IBM Business Automation Workflow on Containers
Technical Introduction

Technical Overview
Version 2.4.1

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Latest version: http://ibm.biz/workflowcontainers
Agenda

Introduction

Licensing and Support

BAW on Containers Runtime

BAW on Containers Development
Cloud Paks – Enterprise-ready containerized software

A faster, more secure way to move your core business applications to any cloud through enterprise-ready containerized software solutions

IBM containerized software
Packaged with Open Source components, pre-integrated with the common operational services, and secure by design

Container platform and operational services
Logging, monitoring, security, identity access management

Complete yet simple
Application, data and AI services that are modular, term licensed, and easy to consume

IBM certified
Full software stack support, and ongoing security, compliance and version compatibility

Run anywhere
On-premises, on private and public clouds, and in pre-integrated systems
Today, IBM offers clients the first six Cloud Paks...

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<th>Cloud Pak for Applications</th>
<th>Cloud Pak for Data</th>
<th>Cloud Pak for Integration</th>
<th>Cloud Pak for Automation</th>
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<td>Frameworks and Runtimes</td>
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</tbody>
</table>

- Cloud Pak for Applications:
  - Developer & DevOps Tools
  - Modernization Toolkit
  - Frameworks and Runtimes

- Cloud Pak for Data:
  - Container platform and operational services

- Cloud Pak for Integration:
  - Container platform and operational services

- Cloud Pak for Automation:
  - Container platform and operational services

- Cloud Pak for Multicloud Management:
  - Container platform and operational services

- Cloud Pak for Security:
  - Container platform and operational services

Cloud Pak for Security:
- Federated Search and Investigation
- Incident Response
- Security Orchestration and Automation

Cloud Pak for Integration:
- API Lifecycle
- Messaging and Events
- App and Data Integration

Cloud Pak for Automation:
- Content
- Operational Intelligence
- Workflow and Decisions

Cloud Pak for Multicloud Management:
- Multicluster
- App and Infrastructure
- Security and Compliance Management

Cloud Pak for Security:
- Federated Search and Investigation
- Incident Response
- Security Orchestration and Automation

IBM Cloud Systems
- Edge
- Private
- Systems

Cloud Paks – Pre-integrated for cloud use cases
Multiple ways to deploy the automation platform

- **On-Premises**
  - Individual Modules
  - License individual modules separately
  - Traditional on-prem install

- **Cloud Pak for Automation**
  - One license gives entitlement to both certified containers and traditional on-prem install
  - Fully supported on Red Hat OpenShift Container Platform
  - OpenShift Container Platform included
  - Move to containers at your own pace

- **Any Cloud**
  - Fully supported on Red Hat OpenShift Container Platform
  - OpenShift Container Platform included

- **SaaS**
  - Fully Managed Software-as-a Service
  - Runs on IBM Cloud
Three ways to run Cloud Pak for Automation

Embraces next-generation hybrid multicloud Cloud Pak platform

**Your own environment**
- Install and run on your own Red Hat OpenShift Container Platform

**Your own environment on Cloud Pak System**
- Cloud Pak System includes hardware preintegrated with VMware and IBM Cloud Pak for Automation
- (Includes licenses for Cloud Pak for Automation)

**OpenShift Managed Service on IBM Public Cloud**
- Fully managed OpenShift containers running on highly scalable and reliable IBM Cloud platform
- (Client provides licenses for Cloud Pak for Automation)
### CP4A components and deployment options

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<th>New</th>
<th>Traditional On-premises</th>
<th>Cloud Native Containerized</th>
<th>Deprecated</th>
<th>Traditional &amp; Containerized Versions</th>
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</thead>
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<td>Business Automation Content Analyzer</td>
<td>Enterprise Records</td>
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<td>Business Automation Studio</td>
<td>Business Automation Application Designer</td>
<td></td>
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</tr>
</tbody>
</table>

**Legend**
- New
- Traditional On-premises
- Cloud Native Containerized
- Deprecated
- Traditional & Containerized Versions
IT Value of Workflow Containers

Cloud Pak for Automation
- Unified platform experience
- Better component reuse
- New capabilities: Studio, App Builder, Workstream Services, etc.

Red Hat OpenShift
- Application Lifecycle Services based on Operators: Installation services, packaging, servicing and updates
- Common diagnostic services: Logging, monitoring, and metering

Kubernetes
- Commodity infrastructure skills
  - Standardized load balancing
  - More scalable: policy-based auto-scaling
  - Innate High Availability
  - Continuous Availability: no down-time for upgrades for minor updates
- Better application isolation: Faster and cheaper to create an additional application domain
- Improved application portability
- Topology Best Practice out-of-the-box (Operators)

Docker
- Standardized provisioning (installation) - Much faster environment creation
- Reduced support costs - Docker containers are provided by IBM and considered "read only" black boxes
- Simpler updates - Applying a cumulative fix or just an iFix is a new Docker image.
- More flexible architectures - A mix of different runtimes such as Jakarta (Liberty), JavaScript (Node.js), or even C/C++ (MQ).
- Faster delivery of product capabilities - a benefit of microservices

WebSphere Liberty
- Smaller package: 800 MB for Liberty container vs. multiple GB for traditional
- Faster start up time: 10s of seconds vs. several minutes
- Simpler configuration: 100s down to dozens of configuration parameters
All tiers are for all application domains
- Task federation (PFS)
- Single UI tier (Navigator)
- Common content services (CPE)
- Global Teams (UMS)
- Aggregated monitoring/KPIs (BAI)
- Federated BPM Portal
- All application tier federated by default (BAW)

Each tier is independently scalable using auto-scaling to optimize resources

Greatly reduces cost of application isolation – only need to have another application tier (BAW)
- Avoid resource contention

Simplify migration from BAW traditional
- Start new work on the container environment, finish existing work on traditional environment
Workflow for Multicloud Strategy

Business Automation Workflow

Developer
Case Builder
Web Process Designer
Integration Designer
Case
Process (BPMN)
Process (BPEL/SCA)

Developer
Case Builder
Web Process Designer
Integration Designer
Case
Process (BPMN)

IT Developer
CNCF (BAW) & OpenShift (CP4Auto)

Automation Workstream Services (CP4Auto)

Business Developer
Workplace

Process Portal & Case Client

WAS-ND (traditional) & VM (VMWare, AWS, Azure)

CNCF (BAW) & OpenShift (CP4Auto)
What is Workflow Server on Containers?

**Runtime Environment**
- Workflow Server
  - Packaged as Docker Containers
    - Most containers based on WebSphere Liberty
  - Deployed as Pods
    - Managed by K8S runtimes i.e. OpenShift
- Supported Solutions must be
  - Case Solutions
  - Process App
- Workflow Server management
  - Deploy
  - Configure
  - Console support

**Development Environment**
- Tools run on Traditional WAS not in Containers
- Process Designer
  - Helps to convert from to
  - Flags all the artifacts that need to be converted including toolkits
  - Once a target environment is selected provides authoring artifact that match the project type
- Workflow Center
  - Provides support for tagging Solutions
  - Enables to create install package for remote deploy to Workflow Server on Containers

BAW supports two Target Environments:
- "Traditional Only"
- "Traditional or Container"
Workflow Server on Containers – What’s supported?

- High Availability and Disaster Recovery
  - Load balancing, clustering, high-availability, and disaster recovery will rely on Kubernetes not on WAS ND

- Infrastructure ops, including admin APIs and tuning
  - Will not be able to rely on WAS ND features (wsadmin and WAS Admin Console)
  - The functionality and features will remain the same but relay on REST APIs and Kubernetes

- The following BAW capabilities are supported in the container environment:
  - Process apps, case solutions, and toolkits that are built with the web-based IBM Process Designer that do not use deprecated APIs or deprecated features. See Artifact support in traditional and container runtime environments.
  - Online and offline deployment from IBM Workflow Center
  - REST Operations APIs and REST Runtime APIs
  - IBM Business Automation Insights event emission
  - Process Admin Console (only UMS based users are supported)
  - Process Portal
  - Playback server in the Workflow Center
Workflow Server on Containers – What’s not supported?

Deprecated features are not supported

Processes
- See Deprecated and removed features of IBM Business Automation Workflow
- Only Web Process Designer artifacts are supported, Desktop Process Designer artifacts must be converted
- Exception: Heritage Human Services
  - Although are supported, heritage coaches that are included in heritage human services are not supported. See Artifact support in traditional and container runtime environments.
- LiveConnect API (deprecated)
  - To invoke Java from JavaScript in containers is a security concern

Advanced capabilities
- Applications created with Integration Designer: BPEL processes, Mediation flows, SCA applications
- Advanced Integration Services

Monitoring capabilities
- Performance Data Warehouse
- Monitor models for IBM Business Monitor in process apps and toolkits

WAS ND dependent capabilities are not supported (due to architectural differences in Liberty)

Capabilities not currently available in v20.0.0.1

Dashboards that do not support Federated API

Monitoring capabilities
- Dynamic Event Framework (DEF) XML event emission

Web Services Policy Sets
- Depends on Liberty support Playback in the container runtime environment

Integrations based on the integration.jar:
- SQL integrations, IBM MQ and JMS integrations, XML validation and transformation

Cases
- Case forms
Agenda

Introduction

Licensing and Support

BAW on Containers Runtime

BAW on Containers Development
Licensing/Entitlement

Licensing

BAW on containers are licensed per VPC (charge for **engine containers only**: BAW/CPE)

Entitlement

All **BAW** customers and **CP4Auto** customers with current entitlements have access to the containers on June 26, 2020
- BAW 20.0.0.1
- IBM Cloud Pak for Automation 20.0.2
  - Since BAW itself is part of the CP4A bundle, BAW containers will also be available for all CP4A customers with current entitlements.
BAI is packaged as a supporting program

- BAW 20.0.0.1 includes BAI (officially CP4A, but only the BAI capability) as a supporting program with the following restrictions:
  - The license will limit its usage to only collecting events from BAW (Case, BPMN, and BPEL) and it will be capped at a specific number of VPCs for the Flink job.
    - The number of VPCs is 6.
  - So if a customer wants to collect events from other sources than BAW, they would need to trade up to CP4A.
    - If they exceed their capacity for event processing they would need to trade up.

- This includes the BAI Single Server and BAI Containers/K8s with the following supported scenarios:
  1. BAI Container/K8s and BAW traditional - this we've supported since BAW 18.0.0.1
  2. BAI Single Server and BAW traditional - expected usage and supported
  3. BAI Container/K8s and BAW on containers - expected usage and supported
  4. BAI Single Server and BAW on containers - non standard configuration and not supported.

- Learn more about IBM BAI
Supported Environments and Support Policy

Support Policy
- Based on the IBM continuous delivery support model: https://www.ibm.com/support/pages/ibm-software-support-continuous-delivery-lifecycle-policy

Supported Environments
- BAW Offering supports Red Hat OpenShift and certified Kubernetes (CNCF)
- CP4Auto Offering only supports Red Hat OpenShift and includes OpenShift licenses.

BAW V20. Announcement Letter
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**Legend**

- Open Shift Only
- Open Shift and CNCF
BAW on Containers Runtime

Kubernetes Introduction

Docker Images and Pods

Server Management and Administration

Install

Process Federation Server

Process Portal
WebSphere Cell versus Kubernetes Cluster

**WebSphere Cell**
- admin
- Dmgr
- Node 1
- Node 2
- IBM HTTP Server

**Kubernetes Cluster**
- admin
- Master node
- Worker Node 1
- Worker Node 2
- Infra Node

Exposes master node
WebSphere Cell versus Kubernetes Cluster

**WebSphere Cell**
- Datasource
- JNDI props
- Connection factory
- HTTP transport
- KeyStore
- Auth alias
- .ear application

**Kubernetes Cluster**
- Persistent volume
- Config map
- Ingress
- Role
- Role Binding
- Secret
- Pod

**Diagram**
- Ear File
  - EJB
  - Jar File
- RAR File
  - Resource Adapter
- WAR File
  - JSP
  - Servlet
- Pod replicated across all Nodes
- Pod replicated across 2 Nodes
- Pod singleton (i.e. resource registry)
Operators

- Workflow Server on Container installation, config changes and upgrade is based on **Operators**
- An Operator is a method of **packaging, deploying and managing** a Kubernetes-native application
  - Based on **Ansible** to support full pod lifecycle (from install to scaling)
- Operator is running in a Pod on the cluster
  - Interacts with the Kubernetes API server.
  - Introduces new object types through **Custom Resource (CR)**
    - Watches CRs and is notified about their presence or modification.
    - Ensures the Pods defined in CRs are actually available and configured in the way the user expressed in the object’s specification
- More about operators:
  - [https://www.openshift.com/learn/topics/operators](https://www.openshift.com/learn/topics/operators)
BAW on Containers Runtime

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BAW on Containers (Pods) – Runtime (Workflow Server)

- BAW on Container means:
  - **Workflow Server on Containers only**
- BAI requires Pods not built by IBM
  - ELK and Kafka
  - If ELK is not supplied, then PFS and BAI both use their own Elasticsearch installed by the operator (BAI & PFS installs its own Elasticsearch)
- Db2 and LDAP
  - Is supplied in the “demo” install package as Docker Containers
  - Enterprise install enables to connect to exiting Db2 and LDAP instances

---

Test / UAT/ Production Workflow Server

- Workflow Server
  - Liberty
- Workflow Messaging (JMS)
- User Management
- Business Automation Insights (BAI)
- Process Federation
  - ELK 1 with Elasticsearch
  - ELK 2 with Elasticsearch
- Kafka
- CMIS
- Content Platform Engine
  - CPE
  - Liberty
- Resource Registry (etcd)
  - Not required for minimum configuration

OpenShift (CP4Auto) & CNCF (BAW)

- BAW DB: used by BAW, UMS, Navigator
- LDAP: used by CMIS, Navigator, CPE, UMS
What’s in the Workflow Server Pods?

- CMIS
- Liberty
- Process Federation
- LDAP
- Elasticsearch
- Workflow Messaging
- Process Federation
- User Management
- Process Admin
- Process API
- Process Runtime
- Case Admin
- Case API
- Case BAI Emitter
- Case Runtime
- Liberty
- Resource Registry
- JMS
- Liberty
- Workflow Server
- BAI Emitter
- Case Client
- Case Admin
- Case API
- Case BAI Emitter
- Case Runtime
- Liberty
- Process Runtime
- Process Admin
- Process API
- Process Runtime
- Liberty
- DBA Navigator
- CPE tables
- BPMD
- ProcServer
- Messaging ME tables
- LDAP
- Elasticsearch
Workflow Server Pods - Key Component Dependencies

- **Workflow Server** uses the **External Navigator**.
- **Workflow Server** does not use the embedded Navigator and **CPE**.
- **Workflow Server** loads plugins.
- **Workflow Server** deploys **Case Solution Artefacts**.
- **Workflow Server** does not use embedded libraries.
- **External Content Platform Engine (CPE)** used by **Workflow Server**.
- **Object Store** dedicated to process instance document attachments is now configured in **external CPE**.
BAW on Containers Runtime

Kubernetes Introduction

Docker Images and Pods

Server Management and Administration

Install

Process Federation Server

Process Portal
BAW on Containers – Runtime – BAW Admin

- On-prem customers moving to containers are accustomed to on-prem admin experience
- Container based BAW supports:
  1. Process Admin Console for Workflow Server process administration
  2. ACCE for content administration
  3. Case Manager Admin Client for Cases administration
  4. PFS Admin REST API and ES Head

OpenShift (CP4Auto) & CNCF (BAW)
BAW on Containers does not support VMM. Users and Groups are managed using UMS Team UI.

Users are sourced from an external LDAP federated via UMS Team Server.

BAW on Containers – Runtime – Admin - Workflow

BAW on Containers

BAW Traditional

Not available in BAW on Containers
Object Store dedicated to process instance document attachments is now configured in external CPE.

BAW ECM Server definition for the former BPM Document Store now directly points to this CPE.
BAW on Containers – Runtime – Server Management

- On prem customers to perform WAS admin tasks and BAW configuration tasks used
  - `wsadmin` commands
  - WAS Admin Console
- In Docker version there is no WAS Admin Console or WAS `wsadmin` commands
- In Workflow Server on Containers most of the configuration tasks are available as REST API
  - More recently added ops “commands” have been introduced as REST Ops APIs only with no `wsadmin` equivalents
REST Operations API were expanded

- REST API version of most of the wsadmin commands is already available in Workflow Server on tWAS
- New REST API were added to ensure all admin functions provided by wsadmin commands are available
- See
### Exposed Process Value

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<tr>
<th>Method</th>
<th>URL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/std/bpm/containers/(container)/versions/(version)/epvs</td>
<td>Retrieve a list of exposed process values (EPVs) for a specific snapshot.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/versions/(version)/epvs</td>
<td>Set the value of an exposed process value variable for a specific snapshot.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/versions/(version)/epvs/sync</td>
<td>Copy the exposed process values (EPVs) from between two snapshots.</td>
</tr>
<tr>
<td>DELETE</td>
<td>/std/bpm/containers/(container)/versions/(version)/epvs/history</td>
<td>Delete exposed process values (EPVs) that are no longer required.</td>
</tr>
</tbody>
</table>

### Process

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</tr>
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<tr>
<td>GET</td>
<td>/std/bpm/processes/count</td>
<td>Retrieve a count of process instances.</td>
</tr>
<tr>
<td>DELETE</td>
<td>/std/bpm/processes</td>
<td>Delete specified process instances.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/processes/resume</td>
<td>Resume suspended process instances.</td>
</tr>
</tbody>
</table>

### Branch

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<tr>
<th>Method</th>
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</tr>
</thead>
<tbody>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/branches/(branch)/env_vars</td>
<td>Sets the value of environment variables for the tip snapshot of a specified track.</td>
</tr>
<tr>
<td>GET</td>
<td>/std/bpm/containers/(container)/branches</td>
<td>Retrieve a list of all tracks for a process application or toolkit.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/branches</td>
<td>Create new track in process application or toolkit.</td>
</tr>
<tr>
<td>GET</td>
<td>/std/bpm/containers/(container)/branches/(branch)/count</td>
<td>Retrieves the count of all the tracks of a process application or toolkit.</td>
</tr>
<tr>
<td>GET</td>
<td>/std/bpm/containers/(container)/branches/(branch)</td>
<td>Retrieve track details.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/branches/(branch)/update_target_environment</td>
<td>Update the target environment of the project.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/branches/(branch)/update_dependency</td>
<td>Update a toolkit dependency.</td>
</tr>
<tr>
<td>POST</td>
<td>/std/bpm/containers/(container)/branches/(branch)/update_file</td>
<td>Update the contents of an external file on the specified track.</td>
</tr>
</tbody>
</table>
## Example: Container

<table>
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<tr>
<th>Method</th>
<th>Endpoint</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td><code>/std/bpm/containers</code></td>
<td>Retrieve a list of all process applications and toolkits.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers</code></td>
<td>Creates a process application or toolkit.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/migrate</code></td>
<td>Migrates instances from one snapshot to another snapshot.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/check_orphans</code></td>
<td>Detects the possibility of orphaned tokens by comparing one snapshot with another.</td>
</tr>
<tr>
<td>GET</td>
<td><code>/std/bpm/containers/count</code></td>
<td>Retrieve a count of process applications and toolkits.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/migration_policy</code></td>
<td>Extract the information used to migrate instances from other snapshots to the newly installed snapshot.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/install</code></td>
<td>Install an application on Workflow Server or Workflow Center.</td>
</tr>
<tr>
<td>DELETE</td>
<td><code>/std/bpm/containers/{container}</code></td>
<td>Delete a process application or toolkit.</td>
</tr>
<tr>
<td>GET</td>
<td><code>/std/bpm/containers/{container}</code></td>
<td>Retrieve process application or toolkit details.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/{container}/archive</code></td>
<td>Archive a deactivated process application or toolkit.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/{container}/restore</code></td>
<td>Restore a process application or toolkit that was previously archived.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/{container}/update_file</code></td>
<td>Update the contents of an external file on the default track.</td>
</tr>
<tr>
<td>GET</td>
<td><code>/std/bpm/containers/orphaned</code></td>
<td>Retrieve a list of orphaned toolkit snapshots.</td>
</tr>
<tr>
<td>GET</td>
<td><code>/std/bpm/containers/{container}/orphaned</code></td>
<td>Retrieve a list of orphaned toolkit snapshots.</td>
</tr>
<tr>
<td>POST</td>
<td><code>/std/bpm/containers/{container}/regenerate_theme</code></td>
<td>Regenerate the runtime theme CSS for a process app, case solution, or toolkit snapshot.</td>
</tr>
</tbody>
</table>
BAW on Containers – Runtime – App Configuration

- On prem customers used
  - WAS Admin console
    - i.e. Next Task mashup config
  - 100custom.xml
    - i.e. Transaction timeouts
- In Docker version there is no WAS Admin Console
- In Docker version 100custom.xml files are in PVs
- To accomplish both tasks in Docker version we recommend using Custom Resource

OpenShift (CP4Auto) & CNCF (BAW)
Using Custom Resources

1. Create a Secret
   - `lombardi-custom-secret`

2. Edit Secret to add required configurations

3. Add secret to Custom Resource

   - Overview

   ```
   <xml version="1.0" encoding="UTF-8" >
   <properties>
     <server merge="mergeChildren">
       <coach-generation-config merge="mergeChildren">
         <is-debug merge="replace">true</is-debug>
       </coach-generation-config>
     </server>
   </properties>
   ```

   - YAML

   ```
   encryption_key_secret: icp4a-shared-key-secret
   image_pull_secrets:
     - icp4a-operator-image-pull-secret-1
     - icp4a-operator-image-pull-secret-2
     - icp4a-operator-image-pull-secret-3
     - icp4a-operator-image-pull-secret-4
   ```
Create and Edit Secret

Use the same XML settings as documented in 100custom.xml. This setting enables CSHS coach debug in a web browser.
Add Secret to CR

1. Secret content gets saved to 199Custom.xml
2. Pods are incrementally restarted to get reconfigures with the new config data. Restart is staged so that at least one Pod is always up to ensure HA.
In BAW on WAS, to configure BAW runtime, we often updated 100custom.xml file directly.
In BAW on Containers this can be done using CRs and Secrets.

What is the commanded method and why?

Always use CRs and Secrets!
Here are the key advantages:
- CR and Secrets once configured can be saved and reused to configure other clusters.
- Secrets are a form or record that shows what configurations were performed.
- When restarting containers the state of PV is unpredictable in fact some setting may be lost.
- During a lifecycle of pods, when the are destroyed and recreated the Operator will start applying the configuration from CR and Secret.
BAW on Containers Runtime

Kubernetes Introduction

Docker Images and Pods

Server Management and Administration

Install

Process Federation Server

Process Portal
Install Options

- Select install method
  - **Enterprise**
    - Fully configurable and upgradable
  - **Evaluation (a.k.a. “Demo” Pattern)**
    - Simple install steps
      - Because there are no configuration option installer takes care of dependencies and prerequisites
      - The only preparation step is to secure storage class
    - Restrictions
      - Cannot be updated
      - Cannot be upgraded to Enterprise deployment

- Select what to install option for CP4A
  - Business Automation Workflow and Workstream Services
  - Business Automation Workflow
  - **Workstream Services**

- Select what to install option for BAW on Containers
  - Business Automation Workflow
BAW on Containers System Prerequisites

- System
  - Kubernetes 1.16 with Kubernetes command line interface
  - OpenShift 3.11+ with OpenShift Container Platform CLI
  - Full spec
- Dynamic storage created and ready
  - Configured NFS server and client for the OCP nodes
- A non-administrator user that can be used to run the deployment script
- H/W requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>CPU</th>
<th>Memory</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM BAW Server on Containers</td>
<td>1 master node with 4 CPUs</td>
<td>16G on the master and infrastructure nodes</td>
<td>231 GB</td>
</tr>
<tr>
<td></td>
<td>1 infrastructure node with 4 CPUs</td>
<td>24G on the worker nodes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 worker nodes with 6 CPUs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM BAW Server on Containers with IBM Business Automation Insights</td>
<td>1 master node with 4 CPUs</td>
<td>16 Gi on the master and infrastructure nodes</td>
<td>761 GB</td>
</tr>
<tr>
<td></td>
<td>1 infrastructure node with 4 CPUs</td>
<td>24 Gi on the worker nodes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 worker nodes with 10 CPUs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Evaluation Installation Steps

- **Prepare storage**
  - To run stateful applications, developers need to store the persistent data in a managed storage that is backed by some physical storage.

- **Run cp4a-clusteradmin-setup.sh**
  - Sets up security for selected cluster user and returns host name and storage class to be used in the next script

- **Download install images**
  - From PPA or IBM Entitled Registry to local Docker registry

- **Run cp4a-deployment.sh**
  - User is prompted for: storage class, host name of the infrastructure node, docker registry url
  - Uses customized ibm_baw_cr.yaml (resource file) to deploy and configure Workflow Server on Container pods

- **Get BAW console urls and credentials**
  - `oc get route`
  - `oc get secret`
BAW on Containers – How many Pods?

### Minimum configuration
- 8 pods
  - See next chart!
  - Db2 and LDAP are external
  - No PFS (not supported)
  - Simply remove this sections

### Maximum configuration
- 49 pods
  - Workflow Server Pods
  - PFS
  - BAI
  - Db2
  - LDAP
  - Additional unrelated pods
  - Workplace
  - Workstreams (runs on BAW pods)
  - App Engine (no App Designer)
Minimum Configuration

<table>
<thead>
<tr>
<th>Name</th>
<th>Node</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ibm-cp4a-operator-6bd96694bc-vz6q5</td>
<td>worker0.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-cpe-deploy-645f75d-qsqx4</td>
<td>worker1.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-dba-rr-7e3f519150</td>
<td>worker1.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-instance1-workflow-server-0</td>
<td>worker1.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-navigator-deploy-78f9b8b9c7-dfthnl</td>
<td>worker1.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-ums-deployment-8459bf5c45-cszxk</td>
<td>worker1.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-cmis-deploy-7648bcb94b-hvmnx</td>
<td>worker2.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
<tr>
<td>demo-instance1-workflow-server-jms-0</td>
<td>worker2.chafes.os.fyre.ibm.com</td>
<td>Running</td>
</tr>
</tbody>
</table>

Above docker containers have 1:1 correspondence with Pods
OS Resource Monitoring – Workflow Server Pod
BAW on Containers Runtime

Kubernetes Introduction

Docker Images and Pods

Server Management and Administration

Install

Process Federation Server

Process Portal
Process Federation Server on Containers

- Process Federation Server enables task workers to access all their work from a single Workflow Portal.
- Tasks that can be federated:
  - BPMN tasks and instances of BAW on premises version 18.0.0.1 and later, and BAW Container systems
  - Workstream tasks of IAWS (under the cover, those are BPMN tasks)
- It will be non-optional component in BAW on Containers:
  - Easier to configure and manage than on prem
Process Federation Server Architecture

Configuration

- BAW Server register itself to DBA registry
- PFS discovers BAW Server from DBA registry
- One of BAW system is chosen to host Federated Portal
- PFS returns tasks and process instances to Federate Portal

Runtime Operations

- BAW Server Event Listener dates BPMDB Change Log
- Indexer queries Change Log
- Indexer updates Elastic Search indices
BAW on Containers Runtime

Kubernetes Introduction

Docker Images and Pods

Server Management and Administration

Install

Process Federation Server

Process Portal
Process Portal in Workflow Server Container

Workflow Server on Containers

Workflow Server - Traditional

Other features not available in Process Portal on Containers:

- Audit History
- Process Diagram
What is Next Task Dashboard?

**NEXT TASK** Dashboard can be configured to replace the default **WORK** Dashboard.

In configuration it is possible to specify what team can see **WORK** versus **NEXT TASK** dashboard in the IBM Process Portal.

**Task Worker** can only see one task at a time.
Agenda

Introduction
Licensing and Support
BAW on Containers Runtime

BAW on Containers Development
BAW on Containers Development

Playback and Deployment

Target Environment

Examples of Unsupported Features

Migrating Solutions to BAW on Containers – Process

Migrating Solutions to BAW on Containers - Case
BAW on Containers – Playback

**Authoring Environment**
- Workflow Center
- WebSphere
- Web Designer
- Case Builder
- Workflow Server
- BAW DBs

**Workflow Server on Containers**
- Workflow Server
- User Management
- Workflow Messaging (JMS)
- DBA Navigator
- Content Platform Engine (CPE)
- CMIS
- Process Federation
- Elasticsearch
- Resource Registry (etcd)
- BAW DBs
- LDAP

VM or On Prem

Playback and Debug for “Traditional and Container” projects. Not available in 20.0.0.1 release. Targeted for a future release.

Playback and Debug for “Traditional” and “Traditional or Container” projects.

“Traditional Only” projects

“Traditional or Container” projects

OpenShift (CP4Auto) & CNCF (BAW)
Playback for “Traditional and Container” Processes

“Traditional and Container” projects will not run on “playback” Workflow Center Server if conversion errors exist.
BAW on Containers – Deployment

**Authoring Environment**

- Workflow Center
  - Workflow Center
  - Web Designer
  - Case Builder
  - Workflow Server

- BAW DBs

- VM or On Prem

**Workflow Server on Containers**

- Workflow Server
  - Liberty
- User Management
- Workflow Messaging (UMS)
- DBA Navigator
- Content Platform Engine (CPE)
- CMIS
- Process Federation

- Elasticsearch
- Resource Registry (etcd)

- OpenShift (CP4Auto) & CNCF (BAW)

**Deployment Options**

- **Online Deploy** for “Traditional and Container” projects
- **Offline Deploy** for “Traditional Only” projects and “Container” projects. Provides updated REST API.

“Traditional Only” projects
“Traditional or Container” projects
Deploying on Workflow Server on Containers

Off Line Deploy

Hands-on lab

Starting BAW on Containers Tech Preview Environment (Paul Pocholski).pdf
Create an Online Workflow Server on Containers

Online Deploy

When creating Workflow Server select **Container**

By default the “Connection status” shows **Offline**. See next chart for configuration details.
Configuration to enable online deploy

1) A tls secret needs to be created within the operator code using the rootCA cert of the WC so that it can be recognized as a trusted server.
Steps are:
* kubectl create secret generic baw-tls-secret --from-file=tls.crt=/root/WC.cert
* add this secret in the trust list of baw_configuration.tls.tls_trust_list of workflow deployed CR file like below:
  ```yaml
baw_configuration:
  - name: instance1
    tls:
      tls_trust_list: [baw-tls-secret]
  ```
You can get the WC.cert by pasting the first cert you see when you execute - $keytool -printcert -sslserver example.fyre.ibm.com:9443 –rfc

2) A WC credentials secret needs to created in "adminSecrets4operator-ctnrs.yaml". Something along the lines of:
```yaml
apiVersion: v1
kind: Secret
metadata:
  name: ibm-baw-wc-secret
type: Opaque
stringData:
  username: deadmin
  password: deadmin
```
with the stringData having the "username" and "password" of the WC. Then apply this secret $oc apply -f ./baw_ctnrs/adminSecrets4operator-ctnrs.yaml

3) You should see new config parameters in your BAW Custom Resource for the WC. An example of the values are:
```yaml
workflow_center:
  url: "https://example.fyre.ibm.com:9443/ProcessCenter"
  secret_name: "ibm-baw-wc-secret"
  heartbeat_interval: 30
```
You might need to redeploy or get the updated CR recognized at this point. After the above three steps completed the BAW on Container should show up in the WC. You can check the servers page of the WC to test see if it shows up.

4) Use Workflow Center WebSphere Admin Console to add Workflow Server on Conatiner certificate.
Go to Security > SSL certificate and key management > Key stores and certificates > CellDefaultTrustStore > Signer certificates > Retrieve from port. Enter the BAW PS router hostname and port and save.
Enable Online Workflow on Container Server

Online Deploy

Once communication is established (Workflow Center Server detects a heartbeat) the Connection status will change to Online.

See the instructions below in Speaker Notes to enable communications between Workflow Center on Workflow Server on Containers.
Deploy to Online Workflow on Container Server

Online Deploy

Once communication is established (Workflow Center Server detects a heart beat) the Connection status will change to Online.
BAW on Containers Development

Playback and Deployment

Target Environment

Examples of Unsupported Features

Migrating Solutions to BAW on Containers – Process

Migrating Solutions to BAW on Containers - Case
Target Environment – New Authoring Option

New capability to **specify the target runtime** environment for Process Apps and Case Solutions. **Triggers project features validation** to ensure that they are supported in the selected environment.

- **Traditional**
  
  Projects are targeted to the Workflow Server in the traditional WebSphere environment.
  
  The project features are automatically validated to ensure that they are supported in this environment.

- **Traditional or Container**
  
  Projects are targeted to the Workflow Server in either the traditional WebSphere environment or the container environment.
  
  The project features are automatically validated to ensure that they are supported in both environments.
Why do we need Target Environment?

1. To ensure only those artifacts are shown/offered that are supported in the target environment
   - i.e. emitting events to IBM Business Monitor is not supported on Containers

2. Enable conversion of artefacts that are supported only in Traditional environment to artifacts supported in Traditional and Container environment
   - i.e. AIS Services must be removed and converted to use supported bindings such as Web Services
Target Environment in Process Designer

Target Environment Conversion

Available in Process App Settings > Overview Tab
Target Environment – in Process Designer

- Unsupported / removed features shown in Target Environment Conversion Tab
- Action will need to be taken to perform conversions and deletions
  1. BPD, UI, Service conversion
     - This happens if the a ProcessApp or Toolkit was originally authored in desktop PD
  2. Automatic conversion
  3. Artefact deletions
  4. Manual conversions
  5. Toolkits that require conversions
- Conversion issues are also listed in Validation Errors and Warnings View
- System Data Toolkit conversion to Traditional and Container (_TC version)
Target Environment in Workflow Center

New Target Option in Workflow Center

New feature to set Target Environment when creating a new Process App or a Case Solution
Tiles are marked with icons to indicate the target environment.

Snapshots are labelled to clarify to what server type a snapshot should be deployed to.
Target Environment in Workflow Center
Validation Errors

The V1.3 snapshot of the Simple ECM Approval Workflows project can’t be installed.

- The Heritage Coach CSS template is not supported in the target environment. Remove the reference to this CSS template.
- The Heritage Coach XSL template is not supported in the target environment. Remove the reference to this XSL template.
- This project can’t be installed onto a Workflow Server because the ‘NVUserTK(v8.6.0.2)’ toolkit refers to a ‘Traditional’ target environment and the ‘Traditional’ target environment isn’t compatible with this project’s ‘Traditional or Container’ target environment. Change the target environments to be compatible.

New type of validation errors that prevent snapshot to be installed on selected Target Server.

Oonly Install actions is removed
BAW on Containers Development

Playback and Deployment

Target Environment

Examples of Unsupported Features

Migrating Solutions to BAW on Containers - Process

Migrating Solutions to BAW on Containers - Case
System Data Toolkit Conversion

System Data (8.6.0.0)
Includes unsupported Services:
SQL, JMS, MQ integrations and XML validation and transformation

System Data (8.6.0.0_TC)
Unsupported Services are removed
System Data Toolkit Conversion

**System Data (8.6.0.0)**
Includes Integration.jar used to create Java Service from Server File, which includes JMS/SQL/XML integration Java classes

**System Data (8.6.0.0_TC)**
JMS/SQL/XML integration Java classes not available
Outbound Web Services - Policy Sets and Policy Binding

**Traditional**
Policy Sets are supported by WAS ND runtime

**Traditional & Container**
Policy Sets cannot be specified.
They are flagged as critical errors (cannot deploy)
Must be converted (Convert button removes Policy Sets)
Outbound Web Services – Other Differences

▪ Removed compatibility flags

<table>
<thead>
<tr>
<th>Flag</th>
<th>Behavior in BAW on Containers</th>
</tr>
</thead>
<tbody>
<tr>
<td>use-protect-wsdl-auth-in-webservice</td>
<td>False</td>
</tr>
<tr>
<td>use-advanced-response-type-mapping</td>
<td>False</td>
</tr>
<tr>
<td>serializer-exclude-incomplete-element</td>
<td>True</td>
</tr>
<tr>
<td>use-breadth-first-search-wsserver</td>
<td>True</td>
</tr>
<tr>
<td>preserve-pre85-default-nillable-value</td>
<td>False</td>
</tr>
<tr>
<td>use-jaxws</td>
<td>True</td>
</tr>
<tr>
<td>dateandtime-include-milliseconds</td>
<td>True</td>
</tr>
</tbody>
</table>

▪ Removed WSDL cache flags

  – The WSDL is not required at run time in BAW on Containers and therefore the WSDL cache with its configurations is obsolete in BAW on Containers.

▪ Message Level Encryption

  – Not available

More details...
Inbound Web Services are not available

Traditional
Inbound Web Service. Could be used with UCA and Service Flow to expose a Process

Traditional & Container
Cannot be created
It is a critical error category and must be deleted before Process App can be deployed
Advanced Integration Services

- Integration Designer will not be supported including BPEL, MFC, SCA, etc.
  - BAW on Containers does not include BPM Adv runtime
  - If you are using AIS you will see errors that look similar to this

- Changing Target environment to TC automatically disassociates Process App from Advanced Content in Integration Designer

- There are three patterns conversion patterns - see Conversion to BAW on Containers - Best Practice
  1. Calling Advanced Integration Services from Processes
  2. Calling a Process from BPM Adv
  3. Inbound SCA
BAW on Containers Development
Playback and Deployment
Target Environment
Examples of Unsupported Features

Migrating Solutions to BAW on Containers – Process

Migrating Solutions to BAW on Containers - Case
Environment Migration Traditional to Containers

- General migration approach of migration of
  - Use side by side artifact migration
  - Similar in effort to BPM 8.0 to BPM 8.5 migration.
  - No runtime migration (running instances or tasks)

- Can use PFS (Federation) to make it seamless to the business users allowing the drain method of completing tasks on the traditional instance of BAW and starting new instance on BAW on container.

- Can use dual license entitlement to run both for the period of migration (up to 18 months)
Conversion to BAW on Containers - Best Practice

**CHALLENGE**

- I have several large Apps
  - Based on BPDs (in eclipse PD)
  - Based on Processes (in Web PD)
- What is the best way convert a Process App to run on Workflow Server on Containers?
  - What do I need to do first?
  - What is the conversion process?
- Is the conversion automated?
- How can I plan my work?
  - Can I do the work in parallel deploying multiple developers?

**SUGGESTED BEST PRACTICE**

- This Best Practice describes the steps to convert Process Applications
- It all starts with selection of the Target Environment in Web PD...

---

![Diagram of Process App Settings with options for Target Environment and Authorization]
Conversion to BAW on Containers - Best Practice

Steps
1. Use Workflow Center to find out what are the toolkit dependencies to help you plan your work
2. If coming from eclipse PD, convert artefacts supported only in eclipse PD artefact to Web PD artefacts
3. Set the Target Environment to Traditional and Container
4. Pick the next leaf toolkit and convert all artefact in the toolkit
   - Update System Data Toolkit to 8.6.3.0 TC
   - Examine: target Server Conversion tab and Validation and Warnings
   - Perform the conversions; Manual Conversion, Automated Conversion, Deletions
   - Examine and fix Validation and Warnings after conversions
5. Go to 4
6. After all toolkits are converted convert the Process App

Notes
- Take a snapshot at every conversion milestone
- Perform individual unit tests as you converting
- Assign work to multiple developers
  - Convert Toolkits first
  - Process App last step done when all toolkits are converted
Conversion to BAW on Containers - Steps

1. Determine dependent Toolkits for your Process App
2. Perform eclipse to Web PD conversions of your Process App
3. Set Target Environment to TC in your Process App
4. Select the next Toolkit and convert the artifacts
5. Convert artifacts in your Process App
Find out what are the toolkit dependencies

This toolkit in Process Designer has a lot toolkit dependencies (as shown in Workflow Center view on the right).

Using the recommended approach, we need to convert all the dependent toolkits first need to start with the leaf toolkit labelled.
Conversion to BAW on Containers - Steps

1. Determine dependent Toolkits for your Process App
2. Perform eclipse to Web PD conversions of your Process App
3. Set Target Environment to TC in your Process App
4. Select the next Toolkit and convert the artifacts
5. Convert artifacts in your Process App

*If required...*
If needed (coming from eclipse PD), convert eclipse PD only supported artefact to Web PD artefacts
Conversion to BAW on Containers - Steps

1. Determine dependent Toolkits for your Process App
2. Perform eclipse to Web PD conversions of your Process App
3. Set Target Environment to TC in your Process App
4. Select the next Toolkit and convert the artifacts
5. Convert artifacts in your Process App
Set the Target Environment to **Traditional and Container**
Conversion to BAW on Containers - Steps

1. Determine dependent Toolkits for your Process App
2. Perform eclipse to Web PD conversions of your Process App
3. Set Target Environment to TC in your Process App
4. Select the next Toolkit and convert the artifacts
5. Convert artifacts in your Process App

More information about conversion of deprecated artefacts
Use References View to Select Next Toolkit to Migrate

Using the toolkit “Snapshots References” view, convert dependent toolkits recursively starting from “leaves” and progressing up the toolkit dependency tree following the order: 1, 2, 3, 4, 5.
Examine what needs to be converted

Only when this list is empty you should start converting. The artefacts shown in this view!

You should not see any artifact here at this point. Eclipse PD to Web PD artefact conversion should be done first.

Manage Directly Referenced Toolkits

Use Toolkit Dependencies view to manage dependent toolkits that are not compatible with Traditional or Container target.

- Do not start any conversion tasks if you see any dependent toolkits in this converting.
- The artefacts shown in this view!
A user task can't refer to an external implementation. Open the process and change the reference to the external implementation in the "User Task Extmpl" user task to refer to an external service.

Press 'F2' for focus

Points to an exiting are tactic that includes unsupported feature. Click the link to open the artefact and convert to a supported implementation.

As prescribed in the hover-over help, use External Service > External Implementation
Most "Deletion Required" artefacts are visible only in desktop PD.

[Critical] A key performance indicator (KPI) cannot be used in a "Container" target environment. Delete this KPI.
Convert – Automated Conversion

Automated action to trigger conversion of 8.5 Case Type to Process.

Case types are not supported. Select the case type and click Convert to convert it to a process.

- Other Conversions Required (3)
  - CaseType1
    - The Heritage Coach CSS template is not supported. Remove the CSS template reference.
    - The Heritage Coach XSL template is not supported. Remove the XSL template reference.

Convert
Examine and fix Validation and Warnings

New “Critical” label means you will not be able to install on target platform

Click on the error to open the artifact in Editor.
Converting Advanced Integration Services

1. Calling Advanced Integration Services from Processes

- Advanced Content is automatically disassociated from Process App in Integration Designer
- Expose the SCA Components formerly marked As Advanced Integration Services as Web Services
- Refactor Service Flows that call AISes to call Web Services
- More information on using AISes
Converting Advanced Integration Services

2. Calling BPMN Processes from BPEL Processes

- Advanced Content is automatically disassociated from Process App in Integration Designer
- Expose Process as a Web Service in Process Designer
- Use the Web Service Import in Integration Designer
- Be aware that there are two invocation patterns
  - One Way (i.e. to start a BPMN Process)
    - Use Web Service call
  - Request Response (i.e. to start BPM process for human task implementation)
    - Requires a callback from the Process back to the invoking BPEL process
Converting Advanced Integration Services

3. Inbound SCA

- **What is it?**
  - Allows to use SCA Service as triggering mechanism to start Message Events
  - This triggering mechanism makes it possible to use instance-based correlation that always delivers the message to exactly one event of one instance.

- **Steps to convert**
  - Disassociate Process App from Advanced Content in Integration Designer
  - Associate the UCA triggers with new inbound Web Service
  - Change the SCA Components to invoke the exposed inbound Web Services
Conversion to BAW on Containers - Steps

1. Determine dependent Toolkits for your Process App
2. Perform eclipse to Web PD conversions of your Process App
3. Set Target Environment to TC in your Process App
4. Select the next Toolkit and convert the artifacts
5. Convert artifacts in your Process App
Convert App Level Artifacts – this is the final step!

- You should not see any artifact here at this point. Eclipse PD to Web PD artefact conversion should be done first.
- Only when this list is empty you should start converting. The artefacts shown in this view!
BAW on Containers Development

Playback and Deployment

Target Environment

Examples of Unsupported Features

Migrating Solutions to BAW on Containers – Process

Migrating Solutions to BAW on Containers - Case
Migrating Case Solution to Containers

- **Process App**
  - First migrate the Process App associated with a Case Solution

- **Case**
  - Use Process Designer to change Target Environment (in Workflow Center) to Traditional and Containers
  - Use Case Designer to remove Case Forms

- **ACCE Console**
  - Ensure that all custom Content Platform Engine (CPE) event handlers will work in Content Platform Engine in a container environment

- **Navigator**
  - Ensure that all custom Content Navigator plug-ins work in IBM Content Navigator in a container environment
Supported Project Types

- Case Solutions (Process Apps, Templates, Toolkits)
- Process Apps (Toolkits)
- Legacy Cases (created in Case tooling prior to BAW 18.x) must be first converted to Case Solutions

2. BAW Solution created in Case Builder (in BAW 18.x or higher) must be Promoted using the “Promote to workflow project” option

Case project built in a pre-BAW Case Builder must be first upgraded using the Promote button which will upgrade the project to a BAW 18.x project
THANK YOU
Playback Options in Web Process Designer

Traditional
- Playback runs on Workflow Server on Workflow Center

Traditional or Container
- Optionally, Playback runs on external Workflow Server on Container which must be dedicated to this function and installed/configured separately (see note 1)
  - When you click Debug or Run button
    - Default 1st unnamed snapshot (since you did a save) will be packaged and installed on the external PS on Container
- Optionally Playback runs on external Workflow Server on Workflow Center
- Ability to debug a process instance on a "connected" Test/AQ/Prod Workflow Server
  - Feature formerly available only on eclipse Process Designer

Note 1: Not available in 20.0.0.1 release. Targeted for a future release.
Debug/Run Instance of Remote Process Server

- This feature is one of few available only in desktop PD
- There are plans to make offer this feature in web PD

Not available in 20.0.0.1 release
Targeted for a future release
Pods by Name

- dbu-release-db2u-0 worker-2
- dbu-release-db2u-1 worker-0
- dbu-release-db2u-tools-565c8f93-k7qi worker-1
- dbu-release-etc-d-0 worker-1
- dbu-release-etc-d-1 worker-0
- dbu-release-etc-d-2 worker-2
- ibm-cp4o-operator-9d669f654-vqsp worker-0
- ip4deploy-cmbs-deploy-b5fd5b58b-qj5q worker-1
- ip4deploy-cpe-deploy-84c855596d-hbs6b worker-1
- ip4deploy-dbe-rr-1asc272c45 worker-1
- ip4deploy-dbo-rr-c03bade6f worker-0
- ip4deploy-dbs-r-18804d66f worker-2
- ip4deploy-elasticsearch-statefulset-0 worker-1
- ip4deploy-instanceurl-workflow-server-0 worker-0
- ip4deploy-instanceurl-workflow-server-jms worker-1
- ip4deploy-navigator-deploy-757bc59495-4n76f worker-0
- ip4deploy-openid-deploy-84df75b69-jbx worker-2
- ip4deploy-pfs-0 worker-1
- ip4deploy-pfs-dbsreg-5bbf555d49-764w worker-0
- ip4deploy-pshicadmin-c8197c4659 worker-1
- ip4deploy-ums-deployment-7f864bd95f-rv worker-0
- ip4deploy-ums-deployment-7f864bd95j2 worker-1
<table>
<thead>
<tr>
<th>Process Name</th>
<th>Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>db2u-release-db2u-ldap-6cb9cdfbd-zhwrn</td>
<td>worker-0</td>
</tr>
<tr>
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<tr>
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<tr>
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<td>icp4adeploy-ums-deployment-7f86f4bd95-j2b2q</td>
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<tr>
<td>db2u-release-etcd-2</td>
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<tr>
<td>icp4adeploy-dba-rr-f880d66f24</td>
<td>worker-2</td>
</tr>
</tbody>
</table>
## Pods by Function

### db2u-release
- db2u-release-db2u-idap, #1
  - Memory: 801 MB
  - CPU: 0.009 cores
  - Reads: 1 of 1 pods
- db2u-release-db2u-tools, #1
  - Memory: 14.9 MB
  - CPU: 0.000 cores
  - Reads: 1 of 1 pods
- db2u-release-db2u
  - Memory: 3,658 MB
  - CPU: 0.029 cores
  - Reads: 1 of 1 pods
- db2u-release-vtcd
  - Memory: 173.6 MB
  - CPU: 0.040 cores
  - Reads: 3 of 3 pods

### ibm-dba
- ibm-cp4a-operator, #1
  - Memory: 507.8 MB
  - CPU: 0.970 cores
  - Reads: 1 of 1 pods

### icp4deploy-cmis-deploy
- icp4deploy-cmis-deploy, #1
  - Memory: 453.2 MB
  - CPU: 0.007 cores
  - Reads: 1 of 1 pods

### icp4deploy-cpe-deploy
- icp4deploy-cpe-deploy, #1
  - Memory: 939.1 MB
  - CPU: 0.039 cores
  - Reads: 1 of 1 pods

### icp4deploy-elasticsearch
- icp4deploy-elasticsearch
  - Memory: 1,405.8 MB
  - CPU: 0.006 cores
  - Reads: 1 of 1 pods

### icp4deploy-instance-workflow-server-jms
- icp4deploy-instance-workflow-server-jms
  - Memory: 283.8 MB
  - CPU: 0.022 cores
  - Reads: 1 of 1 pods

### icp4deploy-navigator-deploy
- icp4deploy-navigator-deploy
  - Memory: 602.2 MB
  - CPU: 0.017 cores
  - Reads: 1 of 1 pods

### icp4deploy-openldap-deploy
- icp4deploy-openldap-deploy, #1
  - Memory: 63.4 MB
  - CPU: 0.000 cores
  - Reads: 1 of 1 pods

### icp4deploy-pfs
- icp4deploy-pfs-dbreg, #1
  - Memory: 481.7 MB
  - CPU: 0.028 cores
  - Reads: 1 of 1 pods
- icp4deploy-pfs
  - Memory: 2,665.8 MB
  - CPU: 0.044 cores
  - Reads: 1 of 1 pods

### icp4deploy-ums
- icp4deploy-ums-deployment, #1
  - Memory: 678.4 MB
  - CPU: 0.046 cores
  - Reads: 2 of 2 pods

### phpldapadmin
- icp4deploy-phpldapadmin, #1
  - Memory: 97.0 MB
  - CPU: 0.000 cores
  - Reads: 1 of 1 pods

### workflow-server
- icp4deploy-instance-workflow-server
  - Memory: 2,459.3 MB
  - CPU: 0.142 cores
  - Reads: 1 of 1 pods

### icp4deploy-ums
- icp4deploy-ums-deployment, #1
  - Memory: 678.4 MB
  - CPU: 0.046 cores
  - Reads: 2 of 2 pods

### phpldapadmin
- icp4deploy-phpldapadmin, #1
  - Memory: 97.0 MB
  - CPU: 0.000 cores
  - Reads: 1 of 1 pods

### workflow-server
- icp4deploy-instance-workflow-server
  - Memory: 2,459.3 MB
  - CPU: 0.142 cores
  - Reads: 1 of 1 pods
Pods listed using command line

db2u-release-db2u-0
db2u-release-db2u-ldap-6cb9cdfdbd-zhwrmm
db2u-release-db2u-tools-5865c8f997-k7gwr
db2u-release-etcd-0
db2u-release-etcd-1
db2u-release-etcd-2

ibm-cp4a-operator-9d869f854-vpksp

icp4adeploy-cmis-deploy-b5fcd558b-qj5q5
icp4adeploy-cpe-deploy-84c855596d-hbs6b

icp4adeploy-dba-rr-1aac272c45
icp4adeploy-dba-rr-cd3bade8fa
icp4adeploy-dba-rr-f880d66f24

icp4adeploy-instance1-workflow-server-0
icp4adeploy-instance1-workflow-server-jms-0

icp4adeploy-navigator-deploy-757bc59495-4n76f
icp4adeploy-openldap-deploy-84dfd7b569-jlx26
icp4adeploy-phpldapadmin-c8ff5c465-9wlkp

icp4adeploy-pfs-0
icp4adeploy-pfs-dbareg-5b9d655d49-764jw
icp4adeploy-elasticsearch-statefulset-0

icp4adeploy-ums-deployment-7f86f4bd95-fv9rw
icp4adeploy-ums-deployment-7f86f4bd95-j2b2g
What is Next Task Dashboard?

Task Workers can only see the (single) next task to work on

- When enabled, replaces Works dashboard
- Displays only one task
  - The task selection/ordering criteria can be **customized using a dedicated Saved Search** (by default its is the same for the Work dashboard)

- New Task dashboard enablement and configuration in WAS Admin Console
  - Configure what **teams** can see New Task dashboard
  - **Select** either Work or Task dashboards (they are mutually exclusive)
  - Configure if claimed but **not completed tasks** are returned back to the queue
  - Configure **Saved Search** used for task selection/ordering criteria
Why do we need Target Environment?

- When you select Target Environment in Web Process Designer unsupported / removed features shown Target Environment Conversion Tab
- Action will need to be taken to
  - BPD, UI, Service conversion
    - This is if the a ProcessApp/Toolkit is converted from desktop to web PD
  - Automatic conversion
  - Artefact deletions
  - Manual conversions
- Conversion issues are also listed in Validation Errors and Warnings View
Validation Errors

- Design File (1 error)
  - DesignFile1.xsl (1 error)
    - A design file cannot be used in a "Container" target environment. Delete this design file.

- Document Type (1 error)
  - DocumentType1 (1 error)
    - A document type cannot be used in a "Container" target environment. Delete this document type.

- Process (4 errors, 3 warnings)
  - CaseType1 (1 error)
    - A case type cannot run in a "Container" target environment. Open the case type to automatically convert it to a process, then convert the process to use BPM content management.
  - SystemTaskExtServ (1 error, 1 warning)
    - No input parameter mapping found for parameter without default t
    - A system task reference to an external service is not supported in a "Container" target environment. Convert the system task named "asdf" to a user task to reference an external service in this target environment.
  - UserTaskExtImpConv (1 error, 1 warning)
    - No input parameter mapping found for parameter without default t
    - The user task "User Task ExtImpConv" has a reference to an external implementation, which is not supported in a "Container" target environment. Change the reference to point to an external service.
  - UserTaskExtServ (1 error, 1 warning)
    - No input parameter mapping found for parameter without default t
    - A user task reference to an external implementation is not supported in a "Container" target environment. Convert the external implementation referenced by the user task "User Task" to an external service.

- Process App Settings (4 errors)
  - The IBM Content Integrator Server connector is not supported in a "Container" target environment. Delete the ContentIntegServer_connectorName server entry.
  - The IBM Content Integrator server type is not supported in a "Container" target environment. Delete the ContentIntegServer server entry.
  - The Operational Decision Manager server type is not supported in a "Container" target environment. Delete the DecisionServer server entry.
  - The SAP server type is not supported in a "Container" target environment. Delete the SAPServer server entry.
Validation Errors

- **Unsupported Artifacts (17 errors)**
  - AjaxService1 (1 error)
    - This service cannot be used in a "Container" target environment. Convert this service to a Service Flow.
  - GeneralSystemService1 (1 error)
    - This service cannot be used in a "Container" target environment. Convert this service to a Service Flow.
  - GDPS (1 error)
    - A BPD cannot run in a "Container" target environment. Convert the BPD to a process to run in this target environment.
  - (1 error)
    - External implementation cannot be used in a "Container" target environment. Convert the external implementation to an external service.
  - EclipseEclipse (1 error)
    - External implementation cannot be used in a "Container" target environment. Convert the external implementation to an external service.
  - HistoricalAnalysisScenario1 (1 error)
    - A historical analysis scenario cannot be used in a "Container" target environment. Delete this historical analysis scenario.
  - IBMCaseManagerIntegrationService1 (1 error)
    - This service cannot be used in a "Container" target environment. Delete this service using the "Target Environment Conversion" tab.
  - DeploymentService (1 error)
    - This service cannot be used in a "Container" target environment. Convert this service to a Deployment Service Flow.

- **IntegrationService1 (1 error)**
  - This service cannot be used in a "Container" target environment. Convert this service to a Service Flow.

- **ChartType1 (1 error)**
  - Layouts cannot be used in a "Container" target environment. Delete this layout.

- **KeyPerformanceIndicator1 (1 error)**
  - A key performance indicator (KPI) cannot be used in a "Container" target environment. Delete this KPI.

- **Report1 (1 error)**
  - A report cannot be used in a "Container" target environment. Delete this report.

- **DecisionService1 (1 error)**
  - This service cannot be used in a "Container" target environment. Convert this service to a Service Flow.

- **Scoreboard1 (1 error)**
  - A scoreboard cannot be used in a "Container" target environment. Delete this scoreboard.

- **SimulationAnalysisScenario1 (1 error)**
  - A simulation analysis scenario cannot be used in a "Container" target environment. Delete this simulation analysis scenario.

- **ServiceLevelAgreement1 (1 error)**
  - A service level agreement (SLA) cannot be used in a "Container" target environment. Delete this SLA.

- **TimingInterval1 (1 error)**
  - A timing interval cannot be used in a "Container" target environment. Delete this timing interval.
Configuring Next Task Capability in Process Portal
Example of the use of WAS Admin Console mashup setting not available in BAW on Containers

Add new custom property

Specify teams to use the Next Task Dashboard. “all” – means all the teams/users

Use WAS Admin Console to enable and configure Next Task dashboard

com.ibm.bpm.portal.defaultNextTaskSavedSearch
- Identify the saved search that is used to determine which tasks the Next Task dashboard shows to all the users who are allowed to see this dashboard.
- If the property is not set, the built-in default saved search is used

com.ibm.bpm.portal.returnTaskToTeamOnLogout
- Determine what happens when users who work with the Next Task dashboard logs out.
- The property can be set to all or a set of teams. On this case if the user logs out without finishing the task, the task is assigned back to the user team.
- If the property is not set the user who has just logged out remains the task owner.