
AWS
re:Invent

HLC203

Securing protected health information and high-risk datasets

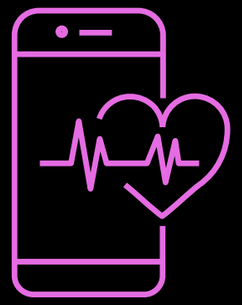
Jonathan Cook
Chief Technology Officer
Arcadia

Anton Hrydzin
Sr. Solutions Architect
AWS

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Healthcare industry trends



Global focus on value-based care



Reducing the cost of care



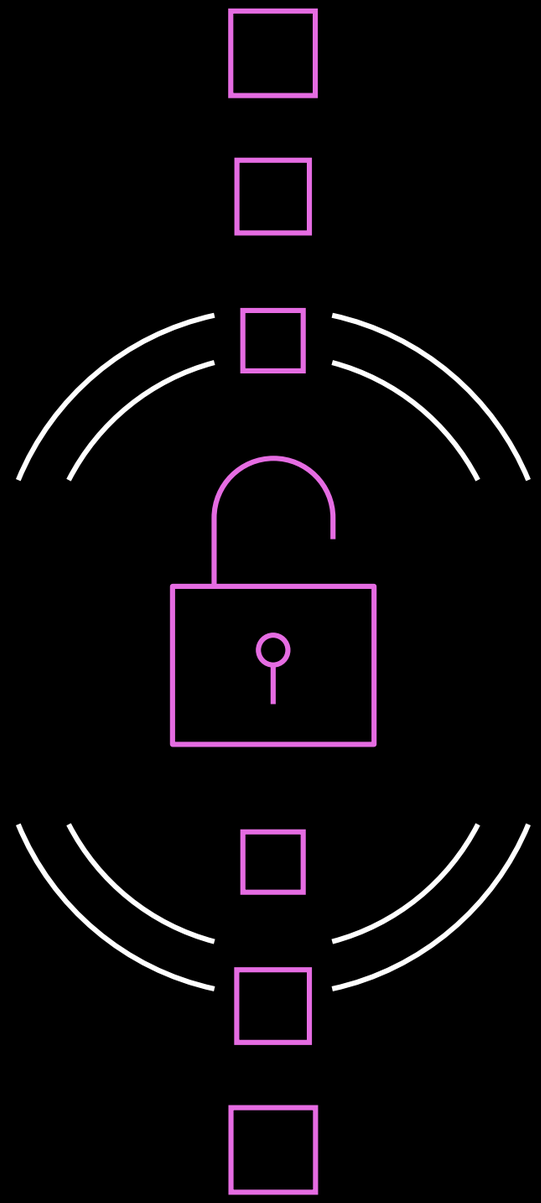
Increasing prevalence of cyber attacks

AWS for security in the Healthcare industry

- Expertise
- Shared responsibility
- Supported compliance programs and frameworks

  HIPAA, HITRUST, ISO 27001, and more
- Variety of security services

  From AWS Key Management Service to Amazon GuardDuty and beyond



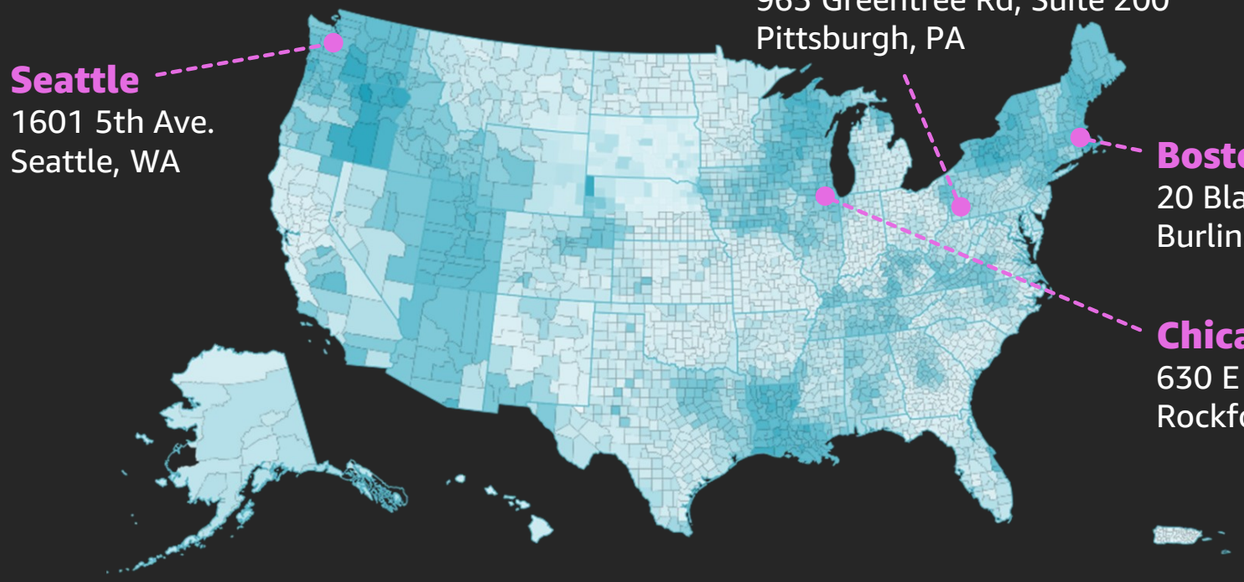
About Arcadia

ARCADIA OVERVIEW

Arcadia is the only **healthcare data and software** company dedicated to helping healthcare organizations **achieve financial success in value-based care.** Our purpose-built population health platform delivers enterprise-level transformational healthcare outcomes.

PATIENTS MEASURED AS OF JULY 2020

106.6 million patients nationally, **95.5 million** unique matches



$2.4B **Customer savings** through 2018

2.5x **Higher ACO** performance

$10.1M **Average savings** in NGACO

50+ **EHR vendors** mapped and catalogued

>1759 **Connectors** active

End-to-end **HITRUST CSF certified**

No. 1 Value-based services **2 years in a row**

Mission and focus

ARCADIA OVERVIEW

Our mission



The success of value-based care

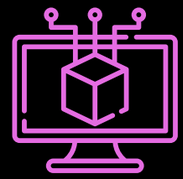


Better returns on investment

How we work to meet those goals



We tame health data



We build great software



Community of pioneers



Market leadership

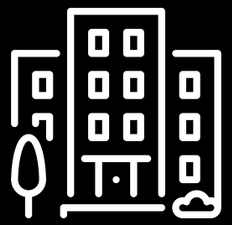
Key actors

SUCCESS IN VALUE-BASED CARE

1

Medical expense

9.6% Reduction of TCC resulting in $23.5M in MSSP bonuses

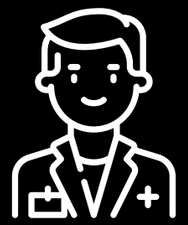


Administration

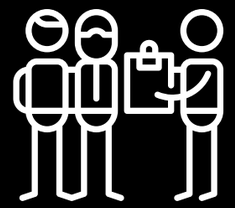
2

Risk adjustment

3% increase in HCC scores for Nextgen ACO



Coders

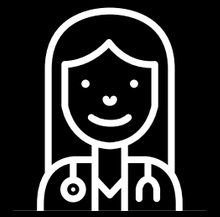


Navigators

3

Quality improvement

Achieved 99.6% quality performance under MSSP



Care team

What Arcadia does

Data lifecycle scale zones

Real-time and batch engine(s)

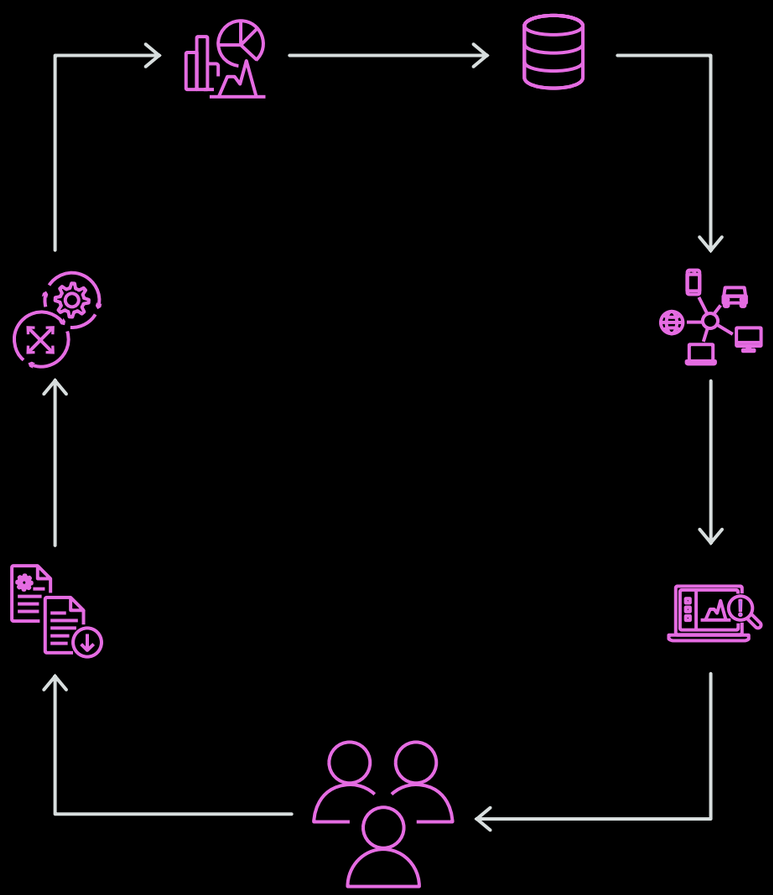
Applies algorithms to calculate metrics, KPIs, and quantitative facts to further enrich data

Cleansing and enrichment

Refines raw client data into rich in-spec data assets by using natural language processing, machine learning algorithms, and reference dictionaries

Discovery and migration

Scans and discovers on-premises client data and securely transmits to Arcadia cloud



Master catalog

Stores and manages the intermediate, enriched datasets and metadata

Data services gateway

Provides secure APIs and high-speed data-marts for ad hoc data exploration and retrieval

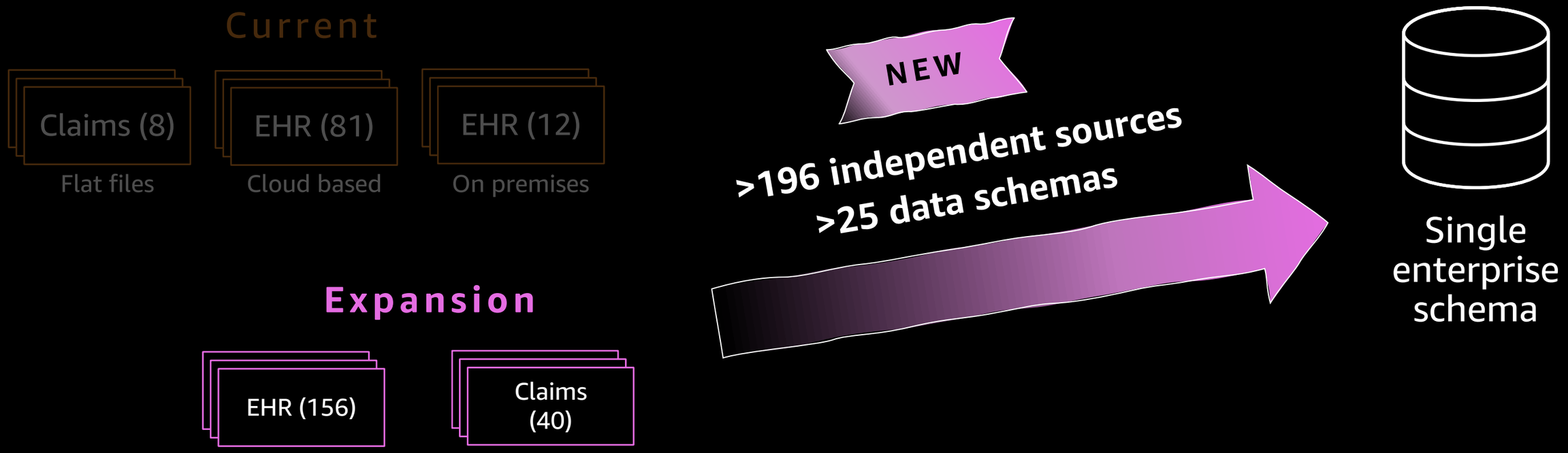
Applications

Converts data into value-add information per business settings

Single client connectivity: Challenge (number of clients)



Single client connectivity: Expansion!



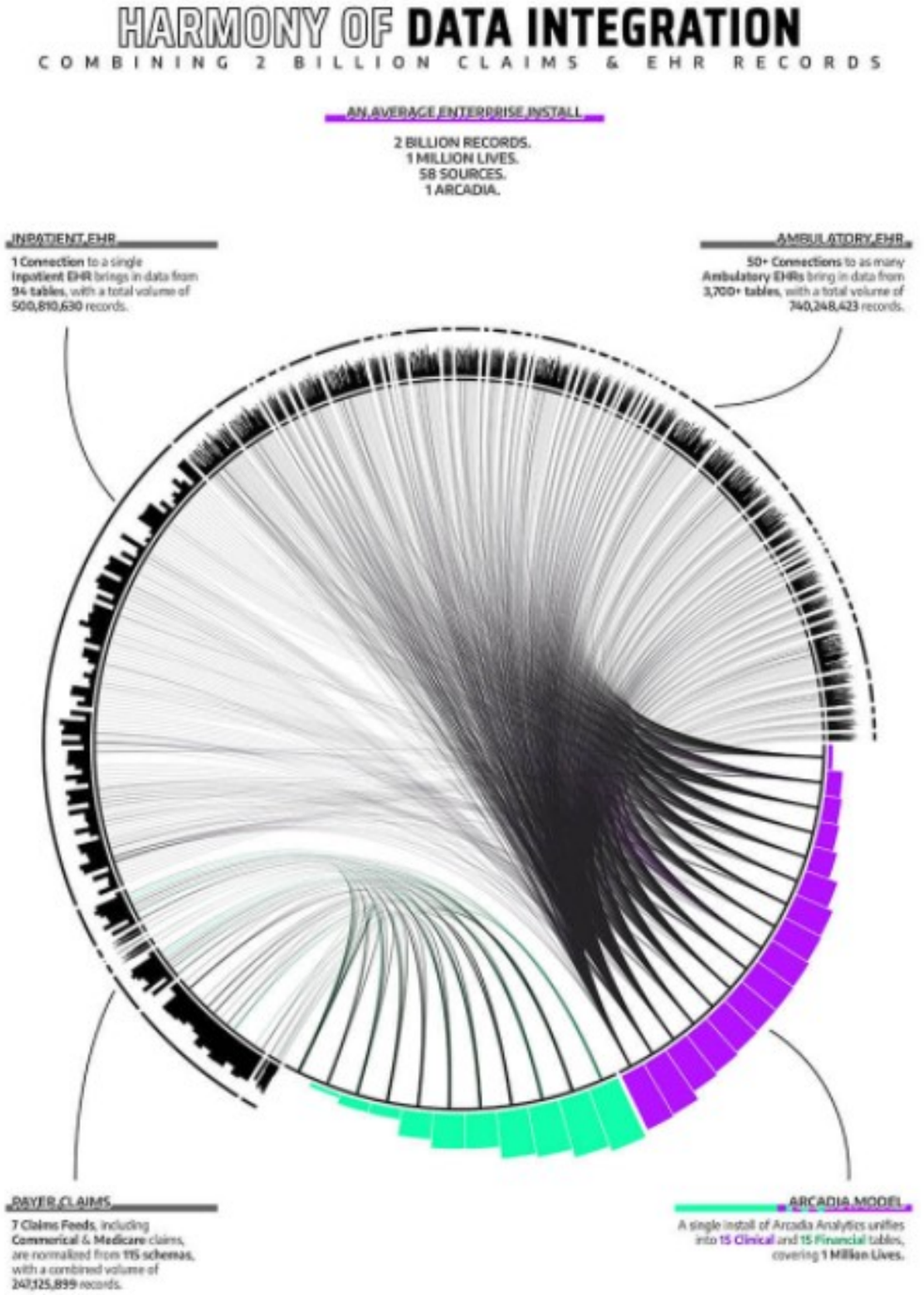
Arcadia’s technology story

- Security, reliability, and availability
- Innovation, time to market, and security
- Attractiveness to “advanced” tech talent in the market
- Ability to execute or train on infrastructure
- Pioneering processes and software related to HIPAA
- “Black Friday problem” on any given day



AWS benefits

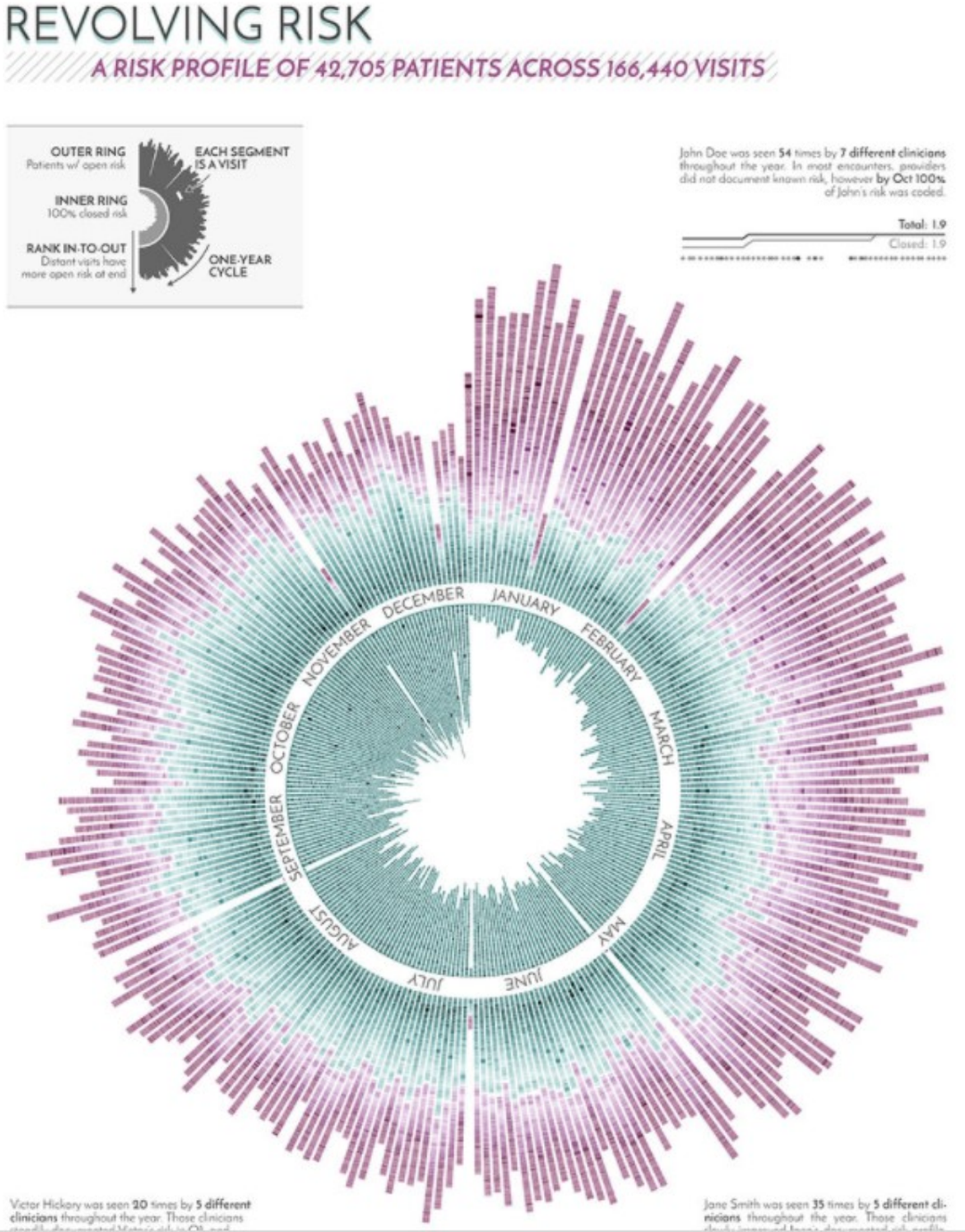
- Exchange of sensitive data requires “trust”
- Security & Compliance Certifications – AWS and Arcadia
- AWS Shared Responsibility Model
- Automation of provisioning to ensure compliance
- Audit of infrastructure and activity
- Enabled speed of new / additional infrastructure
- Dynamic provisioning with supportive cost models
- “Known” tech skills, documentation, and architects



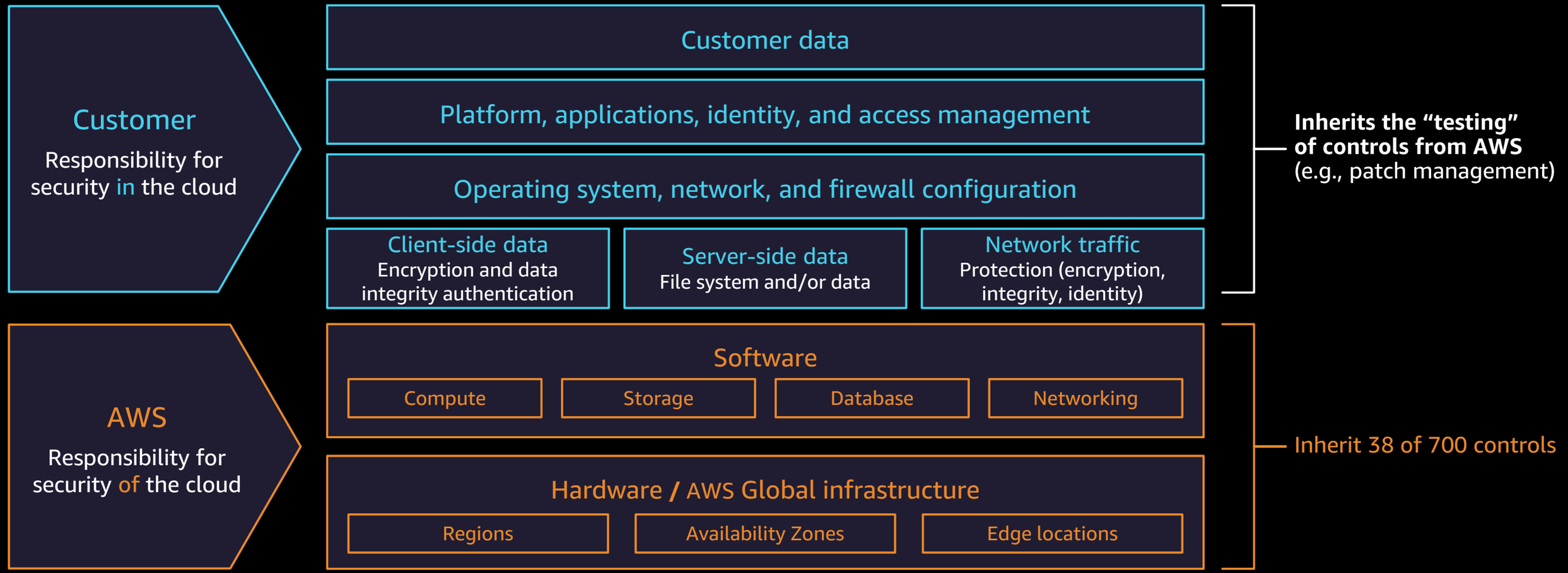
Security primer

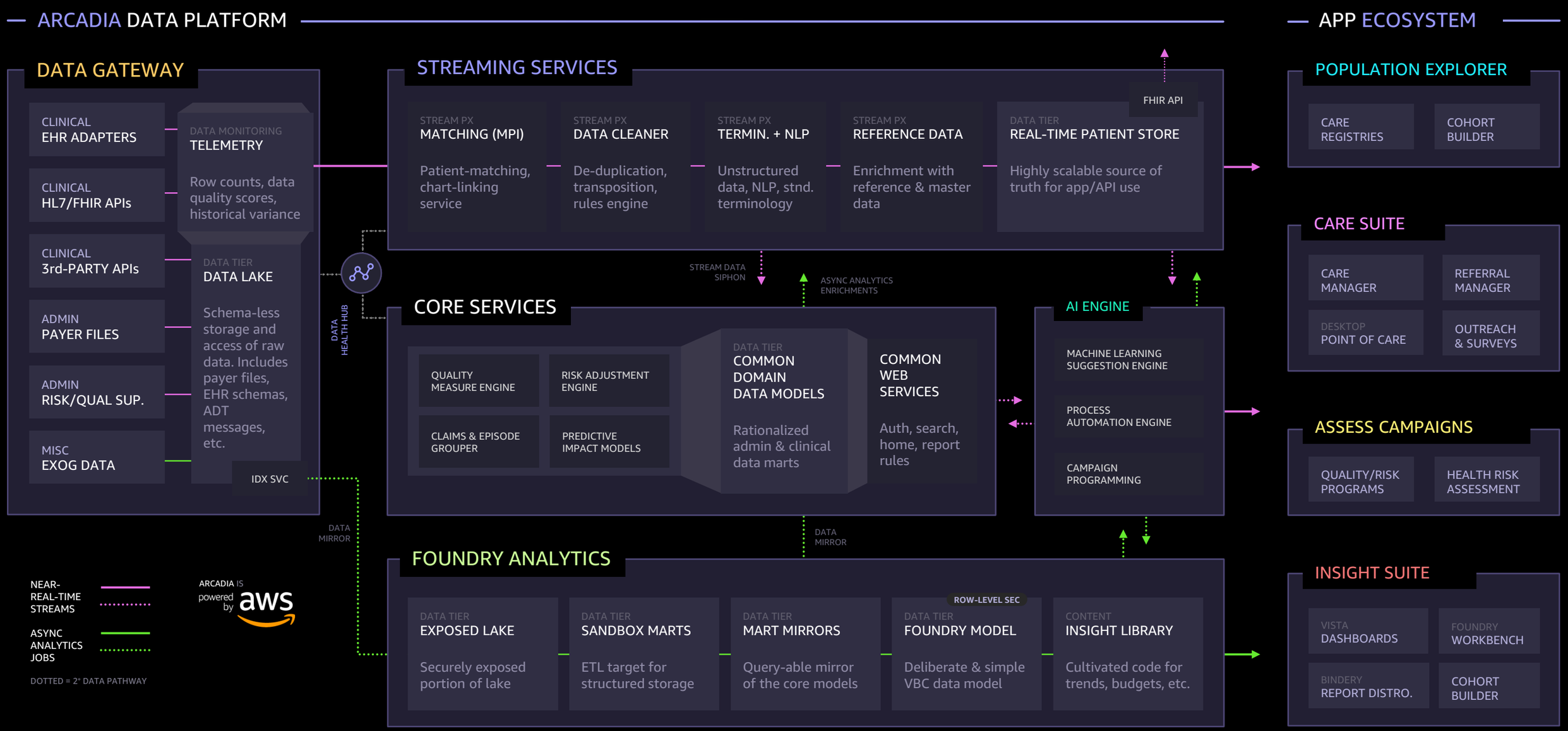
Health Insurance Portability and Accountability Act (HIPAA)

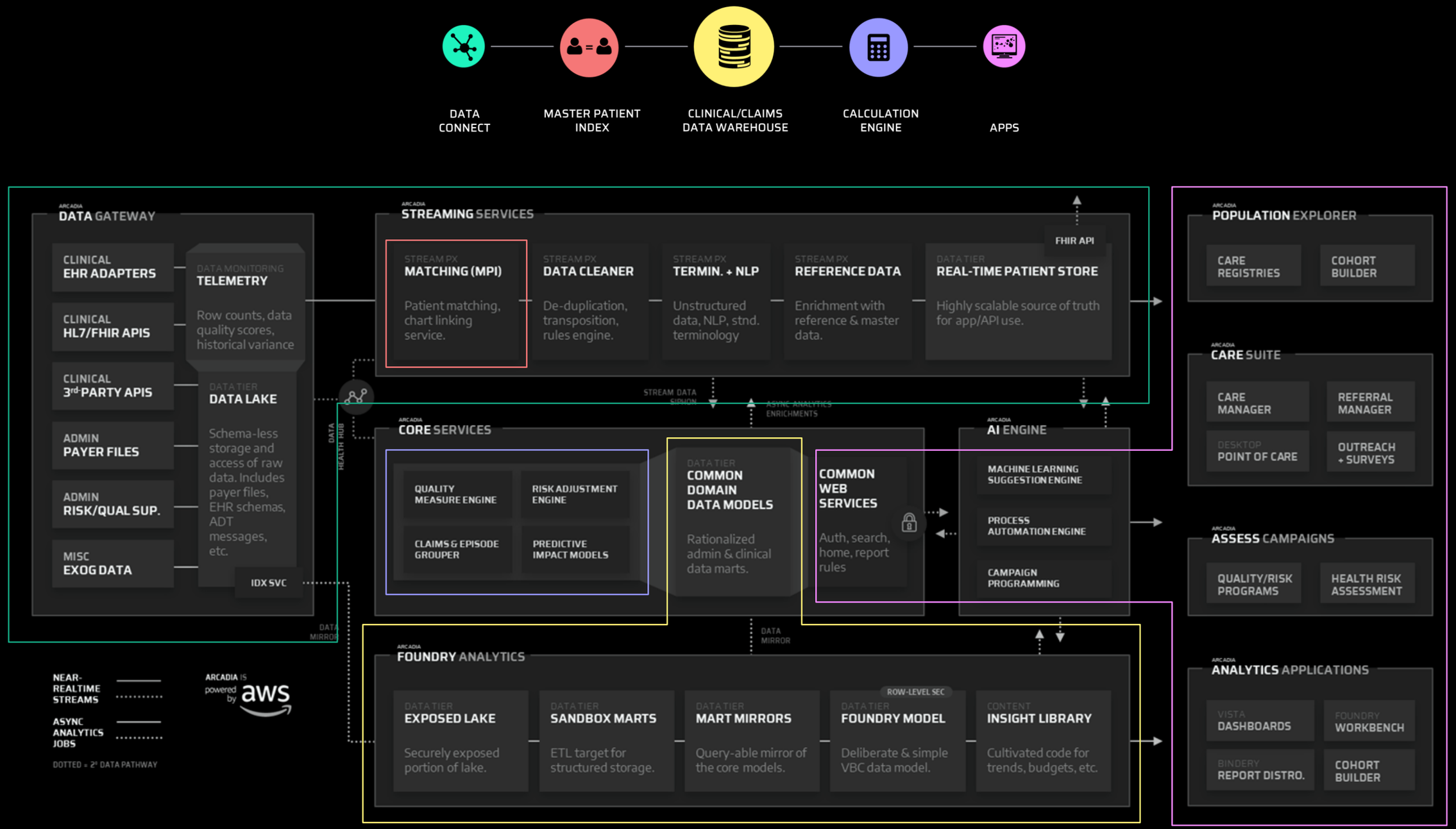
Health Information Trust Alliance Common Security Framework (HITRUST CSF)



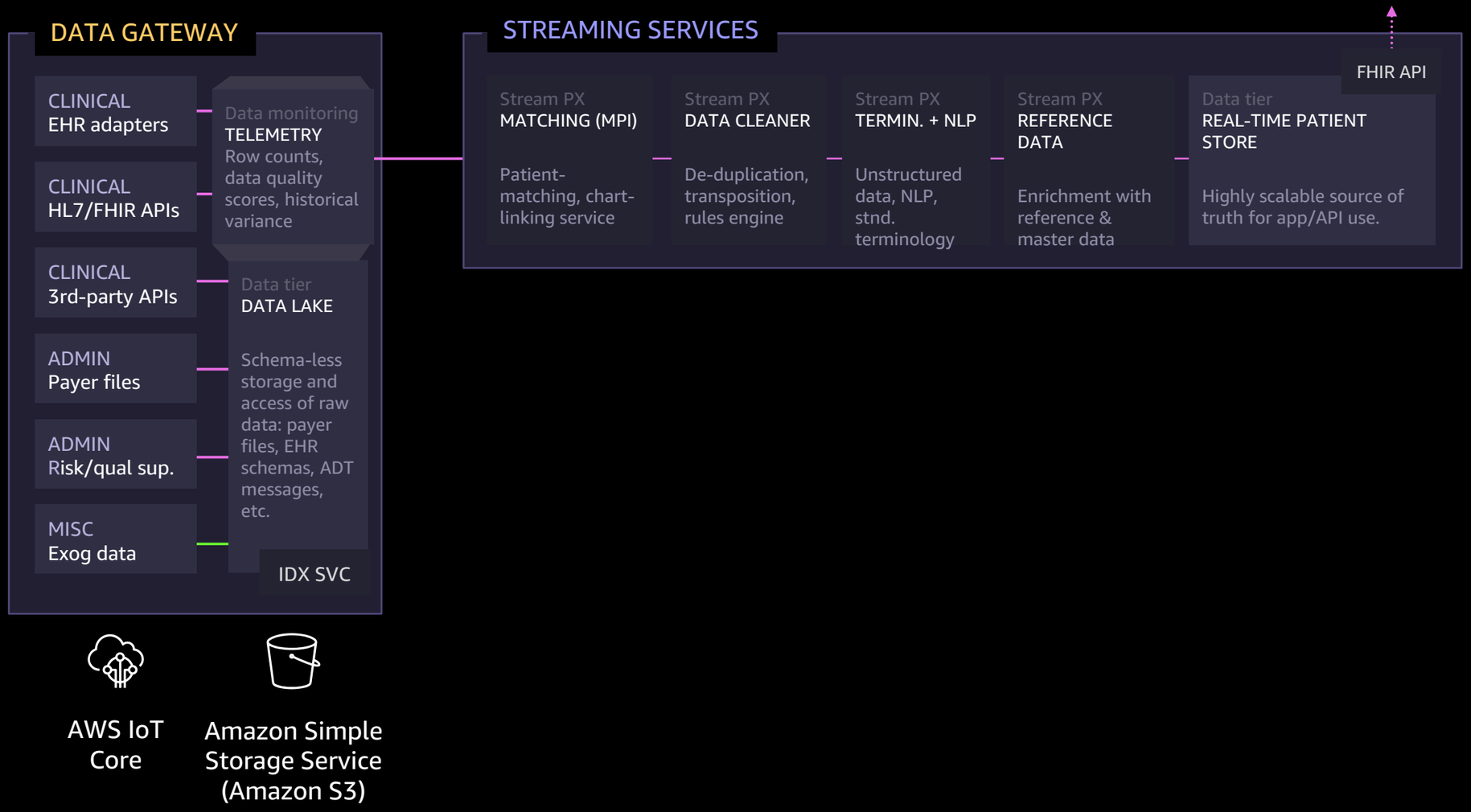
AWS Shared Responsibility Model



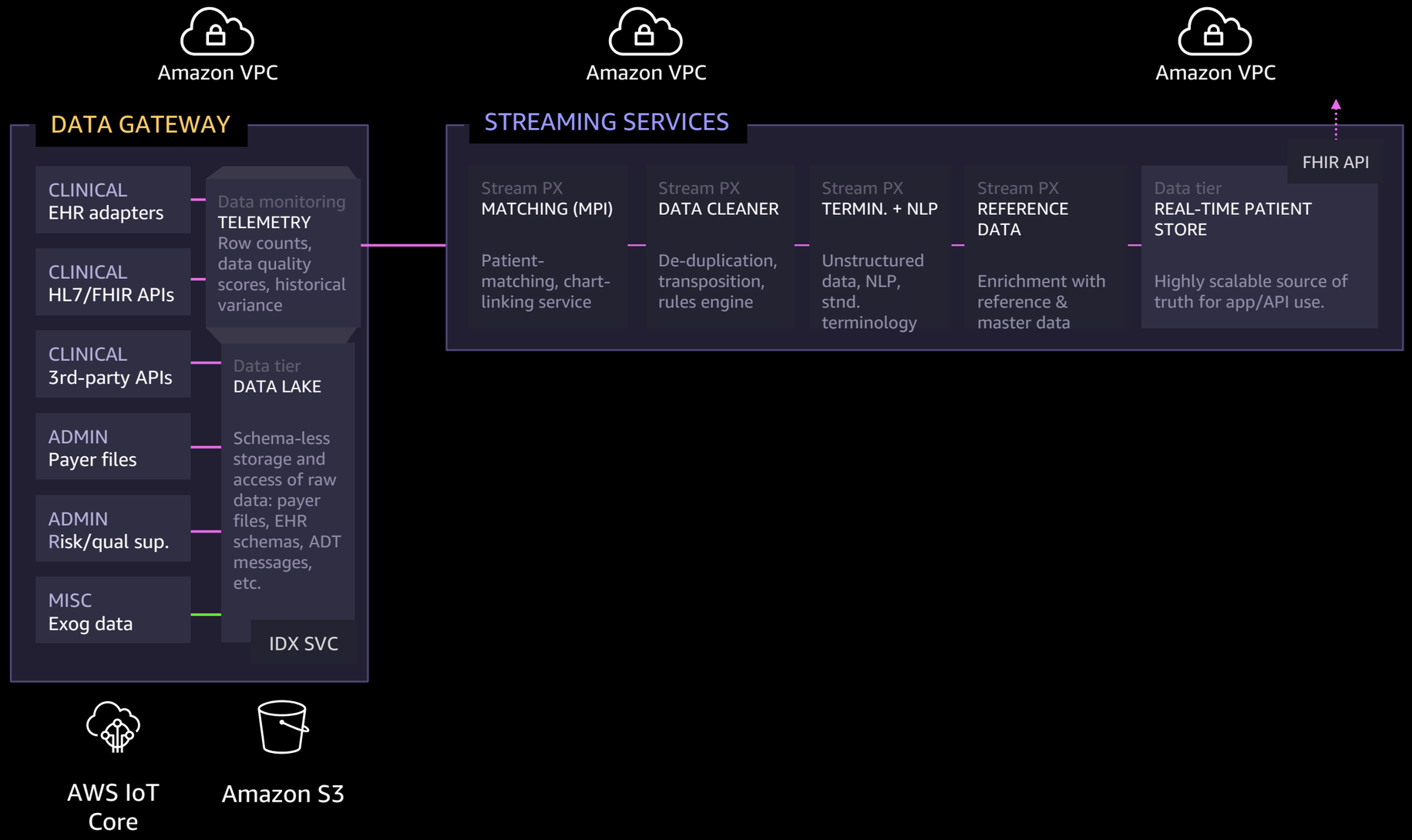

ARCADIA DATA PLATFORM
APP ECOSYSTEM
DATA GATEWAY
CLINICAL
EHR ADAPTERS
CLINICAL
HL7/FHIR APIs
CLINICAL
3rd-PARTY APIs
ADMIN
PAYER FILES
ADMIN
RISK/QUAL SUP.
MISC
EXOG DATA
DATA MONITORING
TELEMETRY
Row counts, data quality scores, historical variance
DATA TIER
DATA LAKE
Schema-less storage and access of raw data. Includes payer files, EHR schemas, ADT messages, etc.
IDX SVC
DATA HEALTH HUB
STREAMING SERVICES
FHIR API
STREAM PX
MATCHING (MPI)
Patient-matching, chart-linking service
STREAM PX
DATA CLEANER
De-duplication, transposition, rules engine
STREAM PX
TERMIN. + NLP
Unstructured data, NLP, stnd. terminology
STREAM PX
REFERENCE DATA
Enrichment with reference & master data
DATA TIER
REAL-TIME PATIENT STORE
Highly scalable source of truth for app/API use
STREAM DATA SIPHON
ASYNC ANALYTICS ENRICHMENTS
CORE SERVICES
QUALITY MEASURE ENGINE
RISK ADJUSTMENT ENGINE
CLAIMS & EPISODE GROUPER
PREDICTIVE IMPACT MODELS
DATA TIER
COMMON DOMAIN DATA MODELS
Rationalized admin & clinical data marts
COMMON WEB SERVICES
Auth, search, home, report rules
AI ENGINE
MACHINE LEARNING SUGGESTION ENGINE
PROCESS AUTOMATION ENGINE
CAMPAIGN PROGRAMMING
DATA MIRROR
DATA MIRROR
FOUNDRY ANALYTICS
DATA TIER
EXPOSED LAKE
Securely exposed portion of lake
DATA TIER
SANDBOX MARTS
ETL target for structured storage
DATA TIER
MART MIRRORS
Query-able mirror of the core models
ROW-LEVEL SEC
DATA TIER
FOUNDRY MODEL
Deliberate & simple VBC data model
CONTENT
INSIGHT LIBRARY
Cultivated code for trends, budgets, etc.
POPULATION EXPLORER
CARE REGISTRIES
COHORT BUILDER
CARE SUITE
CARE MANAGER
REFERRAL MANAGER
DESKTOP
POINT OF CARE
OUTREACH & SURVEYS
ASSESS CAMPAIGNS
QUALITY/RISK PROGRAMS
HEALTH RISK ASSESSMENT
INSIGHT SUITE
VISTA
DASHBOARDS
FOUNDRY
WORKBENCH
BINDERY
REPORT DISTRO.
COHORT BUILDER
NEAR-REAL-TIME STREAMS
ASYNC ANALYTICS JOBS
DOTTED = 2° DATA PATHWAY
ARCADIA IS powered by aws


DATA CONNECT
MASTER PATIENT INDEX
CLINICAL/CLAIMS DATA WAREHOUSE
CALCULATION ENGINE
APPS
ARCADIA DATA GATEWAY
CLINICAL EHR ADAPTERS
CLINICAL HL7/FHIR APIS
CLINICAL 3rd-PARTY APIS
ADMIN PAYER FILES
ADMIN RISK/QUAL SUP.
MISC EXOG DATA
DATA MONITORING
TELEMETRY
Row counts, data quality scores, historical variance
DATA TIER
DATA LAKE
Schema-less storage and access of raw data. Includes payer files, EHR schemas, ADT messages, etc.
IDX SVC
DATA HEALTH HUB
ARCADIA STREAMING SERVICES
FHIR API
STREAM PX
MATCHING (MPI)
Patient matching, chart linking service.
STREAM PX
DATA CLEANER
De-duplication, transposition, rules engine.
STREAM PX
TERMIN. + NLP
Unstructured data, NLP, stnd. terminology
STREAM PX
REFERENCE DATA
Enrichment with reference & master data.
DATA TIER
REAL-TIME PATIENT STORE
Highly scalable source of truth for app/API use.
STREAM DATA SIPHON
ASYNC ANALYTICS ENRICHMENTS
ARCADIA CORE SERVICES
QUALITY MEASURE ENGINE
RISK ADJUSTMENT ENGINE
CLAIMS & EPISODE GROUPER
PREDICTIVE IMPACT MODELS
DATA TIER
COMMON DOMAIN DATA MODELS
Rationalized admin & clinical data marts.
COMMON WEB SERVICES
Auth, search, home, report rules
ARCADIA AI ENGINE
MACHINE LEARNING SUGGESTION ENGINE
PROCESS AUTOMATION ENGINE
CAMPAIGN PROGRAMMING
DATA MIRROR
DATA MIRROR
ARCADIA FOUNDRY ANALYTICS
ROW-LEVEL SEC
DATA TIER
EXPOSED LAKE
Securely exposed portion of lake.
DATA TIER
SANDBOX MARTS
ETL target for structured storage.
DATA TIER
MART MIRRORS
Query-able mirror of the core models.
DATA TIER
FOUNDRY MODEL
Deliberate & simple VBC data model.
CONTENT
INSIGHT LIBRARY
Cultivated code for trends, budgets, etc.
ARCADIA POPULATION EXPLORER
CARE REGISTRIES
COHORT BUILDER
ARCADIA CARE SUITE
CARE MANAGER
REFERRAL MANAGER
DESKTOP
POINT OF CARE
OUTREACH + SURVEYS
ARCADIA ASSESS CAMPAIGNS
QUALITY/RISK PROGRAMS
HEALTH RISK ASSESSMENT
ARCADIA ANALYTICS APPLICATIONS
VISTA
DASHBOARDS
FOUNDRY
WORKBENCH
BINDERY
REPORT DISTRO.
COHORT BUILDER
NEAR-REALTIME STREAMS
ASYNC ANALYTICS JOBS
DOTTED = 2nd DATA PATHWAY
ARCADIA IS powered by aws

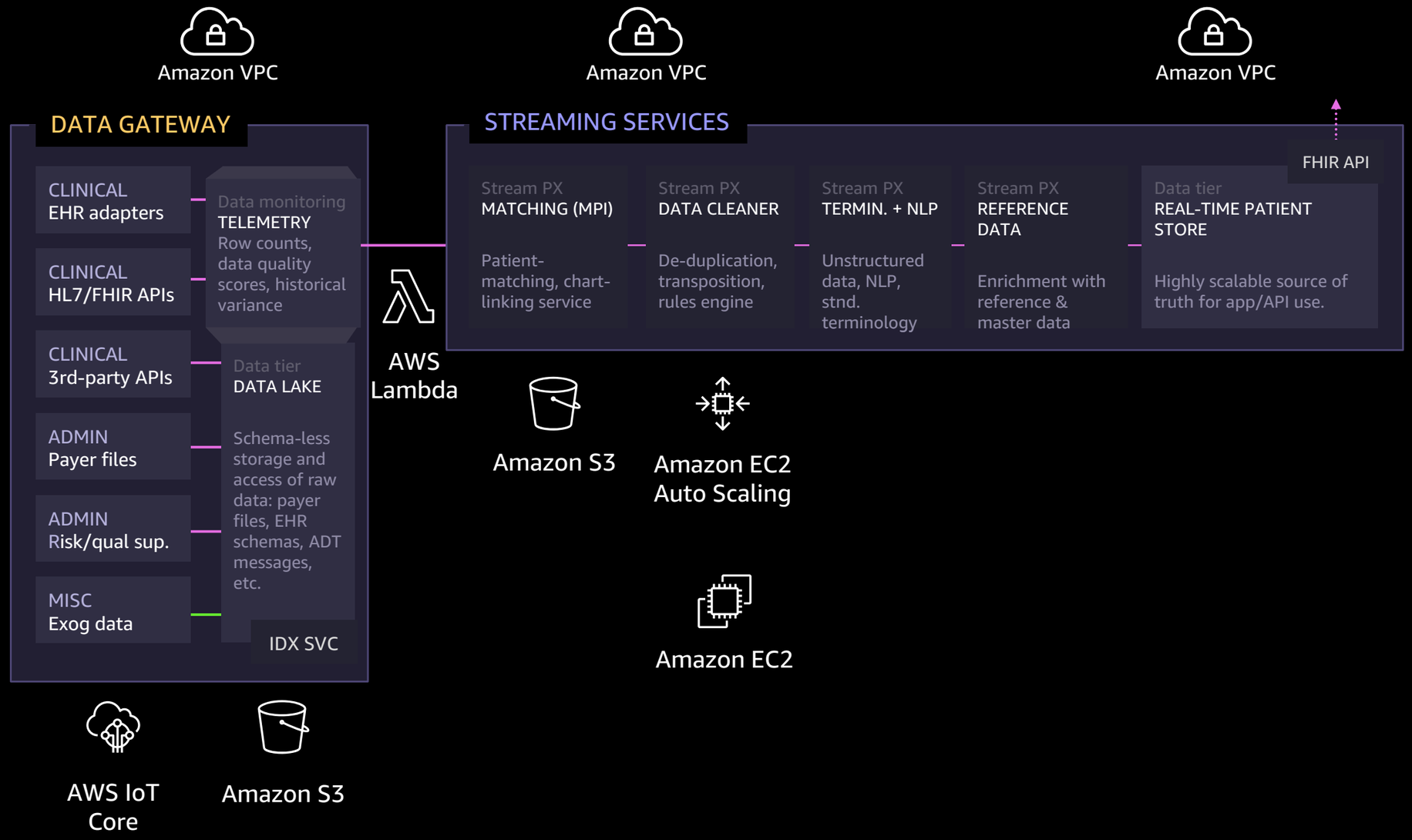
Drill down into ingress, processing & storage



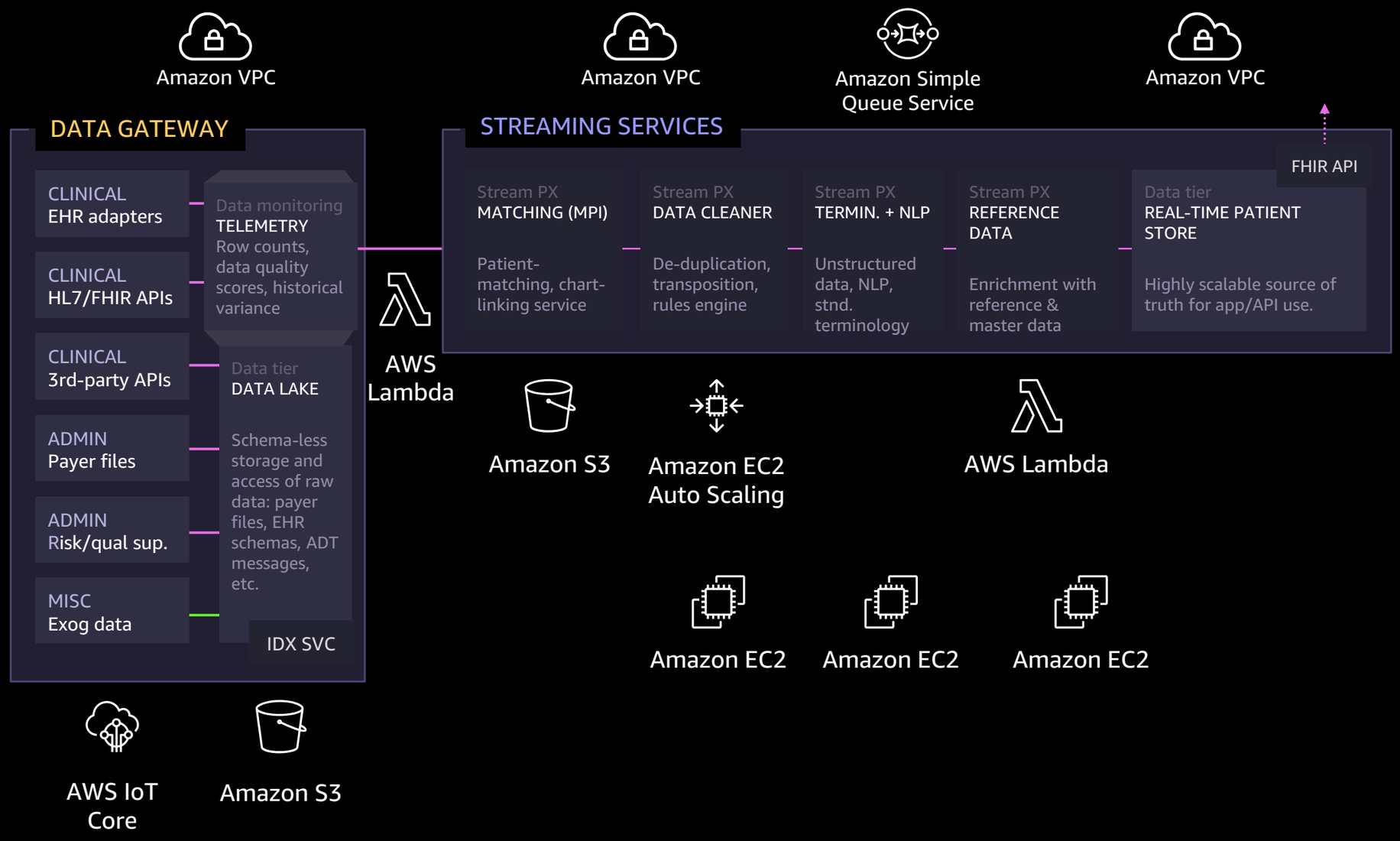
Drill down into ingress, processing & storage



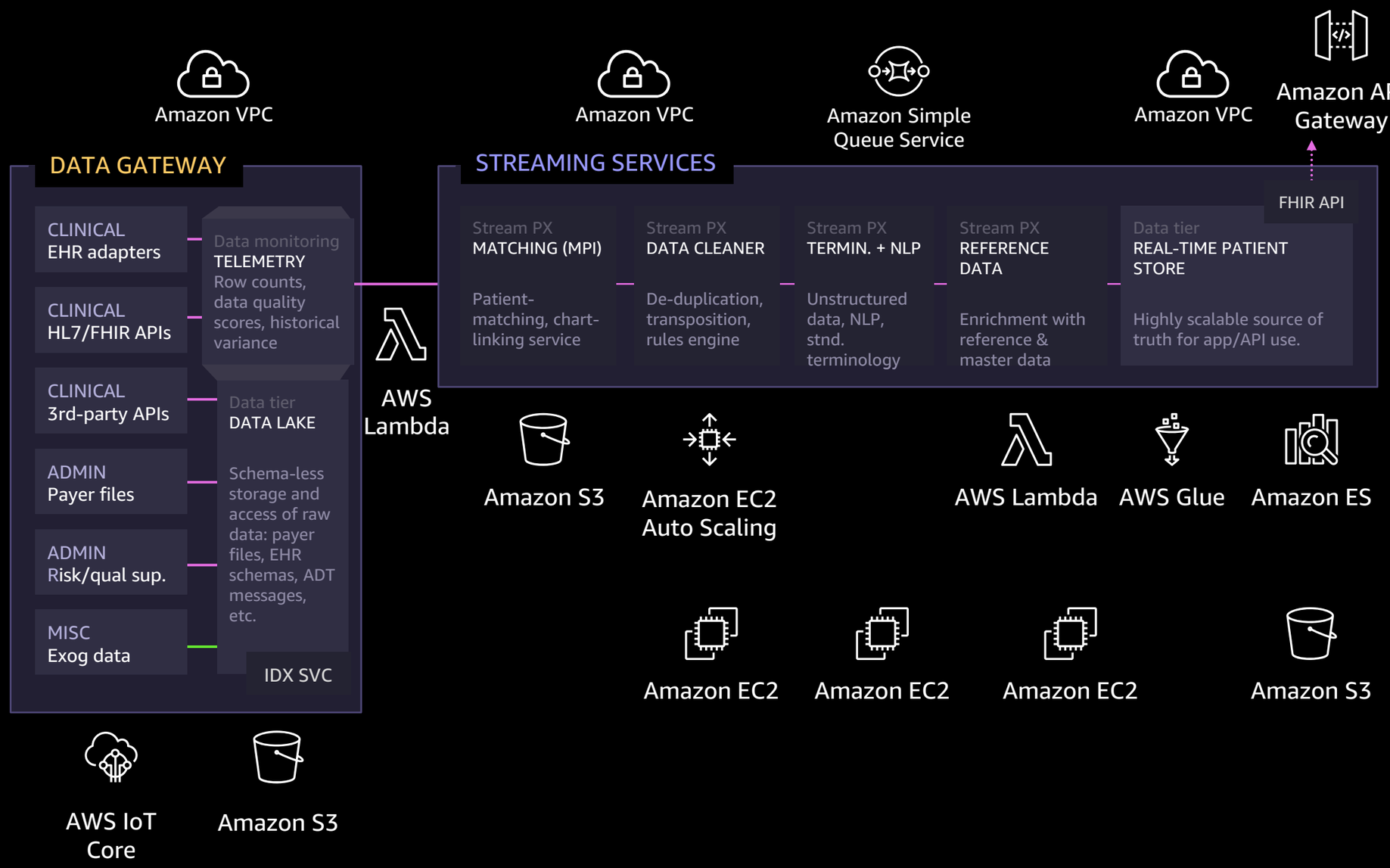
Drill down into ingress, processing & storage



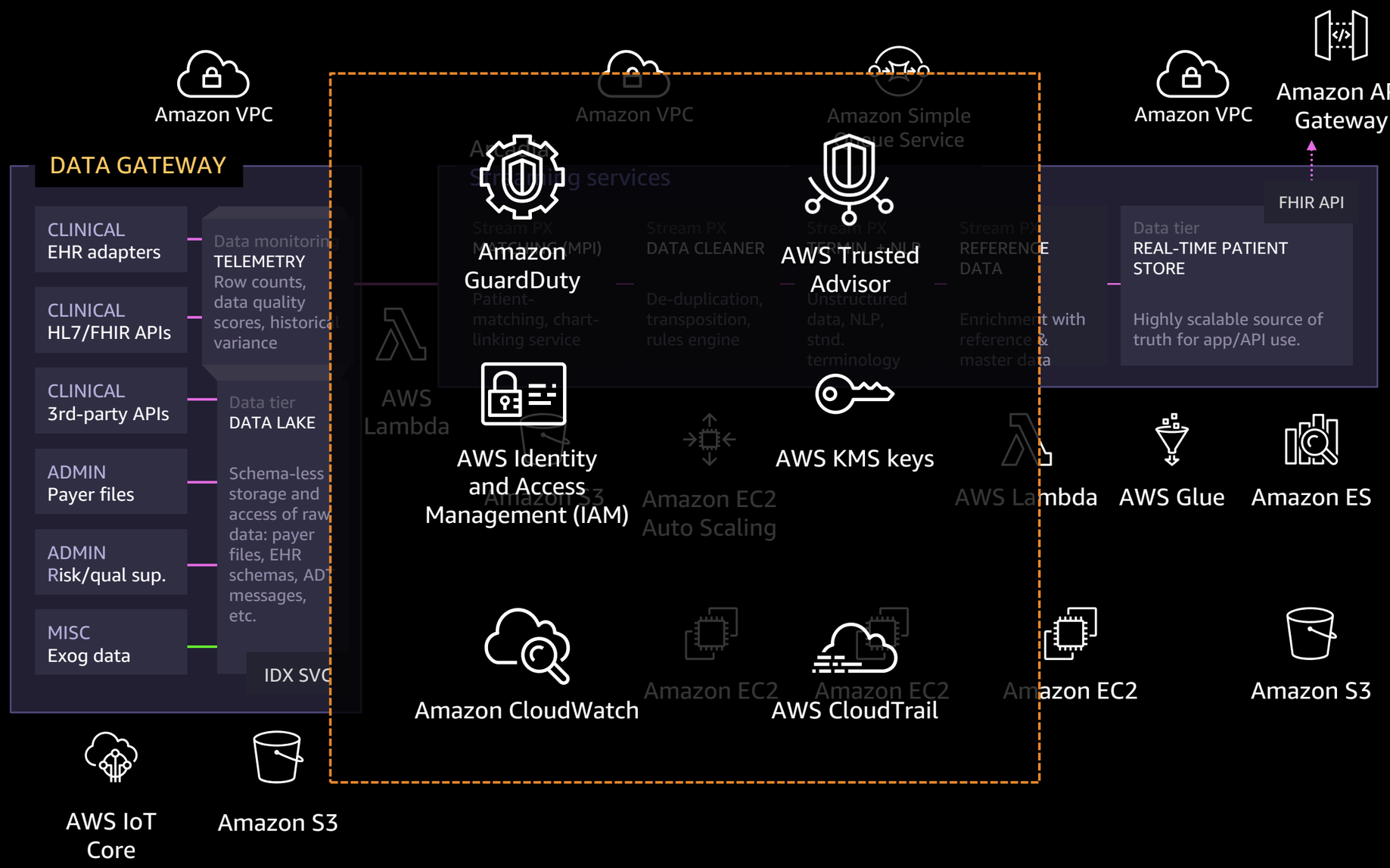
Drill down into ingress, processing & storage



Drill down into ingress, processing & storage

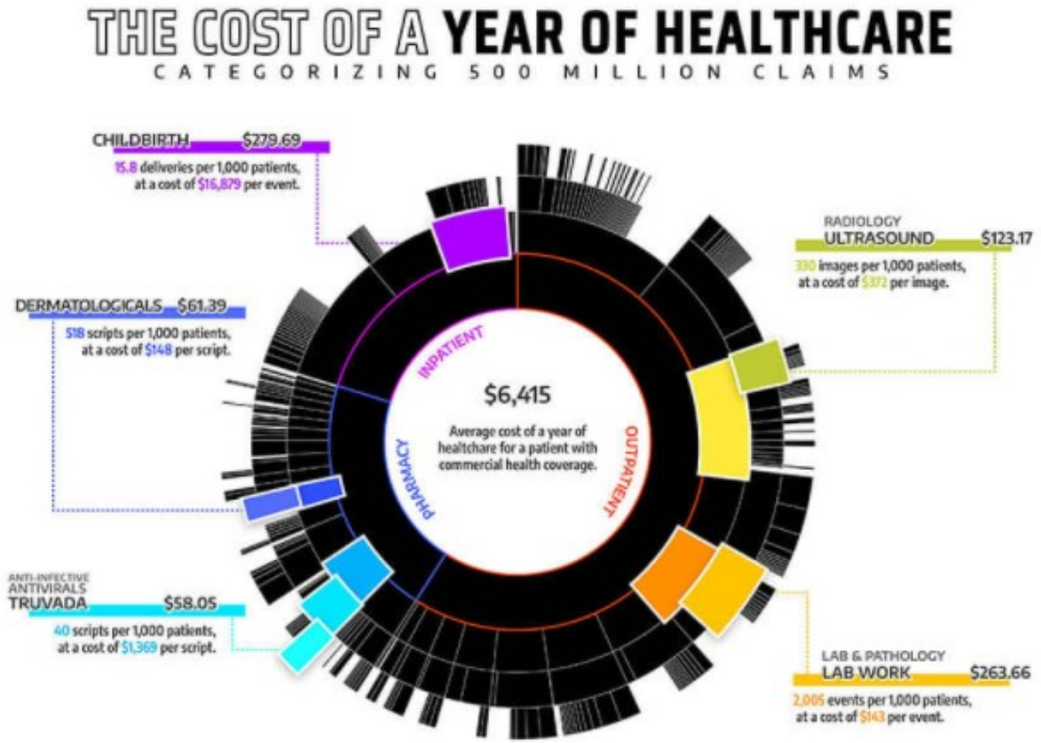


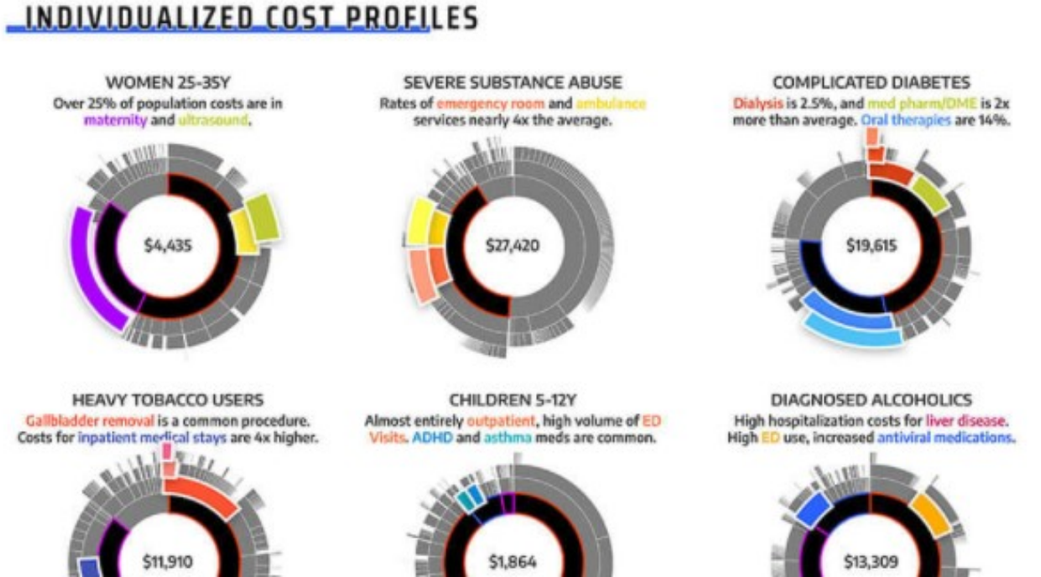
Drill down into ingress, processing & storage



Summary

- Powered by datasets growing at an exponential pace
- Requires tight partnership between business and technical stakeholders
- Without a hyperscalable platform, transformation is impossible
- Rapid evolution of policy and regulatory frameworks
- AWS enabled responsiveness to customer business needs while, in parallel, maintaining a market-leading privacy and compliance program





Learn More

ARCADIA

Arcadia.io Products



aws healthcare

Healthcare & Life Sciences at AWS



Healthcare sessions at re:Invent 2020

ID	TITLE
HCL201	Healthcare executive outlook: Accelerating transformation
HLC202	Making healthcare more personal with MetroPlus Health
HLC203	Securing protected 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
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!



AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Please complete the session survey

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.