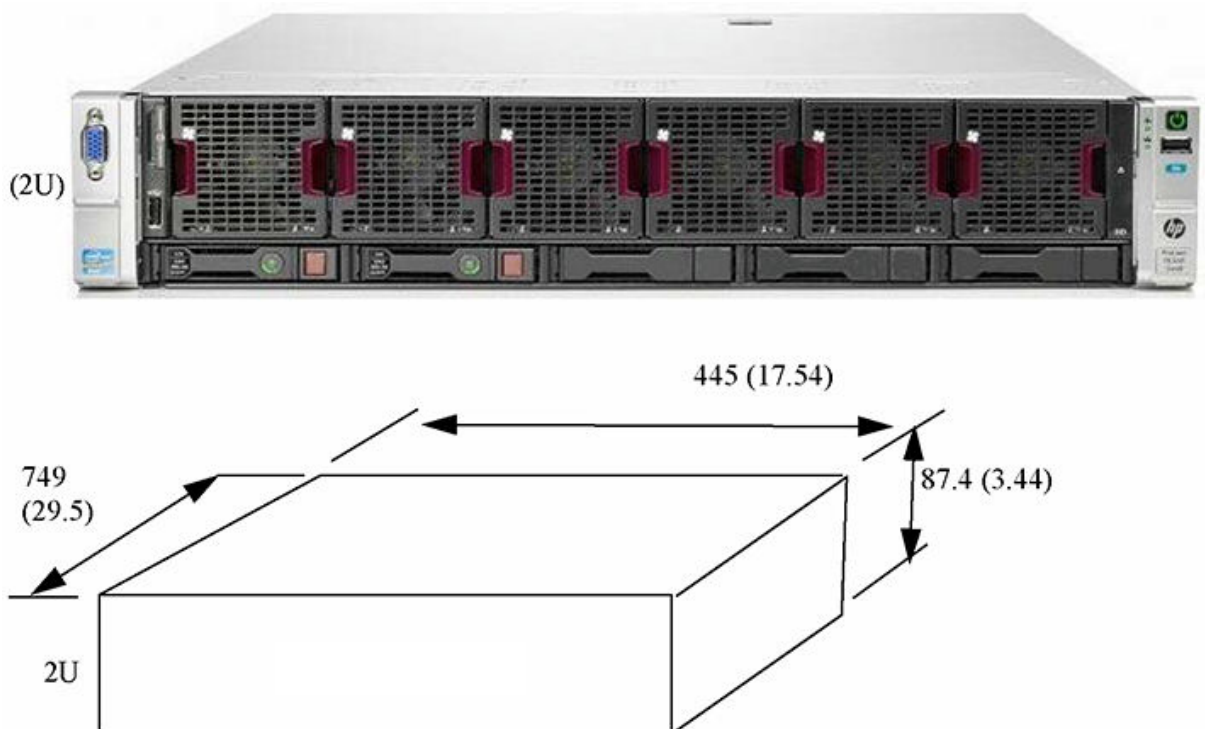
Figure A-24 Dimensions of the HPE ProLiant DL560 Gen8 Server

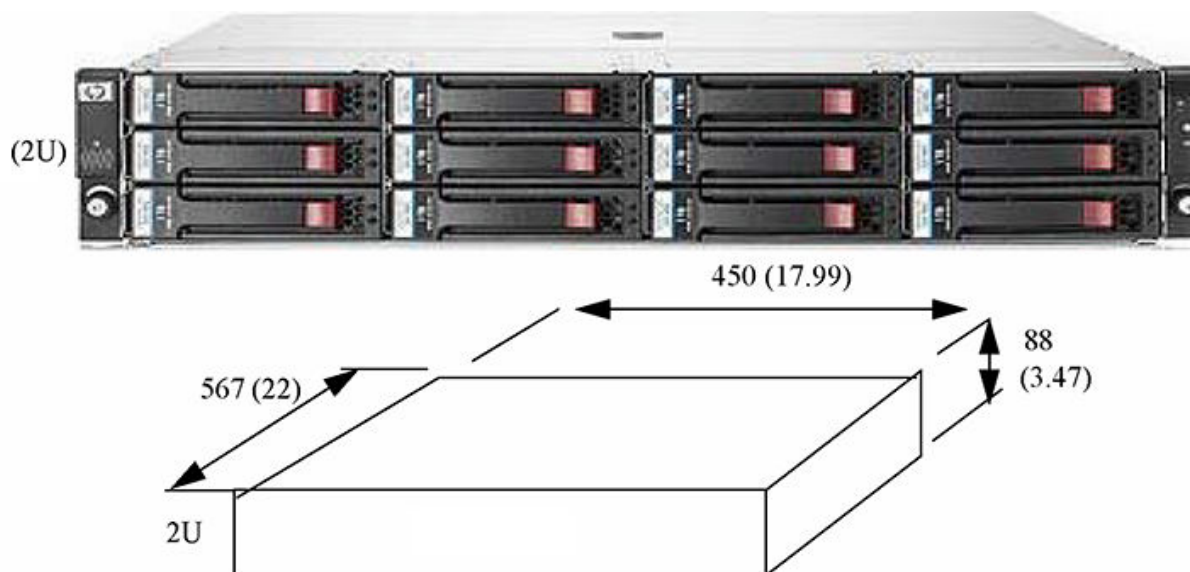
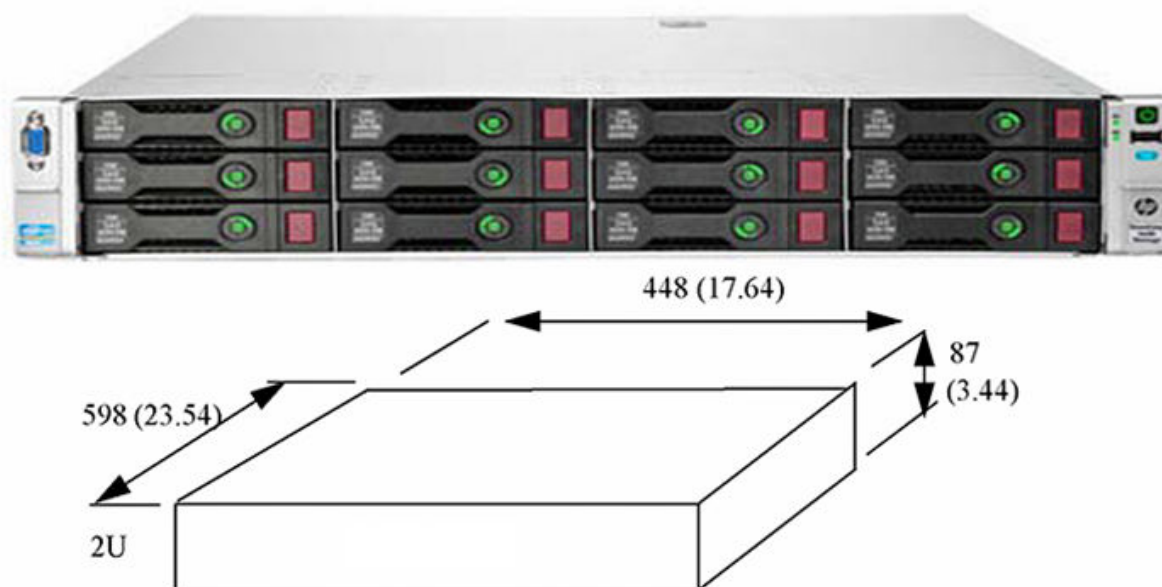
Figure A-25 Dimensions of the HP D2600 DAS**Figure A-26 Dimensions of the HP D3600 DAS**

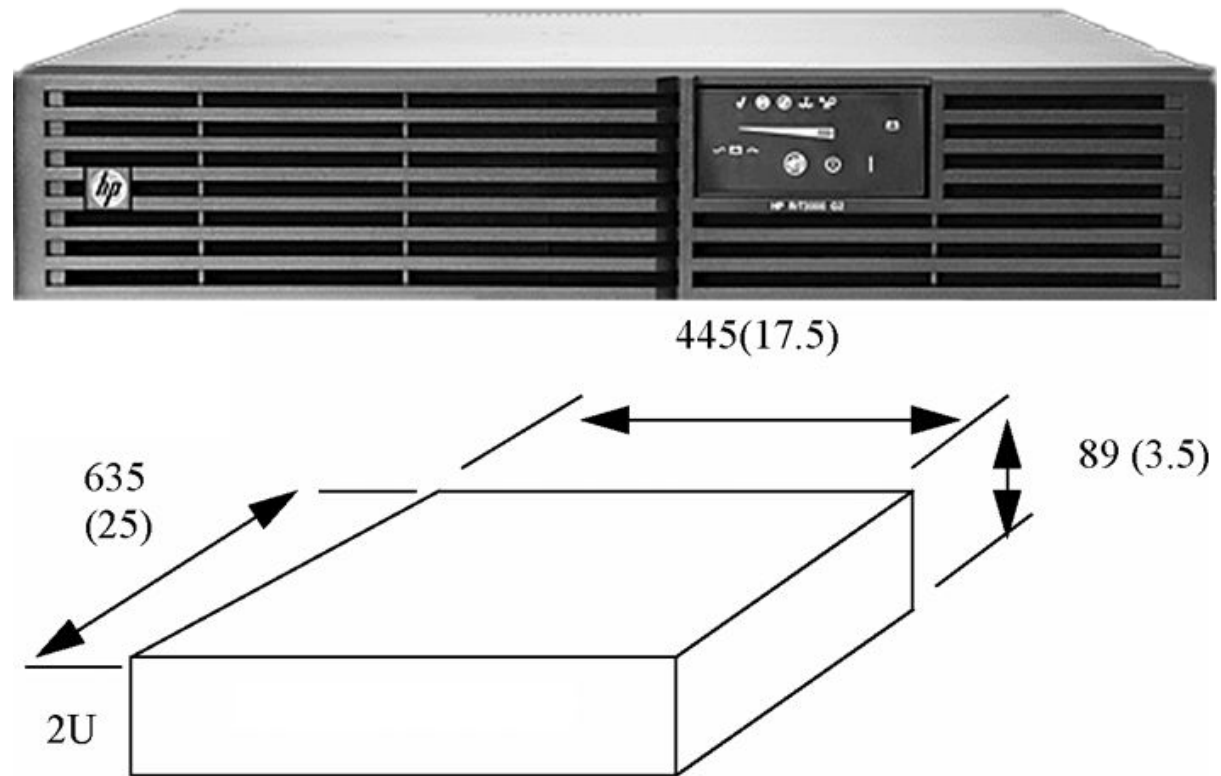
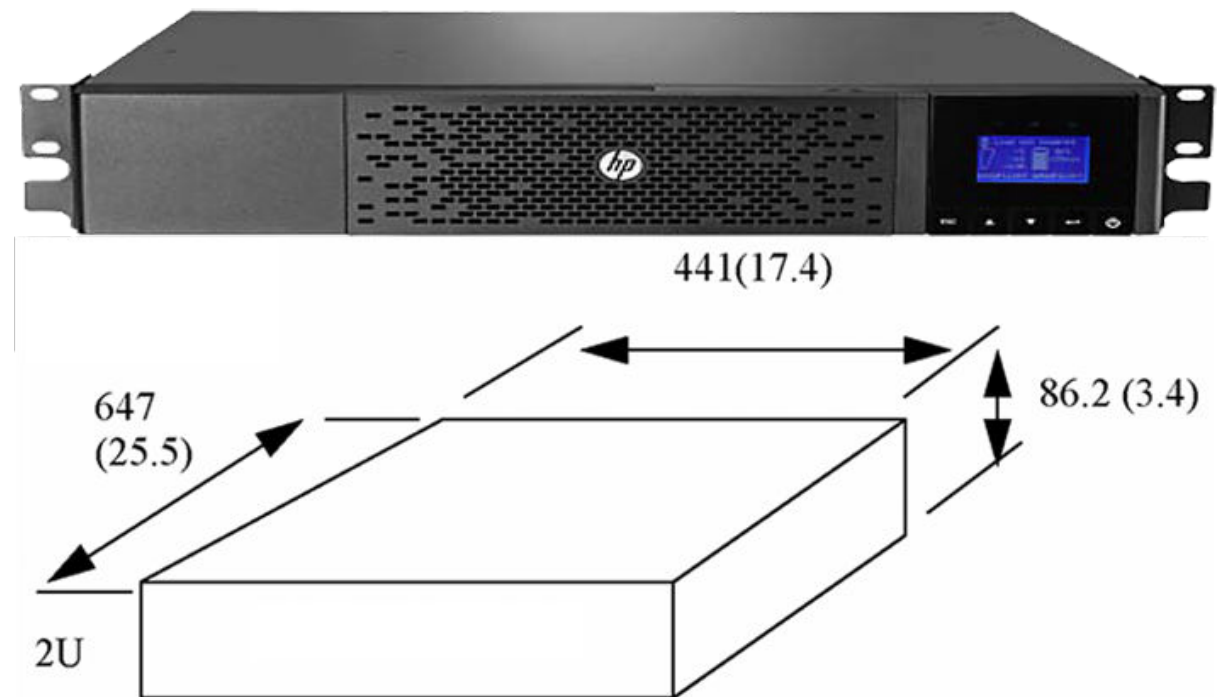
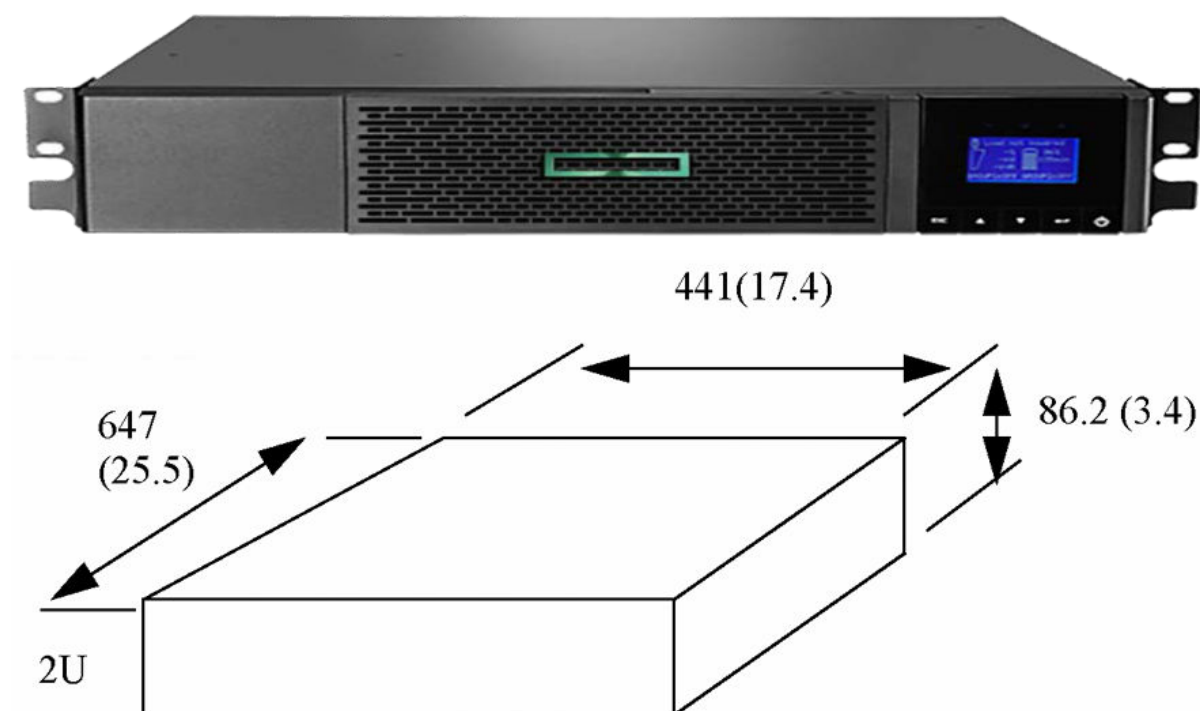
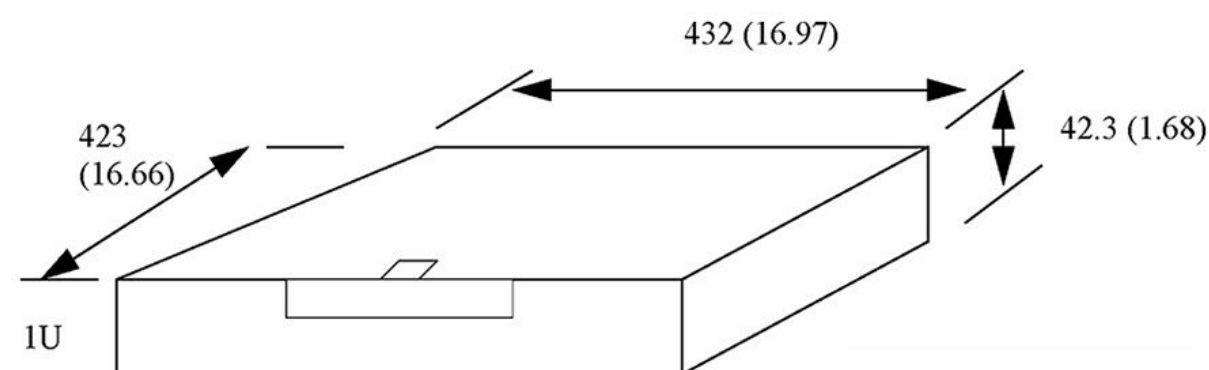
Figure A-27 Dimensions of the HPE R/T3000 G2 UPS**Figure A-28 Dimensions of the HPE R/T3000 G4 UPS**

Figure A-29 Dimensions of the HPE R/T3000 G5 UPS**Figure A-30 Dimensions of the KVM option (fold down)**

A.3.4.2 Mounting Requirements

HPE ProLiant ML350p Gen8 Server Low Tier:

Rack option mounting requirements for the are defined in the AW Server 3.2 Hardware Installation Manual 5719442-1EN.

HPE ProLiant DL580 G7 Server/HPE ProLiant DL560 Gen8 Server High Tier:

Mounting requirements are defined in the AW Server 3.2 Hardware Installation Manual 5719442-1EN for the high tier as well as for the HP D2600 DAS, HPE R/T3000 UPS and accessories.

A.3.4.3 Shipping

A.3.4.3.1 HP ProLiant ML350 G6 Server/HPE ProLiant ML350p Gen8 Server

Shipping, handling and physical installation are under GEHC responsibility.

Product/Component	Height×Width×Depth	Weight	Method of shipment
HP ProLiant ML350 G6 Server parts	Shipment, handling and Installation are under GEHC responsibility	Not available at time of release	Carton on pallet
HPE ProLiant ML350p Gen8 Server parts	Shipment, handling and Installation are under GEHC responsibility	Not available at time of release	Carton on pallet
HPE ProLiant ML350p Gen8 Server rack option	27.1 × 88.19 × 19.53 cm (10.6 × 34.7 × 7.7 inch)	5.84 kg 12.2lbs	Carton

A.3.4.3.2 HP High Tier server, DAS, UPS and accessories

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Shipping, handling and physical installation are under GEHC responsibility.

Product/Component	Height×Width×Depth	Weight	Method of shipment
HPE ProLiant DL580 G7 Server	Shipment, handling and Installation are under GEHC responsibility	42.6 Kg 94 lbs	Carton on pallet
HPE ProLiant DL560 Gen8 Server	Shipment, handling and Installation are under GEHC responsibility	27.6 Kg 61 lbs	Carton on pallet
HP D2600 DAS/HP D3600 DAS	Shipment, handling and Installation are under GEHC responsibility	46.3 / 35.4Kg 102 / 78 lbs	Carton on pallet
PDU kit US/Japan	Shipment, handling and Installation are under GEHC responsibility	5.4 Kg 12 lbs	Carton on pallet
PDU kit International	Shipment, handling and Installation are under GEHC responsibility	9.5 Kg 21 lbs	Carton on pallet
HPE R/T3000 G2 UPS parts	Shipment, handling and Installation are under GEHC responsibility	56.7 Kg 125 lbs	Carton on pallet
HPE R/T3000 G4 UPS parts	Shipment, handling and Installation are under GEHC responsibility	54.7 Kg 120.5 lbs	Carton on pallet
HPE R/T3000 G5 UPS parts	Shipment, handling and Installation are under GEHC responsibility	54.7 Kg 120.5 lbs	Carton on pallet
Standalone rack	Shipment, handling and Installation are under GEHC responsibility	145Kg 320 lbs	Carton on pallet

A.3.4.3.2.1 Optional long SAS cable kit for HP D2600 DAS

In case a longer SAS cable (about 2 meters) would be needed instead of the standard cable delivered (about 0.5 meter), to connect the HP D2600 DAS to the HPE ProLiant DL560 Gen8 Server high tier server, it shall be ordered under CAT number: **M81501WC** - AW Server Standalone SAS Cable.

NOTE

This cable is useless for the HP D3600 DAS, that is factory shipped with a 2 meters long SAS cable.

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