EXCELERATE '22

NO LIMITS

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Journey to iSeries

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iBASEt

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Solumina iSeries

Leveraging Cloud Native Computing to build and run scalable applications in modern, dynamic environments such as public, private and hybrid clouds

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Today's Agenda

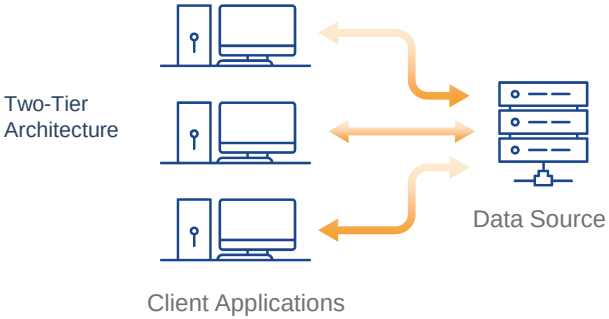
- Architecture
- Benefits
- Configurations
- Deployments
- Evolution

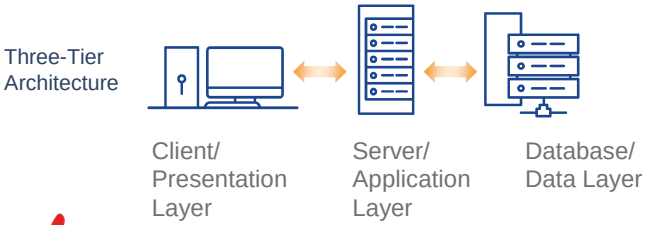
iBASEt

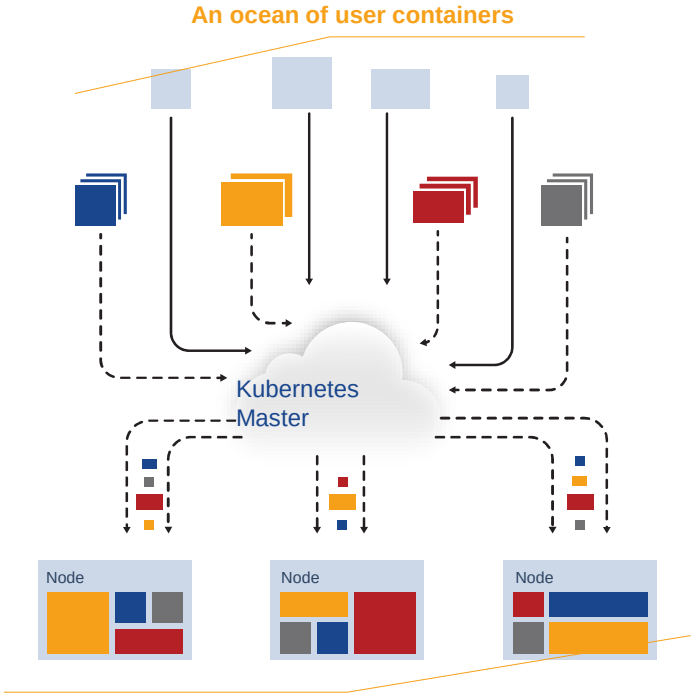
iSeries Architecture

iBASEt

History of iBASEt's Solumina Platform

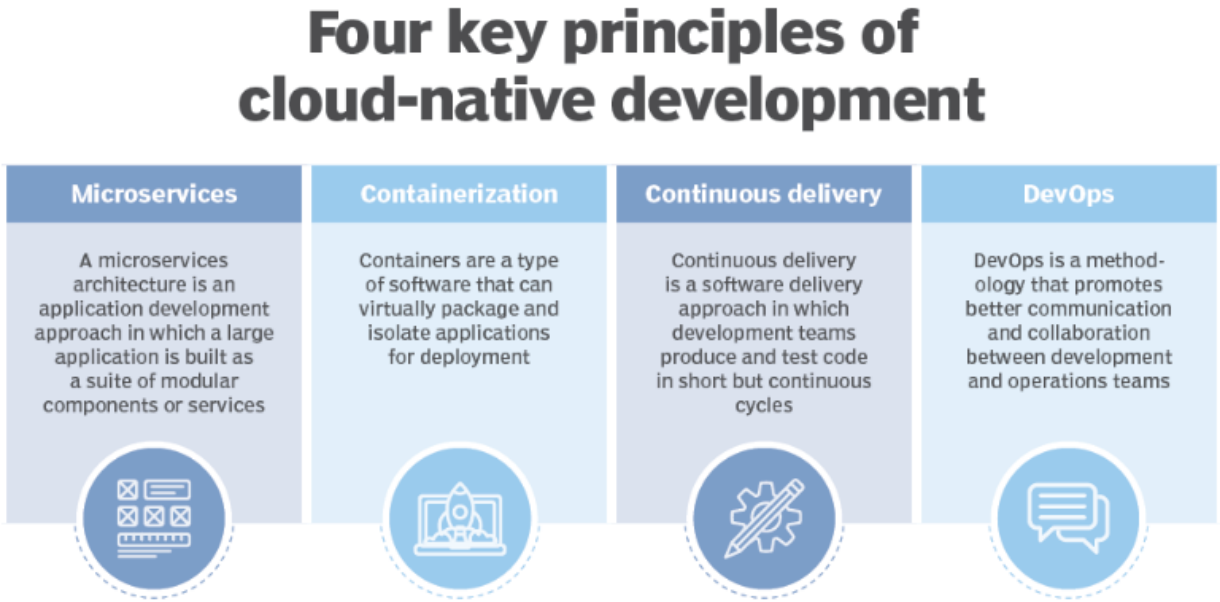




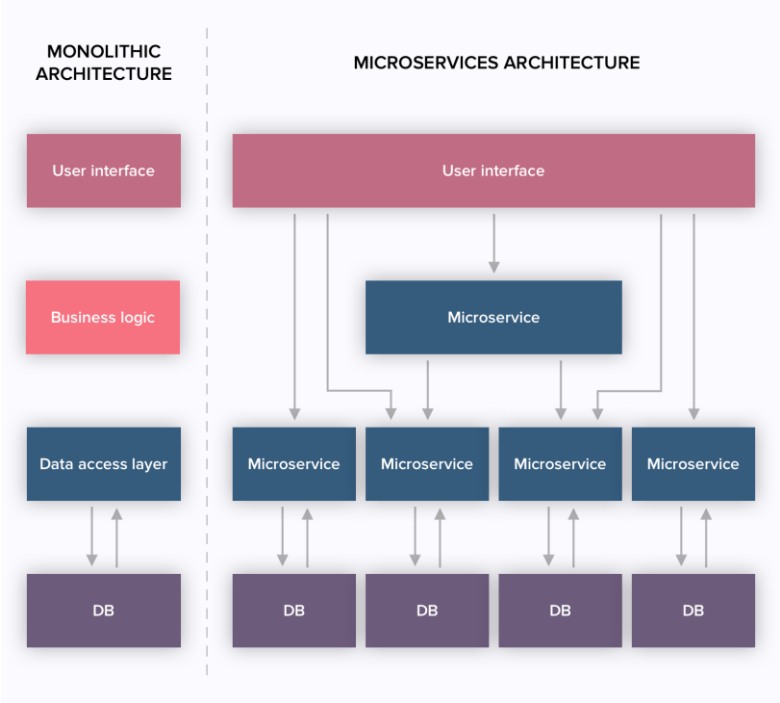


Scheduled and packed
dynamically onto nodes

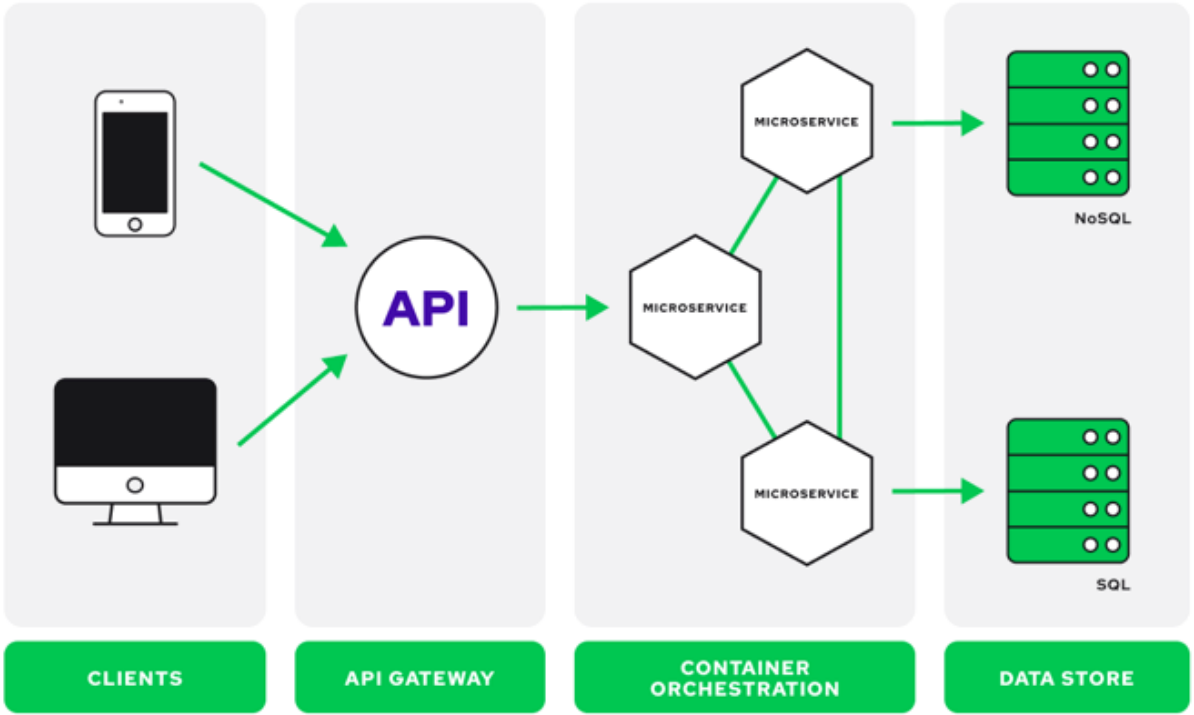
Solumina iSeries



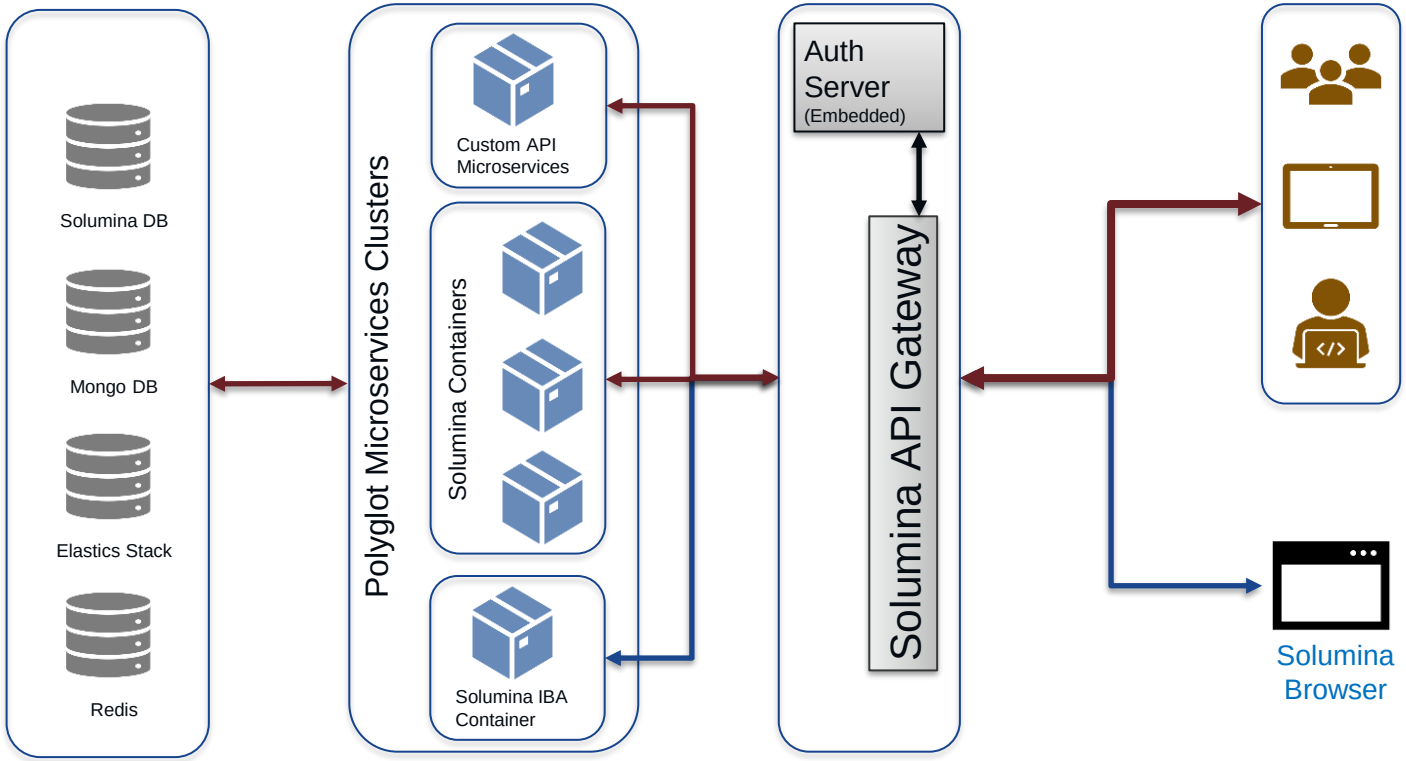
Microservices



REST API - Microservices



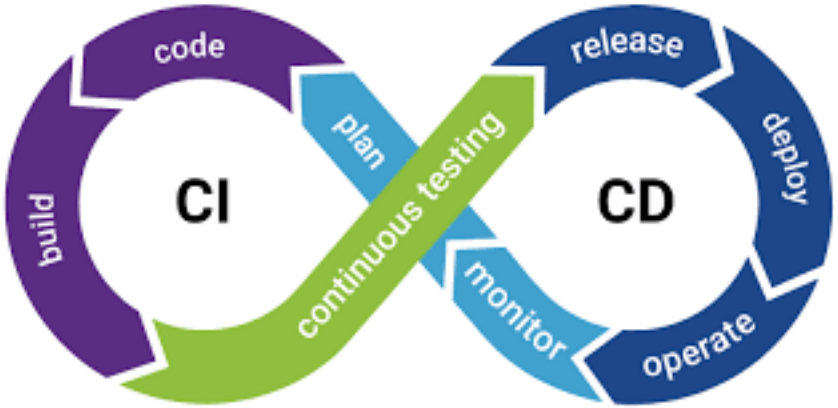
Solumina API



Containerization

- A container is a virtual environment for running a program, which restricts the program's access to things like files and resources on the computer.
- Creating a container is a bit like creating a sandbox for an application. When an app is running inside a container, it gets a restricted view, which gives it limited access to other files and processes.
- A container image is just a package of bits and bytes, which contains all the files and settings needed to create a container.
- A container is usually created from an image. You can think of an image like a template or blueprint for creating containers.
- You can create hundreds (or millions) of containers from the same image.
- The Key for Cloud Native with Container is the Container Orchestration Layer → Kubernetes

CI/CD and DevOps



iSeries Tech Stacks

- Solumina DB – RDBMS
- Application cluster
  - Microservices written in Java with Spring and Hibernate Frameworks
  - Microservices written in Node.js
- ReactJS based WebUI
- Delphi based WinClient
- JSReport for Reporting

Benefits

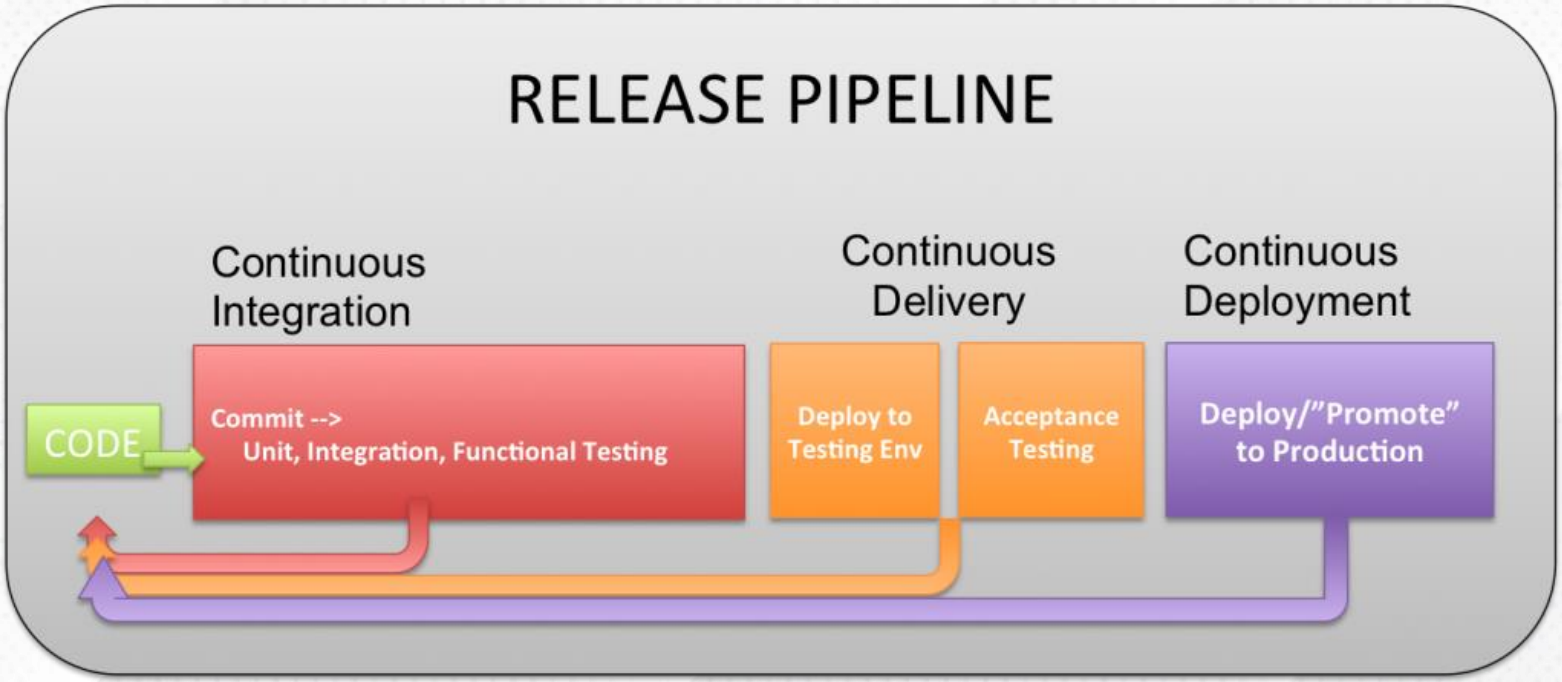
Cloud Native Architecture & Technology

- Agility, Scalability, Elasticity, Resilient
- Ready to support Global Templates
- Cloud Ecosystem Ready
- Standardizing Deployment
- Automating Deployment

True Automation

- Dev
- Build
- Test
- Delivery
- Deploy

Continuous Delivery / Deployment



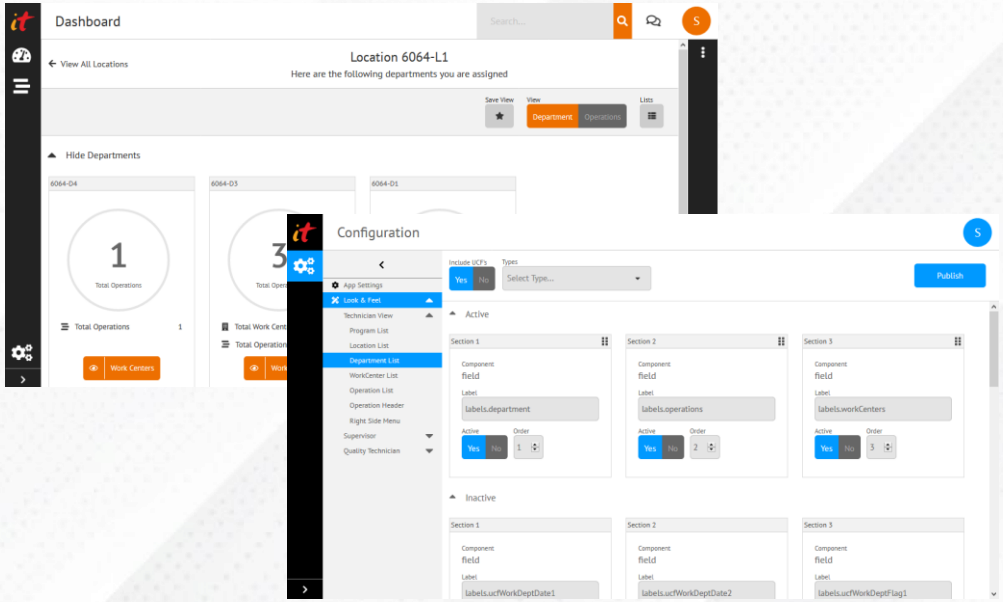
iSeries Configurations

Configuration

Out of Box – Configuration Tool

UI screen extension

User specific language & colors schema

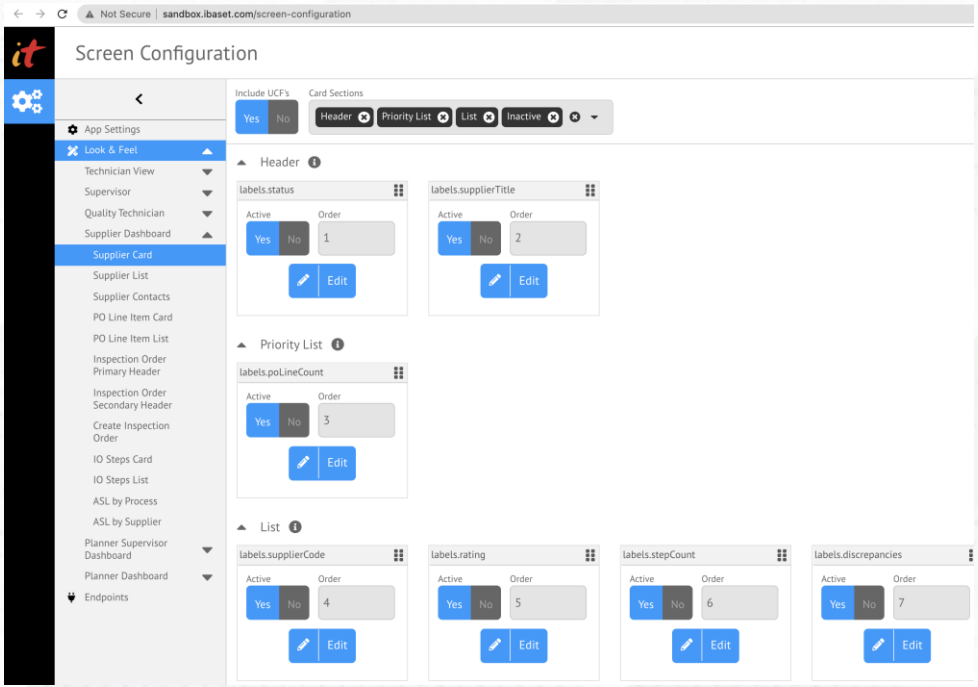


Extensible – iSeries SDK

Recipe to create your own app using Solumina Authentication

Configuration Tool

- Used to configure fields in standard iSeries Web UI
- Drag and Drop design
- No-code configuration
- Included in iSeries Web UI
- Available only for existing screens



SDK – Software Development Kit

Provides access to the iSeries ecosystem.

The **SDK Server** side allows API developers to write custom microservices and APIs.

The **SDK Front-End** side allows UI developers to write custom screens.

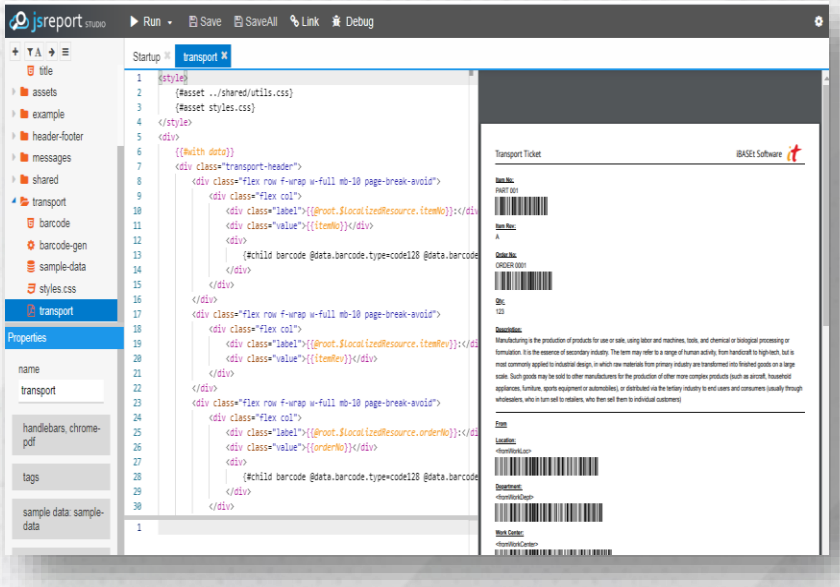
What Does the iSeries SDK Provide?

- Access to the iSeries ecosystem
- On the backend microservice
  - It allows API developers to write APIs.
  - It allows to wrap out-of-the-box APIs and have custom code before and after for validation and manipulation.
- On the frontend, it enables UI developers to write custom screens.

Reporting Tool – Js Report

- Dynamically design and produce complex and interactive reports in various formats, including pdf, excel, docx, pptx and many more
- Js report provides internationalization, scheduling, templates versioning, import-export and backup, sub reports
- User friendly Js report studio with preview facility

Js Report Studio



Deployment Options

Three Deployment Options

- On-Prem K8s with Oracle or MS SQLServer (recommended for offline or classified)
- AWS EKS based with Oracle RDS
- Azure AKS based with AzureSQL

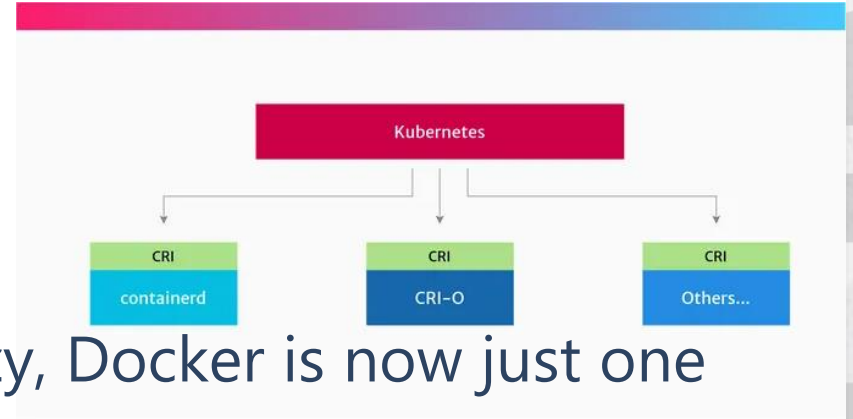
iSeries – 3rd Party Requirements

- Solumina DB (RDBMS): Oracle or MS SQLServer
- Application Cluster:
  - CentOS or RHEL
  - Kubernetes, ContainerD, Helm
  - Kong, ELK, MongoDB, Redis
  - Prometheus, Grafana
  - Perl (required for Oracle based deployment)
- BIS: ActiveMQ

Evolution: What's Ahead

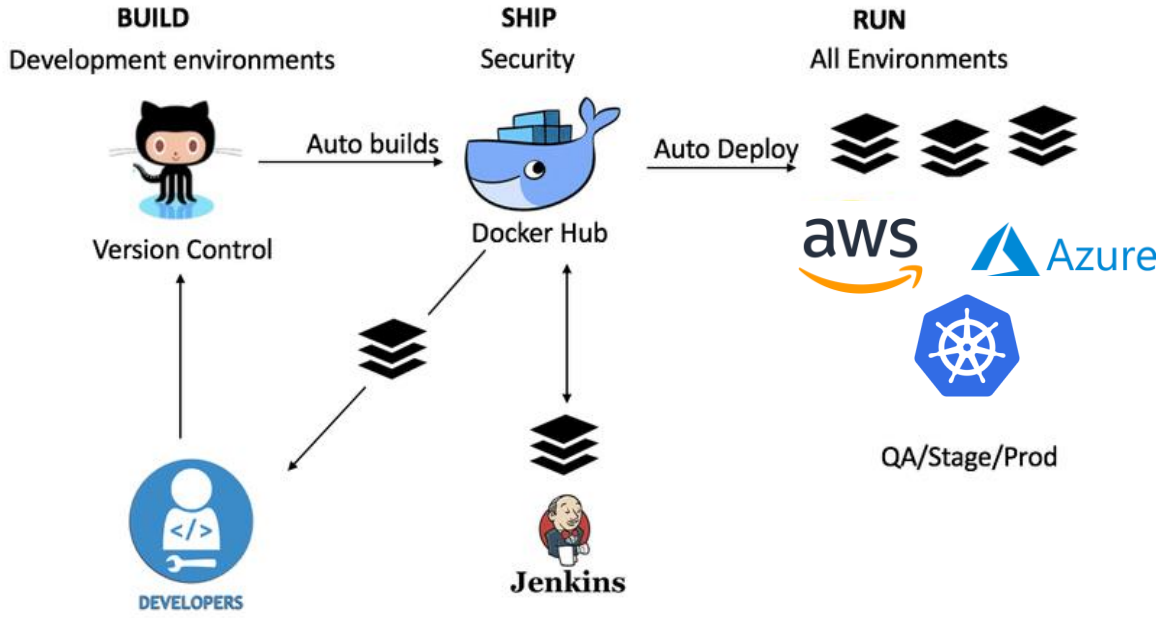
- i080 and Beyond

Containers

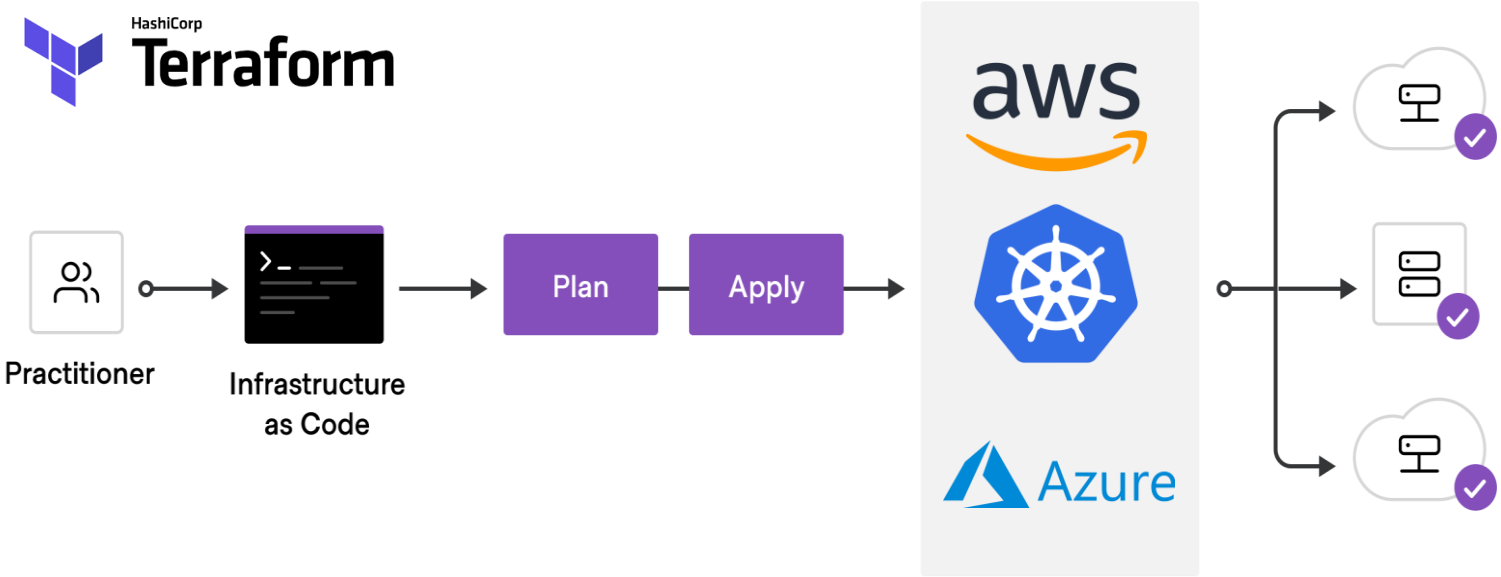


- Docker started the frenzy, Docker is now just one of the many options
- Standardizations:
  - OCI (Open Container Initiative) – specifications for containers and their images
  - CRI (Container Runtime Interface) – defines API between K8s and a container runtime
- i080 moving to container'd to run Solumina containers

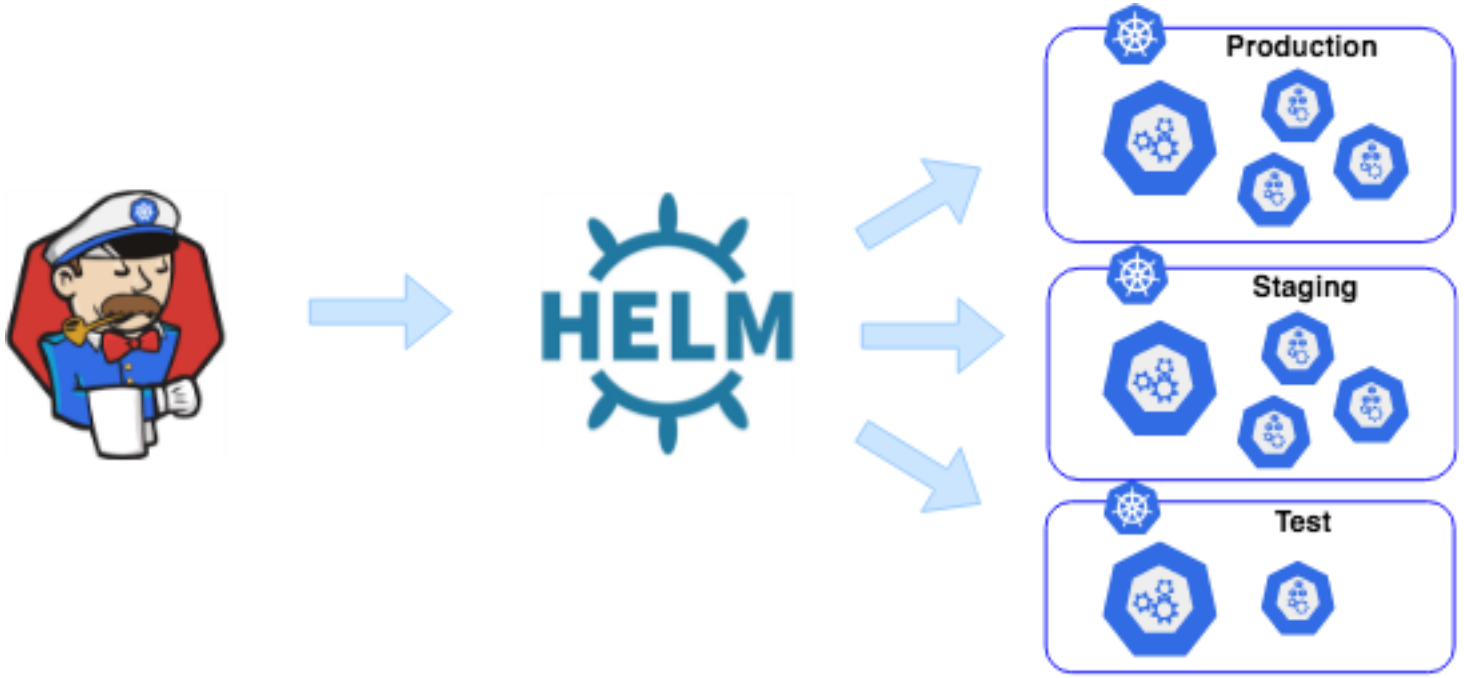
CI/CD Architecture with Customers



Deployment Automation



Deployment Automation



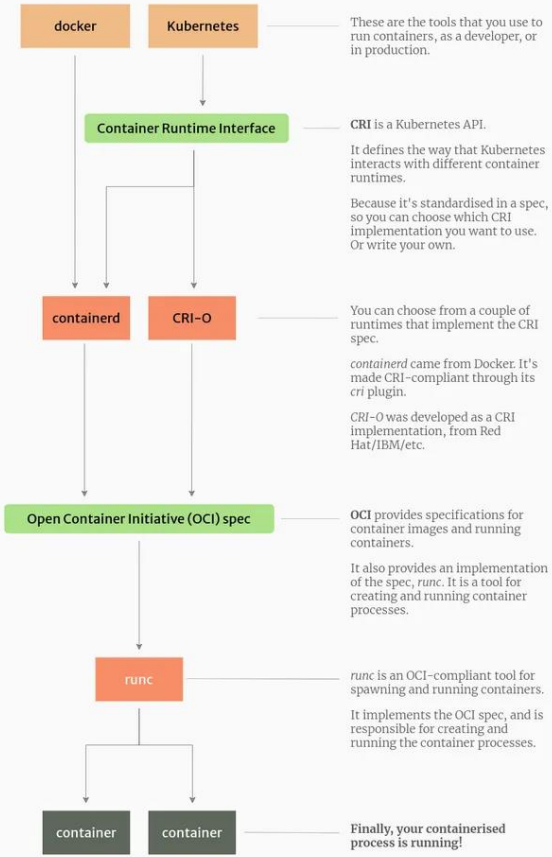
Helm Charts

- Simpler Roll Out
  - Solumina deployment requires user input – prone to user errors – deployment configs can be automated
- Re-Runnable
- SDK
  - Easier development of services - no need to write individual deployment files per service

THANK YOU

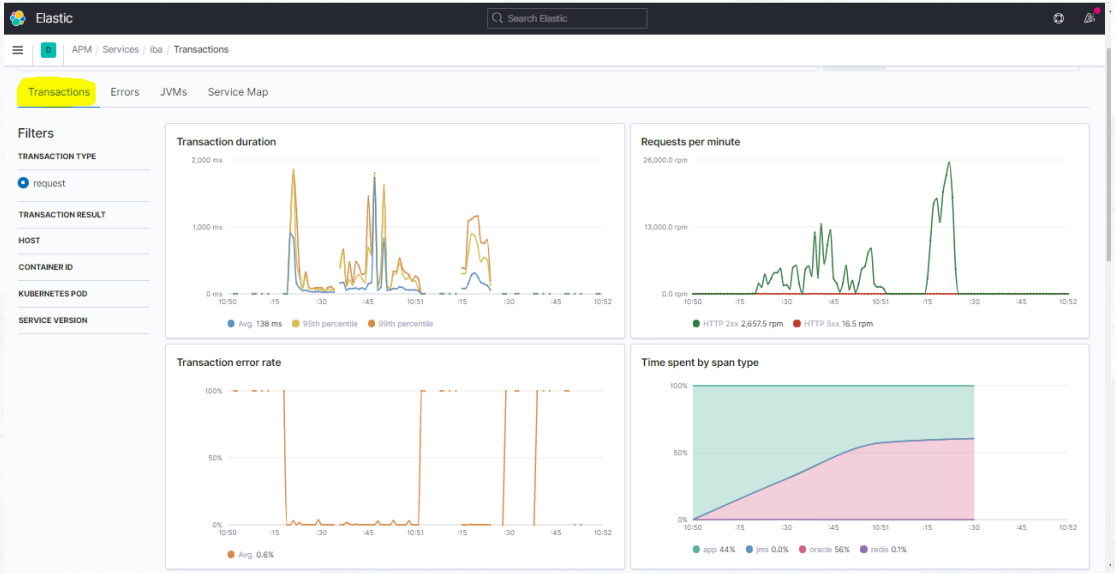
QUESTIONS?

Docker, Kubernetes, OCI, CRI-O, containerd & runc: **How do they work together?**



iSeries Monitoring

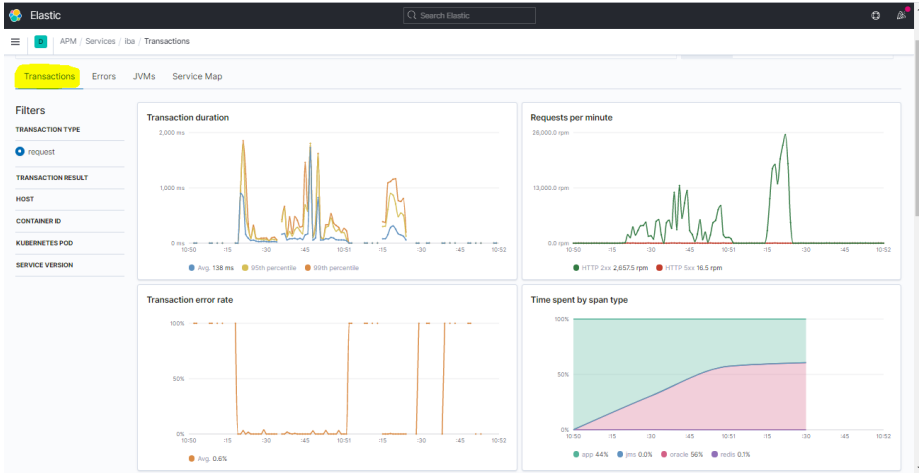
Elastic APM – Application Performance Monitoring

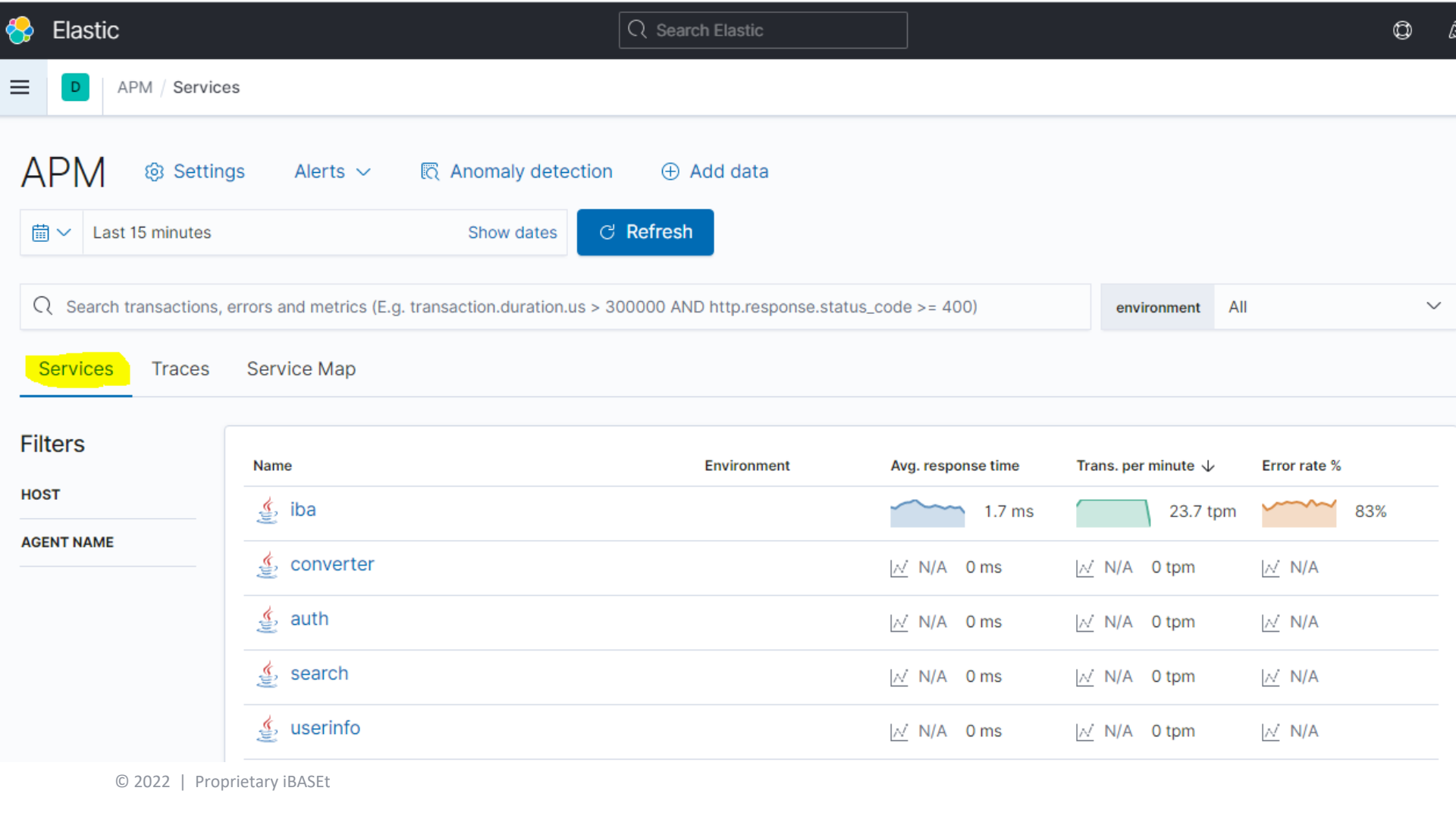


Elastic APM Application Performance Monitoring

Java Services configured:

- IBA
- Converter
- Auth
- UserInfo
- Search





Sample Elastic APM Metrics

Transactions

Name	Avg. duration	95th percentile	Trans. per minute	Impact
OperationComponentController#getOrderComponentDetailsForMu…	241 ms	733 ms	250.0 tpm	
OperationController#fetchOperationDetails	141 ms	412 ms	300.0 tpm	
PartExecutionController#performPartExecution	663 ms	1,752 ms	50.0 tpm	
BuyoffExecutionController#performBuyoffExecution	662 ms	1,547 ms	50.0 tpm	
HoldController#getOperationUnitHoldCount	105 ms	257 ms	250.0 tpm	
OperationController#fetchOperationUnitDetails	72 ms	266 ms	250.0 tpm	
PartController#getPartDetails	163 ms	565 ms	100.0 tpm	
DataCollectionController#getDcDetails	159 ms	622 ms	100.0 tpm	
DataCollectionExecutionController#performDataCollectionExe…	224 ms	487 ms	50.0 tpm	
ToolController#getToolDetails	111 ms	311 ms	100.0 tpm	
UserOperationAckController#userAcknowledgements	108 ms	213 ms	100.0 tpm	

Elastic

Search Elastic

D APM / Services / iba / Transactions

Transactions Errors JVMs Service Map

Filters

TRANSACTION TYPE

request

TRANSACTION RESULT

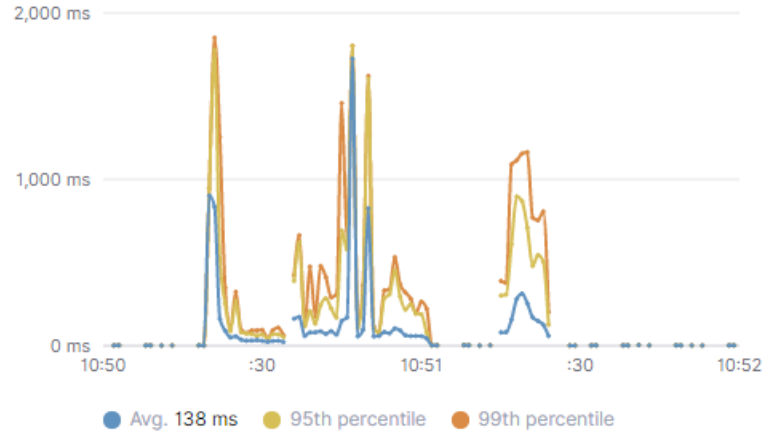
HOST

CONTAINER ID

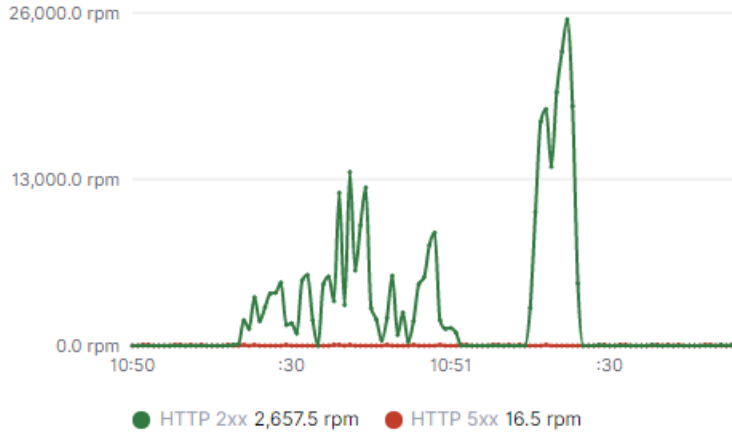
KUBERNETES POD

SERVICE VERSION

Transaction duration



Requests per minute



Transaction error rate

Time spent by span type

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APM / Services / iba / Errors

Transactions | Errors | JVMs | Service Map

Filters

HOST

CONTAINER ID

KUBERNETES POD

SERVICE VERSION

Error occurrences

Errors

Group ID	Type	Error message and culprit	Occurrences ↓	Latest occurren...
cff65	java.io.IOExce...	Broken pipe N/A	20	an hour ago
72cc1	java.io.IOExce...	Connection reset by peer N/A	13	an hour ago
40b02	java.sql.SQLE...	ORA-22835: Buffer too small for CLOB to CHAR or BLOB to RAW N/A	1	an hour ago

< 1 >

Error occurrence

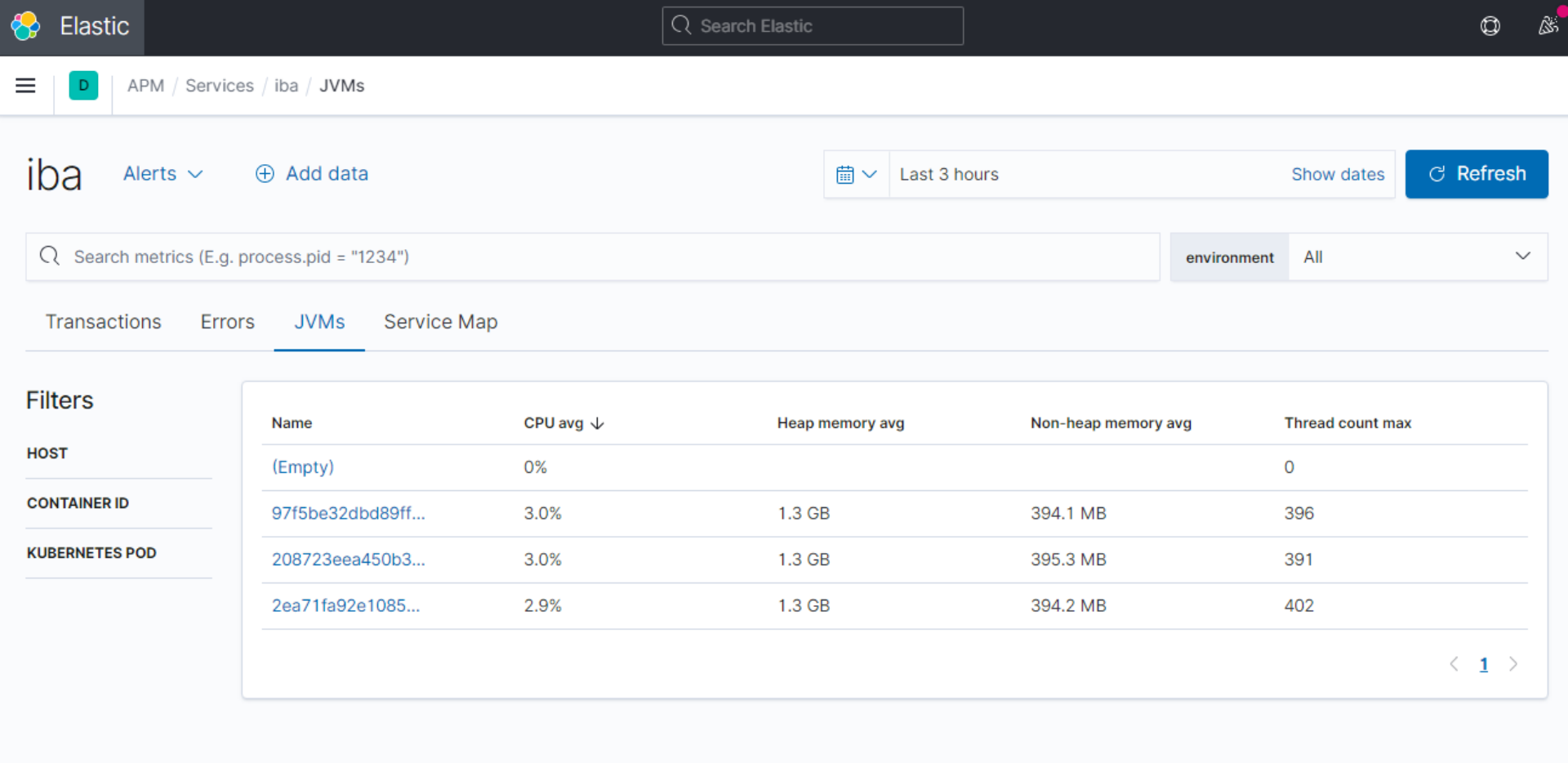
View 1 occurrence in Discover.

2 hours ago | DataCollectionController#getDcDetails

Exception stack trace | Metadata

ORA-22835: Buffer too small for CLOB to CHAR or BLOB to RAW conversion (actual: 4196, maximum: 4000)

```
at oracle.jdbc.driver.T4CTTIoer11.processError(T4CTTIoer11.java:494)
at oracle.jdbc.driver.T4CTTIoer11.processError(T4CTTIoer11.java:446)
at oracle.jdbc.driver.T4C8Oall.processError(T4C8Oall.java:1054)
at oracle.jdbc.driver.T4CTTIfun.receive(T4CTTIfun.java:623)
at oracle.jdbc.driver.T4CTTIfun.doRPC(T4CTTIfun.java:252)
at oracle.jdbc.driver.T4C8Oall.doOALL(T4C8Oall.java:612)
at oracle.jdbc.driver.T4CPreparedStatement.doOall8(T4CPreparedStatement.java:226)
at oracle.jdbc.driver.T4CPreparedStatement.doOall8(T4CPreparedStatement.java:59)
at oracle.jdbc.driver.T4CPreparedStatement.executeForRows(T4CPreparedStatement.java:910)
at oracle.jdbc.driver.OracleStatement.doExecuteWithTimeout(OracleStatement.java:1119)
at oracle.jdbc.driver.OraclePreparedStatement.executeInternal(OraclePreparedStatement.java:3780)
at oracle.jdbc.driver.T4CPreparedStatement.executeInternal(T4CPreparedStatement.java:1343)
at oracle.jdbc.driver.OraclePreparedStatement.executeLargeUpdate(OraclePreparedStatement.java:3865)
at oracle.jdbc.driver.OraclePreparedStatement.executeUpdate(OraclePreparedStatement.java:3845)
at oracle.jdbc.driver.OraclePreparedStatementWrapper.executeUpdate(OraclePreparedStatementWrapper.java:1061)
at org.apache.tomcat.dbcp.dbcp2.DelegatingPreparedStatement.executeUpdate(DelegatingPreparedStatement.java:136)
at org.apache.tomcat.dbcp.dbcp2.DelegatingPreparedStatement.executeUpdate(DelegatingPreparedStatement.java:136)
at net.bull.javamelody.JdbcWrapper.doExecute(JdbcWrapper.java:407)
```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D
APM / Services / iba / JVMs
iba
Alerts
Add data
Last 3 hours
Show dates
Refresh
Search metrics (E.g. process.pid = "1234")
environment
All
Transactions
Errors
JVMs
Service Map
Filters
HOST
CONTAINER ID
KUBERNETES POD
Name
CPU avg
Heap memory avg
Non-heap memory avg
Thread count max
(Empty) 0% 0
97f5be32dbd89ff... 3.0% 1.3 GB 394.1 MB 396
208723eea450b3... 3.0% 1.3 GB 395.3 MB 391
2ea71fa92e1085... 2.9% 1.3 GB 394.2 MB 402
1

iba

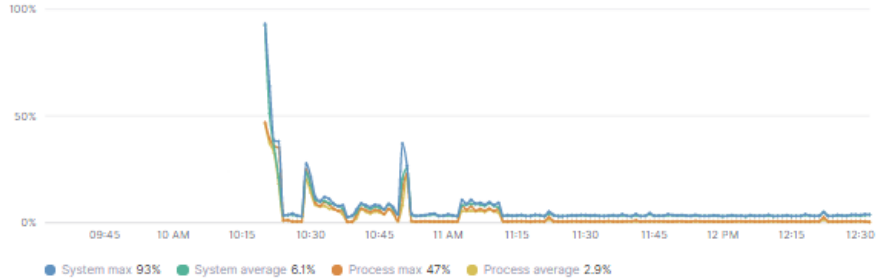
Last 3 hours | Show dates | Refres

Search metrics (E.g. process.pid = "1234")

environment | All

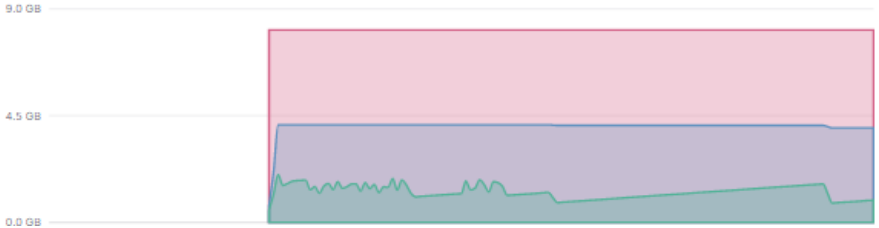
Service name	Host	Container ID
iba	N/A	97f5be32dbd89ff5...

CPU usage



System memory usage

Heap Memory



Non-Heap Memory