

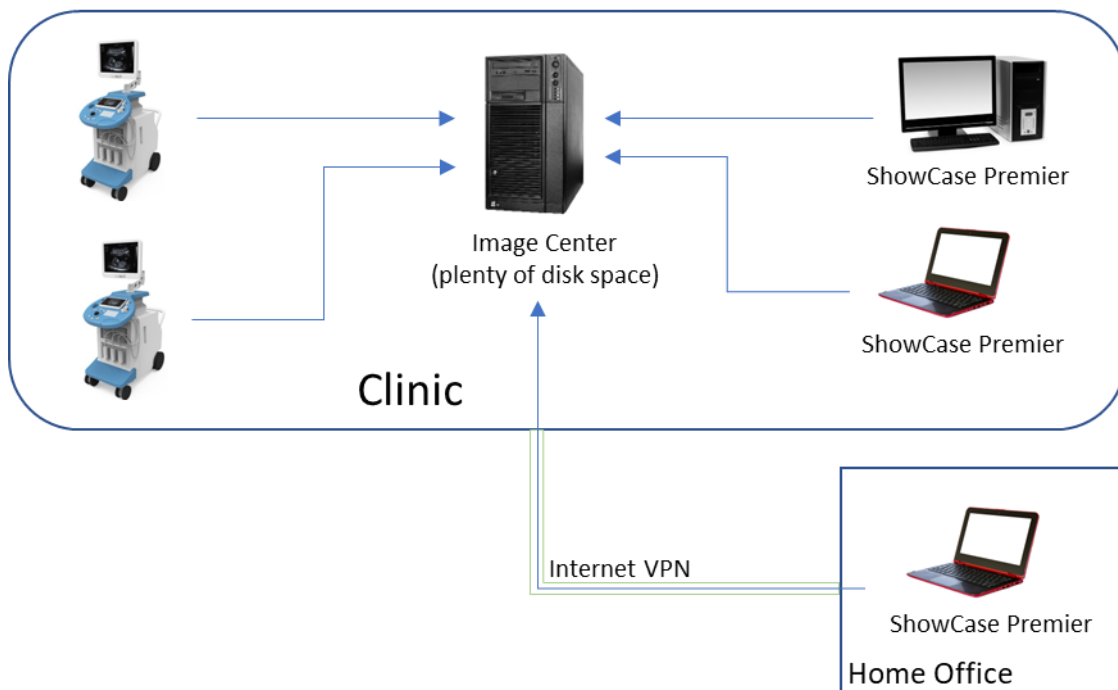


SHOWCASE® and Image Center Deployment

ShowCase and Image Center are designed to work in a variety of settings, from very small individual practices to mobile ultrasound groups to large practices that span multiple clinics. There are two software components: the ShowCase Viewer and the ShowCase Image Center. The Viewer, which comes in three 'flavors', Basic, Premier, and Workstation, is used to read DICOM studies. The Image Center receives studies from imaging devices, stores them, and makes them available to the ShowCase Premier and Workstation Viewers.

Deployment Scenarios

Single Clinic with Remote Viewing

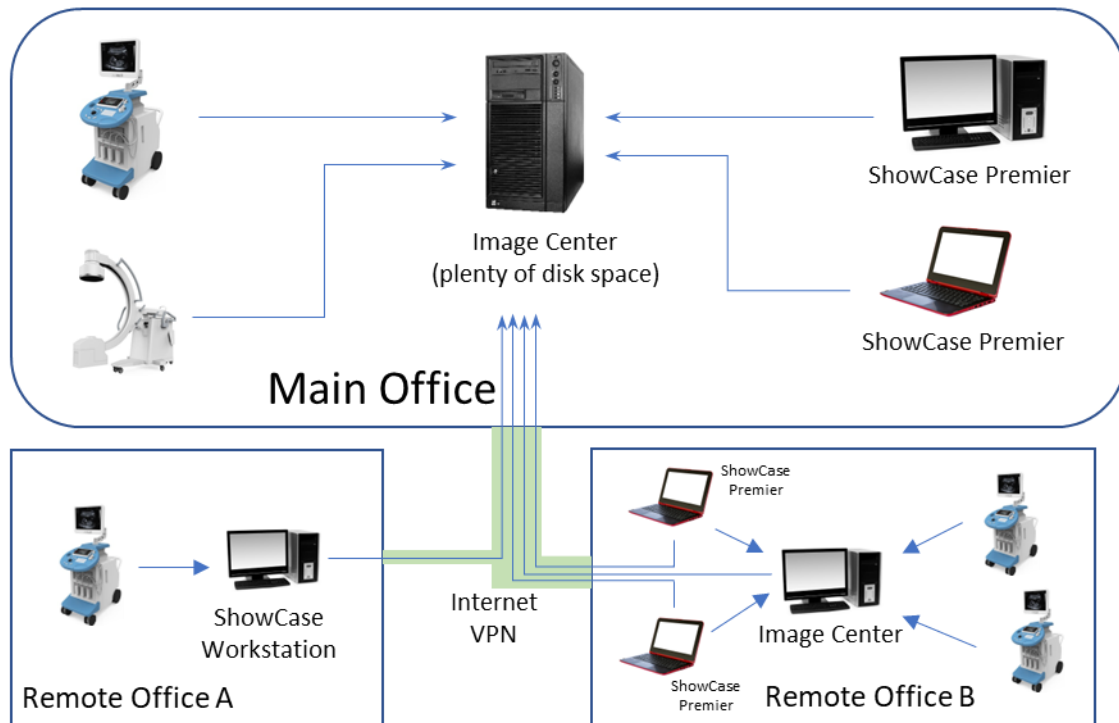


Typically, a clinic designates one computer as the “Server”. This computer runs the Image Center software, which receives images from the ultrasound machines and stores them to a disk drive. ShowCase Premier is then installed on other computers in the office and accesses studies through the Image Center. ShowCase Premier can also be installed on geographically remote computers, e.g. home PCs or other clinics, and studies can be reviewed over a Virtual Private Network (VPN).

Local and Remote Viewing

Local viewing is done over the local network, which is very fast. Images appear almost instantly when a study is opened. VPNs are usually 10 to 100 times slower than local networks. A ShowCase Viewer in “Remote Mode” will cache studies on a local hard drive. Manually retrieving a study from an office to a remote viewer can take anywhere from 2 to 20 minutes, depending on the speed of your VPN. For this reason, there is an automated download feature available in ShowCase that does this in the background so that when the reading physician sits down at ShowCase to read a study remotely, it opens instantly because it's already been cached. The local cache can be configured to automatically clean up these pre-fetched studies so your disk does not become overfull.

Multiple Offices Using Conventional Internet



This common deployment assumes multiple offices connected via conventional internet, like Comcast Business Class. This example shows one 'central' office with two satellite offices. Remote Office A is small, with scanning and little or no reading going on there. Remote Office B is larger, with physicians based there or frequently reading studies at that location.

Main Office: Imaging machines in the main office send studies to the Image Center in the main office, where they are stored and made available to the ShowCase Premier viewers in that office. These studies are also available for remote viewing at Office A and Office B.

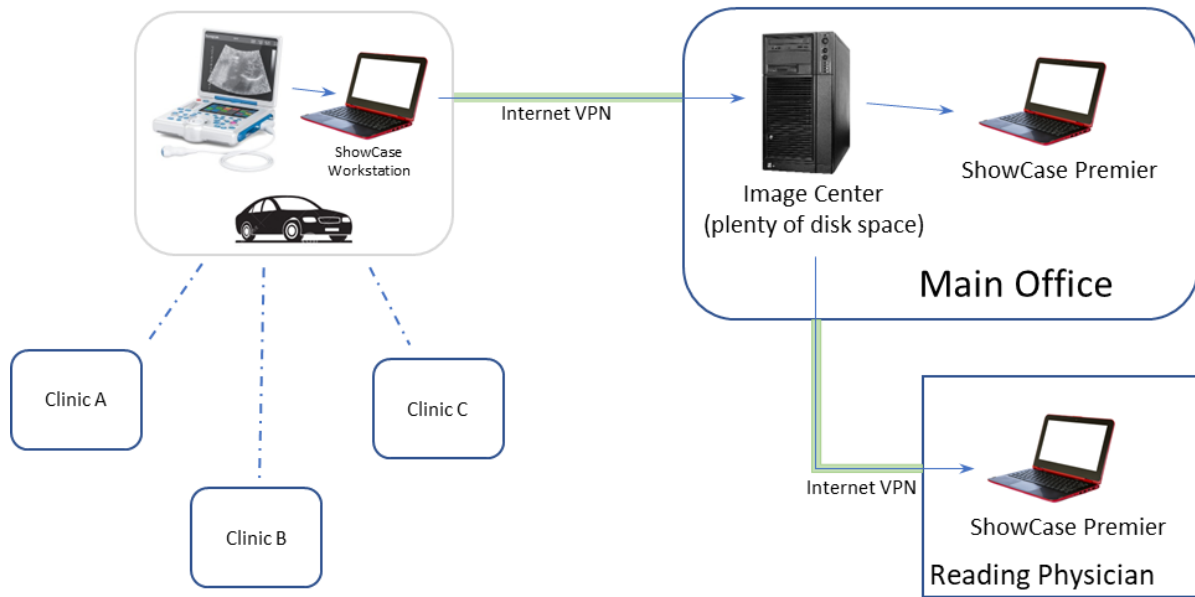
Remote Office A: The imaging machine sends studies to a ShowCase Workstation, which stores them to a local cache for immediate viewing at the Workstation. The Workstation then automatically forwards the studies to the Image Center in Main Office for long term storage and viewing from all locations.

Remote Office B: The imaging machines send studies to a local Image Center, which stores them for immediate viewing by all ShowCase Premier clients on site. The Image Center then automatically forwards the studies to the Image Center in the Main Office for long term storage and viewing from all locations. The local ShowCase Premier clients can read studies from both the Main Office and Remote Office B.

Why not just send the studies directly to the Image Center in the Main Office?

Network speed, bandwidth and load. Please see the section Multiple Offices Using Dedicated Network Connections later in this guide, for details.

Mobile Ultrasound Practice



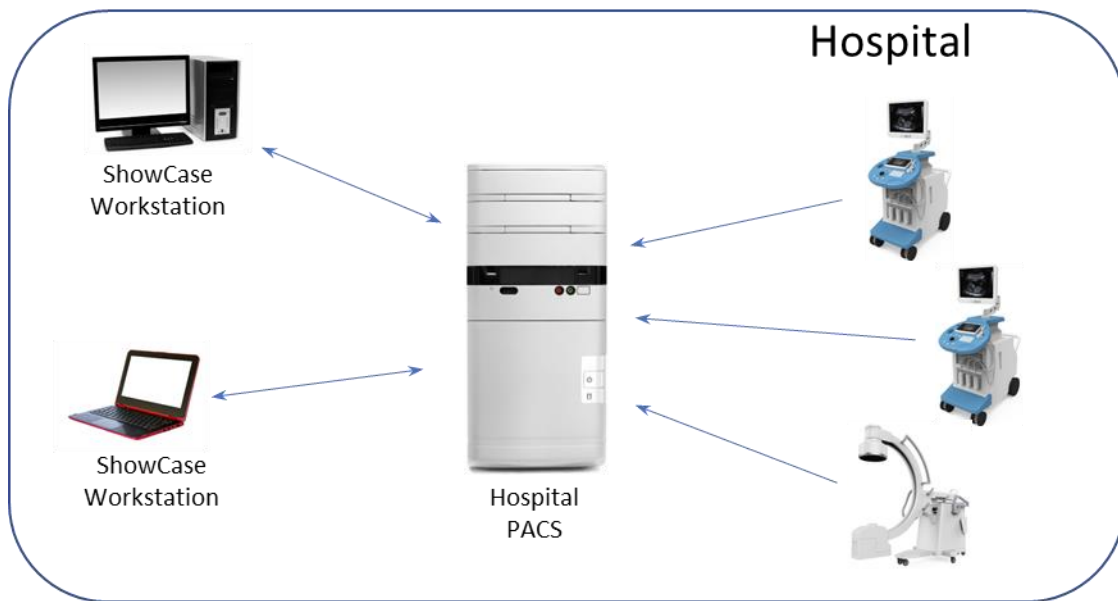
In this scenario, the sonographer travels from clinic to clinic with a portable US machine. They will also need a computer with ShowCase Workstation installed on it that they will download the studies to. The Workstation, will, in turn, forward those studies over conventional internet connections, to the Image Center.

The Main Office is where the studies are stored long term. The reading physician accesses the studies from wherever they happen to be located over VPN. A copy of ShowCase Premier is present in the Main Office to allow viewing and managing studies.

The Workstation affords the sonographer a lot of flexibility. They could be carrying it with them, wirelessly accepting studies from the portable ultrasound machine. Or leave the Workstation on a PC at home, connecting the US machine to it when they get home, at which point the studies will auto-forward to the Image Center. This avoids the need to take the US machine into the Home Office in order to transfer the studies to the Image Center for reading.

There are a lot of different ways to address the needs of mobile practices. This is just one example.

Query/Retrieve from PACS

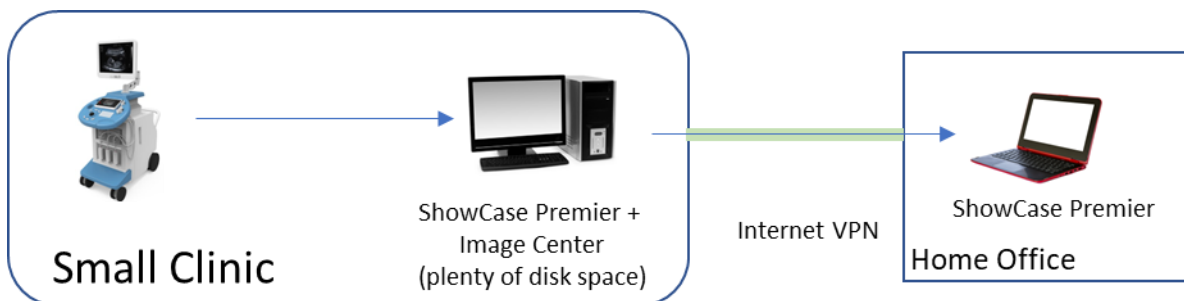


Studies are stored on your PACS, and you want a cardiology friendly solution for review. Use ShowCase Workstation to DICOM Query/Retrieve studies for review. Studies can also be 'pushed' to the PACS from the Workstation, e.g. if you've received a study on media (DVD, USB, etc.) and need a quick means to review the study and upload it to the PACS.

Auto-Forwarding To PACS

ShowCase Workstation and ShowCase Image Center can also be configured to automatically forward studies to the PACS, as well. Let's say you have a clinic that is very cardiology focused, and your PACS may not be, and you wish to use ShowCase in clinic, for immediate review. Just set up your Workstation (or Image Center) to auto-forward to your PACS, and you'll have both the convenience of an immediately available read and the security of knowing your studies are going off to your long term archival PACS. [This is not reflected in the diagram up above.]

A Very Small Practice

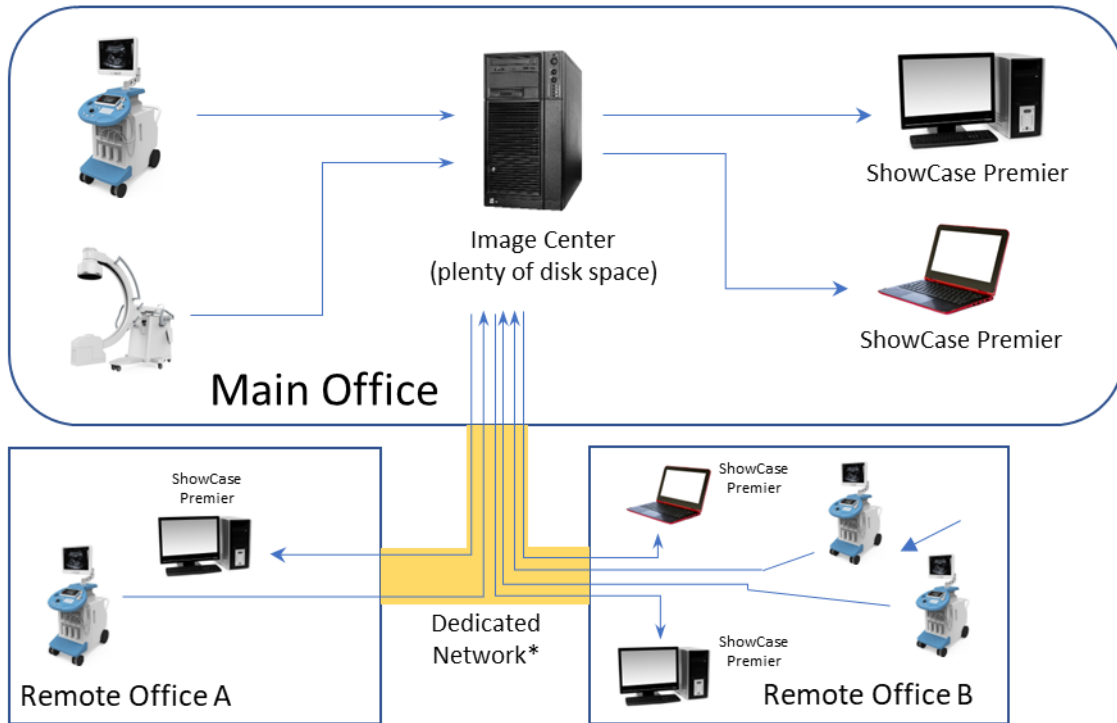


ShowCase Premier and Image Center are both installed on one computer at the office. Studies are sent from the ultrasound machine to the Image Center and the physician can review those studies on the same computer. ShowCase Premier can also be installed at the physician's home, and that license for ShowCase Premier can be

'shared', to keep costs to a minimum. (A shared license can be installed on several machines but only in use on one machine at a time.)

This is a cost effective startup solution for the small practice, with plenty of opportunity for growth if that is needed.

Multiple Offices with Dedicated Network



Studies are sent from all imaging modalities to the Image Center in the main office, and every ShowCase Premier client connects to the Image Center to access and display those studies.

This multi-office deployment requires dedicated network connections between each location, either dedicated bidirectional high-speed fiber or bonded T1 lines. In effect, a WAN with similar speed, bandwidth, and reliability as a LAN.

The advantage of this deployment is that all of your data is stored in one location, which makes it easier to manage and back up. This deployment has two major drawbacks:

1. Sending studies from the ultrasound machines to the Image Center machine requires a high-quality, **expensive internet connection**. One ShowCase customer with this deployment uses 3 dedicated, bonded T1 lines to connect their clinics.
2. Studies must make the trip to the Image Center and back to the copies of ShowCase Premier at each site. An average cardiology study of 150MB must travel across the network to be read at the remote clinics.

Most customers find that drawback #1 prevents them from going with centralized deployment. Ultrasound machines are designed to send studies over a LAN, and do not perform well on slow or 'choppy' networks.

When it comes to the actual performance of a network connection, advertising is often deceiving. For example, Comcast Business happily touts 1G+ speeds but leaves out mention that those speeds are only one way *and* they will arbitrarily throttle (slow down) your network if you start using more bandwidth than they like.

We always recommend trying your network out before committing to this kind of deployment. Contact your network service provider. Find out what speeds and guarantees they provide. Download our 30 day trial. Send some studies to the Image Center. Watch for transmission timeouts at the ultrasound machine. Try reading from a different site to see if this works for your specific needs.

This deployment is rare amongst our customer base because of the costs involved and the level of network management required.

Hardware and Licensing

Image Center Hardware

The Image Center software can be run on everything from a laptop to server grade hardware to a VM, depending on the needs of your practice. Whatever computer you choose to host the software should be an 'always on' computer, so that is always available to receive studies from imaging machine or serve up studies to ShowCase viewer clients.

Disk Space Is Important

Medical records need to be (typically) stored for a minimum of 7 years, but it varies from state to state and the nature of your practice. Fortunately, disk is very affordable. This storage can be a hard drive, RAID, NAS, etc. You want to purchase reliable storage and plenty of it. For more detail, see our "Image Directory Creation and Maintenance" guide.

Offsite Backup Is Important

Trillium does not provide offsite backup of your data. You will need to do that on your own. As it is one of the only effective countermeasures to ransomware (or other catastrophic situations) it is essential that you implement this.

Workstation

ShowCase Workstation will run on everything from a laptop to a server. You'll want about 300G of free space for the Workstation to use when it locally caches studies it is query/retrieving, receiving, and/or forwarding.

For you DICOM works, the Workstation can be run as its own stand-alone DICOM SCP. It just doesn't have an archive.

Viewing Stations

ShowCase Premier is installed on each computer that needs to access studies from the Image Center. (ShowCase Basic cannot access an Image Center.) Each copy of ShowCase Premier requires a license. The viewing computers do not require a lot of disk space, and conventional video cards work well with ShowCase. Avoid USB video, which can cause viewing problems.

Local viewing stations need read-only access to the Image Directories in the Image Center. Remote viewing stations are configured to locally cache studies for viewing, but the disk space requirements are small if the locally stored studies are periodically removed from the local cache folder.

ShowCase Premier Licenses can be shared between ShowCase computers, but only one person at a time can be using that license, so it's best to buy a number of licenses equal to the number of sonographers + number of reading physicians so no-one is fighting over licenses.

VPN

If your practice does not already have a VPN, we suggest trying the LogMeIn Hamachi software VPN. It is reliable, easy to deploy, and inexpensive.

What About Remote Desktop Solutions?

Remote desktop solutions such as Windows Terminal Services, Citrix, LogMeIn, GoToMyPC, etc. are designed to provide a functional approximation of your desktop for reading documents and interacting with some of your software. It is not designed to render accurate color or gray scale or display diagnostic-quality medical video.

ShowCase is an FDA regulated medical device that has been designed to assure that ShowCase renders images at their maximum diagnostic quality using accurate color, gray scale range and playback rates. Any changes in image quality are clearly marked for the user. Therefore, it is incompatible with our FDA clearance to use ShowCase viewers with remote desktop software. It is not an intended use of ShowCase, and our staff cannot support such configurations.

Free 30 Day Trial

At Trillium, we are strong believers in “try before you buy.” We encourage all of our potential customers to go to the Download section of www.triltech.com and download the free 30 day trial of our Image Center and ShowCase viewing software. Install it on your existing hardware and try it with your network, workflow, and how you operated your practice. The “Getting Started...” page at http://www.triltech.com/getting_started.html provides the steps to get the software installed and configured. If you have questions, please contact us at support@triltech.com.

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