Deploying and Managing Integrations across private and third-party clouds with App Connect Enterprise Containers

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IBM App Connect Enterprise, IBM UK Ltd.

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Session JH

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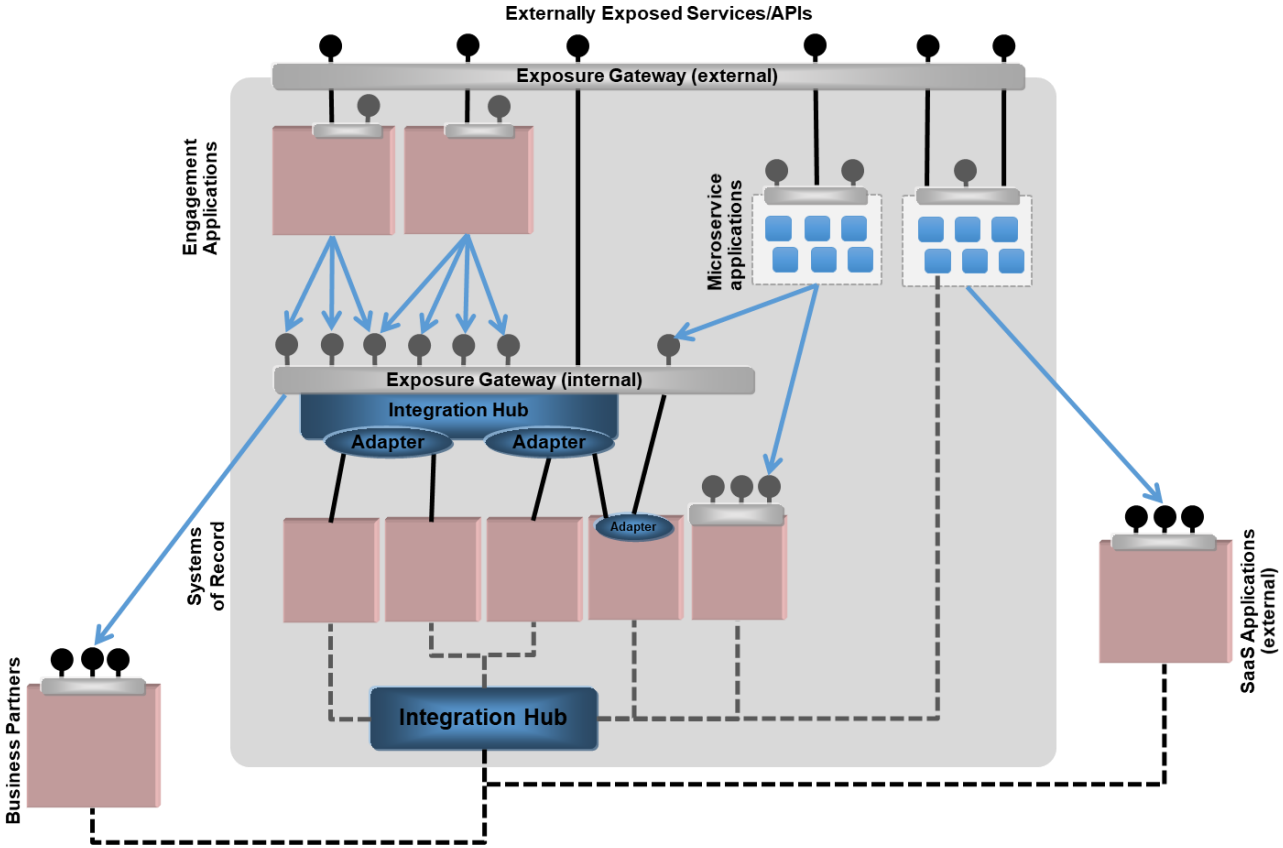
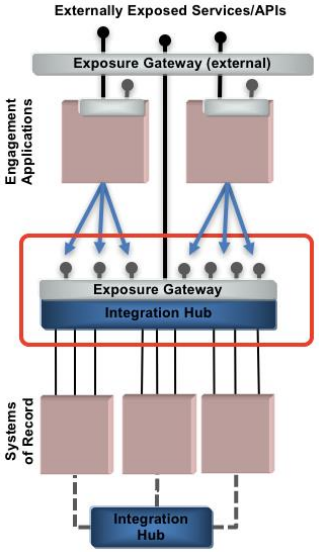
Where most people are today …

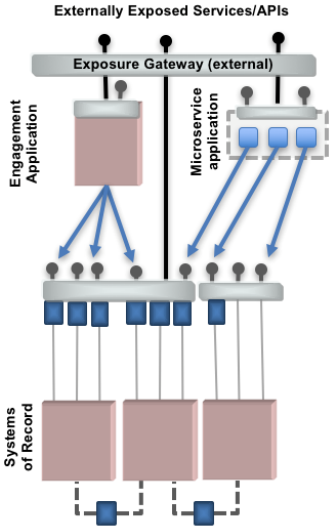


How we observe things are changing …

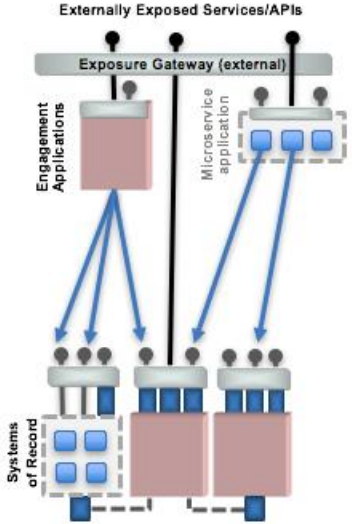
Centralized ESB



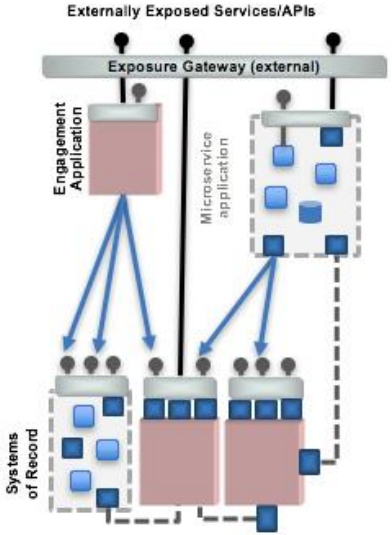
Fine-grained integration deployment



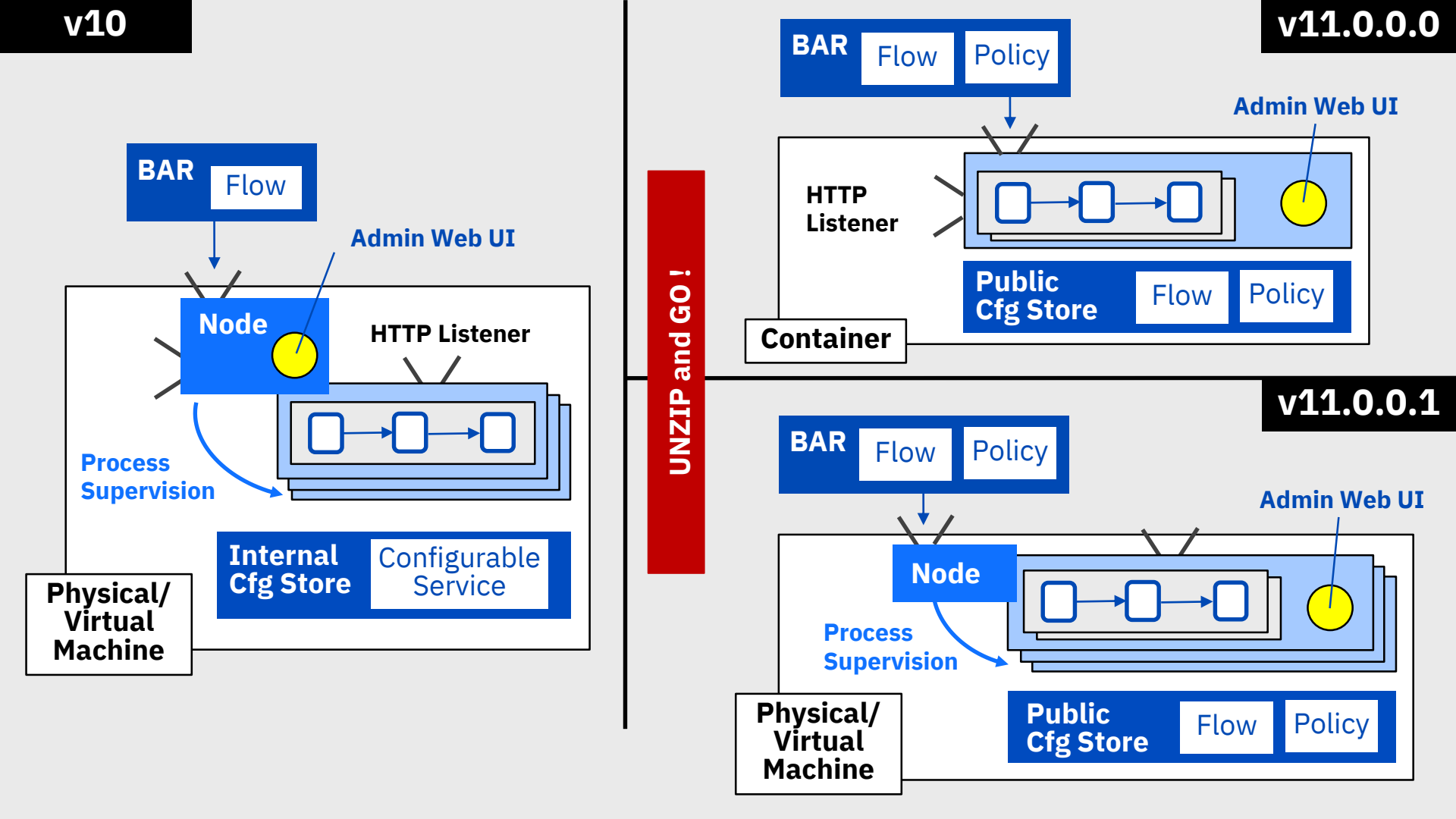
Decentralized integration ownership

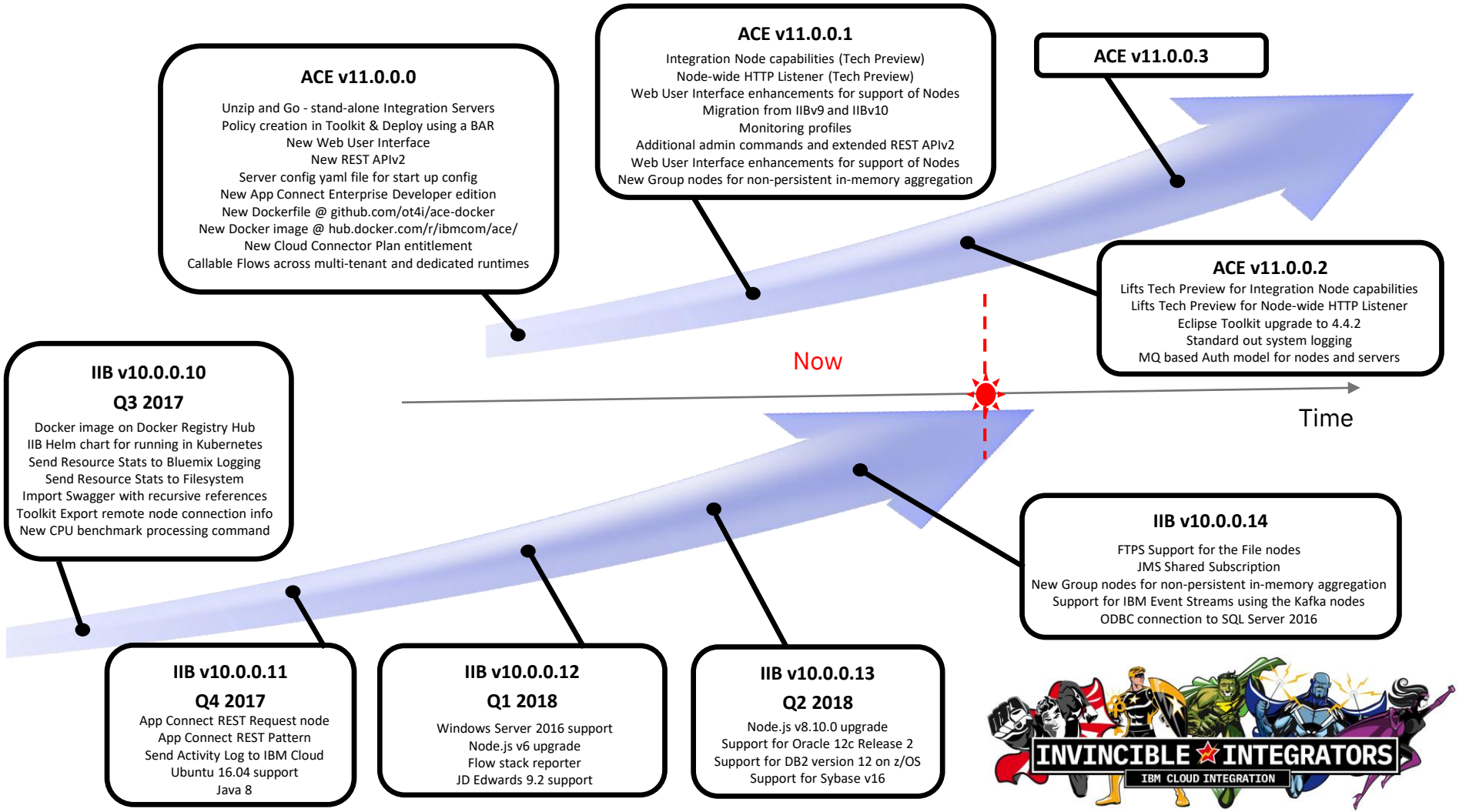


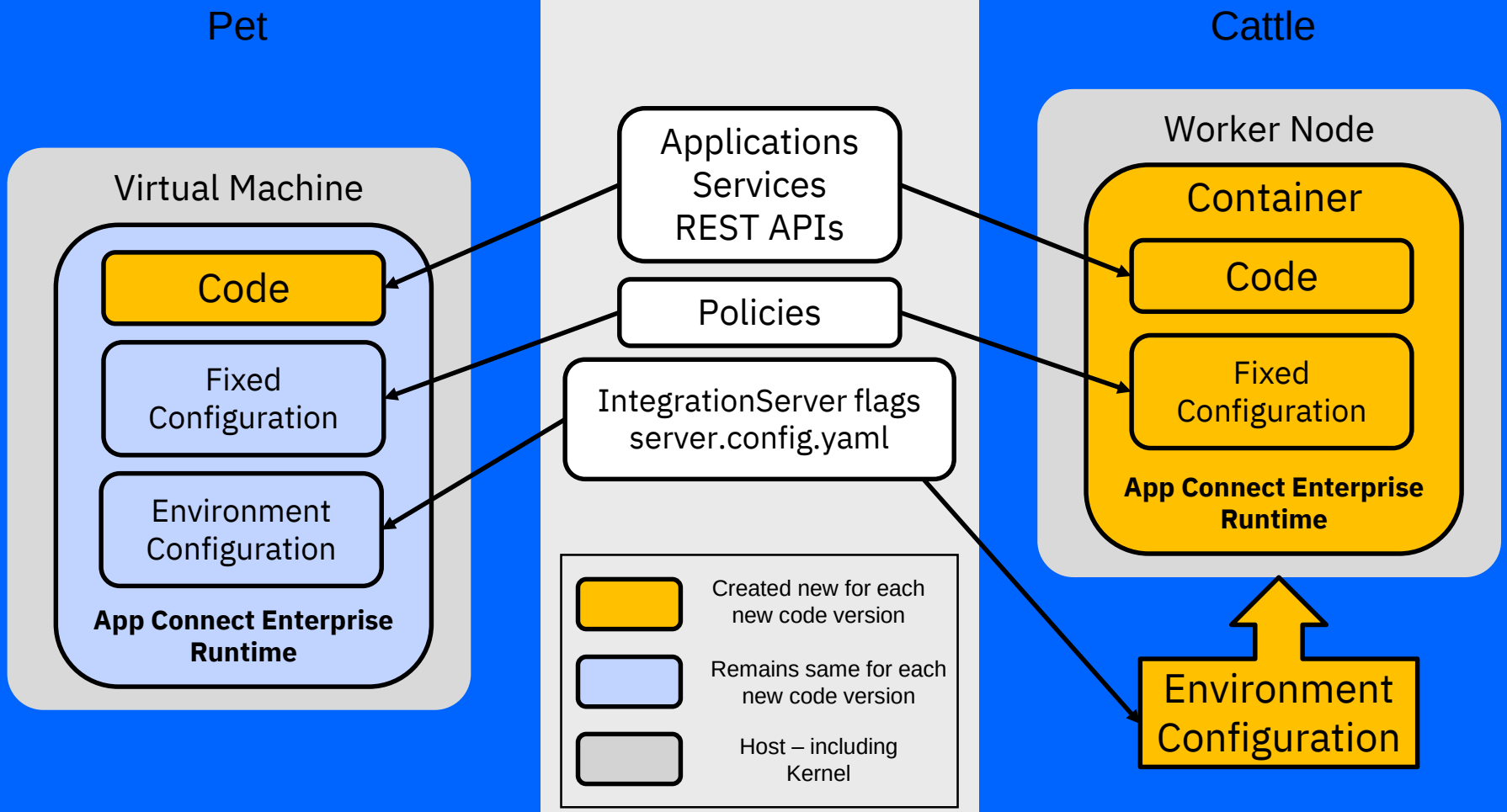
Integration as a microservice runtime

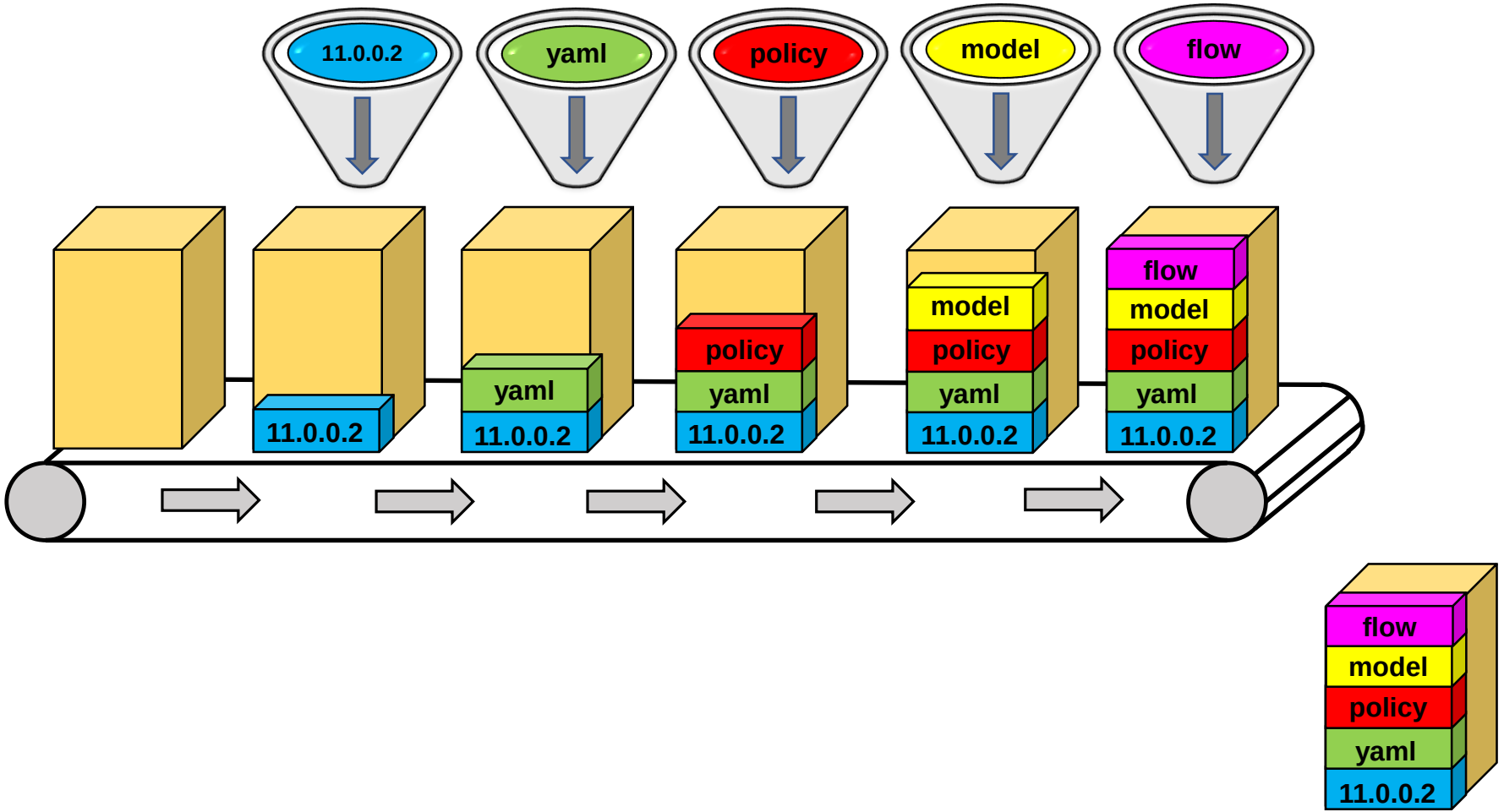


Containerization → *Application autonomy* → *Polyglot runtimes*


v10
BAR
Flow
Admin Web UI
Node
HTTP Listener
Process Supervision
Internal Cfg Store
Configurable Service
Physical/ Virtual Machine
UNZIP and GO !
v11.0.0.0
BAR
Flow
Policy
Admin Web UI
HTTP Listener
Public Cfg Store
Flow
Policy
Container
v11.0.0.1
BAR
Flow
Policy
Admin Web UI
Node
Process Supervision
Public Cfg Store
Flow
Policy
Physical/ Virtual Machine


ACE v11.0.0.0
Unzip and Go - stand-alone Integration Servers
Policy creation in Toolkit & Deploy using a BAR
New Web User Interface
New REST APIv2
Server config yaml file for start up config
New App Connect Enterprise Developer edition
New Dockerfile @ github.com/ot4i/ace-docker
New Docker image @ hub.docker.com/r/ibmcom/ace/
New Cloud Connector Plan entitlement
Callable Flows across multi-tenant and dedicated runtimes
ACE v11.0.0.1
Integration Node capabilities (Tech Preview)
Node-wide HTTP Listener (Tech Preview)
Web User Interface enhancements for support of Nodes
Migration from IIBv9 and IIBv10
Monitoring profiles
Additional admin commands and extended REST APIv2
Web User Interface enhancements for support of Nodes
New Group nodes for non-persistent in-memory aggregation
ACE v11.0.0.3
ACE v11.0.0.2
Lifts Tech Preview for Integration Node capabilities
Lifts Tech Preview for Node-wide HTTP Listener
Eclipse Toolkit upgrade to 4.4.2
Standard out system logging
MQ based Auth model for nodes and servers
Now
Time
IIB v10.0.0.10
Q3 2017
Docker image on Docker Registry Hub
IIB Helm chart for running in Kubernetes
Send Resource Stats to Bluemix Logging
Send Resource Stats to Filesystem
Import Swagger with recursive references
Toolkit Export remote node connection info
New CPU benchmark processing command
IIB v10.0.0.14
FTPS Support for the File nodes
JMS Shared Subscription
New Group nodes for non-persistent in-memory aggregation
Support for IBM Event Streams using the Kafka nodes
ODBC connection to SQL Server 2016
IIB v10.0.0.11
Q4 2017
App Connect REST Request node
App Connect REST Pattern
Send Activity Log to IBM Cloud
Ubuntu 16.04 support
Java 8
IIB v10.0.0.12
Q1 2018
Windows Server 2016 support
Node.js v6 upgrade
Flow stack reporter
JD Edwards 9.2 support
IIB v10.0.0.13
Q2 2018
Node.js v8.10.0 upgrade
Support for Oracle 12c Release 2
Support for DB2 version 12 on z/OS
Support for Sybase v16
INVINCIBLE INTEGRATORS
IBM CLOUD INTEGRATION


Pet
Cattle
Virtual Machine
Code
Fixed Configuration
Environment Configuration
App Connect Enterprise Runtime
Applications Services REST APIs
Policies
IntegrationServer flags server.config.yaml
Worker Node
Container
Code
Fixed Configuration
App Connect Enterprise Runtime
Environment Configuration
Created new for each new code version
Remains same for each new code version
Host – including Kernel


11.0.0.2
yaml
policy
model
flow
11.0.0.2
yaml
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yaml
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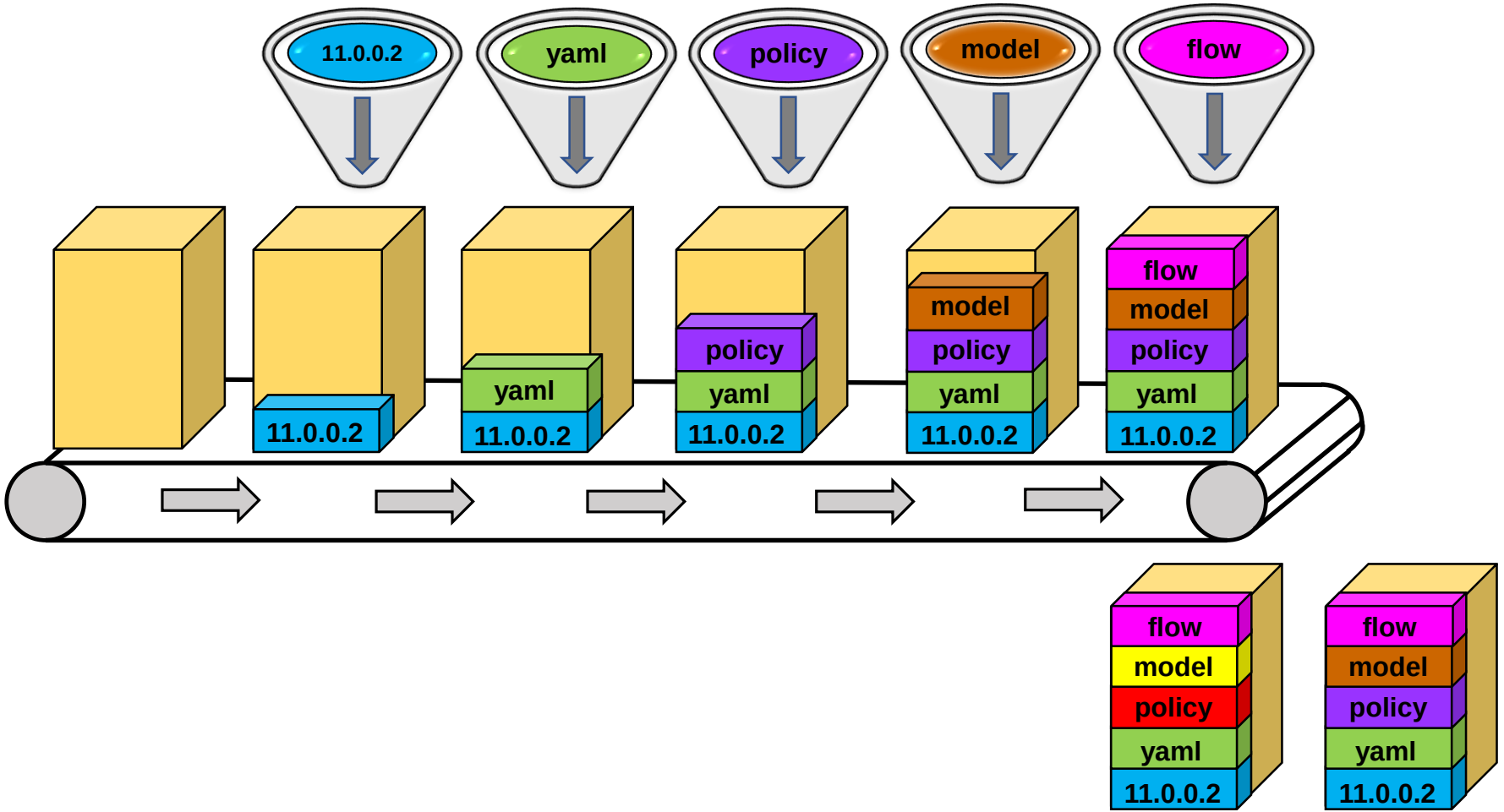
11.0.0.2
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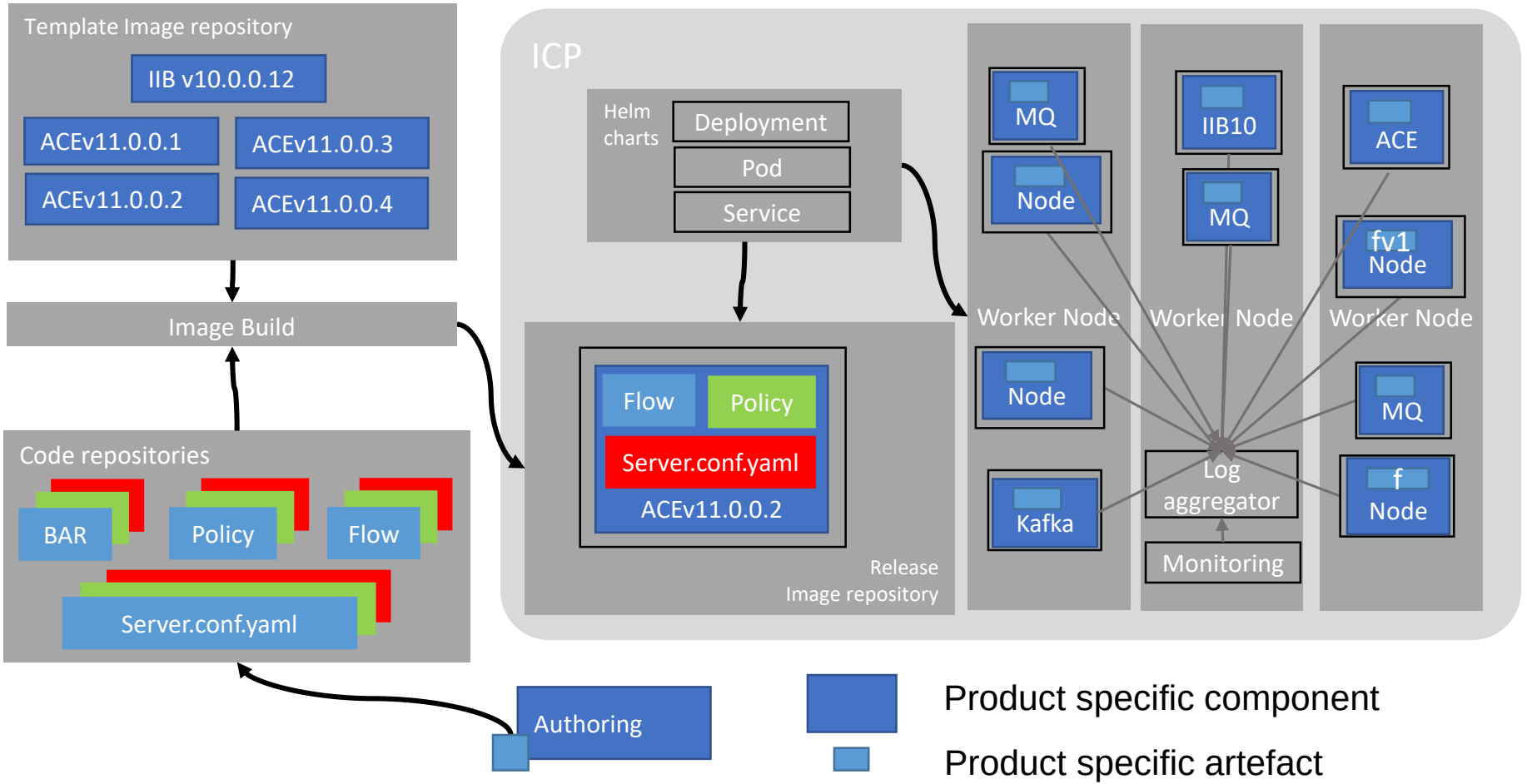
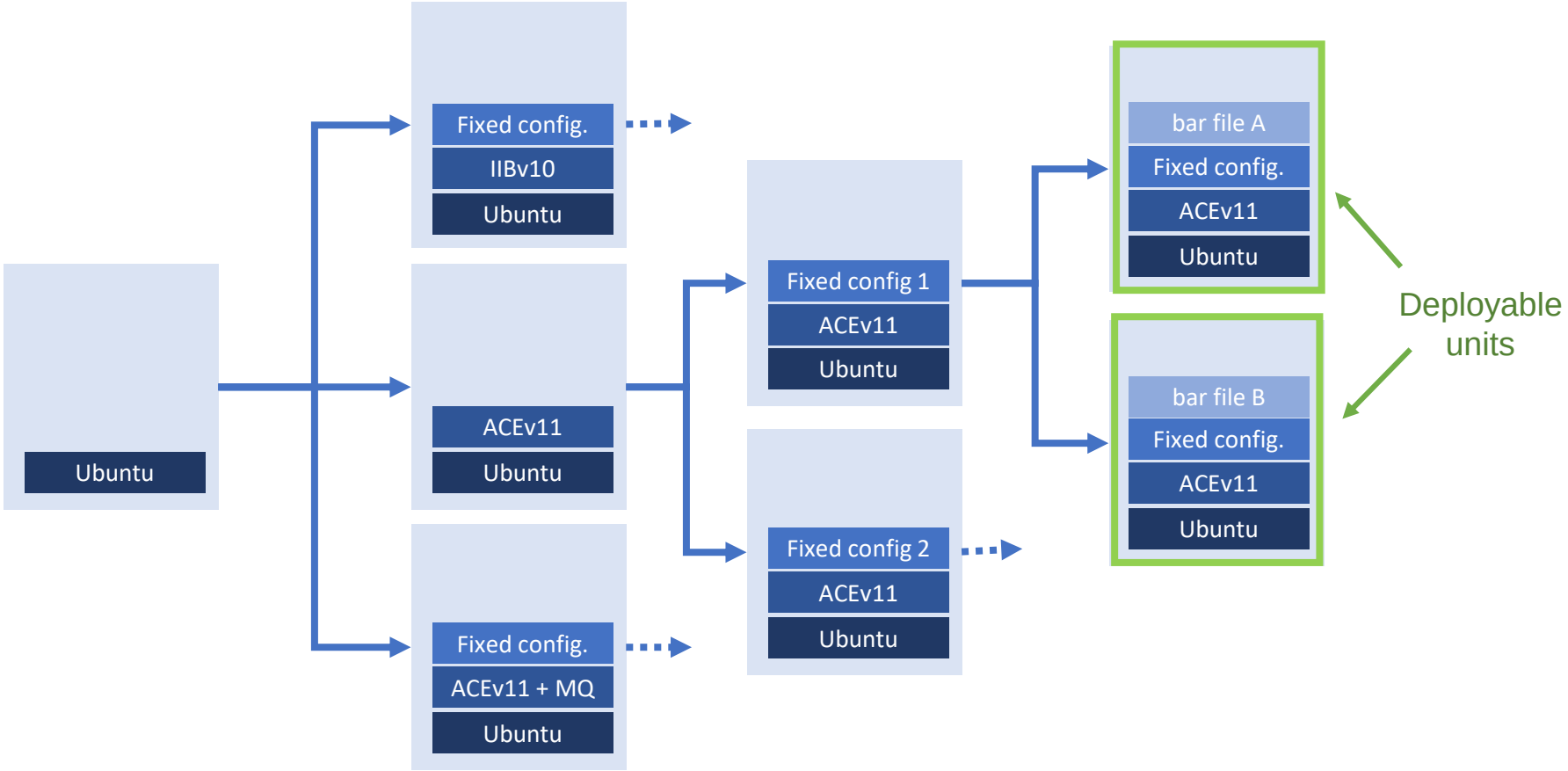
A Tangible Example

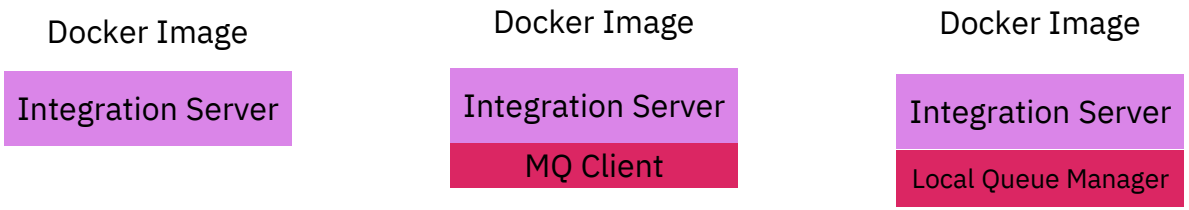


Building up the layers of your Docker images



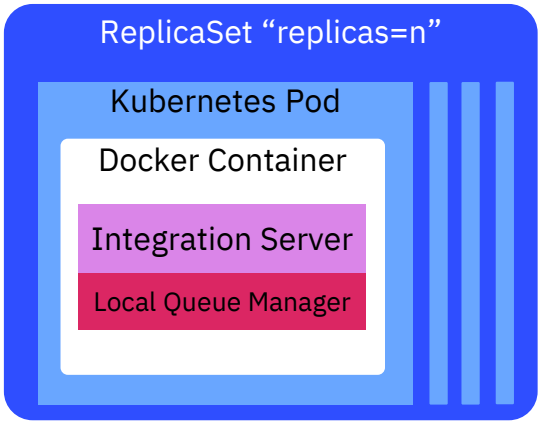
"Cattle not pets: Achieving lightweight integration with IIB" http://ibm.biz/CattlePetsIIB

Docker Image Options for ACE and MQ



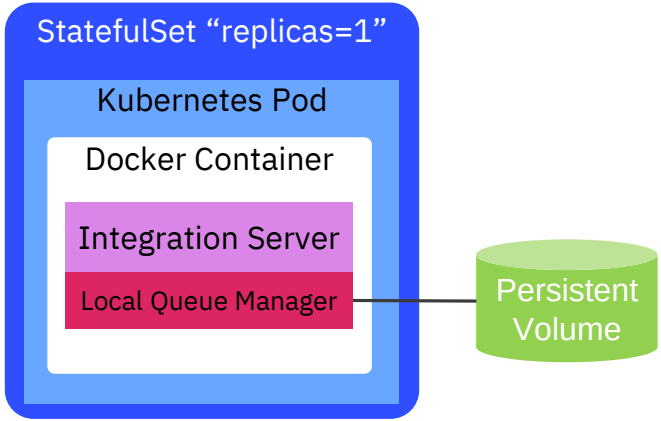
MQ connectivity	Yes (HTTP API)	Yes (client binding)	Yes (server binding)
1PC for MQ	No	Yes	Yes
EDA nodes	No	No	Yes
2PC	No	No	Yes
Horizontally scalable	Yes	Yes	Yes (with loss of sequencing)
Persistent volume	Not required	Not required	Required (if durability desired)
Start up	Fast	Fast	Slower
Disk space	Smallest	Medium	Largest

Same ACE/MQ image
…but different configuration and usage



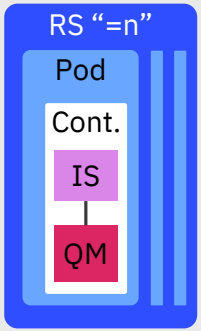
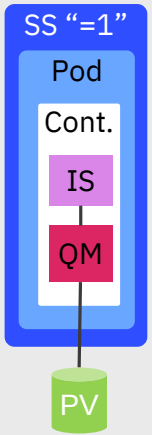
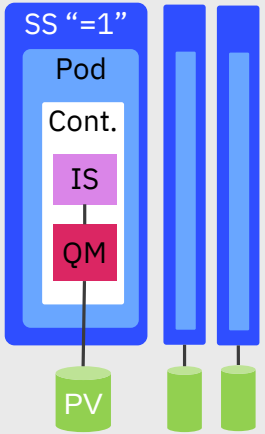
replicas = n
no persistent volume claim

- HA by replication (**continuous** availability)
- **Elastic** horizontally scalability
- **Non-durable** use of EDA nodes
- No 2 Phase Commit

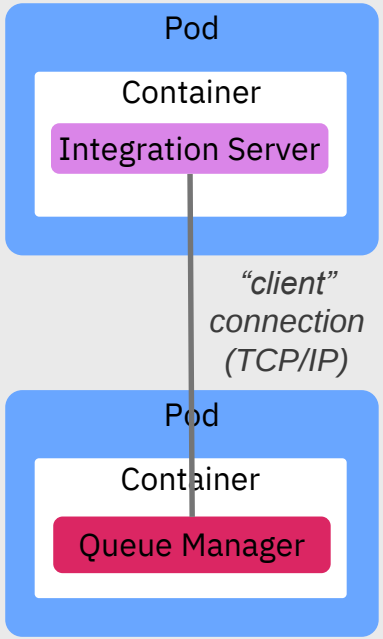


replicas = 1
persistent volume claim

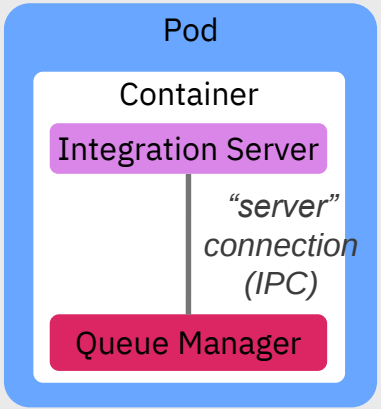
- HA by reinstatement
- **Manual** horizontal scalability
- **Durable** use of EDA nodes
- **2 Phase Commit**

Scalable no MQ Client	Scalable with MQ Client	Scalable, with non-persistent local MQ	Single instance with persistent local MQ	Active/active with persistent independent local MQ	Traditional (with node)
					Shown separately
Stateless	Stateless	Stateless	Stateful	Stateful	Stateful
Continuous availability	Continuous availability	Continuous availability	High Availability	Continuous Service Availability High Message Availability	Continuous Availability
Dynamic horizontal scaling	Dynamic horizontal scaling	Dynamic horizontal scaling	Vertical scaling only	Non-dynamic horizontal scaling	Non-dynamic horizontal scaling
No EDA	No EDA	Enables EDA, but note that must be replica=1 for sequencing	Enables EDA and 2PC	Enables EDA and 2PC	Enables EDA and 2PC

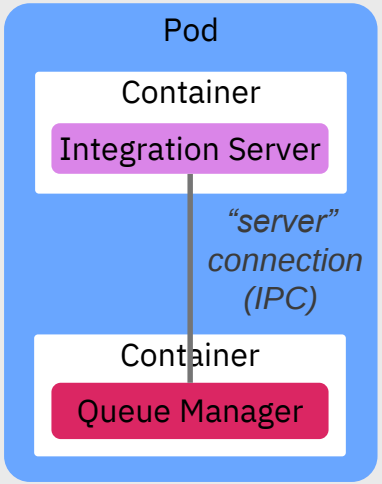
Containers and pods for ACE and MQ



- Standard ACE and MQ containers can be used
- Does not enable event nodes
- Does not enable 2PC



- Requires combined ACE/MQ image – not ideal from container design point of view. Prefer to only have one core purpose/process per container.
- Enables event nodes
- Enables 2PC (MQ, ODBC, JMS, JDBC, CICS)
- Ties topology of ACE and MQ together.



- Standard ACE and MQ images can be used
- Enables event nodes
- Enables 2PC (MQ, ODBC)
- Requires Docker 1.12 or later and Kubernetes 1.10 (alpha feature)

TCP/IP = Network based inter-communication
IPC = Inter Process Communication (via shared memory)

(The current generation of ...)

App Connect Enterprise on IBM Cloud Private

https://9.42.134.188:8443/oidc/login.jsp

IBM **Cloud** Private

Fast. Flexible. Intelligent. Open. Enterprise-grade.

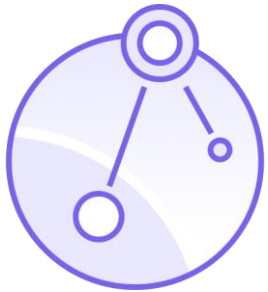
Log in to your account

Username

Password

Log in

Installing App Connect Enterprise into IBM Cloud Private



Procedure

Complete the following steps to deploy IBM App Connect Enterprise (Advanced Edition) to IBM Cloud Private:

1. Obtain the IBM App Connect Enterprise compressed file from IBM Passport Advantage.
2. Log in to your cluster from the IBM Cloud Private CLI and log in to the Docker private image registry, as shown in the following command:

   ```
   bx pr login -a https://cluster_CA_domain:8443 --skip-ssl-validation
   docker login cluster_CA_domain:8500
   ```

   where *cluster_CA_domain* is the certificate authority (CA) domain. If you did not specify a CA domain, the default value is `mycluster.icp`.
3. Install the IBM App Connect Enterprise compressed file from Passport Advantage, by entering the following command:

   ```
   bx pr load-ppa-archive --archive compressed_file_name [--clustername cluster_CA_domain] [--namespace namespace]
   ```

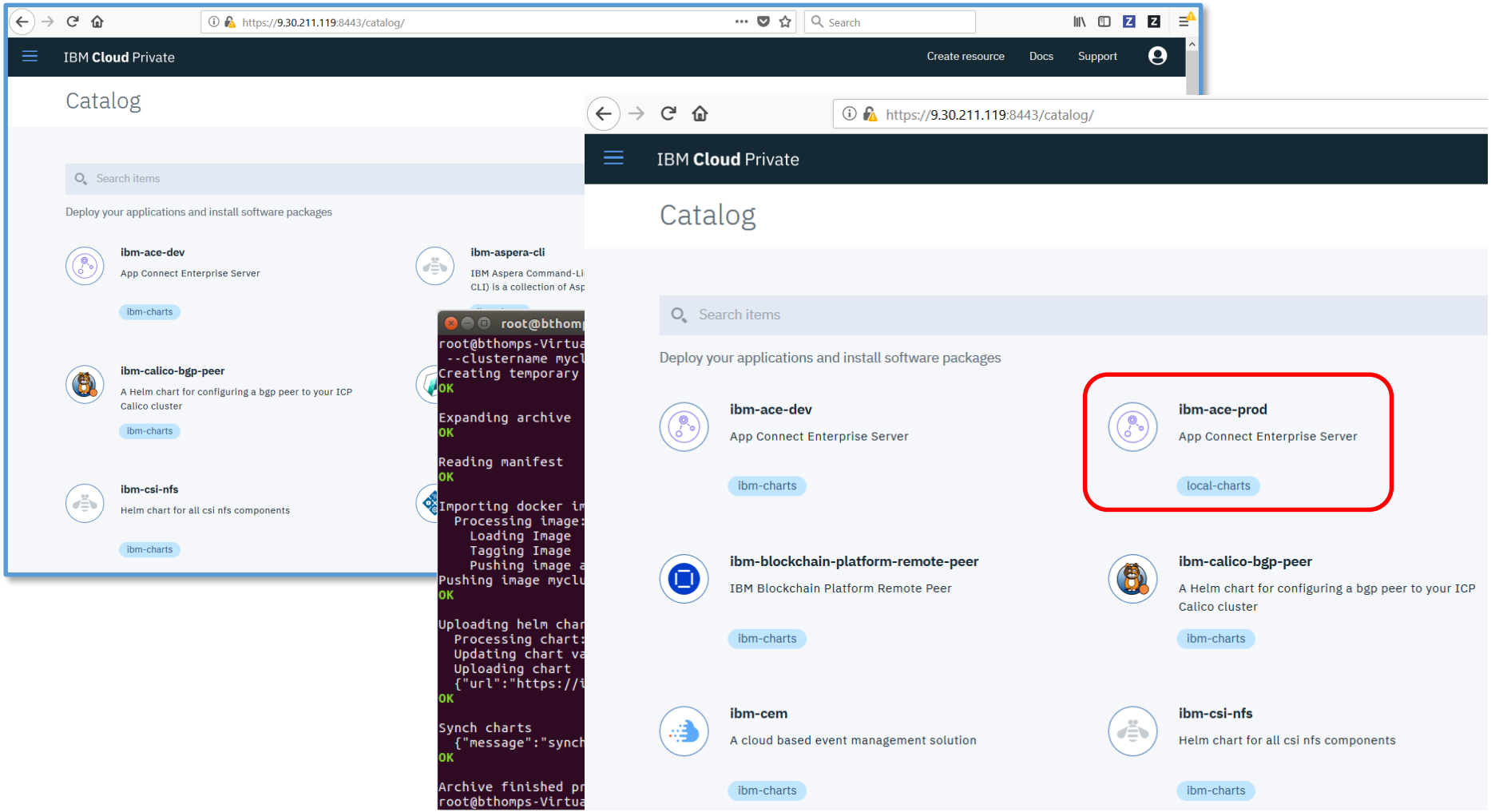
   where *compressed_file_name* is the name of the file that you downloaded from Passport Advantage, *cluster_CA_domain* is the (CA) domain, and *namespace* is the Docker namespace that hosts the Docker image.
4. Manually sync the repositories, so that the installed chart appears in the Catalog:
   a. From the menu in the IBM Cloud Private dashboard, select **Manage** > **Helm Repositories**.
   b. Click **Sync repositories** and then select **OK**.
   c. When it has completed, the **ibm-ace-prod** chart is displayed in the Catalog.
5. You can install and configure the IBM App Connect Enterprise chart from the IBM Cloud Private Catalog, or you can use the command line to access the Helm Charts directly from https://github.com/IBM/charts. The following steps show how to access and install the chart by using the Catalog:
   a. From the menu in the IBM Cloud Private dashboard, select **Catalog** > **Helm Charts**.
   b. Select the **ibm-ace-prod** chart and then click **Configure**.
   c. A configuration page for your new IBM App Connect Enterprise service is displayed.
6. Configure your IBM App Connect Enterprise service, by setting values for the following properties:
   a. Set the **Release name** property to the name of your new service.
   b. Accept the license by ticking the box.
   c. Click **Install**.

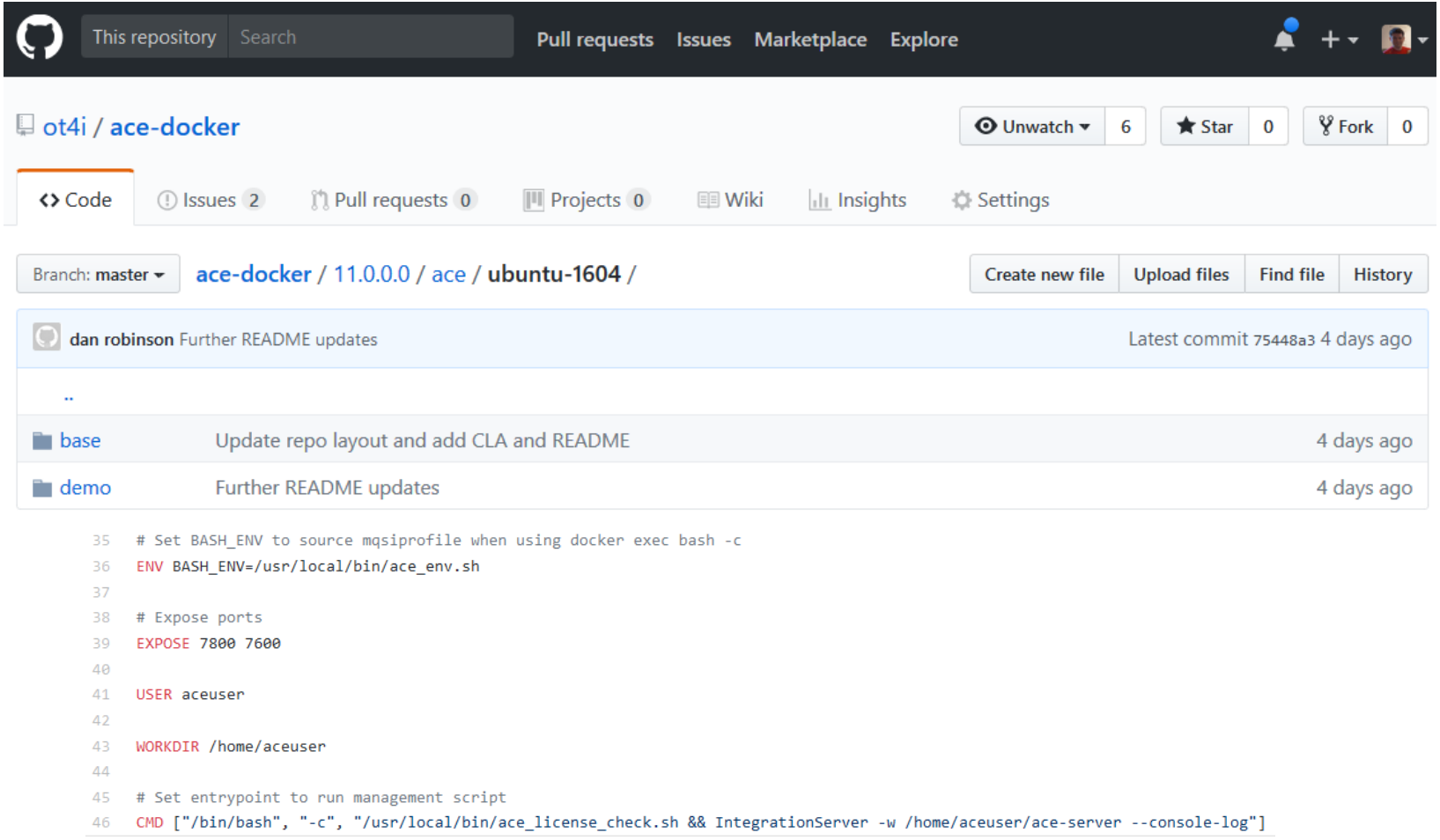
   For more information about the IBM App Connect Enterprise Helm Chart, see ot4i/ace-helm.
7. You are now ready to start using IBM App Connect Enterprise.

☐ IBM App Connect Enterprise V11.0 For Container Multilingual (CNTJ9ML) - View details

Size	550MB
Date posted	14 Jun 2018

License agreement Download estimate → eAssembly


https://9.30.211.119:8443/catalog/
Search
IBM Cloud Private
Create resource
Docs
Support
Catalog
Search items
Deploy your applications and install software packages
ibm-ace-dev
App Connect Enterprise Server
ibm-charts
ibm-aspera-cli
IBM Aspera Command-Li
CLI) is a collection of Asp
ibm-calico-bgp-peer
A Helm chart for configuring a bgp peer to your ICP Calico cluster
ibm-charts
ibm-csi-nfs
Helm chart for all csi nfs components
ibm-charts
root@bthom
root@bthomps-Virtua
--clustername mycl
Creating temporary
OK
Expanding archive
OK
Reading manifest
OK
Importing docker im
Processing image:
Loading Image
Tagging Image
Pushing image a
Pushing image myclu
OK
Uploading helm char
Processing chart:
Updating chart va
Uploading chart
{"url":"https://i
OK
Synch charts
{"message":"synch
OK
Archive finished pr
root@bthomps-Virtua
https://9.30.211.119:8443/catalog/
IBM Cloud Private
Catalog
Search items
Deploy your applications and install software packages
ibm-ace-dev
App Connect Enterprise Server
ibm-charts
ibm-ace-prod
App Connect Enterprise Server
local-charts
ibm-blockchain-platform-remote-peer
IBM Blockchain Platform Remote Peer
ibm-charts
ibm-calico-bgp-peer
A Helm chart for configuring a bgp peer to your ICP Calico cluster
ibm-charts
ibm-cem
A cloud based event management solution
ibm-charts
ibm-csi-nfs
Helm chart for all csi nfs components
ibm-charts


This repository
Search
Pull requests
Issues
Marketplace
Explore
ot4i / ace-docker
Unwatch 6
Star 0
Fork 0
Code
Issues 2
Pull requests 0
Projects 0
Wiki
Insights
Settings
Branch: master
ace-docker / 11.0.0.0 / ace / ubuntu-1604 /
Create new file
Upload files
Find file
History
dan robinson Further README updates
Latest commit 75448a3 4 days ago
..
base
Update repo layout and add CLA and README
4 days ago
demo
Further README updates
4 days ago
35 # Set BASH_ENV to source mqsiprofile when using docker exec bash -c
36 ENV BASH_ENV=/usr/local/bin/ace_env.sh
37
38 # Expose ports
39 EXPOSE 7800 7600
40
41 USER aceuser
42
43 WORKDIR /home/aceuser
44
45 # Set entrypoint to run management script
46 CMD ["/bin/bash", "-c", "/usr/local/bin/ace_license_check.sh && IntegrationServer -w /home/aceuser/ace-server --console-log"]

A Quick Look at the ACE Docker file

```
8  FROM ubuntu:16.04
9
10 LABEL "maintainer"="Dan Robinson <dan.robinson@uk.ibm.com>" \
11       "product.id"="447aefb5fd1342d5b893f3934dfded73" \
12       "product.name"="IBM App Connect Enterprise" \
13       "product.version"="11.0.0.0"
14
15 WORKDIR /opt/ibm
17 # Install ACE V11 Developer Edition
18 RUN apt update && apt -y install --no-install-recommends curl rsyslog sudo \
19   && curl http://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/integration/ACE-LINUX64-DEVELOPER.tar.gz \
20    | tar xz --exclude ace-11.0.0.0/tools --directory /opt/ibm/ \
21   && /opt/ibm/ace-11.0.0.0/ace make registry global accept license silently \
22   && apt remove -y curl \
23   && rm -rf /var/lib/apt/lists/*
25 # Configure the system
26 RUN echo "ACE_11:" > /etc/debian_chroot \
27   && touch /var/log/syslog \
28   && chown syslog:adm /var/log/syslog \
29 # Increase security
30   && sed -i 's/sha512/sha512 minlen=8/'  /etc/pam.d/common-password \
31   && sed -i 's/PASS_MIN_DAYS\t0/PASS_MIN_DAYS\t1/'  /etc/login.defs \
32   && sed -i 's/PASS_MAX_DAYS\t99999/PASS_MAX_DAYS\t90/' /etc/login.defs
```

LABELs identify the built image for ICP purposes

Download ACE installation binaries and unzip them to install

Prepare syslog and set password defaults

A Quick Look at the ACE Docker file

```
34  # Copy in script files
35  COPY *.sh /usr/local/bin/
36
37  # Create a user to run as, create the ace workdir, and chmod script files
38  RUN useradd --create-home --home-dir /home/aceuser -G mqbrkrs,sudo aceuser \
39    && sed -e 's/^%sudo   .*/%sudo        ALL=NOPASSWD:ALL/g' -i /etc/sudoers \
40    && su - aceuser -c '. /opt/ibm/ace-11.0.0.0/server/bin/mqsiprofile && mqsicreateworkdir /home/aceuser/ace-server' \
41    && chmod 755 /usr/local/bin/*

43  # Set BASH_ENV to source mqsiprofile when using docker exec bash -c
44  ENV BASH_ENV=/usr/local/bin/ace_env.sh
45
46  # Expose ports
47  EXPOSE 7800 7600
48
49  USER aceuser
50
51  WORKDIR /home/aceuser
52
53  # Set entrypoint to run management script
54  CMD ["/bin/bash", "-c", "/usr/local/bin/ace_license_check.sh && IntegrationServer -w /home/aceuser/ace-server --console-log"]
```

Create a user and set up a working directory using mqsicreateworkdir

No create and deploy steps are needed … just start up a server pointing at the work directory!

(The next generation of ...)

App Connect Enterprise on IBM Cloud Private

IBM Cloud Paks are Enterprise Ready out of the box

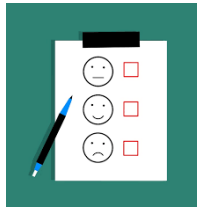
	Ad hoc client created containers Client takes software binaries, Creates their own containers.	IBM provided containers Client receives IBM Software in the form of container(s)	IBM Cloud Paks on IBM Cloud Private Simplified, Enterprise grade, Fully supported
IBM Software supported	Depends on product	Yes	Yes
Full stack support by IBM (Base OS, software, deployment on cloud platform)	No	No	Yes
Vulnerability Scanned (Manages image vulnerabilities)	Scan yourself	Yes	Yes
Orchestrated for Production (Built for Kubernetes by product experts)	None	None	Yes
Management and Operations	Roll your own	Roll your own	Built-in
License Metering Integration	Do it yourself	Do it yourself	Yes
Lifecycle Management	Manage it yourself	Manage it yourself	Yes

Demos and Questions

We want your feedback!

- Please submit your feedback online at ….
  - ➢http://conferences.gse.org.uk/2018/feedback/JH

- Paper feedback forms are also available from the Chair person

- This session is JH

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