

PICTURE ARCHIVING COMMUNICATION SYSTEM

The National Cybersecurity Center of Excellence (NCCoE) is addressing the challenge of securing the Picture Archiving and Communication System (PACS) ecosystem in Healthcare Delivery Organizations (HDOs) by collaborating with industry and the information technology community, including vendors of cybersecurity solutions. This fact sheet provides an overview of the Healthcare PACS project, including background and challenge, approach, and benefits. If you have feedback on the architecture or the relevance and usefulness of this practice guide, please contact us at hit_nccoe@nist.gov.

BACKGROUND

As clinical care practices and technology have evolved, the use of medical imaging plays an increasingly important role in diagnosing and treating patients. Over the past few decades, imaging technology has seen vast changes and improvements. For instance, images once processed on film in dark rooms are now digital, and are easily uploaded, stored, and shared. PACS acts as a central storage point for digital medical images and serve as a core system for Radiology and other image intensive departments. PACS may interact with electronic health records, hospital information systems, regulatory registries, and multicenter government, academic, and commercial archives. These interactions enable users to easily access images on work or personal devices, giving them the ability to make a diagnosis in a fraction of the time it once required.

CHALLENGE

Common challenges that HDOs face when attempting to secure a PACS are:

- controlling/monitoring and auditing HDO user accounts, including identifying outliers in behavior
- controlling/monitoring and auditing access by users that are external to the HDO, including identifying outliers in behavior that are controlling/monitoring and auditing access and modification to images
- enforcing least privilege and separation-of-duties policies for internal and external users
- ensuring data integrity as imaging moves across the enterprise
- securing and monitoring connections to the HDO ecosystem

- securing and monitoring connections to and from systems external to the HDO
- providing security, data protection, and access management without impacting system performance or user productivity

APPROACH

This project demonstrates how an organization may implement a solution to mitigate identified risks. The reference architecture includes technical and process controls to implement:

- a defense-in-depth solution, including network zoning practices
- access control mechanisms that include multifactor authentication for authorized users and certificate-based authentication for imaging devices and clinical systems
- a holistic risk management approach that includes medical device asset management that augments enterprise security controls

BENEFITS

The potential business benefits of enacting stronger security controls to a PACS includes:

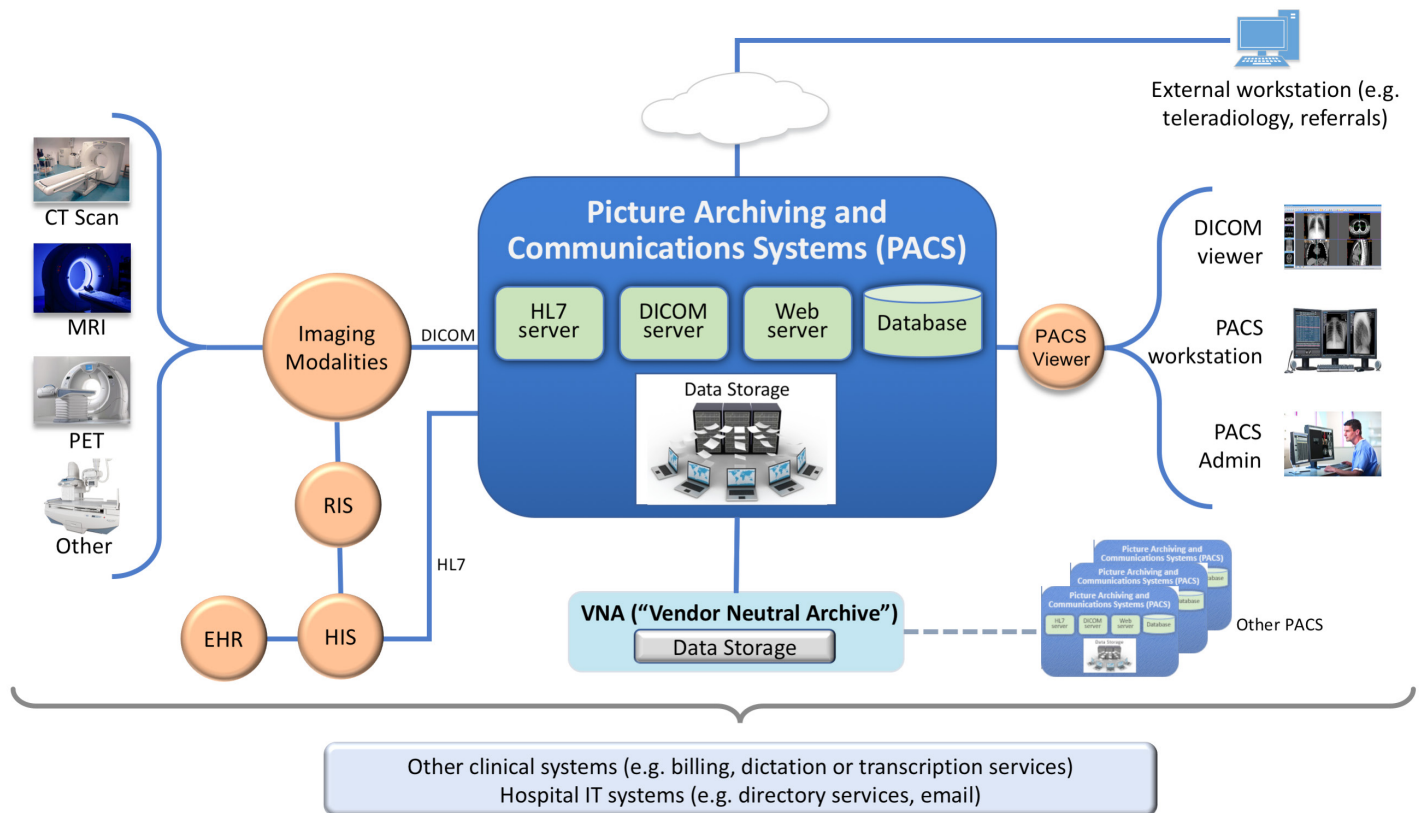
- reduces the likelihood of a breach
- reduces risk of significant data losses
- minimizes disruption(s) to a hospital or medical center's systems
- enables timely access to imaging with information less vulnerable to being altered or misdirected
- helps protect patient privacy

The National Cybersecurity Center of Excellence (NCCoE), a part of the National Institute of Standards and Technology (NIST), is a collaborative hub where industry organizations, government agencies, and academic institutions work together to address businesses' most pressing cybersecurity challenges. Through this collaboration, the NCCoE develops modular, easily adaptable example cybersecurity solutions demonstrating how to apply standards and best practices using commercially available technology.

LEARN MORE ABOUT NCCOE
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CONTACT US
nccoe@nist.gov
301-975-0200

HIGH-LEVEL ARCHITECTURE



TECHNOLOGY PARTNERS/COLLABORATORS

The technology vendors who participated in this project submitted their capabilities in response to a call in the Federal Register. Companies with relevant products were invited to sign a Cooperative Research and Development Agreement with NIST, allowing them to participate in a consortium to build this example solution. Technology collaborators on this project include:



Certain commercial entities, equipment, products, or materials may be identified in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by NIST or NCCoE, nor is it intended to imply that the entities, equipment, products, or materials are necessarily the best available for the purpose.

DOWNLOAD THE PROJECT DESCRIPTION

For more information about this project, visit:
<https://nccoe.nist.gov/projects/use-cases/health-it/pacs>.

HOW TO PARTICIPATE

As a private-public partnership, we are always seeking insights from businesses, the public, and technology vendors. If you are interested in contributing technology or expertise to this project, please send an email to hit_nccoe@nist.gov.