CLINICAL CHALLENGES
Healthcare IT management continues to be challenged by the growing volumes and file sizes of medical imaging data resulting from technological advances in modalities and diagnostic image retention requirements. Compounding this challenge is the difficulty of sharing data across multiple PACS systems and managing these images with other correlated structured and unstructured content related to a patient’s care. To provide optimum patient care delivery, IT managers are investing in automated tools and integrated solutions to minimize the stovepipes of information created by many proprietary applications so caregivers get a 360-degree patient view.

SOLUTION DESCRIPTION
The EMC® Medical Image Sharing and Management Solution: Enabled by J4Care makes it possible for healthcare providers to improve clinical workflow and productivity for safer, collaborative care decisions. This offering is one of EMC’s Solutions for Collaborative Healthcare, providing patient-centric infrastructure to “content-enable” PACS, HIS, and EMR applications for access to all relevant clinical, financial, and operational data.

Based on open standards in accordance with the Integrating the Healthcare Enterprise (IHE) initiative which promotes the coordinated use of established standards such as DICOM, HL7, and XDS, the solution leverages the EMC Documentum® Content Server to manage the storing, retrieval, updating, and archiving of patient information and its metadata in an open, non-proprietary format. The Content Server also provides the appropriate retention policies, security policies, and services-oriented management policies to ensure the compliance and availability of medical information during its lifecycle.

The solution, enabled by J4Care, helps to improve clinical workflow and time to treatment by delivering integrated, unstructured data at the point of care. It enhances operational agility through the abstraction of applications and infrastructure, improves financial performance by managing physical and virtual assets with highly automated tools, and secures access to and prevents loss of protected health information (PHI) and personally identifiable information (PII).

The solution is modular, and can be enhanced with additional capabilities as new components are added.
**SOLUTION COMPONENTS**

Enabled by J4Care, the offering runs on Linux RedHat 5.5 64-bit O/S and Oracle 11g R2 DB, and consists of the following components:

- J4Care-enhanced IHE protocol support to enable the coexistence of multiple implementations of DICOM and HL7 standards, communication, and visualization.
- The J4Care Healthcare Connector (HCC) software establishes an IHE-compliant Image Archive and Report Repository integrated with the EMC Documentum platform. The HCC communicates with external healthcare systems via a wide set of communication interfaces providing:
  - A DICOM and HL7 interface connected to a Documentum installation to store and retrieve DICOM objects such as medical images from clinical modalities to accept patient demographic updates and pre-fetch requests
  - Grayscale Presentation States (GSPS) to specify the presentations of images as grayscaling, zoom, text, and graphical annotations
  - Key Objects (KO), to specify a particular selection of images for a specified reason and with an attached note
  - Structured Reports (SR) to process HL7 notification messages regarding Procedure Scheduling, Procedure Updates, and Patient Information Updates to process DICOM Modality Performed Procedure

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**Figure 1. High-level architecture of the EMC Medical Image Sharing and Management Solution: Enabled by J4Care**

- EMC Documentum provides complementary capabilities to traditional RIS/PACS integrations—allowing documents, patient records, prescriptions, invoices, and other unstructured content to be easily accessed via a secure, virtual, and federated repository, while leveraging open standard message formats to reduce the expensive point-to-point integrations that are typically required.
- Documentum Content Server governs the Documentum content repository containing the data and metadata. Content Server can support multi-site enterprise deployments, and can manage HTML and XML, graphics, multimedia, other types of rich media, and traditional documents created with desktop applications.
• Documentum Retention Policy Services (RPS) enables compliance with regulations for the retention and disposal of patient information. RPS attaches the appropriate lifecycle policies to the different types of medical information stored in the Documentum repository. Static and dynamic policies can be configured to support real-life events based on any metadata on the objects or through referenced objects such as the patient or the facility.

• Documentum Content Storage Services (CSS) stores each medical document in a file store when it reaches the repository. CSS provides deduplication and compression without changing the original file and both automated and policy-based storage and migration of data across tiered storage layers of the corporate network. CSS provides the ability to define and execute ILM policies based on the rich clinical metadata provided by the HCC and the XDS adapter to Documentum.

• Trusted Content Services (TCS) provides an additional security layer for controlling how content is protected, accessed, and authorized under complex, dynamic conditions. It provides a flexible authentication framework that supports advanced authentication, authorization and auditing, identity management, and encrypted communications.

• EMC Archiving Solutions create an accessible online medical image archive, lower operational costs, achieve regulatory and litigation requirements, and facilitate retrieval of patient information. EMC offers a range of backup solutions, including purpose-built cloud storage platforms that can manage millions of objects per day and efficiently store and protect data at petabyte scale throughout your healthcare organization.

• VMware® vSphere® dramatically reduces capital and operating costs and maximizes IT efficiency while giving healthcare organizations agility through automation and the freedom to choose applications, operating systems, and hardware.

Figure 2. The detailed hardware layout of the EMC Medical Image Sharing and Management Solution for improving clinical workflow and productivity for safer, collaborative care decisions
SOLUTION BENEFITS

The EMC Medical Image Sharing and Management Solution simplifies internal healthcare IT processes by providing an integrated, virtualized, and services-oriented IT environment for the management of all the information in the healthcare organization. Clinicians gain a 360-degree view of the patient that is secure, easy to access, and compliant-ready.

Clinical workflow and time to treatment is accelerated through the delivery of integrated, unstructured data to the point of care. The solution enhances operational agility through the abstraction of applications and infrastructure, improves financial performance by managing physical and virtual assets with highly automated tools, and secures access to and prevents loss of protected health information.