PLATFORM ONE

Compliance as Code for Big Bang

Risk Management Framework (RMF) Control Mapping to Accelerate Department of Defense (DoD) Authorization to Operate (ATO)

Platform One

AFLCMC/HNCX

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Why Platform One

DoD Continually Falls Behind Adversaries in Software

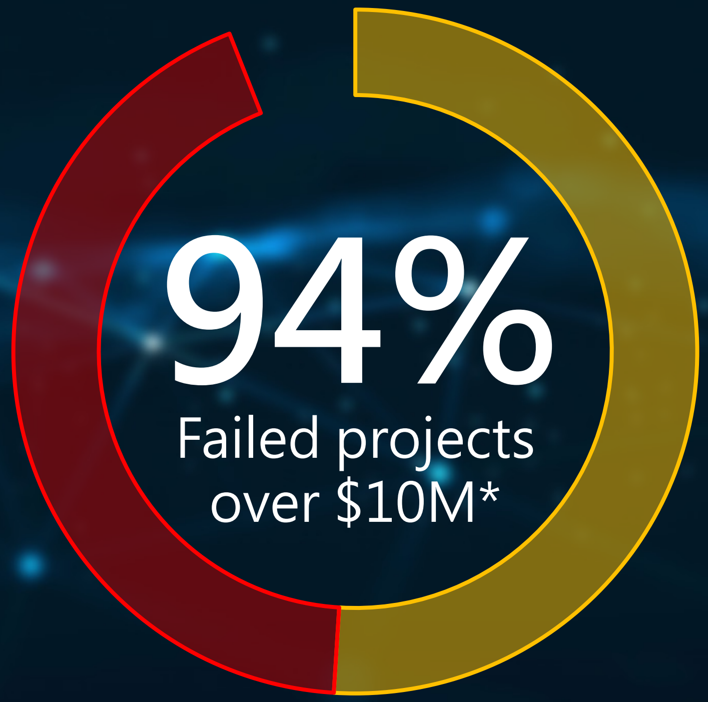
Yet... **all** modern DoD systems including weapon systems are **software**-intensive systems

Build → Learn → Build ... **takes too long...**

Fielding simplest, useful function	3 – 5 yrs
Testing complete system against side-effects	2 yrs
Testing cybersecurity via audit/penetration	2 yrs
Fielding high priority function	1 – 5 yrs
Fixing security holes	1 – 18 mos
Publishing software to use	1 – 18 mos

Months
Years

...and we **still fail**



94%

Failed projects over $10M*

43%

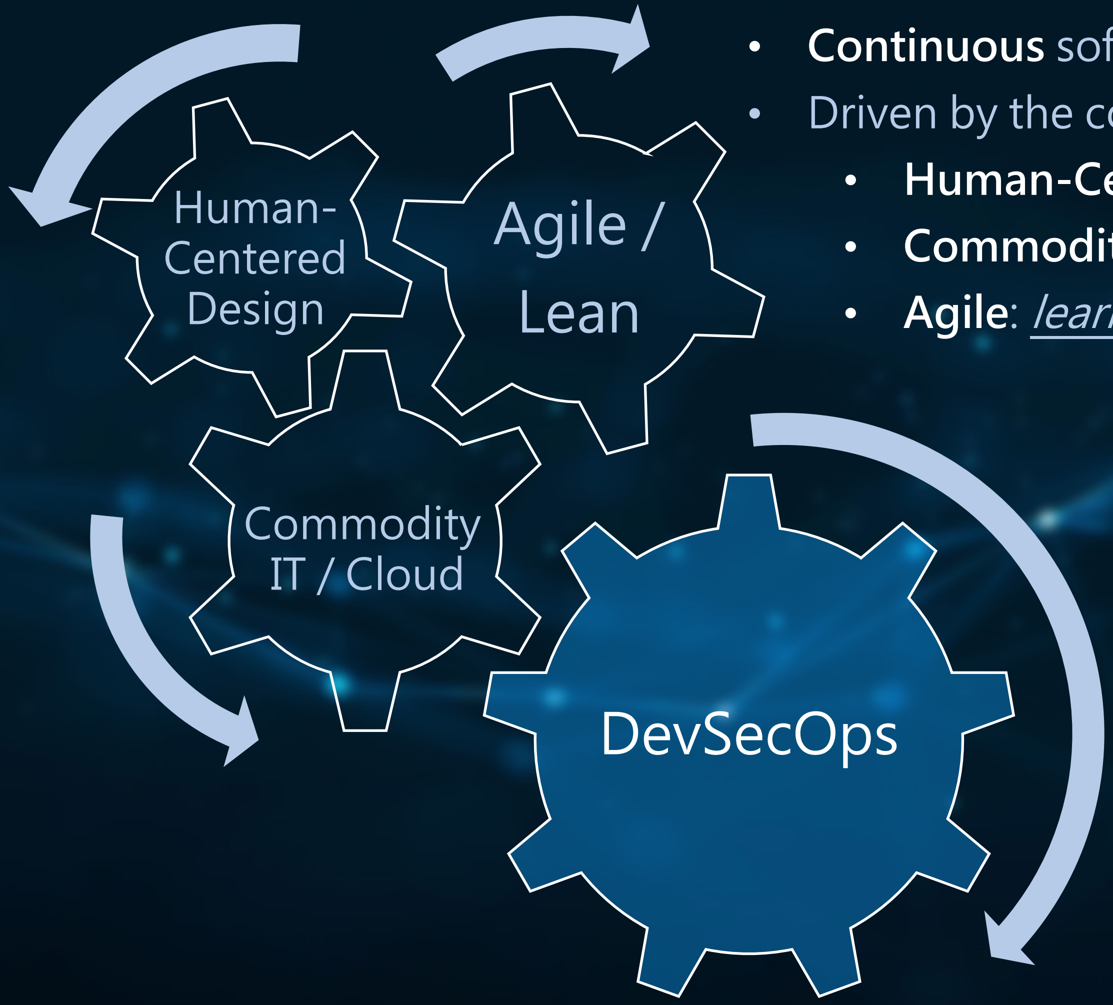
Utter and Complete **Failures**

51%

Failed Expectations Over Budget Behind Schedule

*Standish Group CHAOS report

What is DevSecOps?



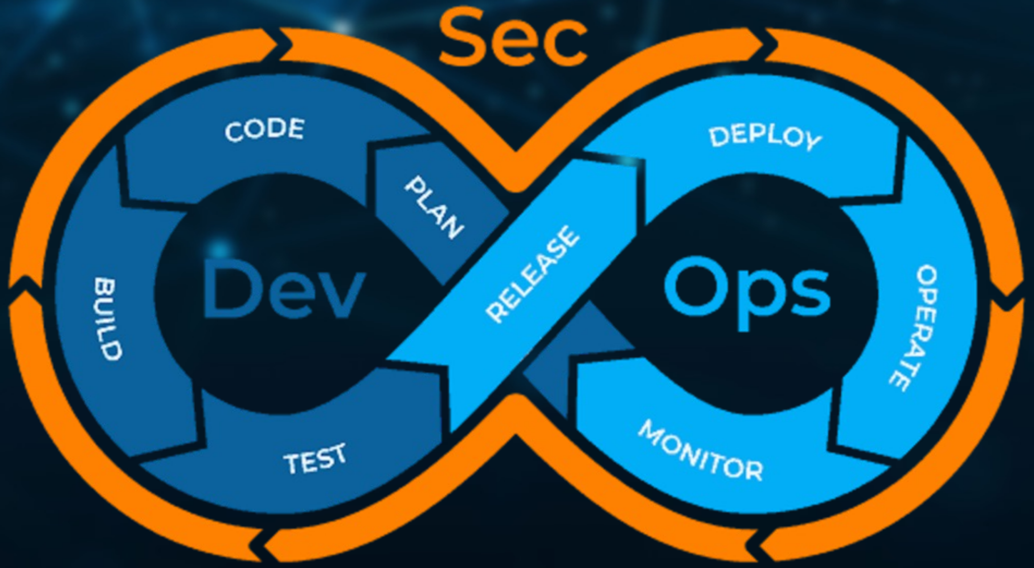
Human-Centered Design

Agile / Lean

Commodity IT / Cloud

DevSecOps

- **Continuous** software development with ops/sustainment w/security throughout
- Driven by the convergence of:
  - **Human-Centered Design** (HCD): a humanistic way to learn and work
  - **Commodity IT**: cheap, ubiquitous infrastructure = low-barrier of entry
  - **Agile**: *learning fast* to find solutions for complex/ill-defined challenges



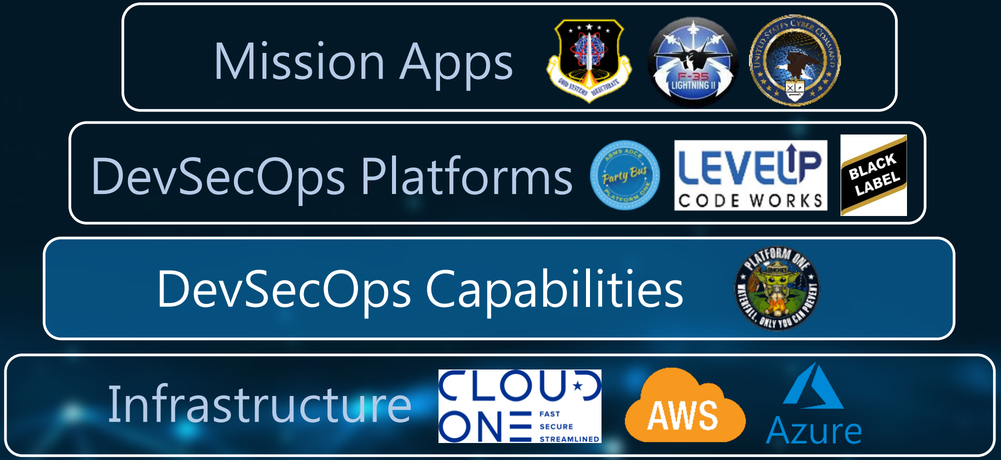
Platform One: Why, How, What

MISSION

Accelerate Secure Software Delivery for the DoD.

VISION

A collaborative Defense Department enabled by continuous delivery



Secure & Connect Users

Cloud Native Access Point provides **zero-trust security** for development, test, and production enclaves

Harden & Store Components

DoD repository of **hardened binary container images** approved for DoD-wide use across enclaves

Build & Deploy Platforms

Infrastructure as Code (IaC) and Configuration as Code (CaC) deployable to cloud or on-premise infrastructures

Code & Operate Apps

DevSecOps Platform-as-a-Service at IL-2 to IL-4 accredited and managed by Platform One

Why Big Bang

3 Feb 2022 Continuous Authority to Operate (cATO)

- Issued by DoD Senior Information Security Officer
- Calls out specific guidance for cATO programs
  - Continuous Monitoring
  - Active Cyber Defense
  - Secure Software Supply Chain
- Big Bang is the Platform One starting point for a K8s-based platform that provides for Continuous Monitoring and Active Cyber Defense
  - Both inside Platform One, and used by third parties across the DoD as they wish

PLATFORM ONE
BIG BANG

Architecture & Tools

Customer Repos

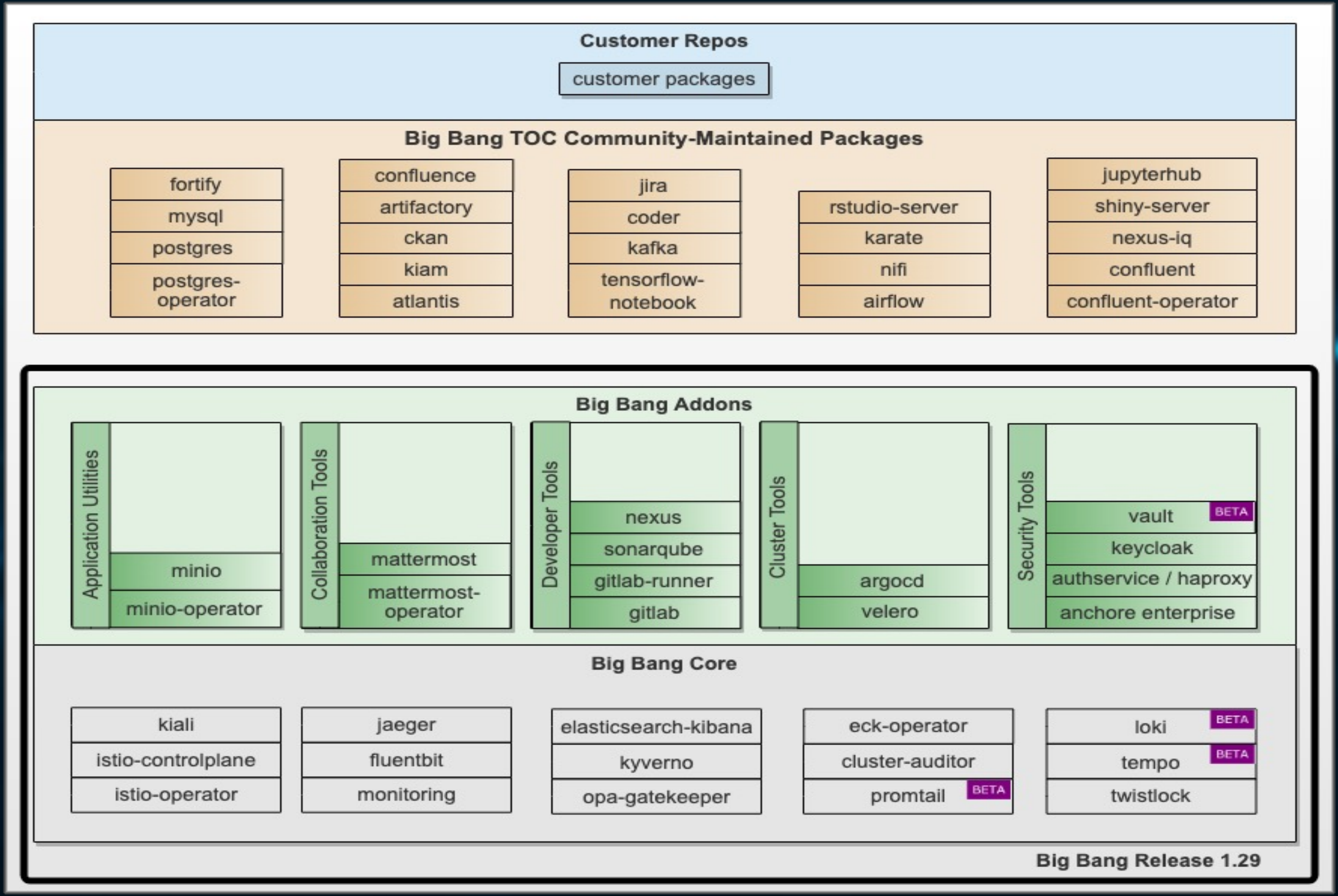
3rd Party Additions

Big Bang **Addons**

Big Bang **Core**

Vendor Cluster
(RKE2, OCP, Konvoy)

Infrastructure
(AWS, Azure, On-Prem)



Customer Repos

customer packages

Big Bang TOC Community-Maintained Packages

fortify
mysql
postgres
postgres-operator

confluence
artifactory
ckan
kiam
atlantis

jira
coder
kafka
tensorflow-notebook

rstudio-server
karate
nifi
airflow

jupyterhub
shiny-server
nexus-iq
confluent
confluent-operator

Big Bang Addons

Application Utilities
minio
minio-operator

Collaboration Tools
mattermost
mattermost-operator

Developer Tools
nexus
sonarqube
gitlab-runner
gitlab

Cluster Tools
argocd
velero

Security Tools
vault BETA
keycloak
authservice / haproxy
anchore enterprise

Big Bang Core

kiali
istio-controlplane
istio-operator

jaeger
fluentbit
monitoring

elasticsearch-kibana
kyverno
opa-gatekeeper

eck-operator
cluster-auditor
promtail BETA

loki BETA
tempo BETA
twistlock

Big Bang Release 1.29

Why OSCAL

The RMF/ATO "problem"

- Per GSA (18f):
  - "ATOs across government have traditionally taken 6-18 months, with a lot of slow back-and-forth between system owners and assessors."
- Within the DoD, the RMF *process* is synonymous with the *tools* used to track controls
  - Manually intensive effort between tool experts and system experts called out by GSA
- Particularly with the advent of cloud software, control inheritance is of particular interest

RMF as a Hurdle to Adoption

- Big Bang is being deployed in different development and production environments across different services, both on-prem and in the cloud
  - Different customers (deployers) use different systems to manage the RMF process
  - Customers need to know what controls are inherited from Big Bang
    - Cannot afford 18 months of control entry!
- Big Bang releases a new version every 2 weeks
  - Did the answers to different RMF controls change?
- Our Solution: Distribute OSCAL control list with every version
  - Always up to date with version, and hopefully it works across systems

How OSCAL

Implementation Roadmap

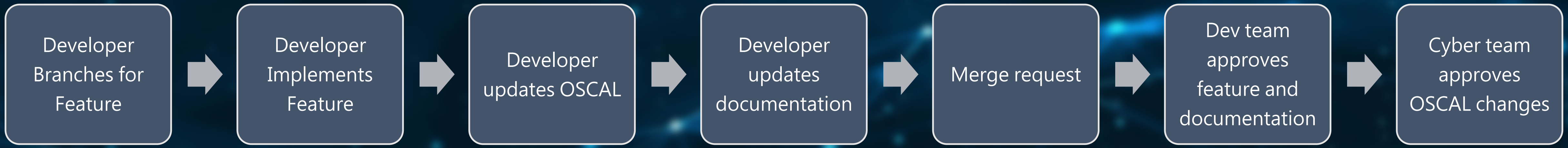
- Map RMF controls to Platform One products
    - This was an intensive 2-day effort with some of our top engineers
    - Generated a mightily impressive Excel file
- Publish those controls in OSCAL format
    - This effort is ongoing
    - We have a few key stakeholders that we are working with to pilot this effort
        - Maybe some new ones in this venue?
- Integrate control mapping/OSCAL updates into the code release process

Control Mapping Layers

- Infra - The cloud/infra provides this control to the application **directly**
- CNAP - The CNAP provides this control to the application **directly**
- IDP - Control would be provided by using an Identity Provider
- Distro - control would be provided by the Kubernetes distribution, which includes the OS/AMI
- Org - The organization implements the control outside of the tech stack
- Self - This package implements the control itself
- N/A - This control does not apply to this package
- Package - control is inherited from package

Proposed Updated Release Process

- In order to keep up to date, must be incorporated with the branch-merge workflow of the Big Bang Team



Developer Branches for Feature → Developer Implements Feature → Developer updates OSCAL → Developer updates documentation → Merge request → Dev team approves feature and documentation → Cyber team approves OSCAL changes

Questions?

Comments?