

AWS 헬스케어 솔루션 및 활용사례 소개

AWS for Healthcare and LifeScience

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Solutions Architect

Partner Development Manager

Business Development Manager



Lead Development Rep

웨비나 서베이 프로모션



1. 서베이 **제출**하신 고객중 추첨하여 **스타벅스 기프트 카드** 증정

2. 서베이 작성 후 **상담 신청**한 고객 추첨 하여 배달의민족 상품권 증정



목차

- 1. 클라우드 활용 이점
- 2. AWS 헬스케어 솔루션 소개
- 3. AWS 활용 고객 사례 소개

클라우드 활용 이점

Agility

Elasticity

Cost Savings

Deploy Globally within Minutes

민첩성

단 몇 분 만에 기술 서비스를 배포할 수 있으며 이전보다 몇 백배나 더 빠르게 아이디어를 구현할 수 있습니다.

탄력성

비즈니스 요구가 변화함에 따라 이러한 리소스를 확장하거나 축소하여 용량을 즉시 늘리거나 줄일 수 있습니다.

비용 절감

클라우드를 통해 고정 비용(데이터 센터, 물리적 서버 등)을 가변 비용으로 전환하고, 사용한 만큼만 IT 비용을 지불할 수 있습니다.

몇 분 만에 전 세계에 배포

단 몇 분 만에 기술 서비스를 배포할 수 있으며 이전보다 몇 백배나 더 빠르게 아이디어를 구현할 수 있습니다.



AWS 헬스케어 솔루션 소개

AWS를 활용한 데이터 가치 향상

10+

years with dedicated healthcare and life sciences practice



years as world's first, most comprehensive, and broadly adopted cloud platform



years on average, AWS team leaders have been in the healthcare and life sciences industry



9 of the top 10 pharma companies use AWS for data analytics and ML

"Most mature, enterprise-ready provider, with the strongest track record of customer success and the most useful partner ecosystem"

"고객 성공에 대한 가장 뛰어난 성과 및 가장 유용한 파트너생태계를 갖춘 가장 성숙하고 전문적인 솔루션 제공업체"





폭 넓은 서비스 포트폴리오

ANALYTICS

ANALYTICS
DATA EXCHANGE
DATA LAKE
DATA PIPELINES
DATA WAREHOUSE
ELASTICSEARCH

STREAMING
ETL
HADOOP / SPARK
INTERACTIVE SQL QUERIES
VISUALIZATIONS

BUSINESS APPLICATIONS

CONTACT CENTER
SHARING & COLLABORATION
ONLINE MEETINGS & CHAT
VOICE-ENABLED WORKPLACE

UNIFIED COMMUNICATIONS

MOBILE & WEB APPS WITHOUT
PROGRAMMING

BLOCKCHAIN

BLOCKCHAIN TEMPLATES LEDGER DATABASE MANAGED BLOCKCHAIN

SECURITY, IDENTITY, AND COMPLIANCE

ACCESS CONTROL
ASSESSMENT & REPORTING
CONFIGURATION COMPLIANCE
DATA PROTECTION
DDOS PROTECTION
IDENTITY MANAGEMENT
KEY MANAGEMENT & STORAGE

MONITORING & LOGGING
RESOURCE MANAGEMENT
THREAT DETECTION
WEB APPLICATION FIREWALL

A STORAGE

ARCHIVE STORAGE
BACKUP & RESTORE
BLOCK STORAGE
DATA TRANSFER
EDGE PROCESSING & COMPUTING
FILE STORAGE
HIGH-PERFORMANCE FILE SYSTEM

HYBRID CLOUD STORAGE
OBJECT STORAGE
WINDOWS FILE SYSTEM

DATABASE

RELATIONSHIP DATABASES
HIGH-PERFORMANCE RELATIONAL
DATABASE
BUILT FOR THE CLOUD
MANAGED MARIADB
MANAGED MYSQL
MANAGED ORACLE
MANAGED POSTGRESQL
MANAGED SQL SERVER

PURPOSE-BUILT DATABASES
DOCUMENT DATABASE
GRAPH DATABASE
IN-MEMORY CACHING
KEY-VALUE STORE DATABASE
LEDGER DATABASE
TIME SERIES DATABASE

© DEVELOPMENT TOOLS

ANALYZE AND DEBUG
APPLICATION LIFECYCLE
MANAGEMENT
AUTHORING
BUILD & TEST
CONTAINERS

DEVOPS RESOURCE MANAGEMENT
ONE-CLICK APP DEVELOPMENT
PATCHING
PIPELINE ORCHESTRATION
RESOURCE TEMPLATES
TRIGGERS

COMPUTE

COMPUTE
AUTO SCALING
BATCH JOBS
EVENT-DRIVEN SERVERLESS
COMPUTING
INSTANCE TYPES
MANAGED VIRTUAL PRIVATE
SERVERS
MANAGED REPOSITORY FOR
SERVERLESS APPS

RUN & MANAGE
WEB APPS
SERVERLESS COMPUTE
VIRTUAL SERVERS
CONTAINERS
CONTAINER SERVICE
MANAGED KUBERNETES
STORE & RETRIEVE DOCKER IMAGES

▶ MEDIA SERVICES

LIVE VIDEO TRANSPORT
MEDIA STORAGE
TRANSCODING
VIDEO ORIGINATION & PACKAGING

VIDEO PERSONALIZATION &
MONETIZATION
VIDEO PROCESSING & DELIVERY
VIDEO STREAMING ANALYSIS

HYBRID ARCHITECTURE

AWS SERVICES ON-PREMISES
DATA INTEGRATION
INTEGRATED DEVICES & EDGE
SYSTEMS
INTEGRATED IDENTITY & ACCESS

INTEGRATED NETWORKING
INTEGRATED RESOURCE &
DEPLOYMENT MANAGEMENT
VMWARE CLOUD ON AWS
INTEGRATED 5G

INTERNET OF THINGS (IOT)

RULES ENGINE
DEVICE ANALYTICS
DEVICE GATEWAY
DEVICE SDK
DEVICE SHADOWS
EVENT DETECTION & RESPONSE
LOCAL COMPUTE

LOCAL DATA COLLECTION
MANAGEMENT & SECURITY
MICROCONTROLLER
OPERATING SYSTEM
REGISTRY
VISUAL APPLICATIONS
DEVELOPMENT

AI SERVICES

MACHINE LEARNING

ML FRAMEWORKS
DEEP LEARNING AMIS &
CONTAINERS
HARDWARE ACCELERATION
ML AT THE EDGE
TENSORFLOW, PYTORCH, MXNET

SAGEMAKER
AUTOMATIC MODEL TUNING
DATA LABELING
HOSTED NOTEBOOKS
ML MARKETPLACE
MODEL HOSTING
MODEL OPTIMIZATION
MODEL TRAINING
PRE-BUILT ALGORITHMS
TOPIC MODELING
DEEP LEARNING MODELS
REINFORCEMENT LEARNING
SPOT INSTANCES
BATCH PREDICTIONS

REAL-TIME PREDICTIONS

CHATBOTS ENTITY EXTRACTION FACE ANALYTICS FACE SEARCH FORECASTING IMAGE LABELING NATURAL LANGUAGE PROCESSING PERSONALIZATION & RECOMMENDATION SENTIMENT ANALYSIS SPEECH TRANSCRIPTION TEXT & DATA EXTRACTION TEXT TO SPEECH TRANSLATION VIDEO & IMAGE ANALYSIS CONTENT MODERATION



AWS 글로벌 인프라스트럭쳐

31 Launched Regions, 99 Availability Zones and 450+ Points of Presence



aws

* To comply with China's legal and regulatory requirements, AWS has collaborated with Sinnet and NWCD, the local partners in China for delivering cloud services within AWS China (Beijing) Region and AWS China (Ningxia) Region respectively.

HealthCare & LifeScience 분야를 위한 서비스



Amazon HealthLake

Analytics & imaging Store, transform, query, and analyze health data



Amazon OMICS

Transform genomic, transcriptomic, and other omics data into insights



Amazon Textract

Easily extract text and data from virtually any medical document



AWS Data Exchange

Find, subscribe to, and use third-party data in the cloud

COMING SOON



123.3.21

AWS Clean Rooms

Securely match, analyze, and collaborate without sharing or revealing underlying datasets



Amazon Comprehend Medical

Understand and extract health data from medical text using natural language processing



Amazon Transcribe Medical

Automatically convert medical speech to text



Amazon Datazone

Discover, share, and govern data at scale across organizational boundaries aligned to a data mesh foundation

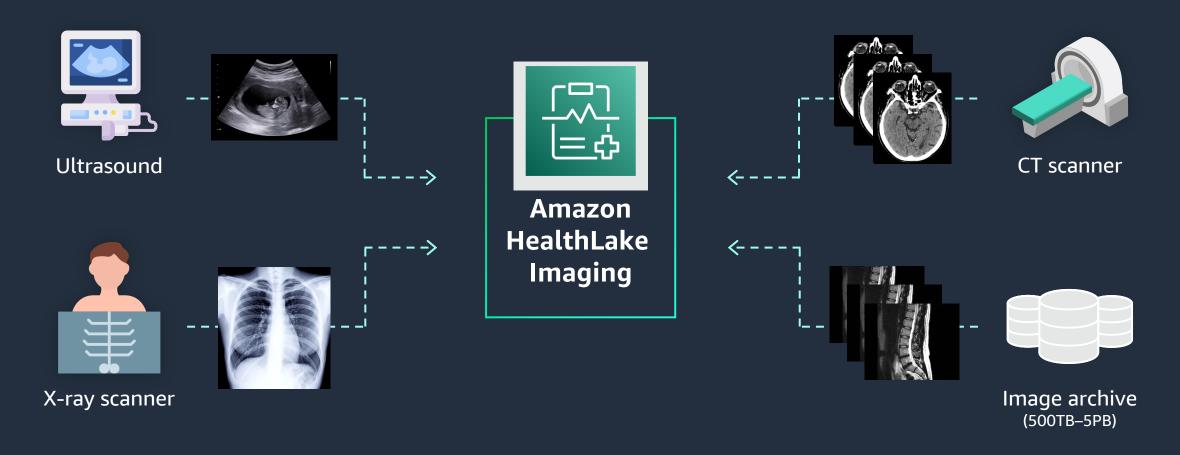


AWS ID Resolution

Match and resolve disparate records into a complete view of consumers



Amazon HealthLake Imaging





Amazon Datazone vs. AWS Clean Rooms

Data Zone	Clean Rooms
하나의 기업내에서 데이터 제공 및 조회	여러 기업간 데이터 제공 및 조회
기업내의 모든 데이터 공유,분석	필요한 데이터만 Clean하게 공유, 하나의 기업만 분석가능
원본 데이터 공유가능(제약 가능)	원본 데이터 공유하지 않음(실시간조회)

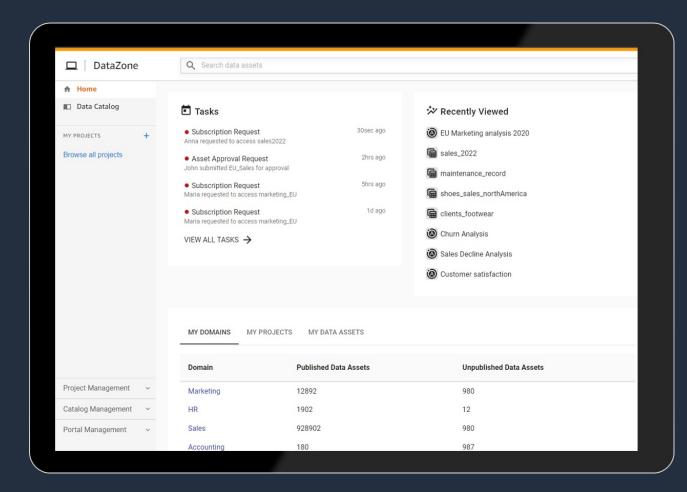


Amazon Datazone 기업내에서 데이터 제공 및 조회





Amazon Datazone 기업내에서 데이터 제공 및 조회



- 풍부한 시각적 인터페이스로 데이터 자산 검색 및 발견
- Amazon Athena 및 Amazon Redshift와 함께 Data Portal Deep Links를 통해 데이터 쿼리
- 다른 데이터 과학 및 분석 팀과 협업

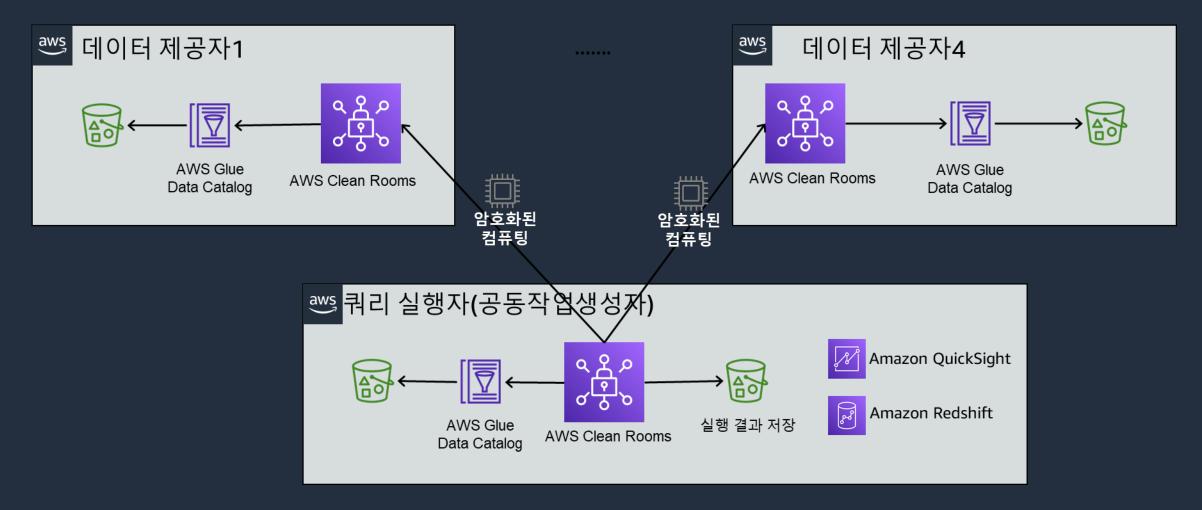


Amazon Datazone vs. AWS Clean Rooms

Data Zone	Clean Rooms
하나의 기업내에서 데이터 제공 및 조회	여러 기업간 데이터 제공 및 조회
기업내의 모든 데이터 공유,분석	필요한 데이터만 Clean하게 공유, 하나의 기업만 분석가능
원본 데이터 공유가능(제약 가능)	원본 데이터 공유하지 않음(실시간조회)

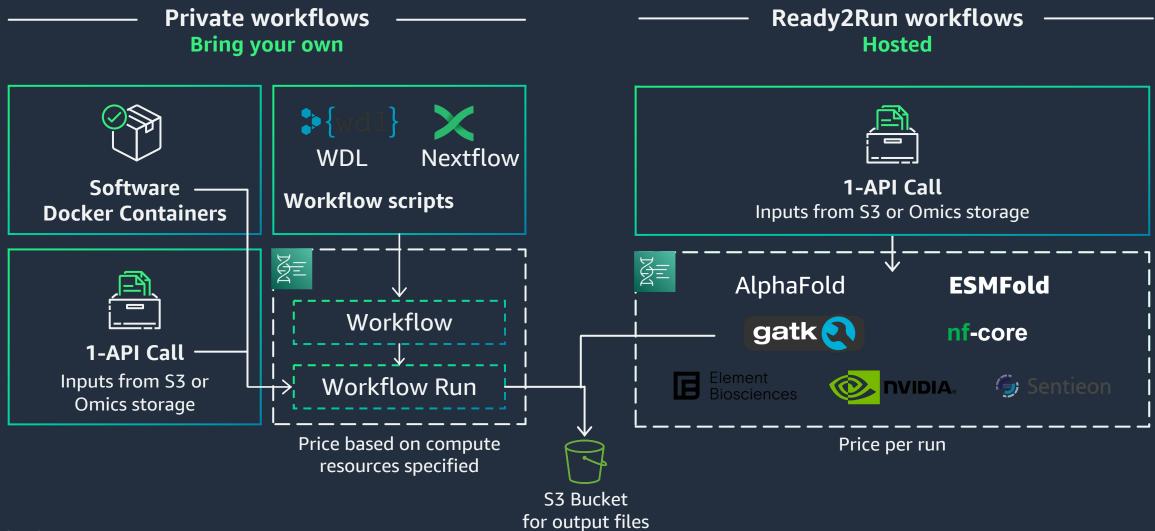


AWS Clean Rooms 기업간 데이터 제공 및 조회





Amazon Omics





Amazon Transcribe Medical



Microphone-enabled Client







- 2) Pass an audio stream
- 3) Get a stream of text



Amazon Transcribe Medical



Amazon Comprehend Medical

patient is a 62-year-old female with a history of Type 2 diabetes mellitus with insulin use (1/14/2019). Admitted ER 1/11/2020 for an elevated BP with no previous history of HTN. 3/28/2020 she was admitted for hypothyroidism and prescribed metformin (GLUCOPHAGE) 1000 mg take daily by mouth in evening. Follow up clinic visit (9/20/2020) with A1C results of...

Medical conditions



Abbreviations, and time stamps

```
-Overlap
                                               Overlap-
                                                                                                   Diagnosis, Negation
                           1/11/2020 for an
Admitted ER
                                                             elevated BP with no previous history of HTN.
                                                                                                                            3/28/2020 she was admitted
            Address (ER)

    Dx name (HTN)

    Dx name (elevated BP)

    Time to dx name (3/28/2020)

    Time to test name (1/11/2020)

    Test value (elevated)

                                                                                                                            Date (3/28/2020)

    Time to dx name (1/11/2020)

    Test name (BP)

                           Date (1/11/2020)
```

```
"Id": 22,
    "BeginOffset": 93,
    "EndOffset": 102,
    "Score": 0.9999784231185913,
→ "Text": "1/14/2019",
    "Category": "TIME EXPRESSION",
—→"Type": "TIME TO DX NAME",
    "Traits": [],
    "Attributes": [
        "Type": "DX NAME",
        "Score": 0.9177364706993103,
        "RelationshipScore": 0.5882568955421448,
        "RelationshipType": "OVERLAP",
        "Id": 8,
        "BeginOffset": 47,
        "EndOffset": 71,
   → "Text": "type 2 diabetes mellitus",
        "Category": "MEDICAL CONDITION",
        "Traits": [
       → "Name": "DIAGNOSIS",
            "Score": 0.9727892875671387
```



	Named Entit	ies Analysis
8		
	Medical Condition	
P	Add Medical Condition	
	upset my stomach K31.89 Other diseases of stomach and d	
0	diabetes E11.9 Type 2 diabetes mellitus without complications 69.74%	
	pain R52 Pain, unspecified 82.65%	×
B	pain R62 Pain, unspecified 90.18%	X
_	chest pain R07.9 Chest pain, unspecified 88.58%	× ×
_	pain R62 Pain, unspecified 82.03%	• v ×
	heart attack 125.2 Old myocardial infarction 81.24%	<u> </u>
	Medication	
1	Add Medication	The second secon
	albuterol 435 albuterol 89.39%	· ×
	notaceium I 190170A I Mirroancanentatad Detaceium Chlorida	
	SOAP Notes	Live Transcription
		patient I've been walkingaround the house.
As	ssessment:-	doctor: Okay, let's get you started with some
	iagnosis:	cardiac rehabilitation. The earlier we get that
	atient is likely suffering from diabetes, pain, eart attack.	started the guicker you'll be feeling better. How
		have you been walking? Um
	lan:- he suggested plan is to take the following	patient: Yes, I've been using my albuterol inhaler,
DA	edication(s): albuterol, potassium, potassium	but only once or twice a day.
	applements, metformin, Vicodin. The suggested reatment(s) to follow is below:	
po	otassium level, potassium supplements, blood	doctor: Good. I see that you were using inhaler in the hospital. Are you still using that?
	agar, Blood sugar, blood sugars, strong pain edications, surgery, coronary artery bypass	
	argery.	patient: Um, no, I I take the potassium 20 Miller
Sı	ubjective:-	equivalence or 20 milliequivalents every day it
C	hief Complaint(s):	does not upset my stomach.
	atient presents with heart attack. istory of Present Illness(s):	doctor: I also see from the records that your
P	atient is here for diabetes, pain, heart	potassium level was low on last check. Are you
	ttack. Patient noted issues with: stomach, hest, heart, coronary artery with symptoms like	having any trouble taking your potassium
c)	nest pain, pain. Current medications include	supplements every day?
	lbuterol, potassium, potassium supplements, etformin, Vicodin.	doctor: Keep taking your metformin 500 mg twice
		a day for your diabetes and check your blood
O	ojective:-	sugar, as you have been keep a record of them so
		we can review them in a month or so.
		doctor: That's great.
		patient: Blood sugar this morning was 1 35.
		doctor: How have your blood sugars readings
		been at home?
		The state of the s
		doctor: Okay. Your blood sugar readings were
		bibv aligit.
		nationt: Ah yeah They sent me home with





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AWS Data Exchange

Registry of Open Data on AWS



About

This registry exists to help people discover and share datasets that are available via AWS resources. Learn more about sharing data on AWS.

See all usage examples for datasets listed in this registry.

See datasets from Allen Institute for Artificial Intelligence (AI2), Digital Earth Africa, Facebook Data for Good, NASA Space Act Agreement, NIH STRIDES, NOAA Big Data Program, Space Telescope Science Institute, and Amazon Sustainability Data Initiative.

Search datasets (currently 19 matching datasets)



Add to this registry

If you want to add a dataset or example of how to use a dataset to this registry, please follow the instructions on the Registry of Open Data on AWS GitHub repository.

Unless specifically stated in the applicable dataset documentation, datasets available through the Registry of Open Data on AWS are not provided and maintained by AWS. Datasets are provided and maintained by a variety of third parties under a variety of licenses. Please check dataset licenses and related documentation to determine if a dataset may be used for your application.

The Cancer Genome Atlas



The Cancer Genome Atlas (TCGA), a collaboration between the National Cancer Institute

(NCI) and National Human Genome Research Institute (NHGRI), aims to generate comprehensive, multi-dimensional maps of the key genomic changes in major types and subtypes of cancer, TCGA has analyzed matched tumor and normal tissues from 11,000 patients, allowing for the comprehensive characterization of 33 cancer types and subtypes, including 10 rare cancers. The dataset contains open Clinical Supplement, Biospecimen Supplement, RNA-Seq Gene Expression Quantification, miRNA-Seq Isoform Expression Quantificati...

Details →

Usage examples

- Molecular Characterization and Clinical Relevance of Metabolic Expression Subtypes in Human Cancers by Xinxin Peng, Zhongyuan Chen, et al.
- The chromatin accessibility landscape of primary human cancers by M. Ryan Corces, Jeffrey M. Granja, et al.
- Cancer Genomics Cloud by Seven Bridges
- Pan-Cancer Analysis of IncRNA Regulation Supports Their Targeting of Cancer Genes in Each Tumor Context by Hua-Sheng Chiu, Sonal Somvanshi, et al.
- Integrated Genomic Analysis of the Ubiquitin Pathway across Cancer Types by Zhonggi Ge, Jake S. Leighton, et al.

See 29 usage examples →

Therapeutically Applicable Research to Generate Effective Treatments (TARGET)



cancer genomic life sciences STRIDES whole genome sequencing

Therapeutically Applicable Research to Generate Effective Treatments (TARGET) is the collaborative effort of a large, diverse consortium of extramural and NCI investigators. The goal of the effort is to accelerate molecular discoveries that drive the initiation and progression of hard-to-treat childhood cancers and facilitate rapid translation of those findings into the clinic. TARGET projects provide comprehensive molecular characterization to determine the genetic changes that drive the initiation and

Registry of Open Data on AWS

VitalDB





biology health life sciences medicine signal processing

Description

VitalDB, a high-fidelity multi-parameter vital signs database in surgical patients.

Update Frequency

Not updated

License

Creative Commons Attribution 4.0 International Public License https://creativecommons.org/licenses/by/4.0/

Documentation

https://vitaldb.net/dataset

Managed By



See all datasets managed by VitalLab.

Contact

Post any questions to re:Post.

Resources on AWS

Description

The .vital and .csv files for VitalDB dataset

Resource type

S3 Bucket Controlled Access

Amazon Resource Name (ARN)

arn:aws:s3:::vitaldb-open

AWS Region

ap-northeast-2

https://registry.opendata.aws/



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End User Computing Service

Amazon WorkSpaces

Cloud-native persistent desktops

Amazon AppStream 2.0

Cloud-native non-persistent apps and desktops

Contingent workforce Contact center agents Remote workforce and work-from-home App migration and compute-intensive apps Remote students and labs

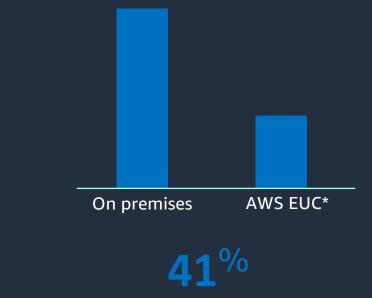


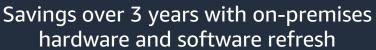
Spend efficiently and control costs

Total Economic Impact of AWS End User Computing¹



Infrastructure cost savings or avoidance from moving to the cloud







Savings over 3 years with no onpremises hardware and software refresh

^{*}AWS End-user computing service is Amazon AppStream 2.0 (always on)
41% Assumes one complete hardware and software refresh during this time period
Without a hardware and software refresh during this time period, savings are closer to 5% yearly; 15% over 3 years



Amazon S3 (Simple Storage Service)

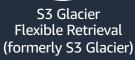














S3 Glacier Deep Archive



S3 One Zone-IA



S3 Outposts

AWS Region ≥ 3 Availability Zones

Data with changing access patterns

- Milliseconds access
- No retrieval charge
- Object monitoring charge
- Archive Instant **Access tier**
- Opt-in Async Archive tiers

Frequently accessed <u>data</u>

- Milliseconds access
 - - per-GB

Infrequently accessed data

- Milliseconds access
- Retrieval charge

Rarely accessed data

- Milliseconds access
 - duration
 - Retrieval charge per-GB

- Minimum storage

Archive data

- Retrieval options from minutes to hours
- Free bulk retrievals
- Retrieval charge per-GB

Long-term archive data

- Retrieval in hours
- Retrieval charge per-GB

AWS AZ

Re-creatable, less accessed data

- Milliseconds access
- Retrieval charge per-GB

AWS Outposts

On-premises data

- Milliseconds access
- Retrieval charge per-GB



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AWS Snowball Edge



ANXBIE 30 LBS 10F1

SALADOS WAS SERVICES SERVICES
SEATTE WAS 98101

SHIP TO:
Paul Huggett
555 Homestead Ln

Seattle, WA 98109

WA 070 9-01

WYS 2ND DAY AIR
TRACKING #: 1Z 003 203 02 9618 6036

DILLING: PyP

BILLING: PyP

E-ink shipping label

80 TB 10G 네트워크 50 TB/80 TB Capacity (Snowball)

100 TB Capacity (Snowball Edge)

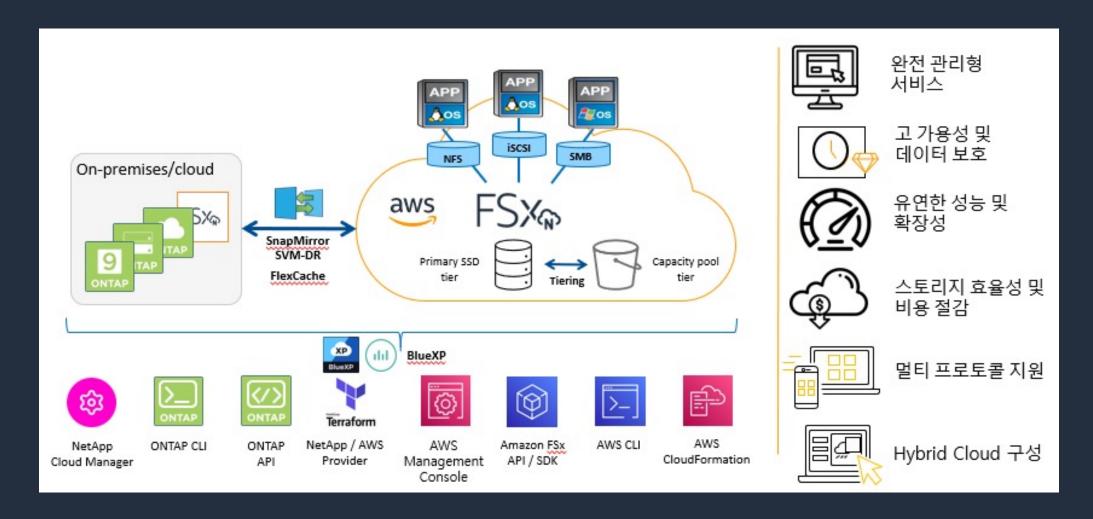
Local S3 Storage APIs (Edge)

Local Lambda Functions (Edge)

멀티미디어 트랜스코딩, 실시간 압축, 커스텀 오디팅 지원



Amazon FSx for NetApp ONTAP 완전관리형 공유 스토리지





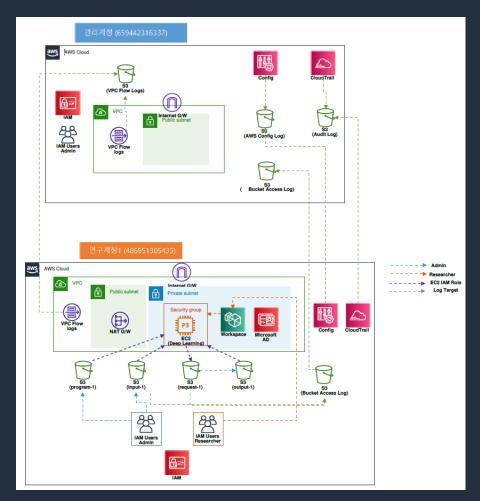
AWS 활용 고객 사례

가톨릭중앙의료원 - AWS PoC 프로젝트

계정분리를 통한 보안 아키텍처

- 의료원: 데이터 저장 및 사용 현황 모니터링
- 외부기관: 데이터 분석에 소요된 컴퓨팅 리소스 비용 부담
- 데이터의 외부 반출은 불가능

의료 빅데이터에 대해 기존 on-premise 환경과 똑같이 AI 연구 가능함 의료기관의 데이터를 외부로 유출되지 않으면서, 외부 연구자가 활용할 수 있는 체계를 구축 의료기관 데이터 개방활용의 첫걸음



Source - https://summits-korea.virtual.awsevents.com/



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Samsung Medical Center

- 전세계 의료 종사자와 제약회사 연구원들이 치료 결과 및 전략을 공유하고 환자 데이터를 분석하는 것은 물론, 치료 결과를 해석해 의학발전을 도모할 수 있는 안전하고 확장가능한 플랫폼을 구축
- 완전관리형 머신러닝 서비스인 아마존 세이지메이커를 활용해 머신러닝 모델을 훈련시켜, 다양한 연구 프로젝트를 통해 확보한 방대한 양의 질병연구 데이터에 대한 연구진의 이해를 돕고, 새로운 치료 방법을 찾는 것을 지원
- 논리적으로 격리된 안전한 가상 네트워크에서 AWS 리소스를 시작할 수 있는 아마존 VPC 서비스를 이용해, 연구진이 환자 데이터를 다룰 때 완전한 데이터 보호 및 네트워크 보안을 유지하여, 연구 데이터를 완벽히 보호

https://zdnet.co.kr/view/?no=20210702105031

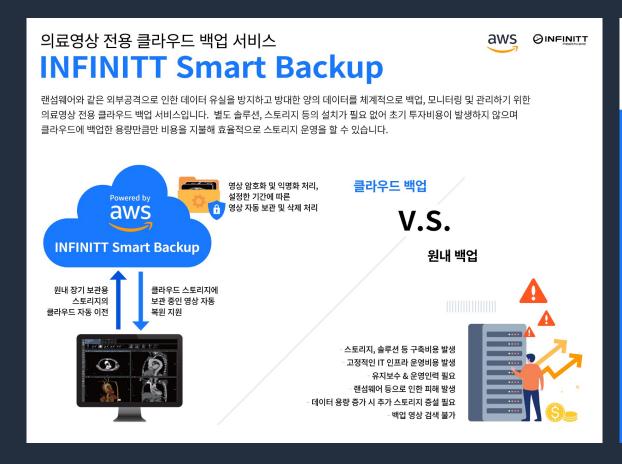


"AWS상에 임상연구 플랫폼을 구축함으로써, 연구진 및 의료진들이 생명을 구하기 위한 의료 연구를 가속화할 수 있게 됐다. AWS의 뛰어난 클라우드 서비스를 통해 우리 의료진들은 삼성서울병원 플랫폼에서 국내외 다른 의료기관과 원활하게 협업하여 전세계적으로 질병에 대한 이해를 높이고 환자의 치료 결과를 개선할 수 있을 것이다."

이풍렬 교수, 삼성서울병원 데이터혁신추진단장



INFINITT Healthcare (Smart Backup)



의료영상 전용 클라우드 백업 서비스





INFINITT Smart Backup

Dashboard

• 관리자용 대시보드에서 병원의 백업 현황 실시간으로 모니터링



Billing Report

• 일별/월별 백업 현황(증가량, 삭제량, 누적 영상 수 및 용량) 및 사용금액 조회



그룹병원 관리

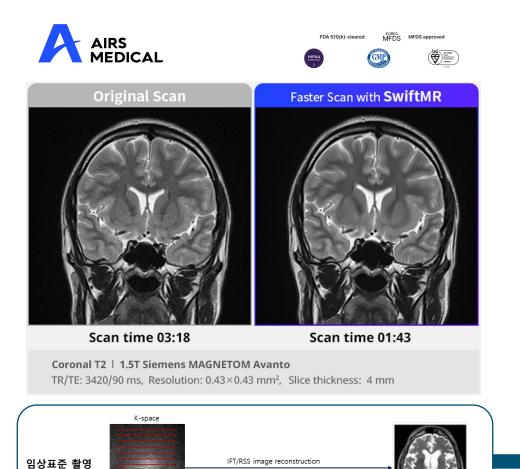
・그룹병원 내 백업 현황 한번에 통합관리



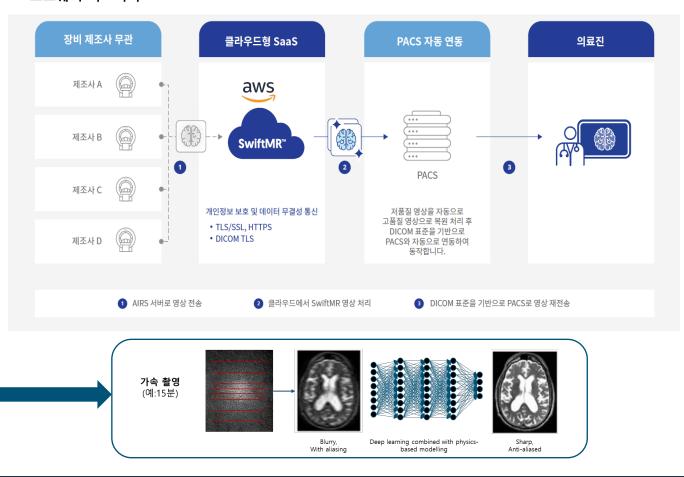


AIRS Medical

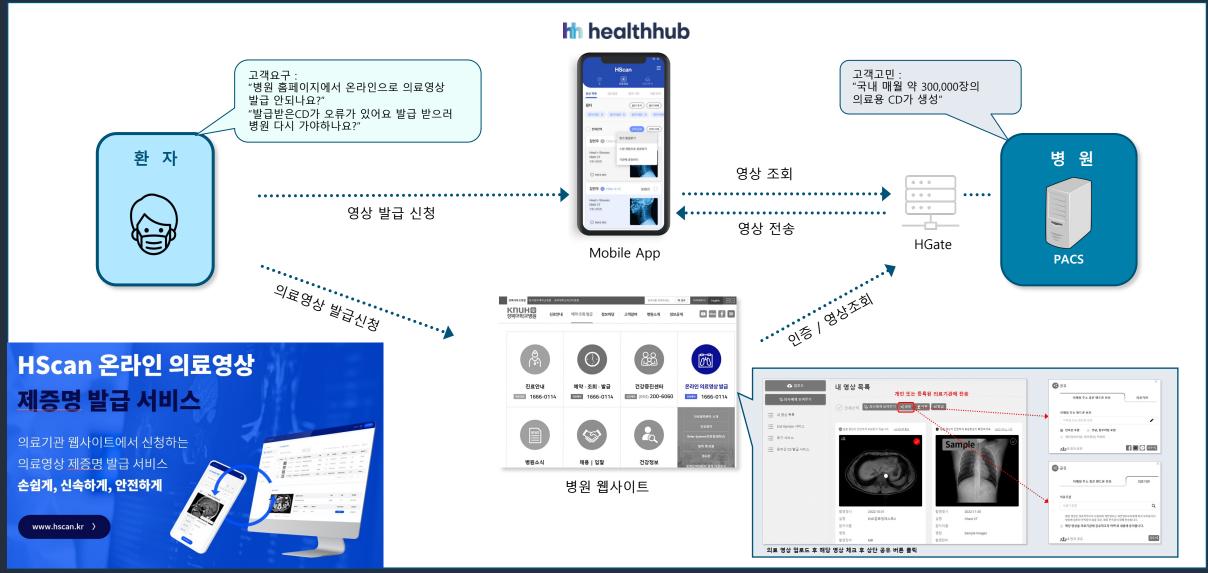
(예: 30분)



딥러닝 기술을 적용하여 기존보다 빠르게 촬영한 저품질 MRI 영상의 품질을 향상시키고 전송할 수 있는 소프트웨어 의료기기

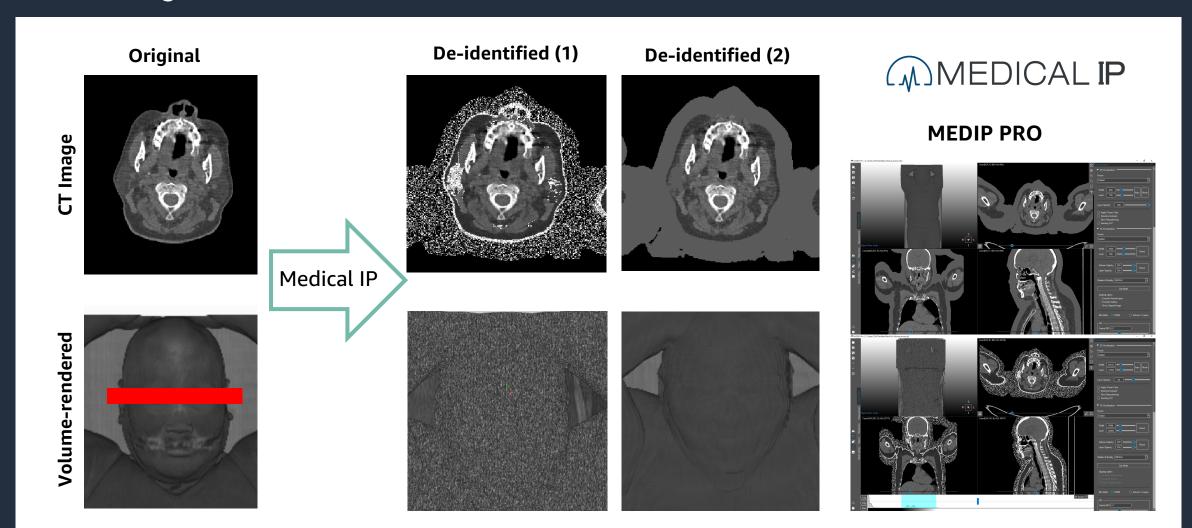


Healthhub



Medical IP

Medical Image de-identification solution





AWS 공공부문 헬스케어 고객 사례집







웨비나 서베이 프로모션



1. 서베이 제출하신 고객중 추첨하여 스타벅스 기프트 카드 증정

2. 서베이 작성 후 **상담 신청**한 고객 추첨 하여 **배달의민족 상품권** 증정





Thank you!



AWS와 함께 성장하기

AWS for Healthcare and LifeScience

노유정 매니저

Global Lead Development team AWS WWPS Korea

목차

- AWS의 헬스케어 분야 지원

- AWS 파트너 네트워크

- 기타 FAQs



AWS의 헬스케어 분야 지원은 어떻게 이뤄지나요?



AWS의 헬스케어 분야 지원은 어떻게 이뤄지나요?





AWS의 파트너 네트워크!



AWS의 파트너 네트워크!





기타 FAQs



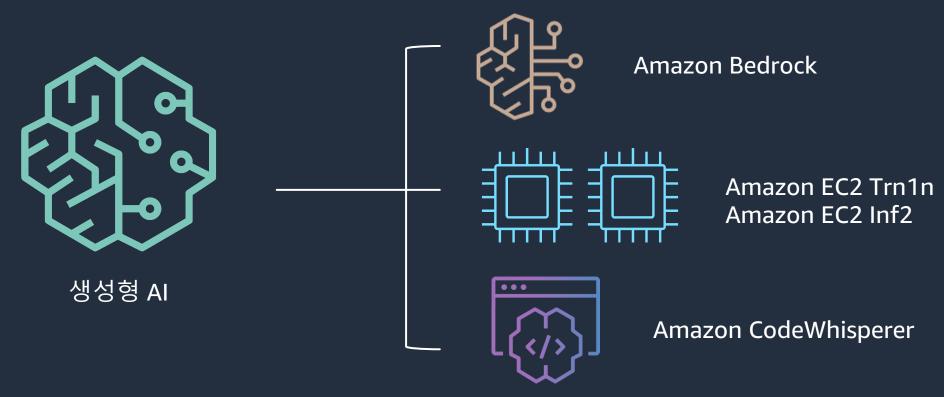
해외진출을 위해 AWS가 도와줄 수 있는 부분은 무엇이 있나요?





Generative AI 서비스를 제공하나요?

자신만의 데이터를 활용해 차별화된 생성형 AI 구축을 위한 신규 서비스 발표





웨비나 서베이 프로모션



1. 서베이 **제출**하신 고객중 추첨하여 **스타벅스 기프트 카드** 증정

2. 서베이 작성 후 **상담 신청**한 고객 추첨하여 **배달의민족 상품권** 증정





Thank you!

노유정 매니저 010-4146-5414 yjnoh@amazon.com