
AWS
re:Invent

WPS202

Transform research environments with Service Workbench on AWS

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AWS re:Invent

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Agenda

Cloud computing for research and genesis of Service Workbench on AWS

Key features of Service Workbench on AWS

Demo

Getting started with Service Workbench on AWS



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Cloud computing for research



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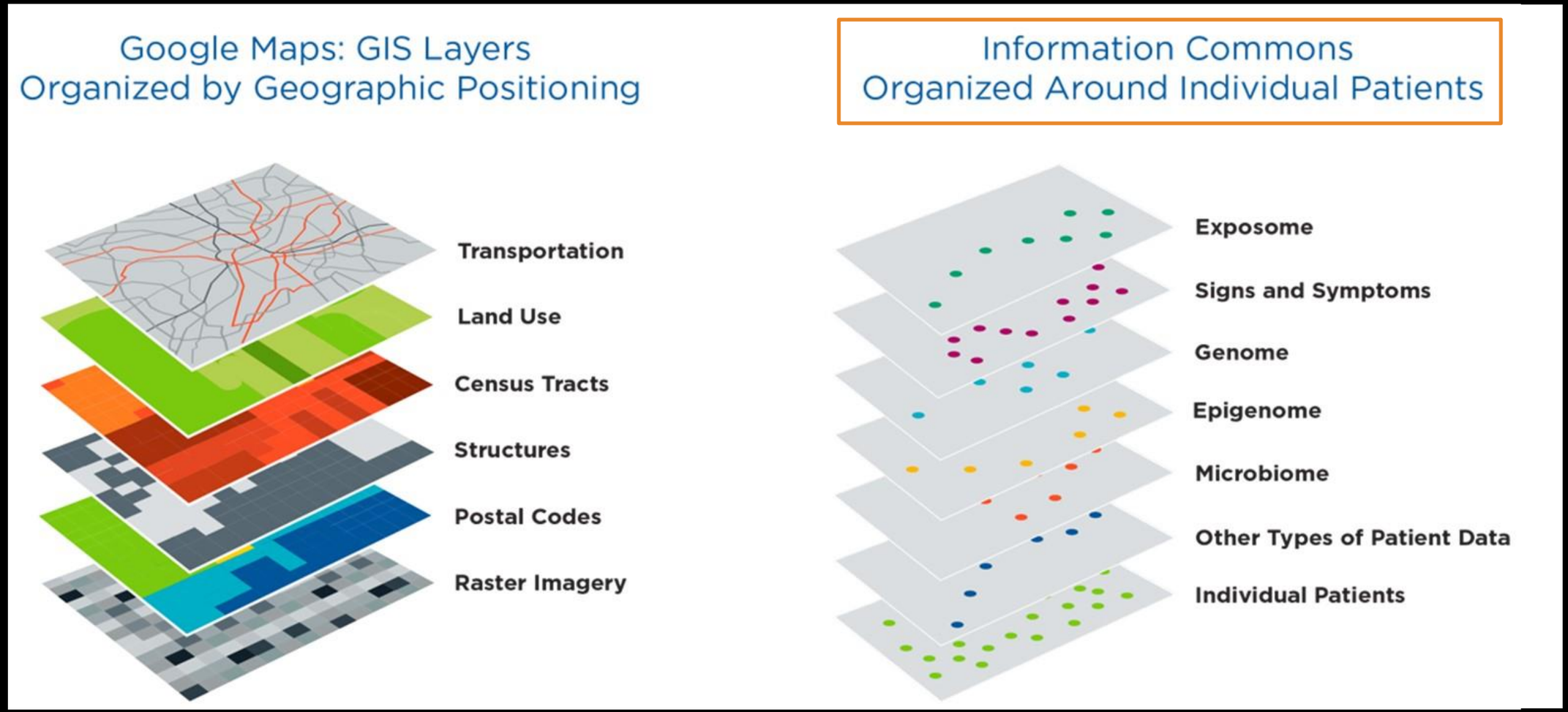
Biomedical discovery infrastructure



Taxonomy of disease

Toward precision medicine

BUILDING KNOWLEDGE NETWORK FOR BIOMEDICAL RESEARCH AND NEW TAXONOMY OF DISEASE



Source: National Academy of Sciences, USA, 2011

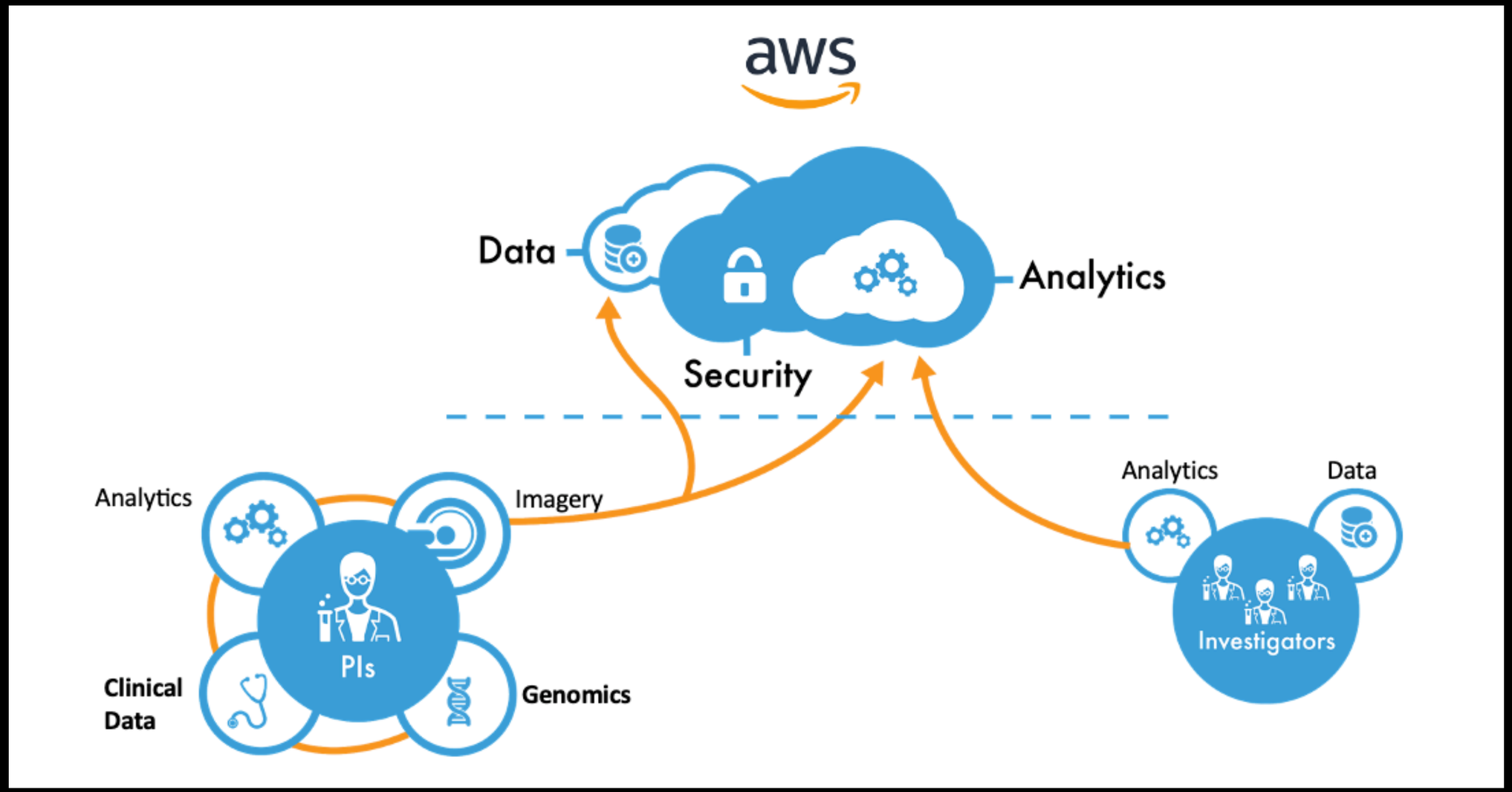
Cloud computing for research

Why would a researcher use public cloud when on-premises cluster is freely available?

- Scalability
- Elasticity
- Security
- Compliance
- Innovation

Biomedical research with AWS

RESEARCH COMPUTING IN THE CLOUD



Patient-centered information commons

STANDARDIZED UNIFICATION OF RESEARCH ELEMENTS

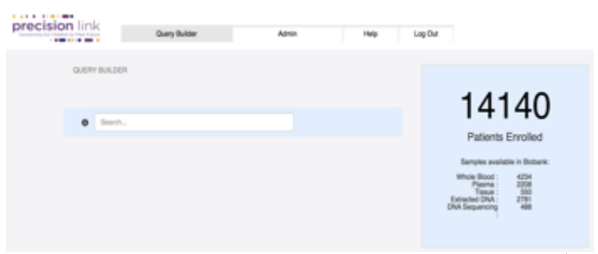
PIC-SURE



Investigators

Search portal

Analysis portal





PIC-SURE API

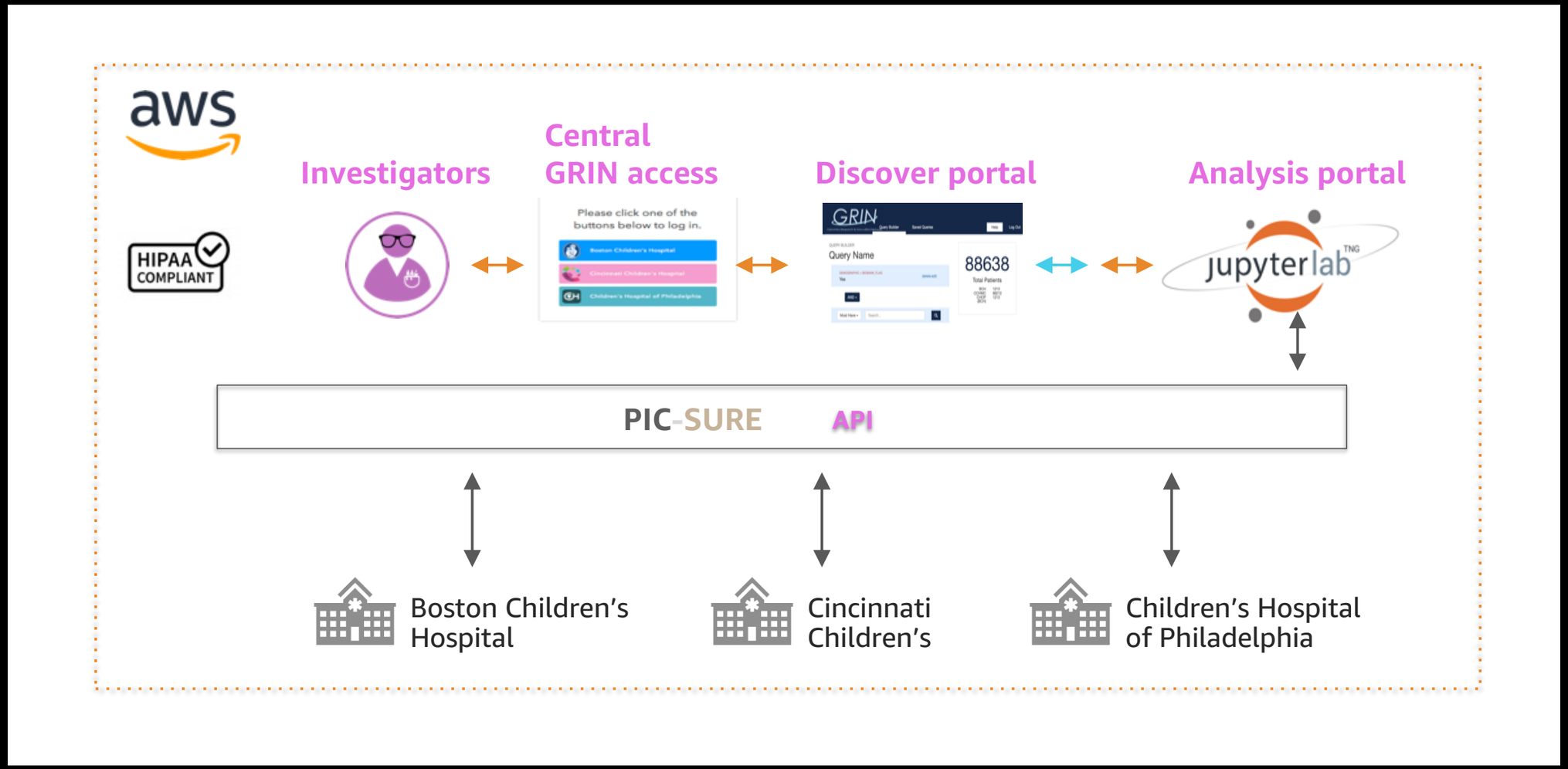
PIC-SURE HPDS

jupyterlab

RStudio

hail

Genomics research and innovation network



Source: Garnet Health, 2019 Sept 4

Cross-institutional federated research

RESEARCH COLLABORATIONS AND NETWORKS

NIH National Heart, Lung, and Blood Institute

BioData Catalyst Powered by Pic-Sure

GIC

Terra

BROAD INSTITUTE

SevenBridges

UDN Undiagnosed Diseases Network

Quest Diagnostics

SFARI Simons Foundation Autism Research Initiative

NIH National Center for Advancing Translational Services

nhanes

CDC National Health and Nutrition Examination Survey

Boston Children's Hospital

Children's Hospital of Philadelphia

Cincinnati Children's

Washington University in St. Louis

University of Pittsburgh Medical Center

Biobank

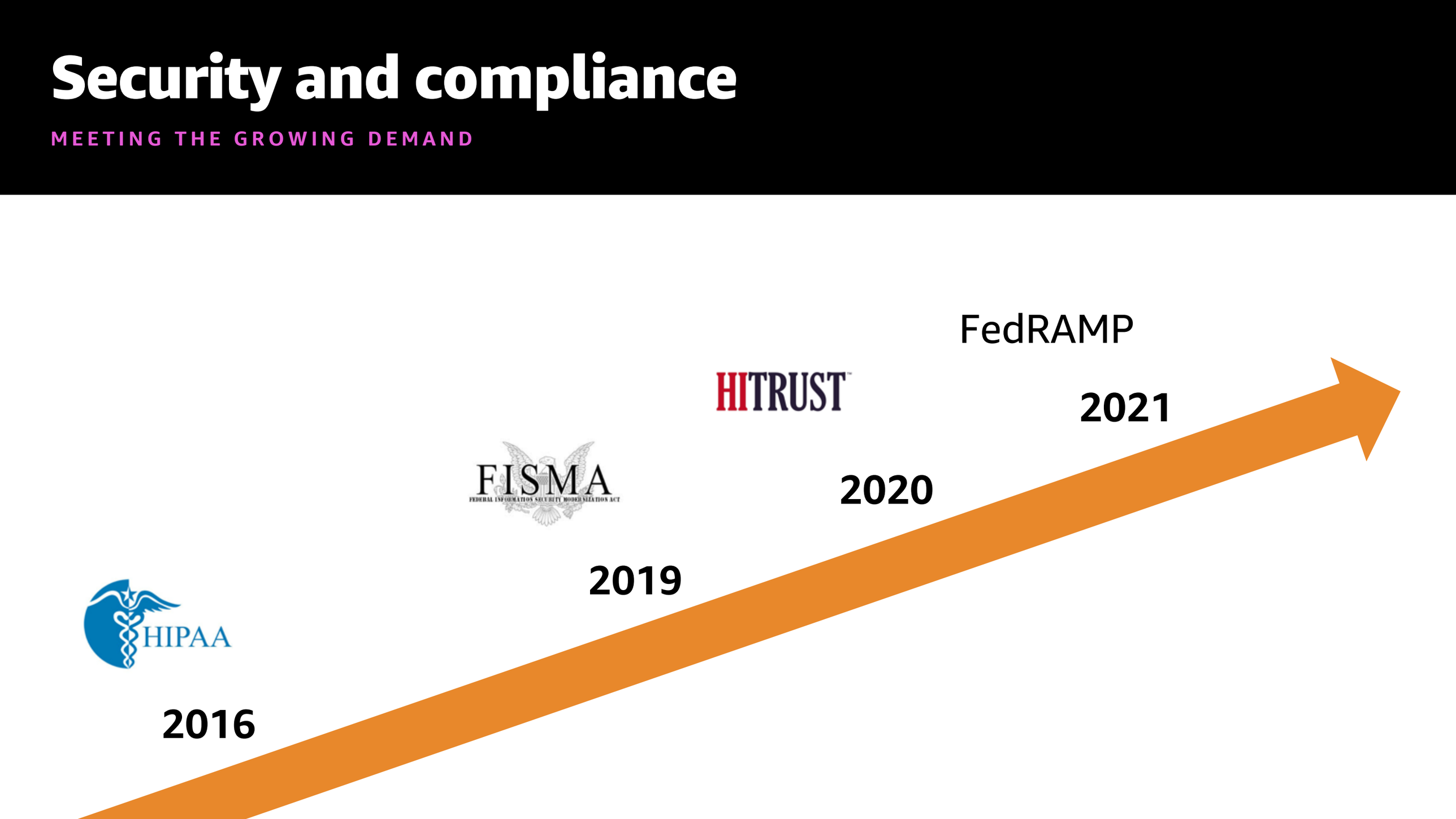
GRIN

pcori

Phelan-McDermid Syndrome Data Network

Security and compliance

MEETING THE GROWING DEMAND




AWS
re:Invent
NOV. 26 – 30, 2018
LAS VEGAS, NV


aws
AWS Village
Directory

Democratize access to public cloud computing

Teaching and research

Full billing control

Multiple funded research projects

Multiple courses

Create multiple AWS accounts

Centrally managed

Secure

Nice, user-friendly user interface























Harvard Medical School –
DBMI prototype

pufferfish



SageMaker



Amazon EMR

hail

hard-code

verb COMPUTING

gerund or present participle: **hard-coding**

fix (data or parameters) in a program in such a way that they cannot be altered without modifying the program.

AISC 610

Education

— Courses

AISC 610 - Computationally-Enabled Medicine

BMI 701 - Foundations in Biomedical Informatics I

BMI 702 - Foundations in Biomedical Informatics II

BMI 703 - Precision Medicine I: Genomic Medicine

BMI 704 - Data Science I: Data Science for Medical Decision Making

BMI 705 - Precision Medicine

Computationally-Enabled Medicine

Computational approaches to analyzing large data sets and applying the insights derived to clinical decision making are central to the present and future of biomedicine. This course will enable students to acquire a computational framework and toolkit for addressing this growing analytic challenge. Selected examples from genomics clinical decision making and from epidemiology informed by "big data" obtained from electronic healthcare data, claims data and even the social web will serve as the basis for exploration of the computational framework. Mentored experiences at medical data science companies and state-of-the-art clinical diagnostics enterprises will enable students to experience the application of and elaborate questions that can be addressed by computational biomedicine.

View in Course Catalog

Service Workbench on AWS

github.com/awslabs/service-workbench-on-aws

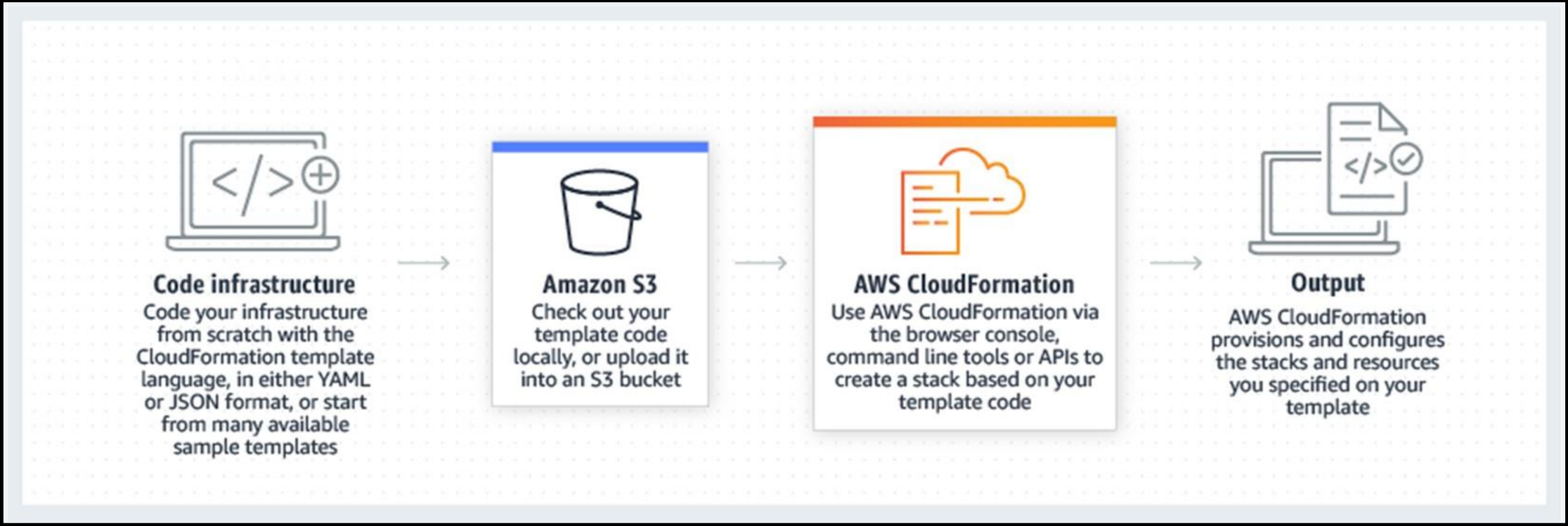


AWS CloudFormation

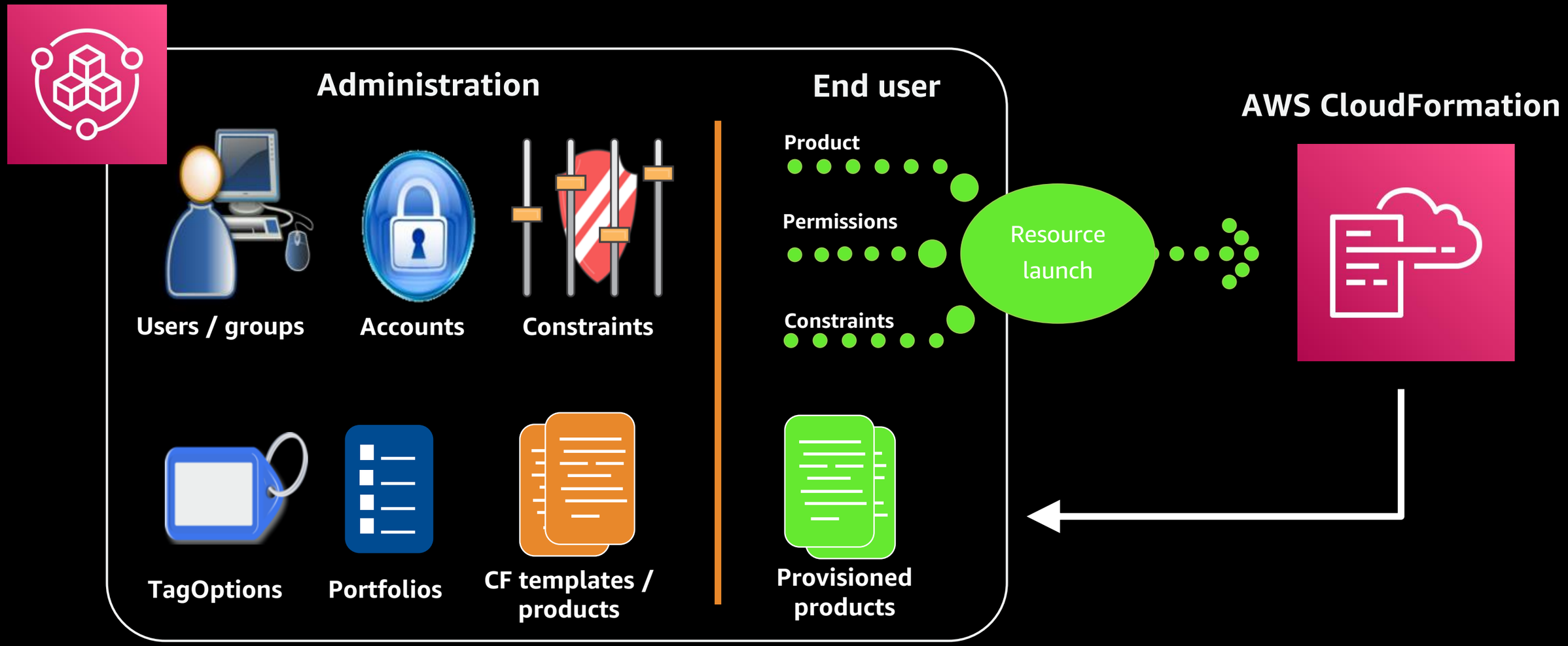
INFRASTRUCTURE AS CODE AND AWS RESOURCE PROVISIONING



AWS CloudFormation



AWS Service Catalog provides governance framework – launch plane onto AWS



Service Workbench on AWS

COLLABORATIVE RESEARCH FRAMEWORK

Self-serve, three-click, on-demand service

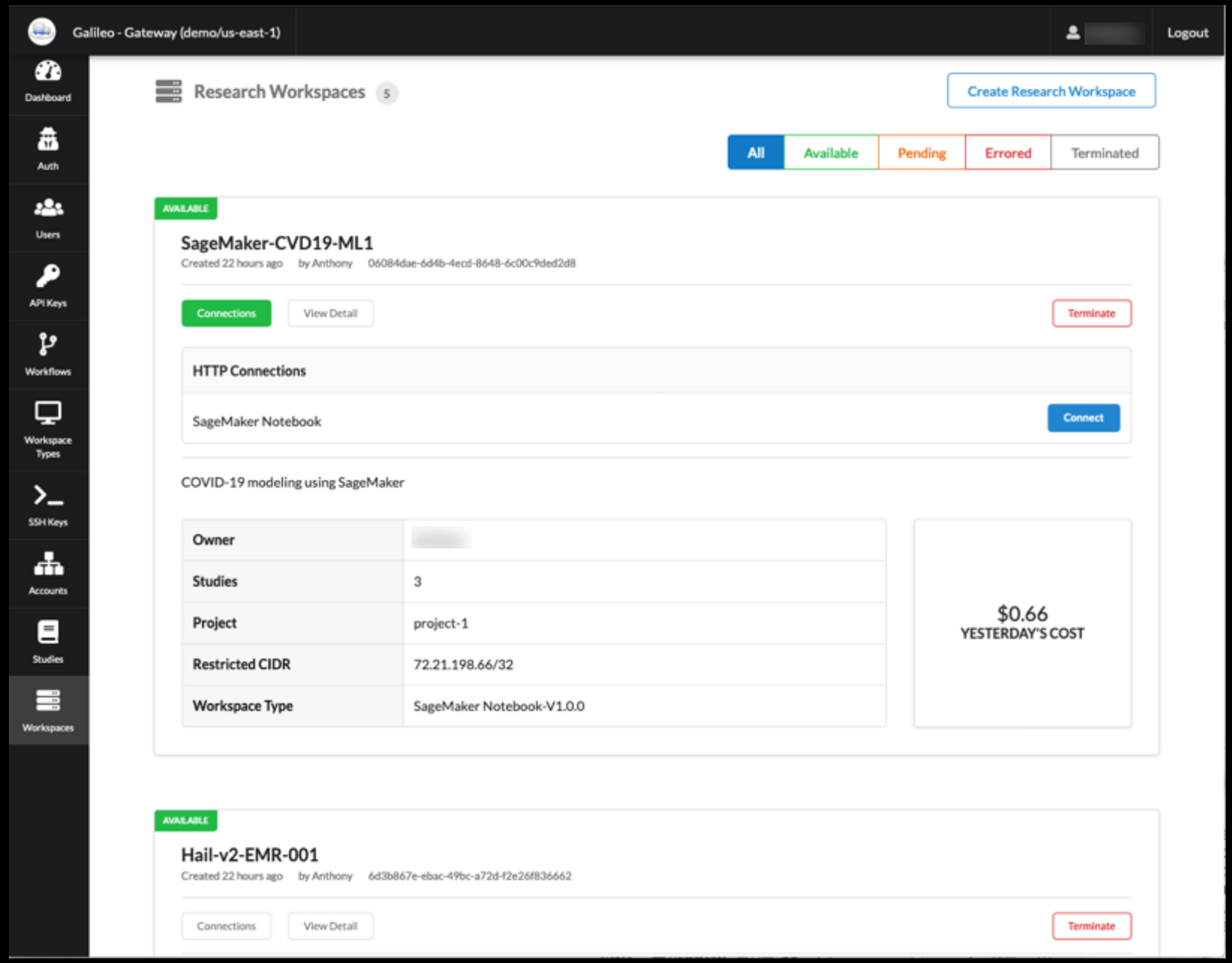
- Launch AWS research environments in minutes, not months
- No cloud infrastructure experience required

Scalable, repeatable launch environments

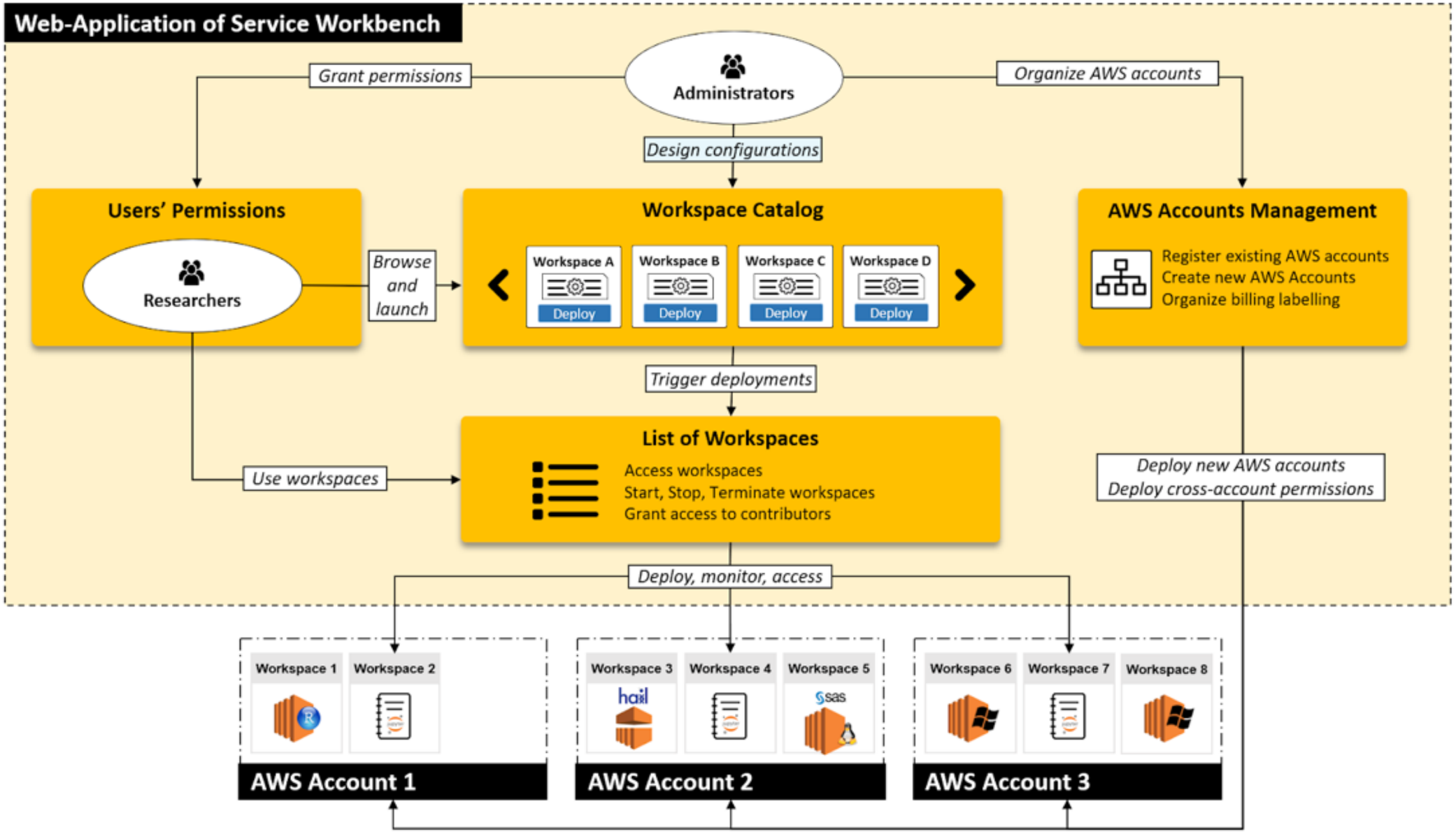
- Simple and extendable access to data, compute power, and tools
- Collaborate securely across internal and external teams

Transparent view of spending

- Project costs, track spending
- Accountable cost centers, budgets, and spending alerting

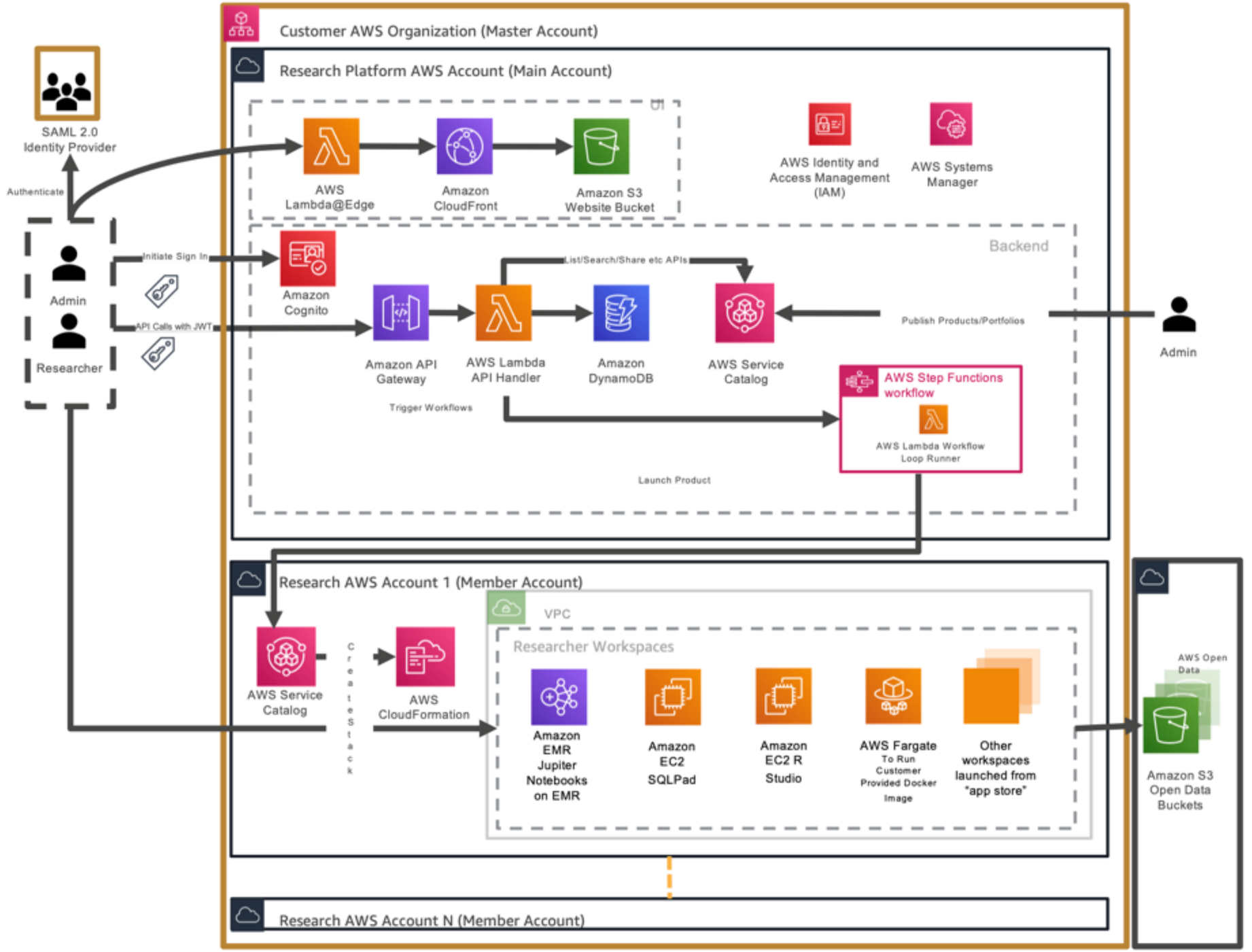


Service Workbench on AWS web application



Service Workbench on AWS architecture

OCTOBER 2020



Demo



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Getting started with Service Workbench on AWS



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Getting started

- Download and install Service Workbench on AWS
  github.com/awslabs/**service-workbench-on-aws**
- Watch repository for updates
- Submit bugs, features, and pull requests
- Build and share your workspaces
- Share your experiences!

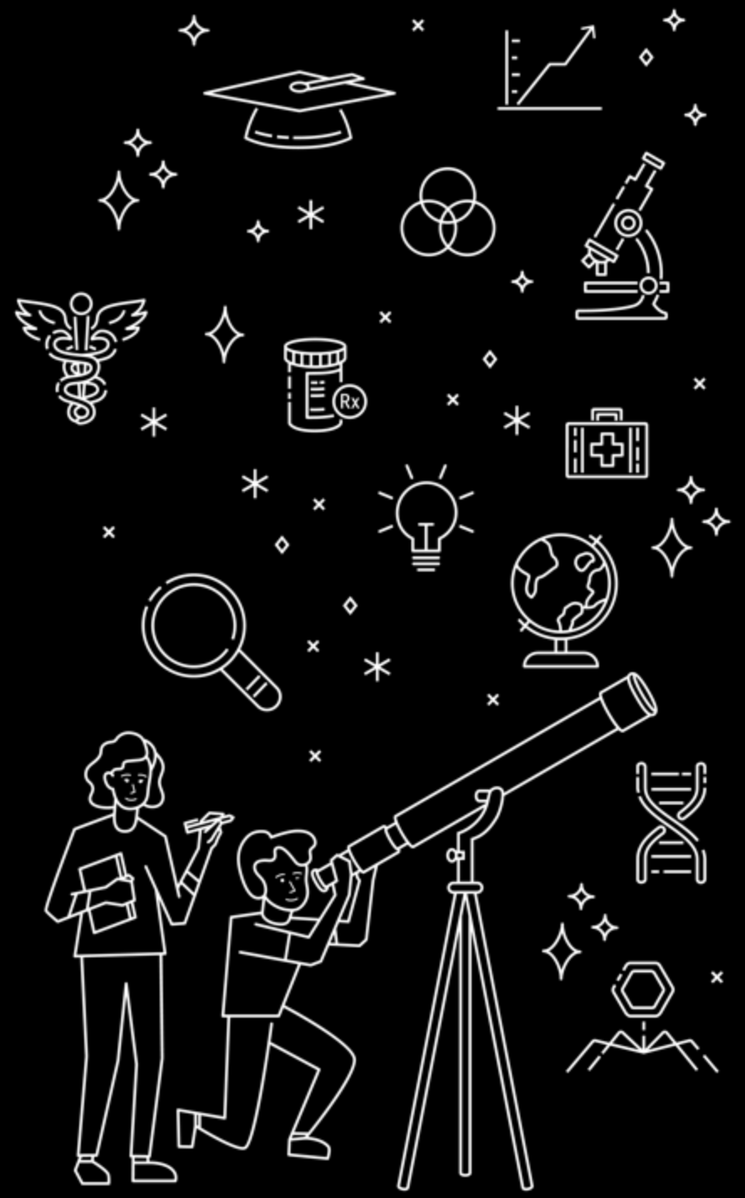
Thank you to all who contributed to this project!

AWS

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Danielle Pillion
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Jeremy Wang



And many more!

github.com/awslabs/service-workbench-on-aws

Healthcare sessions at re:Invent 2020

ID	TITLE
HLC201	Healthcare executive outlook: Accelerating transformation
HLC202	Making healthcare more personal with MetroPlus Health
HLC203	Securing personal health information and high-risk datasets
HLC204	Accelerating the transition to telehealth with AWS
WPS202	Transform research environments with Service Workbench on AWS
WPS209	Reinventing medical imaging with machine learning on AWS
WPS211	An introduction to healthcare interoperability and FHIR Works on AWS
WPS304	Achieving healthcare interoperability with FHIR Works on AWS
AIM303	Using AI to automate clinical workflows
AIM310	Intelligent document processing for the insurance industry
MKT206	Simplify healthcare compliance with third-party solutions
GPS211	AWS Partners driving innovation amidst COVID-19

Thank you!



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