

Digital Services Broadband

(High Speed Internet Connection)

QuickStart Guide

For Diagnostic
Imaging Equipment



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Digital Services Broadband (High Speed Internet Connection) QuickStart Guide

for Diagnostic Imaging Equipment

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Congratulations on your new GE Healthcare Equipment!

Operation of your new GE Healthcare Equipment will greatly benefit from a Broadband high speed internet connection. Our mutual goal is to get you connected to Broadband in order to utilize the GE Digital Services and Applications support that are available via Broadband.

Utilization of GE Digital Services will help you increase productivity via **increased Up-time**. This is enabled by proactive remote monitoring, immediate scan support and faster fixes when needed.

This Guide is intended to give you an overview of the Broadband preparation process that enables your site to have high speed internet connectivity ready at the time of the installation of your Equipment. This Guide contains the following:

- Overview of Digital Services enabled by Broadband
- Support Provided by GE Healthcare
- Broadband Installation Process Flow
- Assessment List

Additional Broadband information (i.e. Broadband Specialist list, current lists of ports and protocols and IPSEC parameters) can be found at the link below.

For more information on the complete scope of site planning requirements, please ask your GE Installation Specialist for typical drawings, a modality specific Site Readiness QuickStart Guide, and the Pre-Installation Manual for your System. Alternatively, you can view and download them electronically via this link:

<http://www.gehealthcare.com/company/docs/siteplanning.html>

**Your Broadband Specialist is your GE focal point.
Please contact your Broadband Specialist with
any questions regarding your connectivity.**

GE Healthcare Support

Your GE Broadband Specialist

GE Healthcare provides support in connecting your Equipment to Broadband through your Broadband Specialist. The following activities are performed by your Broadband Specialist:

- Assist in assessing your site for Broadband Connectivity
- Assist in identifying and overcoming challenges for establishing connectivity
- Interact with GE Field Engineer in establishing initial connectivity
- Interact with Customer's Information Technology personnel to discuss/resolve Broadband Connectivity issues and/or concerns
- Assist in configuring the remote connectivity tools and forwarding information to the GE Online Center (OLC)

For your GE Broadband Specialist contact information, please ask your GE Installation Specialist or visit the link below.

<http://www.gehealthcare.com/company/docs/siteplanning.html>

**Your Broadband Specialist is your
GE Healthcare Focal Point for Connectivity**

Project Team

This Guide is intended for both experienced and new Customer teams.

We recommend that this Guide be utilized by your team members, potentially consisting of:

- Senior Management
- Project Manager
- Information Technology Representative
- Architect and Engineer team
- Construction team
- System Users
- Other personnel affected by the project

Your facility's Information Technology (IT) team involvement is critical to the success of the Broadband readiness process. It is very important to identify your specific team members and start team meetings early in the project in order to develop a quality plan and have Broadband ready when your Equipment arrives.

If your facility does not have an Information Technology (IT) team, GE will require someone with networking knowledge to take the responsibility for your facility and work with you on the GE specific requirements. Please contact your GE Broadband Specialist with any questions.

Digital Services

Digital Broadband provides a fast, reliable, and secure connection that links your medical devices to the GE Healthcare (GEHC) remote service operations center (or Online Center, OLC). Through this connection, GE Healthcare is able to provide Digital Services that deliver several advantages, including:

- **Secure, Two-Way Communication**
- **Increased Up-time & Productivity**
- **Remote Fix Capabilities**
- **Remote System Monitoring**
- **Applications Training & Technical Support**
- **Expanded Imaging Capability Access**

Broadband Built-In - Your System includes the hardware and install support essential to be ready for a high speed internet connection.

Broadband enables advanced Digital Service offerings such as TiP Virtual Assist™, iLinq™, or eFlexTrial™. Your GE Healthcare Services account manager can provide more information on these, and other GE Healthcare Service offerings.

TiP™

Virtual Assist (TVA): Live, real-time Training in Partnership (TiP) applications training with remote console observation and shared system control by your imaging staff and GE trainers.

iLinq™

With one touch of the imaging workstation iLinq button, your staff can communicate live with GE Healthcare personnel to request service and support.

eFlexTrial™

Immediate online access to advanced software downloads to expand your imaging capabilities and try out new software at no charge for 30 days.

Digital Services (continued)

Types of System Access

There are three types of system access which can be performed remotely. Each type of access varies by modality and the support needed.

GE Healthcare initiated interaction – for Imaging Equipment. This is typically in support of service calls made by Customers. Typical remote sessions last 15 minutes or less, with the Online Center engineer utilizing a web-based tool to run diagnostics, analyze log files, observe Equipment operation, or reset subsystems in an effort to restore normal operation to Customers while minimizing any disruption.

Customer initiated connection occurs for Customers who have iLinq® installed on their diagnostic Imaging Equipment. iLinq® (GE Healthcare's optional communications tool-See previous page) provides the connection and reports system status to the Online Center.

Device initiated access occurs when remote service application on the diagnostic Imaging Equipment detects a potential alarm condition and initiates a call to the Online Center to report its status. Typical applications include MRI magnet subsystem monitoring or CT gantry temperature monitoring.

GE Healthcare's normal remote service traffic is sporadic (less than 100K) and most often very brief. This typically consists of basic terminal command/control, or the occasional transfer of an image file or two. Infrequently, there can be heavier traffic from downloading a software package, or a full exam set of images. These events will be coordinated with the Customer or conducted during off hours.

Product Compatibility

This Guide is intended for those Customers that have purchased products that have Broadband Built-In.

The following list* of products are compatible with Broadband functionality. Please check with your GE Broadband Specialist if you have any questions about product compatibility. This list is subject to change. For a current list, please visit the link below.

MR	<i>Minimum Software Version</i>	CT	<i>Minimum Software Version</i>
Signa Ovation	All	HiSpeed CT/e	Minimum 6.0
Signa OpenSpeed	HFO 2.0148b	HiSpeed CT/e dual	Minimum 2.06
Signa LX	Release 9.0	HiSpeedNX/I	Minimum 5.5
Signa TwinSpeed	Release 9.0	HiSpeed X/I (Lxi,Fxi...)	Minimum 6.01
Signa Cardiac	Release 9.1	CT/I	Minimum 6.2
Signa Excite	Release 10.x	LightSpeed QX/I	Minimum 1.3
Signa Excite 3T	All	LightSpeed Plus	Minimum 2.1
Signa CV/I	Minimum CNV4	LightSpeed Ultra	Minimum 3
Signa 3T	Compatible	LightSpeed 16	All
Signa Profile	Minimum 7.72	LightSpeed RT	All
Signa Contour	Minimum 7.72	LightSpeed Pro16	All
Magnet Monitor granite/advantech	Minimum 2.3	LightSpeed VCT	All
X-Ray	<i>Minimum Software Version</i>	Nuclear/Pet	<i>Minimum Software Version</i>
Cardiac		Advance	Minimum 5.1
INNOVA	ALL	Discovery LS	All
Mammography		Discovery ST	All
Seno2000D	All	Mill Myosight, MG...)	Ver. 2.5 build 15 or above
Digital Fluoroscopy		Linux Powerstation	Ver 6.0
Precision	M5	VG	Minimum 6.0
Digital Radiology		eNTEGRA/eNTEGRA VIEW	Minimum 2.03
Revolution XQ/I	Version 10.12.5 or above	Infinia	All
Revolution XR/d	Version 18.0	Xeleris/Xeleris View	All
Network Products	<i>Minimum Software Version</i>	Ultrasound	<i>Minimum Software Version</i>
AW	Version 4.0 or Above	LOGIQ 7	All
GEMNET	All	LOGIQ 9	All
		LOGIQworks	All

*For a current list of product compatibility, please use link below:

<http://www.gehealthcare.com/company/docs/siteplanning.html>

Key Responsibilities (this is not a comprehensive list of responsibilities)

Customer / Project Leader

- Focus communications among team members
- Review your GE Healthcare Terms and Conditions of Sale
- Completion of site-specific construction items prior to Broadband Connectivity
 - Refer to the Assessment List section in this document
- Ensure your Information Technology representative is in contact with GE Healthcare for approval of Broadband Connectivity and initial network data collection (i.e. IP address)

Customer IT Leader / Specialist

- Review GE technical interface requirements for Broadband Connectivity
- Assess Customer network compatibility:
 - Network architecture
 - Router compatibility
- Perform network update activities; if required
- Provide approval to GE for connectivity
- Perform connectivity set-up and testing with GE team

Customer Architect / Engineer

- Develop overall preliminary plan for Customer site, and coordinate with GE Healthcare Installation Specialist for Broadband construction requirements (if needed)

GE Broadband Specialist

- Support the Customer Broadband Connectivity readiness to System install schedule
- Manage the Customer relationship including:
 - Make initial Customer contact and own Customer IT relationship
 - Review Broadband requirements with Customer
 - Address Customer concerns about Broadband / VPN Connectivity
 - Answer any technical questions from Customer
 - Gain approval from the Customer to proceed with Broadband / VPN Connectivity
 - Schedule Connectivity with Customer and GE technical team

Getting Started

GE Healthcare recommends using this QuickStart Guide with your team to connect your GE Imaging Equipment via Broadband. This Guide is available electronically at the link below*.

GE Healthcare looks forward to supporting you in having your Broadband completely configured in time for delivery of your Imaging Equipment.

Please start the following critical processes:

(if you have not already)

**Contact your GE Healthcare
Broadband Specialist**

— — —

**Provide your Information Technology
representative's contact information**

— — —

**Select the potential location(s) of
Network Connections for your
Modality Imaging Systems**

* Documents are available in print (from your GE Broadband Specialist) or by electronic media at the link below:

<http://www.gehealthcare.com/company/docs/siteplanning.html>

Process Flow

This Process Flow section provides you with a high level map and details of the entire process from Network Connection selection to Equipment delivery and installation of your Broadband connection.

ALL team members should have a basic understanding of the steps in this process. This supports the creation of an integrated and predictable schedule.

This section describes the typical Broadband process steps. You will need to determine if your project has special needs not addressed by this typical process flow, and then develop the specific schedule for your project.

The actual duration of your overall schedule will depend on the configuration of your GE Healthcare order and the needs for your site preparation.

Also, your site specific plan and design requires the use of the full set of planning information and specifications found in the GE Healthcare Pre-Installation Manual (PIM) and Final Installation Drawings for the GE Equipment you are having installed. These steps will ultimately be coordinated as part of the Customer Site Preparations with your GE Installation Specialists.

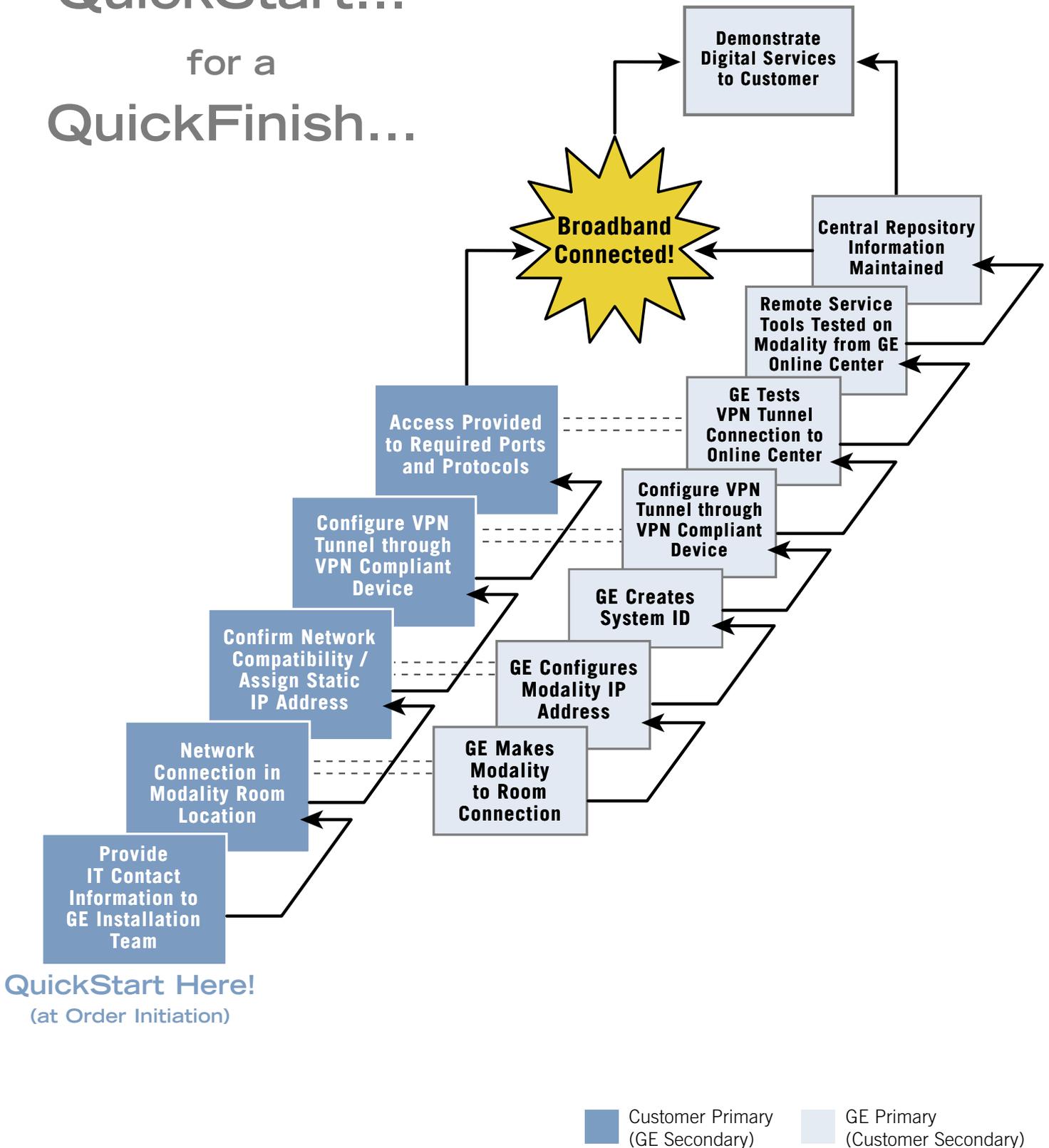
Please contact your GE Installation Specialist if you have not yet received a copy of the GE Healthcare Pre-Installation Manual (PIM) or your Final Installation Drawings.

You can also view and download the PIM electronically via this link:

<http://www.gehealthcare.com/company/docs/siteplanning.html>

An electronic version of this QuickStart Guide and examples of typical equipment drawings are also available at the link above

QuickStart... for a QuickFinish...



This portion of the Process Flow section outlines further task descriptions for each step.

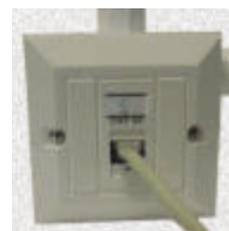
Note: This is not a comprehensive list of tasks or requirements in the process.

Network Connection in Modality Room Location

- A wall outlet is required to have a CAT 5 10/100 M connection
 - Located as per the GE Final Installation Drawings



This type of connector will come out of the GE modality Imaging Equipment



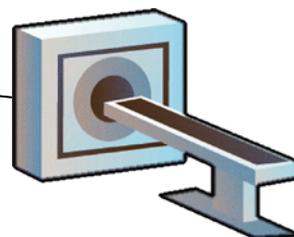
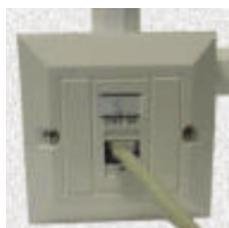
You will need a RJ45 wall plate to connect into

Confirm Network Compatibility / Assign Static IP Address

- Network assessment by Customer IT
 - Network compatibility with GE specifications
 - IP assignment
 - Router compatibility
- A static IP address associated with the GE Equipment needs to be given to your GE Broadband Specialist
 - A static IP address does not change each time a link is established
- Designate AE_Title to correspond with GE System ID(s)

GE Makes Modality to Room Connection

- GE Field Engineer assigns System ID(s) to Equipment
- GE will connect the newly installed modality utilizing CAT 5 cable



Customer Primary (GE Secondary)

GE Primary (Customer Secondary)

GE Configures Modality IP Address

- The GE Field Engineer will configure the modality with the supplied static IP address
- The connectivity information will be forwarded to your GE Broadband Specialist
- GE will keep System ID to IP address record

VPN Tunnel Through VPN Compliant Device

- VPN provides a secure site to site connection between your Equipment and the GE Online Center
- If you have a non registered IP addressing scheme we may need to use NAT (Network Address Translation)
 - If NAT is required the VPN device must have multiple NAT capability
- To be compliant, your VPN device will need to support 3DES and IPSEC protocols
- If your device is not compliant, you can discuss options with your GE Broadband Specialist

Access Provided To Needed Ports

- Please see Remote Service Ports & Protocols section for all needed ports

GE Configures & Tests VPN Tunnel Connection to Online Center

- Your GE Broadband Specialist will schedule time with your Information Technology contact to ensure that a reliable connection is established

Customer Primary
(GE Secondary)

GE Primary
(Customer Secondary)

Remote Service Tools Tested on Modality from GE Online Center

- An initial checkout of the remote service tools will be completed by an On-Line remote engineer



Central Repository Information Maintained

- Provide any information updates/changes for your site to your GE Broadband Specialist and Field Engineer
- GE Field Engineer will alert the Online Center with updates/changes



Broadband Connected!

- Now that your site is Broadband connected, GE will be able to provide the advanced support services, as described in the GE Digital Services section

Demonstrate GE Digital Services to Customer

- Train Customer in the use and features of GE Digital Services

Customer Primary (GE Secondary)

GE Primary (Customer Secondary)

Remote Services Ports & Protocols

The following protocols and destination ports are used during remote service of GE Healthcare Diagnostic Imaging Equipment:

GE Ports and Protocols	
Inbound to Customer	
ping	echo & echo reply (ICMP Type 0 and 8)
FTP	TCP 21
telnet	TCP 23, 2327, 2328 (2327 & 2328 CT/PET only)
HTTP	TCP 80, 8080, 3003, 3128, 4444 (3128 XR only, 3003 & 4444 UL only)
rexec	TCP 512
XR Console Emulation	TCP 3003, 3276-3277
VNC	TCP 5800, 5900
MR firmware diagnostics	TCP 8100
Outbound from Customer	
ping	echo & echo reply (ICMP Type 0 and 8)
FTP	TCP 20
HTTP	TCP 80, 8002
GEHC diagnostics	TCP 7979
X-Windows	TCP 6000-6200

For a current list of IPSEC Parameters, please see link below.

<http://www.gehealthcare.com/company/docs/siteplanning.html>

IPSEC Parameters

The following may be helpful for Information Technology groups needing to establish security protocols:

IPSEC Parameters	
GE VPN Device	Cisco 7200-series Router
GE IPsec Peer	208.51.30.227, .230
GE Encryption Domain	150.2.0.0 255.255.0.0
Pre-shared secret key	Given on the phone
Key Algorithm	ISAKMP (UDP 500)
ISAKMP Auth Mode	Pre-shared Secret
ISAKMP Hash	MD5
ISAKMP Encryption	3DES CBC
ISAKMP Diffie-Hellman	Group 2
ISAKMP Key Lifetime	86,400 Sec (24 hrs)
ISAKMP Key Mode	main
Perfect Forward Secrecy	Off
IPsec Encapsulation	Tunnel Mode
IPsec Protocol Type	ESP (IP Protocol 50)
IPsec Cipher Algorithm	3DES
IPsec Authentication	HMAC-MD5
IPsec Lifetime	3600 seconds (1 hr)

For a current list of IPSEC Parameters, please see link below.

<http://www.gehealthcare.com/company/docs/siteplanning.html>

Site Readiness Assessment

This Assessment Checklist should be used by your Project Manager, IT Leader and your GE Healthcare Installation Specialist to determine if your site is ready for Broadband Connectivity. It is your Project Manager's responsibility to maintain the project schedule and communicate any changes.

GE Healthcare recommends using the Assessment Checklist for guidance in planning your Broadband installation. For your convenience, there is a removable (perforated margin) version of the Assessment Checklist located on page 29 of this guide.

Failure to provide any of the items by the agreed upon installation date MAY result in:

- The inability to deliver the System on the requested date
- Delay in System installation
- Delay in System availability for patient exams and earning revenue

For your GE Broadband Specialist contact information, please ask your GE Installation Specialist or visit the link below.

<http://www.gehealthcare.com/company/docs/siteplanning.html>

Thank you for your diligence in making sure the Assessment Checklist is complete on time. Contact your GE Healthcare Broadband Specialist with questions.

Assessment Checklist for Broadband Installation

Critical items to be completed by Customer before Equipment delivery

Check when complete

Notes / Issues / Action Plan

Construction complete per Pre-Installation Manual requirements

CAT 5 Networking connection in place and connected to facility network

Static IP address and AE_Title established for primary Imaging Equipment (Additional IP addresses and AE_Titles may be required for some Equipment, e.g. MR Magnet Monitoring)

VPN Tunnel open to the Internet via the required ports for GE VPN connection. Check ports needed for connection

Customer and GE have tested and confirmed VPN connection is active

Customer Radiology staff is scheduled and available for Applications training and Remote Services demonstration

Assessment Checklist for Broadband Installation

Critical items to be completed by Customer before Equipment delivery

Check when complete

Notes / Issues / Action Plan

Construction complete per Pre-Installation Manual requirements

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Terminology/Acronyms

3DES.....	An expanded and much more robust Data Encryption Standard that utilizes a 256-Bit Key
AE_Title	This is synonymous with Host Name. It equates to the device name that it is known by on the customer LAN
CAT.....	Category (Describes type of wire that goes in the wall for a network connection)
CT.....	Computed Tomography
DES.....	An encryption standard entitled Data Encryption Standard that is comprised of a 56-Bit Key
FE.....	Field Engineer
GE.....	General Electric Company
GEHC.....	GE Healthcare (A Division of GE)
Guide.....	QuickStart Guide
IP.....	Internet Protocol (An addressing scheme)
IPSEC.....	Type of Security Protocol
IT.....	Information Technology
MR.....	Magnetic Resonance
NAT.....	Network Address Translation
OLC.....	Online Center
PET.....	Positron Emission Tomography
PIM.....	Pre-Installation Manual
Static IP.....	An IP address that does not change each time a link is established
VPN.....	Virtual Private Network

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