



AWS for Health Partner: NVIDIA

## Leverage the power of the cloud and AI to improve medical imaging analysis

Build, manage, and deploy AI models quickly with NVIDIA Clara Imaging on AWS



# 10x

## Faster data annotation

using NVIDIA Clara Imaging on AWS

Radiologists are experiencing increased demand for their services, multiplied by growing requirements for regulatory compliance and reporting. According to current predictions, medical imaging data will double every nine years. Healthcare providers' ability to provide enough capacity is strained, even as they work to improve processes and accelerate digitization.

As imaging instrumentation continues to advance, so does the promise of identifying anomalies and confirming diagnoses from scans rather than more invasive procedures like biopsies.

Robust AI models, along with scalable cloud-based compute capacity and data storage services, are helping to optimize radiology workflows, reduce study read times, identify insights, speed up reporting, and enhance quality of care.

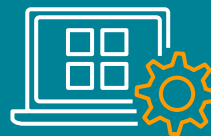
### How it works



Pre-trained models



AI-Assisted annotation



Training framework



Deployment framework

AI models trained on Digital Imaging and Communications in Medicine (DICOM) images, reports, and other data can help improve detection, measurement, classification, and location of anomalies. They can also help with the reconstruction of images, denoising of data, long term sequential tracking and detailed reporting. Clara Imaging on AWS accelerates model creation and deployment with pre-trained models and AI-assisted data labeling to build more generalizable and robust AI models that can be deployed at scale. Federated learning, with NVIDIA FLARE, enables secure, distributed privacy-preserving collaborative development of AI models.

# Launch Clara Imaging on AWS Marketplace in minutes



## Advancing medical imaging workflows with AI

To help radiologists, data scientists, and researchers build AI models to optimize workflows across the medical imaging ecosystem, AWS for Medical Imaging partner NVIDIA offers its Clara Imaging framework on AWS Marketplace for easy and scalable deployment.

Powered by MONAI (Medical Open Network for Artificial Intelligence), Clara Imaging helps simplify building, managing, and deploying AI for healthcare applications. Clara Imaging's full-stack application framework combined with AWS' cloud services enables healthcare organizations to access on-demand tools and resources to help build, train, and deploy AI models quickly.

## The key ingredients

### Medical Open Network for Artificial Intelligence



MONAI is an open-sourced framework for AI creation of medical imaging workflows. The MONAI Institute, established in 2020, is responsible for developing and

exchanging best practices for AI in healthcare imaging for academia and enterprise researchers.

Today, MONAI delivers features and capabilities to facilitate each stage of AI model development and deployment. It simplifies and accelerates AI modeling in medical imaging workflows through tools such as AI-powered data labeling.

### Clara Imaging

Clara Train provides an application framework and tools to advance medical imaging workflows such as AI-assisted data labeling, collaborative and fast AI model training tools, hyperparameter tuning, and scalable deployment.

Clara Train's tools and APIs support data preparation for AI use and accelerates AI model training enabling medical professionals to:

- ✓ Speed up image labeling
- ✓ Use pre-trained models to accelerate model creation
- ✓ Work across institutions to build more robust models, without sharing sensitive patient healthcare data

## Deploying AI in medical imaging on AWS

Clara Imaging on AWS helps organizations optimize data management, reduce storage costs, access industry data, and securely collaborate. Use existing Clara Imaging workflows to accelerate use of AI-assisted medical imaging on AWS.



### Scalable storage

Manage your costs with flexible service offerings and tiered pricing models for compute and storage.



### Image enhancement and improved classification

Process deep learning and improved image processing with virtually unlimited AWS compute and storage capacity to improve image quality and reduce the time spent in MRI scans.



### End-to-end AI app workflows

Streamline AI application development with a large portfolio of AI-supported services.



### Integrated collaboration

Enhance workflow-specific insight to meet patients' needs. Easy-to-use collaboration interfaces for data scientists can give input in AI model creation and evaluation.



### Accelerate learning

Machine learning and high-performance computing (HPC), can help medical imaging professionals leverage collaborative learning techniques to build AI models. Techniques such as Transfer Learning, Auto Machine Learning, and Federated Learning help data scientists and clinicians save time by building a common AI model, reducing medical imaging inference time. Machine learning and HPC on AWS also allows scientists to experiment at scale by training AI models locally using private data or sharing aggregated model rates while preserving patient privacy.



### Robust and generalizable model building

Federated Learning helps organizations build more robust AI models without the need to share confidential patient data. AI models can be trained on more diverse data from different patient types, radiology scanner types, geographies, and hospital types. Keep pace with the latest technological advances with broader use of diverse data, and with powerful compute and AI models that can be deployed in more institutions.



### Extend to edge devices (IoT)

Clara Imaging on AWS accelerates AI integration with smart medical instruments to provide more precise and personalized patient care while reducing the cost and time required to deliver a superior level of image processing.

## The AWS advantage



### Cost-effective, highly scalable cloud infrastructure

AI-powered medical imaging workflows requires cost-effective and high-performance compute capacity for training and hosting of AI models. Leverage the [AWS pay-as-you-go pricing model](#) to pay only for the compute resources you need.



### Enterprise agility

Deploy cloud infrastructure quickly and facilitate AI model building in as little as a few days. Use AWS services to build your own infrastructure or deploy a readily available [AWS QuickStart](#) solution designed for Clara Train SDK in the cloud.



### Advanced machine learning and data integration

Use the [AWS Registry of Open Data](#) to gain access to large, annotated datasets for model training.



### Easily access data already stored in AWS

With the increase of imaging data, many organizations are challenged to optimize imaging data movement, access, and storage. AWS brings the broadest set of scalable storage solutions to facilitate data movement and integration, long-term data retention, and image analysis. AWS customers can leverage the data stored in the AWS cloud to start building AI models and reduce model training from days to hours.



### HIPAA eligible environment

Use AWS to run sensitive workloads regulated under the U.S. Health Insurance Portability and Accountability Act (HIPAA).

## How AWS and NVIDIA work together

NVIDIA, an AWS Partner, provides Clara Imaging, a deep-learning optimized application-building framework for data labeling, hyperparameter model tuning, model training, collaboration, and deployment for medical imaging. NVIDIA provides access to over 20 pre-trained AI medical imaging models that help customers get started quickly.

Powering Clara Imaging is AWS' scalable and cost-effective compute and storage capacity. A globally accessible infrastructure on AWS supports AI model training and purpose-built medical imaging tools to accelerate medical imaging workloads.

Together, researchers and scientists can build, manage, and deploy AI-assisted workflows that allow for faster image labeling, reduce radiologist workloads, and enhance quality of care.

**“I was inspired by my research to make medical imaging more accessible. We needed to make a huge difference in inference time, and NVIDIA enables us to make that difference”,**

Enhao Gong, CEO at Subtle Medical



## GET STARTED TODAY

Clara Imaging is available on AWS Marketplace as an Amazon Machine Image (AMI), enabling organizations to get started in minutes.

- 1 Go to AWS Marketplace
- 2 Search for 'NVIDIA Clara Train SDK Pipelines'
- 3 Subscribe
- 4 Launch and configure an Amazon Elastic Compute Cloud (Amazon EC2) instance
- 5 Download sample data, or your organization's data stored on AWS
- 6 Run the first Clara Imaging analysis

Learn more about AWS  
for Medical Imaging ›

