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Image Sharing

October, 2014

Image Sharing Challenges

Size and location of images

Duplication of images, multiple versions of a study

Data integrity between trusts

Controlled access to images

...

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Options Available Today...

Traditional Approaches

- Image Exchange Portal
- Direct QR
- CD
- COMSOL

Advanced Approaches

- Vue Connect
- XDS
- *Vue Motion/My Vue*

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Vue Connect

Intelligent Image Sharing

Vue Connect

A patient-centric workflow solution so clinicians can access comprehensive patient information regardless of location seamlessly connecting multi-vendor, multi-site RIS & PACS systems.

Vue Connect: **What is it?**

Carestream *Vue Connect* addresses the barriers of:-

- Physical location of images
- Physical location of the user
- Network speed and reliability
- Different PACS/RIS/Reporting vendors on sites
- Data integrity between sites

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Vue Connect: **What is it?**

- ✓ Designed for **diagnostic workflow** in radiology
- ✓ Report *anywhere* concept
- ✓ **Image oriented**
- ✓ Use of **optimized protocols & standards** (CONN, TNL, RICE compression, Tunneling, Streaming)
- ✓ Allows the **integration of 3rd party** systems **via Standard Protocols**
- ✓ Data access from **Carestream Client or Vue Motion or WADO ...**
- ✓ Multiple patient ID support (**PIX**) to allow extra-enterprise integration by keeping local id and adding a global id (Internal PIX management or hosted expernally)
- ✓ Clear identification of the source of exams by the means of **Site ID**
- ✓ **No** physical **data movement** (tunnelling)

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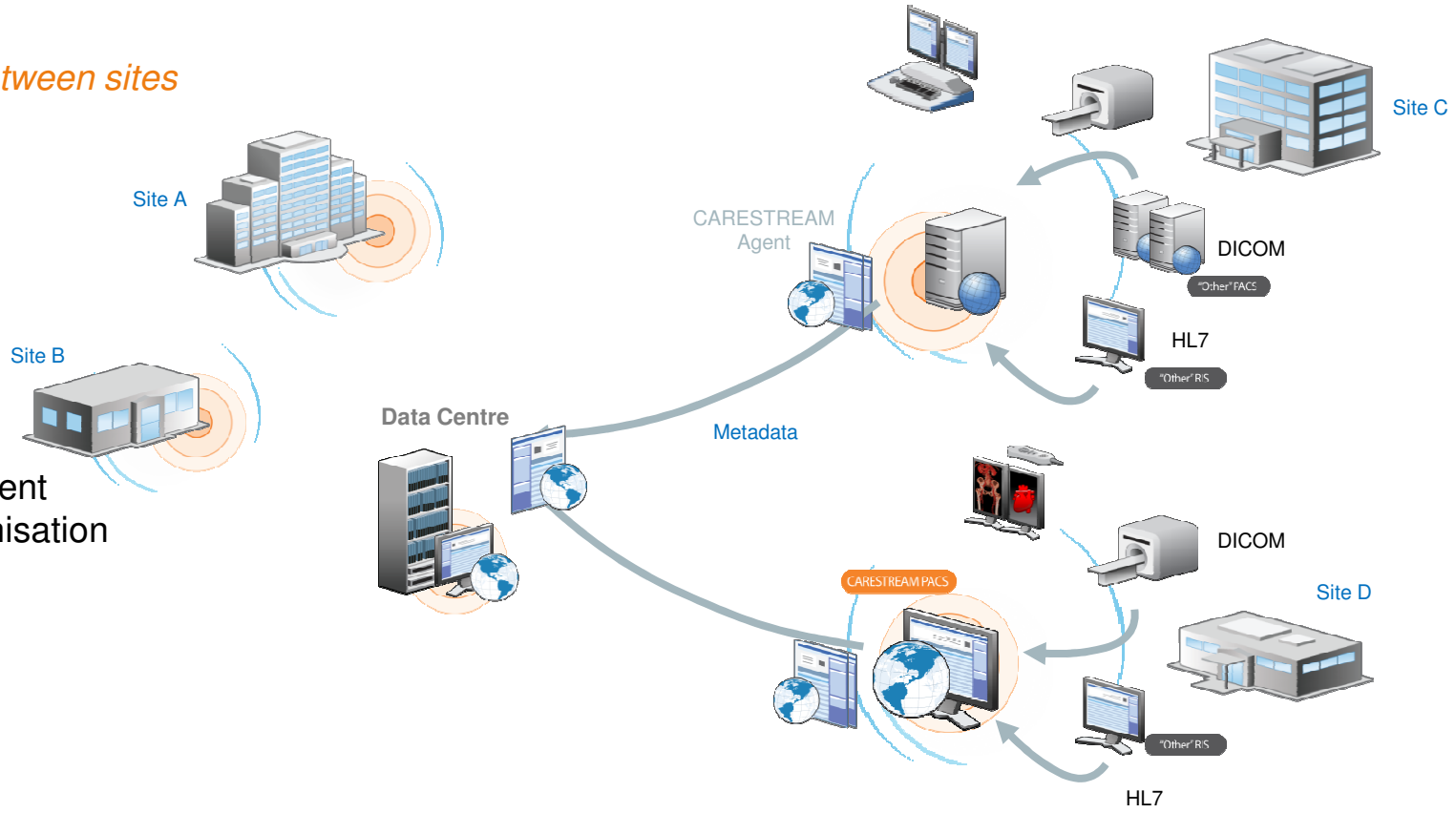
Vue Connect Architecture: **Synchronisation**

Synchronisation between sites



CARESTREAM Agent
Multi-Site Synchronisation

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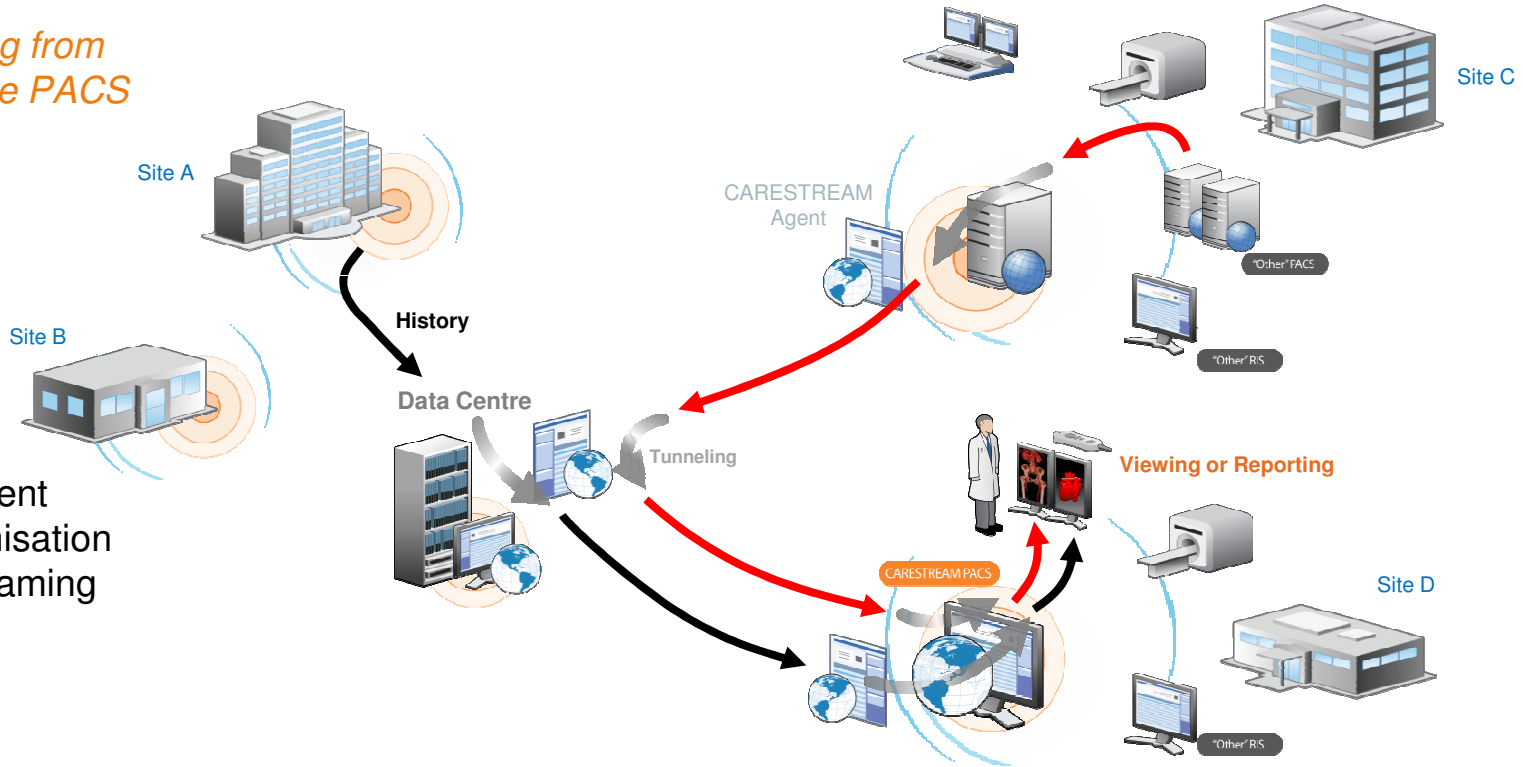
Vue Connect Architecture: ***Flow scenario***

Viewing & Reporting from CARESTREAM Vue PACS



CARESTREAM Agent
Multi-Site Synchronisation
Tunneling and Streaming

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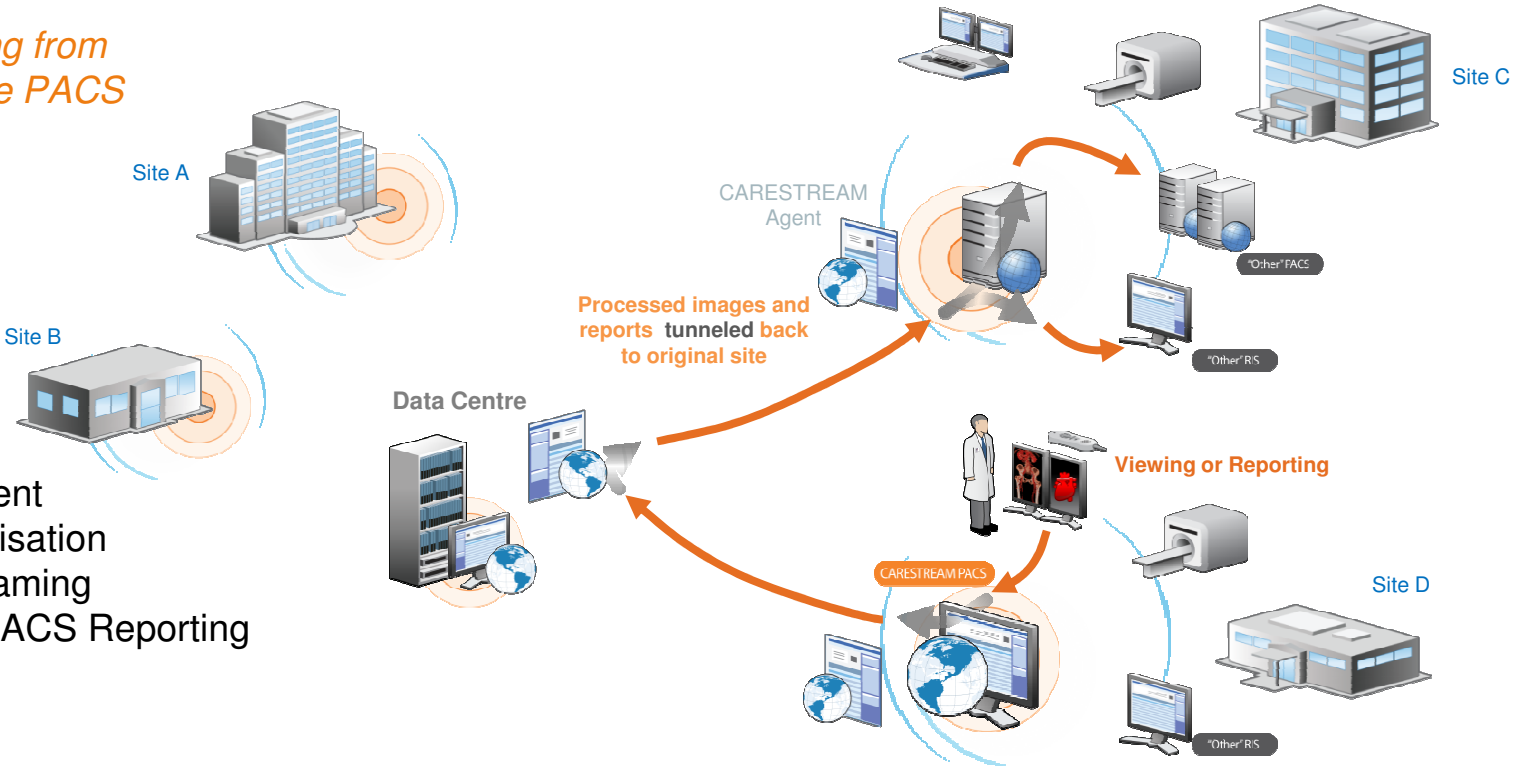
Vue Connect Architecture: ***Flow scenario***

Viewing or Reporting from CARESTREAM Vue PACS



CARESTREAM Agent
Multi-Site Synchronisation
Tunneling and Streaming
Reading & Native PACS Reporting
PIX Support

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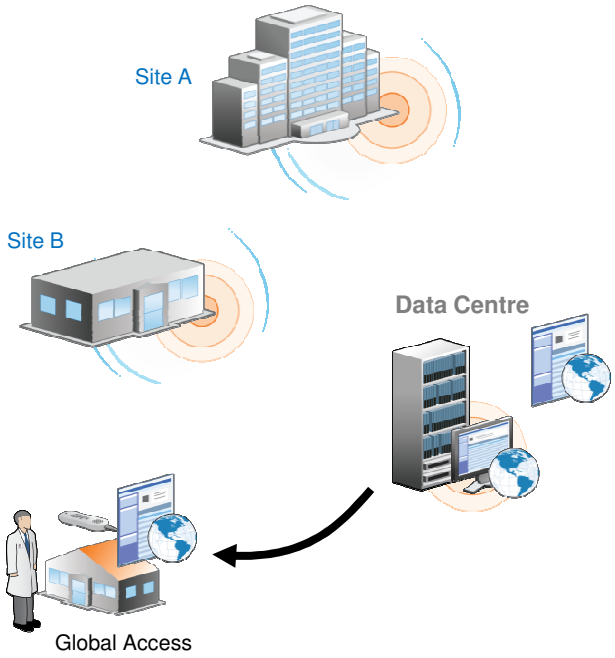
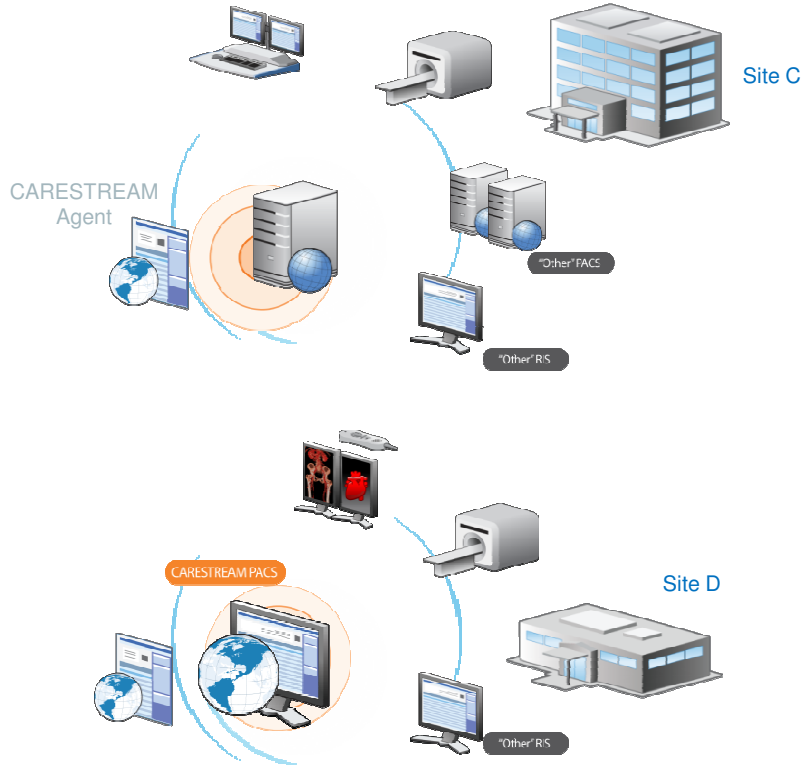
Vue Connect Architecture: ***Remote Viewing***

Remote Viewing or Reporting





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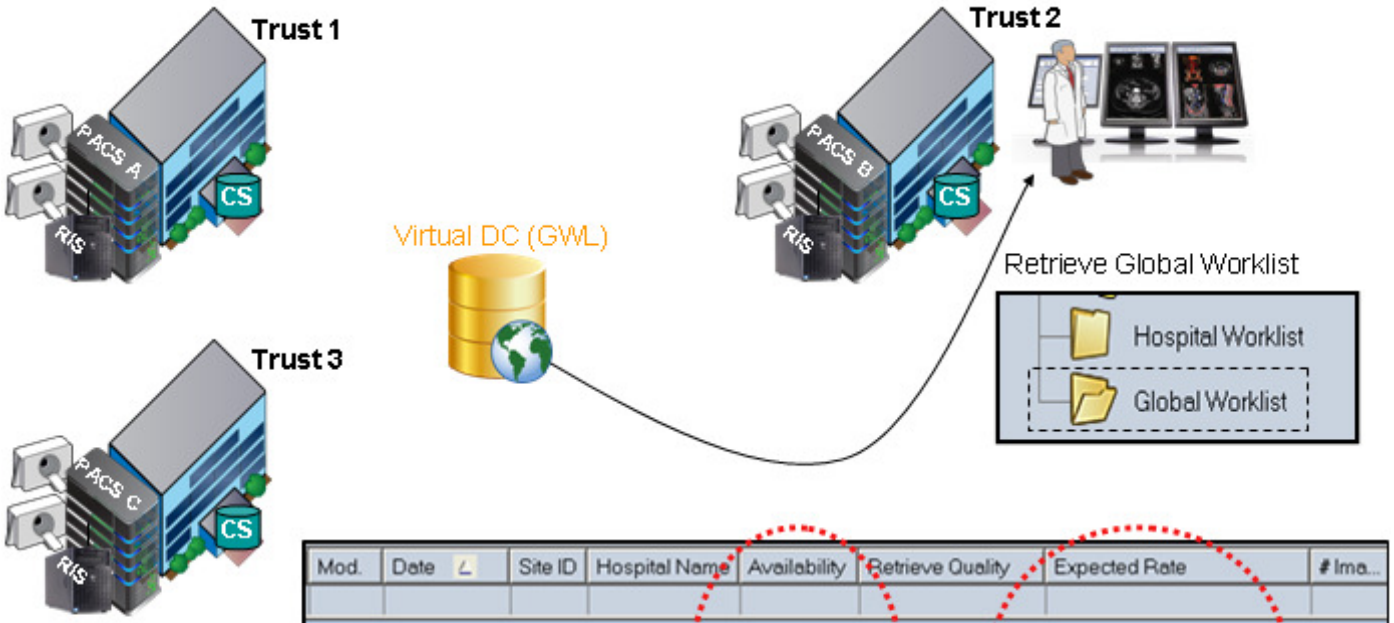
Vue Connect: **What does it look like?**



Mod.	Date	Site ID	Hospital Name	Availability	Retrieve Quality	Expected Rate	# Ima...
US CT	06/06/2007	1	Hospital	ONLINE	Lossless	Fast, Best Quality	457
MR	08/19/2007	1	Hospital	ONLINE	Lossless	Fast, Best Quality	440
US CT	06/06/2007	2	Imaging Center	ONLINE	Progressive Quality	Fast, Progressive Quality	457
MR	08/19/2007	2	Imaging Center	ONLINE	Progressive Quality	Fast, Progressive Quality	440
CT	07/01/2008	1	Hospital	ONLINE	Lossless	Fast, Best Quality	416

Vue Connect: **How Do We Do It?**

Smart Synchronisation

Ability to view a multi-site environment as a single site through automatic meta-data synchronisation without physically copying the data

One global worklist for an infinite number of sites

Tunneling and Streaming

True ad hoc access to data from any source through efficient routing & streaming capabilities. Standard prefetch & manual routing capabilities also available

On-the-fly retrieval of relevant exams and priors

CARESTREAM Agent

Mediator between a local site and the datacentre, which indexes the local information and serves as data access point for the local Site

Enabling disparate systems to participate

Native Reporting

Single interface to provide anywhere/ anytime reporting, while maintaining local data integrity (report is tunneled back to local RIS/HIS)

One global reporting workflow for an infinite number of sites

PIX, Tag Morphing

Mechanisms to consolidate patient id's from different sites and meta-data discrepancies

Patient data consolidation from an infinite number of sites

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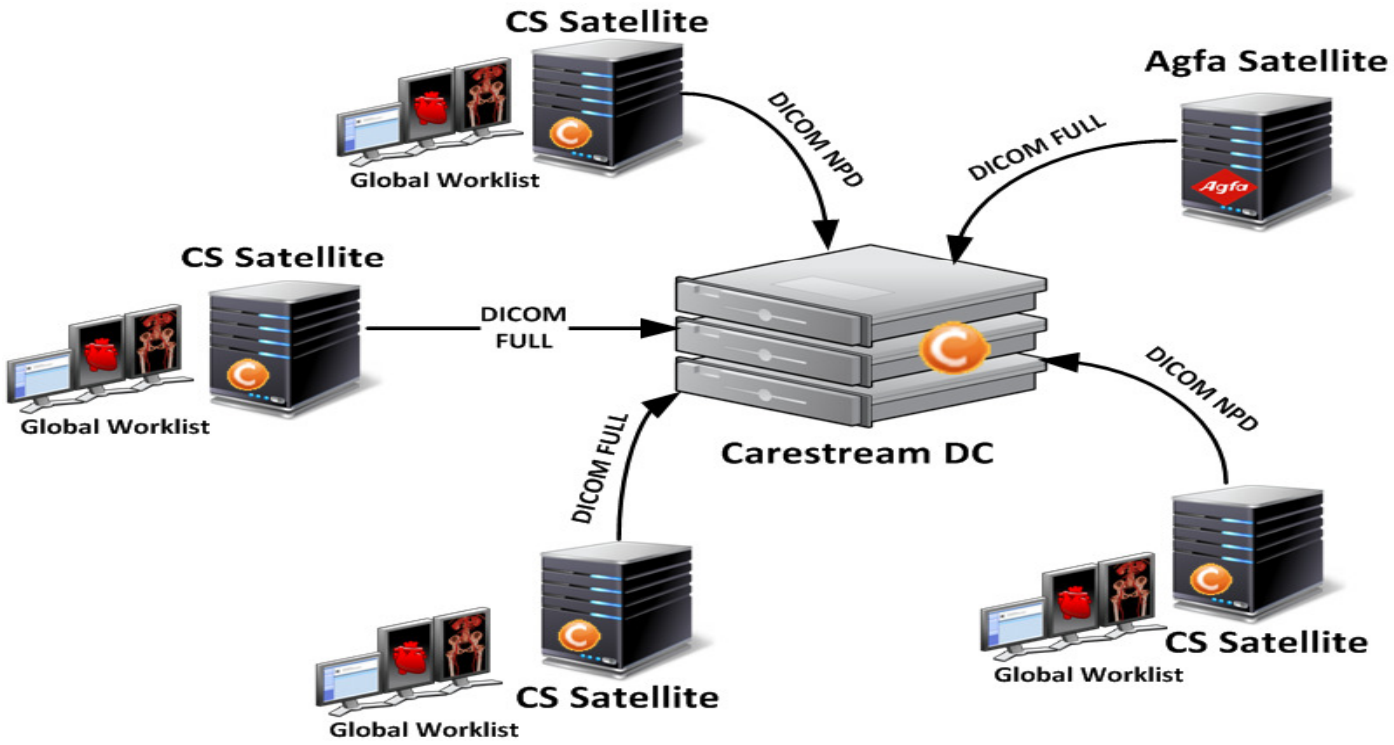
Vue Connect: **Example Architecture**



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Vue Agent

There is no need to replace all non-Carestream PACS in a multi-site environment in order to read them through the global study list.

The main goals of the CS agent are:-

- Allowing users on that site to remotely read other sites
- Synchronizing all required foreign PACS data to the global study list, and enabling other sites to access/read it

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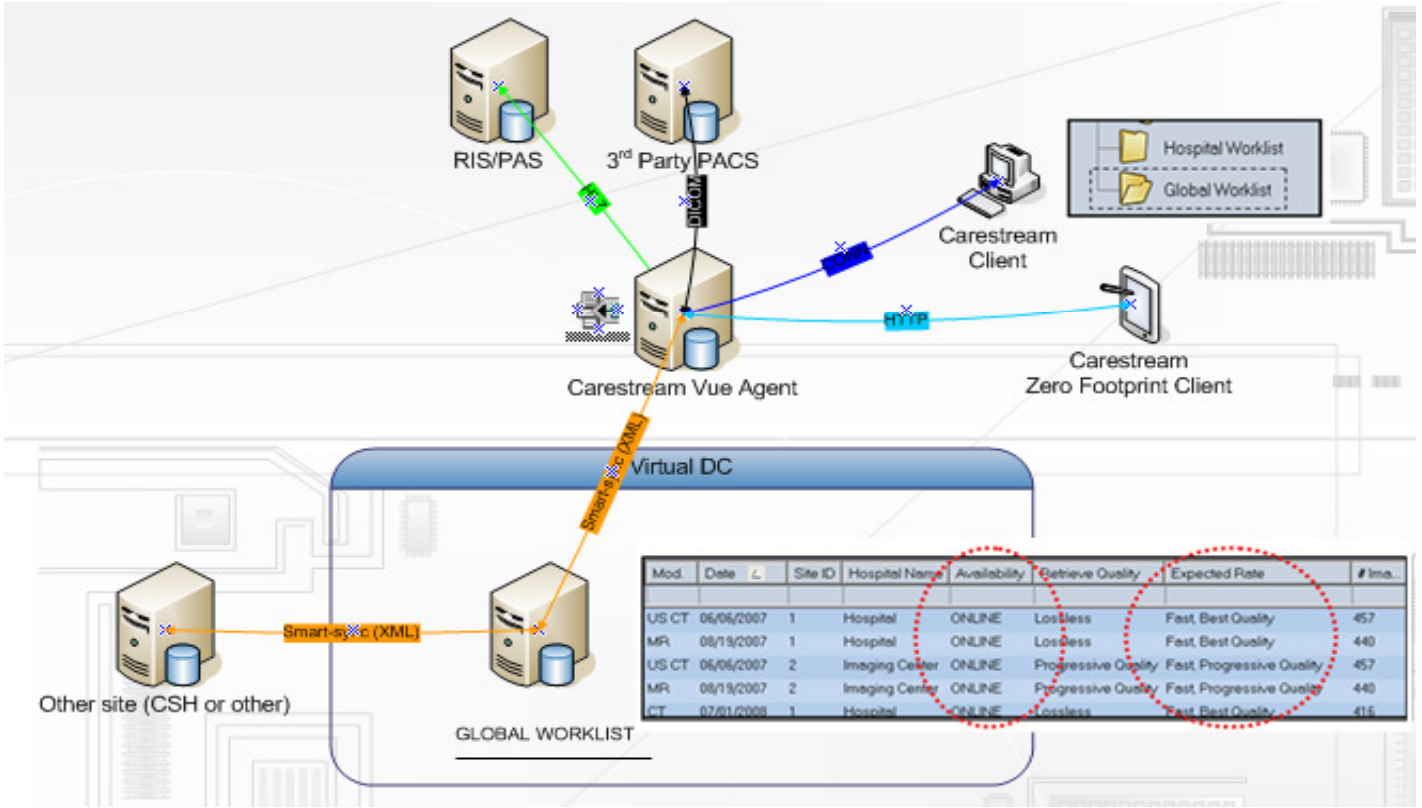
Vue Agent: **Simply Integrated**



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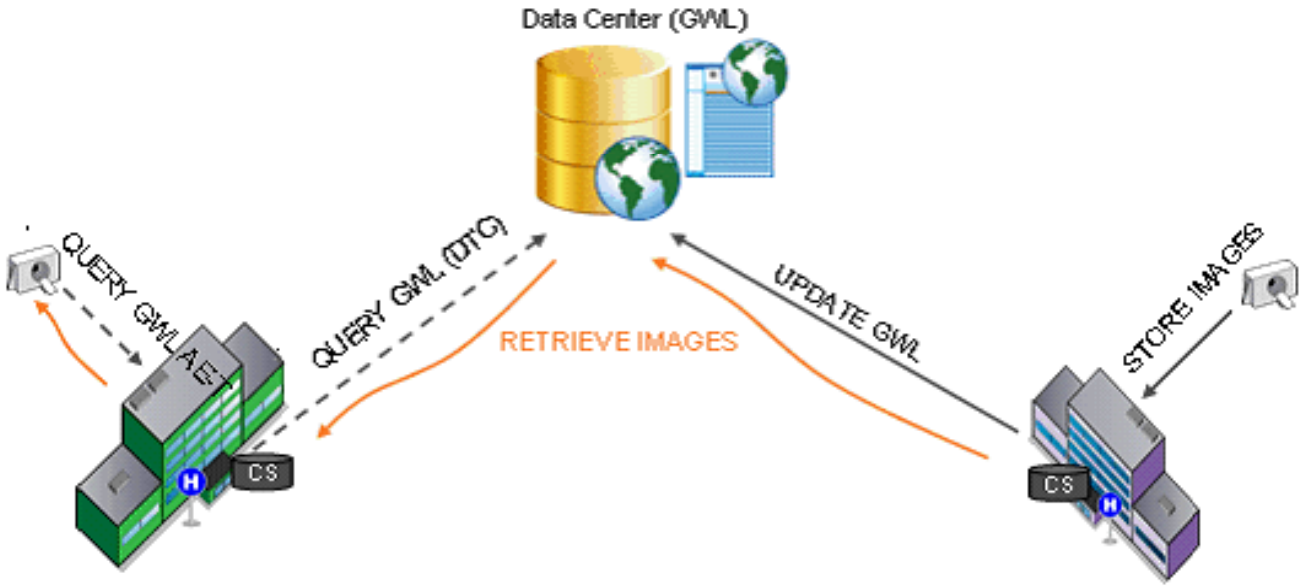
Accessing ‘Global’ Data

DICOM peers (including workstations can query the Global Study List)



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XDS

Cross-Enterprise Document Sharing

XDS: What it is?

- ✓ Designed for cross enterprise **medical data sharing**
- ✓ Enterprise wide, patient centric
- ✓ **Any kind of medical data**, imaging included
- ✓ **Standard interfaces**, based on web services
- ✓ Allows communication between **many different vendors**
- ✓ Data input from **any XDS compliant source**
- ✓ Data access from **any XDS compliant consumer**
- ✓ Multiple patient ID support (**PIX**) to allow extra-enterprise integration by keeping local id and adding a global id (requires external PIX manager)

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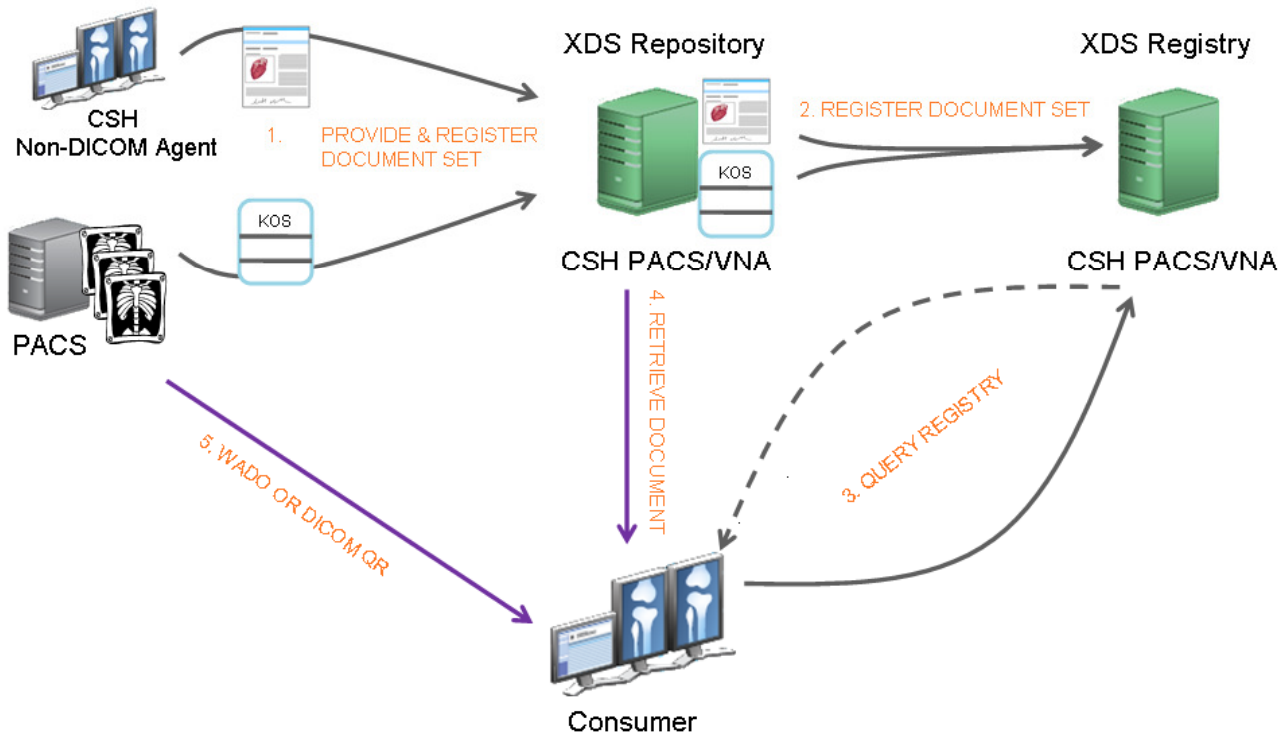
XDS: **What is it?**



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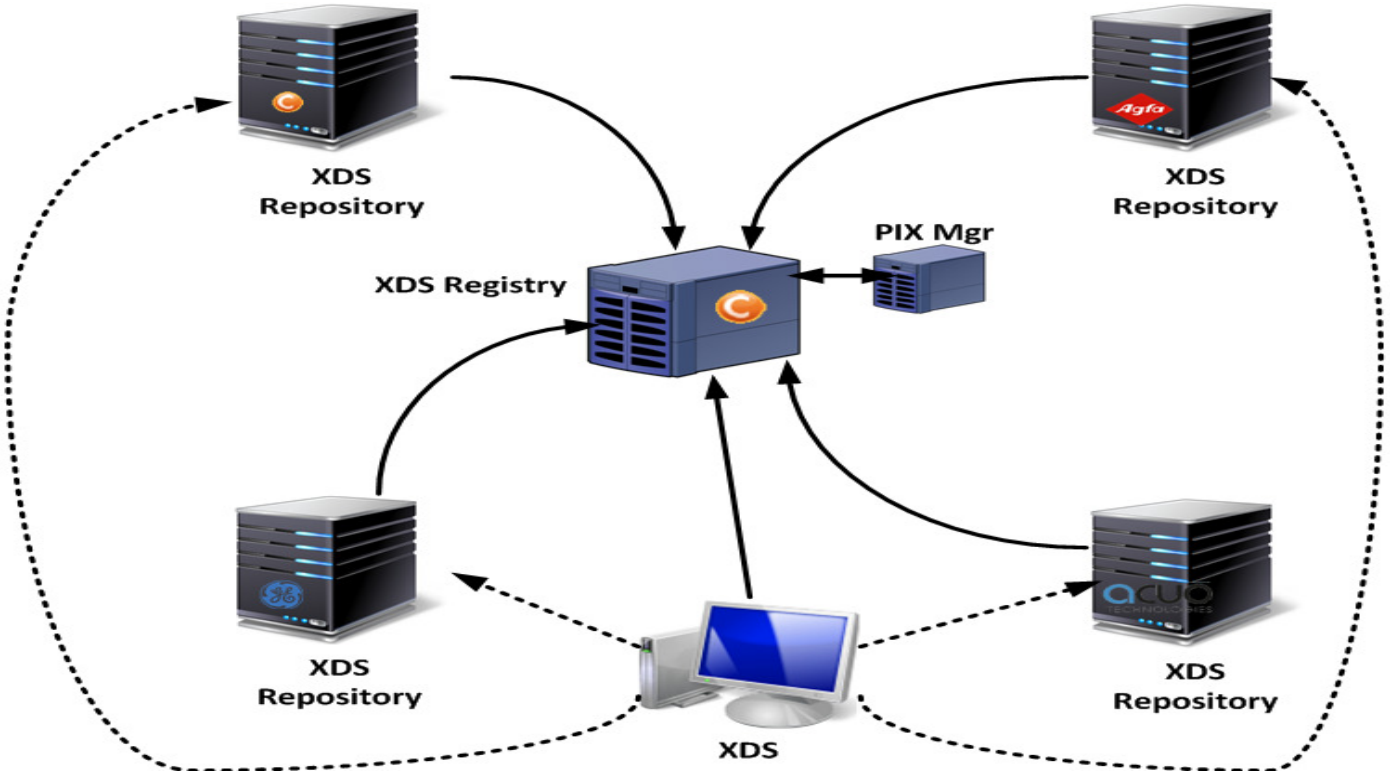
XDS: **Example Architecture**



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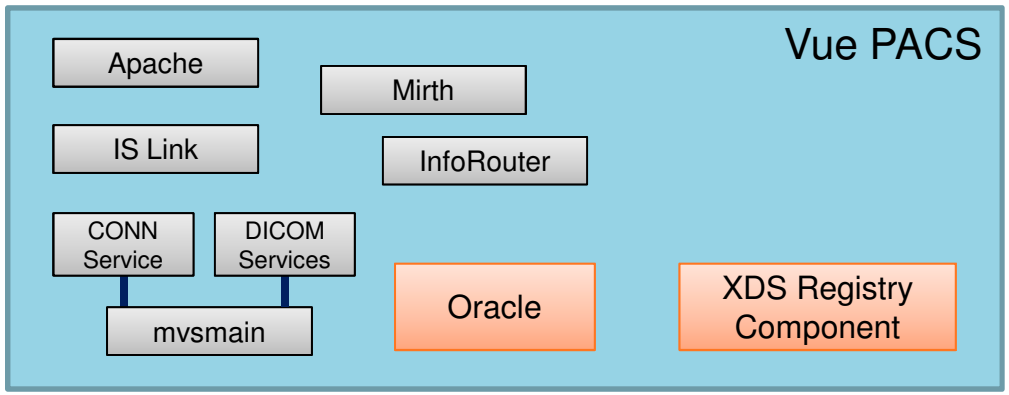
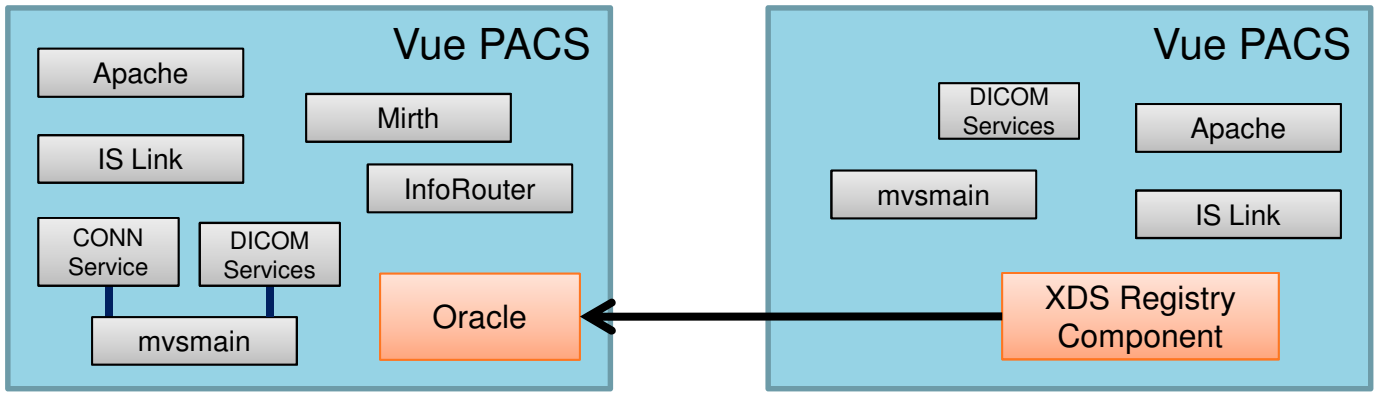
Integral to Vue PACS Server

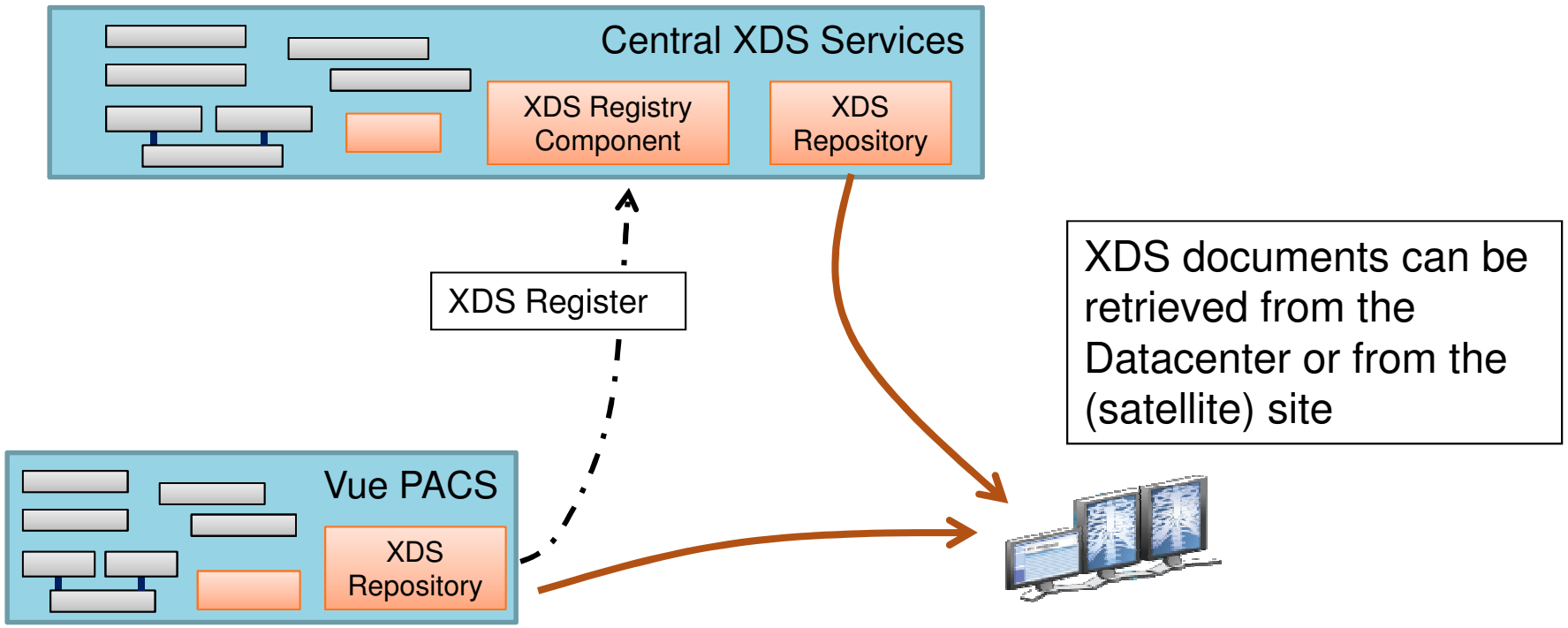


The XDS registry & repository is already installed in the standard package

Or as a dedicated XDS Server



Vue PACS, Vue Connect and XDS



Comparison Table

	Vue Connect	XDS
Primary Target	Diagnostic workflow Data Distribution (Vue Motion, My Vue)	Data Distribution (Vendor Agnostic)
Performance	Optimized (CONN, Streaming, Compression)	Best Effort, but improving (WADO-RS, JPIP)
Standard Format	Yes/partial, proprietary implementation for performance with ability to access via standard protocols	Yes, IHE
Non-DICOM support	Yes, with either Vue Connect exchange format (CONN) OR via standard exchange format using XDS	Yes, with standard XDS exchange format
3rd party vendor integration	Yes (DICOM, HL7, Tag morphing)	Yes (parsing/morhping?)
Multi Patient ID (PIX)	Internal PIX support or via external PIX manager	Yes, BUT requires external PIX manager
Need of physically move data	No	No
Security	ACL (simple, more flexible), Blocking service	BPPC – not always enough?

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XDS or Vue Connect, today...

- ✓ Diagnostic, multi site workflow
  Vue Connect
- ✓ Distribution DICOM and NON-DICOM data via web viewer (including Video Streaming)
  Vue Connect (with MyVue)
- ✓ Receive NON-DICOM data from 3rd parties
  Vue Connect or XDS, having the 3rd party acting as XDS source
- ✓ Distribution of DICOM and NON-DICOM, when 3rd party repositories are involved, and data cannot be moved
  Vue Connect or XDS, using consumer
- ✓ Allow 3rd party systems to distribute via their viewers data located on our system
  Vue Connect or XDS, by allowing access to our repository, registry and/or updating and external registry
- ✓ Performances has priority over *standardization*
  Vue Connect (although WADO-RS, JPIP challenging this)
- ✓ Standardization has priority, or is a mandatory requirement
  XDS although Vue Connect does offer standard access via DICOM, HL7, XDS etc.

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Summary

Vue Connect is a Carestream solution which allows both cross enterprise diagnosis in radiology department and cross enterprise, cross department image distribution – with fast, efficient protocols to facilitate delivery of images.

XDS is a standard for cross enterprise data distribution, which facilitates the integration between different vendors. Today, XDS is more typically used to create a global study list (via a Registry) and not for the delivery method – which is key to performance.

The two solutions may overlap regarding the data distribution part.

The usage of XDS or Vue Connect depends on the existing environment and customer requirements.

The two solutions can be also combined.

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Tackling important issues…

Intelligent Image Sharing

Top 5 Requirements...

Real-time Image Sharing

Vue Connect (Smart-sync with Tunnelling & Streaming), My Vue and/or XDS (WADO-RS, JPIP) longer term

Multi-vendor Support

Vue Connect (Vue Agent) and/or XDS (can use XDS-DICOM adapters)

Single Copy of Imaging

Vue Connect, My Vue and/or XDS Repository (KOS)

Future Proof

Vue Connect (including Tele-radiology), Vue Motion/MyVue (ECG, Streaming Video etc.) - all with XDS capabilities built-in

Cross Boundaries

Vue Connect (with propagated query), My Vue and/or XCA

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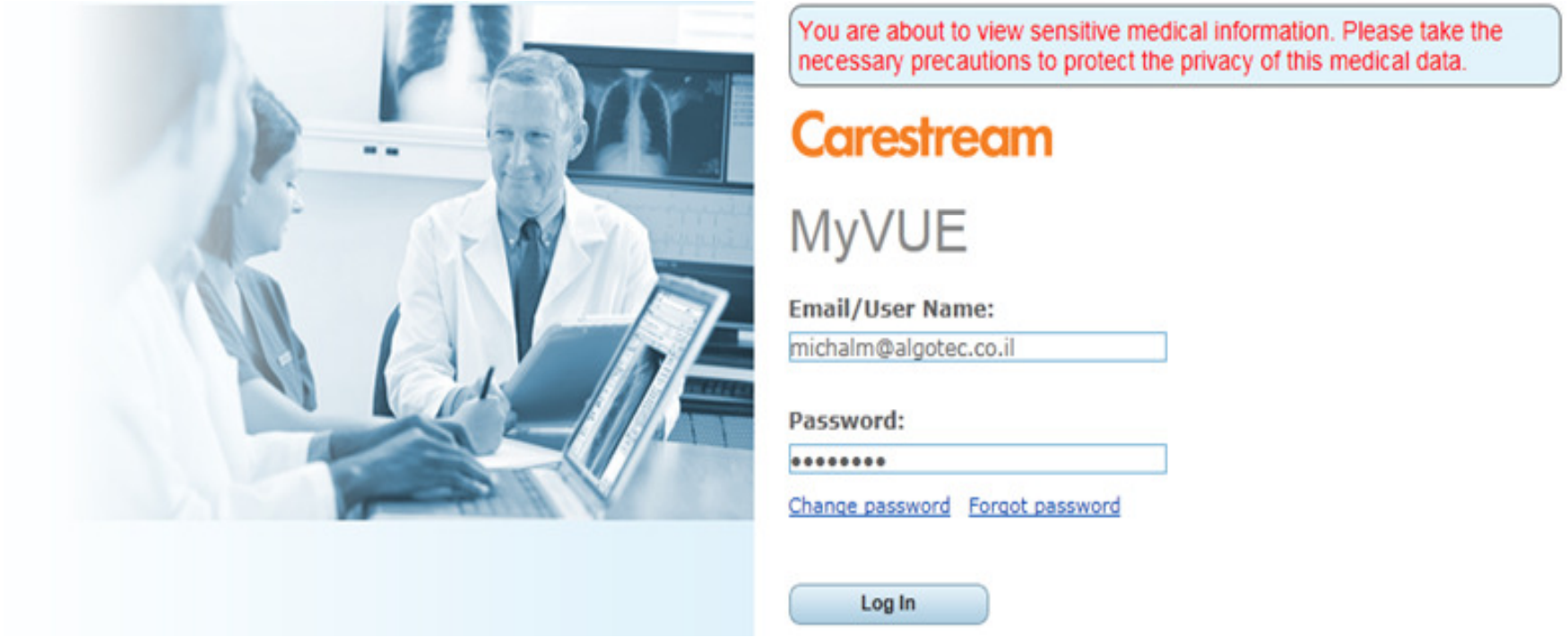
Vue Motion & MyVue Portal

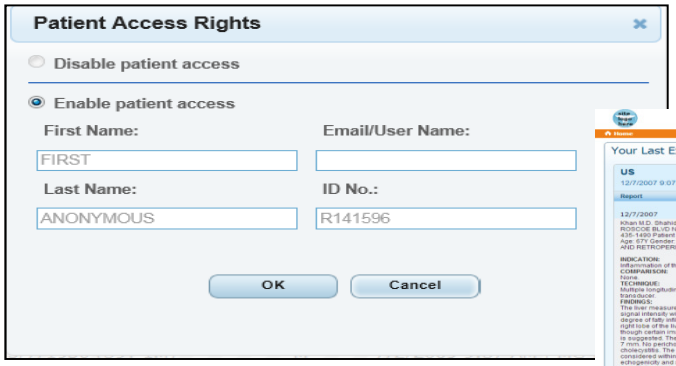
Intelligent Image Sharing

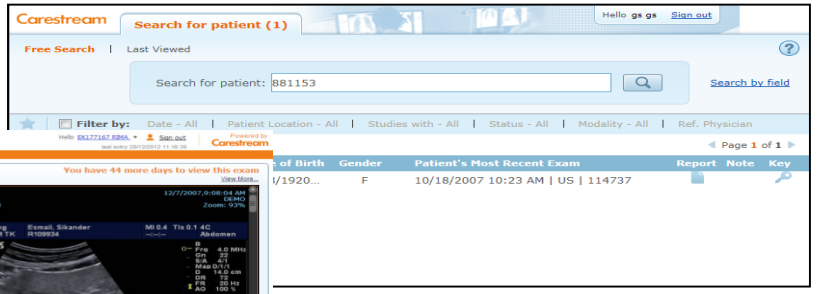
Viewing Exam Data

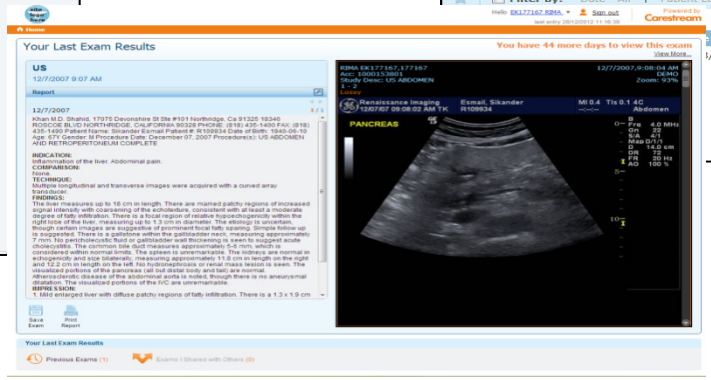


Introducing MyVue

An image display system based on Vue Motion
wrapped with patient setup and sharing capabilities & procedures
backed up by advanced security and privacy measures



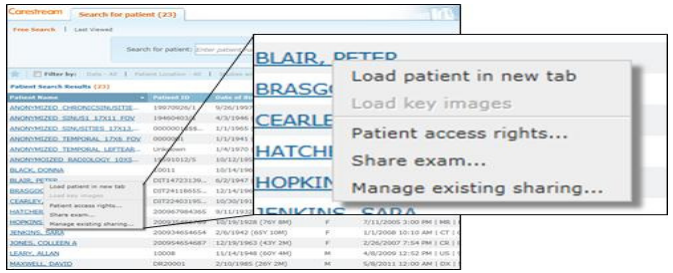


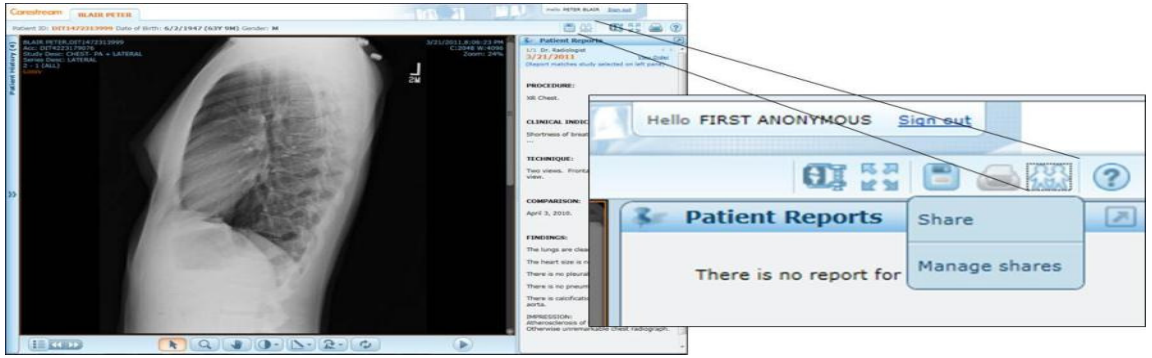


Sharing Exam Data - Health Facility User

A radiologist or other medical users inside the facility may be provided with permission to share any patients data with other users. Sharing in this sense is similar to the previous flow where patients have the ability to share their own data.

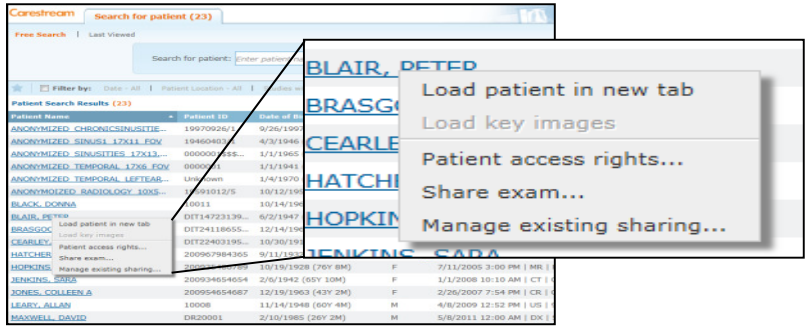
- This sharing is available from inside the Vue Motion viewer or from the AE list.
- Managing all shares is also available





Enabling Patient Access – Admin Staff

- Administrative staff selects patient for sharing
  - Patient data automatically entered
- Administrative staff enters patients e-mail address



Sharing Exam Data – Guest

Having received an invitation email to view exam information, the physician (or non-physician) with whom the exam data is shared can log in to the MyVue system and access the exam images and report. This user is a guest user with whom the exam data is shared, subject to the sharing options set by the sharing user (see Viewing Exam Data – Patient section).

Sharing Exam Data - Guest

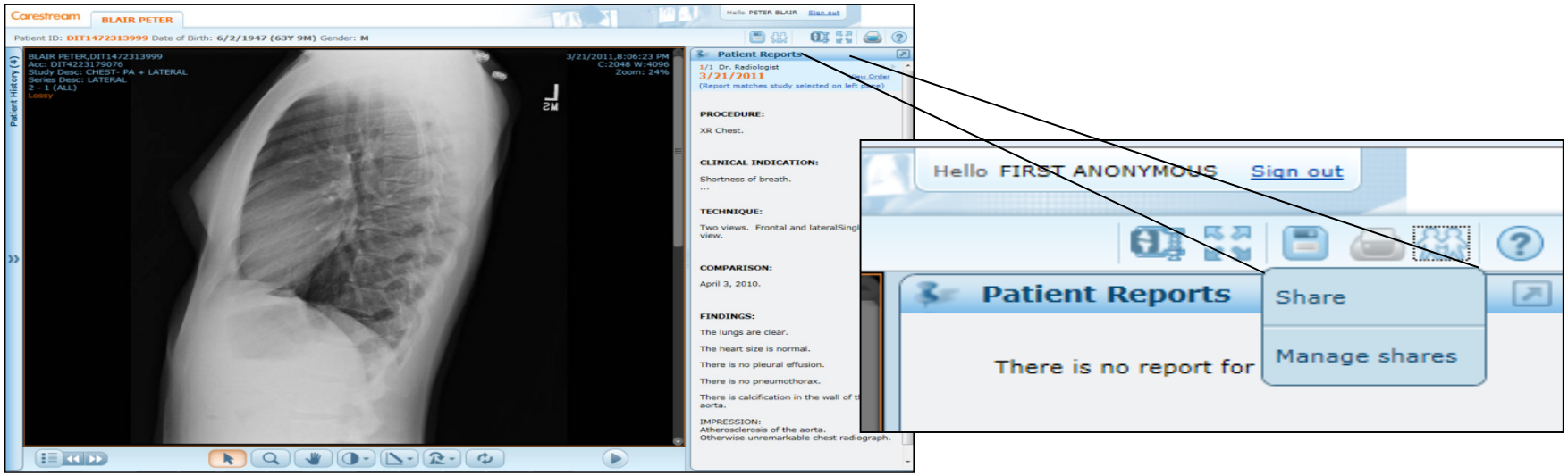
- Guest clicks on link from the e-mail and is directed to MyVue login
- First time access requires registration

Sharing Exam Data - Guest

- Guest is directed to MyVue login
- First time access requires registration
- Registration completed message appears

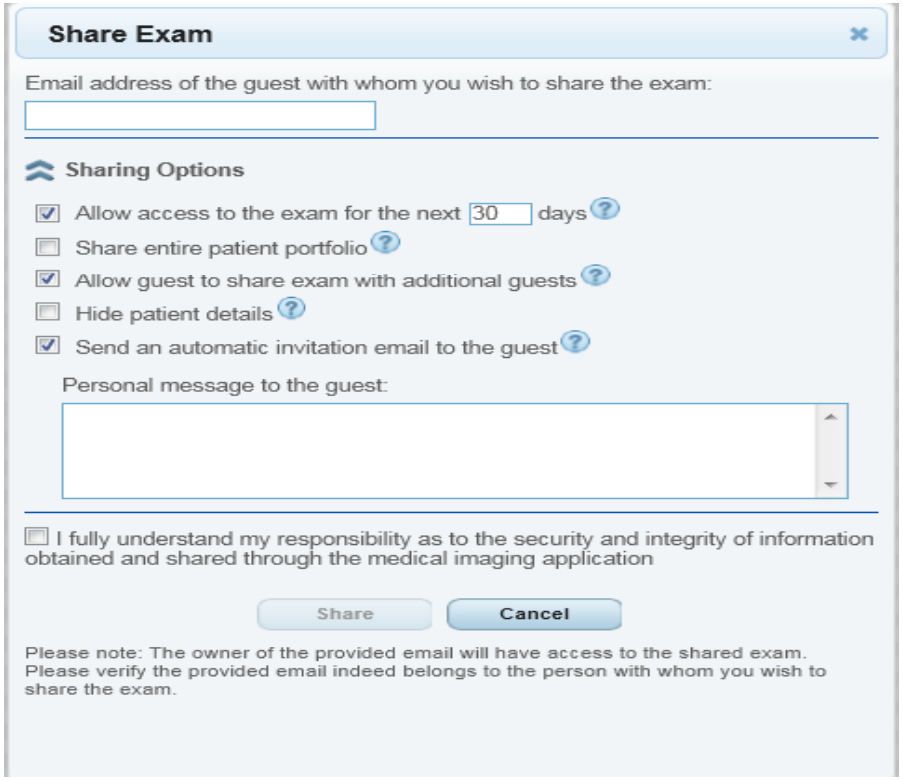
Sharing Exam Data - Patient

A patient may be interested in sharing their exam information with another person (physician or non-physician). The person with whom the exam data is shared has access to all the tools available in MyVue for manipulating images



Sharing Exam Data - Patient

- Patient enters sharing options
  - Sharing period
  - Single study or entire portfolio
  - Allow additional sharing levels
  - Hide patients details
  - send automatic e-mail
  - Optional message
- Patient checks consent
- Patient grants shared access



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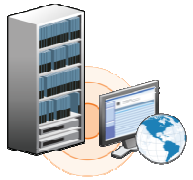

DICOM – meta data

.....DICM		
...		
0008	0050	121212
0008	0060	MRI
0008	1030	MRI Brain
0010	0010	Doe^John
0010	0020	12345
....		

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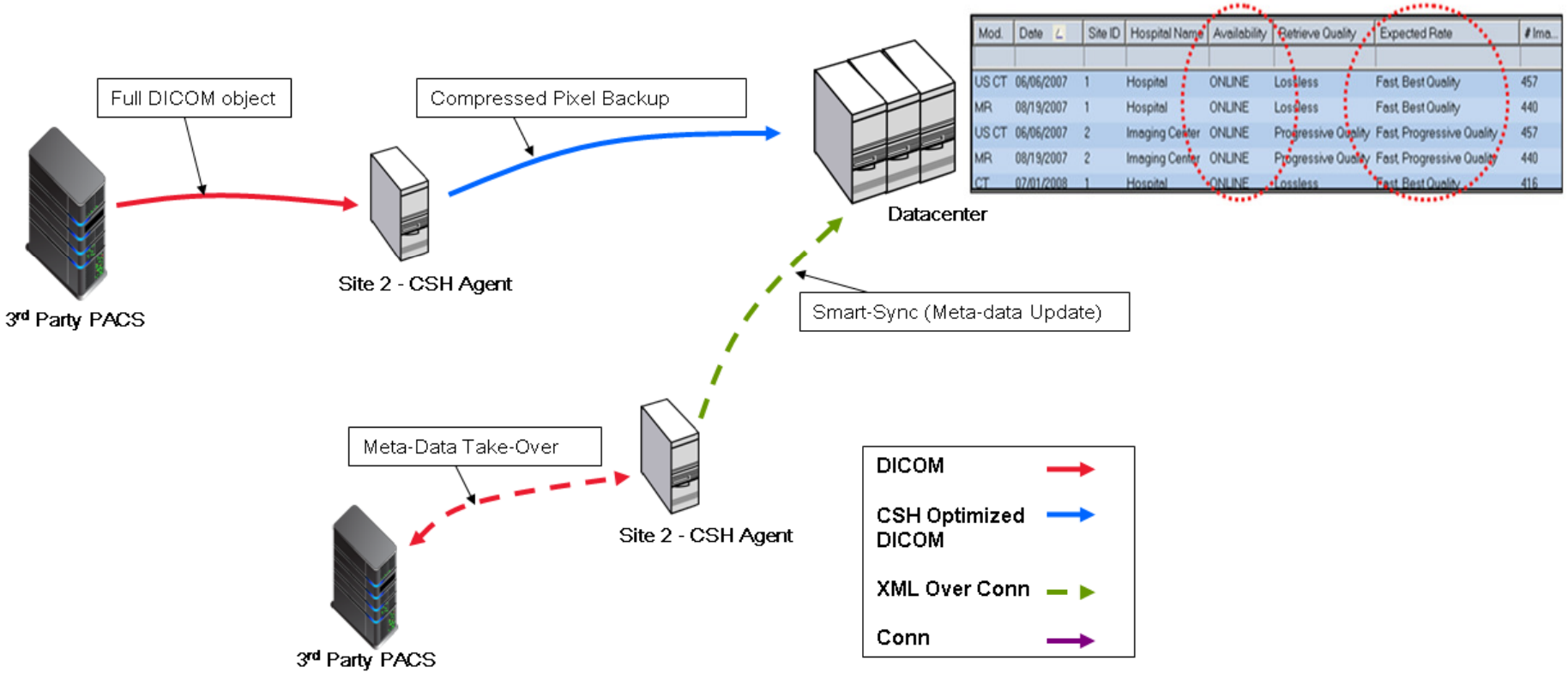
Vue Agent



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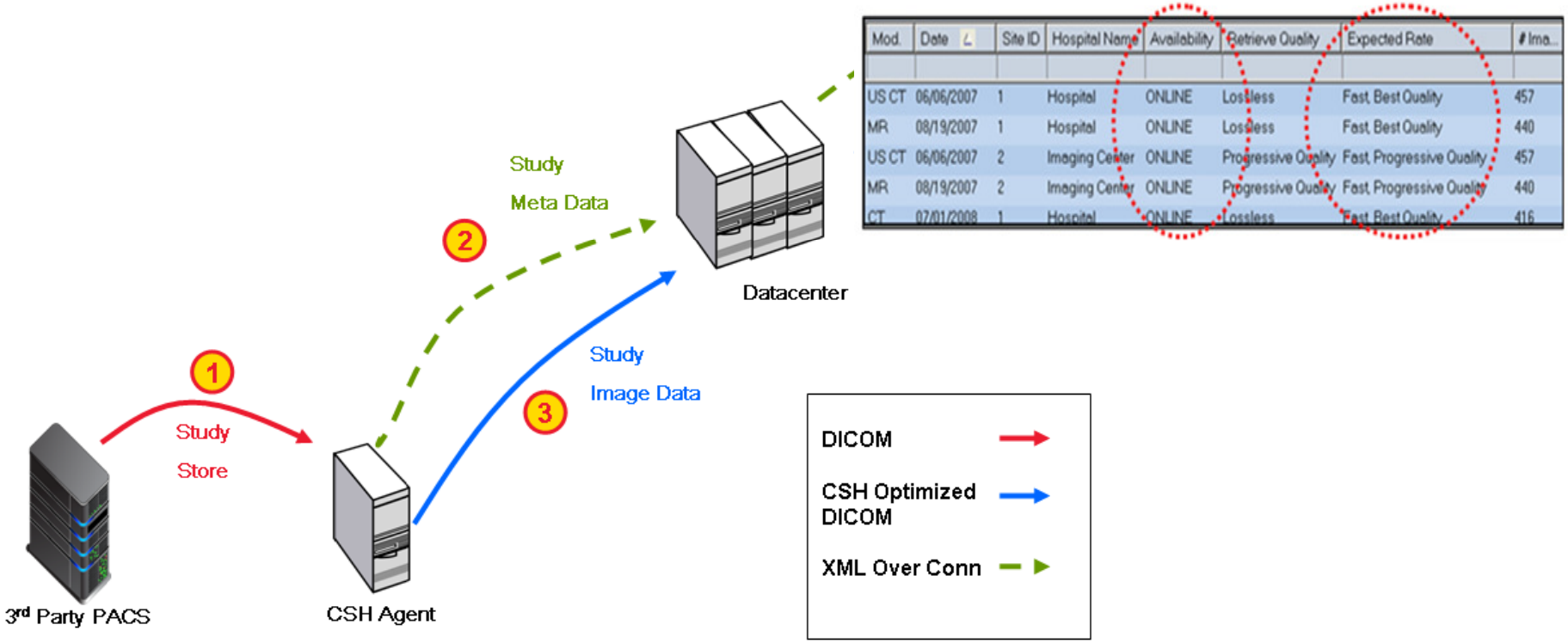
Vue Agent: **Storing a new study**



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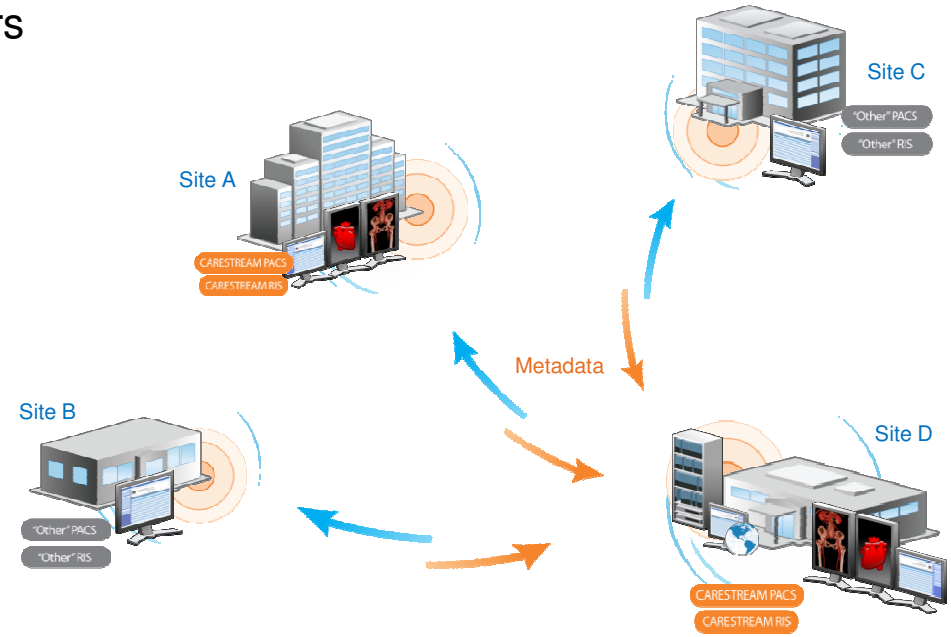
Vue Connect Summary

Healthcare entities working in a multi-site environment seeking to achieve a productive enterprise solution providing efficient cross site reading capabilities

- Local Viewing & Reporting with Global priors
- Image sharing across collaborating sites
- Cross site reporting capabilities

Sites owned & managed by separate entities; business relationship between sites, each owns its own data, may have multiple PACS, RIS, and reporting vendors



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