

# B3CARE XNAT-Based Research Infrastructure for Imaging Biomarker Evaluation

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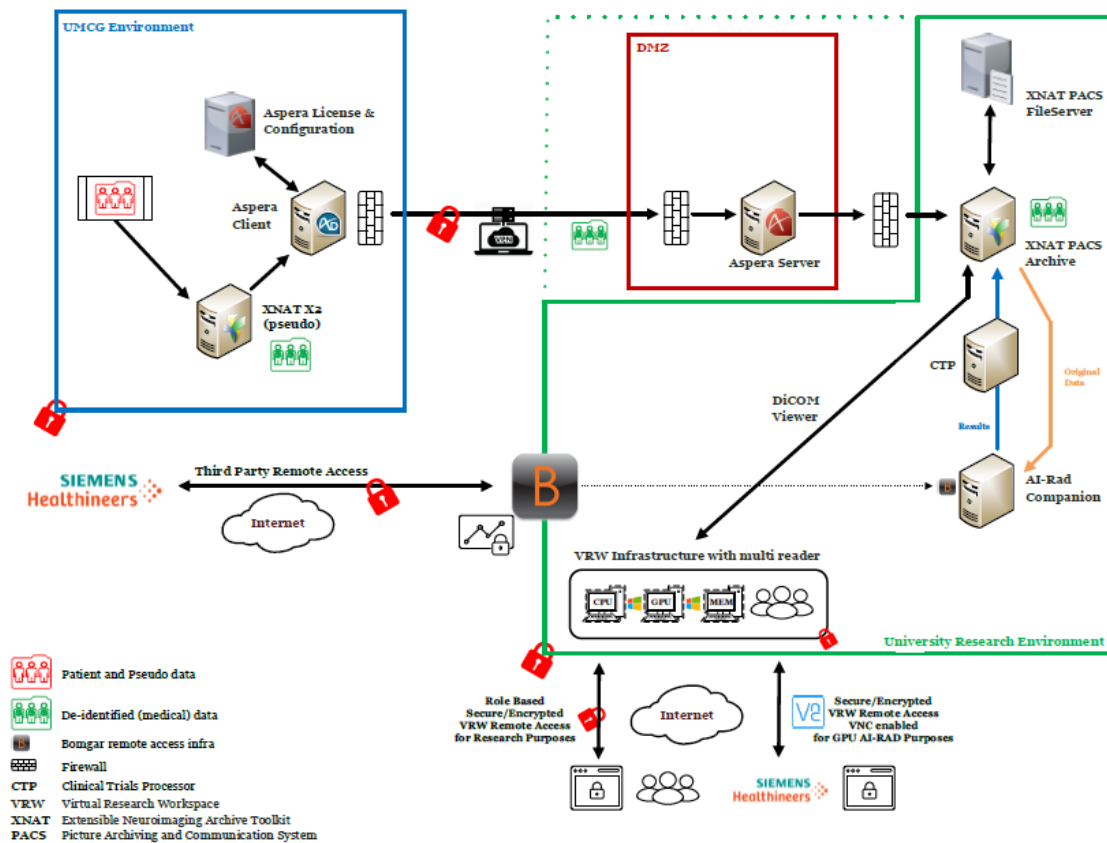
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The B3CARE project aims to validate and evaluate imaging biomarkers for the Big-3 diseases (lung cancer, COPD, and cardiovascular disease). To this end a large-scale, high-quality imaging data biobank is established containing data from different projects resulting in about 70,000 examinations all stored in the XNAT opensource platform and part of the virtual research environment (VRE) of the UMCG. To explore imaging biomarkers different AI solutions are integrated using several methodologies.

Data from the clinical acquisition systems to the research environment are processed via multiple XNAT instances, on the way passing a CTP-service (Clinical Trial Processor) for pseudomization, XNAT-preprocessing and distribution among XNAT-instances.

Data not recognized as belonging to a research project will be automatically put into quarantine.



Within the protected VRE, various data management services are made available to the end-users to perform image data analysis and integrate with the XNAT Research PACS. Part of these services are installed on-premise, others are implemented as a hybrid cloud solution. This hybrid cloud consists of a Liaison server that is embedded in the Research Workspace environment and connects to the cloud server environment that provides the actual AI algorithms.

Due to the requirements regarding information security, the UMCG's privacy and security standards framework had to be completed together with the Security Office (CISO) of the institute. This has resulted in a 'standard' for cloud services for research purposes. Any new cloud services can go through an accelerated procedure and thus be more quickly embedded in the existing IT infrastructure. Access for support and maintenance for all services is arranged through a secure methodology (Bomgar). Current work aims to further develop and optimize the XNAT environment to optimally integrate AI solutions, both developed in-house as well as commercial.