Microsoft

# Maximize Azure Container Apps for Seamless Deployment and Execution

# Overcome technology gaps with Java on Azure Container Apps

Source to Cloud

Java components

Monitor & Troubleshoot

# Java on ACA Roadmap

### Build

Consistently build, maintain and update portable OCI images with Java CNCF Buildpacks

Boost security and reduce risk from CVE

### Deployment

Deploy from source, artifact or image

### Operation

Leverage managed Java components for your apps without operational hassles

In Preview

### Monitoring

Get deep insights into your apps with built-in Java metrics and APMs of your choice

### Diagnostics

Easily identify issues with Java diagnostic information and tools (GC, thread, etc.)

Planned for April

# Build and Deploy Java apps

- Deploy from source, Jar or image

- Consistently build, maintain and update images

- Boost security and reduce risk from CVE

# Containers built using Dockerfile are hard to productionize and scale

Team A

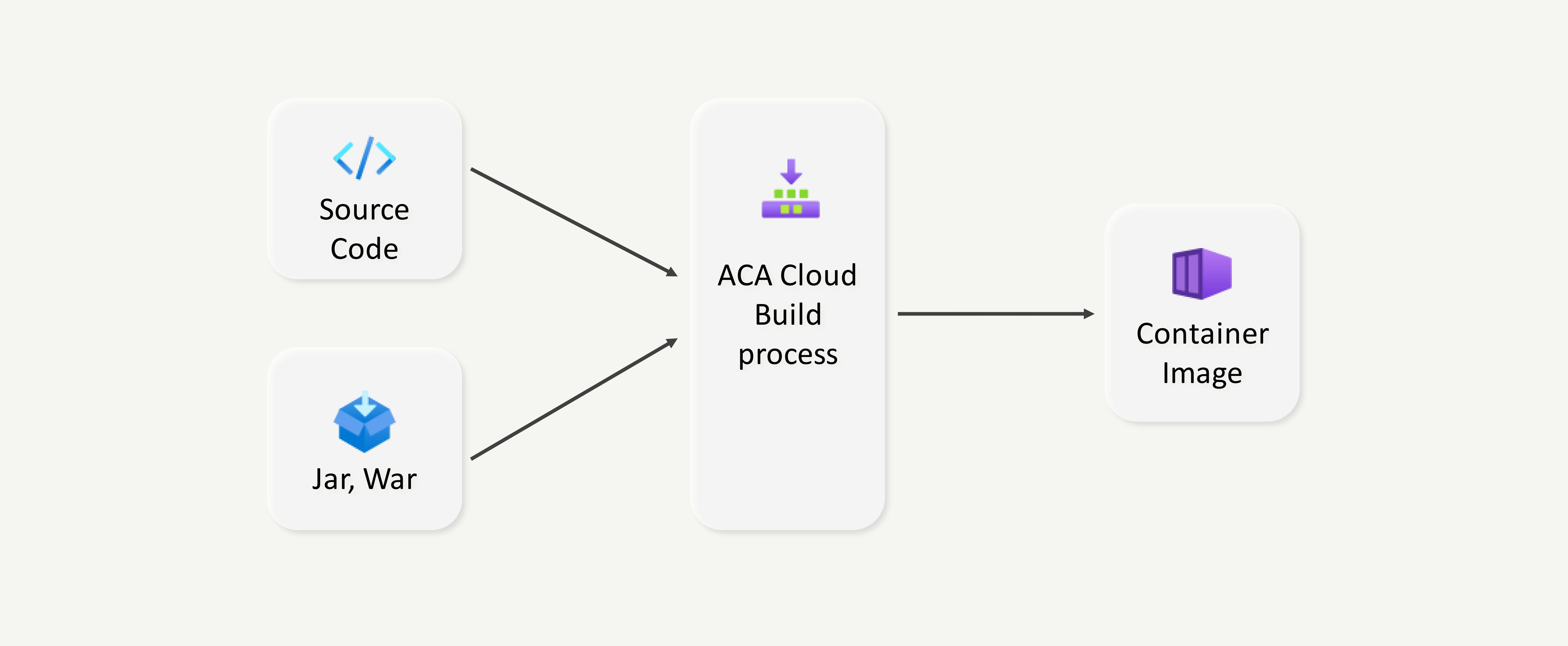
```
FROM ubuntu:20.04
COPY app1 /
#install JDK 17 and maven
RUN apk add openjdk17 maven
CMD [“app1”]
```

Team B

```
FROM centos:stream9
COPY app2 /
#install JDK 11 and maven
RUN apk add openjdk11 maven
CMD [“app2”]
```

← Has Openssl CVE

# Build



Source Code

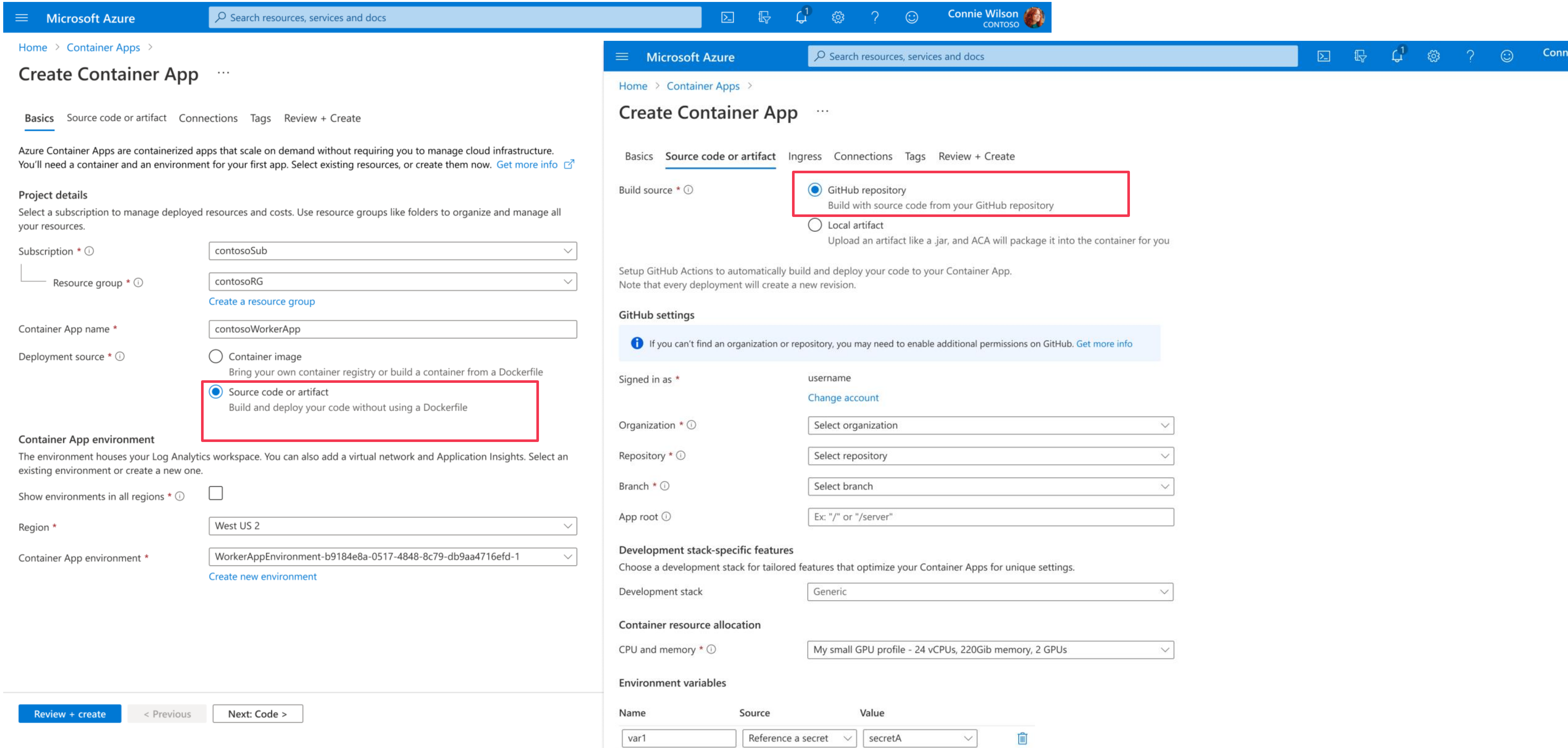
Jar, War

ACA Cloud Build process

Container Image

# Deploy app

## Portal Experience



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### Create Container App ···

Basics | Source code or artifact | Connections | Tags | Review + Create

Azure Container Apps are containerized apps that scale on demand without requiring you to manage cloud infrastructure. You'll need a container and an environment for your first app. Select existing resources, or create them now. Get more info

**Project details**

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ: contosoSub

Resource group * ⓘ: contosoRG

Create a resource group

Container App name *: contosoWorkerApp

Deployment source * ⓘ:

○ Container image
Bring your own container registry or build a container from a Dockerfile

● Source code or artifact
Build and deploy your code without using a Dockerfile

**Container App environment**

The environment houses your Log Analytics workspace. You can also add a virtual network and Application Insights. Select an existing environment or create a new one.

Show environments in all regions * ⓘ: □

Region *: West US 2

Container App environment *: WorkerAppEnvironment-b9184e8a-0517-4848-8c79-db9aa4716efd-1

Create new environment

### Create Container App ···

Basics | Source code or artifact | Ingress | Connections | Tags | Review + Create

Build source * ⓘ:

● GitHub repository
Build with source code from your GitHub repository

○ Local artifact
Upload an artifact like a .jar, and ACA will package it into the container for you

Setup GitHub Actions to automatically build and deploy your code to your Container App.
Note that every deployment will create a new revision.

**GitHub settings**

ⓘ If you can't find an organization or repository, you may need to enable additional permissions on GitHub. Get more info

Signed in as *: username

Change account

Organization * ⓘ: Select organization

Repository * ⓘ: Select repository

Branch * ⓘ: Select branch

App root ⓘ: Ex: "/" or "/server"

**Development stack-specific features**

Choose a development stack for tailored features that optimize your Container Apps for unique settings.

Development stack: Generic

**Container resource allocation**

CPU and memory * ⓘ: My small GPU profile - 24 vCPUs, 220Gib memory, 2 GPUs

**Environment variables**

| Name | Source | Value |
|---|---|---|
| var1 | Reference a secret | secretA |

# Managed Java Components

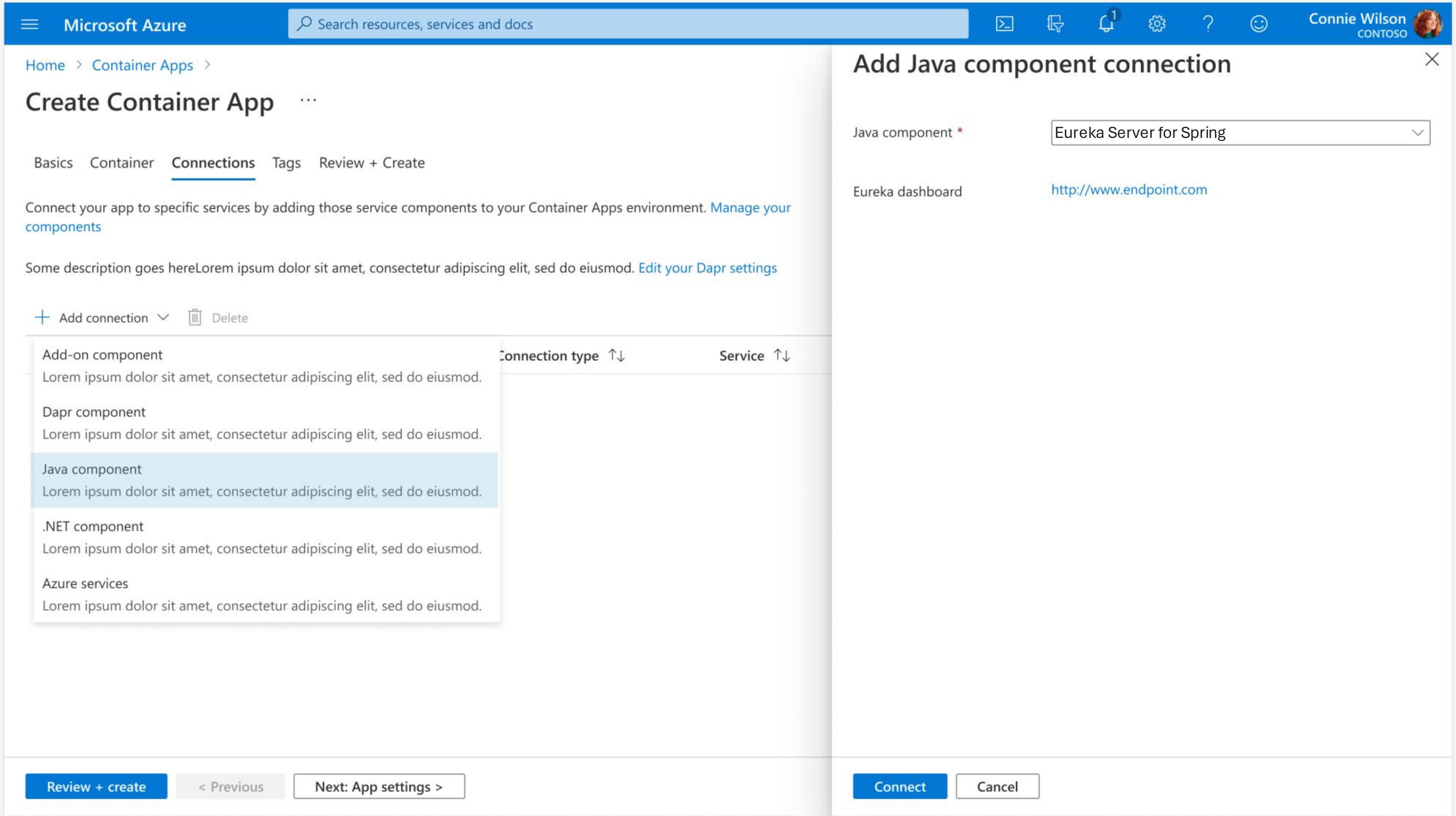
**Discovery**

**Application configuration**

**App monitor**

**API routing**

# Managed Java Components



## Create Container App

Connect your app to specific services by adding those service components to your Container Apps environment. Manage your components

Some description goes hereLorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod. Edit your Dapr settings

Add-on component
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod.

Dapr component
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod.

Java component
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.NET component
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Azure services
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## Add Java component connection

Java component * Eureka Server for Spring

Eureka dashboard http://www.endpoint.com

# Monitor Java Apps

**Providing Java Metrics and Logs**

- Deeper insights into the running status of applications
- Detect/pinpointing specific issues for faster resolution

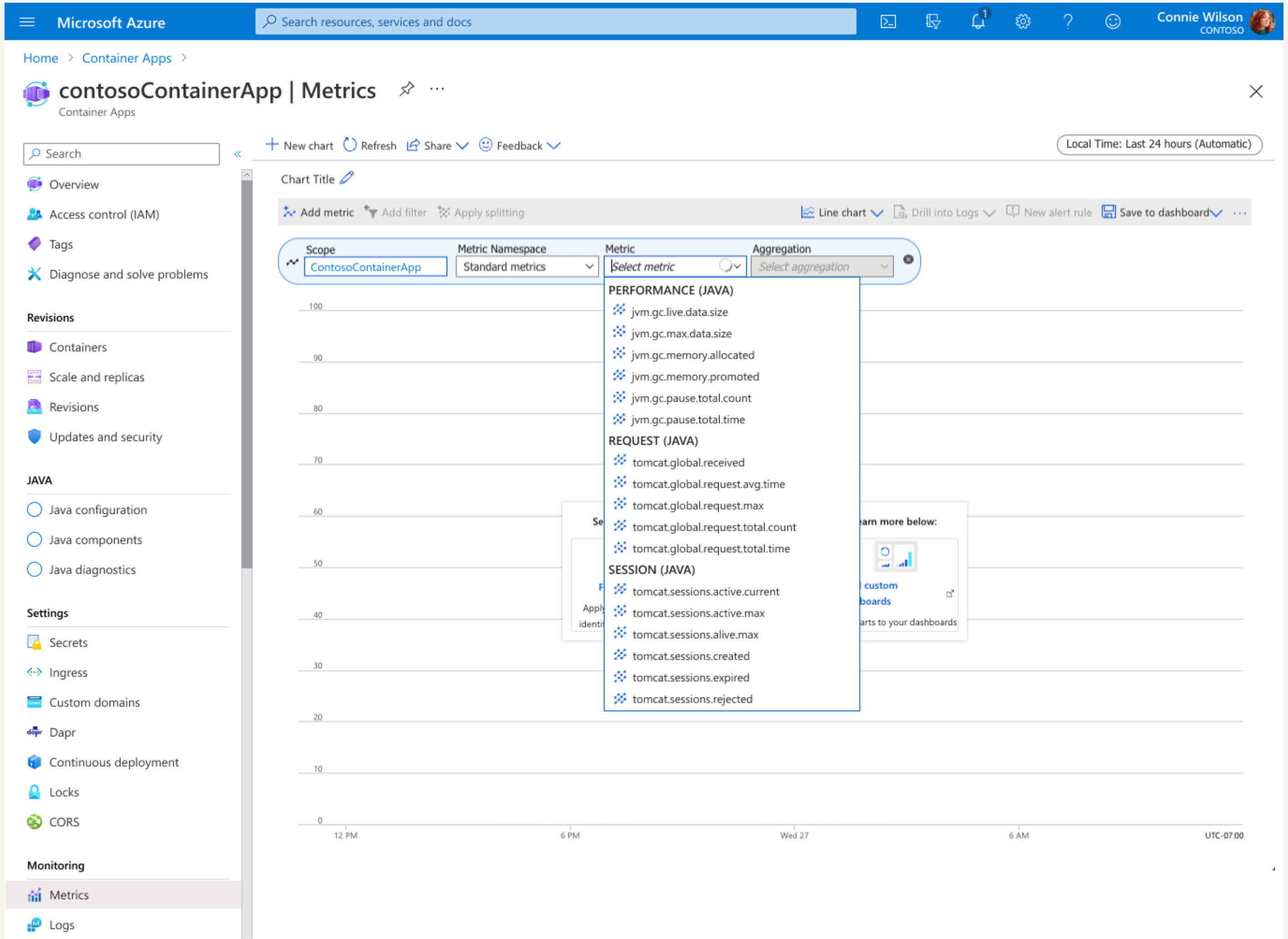
**Enhancing Logs and Metrics for Java Apps**

- JVM metrics (memory, GC…)
- Tomcat

**Integration with Azure Monitor**

- Azure Container Apps is natively integrated with Azure Monitor

# Monitor



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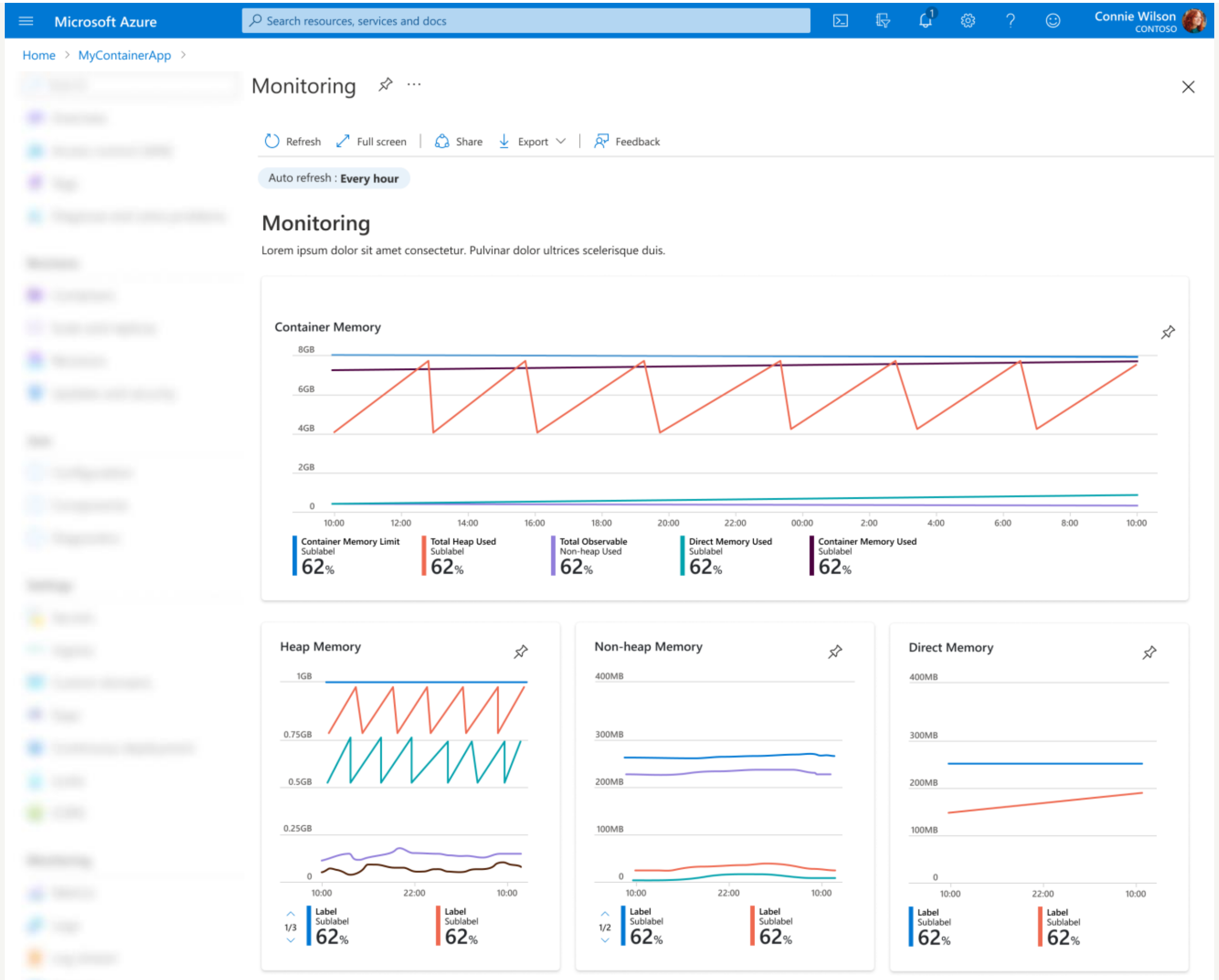
Container Apps
Search
Overview
Access control (IAM)
Tags
Diagnose and solve problems
Revisions
Containers
Scale and replicas
Revisions
Updates and security
JAVA
Java configuration
Java components
Java diagnostics
Settings
Secrets
Ingress
Custom domains
Dapr
Continuous deployment
Locks
CORS
Monitoring
Metrics
Logs
New chart
Refresh
Share
Feedback
Local Time: Last 24 hours (Automatic)
Chart Title
Add metric
Add filter
Apply splitting
Line chart
Drill into Logs
New alert rule
Save to dashboard
Scope
ContosoContainerApp
Metric Namespace
Standard metrics
Metric
Select metric
Aggregation
Select aggregation
PERFORMANCE (JAVA)
jvm.gc.live.data.size
jvm.gc.max.data.size
jvm.gc.memory.allocated
jvm.gc.memory.promoted
jvm.gc.pause.total.count
jvm.gc.pause.total.time
REQUEST (JAVA)
tomcat.global.received
tomcat.global.request.avg.time
tomcat.global.request.max
tomcat.global.request.total.count
tomcat.global.request.total.time
SESSION (JAVA)
tomcat.sessions.active.current
tomcat.sessions.active.max
tomcat.sessions.alive.max
tomcat.sessions.created
tomcat.sessions.expired
tomcat.sessions.rejected
100
90
80
70
60
50
40
30
20
10
0
12 PM
6 PM
Wed 27
6 AM
UTC-07:00

# Monitor



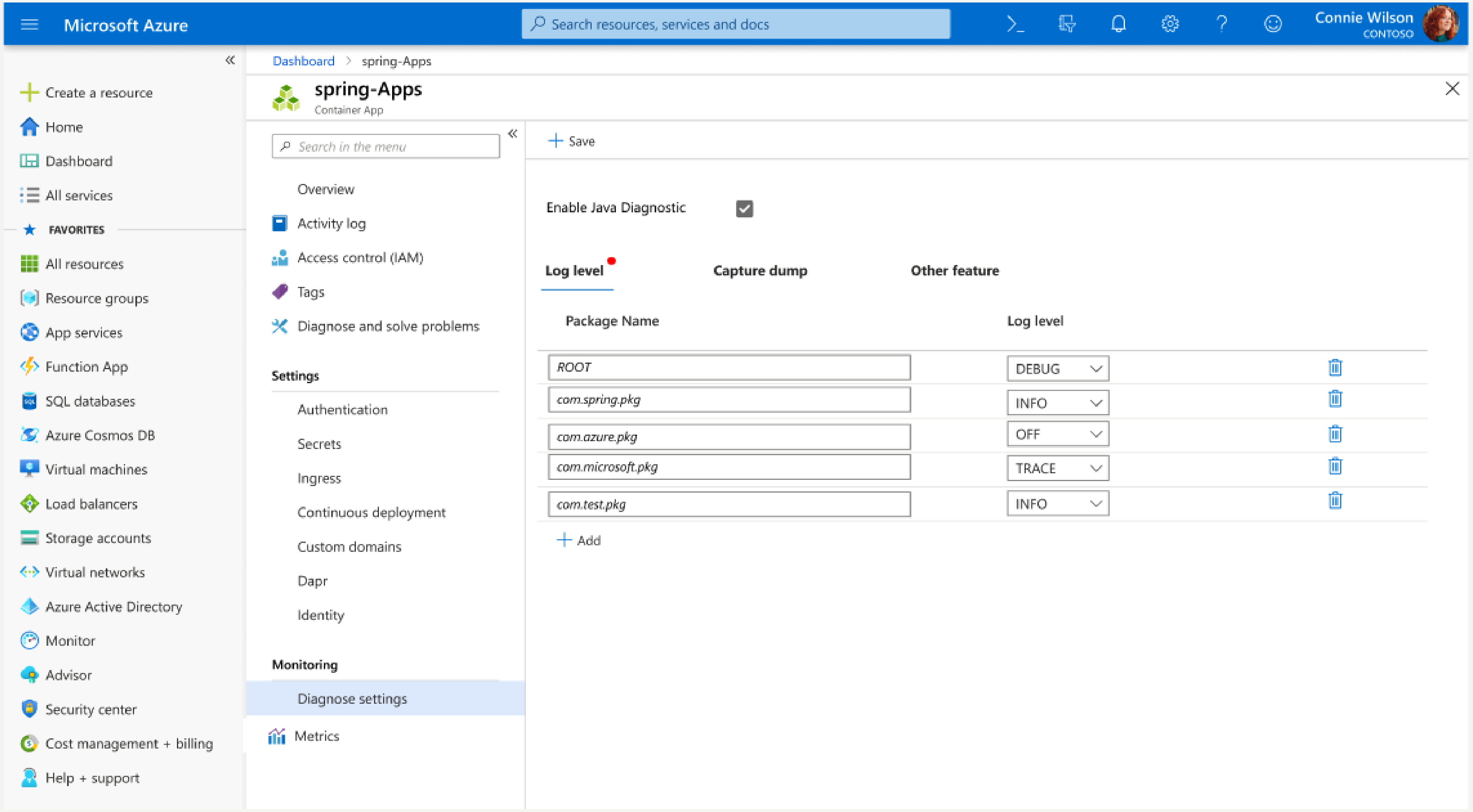
## Monitoring

Lorem ipsum dolor sit amet consectetur. Pulvinar dolor ultrices scelerisque duis.

# Diagnostics

- **Challenges in Mission Critical Java Applications:**
    - Availability and performance issues are common.
    - Diagnosing root causes consumes significant time.
    - Reproducing problems in production environments is challenging.
- **Impact on Business:**
    - Livesite issues that may impact business continuity
- **Key Error Areas:**
    - Memory issues
    - Null pointer exceptions
    - Deadlocks
    - …

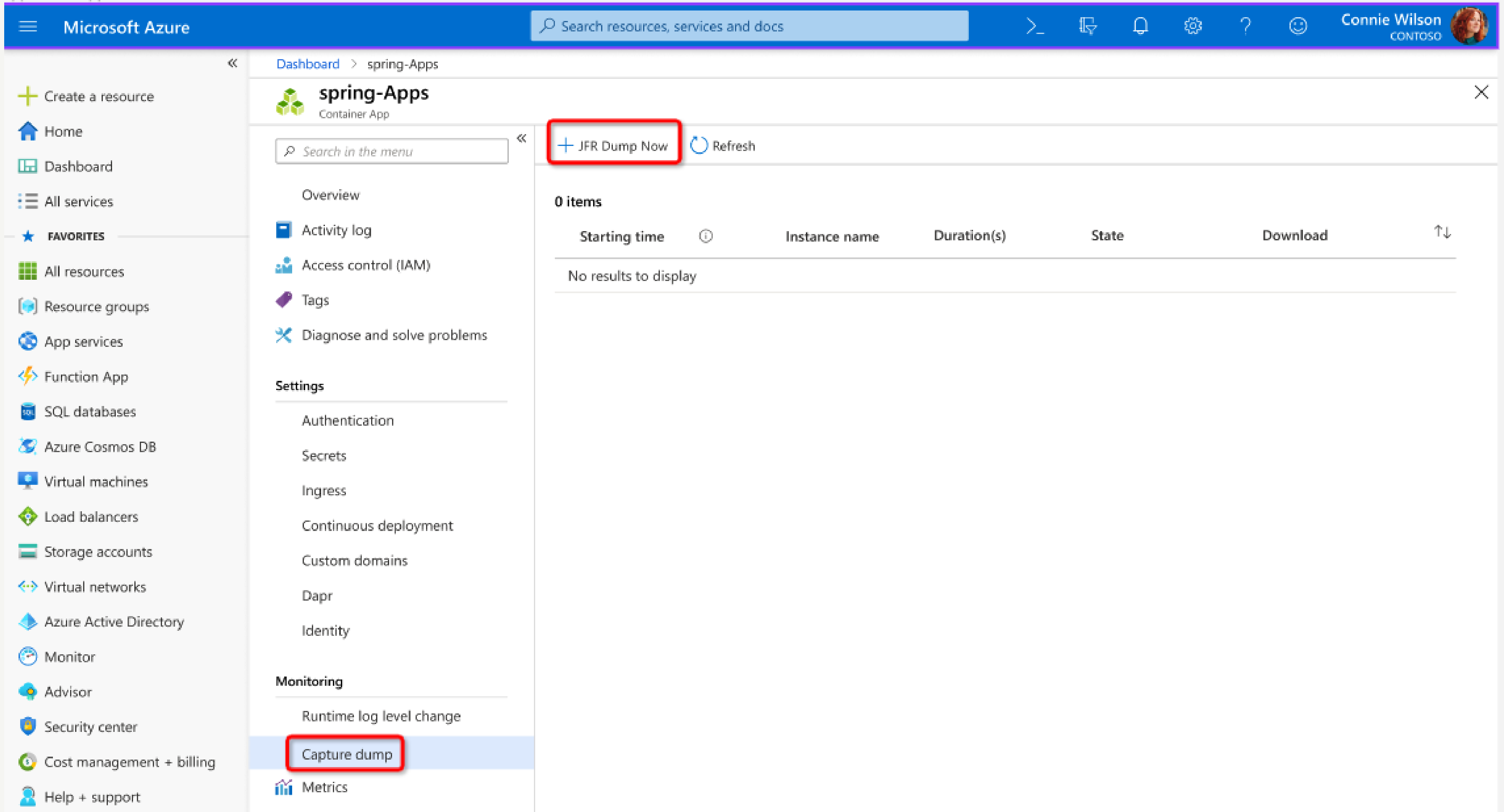
# Diagnostics



Enable Java Diagnostic ☑

| Package Name | Log level |
|---|---|
| ROOT | DEBUG |
| com.spring.pkg | INFO |
| com.azure.pkg | OFF |
| com.microsoft.pkg | TRACE |
| com.test.pkg | INFO |

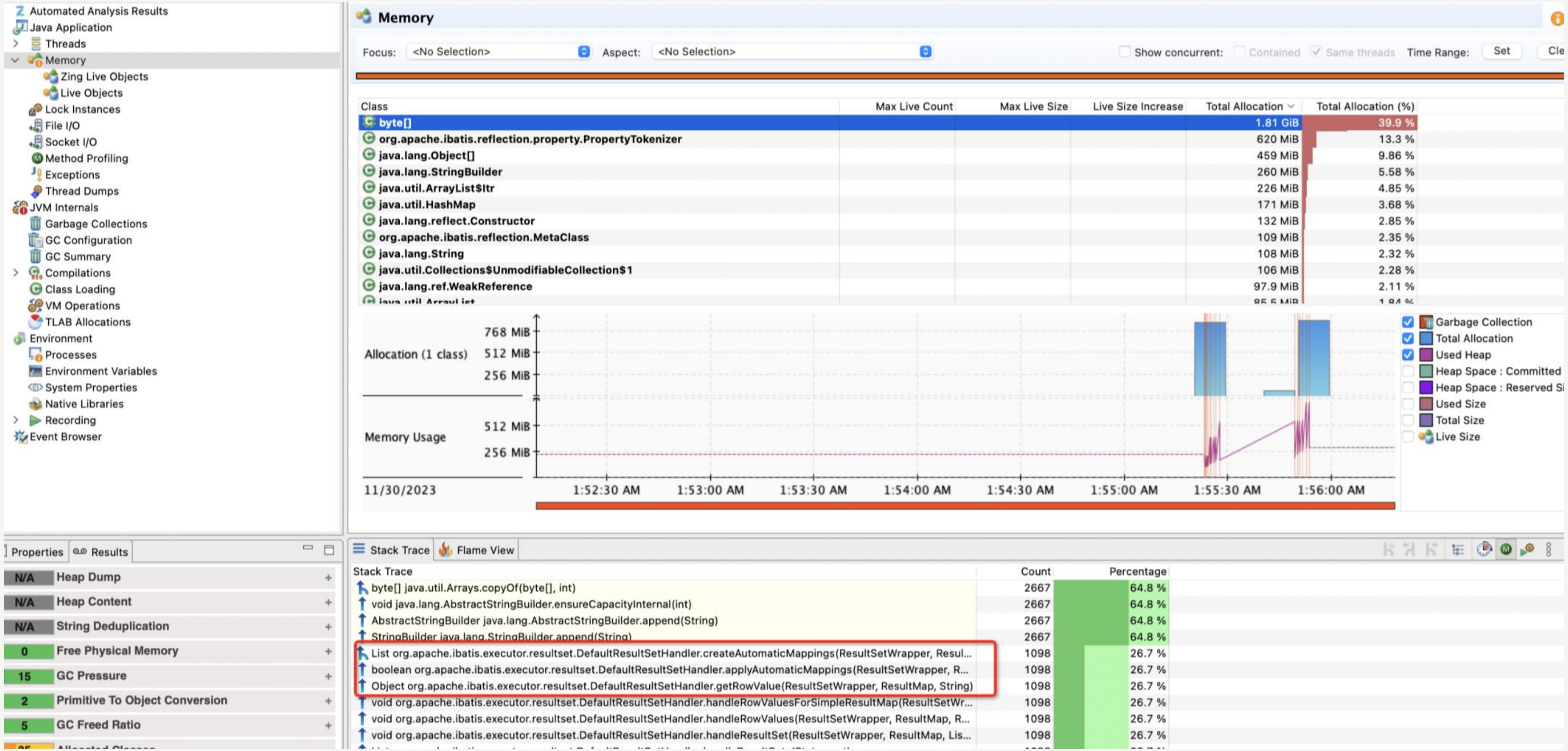
# Diagnostics



0 items

| Starting time | Instance name | Duration(s) | State | Download |
|---|---|---|---|---|
| No results to display | | | | |

# Analyze Java dump in Java Mission Control



- Automated Analysis Results
- Java Application
  - Threads
  - Memory
    - Zing Live Objects
    - Live Objects
  - Lock Instances
  - File I/O
  - Socket I/O
  - Method Profiling
  - Exceptions
  - Thread Dumps
- JVM Internals
  - Garbage Collections
  - GC Configuration
  - GC Summary
  - Compilations
  - Class Loading
  - VM Operations
  - TLAB Allocations
- Environment
  - Processes
  - Environment Variables
  - System Properties
  - Native Libraries
  - Recording
- Event Browser

Memory

Focus: <No Selection> Aspect: <No Selection> □ Show concurrent: □ Contained ☑ Same threads Time Range: Set Cle

| Class | Max Live Count | Max Live Size | Live Size Increase | Total Allocation | Total Allocation (%) |
|---|---|---|---|---|---|
| byte[] | | | | 1.81 GiB | 39.9 % |
| org.apache.ibatis.reflection.property.PropertyTokenizer | | | | 620 MiB | 13.3 % |
| java.lang.Object[] | | | | 459 MiB | 9.86 % |
| java.lang.StringBuilder | | | | 260 MiB | 5.58 % |
| java.util.ArrayList$Itr | | | | 226 MiB | 4.85 % |
| java.util.HashMap | | | | 171 MiB | 3.68 % |
| java.lang.reflect.Constructor | | | | 132 MiB | 2.85 % |
| org.apache.ibatis.reflection.MetaClass | | | | 109 MiB | 2.35 % |
| java.lang.String | | | | 108 MiB | 2.32 % |
| java.util.Collections$UnmodifiableCollection$1 | | | | 106 MiB | 2.28 % |
| java.lang.ref.WeakReference | | | | 97.9 MiB | 2.11 % |
| java.util.ArrayList | | | | 85.5 MiB | 1.84 % |

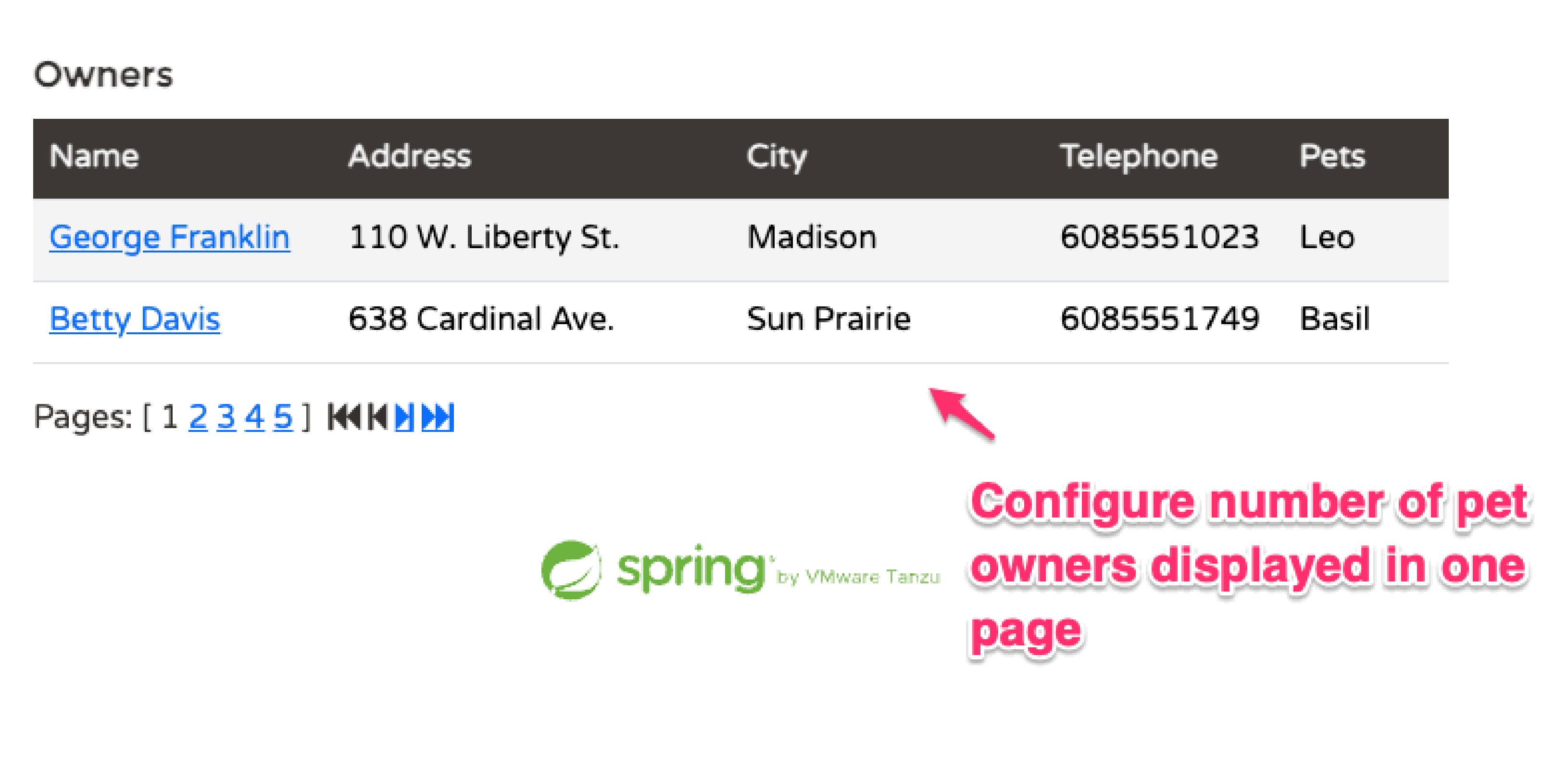
Properties | Results

| | |
|---|---|
| N/A | Heap Dump |
| N/A | Heap Content |
| N/A | String Deduplication |
| 0 | Free Physical Memory |
| 15 | GC Pressure |
| 2 | Primitive To Object Conversion |
| 5 | GC Freed Ratio |
| 25 | Allocated Classes |

Stack Trace | Flame View

| Stack Trace | Count | Percentage |
|---|---|---|
| byte[] java.util.Arrays.copyOf(byte[], int) | 2667 | 64.8 % |
| void java.lang.AbstractStringBuilder.ensureCapacityInternal(int) | 2667 | 64.8 % |
| AbstractStringBuilder java.lang.AbstractStringBuilder.append(String) | 2667 | 64.8 % |
| StringBuilder java.lang.StringBuilder.append(String) | 2667 | 64.8 % |
| List org.apache.ibatis.executor.resultset.DefaultResultSetHandler.createAutomaticMappings(ResultSetWrapper, Resul... | 1098 | 26.7 % |
| boolean org.apache.ibatis.executor.resultset.DefaultResultSetHandler.applyAutomaticMappings(ResultSetWrapper, R... | 1098 | 26.7 % |
| Object org.apache.ibatis.executor.resultset.DefaultResultSetHandler.getRowValue(ResultSetWrapper, ResultMap, String) | 1098 | 26.7 % |
| void org.apache.ibatis.executor.resultset.DefaultResultSetHandler.handleRowValuesForSimpleResultMap(ResultSetWr... | 1098 | 26.7 % |
| void org.apache.ibatis.executor.resultset.DefaultResultSetHandler.handleRowValues(ResultSetWrapper, ResultMap, R... | 1098 | 26.7 % |
| void org.apache.ibatis.executor.resultset.DefaultResultSetHandler.handleResultSet(ResultSetWrapper, ResultMap, Lis... | 1098 | 26.7 % |

# Demo



Owners

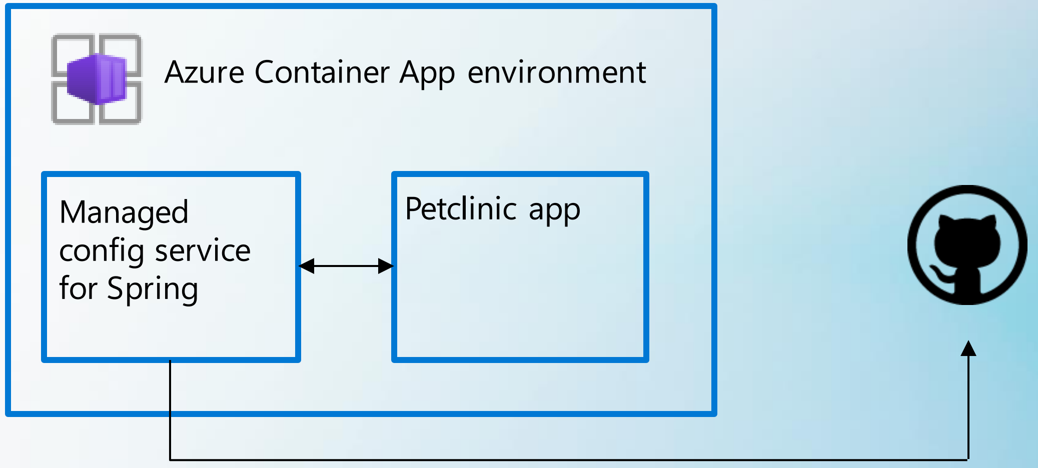
| Name | Address | City | Telephone | Pets |
|---|---|---|---|---|
| George Franklin | 110 W. Liberty St. | Madison | 6085551023 | Leo |
| Betty Davis | 638 Cardinal Ave. | Sun Prairie | 6085551749 | Basil |

Pages: [ 1 2 3 4 5 ] ⏮ ◀ ▶ ⏭

Configure number of pet owners displayed in one page

# Demo

1. Create an Azure Container App environment
2. Create a managed config service in the Azure Container App environment and connect it to Github
3. Create the Petclinic app
4. Bind the Petclinic app with managed config service


Azure Container App environment
Managed config service for Spring
Petclinic app

- Begin your journey and effortlessly deploy a Java artifact file to Azure Container Apps. (https://aka.ms/ACAJD1)

- We want your feedback! Participate in a survey and automatically enter to win **one of five $100 sweepstake prizes**.

# Thank you

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