GE Health Cloud™ IPM on Directly Connected CT Devices Service Manual

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Service Manual

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Manufacturer
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All illustrations are provided as examples only. Your product features and configuration may be different than those shown. Names of persons, institutions, and places and related information are fictitious; any similarity to actual persons, entities, or places is purely coincidental.

http://www.gehealthcare.com

ПРЕДУПРЕЖДЕНИЕ
(BG)

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(ZH-CN)

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UPOZORENJE
(HR)

Ovaj servisni priručnik dostupan je na engleskom jeziku.
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.
Zanemarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.

VÝSTRAHA
(CS)

Tento provozní návod existuje pouze v anglickém jazyce.

- 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)

Denne servicemanual findes kun på engelsk.

- 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 teknikeren, operatøren eller patienten.

WAARSCHUWING
(NL)

Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.

- 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)

This service manual is available in English only.
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)

See teenindusjuhend on saadaval ainult inglise keeles

- 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
(FI)

Tämä huolto-ohje on saatavilla vain englanniksi.

- 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)

Ce manuel d'installation et de maintenance est disponible uniquement en anglais.

- 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)

Diese Serviceanleitung existiert nur in englischer Sprache.

- 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.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ
(EL)

Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.

- Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης.
- Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις.
- Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.

FIGYELMEZTETÉS
(HU)

Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.

- Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése.
- Ne próbálja elkezdeni 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.

AÐVÖRUN
(IS)

Þessi þjónustuhandbók er aðeins fáanleg á ensku.

- Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálaþjónustu.
- 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)

Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.

- 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)

このサービスマニュアルには英語版しかありません。

□ 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。

□ このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないでください。

□□□この警告に従わない場合、サービスを担当される方、操作員あるいは患者□□□□さんが、感電や機械的又はその他の危険により負傷する可能性があります。

경고
(KO)

본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.
고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.
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BRĪDINĀJUMS
(LV)

Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.

- Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu.
- Neveiciet aprīkojuma 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)

Šis eksploatavimo vadovas yra tik anglų kalba.

- 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)

Denne servicehåndboken finnes bare på engelsk.

- 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)

Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.

- 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.

AVISO
(PT-BR)

Este manual de assistência técnica encontra-se disponível unicamente em inglês.

- 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)

Este manual de assistência técnica só se encontra disponível em inglês.

- Se qualquer outro serviço de assistência técnica solicitar este manual noutro 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
(RO)

Acest manual de service este disponibil doar în limba engleză.

- 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 şi 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)

Данное руководство по техническому обслуживанию представлено только на английском языке.

- 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)

Ovo servisno uputstvo je dostupno samo na engleskom jeziku.

- 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.
- Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.

UPOZORNENIE
(SK)

Tento návod na obsluhu je k dispozícii len v angličtine.

- Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.
- Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obluhu a neporozumiete mu.
- Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.

ATENCION
(ES)

Este manual de servicio sólo existe en inglés.

- 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)

Den här servicehandboken finns bara tillgänglig på engelska. .

- 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)

Ta servisni priročnik je na voljo samo v angleškem jeziku.

- 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)

Bu servis kılavuzunun sadece ingilizcesi mevcuttur.

- 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.

Revision History

Revision/Version	Date	Reason for change
1.1	October 10, 2018	Initial Release
2.1	March 29, 2019	Updated flowchart and adjust detailed installation steps.
2.2	April 2, 2019	Updated the document with more service information's
2.3	April 11, 2019	Updated the EVO, Optima and Frontier 2.0 software versions
3.1	May 1, 2019	Updated the document with more service information, applied branding and formatting
3.3	May 7, 2019	Updated Review Comments
3.4	May 9, 2019	Updated the Part# 5825763-1EN
4.0	Oct 20,2019	Included TaiX Products support
5.0	May 27.2020	Updated to Include GA1.0C related changes

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1 Standards and regulations

1.1 Symbols Used in This Document

This table defines symbols used throughout this document and/or the product software:

Symbol	Definition
	This symbol indicates the legal MANUFACTURER of the product.
	This symbol indicates the DATE OF MANUFACTURE of the product.
	This symbol indicates that the user has to CONSULT INSTRUCTIONS FOR USE for further information.
	This symbol indicates the manufacturer's BATCH CODE or lot number of the product.
	This symbol indicates that instructions for use are supplied in electronic form.

1.2 Copyright notice

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1.3 Trademark notes

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2 Service Manual description

The GE Health Cloud™ IPM on Directly Connected CT Devices Service Manual provides comprehensive instructions for healthcare providers and other users on how to install and configure IPM on CT devices. It supplements the GE Health Cloud Imaging Protocol Manager Service Manual (DOC2090972).

2.1 Intended audience

This Service Manual is intended for GE Services members, such as Digital IT Professional Services (ITPS) and Project Managers, responsible for deploying IPM for a client organization.

2.2 Demographic information disclaimer

Any patient identifiable information contained in this manual, including but not limited to name, age, gender, date of birth, medical record number and exam date is fictitious information and was generated for the purposes of illustration only.

2.3 Documentation access

This software is delivered with electronic Instructions For Use (eIFU) in PDF format.

To view this Service Manual online, your device must meet the following requirements:

Operating system:

- Windows® 7 (http://windows.microsoft.com/en-us/windows7/products/system-requirements)
- Windows® 10 (https://www.microsoft.com/en-us/windows/windows-10-specifications)

PDF reader:

- Adobe® Reader® X or later (downloadable from http://www.adobe.com/products/acrobat/readstep.html).

To order a print copy, please contact Help Desk for GE Health Cloud. Your request should be fulfilled within 7 calendar days.

Help Desk # for GE Health Cloud:

USA: +1 800 494 6124

UK: +44 (0) 845 070 2596

The latest version of the Instructions for Use is also available on the Internet at http://apps.gehealthcare.com/servlet/ClientServlet?REQ=Enter+Documentation+Library - on the home page enter DOC2187896 in the search field, and then click ***Search***.

2.4 User interface note

Screen shots in this document are intended to be representative in nature. The actual screen content and application look and feel may vary for specific client site implementations. The representation of specific features in screen shots does not imply its availability or use at any or all customer sites.

3 Imaging Protocol Manger description

Imaging Protocol Manager program (IPM) is to develop a new cloud-based protocol management software solution that helps the healthcare providers to identify the protocol variation, standardize imaging workflow, improve protocol compliance to achieve improved quality of care, operational efficiency and optimized patient experience.

3.1 Applicability

This service manual refers to the use case scenarios Imaging Protocol Manager feature introduced in directly connected devices.

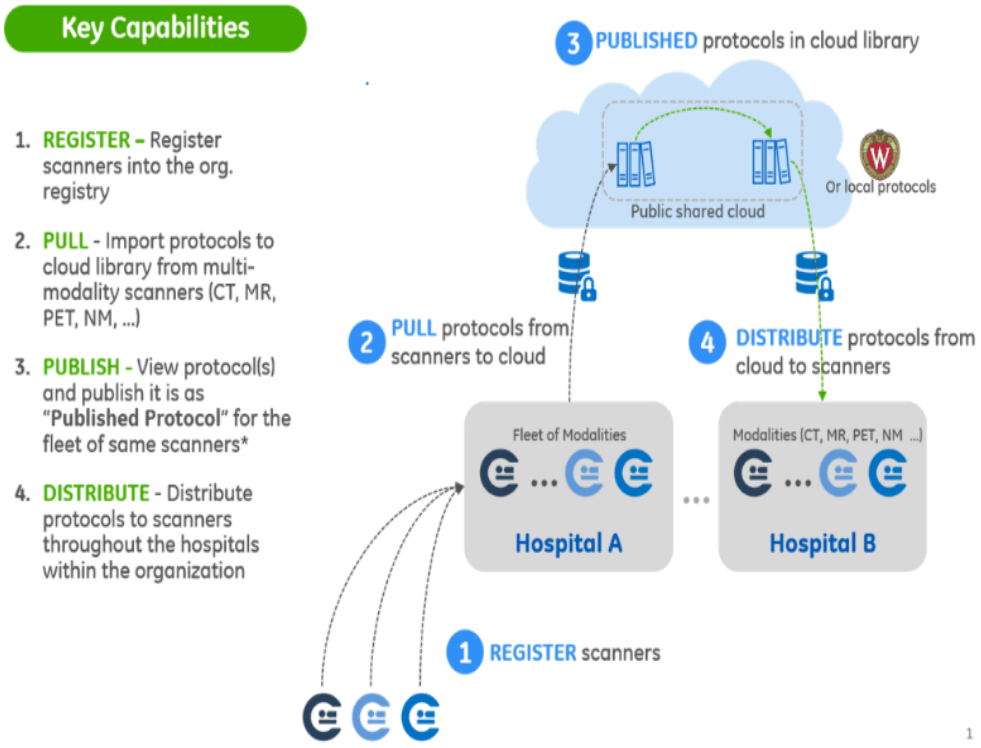
3.2 Compatibility

This Service Manual is applicable to the following products and the respective software versions or **subsequent** software versions.

Product Name	**Base software version + Service Pack**	**Display Name in IPM**
Discovery CT	17BW50.7B + SP 1.3	Discovery CT
Discovery CT750 HD	17BW50.7B + SP 1.3	Discovery CT750 HD
Revolution Frontier	17BW50.13C	Revolution Frontier
Revolution Frontier	18BW35.31 + SP 1.2	Revolution Frontier
Revolution HD	17BW50.7B + SP 1.3	Revolution HD
Revolution HD	17BW50.13C	Revolution HD
Revolution HD	18BW35.31 + SP 1.2	Revolution HD
Revolution EVO	18HW46.17 + SP3.0	Revolution EVO
Revolution EVO EOL	19HW19.4 + SP3.0	Revolution EVO
Revolution Maxima	19BW15.33	Revolution Maxima
Revolution ACE	19BW15.33	Revolution ACE
Optima CT680 Expert	19BW15.33	Optima CT680 Expert
Lightspeed 16 EOL	17BW11.2 + SP2.0	Lightspeed16
Optima CT540	20BW15.6	Optima CT540
Optima Advance	20BW15.6	Optima Advance
Optima CT520 Series	20BW15.6	Optima CT520 Series

3.3 Operation

This section introduces the brief of IPM functions.



3.3.1 REGISTER

Registration process allows to register CT scanners into the organization registry in cloud. This functionality allows to Connect and Reconnect the Scanners.

3.3.2 IMPORT or PULL

This functionality allows IPM cloud to Import protocols from multiple CT scanners registered in the organization and allow basic editing.

3.3.3 MANAGE LIBRARY

This functionality helps create standard libraries in cloud containing the protocols from multiple compatible scanners. These protocols can be Send to the other scanners.

3.3.4 SEND TO DEVICE or DISTRIBUTE

Send to Device functionality allows to distribute protocols to compatible scanners throughout the hospitals within the organization. Send to device provides 'Replace All' and 'Replace' option while sending the protocols to the scanner.

3.3.5 COMMIT

The Commit operation will take place during the Restart of the Scanner provided there are Send to Device transactions pending for the commit. Commit action will either Replace All or Replace (merge) the protocols present in the scanner with the protocols pushed to the individual scanners. During a Successful commit operation, a Revision of the protocols and its dependencies will be made, this facilitate a Restore operation if need arises.

The Replace All action will replace all the protocols existing in the Scanner with the protocols sent from the Library. Replace All will NOT remove the unused Autovoice, Snapshot Assist and Reformat dependencies present in the scanner. The Send to Device transaction may get rejected if the scanner cannot accommodate the incoming dependencies along with the existing dependencies.

The Replace (merge) action will update the scanner with the incoming protocols and its dependencies. The transaction may be rejected if the Autovoice or the Snapshot Assist dependencies have slot conflicts.

3.3.6 RESTORE

Restore the Scanner to an earlier revision of protocols after a Commit. By default, last 5 Revisions will be made available as restore points. If need be Service personal could configure the number of revisions to made available.

4 Getting started with IPM on Directly Connected CT Devices

4.1 Installation workflow

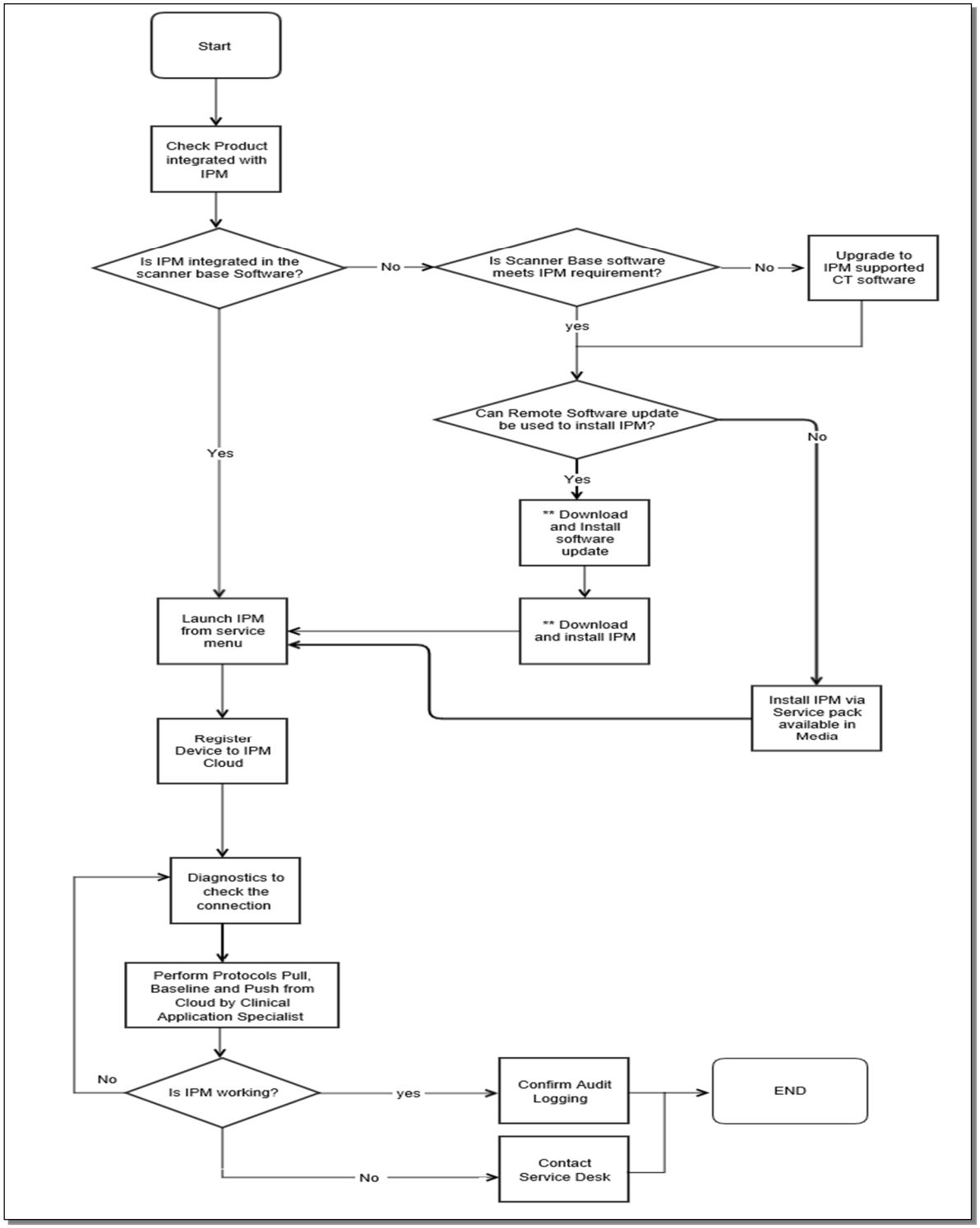
For these products, IPM and Software update software are integrated as part of the CT Application ISO software. IPM will be available in the below mentioned software version or **later** versions.

- Revolution™ Frontier – 17BW50.13C
- Revolution™ HD – 17BW50.13C
- Revolution™ Maxima – 19BW15.33
- Revolution™ ACE – 19BW15.33
- Optima™ CT680 Expert – 19BW15.33
- Optima™ CT520 Series – 20BW15.6
- Optima™ CT540 – 20BW15.6
- Optima™ Advance – 20BW15.6

For these products, IPM and Software update software needed to be installed as Service Packs (SP). IPM will be available in the below mentioned Service Packs or **later** Service Packs.

- Discovery™ CT750 HD – 17BW50.7B + SP 1.3
- Discovery™ CT – 17BW50.7B + SP 1.3
- Revolution™ HD – 17BW50.7B + SP 1.3
- Revolution™ Frontier – 18BW35.31 + SP 1.2
- Revolution™ HD – 18BW35.31 + SP 1.2
- Revolution™ EVO – 18HW46.17 + SP3.0
- Revolution™ EVO – 19HW19.4 + SP3.0
- Lightspeed16™ – 17BW11.2 + SP2.0

This flowchart is to instruct service engineer how to install the IPM feature and validate its function briefly. Follow each step to finish the IPM feature installation



** The Software update and IPM software needs to be downloaded from AutoSC. The downloaded software will be installed automatically during the reboot of the device.

4.2 Preinstallation checks

Before the CT system is installed with the IPM, the system must be performed with some predefined steps to make sure if a Direct Connect IPM system can connect to the Amazon cloud servers prior to installing IPM or if IPM has difficulties.

We suggest running a "curl" command from a command line shell of the scanner console to try to access the IPM configuration server. curl is a Linux command that simulates what our IPM software would do to communicate with the Amazon IPM servers:

https://apps.prdge.us-west-2.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig

So, the simplest "curl" command would be:

Open a Linux terminal and run the following command:

$ curl https://apps.prdge.us-west-2.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig

If it is successful it should respond with something like this. This would mean that it is possible to connect the scanner to IPM cloud services.

```
{"ipm_apiGatewayUrl":"https://apps.prdge.us-west-
2.protocols.gehealthcloud.com/ipmcon_pmapi","enroll_apiGatewayUrl":"ht
tps://apps.prdge.us-west-
2.protocols.gehealthcloud.com/ipmcmn_v2api","region":"us-west-
2","cognitoDetails":{"identity_pool_id":"us-west-2:2ec98a73-cbb1-4b53-
8c19-1e8de4993d02","user_pool_id":"us-west-
2_LrJaiExQq","client_id":"2fkmeuqqst708tqil5rqo9ssii"}}
```

Note: For the above command to work and to return a response, the proxy should be set and the SSL Certificates should be installed in the device.

If this fails, it could be that the system requires a proxy to access the Internet.

If this is the case and you can find out the proxy server IP address and port information and set the proxy for that device. Then use the curl command.

```
setenv http_proxy http://<Proxy Server IP Address>:<Port>
setenv https_proxy http://<Proxy Server IP Address>:<Port>
setenv HTTPS_PROXY http://<Proxy Server IP Address>:<Port>
setenv HTTP_PROXY http://<Proxy Server IP Address>:<Port>
```

$ curl -k https://apps.prdge.us-west-2.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig

After you get the response, unset the proxy using the following command:

```
unsetenv http_proxy http://<Proxy Server IP Address>:<Port>
unsetenv https_proxy http://<Proxy Server IP Address>:<Port>
unsetenv HTTPS_PROXY http://<Proxy Server IP Address>:<Port>
unsetenv HTTP_PROXY http://<Proxy Server IP Address>:<Port>
```

For example:

```
setenv http_proxy https://3.57.130.10:80
setenv https_proxy https://3.57.130.10:80
setenv HTTPS_PROXY https://3.57.130.10:80
```

```
setenv HTTP_PROXY https://3.57.130.10:80
$  curl -k https://apps.prdge.us-west-2.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig

unsetenv http_proxy https://3.57.130.10:80
unsetenv https_proxy https://3.57.130.10:80
unsetenv HTTPS_PROXY https://3.57.130.10:80
unsetenv HTTP_PROXY https://3.57.130.10:80
```

The –k option explicitly allows curl to perform "insecure" SSL connections and transfers. This option will only be used for devices that do not have an SSL Certificate installed.

This could fail for number of reasons:

- If the system is on a network that is blocked from the internet, so we would have to access the IT staff to allow this connection.
- If the software is very old and the curl command is not available.

Note: We strongly recommend using a proxy server to connect the IPM agent on the device to the AWS services due to security reasons.

4.3 Post Installation checks

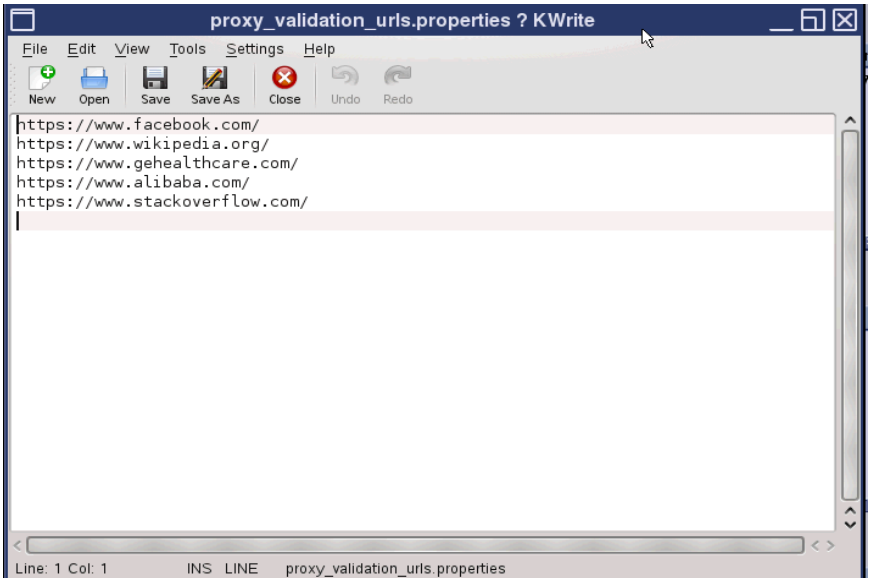
After installing IPM software either as part of the CT Application or as Service pack installation, perform the below steps.

1. Open a Linux terminal, run the following command:

   ```
   kwrite /usr/g/sdapplications/ipm/data/config/proxy_validation_urls.properties
   ```

2. The below window displays few URLs used for Proxy Validations checks. Remove the URL www.alibaba.com and www.stackoverflow.com if available in this file from the below displayed window, click on save and close this window.

   If there are any issues observed in any of the URLs mentioned here, service personal shall add or delete them.



3. Install the user proxy certificates:

   - CT Products having **IPM Software Release 32 or Later** require the Proxy certificates to be installed. Please refer Appendix [1] *Fetching the IPM installation details* to determine the IPM release version.

     Follow the below steps to install the Proxy certificates.

     a. Copy the customers proxy certificate to **/usr/g/ctuser/sdapplications** location on the device.

     b. Check whether the proxy certificate has executable permission. Perform the command and see if the permission as correct:

        $ ls –l /usr/g/ctuser/sdapplications/<certificate_name>

        Following should be the permission for the file if logged in as ctuser:

        –rwxr–xr–x

     c. Perform the following commands to install the certificate to the device:

        $ cd /usr/g/sdapplications/ipm/scripts

        $ ./installCertificates.sh <Certificate Name>
        /usr/g/ctuser/sdapplications/<certificate_name>

   - For other CT Products, refer to Appendix "D" of this document for instruction to import customer's certification within IPM application.

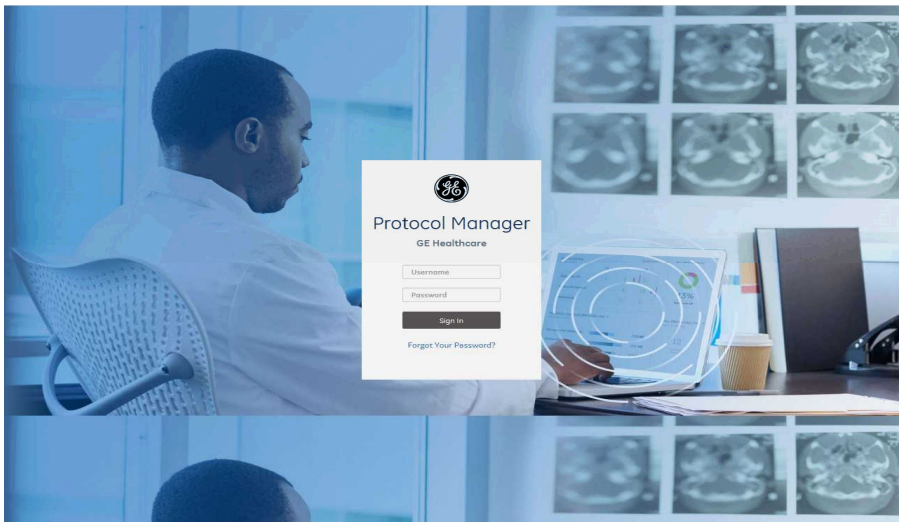
4. **Reboot** the Device

5 Registering a scanner to organization registry

5.1 Scanner on IPM cloud

1. On a Desktop PC, open the IPM website registration Login page. (Registration URL will be available as part of the Option package; the below URL is only an example)

`https://d10fvq0jpcr9o5.cloudfront.net/`



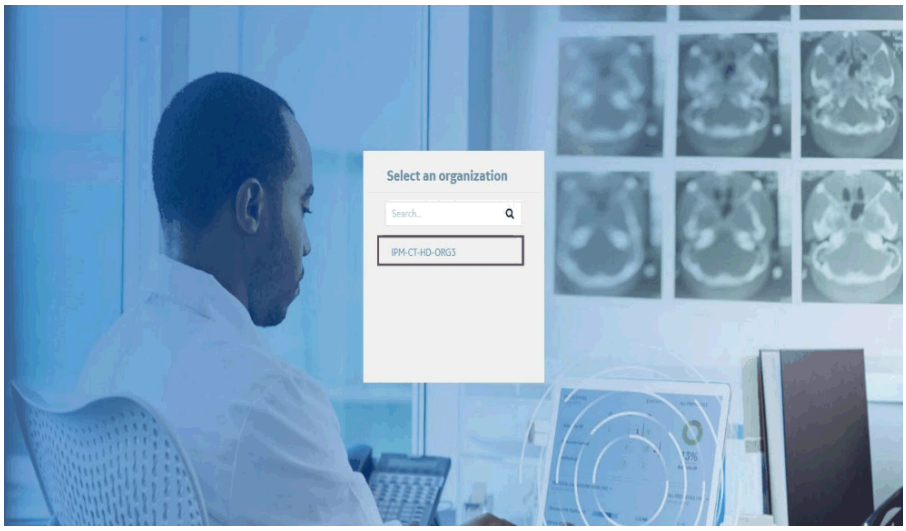
2. Key in the details of Username, and password (This info exists in the IPM option package.) and click “sign in”.

   User Name: _____

   Password: _____

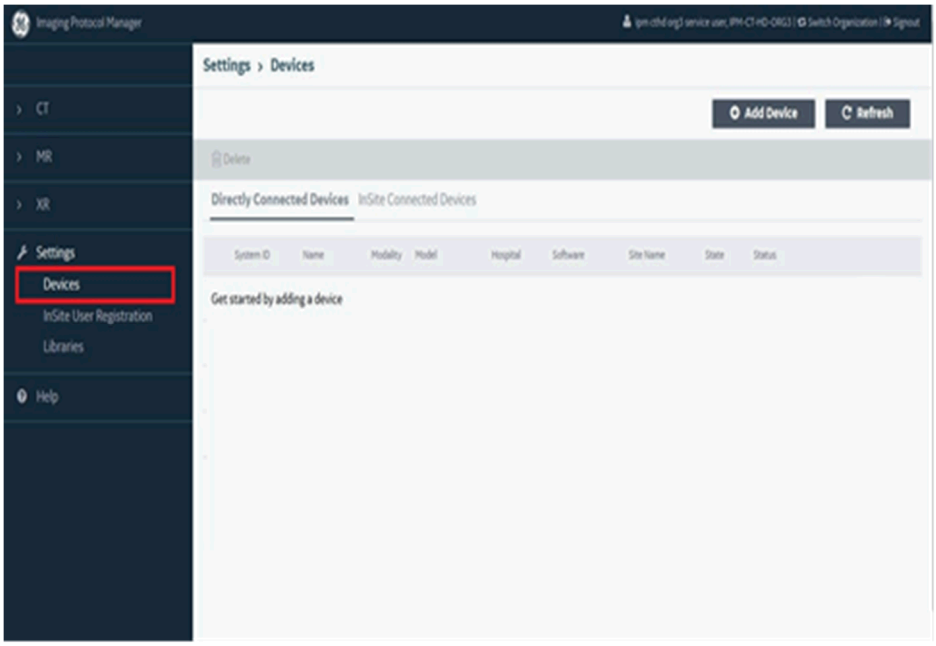
3. Select the organization in the list.

(The data in the field of this screen are examples)

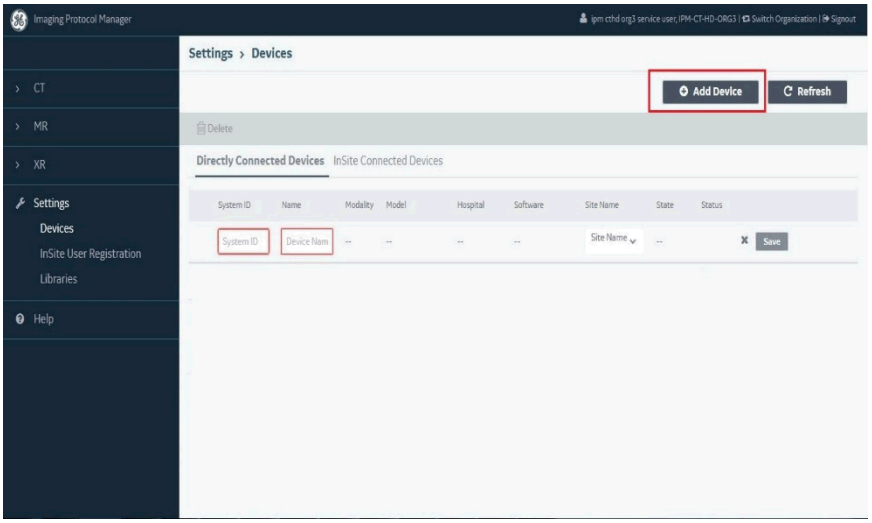


4. After login, the IPM main page display.

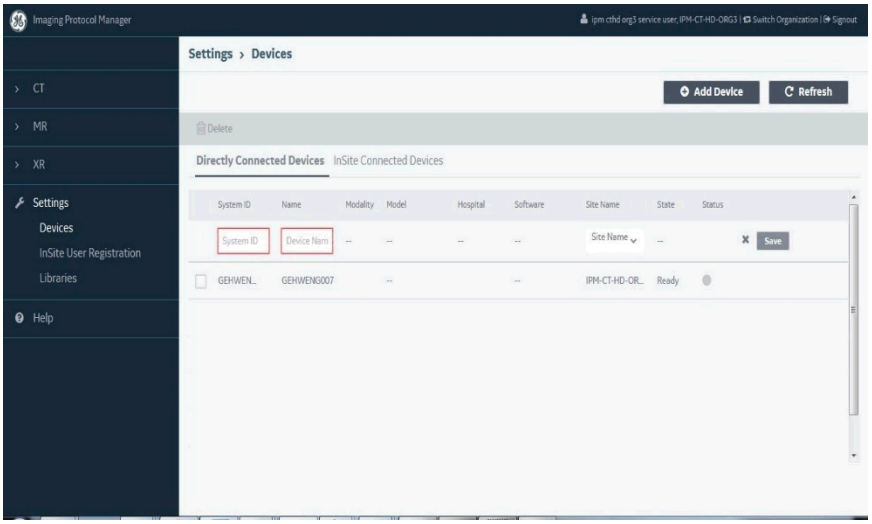
5. Select Settings –> Devices on the left panel,



6. Click “Add Device” on the right panel, then enter the System ID and Name of the CT scanner, Enter the Site Name (Hospital name or organization name), click “Save”.

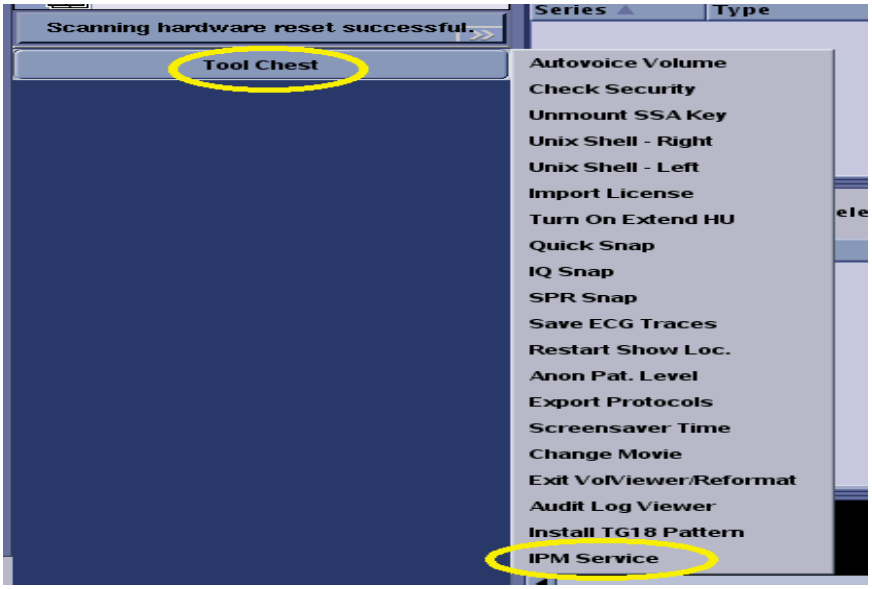


7. The device added on cloud completed.

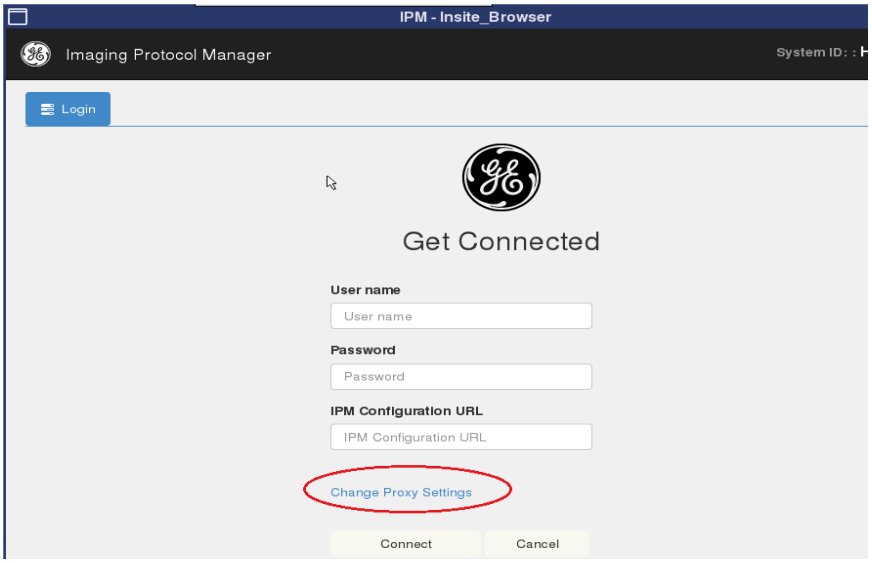


5.2 Registration on scanner

1. On Service Desktop –> Configuration –> Configure HIPPA, Select the “HIPPA ON”.
2. To register the scanner, Open the Image Browser and click on Tool Chest.



3. Click on the IPM Service, below Registration Login page will display, click the “Change Proxy Settings”



4. Enter the proxy details based on site network proxy info, check the “Enable Proxy Server” checkbox, so that the Proxy fields are enabled as shown

   Proxy IP: _____

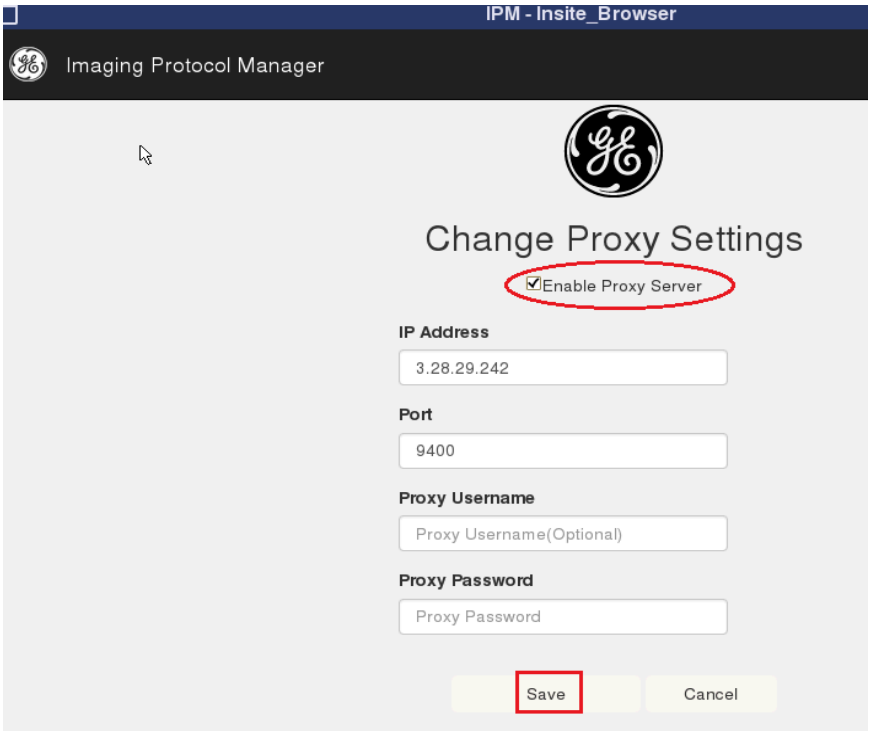
   Proxy Port: _____

   Proxy Username: _____(optional)

Proxy Password: _____(optional)

(The data in the field of this screen are examples), then click “Save”.

Note: If there is no network proxy at site, leave them blank and skip this step.



5. Once the proxy details are saved, the screen navigates back to the Registration Login page. Key in the details of Username, password, and IPM configuration URL.

Note: The username and password must be same as the one used to login to IPM cloud.

(This info exists in the IPM option package)

User Name: _____

Password: _____

IPM Configuration URL: _____

(This info exists in the IPM option package. The data in the field of this screen are examples).

The Proxy validation process authenticates the proxy host, port, username (if provided) and password (if provided) by triggering connectivity to Five different URLs via the proxy server.

The proxy validation process succeeds if any one of the below five URL gets connected via the proxy server.

URLS:

https://www.facebook.com/

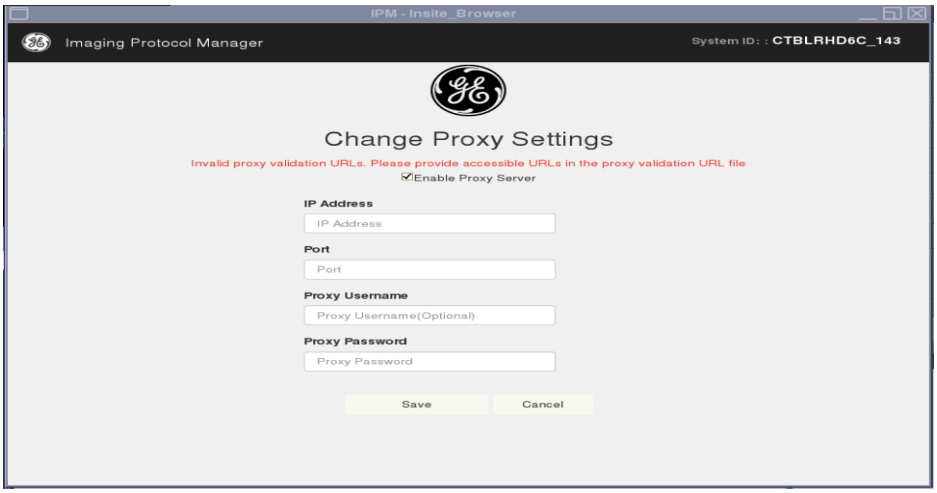
https://www.wikipedia.org/

https://www.gehealthcare.com/

https://www.alibaba.com/ (**Must be removed as mentioned in Sec 4.3**)

https://www.stackoverflow.com/ (**Must be removed as mentioned in Sec 4.3**)

If all the URLs are inaccessible in the country where the site is located, the following error message will be shown.



In this scenario, add a valid URL which can be accessed from the country where the device is located via the proxy server in the following file

```
/usr/g/sdapplications/ipm/data/config/proxy_validation_urls.properties
```

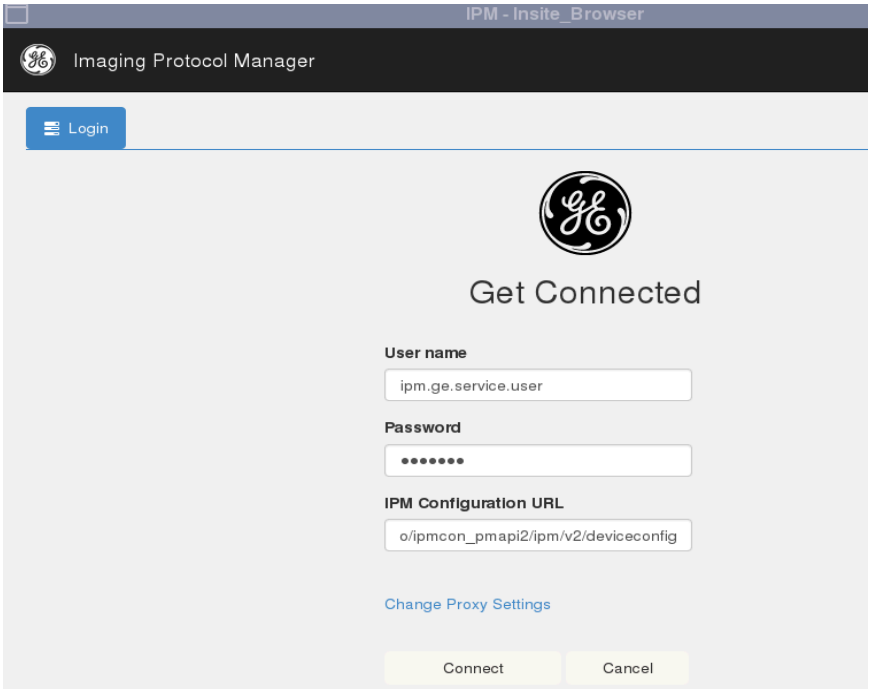
Open a Linux terminal, run the following command:

```
kwrite /usr/g/sdapplications/ipm/data/config/proxy_validation_urls.properties
```

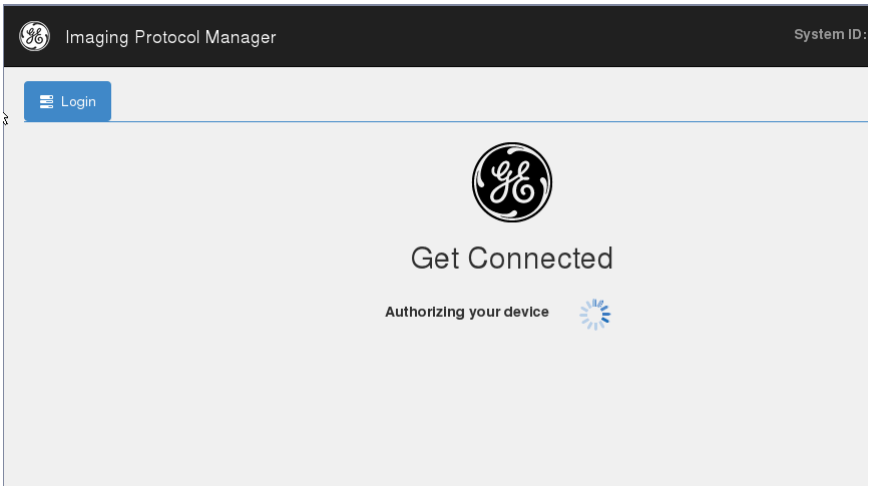
This will open the below displayed window, add the URL in this file, click on save and close this window.

When you are changing the Proxy details after a successful Scanner Registration, ensure to Reboot the device or Disconnect and Re-Connect from Device Authorization Status page.

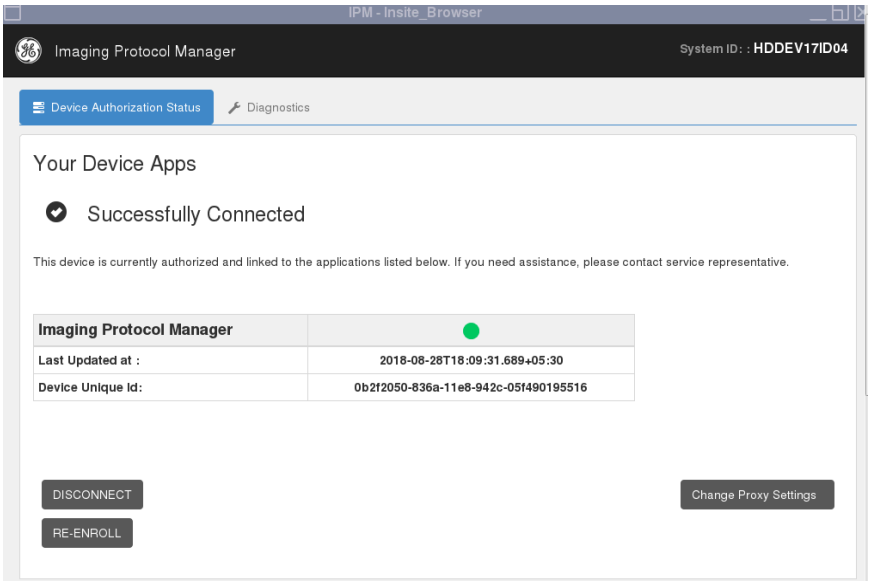
Key in the details of Username, password, and IPM configuration URL as noted in the above step.



6. Click on Connect button, to register the scanner to IPM. The below progression screen will be shown.



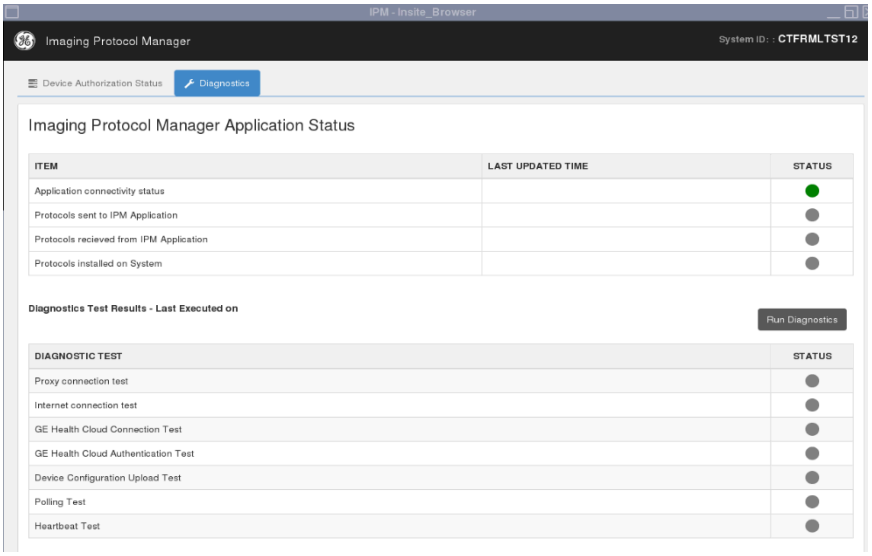
7. Once registration is completed, Registration confirmation screen will be displayed below, it also shows the status of polling as well as the options to change proxy, disconnect and re-enroll the device.



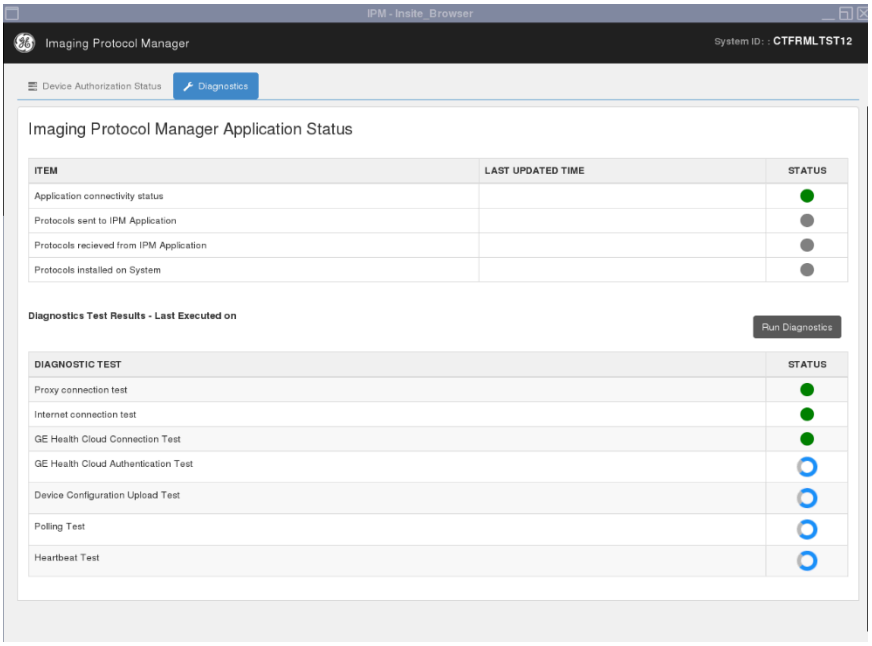
6 Performing diagnostics

1. After IPM registration, click Diagnostics tab, it allows you to check the status of the Imaging Protocol Manager application. It shows the Application connectivity status and the status of Protocols sent, received and committed along with its last updated time.

   Also, it provides option to Run Diagnostics which performs pre-defined diagnostic tests like Proxy connection test, Internet connection test, Polling test, Heartbeat tests etc.

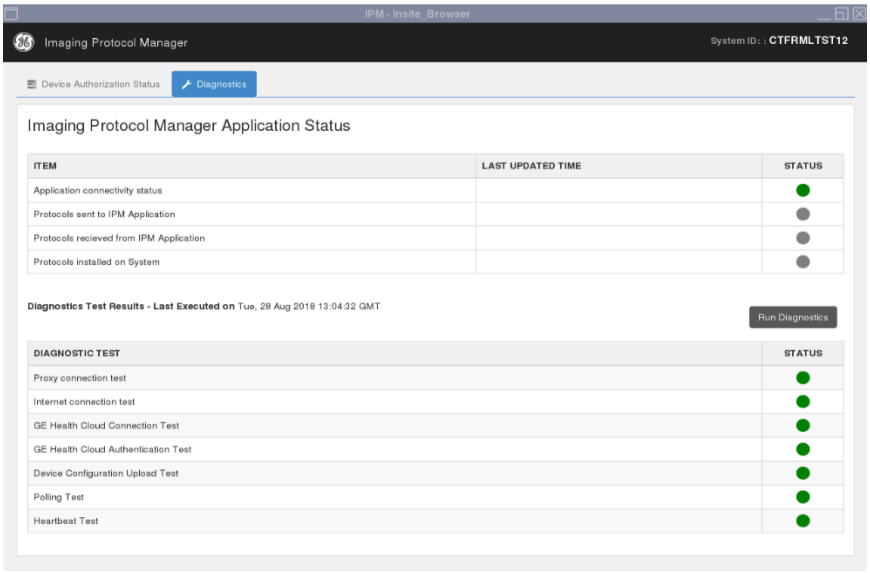


2. Click on "Run Diagnostics" button to run the predefined tests. The below screen showing the InProgress tests will be shown.



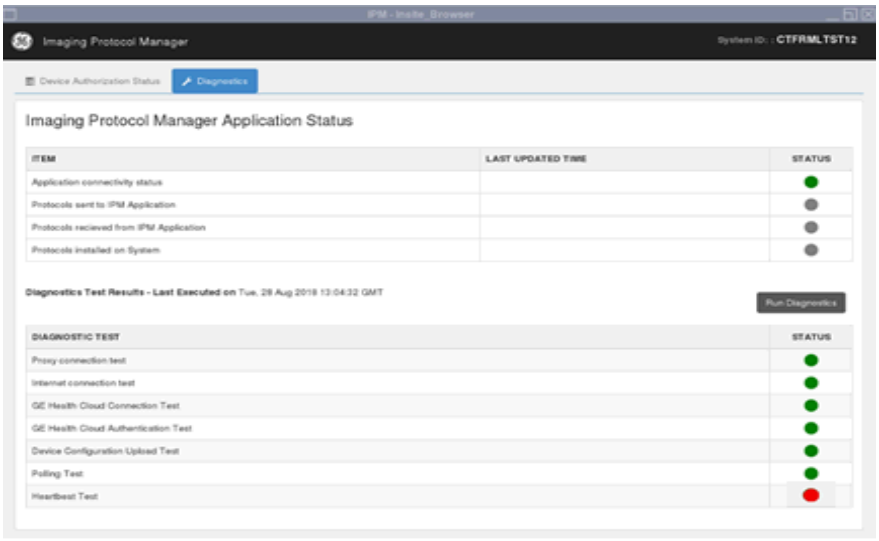
3. Once the diagnostics run is completed, it updates the status with either green (working)/red (not working) icons against each test as shown below.

   PS: For the Scanners which are connected via DNS, the Internet connection test, Polling Test and Heartbeat Test may not be accurate in some products. This has been fixed in later software versions of the products.



4. If the device **Heartbeat Test** status is shown as RED and Device status in IPM Cloud is shown as disconnected as given below and normal operations are happening seamlessly, then it could be due to intermittent network outage. This is a known issue and it will be addressed in the later IPM releases. The suggested solution is to perform a **Reboot** of the device when the device is not in Service and confirm the connection status in Cloud.

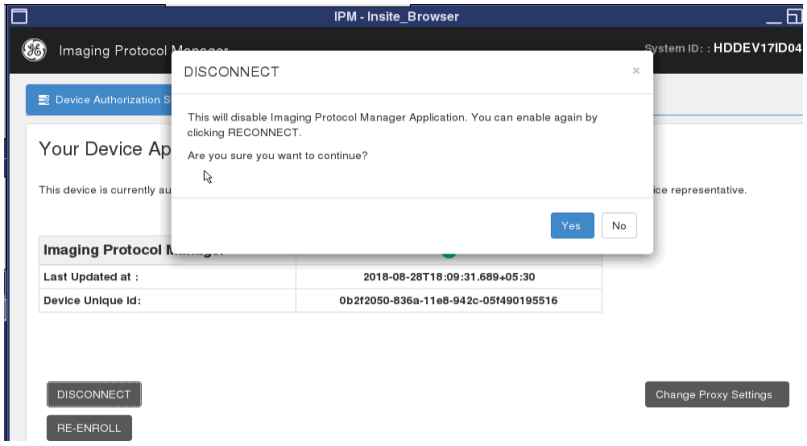
   On Device:



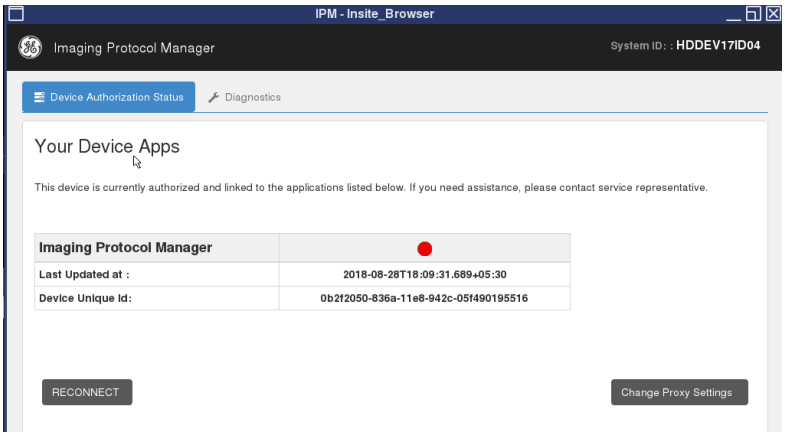
On Cloud:

5. On the "Device Authorization Status", the user has an option to disconnect a device from the cloud application that's already registered.

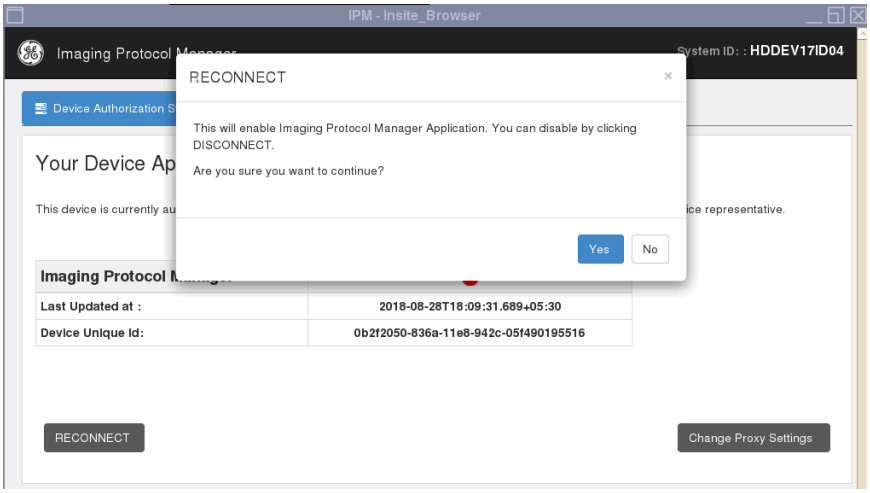
    a. Perform disconnect by clicking on the DISCONNECT button. The below confirmation screen is displayed.



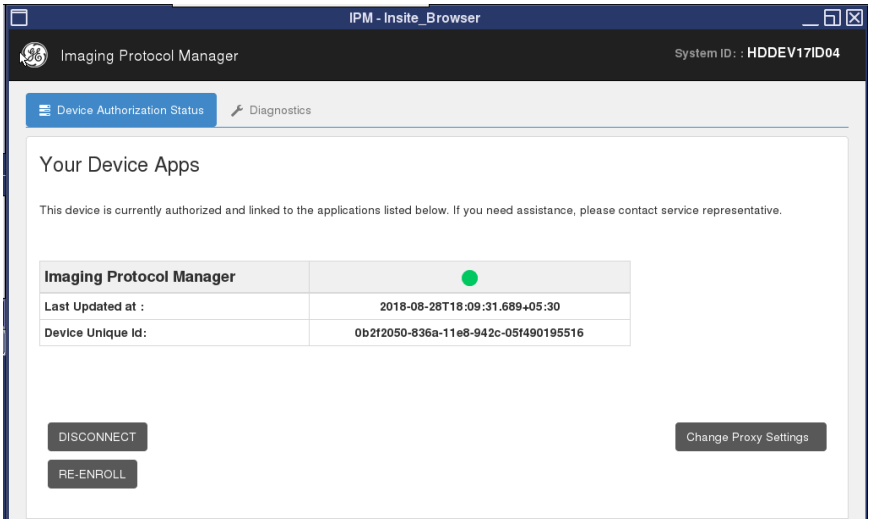
    b. Click on Yes to disconnect the device. The device would have gotten disconnected and the device polling is stopped now (Red icon). The below screen gets displayed with an option to Reconnect the device.



6. The user has an option to reconnect a device that was registered but disconnected. Click on the RECONNECT button which will show the confirmation screen as shown below.



7. Click on Yes to reconnect the device. The device would have gotten connected and the device polling is resumed now (Green icon). The below screen gets displayed with an option to Disconnect the device.



Once you click on Re-Enroll, you will be navigated back to the login page with an option to register the device again by clicking Re-Enroll for the device on the cloud page. Note that once you click on Re-Enroll and select Yes, the KeyStore file will be deleted. It will get regenerated on the following registration.

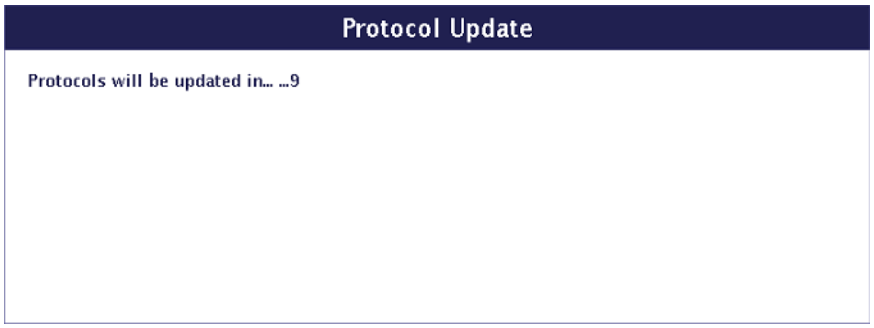
Also note that in case after rebooting the device, an already registered device navigates to the Registration login page, it is suggested to do a fresh device registration.

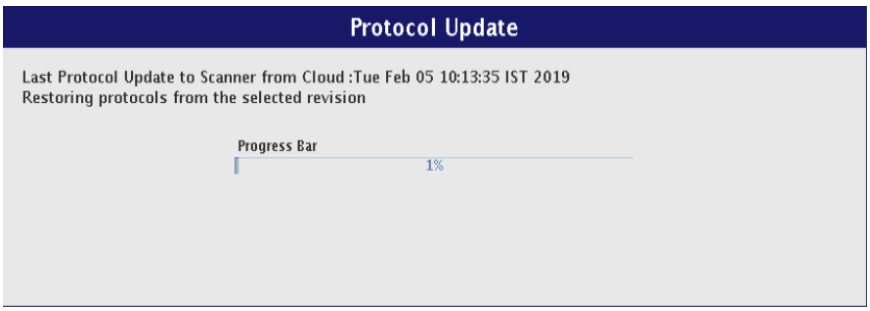
Once registration is completed and device is connected, the user will be able to Pull protocols to IPM Cloud application (send protocols to cloud) where they will get standardized and the device will be able to Push protocols (receive protocols from cloud).

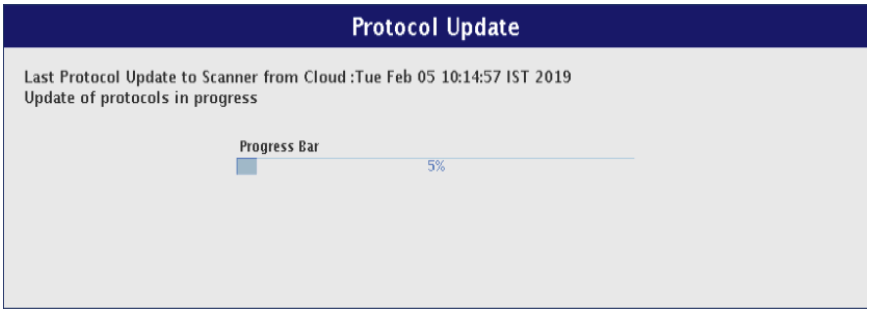
7 Checking the progress of committing protocols to the scanner

When the protocols from the cloud are pushed to the scanner for revision, they go to a holding area on the scanner. During the Reboot of the CT Scanner, if the Scanner holding area contains protocols sent from IPM Cloud, it displays a series of progress messages to show the progress of adding the protocols.

1. The scanner will take a Protocol backup for a revision history each time the addition happens.



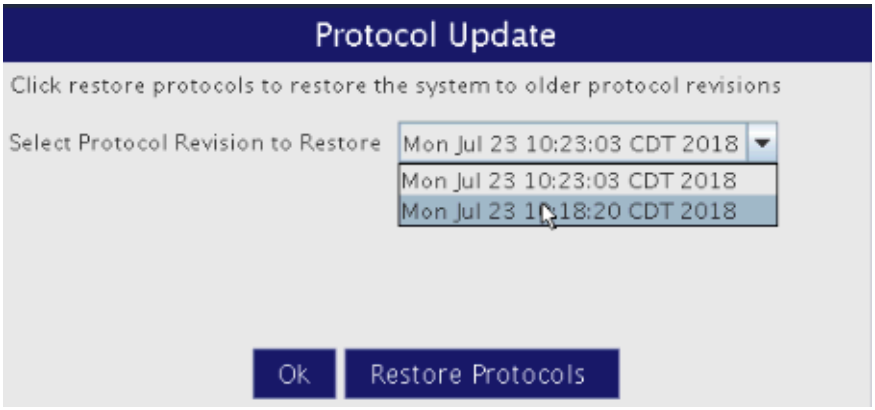


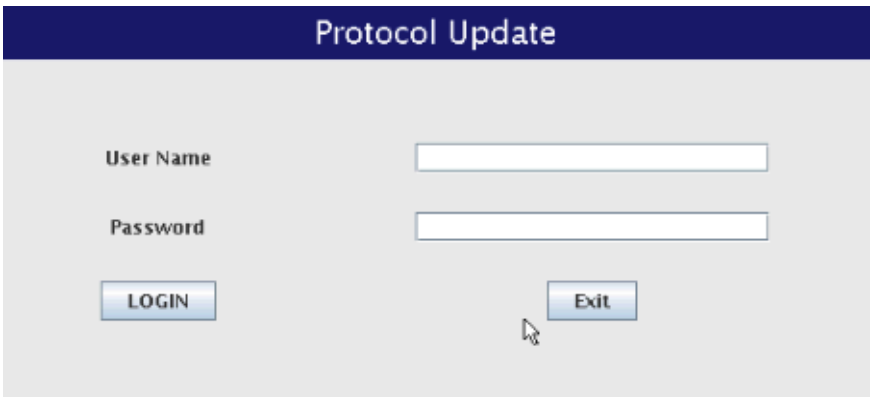


8 Restoring protocols to a different revision on your CT Scanner

When the protocols from the cloud are pushed to the scanner for revision, they go to a holding area on the scanner. On reboot of the scanner, the system will automatically attempt to add protocols from the holding area to the scanner. The following are the possible scenarios.

1. CT scanner takes a backup of the protocols on your system before adding the Pushed protocols. You can then at next reboot Restore Protocols to a prior revision
2. The dialogue box will tell you at the top, when the last protocol update to the scanner from the cloud happened.
3. You must select a protocol revision to restore. You have 5 prior revisions to choose from.
4. You then must have the standard user privilege to restore protocols and you will be asked to enter your user credentials.



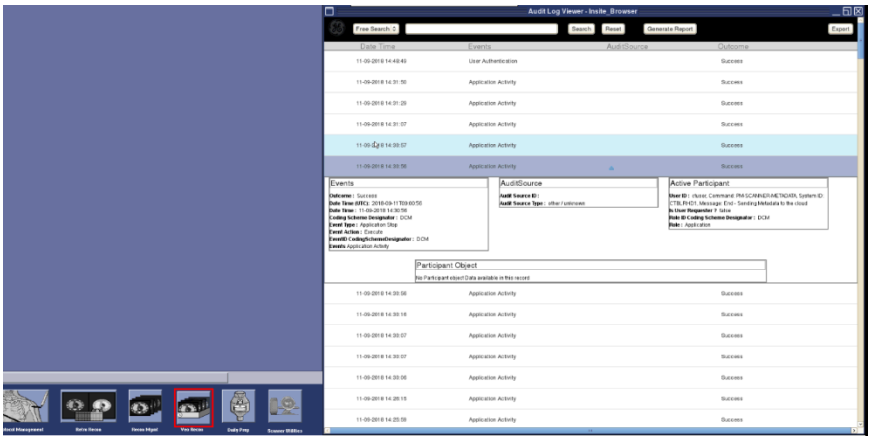


If there are no protocols to commit to the scanner, but there are protocols you can restore you will see the following screen to Restore Protocols.

9 Checking audit logs

The user has an option to check the operations that have occurred in IPM along with its statuses from the *Audit Log Viewer* option.

1. To view Audit Logs, Click on Tool Chest
2. Click the **Audit Log Viewer** option



The following table shows the Audit Log viewer options for each operation. These commands shall be useful for debugging purposes.

Audit Log Command-ID	Description
PM-SCANNER-REGISTRATION	For Scanner Registration
PM-SCANNER-METADATA	For Scanner Metadata during start up
PM-POLLING-STARTED	For Polling Start
PM-PULL-PROTOCOLS	For Import request
PM-CANCEL-REQUEST	For Import and Add to Device Cancel Request
PM-CANCEL-RESPONSE	For Import and Add to Device Cancel Response
PM-PULL-PROTOCOLS-RESPONSE	For Import response
PM-PUSH-PROTOCOLS	For Add to Device Request
PM-PUSH-PROTOCOLS-DOWNLOAD-RESPONSE	For Add to Device Response
PM-REVISION-PROTOCOLS	For Revision of protocols before Commit
PM-UPDATE-PROTOCOLS	For Commit Operation
PM-PUSH-PROTOCOLS-COMMIT-RESPONSE	For Commit Reponses
PM-RESTORE-PROTOCOLS	For Restore of Protocols

A Appendix

1. Fetching the IPM Installation Detail

1. Open file /usr/g/sdapplications/ipm/resources/VERSION
2. Note down following detail:
   - Software Name
   - Software Version
   - Software Release

2. Restoring the protocols and its dependencies to the same state as prior to the Scanner registration

1. Open the terminal login as "ctuser"
2. Bring down the application by running "cleanMon"
3. Change directory to
   `($ cd /usr/g/sdapplications/ipmRestore/scripts)`
4. Execute the script "protocolRestore", e.g.
   - `$ protocolRestore`
5. You will be prompted the message "This operation will replace all the current protocols and corresponding dependencies with the one present just before the IPM registration, please confirm (Y/N)"
6. Enter the response as "Y" or "y" (Any message other than "Y" or "y" will not restore)

   Above procedure will restore the protocols and corresponding dependencies prior to scanner Registration.
7. Reboot the system by running "reboot"

3. Capturing the logs if UI is not being launched successful

1. Open the terminal
2. Bring down the application by running "cleanMon"
3. setenv IPM_DEBUG_LOG ON
4. Bring the system up by running "st"
5. /usr/g/service/log/pmCloudAgentMonitor.log should be created.
6. Pass the log to engineering team

4. Capturing the IPM agent logs for debugging purpose.

1. Open the terminal
2. Bring down the application by running “cleanMon”
3. Run the following commands:
    a. cd /usr/g/sdapplications/ipm/resources
    b. kwrite application.properties
4. Change the line from logging.level.=ERROR → logging.level.=INFO
5. Collect all the logs from /usr/g/sdapplications/ipm/log and send it to the engineering team.
6. Run the following commands
    a. cd /usr/g/sdapplications/ipm/resources
    b. kwrite application_commit.properties
7. Change the line from logging.level.=ERROR → logging.level.=INFO
8. Start up the application and perform the IPM operation. Recreate the erroneous scenarios
9. Pass the log to engineering team
10. Post collecting the logs, make sure to change the log level back to ERROR and then restart the CT APPS.

5. Resetting the SnapShotAssist profiles to default

This procedure will allow the service user to set any of the SnapShotAssist profiles to default. This operation is Strictly controlled and shall be used only when it is extremely necessary to complete the “Replace All” operation request from IPM cloud.

1. Open a terminal and login as “ctuser”
2. Bring down the application by running “cleanMon”
3. Change directory to ($ cd /usr/g/sdapplications/ipmRestore/scripts)
4. Execute the script resetSnapShotAssitProfile <Profile Name>”, e.g.:
   - `$ resetSnapShotAssitProfile 'AG Profile 5'`

   Use the exact name of the Autogating profile as seen in the SnapShotAssist tool and enclose in single quote which needs to be reset. If there are duplicate SnapShotAssist profile names, the profile name needs to be edited in scanner to perform this operation.
5. You will be prompted with the message ″<profile_name> to be reset to default values. Continue (Y/N)?″
6. Enter the response as ″Y″ or ″y″ (Any message other than ″Y″ or ″y″ will not restore)

7. Above procedure will Reset the SnapShotAssist Profile mentioned.

6. Command to list software version of device: swhwinfo

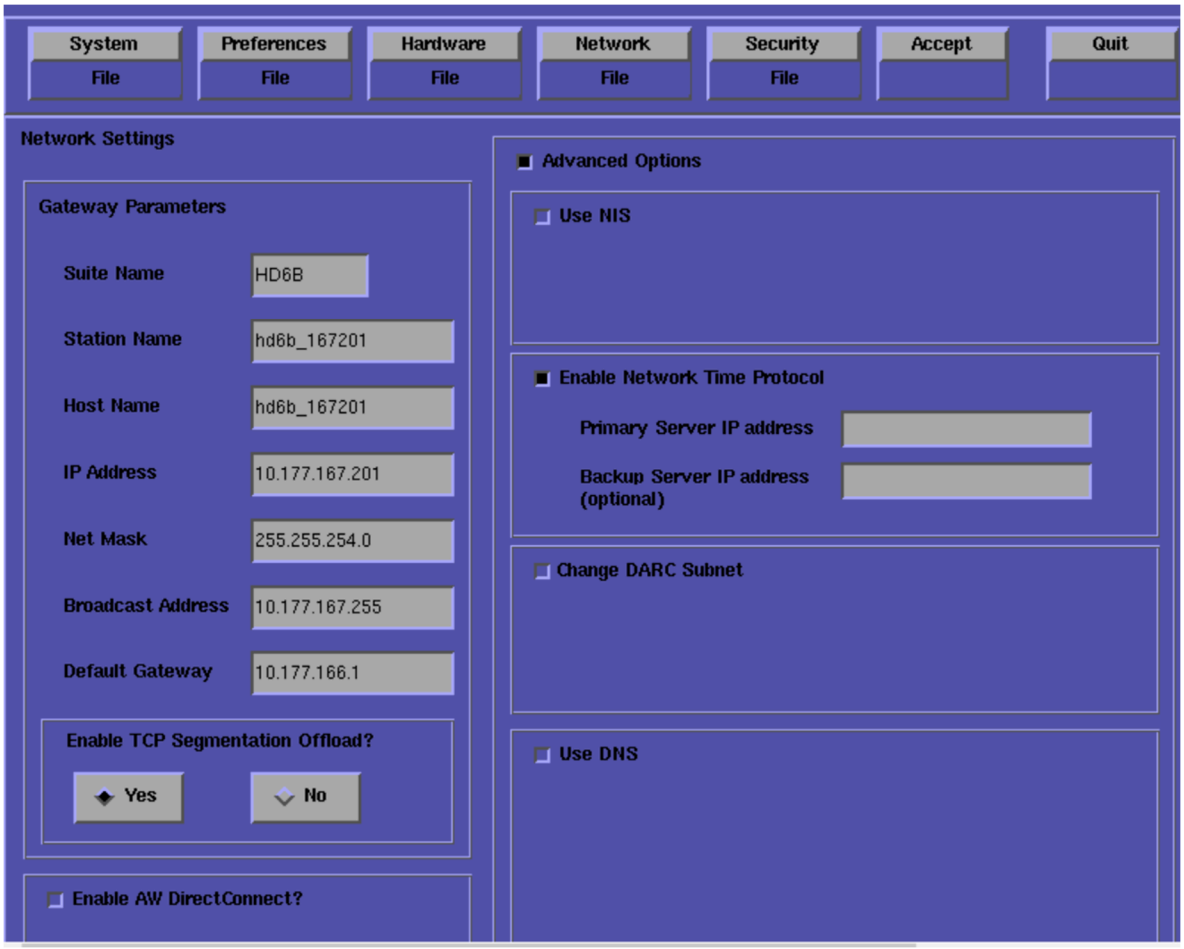
7. Checking protocol count on CT device

```
cd /usr/g/protocols/scanRx
grep -i "protocol id" *.xml    | wc -l
grep -i "protocol file" *.xml    | wc -l
```

8. NTP Server Sync

When the customers device time is out of sync with the local timezone, we have observed problem with IPM application. To rectify this problem, we recommend configuring the scanner with the NTP (Network Time Protocol) server available in the customer's environment. By doing so the machine time will always be in sync with the local timezone.

This can be done by providing the NTP server details in the machine reconfiguration screen (inside Network Tab and on selecting the Advanced Options) as shown below:


System
File
Preferences
File
Hardware
File
Network
File
Security
File
Accept
Quit
Network Settings
Gateway Parameters
Suite Name
HD6B
Station Name
hd6b_167201
Host Name
hd6b_167201
IP Address
10.177.167.201
Net Mask
255.255.254.0
Broadcast Address
10.177.167.255
Default Gateway
10.177.166.1
Enable TCP Segmentation Offload?
Yes
No
Enable AW DirectConnect?
Advanced Options
Use NIS
Enable Network Time Protocol
Primary Server IP address
Backup Server IP address
(optional)
Change DARC Subnet
Use DNS

B US commercial URLs and curl commands

1. Environment URLs

HealthCloud UI / UOM	https://login.gehealthcloud.com
IPM Device Config	https://apps.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig
IPM UI	https://protocols.gehealthcloud.com
Service Org	GE Healthcare Service Organization

2. URL whitelist

Ideally, if the customer is fine with wildcard rules for URL whitelisting, following two entries should be enough for communication between CT/MR devices with IPM in AWS cloud

- *amazonaws*
- *gehealthcloud*

But, if the customer prefers granular monitoring and is whitelisting down to specific URLs on the firewall (i.e. customer is against using wildcards in the firewall rules), following is the list of URLs that needs to be whitelisted to allow successfully allow communication between IPM Agent running on modality devices in customer site to IPM in AWS Cloud.

URL	Purpose
cognito-idp.us-east-1.amazonaws.com	Authentication
cognito-identity.us-east-1.amazonaws.com	Authentication
protocols.gehealthcloud.com	Cloud UI
api.protocols.gehealthcloud.com	Cloud API calls
gehc-us-east-1-979872559648-prd-ipmcmn-configv2-bqyujaiz.s3.us-east-1.amazonaws.com	Blob Store location (AWS S3)
prd-ipm-us-east-1-<customer-organization-id>.s3.us-east-1.amazonaws.com	
sns.us-east-1.amazonaws.com	Message Notification
sqs.us-east-1.amazonaws.com	Message subscription
sts.amazonaws.com	Authorization & Token Service

3. Curl commands to verify whitelisting

$ curl -k https://apps.protocols.gehealthcloud.com/ipmcon_pmapi2/ipm/v2/deviceconfig

{"ipm_apiGatewayUrl":"https://api.protocols.gehealthcloud.com/ipmcon_pmapi","enroll_apiGatewayUrl":"https://api.protocols.gehealthcloud.com/ipmcmn_v2api","region":"us-east-1","cognitoDetails":{"identity_pool_id":"us-east-1:1d64b2fe-db10-43ce-9b28-576817dbd064","user_pool_id":"us-east-1_6Q1jcD5pZ","client_id":"7umicerpmlthmqcr2ekfcqfsou"}}

$ curl -k https://protocols.gehealthcloud.com

```
<!doctype html>
<html>
<head>
<meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
<meta charset="utf-8">
<title>GE Imaging Protocol Manager</title>
<base href="/">
<meta name="viewport" content="width=device-width, initial-scale=1">
<style include="px-theme-styles" is="custom-style"></style>
</head>
<body>
<gepm-root>Loading...</gepm-root>
<script type="text/javascript"
src="/vendor.737de0edec9903257d1b.js"></script><script
type="text/javascript"
src="/app.737de0edec9903257d1b.js"></script></body>
</html>
```

$ curl "https://cognito-idp.us-east-1.amazonaws.com/" -X OPTIONS -H "Access-Control-Request-Method: POST" -H "Origin: https://protocols.gehealthcloud.com" -H "Referer: https://protocols.gehealthcloud.com/login" -H "User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/71.0.3578.98 Safari/537.36" -H "Access-Control-Request-Headers: content-type,x-amz-content-sha256,x-amz-target,x-amz-user-agent" --compressed -I -k

```
HTTP/2 200
date: Fri, 01 Mar 2019 21:57:06 GMT
content-length: 0
x-amzn-requestid: f48bd512-3c6c-11e9-9a7a-bf486e3c0251
access-control-allow-origin: *
access-control-allow-headers: content-type,x-amz-content-sha256,x-amz-target,x-amz-user-agent
access-control-allow-methods: POST
access-control-expose-headers: x-amzn-RequestId,x-amzn-ErrorType,x-amzn-ErrorMessage,Date
access-control-max-age: 172800
```

```
$  curl "https://cognito-identity.us-east-1.amazonaws.com/" -X OPTIONS
-H "Access-Control-Request-Method: POST" -H "Origin:
https://protocols.gehealthcloud.com" -H "Referer:
https://protocols.gehealthcloud.com/login" -H "User-Agent: Mozilla/5.0
(Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)
Chrome/71.0.3578.98 Safari/537.36" -H "Access-Control-Request-Headers:
content-type,x-amz-content-sha256,x-amz-target,x-amz-user-agent" --
compressed -I -k
HTTP/2 200
date: Fri, 01 Mar 2019 21:58:18 GMT
content-length: 0
x-amzn-requestid: 1f3b1c0e-3c6d-11e9-8e3a-ffc24157be16
access-control-allow-origin: *
access-control-allow-headers: content-type,x-amz-content-sha256,x-amz-
target,x-amz-user-agent
access-control-allow-methods: POST
access-control-expose-headers: x-amzn-RequestId,x-amzn-ErrorType,x-
amzn-ErrorMessage,Date
access-control-max-age: 172800
```

$ curl -X OPTIONS https://sts.amazonaws.com -H "Origin: https://protocols.gehealthcloud.com" -H "Access-Control-Request-Method: GET" -I

```
HTTP/1.1 200 OK
x-amzn-RequestId: 47003bc7-3c6d-11e9-90ff-6f1c58ba266e
Access-Control-Allow-Origin: *
Access-Control-Allow-Methods: GET
Access-Control-Expose-Headers: x-amzn-RequestId,x-amzn-ErrorType,x-
amzn-ErrorMessage,Date
Access-Control-Max-Age: 172800
Content-Length: 0
Date: Fri, 01 Mar 2019 21:59:24 GMT
```

$ curl -X OPTIONS https://sns.us-east-1.amazonaws.com -H "Origin: https://protocols.gehealthcloud.com" -H "Access-Control-Request-Method: GET" -I

```
HTTP/1.1 200 OK
x-amzn-RequestId: 3dc8b0f5-b290-5419-8c06-e4061f3bbeec
Access-Control-Allow-Origin: *
Access-Control-Allow-Methods: GET
Access-Control-Expose-Headers: x-amzn-RequestId,x-amzn-ErrorType,x-
amzn-ErrorMessage,Date
Access-Control-Max-Age: 172800
Content-Length: 0
Date: Fri, 01 Mar 2019 22:00:11 GMT
```

$ curl -X OPTIONS https://sqs.us-east-1.amazonaws.com -H "Origin: https://protocols.gehealthcloud.com" -H "Access-Control-Request-Method: GET" -I

```
HTTP/1.1 200 OK
x-amzn-RequestId: 3258b385-bc82-570f-998d-e776115a64e7
Access-Control-Allow-Origin: *
Date: Fri, 01 Mar 2019 22:00:56 GMT
Access-Control-Allow-Methods: GET
Access-Control-Expose-Headers: x-amzn-RequestId,x-amzn-ErrorType,x-amzn-ErrorMessage,Date
Access-Control-Max-Age: 172800
Content-Type: null
Content-Length: 0
```

Please note that the following command is different for each organization. We need to replace customer's organization id for the highlighted value. Following curl command is an example for "GE Healthcare Service Organization"

$ curl -X OPTIONS https://prd-ipm-us-east-1-1106ffd8-096e-4d9a-bb88-a0fe50acb45c.s3.us-east-1.amazonaws.com -H "Origin: https://protocols.gehealthcloud.com" -H "Access-Control-Request-Method: GET" -I

```
HTTP/1.1 200 OK
x-amz-id-2:
0QU1Zl+P/bUR8rqo9IV/quvY+s2YzK46nRzUlmZBHcCY/TO3qhEPQZfOX58jQtPLXVJcrAjyOow=
x-amz-request-id: 2FB16D98D27884C7
Date: Fri, 01 Mar 2019 22:02:23 GMT
Access-Control-Allow-Origin: *
Access-Control-Allow-Methods: GET, POST, PUT
Access-Control-Expose-Headers: ETag, x-amz-meta-x-cos-object-title, x-amz-meta-x-object-type, x-amz-meta-sourcefilename, x-amz-request-id
Access-Control-Max-Age: 3000
Vary: Origin, Access-Control-Request-Headers, Access-Control-Request-Method
Content-Length: 0
Server: AmazonS3
```

Following is a false positive test where the error "CORS is not enabled" is coming from AWS S3 but it confirms the connectivity

$ curl -X OPTIONS https://gehc-us-east-1-979872559648-prd-ipmcmn-configv2-bgyujaiz.s3.us-east-1.amazonaws.com -H "Origin: https://protocols.gehealthcloud.com" -H "Access-Control-Request-Method: GET"

```
<?xml version="1.0" encoding="UTF-8"?>
<Error><Code>AccessForbidden</Code><Message>CORSResponse: CORS is not enabled for this
bucket.</Message><Method>GET</Method><ResourceType>BUCKET</ResourceType><RequestId>7B45E7DAD6BA95AC</RequestId><HostId>tnFhNI3XvoRm3G0vWVJGNzOYGJy6GuUFPAIKUmmXpYuyPtxN2+yUdVLx0gkL5/iZSKQQ5kSrzqU=</HostId></Error>
```

Following is a false positive test where the 403 is coming from cloudfront distribution

```
$ curl --header Content-Type: --header Accept: --header "Full Request
URI: api.protocols.gehealthcloud.com:443" --user-agent "Mozilla/5.0
(Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)
Chrome/70.0.3538.77 Safari/537.36"
https://api.protocols.gehealthcloud.com -X OPTIONS -H "Access-Control-
Request-Method: GET" -k -I
```

```
HTTP/1.1 403 Forbidden
Content-Type: application/json
Content-Length: 23
Connection: keep-alive
Date: Fri, 01 Mar 2019 22:13:16 GMT
x-amzn-RequestId: 366ba01a-3c6f-11e9-8329-e1c8cd5a4962
x-amzn-ErrorType: ForbiddenException
x-amz-apigw-id: V4gzbFOeIAMFp3Q=
Via: 1.1 f2c051917a765f1d1a1cd2ce1622adb9.cloudfront.net (CloudFront), 1.1
b051e9c33308597b659c33b8999b521d.cloudfront.net (CloudFront)
X-Cache: Error from cloudfront
X-Amz-Cf-Id: vk88KQgETi91I-V2TSR3eanmD4GclAa96C6_hcZ0aLrXxz1l2EpASg==
```

4. Getting the list of URLs used by IPM

Ran XT simulator code on a developer box which connects to DEV IPM environment using "3.28.29.242" proxy.

When pull request is initiated from the IPM WebClient on the simulator device, the following S3Uri is being logged by the simulator:

```
s3:dev-ipm-us-west-2-57f6dd92-ed90-46c5-b6e4-
08641be0583c/transactions/av/pull/3f576669-d264-402e-92c8-
e6f17120c772/f3ba73bc-72f4-4bf6-81c7-28e301c57f92
```

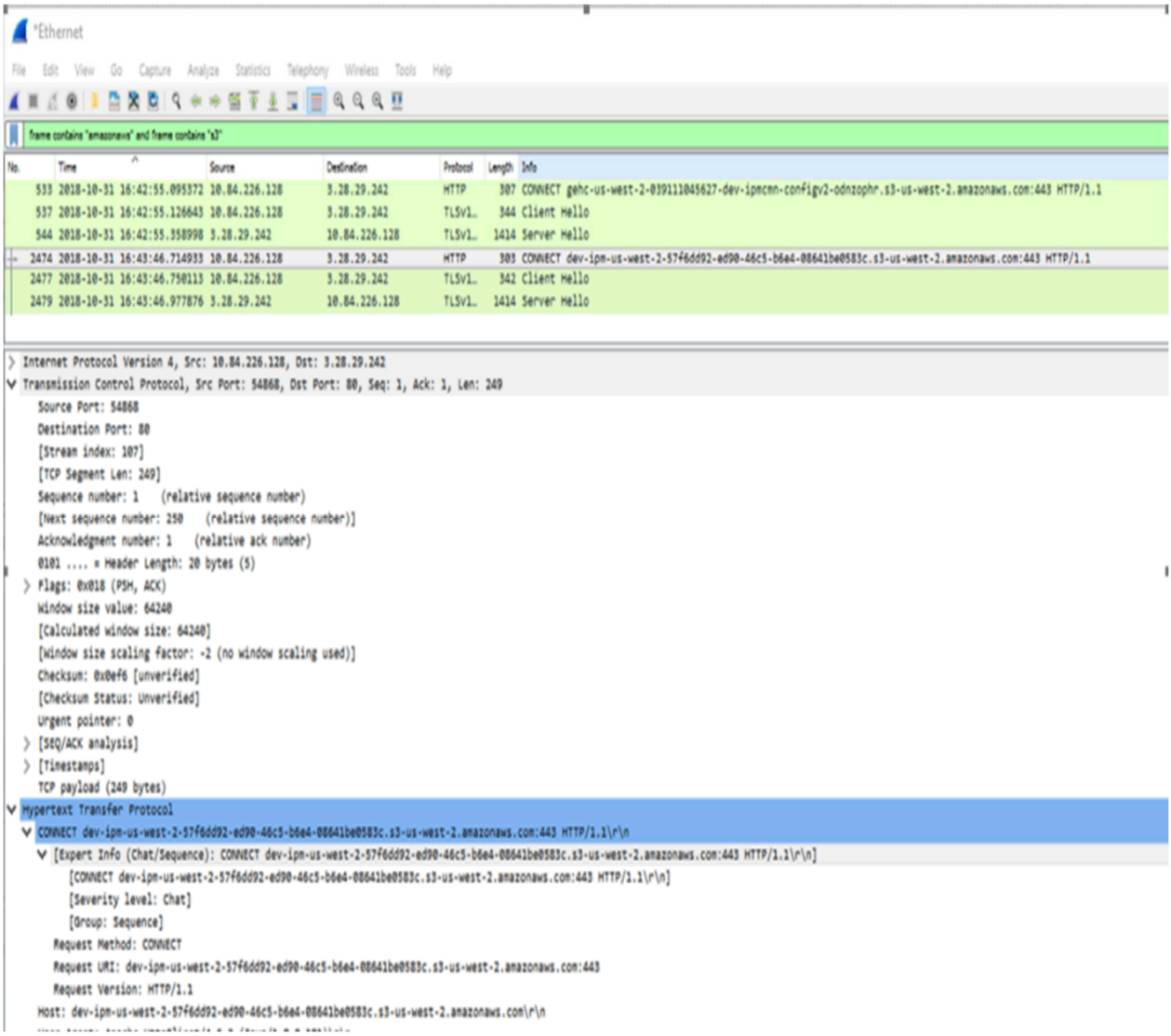
Looking at the following simulator code snapshot, this S3Uri is being used to create session token:

```
for ( File baseFile : file ) {

    GenerateSTSToken.getS3STSToken( inputToken, devicePoolDetails, s3uri );
    AmazonS3 s3client = GenerateSTSToken.s3client;
    // System.out.println("AmazonS3 ClientObject: "+s3client.toString());

    String keyName = null;
    String uploadFileName = baseFile.getName();

    if ( uploadFileName.endsWith( ".zip" ) ) {
        File uploadFile = new File( baseFile.getAbsolutePath() );
        keyName = GenerateSTSToken.keyName + "/" + "rawprotocols" + "/" + uploadFileName;

        try {
            PutObjectRequest request = new PutObjectRequest( GenerateSTSToken.bucketName, keyName, uploadFile );
```

After acquiring the session token, AWS API makes a call to upload device protocol to S3. Looking at the wireshark capture, AWS API is making calling the following endpoint:

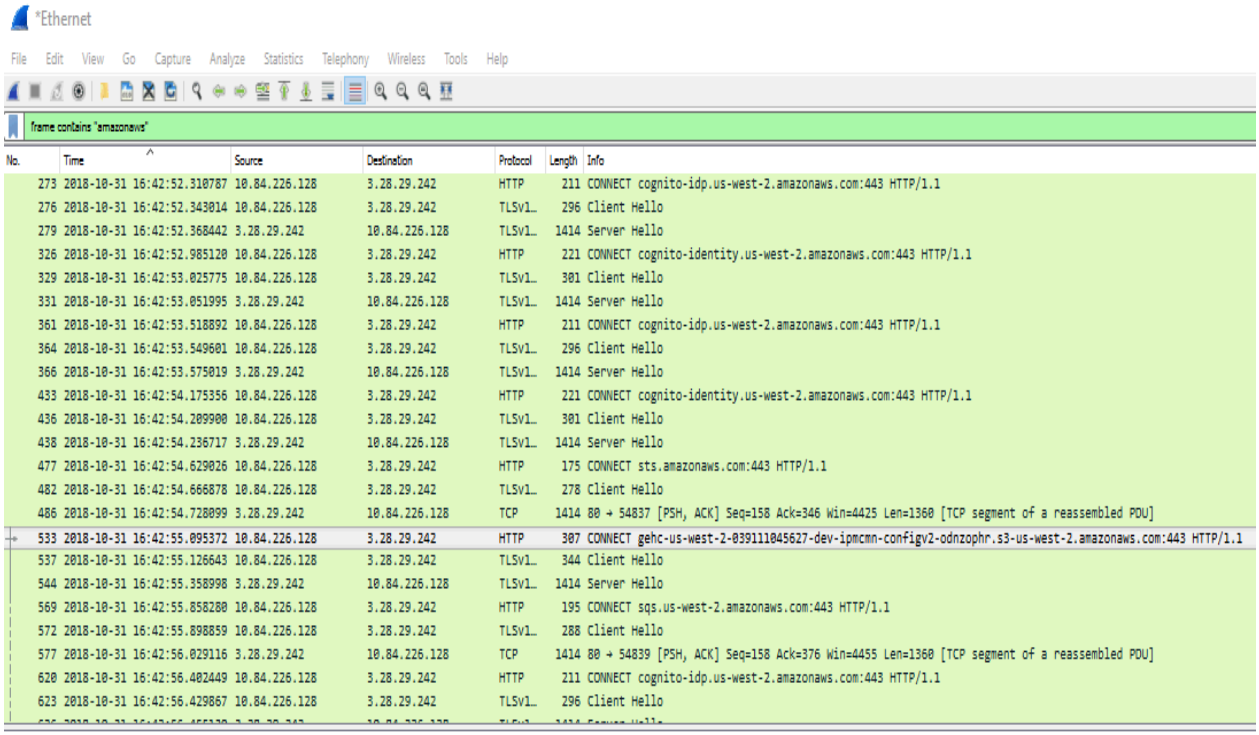
```
https://dev-ipm-us-west-2-57f6dd92-ed90-46c5-b6e4-08641be0583c.s3-us-
west-2.amazonaws.com
```

Following is the wireshark capture of the request:



Similarly, simulator is making calls to the following endpoints (cognito, sns, sqs):

https://cognito-idp.us-west-2.amazonaws.com
https://cognito-identity.us-west-2.amazonaws.com
https://sns.us-west-2.amazonaws.com
https://sqs.us-west-2.amazonaws.com
https://gehc-us-west-2-039111045627-dev-ipmcmn-configv2-odnzophr.s3-us-west-2.amazonaws.com


*Ethernet
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
frame contains "amazonaws"
No. Time Source Destination Protocol Length Info
273 2018-10-31 16:42:52.310787 10.84.226.128 3.28.29.242 HTTP 211 CONNECT cognito-idp.us-west-2.amazonaws.com:443 HTTP/1.1
276 2018-10-31 16:42:52.343014 10.84.226.128 3.28.29.242 TLSv1… 296 Client Hello
279 2018-10-31 16:42:52.368442 3.28.29.242 10.84.226.128 TLSv1… 1414 Server Hello
326 2018-10-31 16:42:52.985120 10.84.226.128 3.28.29.242 HTTP 221 CONNECT cognito-identity.us-west-2.amazonaws.com:443 HTTP/1.1
329 2018-10-31 16:42:53.025775 10.84.226.128 3.28.29.242 TLSv1… 301 Client Hello
331 2018-10-31 16:42:53.051995 3.28.29.242 10.84.226.128 TLSv1… 1414 Server Hello
361 2018-10-31 16:42:53.518892 10.84.226.128 3.28.29.242 HTTP 211 CONNECT cognito-idp.us-west-2.amazonaws.com:443 HTTP/1.1
364 2018-10-31 16:42:53.549601 10.84.226.128 3.28.29.242 TLSv1… 296 Client Hello
366 2018-10-31 16:42:53.575019 3.28.29.242 10.84.226.128 TLSv1… 1414 Server Hello
433 2018-10-31 16:42:54.175356 10.84.226.128 3.28.29.242 HTTP 221 CONNECT cognito-identity.us-west-2.amazonaws.com:443 HTTP/1.1
436 2018-10-31 16:42:54.209900 10.84.226.128 3.28.29.242 TLSv1… 301 Client Hello
438 2018-10-31 16:42:54.236717 3.28.29.242 10.84.226.128 TLSv1… 1414 Server Hello
477 2018-10-31 16:42:54.629026 10.84.226.128 3.28.29.242 HTTP 175 CONNECT sts.amazonaws.com:443 HTTP/1.1
482 2018-10-31 16:42:54.666878 10.84.226.128 3.28.29.242 TLSv1… 278 Client Hello
486 2018-10-31 16:42:54.728099 3.28.29.242 10.84.226.128 TCP 1414 80 → 54837 [PSH, ACK] Seq=158 Ack=346 Win=4425 Len=1360 [TCP segment of a reassembled PDU]
533 2018-10-31 16:42:55.095372 10.84.226.128 3.28.29.242 HTTP 307 CONNECT gehc-us-west-2-039111045627-dev-ipmcmn-configv2-odnzophr.s3-us-west-2.amazonaws.com:443 HTTP/1.1
537 2018-10-31 16:42:55.126643 10.84.226.128 3.28.29.242 TLSv1… 344 Client Hello
544 2018-10-31 16:42:55.358998 3.28.29.242 10.84.226.128 TLSv1… 1414 Server Hello
569 2018-10-31 16:42:55.858280 10.84.226.128 3.28.29.242 HTTP 195 CONNECT sqs.us-west-2.amazonaws.com:443 HTTP/1.1
572 2018-10-31 16:42:55.898859 10.84.226.128 3.28.29.242 TLSv1… 288 Client Hello
577 2018-10-31 16:42:56.029116 3.28.29.242 10.84.226.128 TCP 1414 80 → 54839 [PSH, ACK] Seq=158 Ack=376 Win=4455 Len=1360 [TCP segment of a reassembled PDU]
620 2018-10-31 16:42:56.402449 10.84.226.128 3.28.29.242 HTTP 211 CONNECT cognito-idp.us-west-2.amazonaws.com:443 HTTP/1.1
623 2018-10-31 16:42:56.429867 10.84.226.128 3.28.29.242 TLSv1… 296 Client Hello

C Onboarding a New organization

This section briefly explains the high-level tasks involved in the customer onboarding process. This information will be beneficial to the service engineer to understand the flow of events

1. Task list

Prerequisite: Need GE Admin. Need Service Org name along with Service Org Admin and Service User credentials.

- GE Admin creates Customer Org and sites
- GE Admin adds Org and App admins to Customer Org. Gives full access control to Customer Org Admin
- Customer Org Admin gives "Member" and "Power Member" site access to App Admin
- Customer Org Admin gives "IPM" application access to App Admin
- Customer App Admin gives "IPM" application access with "Enterprise Admin" role (enabled for Org and sites) to Org Admin
- Customer App Admin invites all remaining users for Customer Org and assign the associated IPM Roles
- Customer Org Admin gives "Site Protocol Admin" role (enabled for Org and sites) to App Admin
- Customer Org Admin enables and sends sharing partnership request to Service Org
- Service Org Admin accepts the sharing partnership request from Customer Org
- Service Org Admin enables Sharing partnership for the Service User in "Manage Users" section
- Verify that the Service User has "GE Service" role
- Service User logs into Customer Org through IPM Web to complete bootstrap process

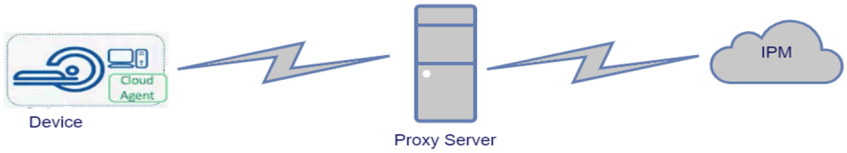
Once the bootstrap process is done, service user can login to the IPM webpage add devices to the Customer Org

D Proxy SSL Certificate

In customer's site, we ran into a certificate issue where CT Scanner failed to register with IPM hosted in AWS. HTTPS requests initiated by the device failed with the following errors:

```
com.ge.pm.device.exception.DeviceUtilityException:
com.amazonaws.SdkClientException:
Unable to execute HTTP request:
sun.security.validator.ValidatorException: PKIX path building failed:
sun.security.provider.certpath.SunCertPathBuilderException: unable to
find valid certification path to requested target
```

Following figure shows customer's network setup where requests generated from scanner device go through a proxy server.



Certain proxy servers (like Squid) when configured as intercepting proxy, act as MITM (Man-In-The-Middle) where they intercept and inspect the traffic between client and the server. One SSL connection is created between proxy and target server (IPM) and another SSL connection is created between proxy and the device.

When the IPM server responds to device's HTTPS request, it is intercepted by the proxy. The response is then forwarded from the proxy to the device. Since the secure connection between proxy and device is signed with customer/proxy's certificate authority (CA), and if customer's cert CA is not in the chain of trusted store of the device, it runs into an exception. This is because the device cannot validate proxy's certificate.

To resolve this issue, customer's cert which is used by the proxy server needs to be installed on the device.

Following are the steps to install customer's certificate into trusted store of device:

1. Download the certificate to a temporary folder (/var/temp)

   To import the certificate, login to the device using the credentials "ctuser".

   2. Change directory to locate certificate directory of the device

      ```
      cd /usr/g/sdapplications/java/latest/lib/security
      ```

   3. Import the certificate by running the following command

      ```
      keytool -importcert -trustcacerts -file /var/temp/<name of the
      certificate>  -alias <give an alias>  -keystore ./cacerts -
      storepass changeit
      ```

   4. To verify that the certificate is installed properly, one can run the following command

```
keytool -list -keystore ./cacerts  -storepass changeit | grep -i
<alias name used in import>
```

5. After this step, reboot the device

Additional Notes:

- For any reason, if the certificate that was imported needs to be backed out, one can run the following command:

```
keytool -delete -alias <alias of the certificate> -
keystore ./cacerts -storepass changeit
```

Manufacturer

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