

AI Strategy and AIOps

Ted Brunell

Sr Principal Solutions Architect

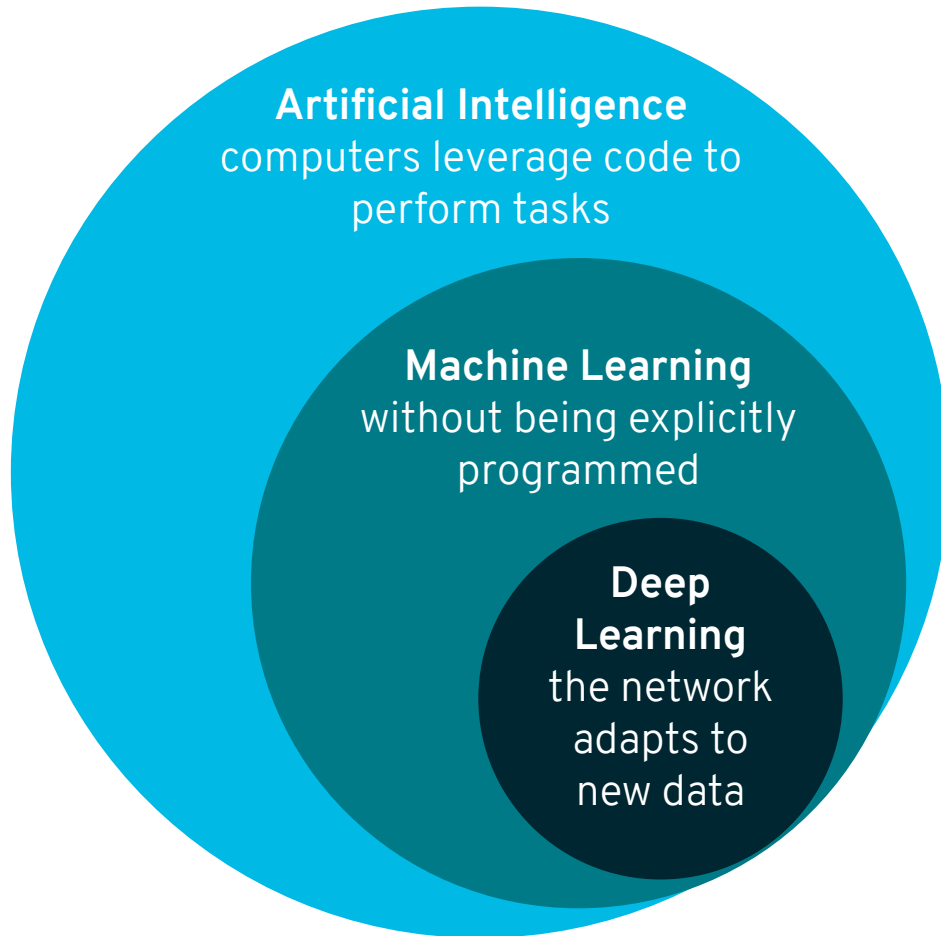
Chief Architect , DoD Programs

tbrunell@redhat.com

@DoDCloudGuy



AI, ML, DL + Predictive Analytics



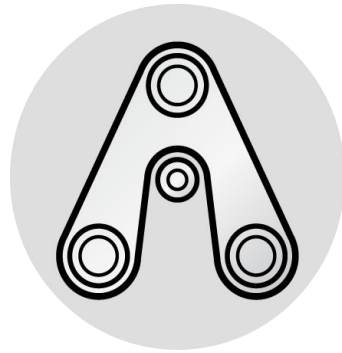
Predictive Analytics

is the application of statistical methods to find patterns in data that predict the future.

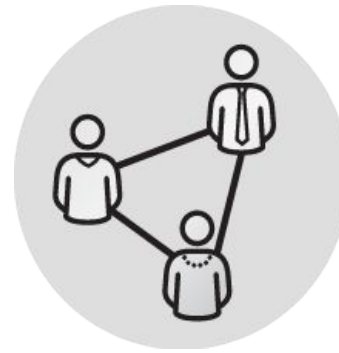
How Red Hat Sees AI



Represents a workload requirement for our **platforms** across the hybrid cloud.



Applicable to Red Hat's existing core business in order to increase **Open Source** development and production **efficiency**.



Valuable to our customers as specific services and product capabilities, providing an **Intelligent Platform** experience.



Enable customers to build **Intelligent Apps** using Red Hat products as well as our broader partner ecosystem.

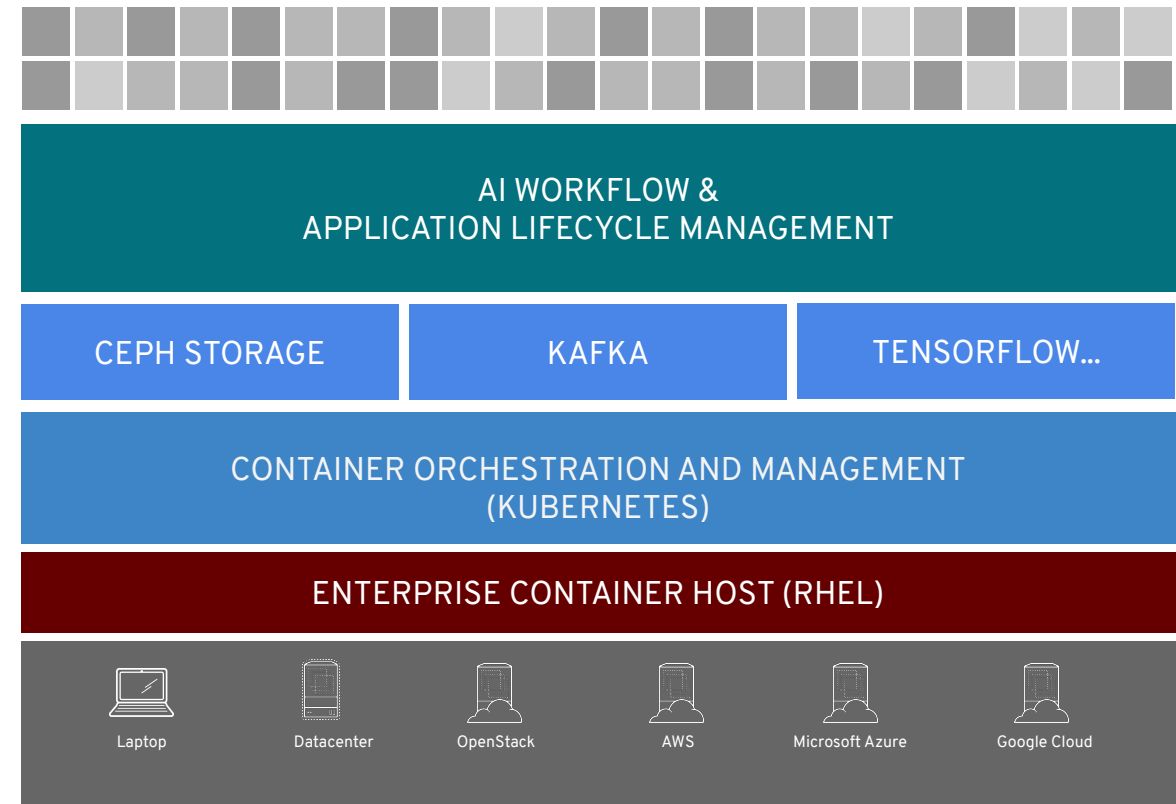
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Data as the Foundation

Hybrid Cloud Platform

The Red Hat platform becomes a default choice for Data, Analytics, and AI workloads across the Hybrid Cloud.

- Requires enablement from the HW up: Storage, IaaS, OS, Container Platform.
- Kubernetes and containers are quickly becoming the default.
- AI workflows resemble other DevOps models - OpenShift.
- Business-critical decisions taken by AI depend on stability and security.
- Auditability increasingly important.
- Heterogeneous ISV landscape benefits from common platform and Service Catalog.



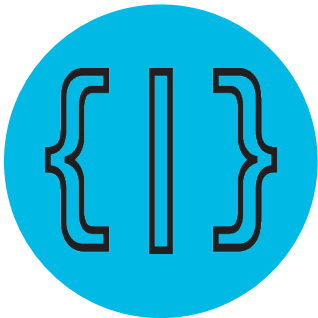
Core Business

Apply AI to Core Engineering and Operations processes.

OUTPUT

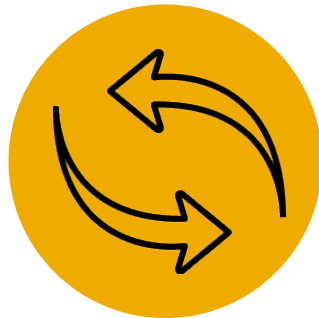
Development

Code analysis.
Dependency management.
Security.



CI /CD

Unusual events.
Flake analysis.
Issue dedupe.



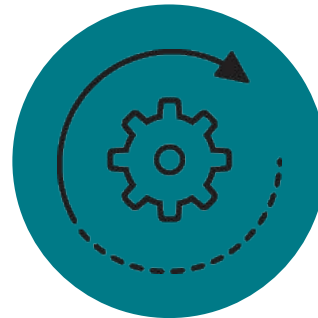
Release + Deployment

Release health. AI
deadman switch.



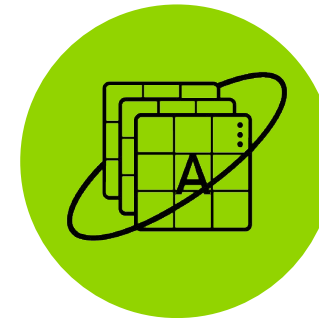
AI Ops

Failure prediction.
Insights guidance.
ML-based alert filtering.



Core Product

Learning scheduler
augmenting static rules.



Support

Customer Sentiment.
Automatic issue resolution.



TECHNIQUES

Anomaly Detection,
Outlier Detection

Cluster Analysis
(Latent Class or
K-means),
Anomaly Detection

K-means,
Hidden Markov
Model (HMM)

Time Series,
Smoothing Models,
Self Organizing
Maps

Regression,
Tree Diagrams
(CHAID)

Natural Language
Processing (NLP)

AI Powered Products & Services

Introduce capabilities in the Red Hat platform to aggregate data and provide predictive analytics and AI based services to customers.

- Complexity of modern software stacks and cloud infrastructure generates huge amounts of log and metrics data.
 - AI is a way to handle this complexity and augment human admins and developers.
 - Make platforms intelligent by integrating AI in the management tools.
 - Provide AI-backed guidance based on aggregated knowledge, establish network effect.
 - Our goal is ‘self driving clusters’.
- Common log aggregation and analysis in OpenShift platform.
 - Red Hat Insights offering predictive operational support.
 - Integration of AI components and Insights in the management stack. AI Ops capabilities in the platform.
 - OpenShift.IO developer services and content guidance to allow Red Hat to scale with the complexity of modern developer stacks.

Intelligent Apps

Enabling customers to build Intelligent Applications and apply AI in their own core business.

- Red Hat's Middleware products provide a set of core capabilities.
- Large spectrum of Open Source components. Upstream enablement through <http://OpenDataHub.io> and <http://radanalytics.io>.
- Red Hat 's broader ISV ecosystem integrated through the Service Catalog.
- Enable customers to build and operate intelligent applications on top of Red Hat's intelligent platforms.

RED HAT MIDDLEWARE PRODUCT	FUNCTIONAL COMPONENT
RED HAT DATA GRID	IN-MEMORY PIPELINE STORAGE
RED HAT FUSE	DATA TRANSFORMATION, SERVICE INTEGRATION
RED HAT AMQ	DATA INGESTION, EVENT DISTRIBUTION
RED HAT 3SCALE	API MANAGEMENT
RED HAT DECISION MANAGER*	RULES & MODEL EXECUTION, COMPLEX EVENT PROCESSING
RED HAT PROCESS AUTOMATION MANAGER	BUSINESS PROCESS AUTOMATION

Data as the Foundation

Data is as important as Code.

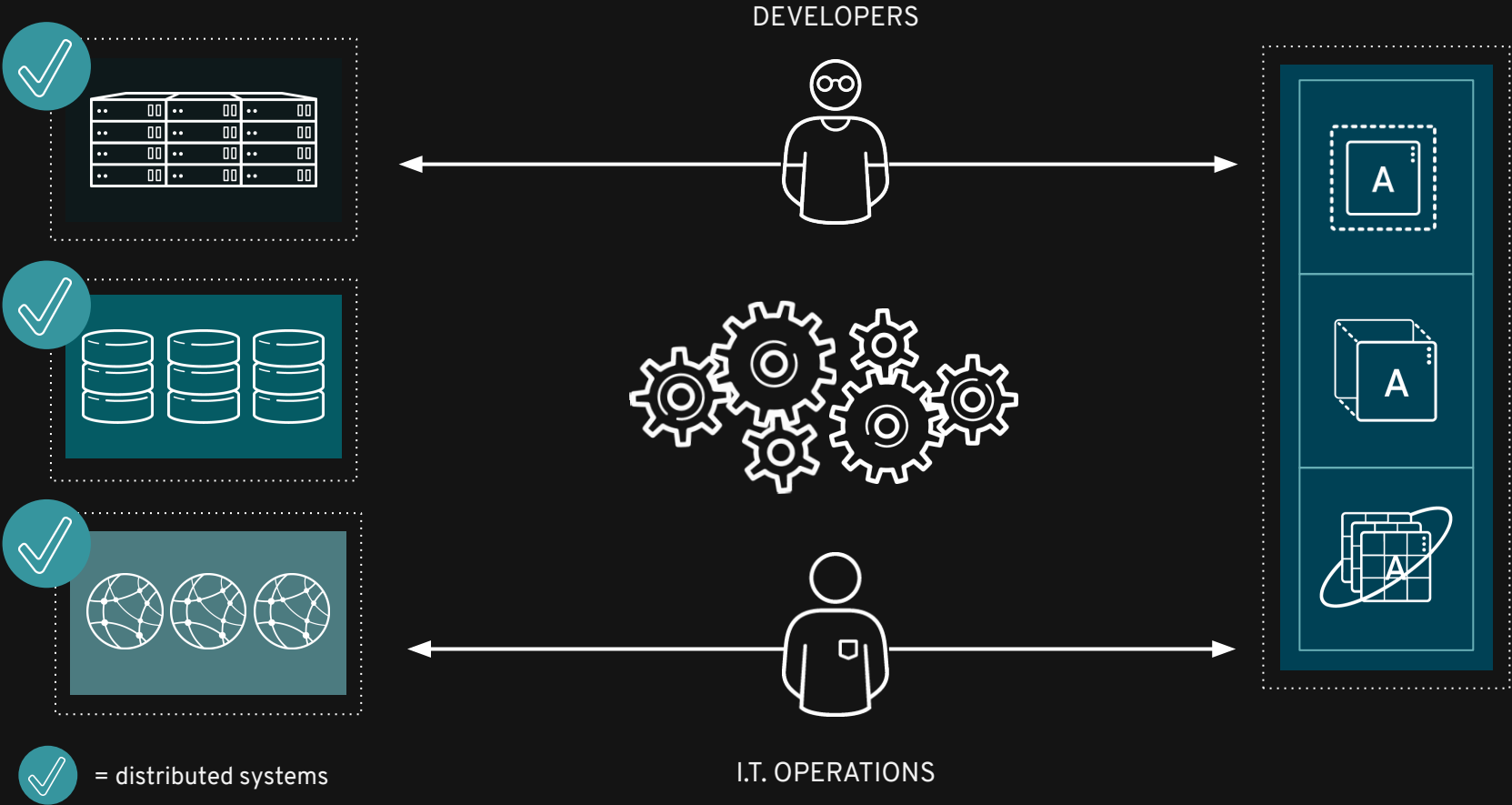
- Red Hat is in a unique position to be a trusted party to aggregate data from internal, community, and customer sources and use it to provide services based on Analytics and Machine Learning.
 - This extends the role of Red Hat from the curator of Open Source software to the aggregator of data.
 - It also requires Red Hat as a leader to actively cultivate an Open Source compatible data philosophy for the industry.
- Cultivate a data-centric practice across Red Hat and our communities.
 - Collaborate on data governance across the different organizational structures, to ensure access as well as compliance and security.
 - Establish a common internal Data and AI platform with the Data Hub project
 - Expand this concept into communities and offer AI-based services. Upstream enablement through <https://OpenDataHub.io>.

AI Ops platforms are software systems that combine big data and **AI** or machine learning functionality to enhance and partially **replace** a broad range of **IT operations** processes and tasks, including availability and performance monitoring, event correlation and analysis, IT service management, and automation.

Source: Gartner Market Guide for AIOps Platforms Published: 03 August 2017 ID: G00322184

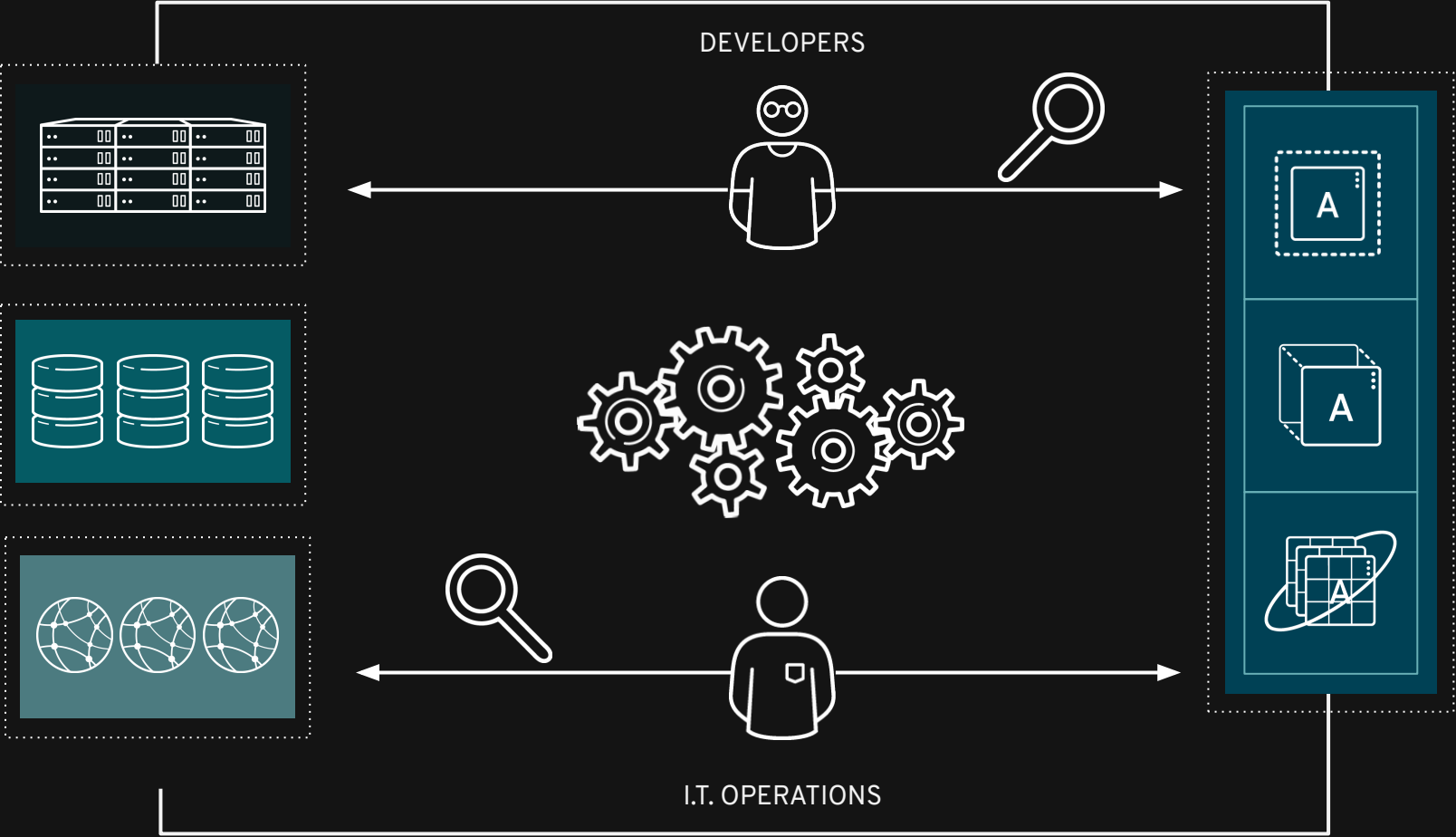
Scalable Distributed Systems

SUPPORT EFFICIENT SEPARATION OF DUTY



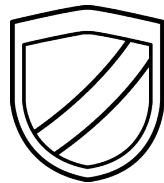
Telemetry Required

DISTRIBUTED SYSTEMS ARE COMPLEX



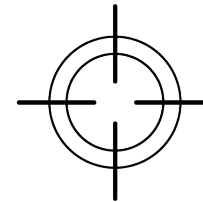
AI Ops Examples

Duality of Defensive and Offensive AI



DEFENSIVE

- Anomaly detection
 - Usage and consumption patterns
- Outlier detection
 - Variances in configurations
- Malware traffic detection
 - Encryption profiling
- Vulnerability detection
- Scaling defensive agents



OFFENSIVE

- High variance testing
 - Test lots and lots of permutations
 - Catalog profile of successful attacks
- Profiling malware traffic
 - Profiling mock attacks without launching full attack
 - Flood high security channels to force activity to lower security channels
- Scaling offensive agents

Embedding AI in Operations



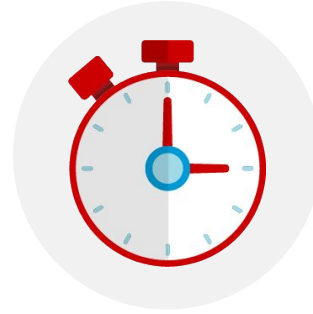
EXPERTISE

Intimidating barrier to entry which requires data science expertise



INFRASTRUCTURE

Expensive and specialized infrastructure and deployments



TIME TO VALUE

Difficult to design, implement, deploy, manage, and modify implementations



COLLABORATION

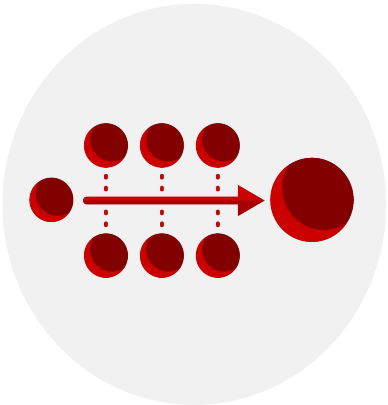
Limited consistency and sharing of artifacts to build a common foundation



DATA

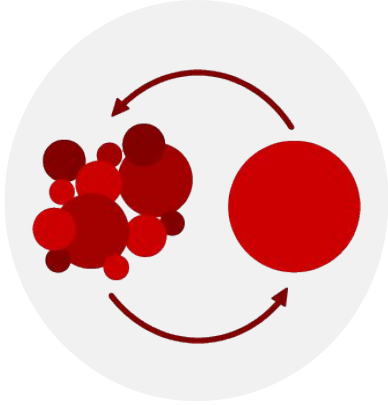
Adequate access, volume, labels, features, quality, latency - to model

Building for Change Requires Standardization



WHY STANDARDIZE?

Portable. Faster.
Transferrable.



HOW TO STANDARDIZE?

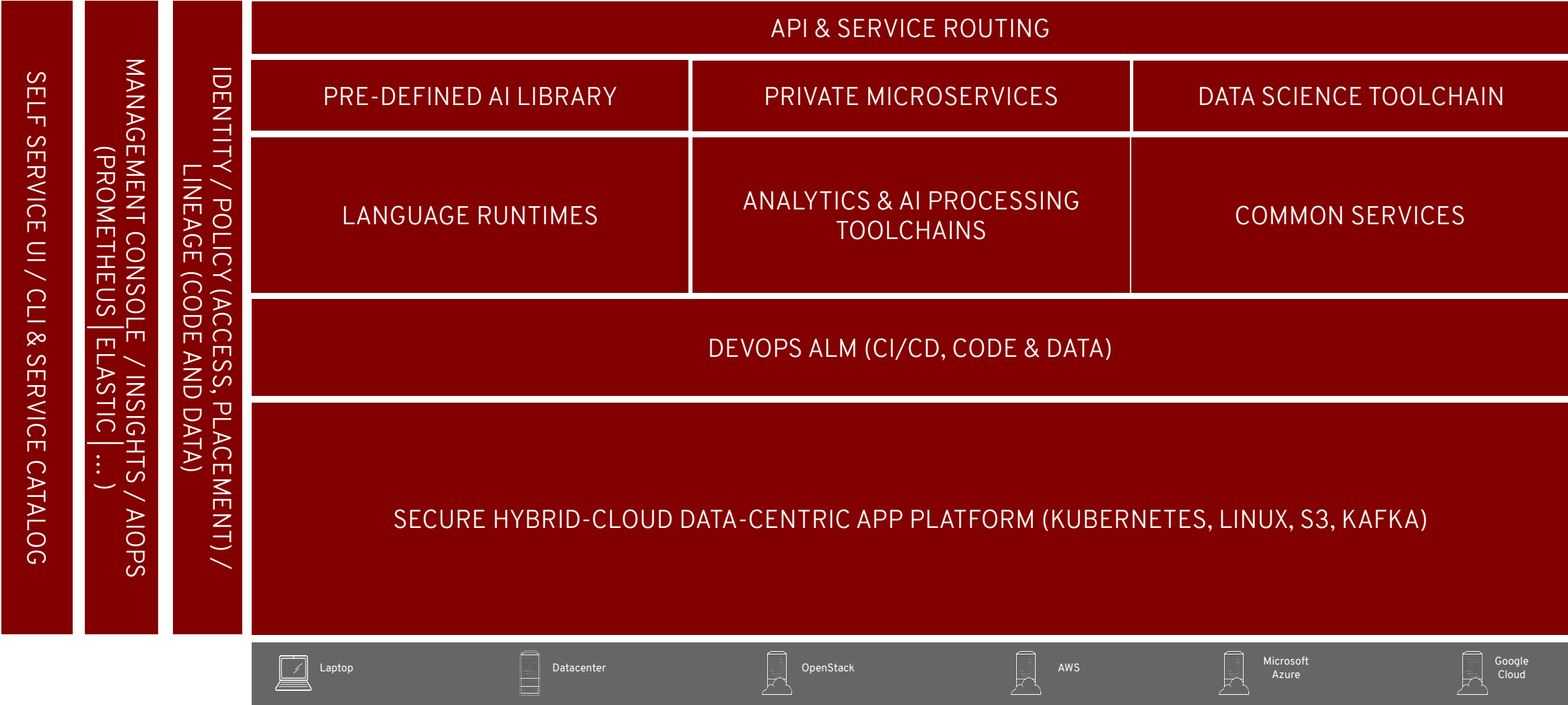
Open. Enterprise. Platform.



CHANGE WHEN STANDARDIZED?

Culture. Processes.
ROE.

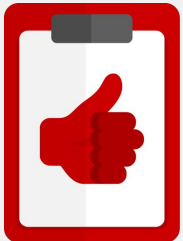
Common Platform Patterns



The Results



- Streamlined, targeted digital services
 - Create a competitive edge
 - Continuous improvement
- Innovation is not a one and done
 - Development of modular, reusable components that improve time to market. Creation of a sharing, transparent and reusable skill sets



- Connected business operations that scale
 - Connect any data, any model to any process requiring any compute
- Lower costs per transaction
 - Instrumenting business operational processes to be automated means investment can be moved to other initiatives

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.



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