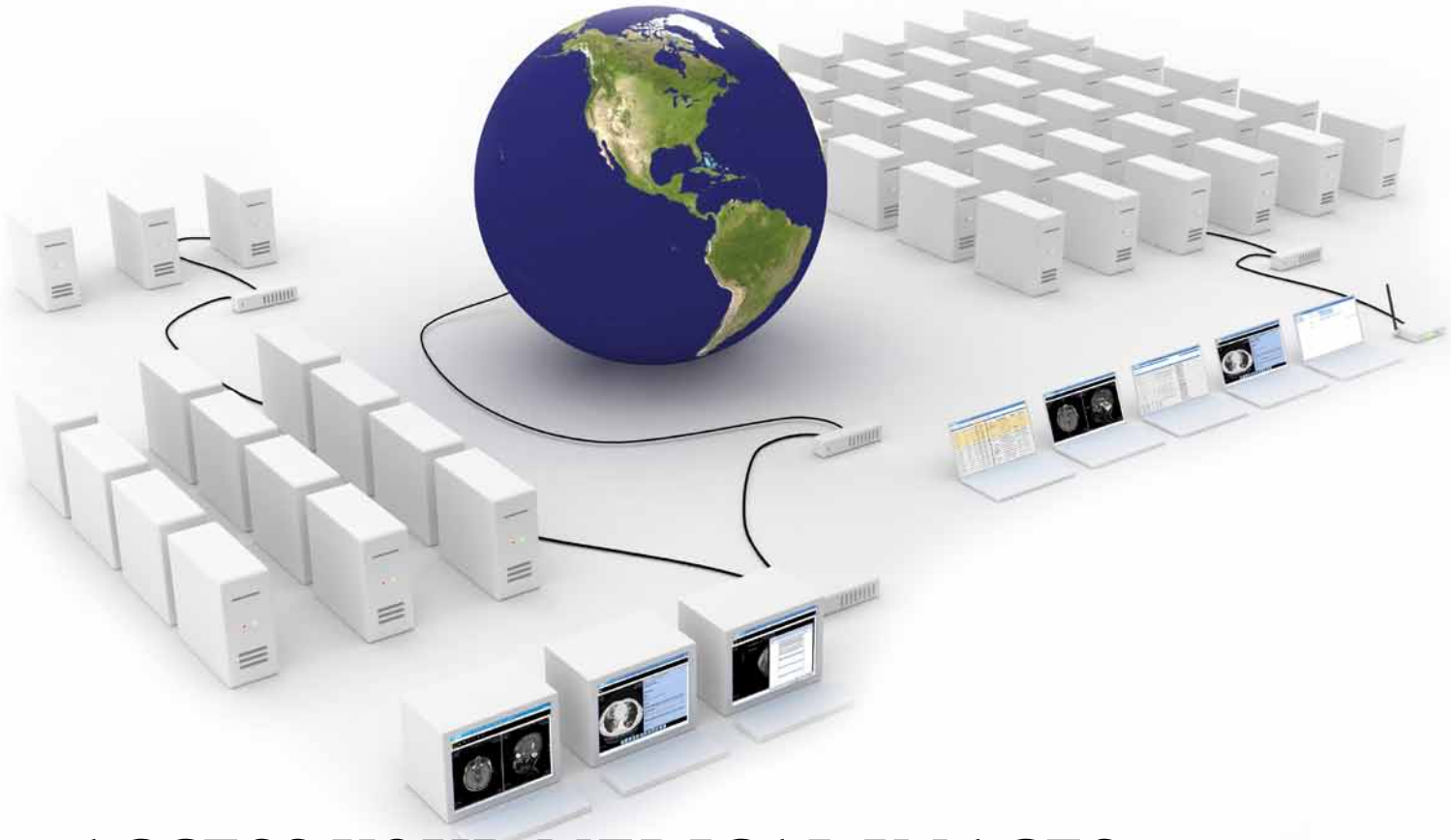
TELERADIOLOGY

AVAILABLE TECHNOLOGIES IN REMOTE DIAGNOSTICS

THE WORLD IN YOUR HANDS



ACCESS YOUR MEDICAL IMAGES ANYTIME AND ANYWHERE

Selecting the right solution for teleradiology is crucial. Therefore, we offer you a comprehensive review of available technologies to make your decision easier and more accurate.

Thanks to the ongoing technology development and the sinking costs of medical diagnostic devices, examinations based on medical imaging studies are becoming increasingly common and accessible to a large part of the population. Even remote regions are nowadays in possession of sophisticated imaging equipment.

Unfortunately, the number of radiologists and specialists trained to read those medical images is not growing at the same rate as the studies being currently produced. This generates a serious bottle-neck, which becomes even more complicated as most professionals in the radiology field tend to settle in metropolitan areas.

Besides, if a second opinion is required, the shipping of images to another specialist may involve high costs, and even the quickest means of transport can be too slow if a human life depends on it.

By implementing teleradiology systems, many hospitals and imaging centers can solve these key issues. Radiologists do not have to be present at the same location as the patients and even the largest images can be transferred in a matter of minutes. This way, hospitals and imaging centers increase their independence and flexibility as well as their savings in time and resources.

Additionally, they can outsource possibilities for sub-specializations while keeping high standards and eliminating bottle-necks.

Technically seen, there are two main parameters that must be taken into account for any teleradiology project:

1. The transmitted and received data must be consistent.
2. The privacy of the patient's data must be ensured either by using high-asymmetric encryption or by pseudonymizing/anonymizing the data.

At present, teleradiology programs can be implemented by using one of the following technologies:

- DICOM email
- Web-based access
- DICOM communication using image compression and VPN or SSL

In order to help you find the appropriate teleradiology solution, we prepared a helpful guide explaining these available technologies for remote diagnostics.

DICOM EMAIL

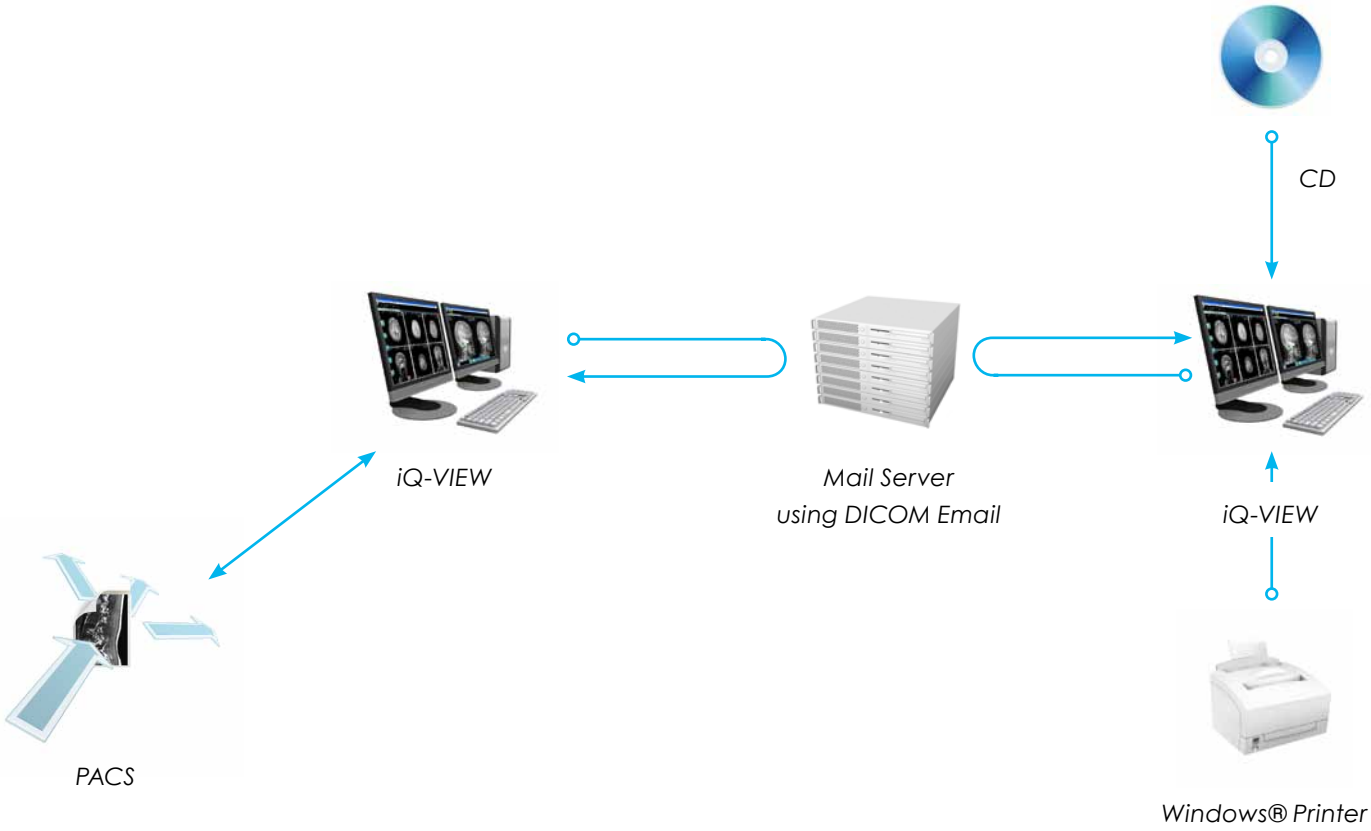
DICOM email is a solution to send emails manually from a DICOM node. This system can be used for any selected DICOM object.

A standard email infrastructure supports the transmission, which makes the system fast, secure (when using encryption), cost-saving and also very stable when working through firewalls.

There is medium-level privacy protection when using DICOM email; the system does not show standardized regulations for signatures.

DICOM email is optimal for the transmission of medical images between low frequented point-to-multipoint independent healthcare providers, like small imaging centers with low imaging traffic. With DICOM email it is further possible to enable bidirectional DICOM communication.

DICOM viewers such as iQ-VIEW already include DICOM email as one of their features.



WEB-BASED ACCESS

The web-based access solution is based on an existing PACS, which distributes the respective studies via http or https web links.

Using web-based access, a secure connection (depending on the access rights and methods) can be established giving the user the possibility to link selected studies/reports with full interactivity.

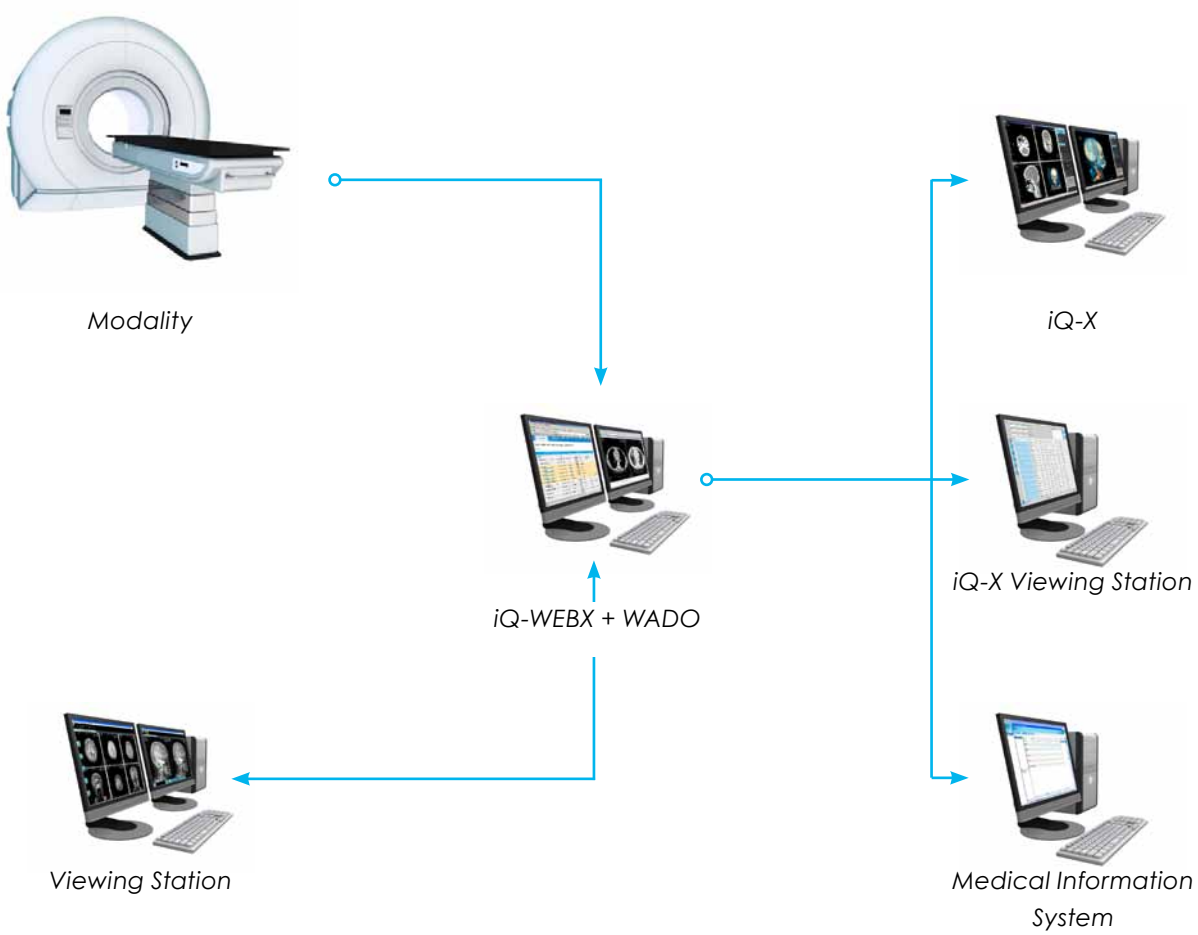
The protection of the patients' privacy is very good and remote storage of images is not required.

When using firewalls, ports for WEB or SSL should be open.

Web-based access is recommended for in-house reading or transmission to referring physicians, e. g. in a hospital.

The file transfer in this kind of solution takes place in pull-mode, i. e. there are waiting times for the images to be loaded. The DICOM communication is unidirectional, i. e. it is optimized for querying of data.

iQ-WEBX, the PACS of IMAGE Information Systems Ltd., is ideal for web-based access.



DICOM COMMUNICATION USING IMAGE COMPRESSION AND VPN OR SSL

This solution uses standard DICOM nodes (IP, AET) on both communication sides. The communication of DICOM protocols takes place by using a compression proxy between the modalities on each site.

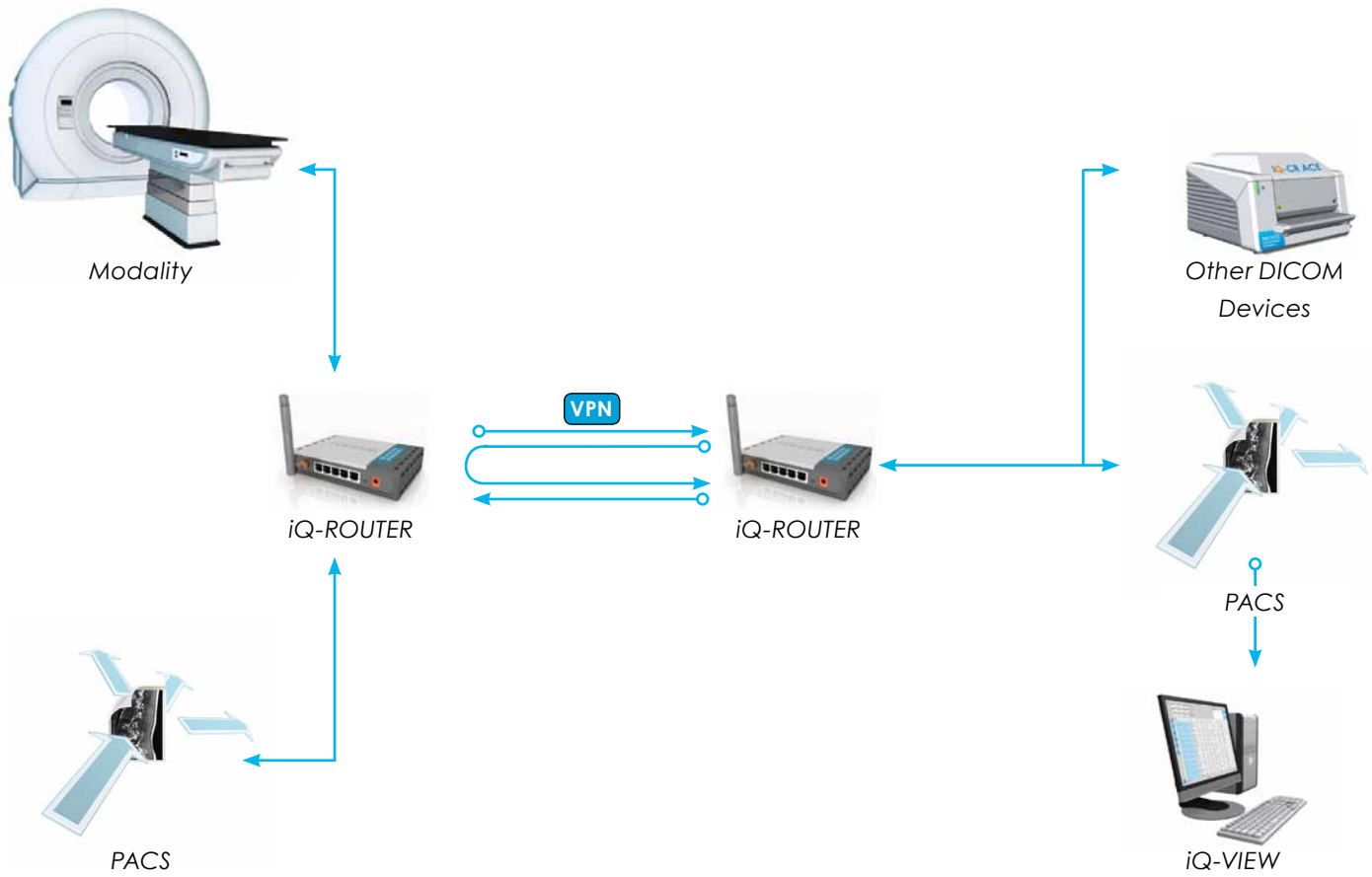
The great advantage of this process is that it can be 2 to 8 times faster than the bandwidth transmission rate, if lossless compression is used. In case of lossy compression, the transmission speed can increase 10 to 50 times. When using transfer in push-mode, objects can be available at distant sites if required.

The security of the system is high, while the level of privacy protection is medium, since only the VPN transmission tunnel is encrypted.

This kind of solution is very complex to install in networks with many nodes. Additionally, the configuration of firewalls can be complicated and VPN support is required for wide area networks. Usually, the use of VPN technology is directly connected to a license fee.

This system is optimal for any highly frequented and/or time-critical connection between imaging centers. The communication can be bidirectional.

IMAGE Information Systems Ltd. offers a product called iQ-ROUTER for optimizing DICOM communication using image compression and VPN.



	DICOM EMAIL	WEB-BASED ACCESS USING COMPRESSION	WEB-BASED ACCESS	DICOM COMMUNICATION USING IMAGE COMPRESSION & VPN/SSL
Principal Functionality	Selected DICOM objects zipped, incl. DICOMDIR (Supp 113)	Distribution of compressed images via https web-link	Image distribution via https web-link	Configuration of standard DICOM parameters (IP, AET) on both sides, Communication of DICOM protocol using a compression proxy between the modalities
Advantages	Standard mailinfrastructure can be used, Fast, Low costs, in-house access,	Secure connection, Links to selected studies/reports with full interactivity, Comparable with in-house access, Very fast	Secure connection, Links to selected studies and reports	Can be 2-4 times faster than the bandwidth using lossless and 10-50 times faster using lossy compression, Transfer in push-mode, Objects available at distant site when needed
Possible issues	No standardized regulation for signature	Image compression	Transfer in pull-mode (waiting for images)	Complex work to install networks with many nodes
Security	High	High (Depending on access rights / method)	High (Depending on access rights / method)	High
Patient's Privacy protection level	Medium	High (No storage at remote site required)	High (No storage at remote site required)	Medium
Firewall integration	Easy (standard email)	Can be complex (VPN support)	Moderate (SSL)	Can be complex (VPN support)
Best for	Low frequented point-to-multipoint teleradiology solutions	Emergency support, Home office, Remote office	Access for in-house reading or referring physician	Any highly frequented and/or time-critical connection between imaging centers
DICOM Communication	Bidirectional	Unidirectional	Unidirectional	Bidirectional
Products that support this technology	iQ-VIEW	iQ-WEBX + optional iQ-ROUTER	iQ-WEBX	iQ-ROUTER

OUR COMPANY AT A GLANCE

IMAGE Information Systems is an international company group with offices in the USA, Germany and the UK, which offers complete, user friendly and cost-effective medical imaging solutions.

Thousands of satisfied clients all over the world are benefiting from our state-of-the-art products for PACS, RIS, nuclear medicine, medical displays, X-ray solutions, 3D processing and teleradiology.

We have pioneered several innovations in the market:

- We have introduced MED-TAB, the first DICOM-calibrated medical tablet worldwide to provide superior portable image analysis
- Our iQ-ROUTER supports virtually all DICOM image formats and transfer syntaxes in data transmission
- DICOMReader has the highest available read-in rate of patient CD-ROMs, ensuring compatibility with almost all available imaging modalities and vendors

IMAGE Information Systems provides the second largest digital imaging user forum on earth, enabling users to share knowledge and best practice.

To learn more about us and our products, please visit our web site.

www.image-systems.biz

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OUR SOLUTIONS FOR YOUR IMAGING NEEDS

Radiologists	RIS and PACS for radiologists
Hospitals	RIS and PACS for hospitals
Veterinarians	Tailored veterinary RIS and PACS
Orthopedics	Orthopedic PACS and workflow tools
Mammography	RIS and PACS for breast care units
RIS/PACS Integration	How to integrate iQ-SYSTEM PACS with any existing Medical Information System
PACS Continuity Planning	How to ensure permanent access to your PACS
Teleradiology	Available technologies in remote diagnostics

IMAGE INFORMATION SYSTEMS LTD.
3RD FLOOR | 207 REGENT STREET | LONDON W1B 3HH | UNITED KINGDOM
TEL. UK: +44 20 3289 1500 | TEL. GER: +49 381 496 5820 | TEL. US: +1 704 323 6663
FAX GER: +49 381 496 582 99
WWW.IMAGE-SYSTEMS.BIZ | INFO@IMAGE-SYSTEMS.BIZ