What's New in App Connect Enterprise v11 software

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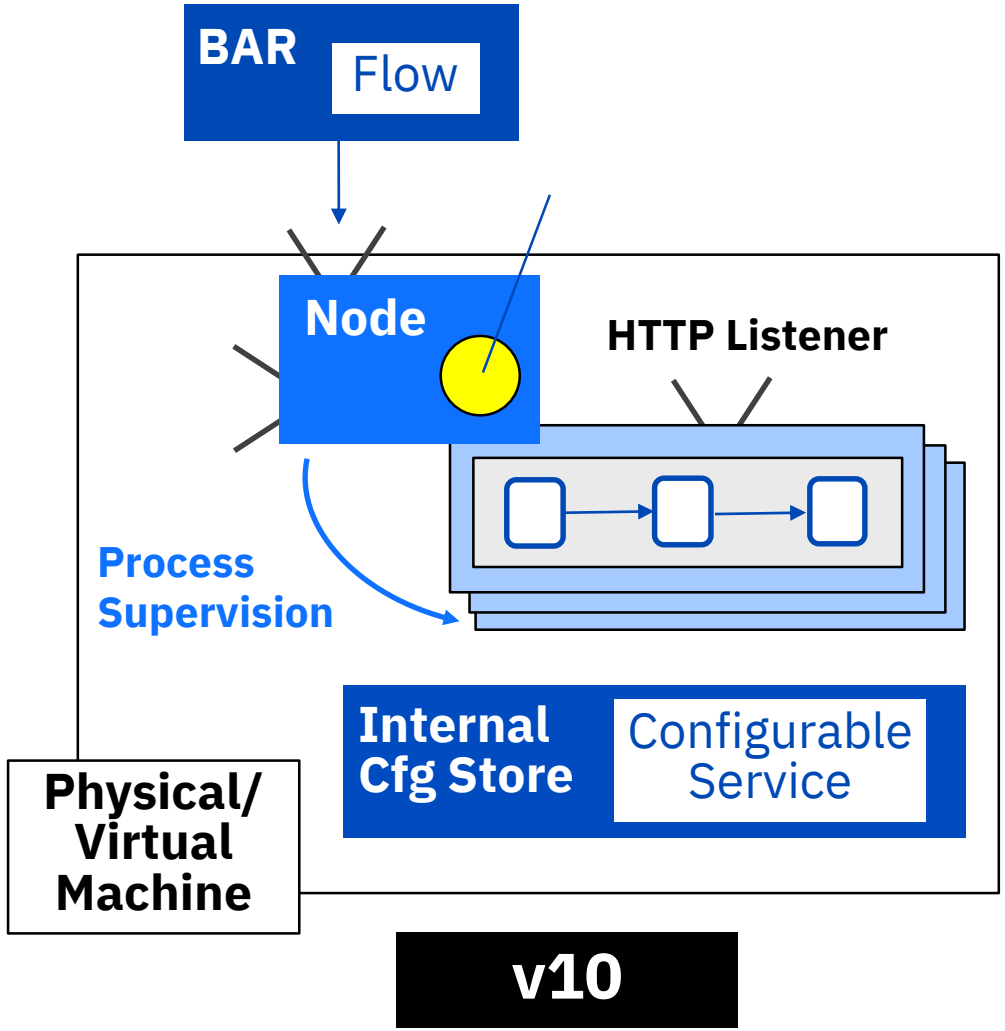
IBM

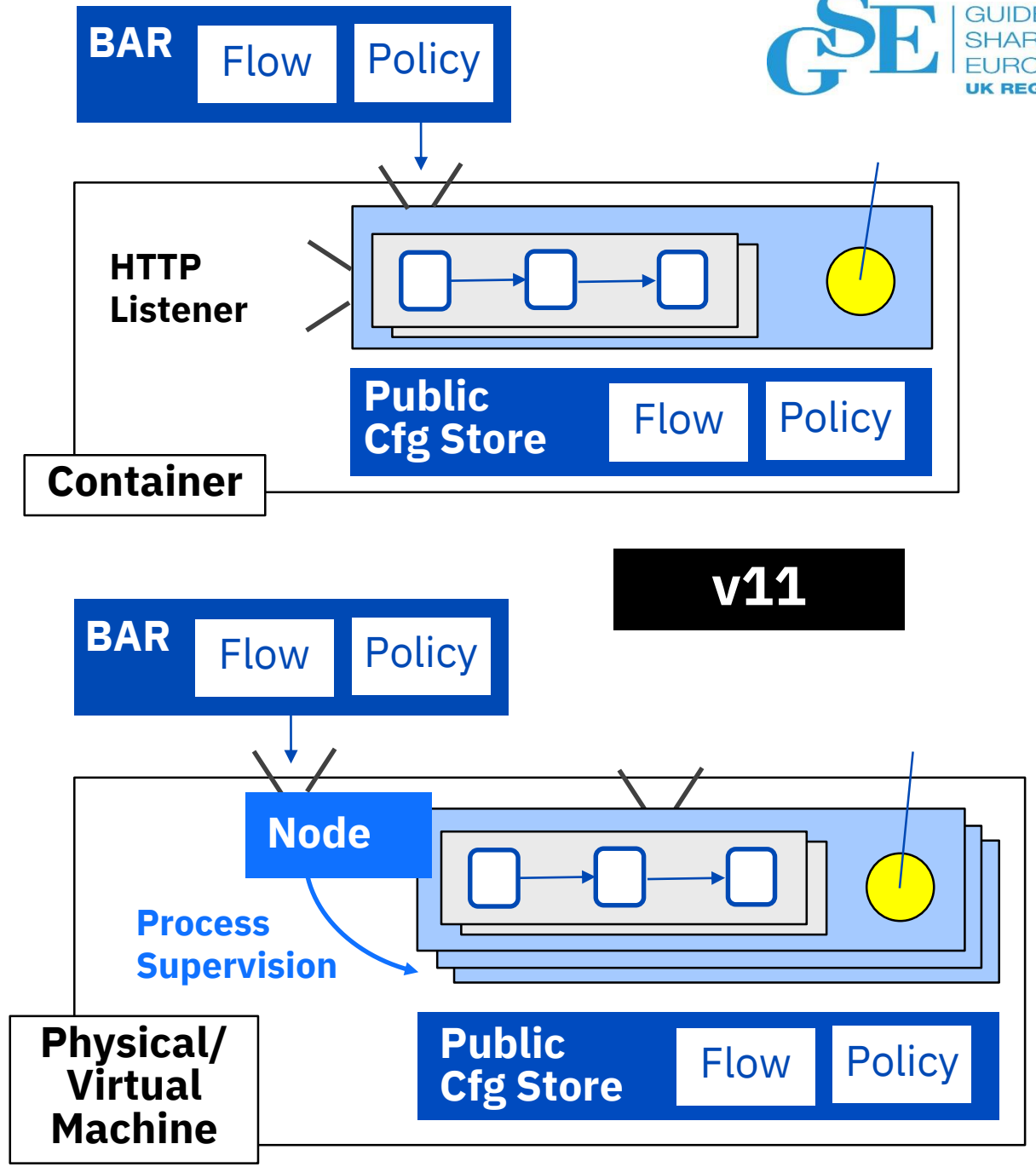
November 2019
Session JJ

ACE Software

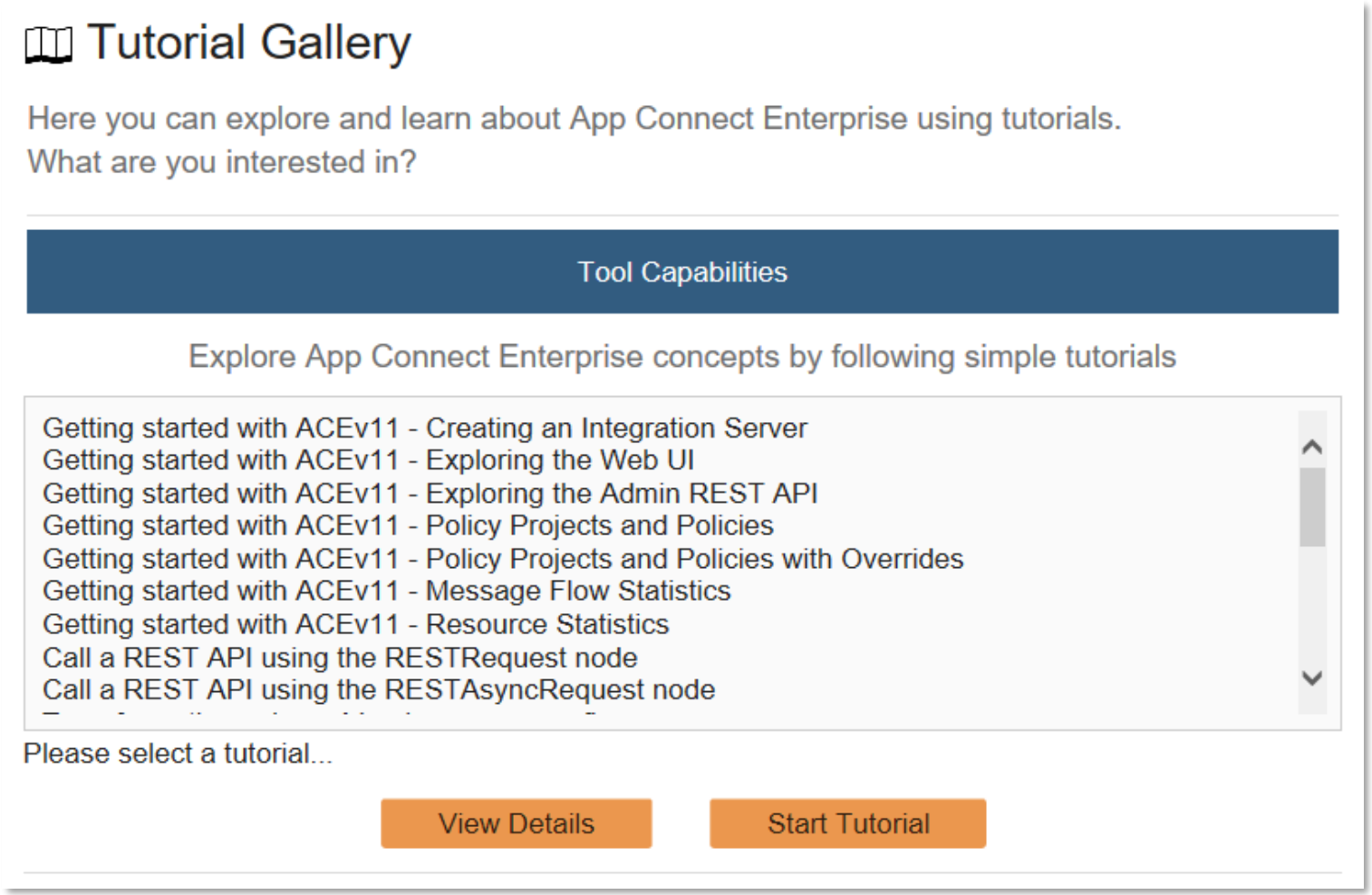
A Quick Reminder!

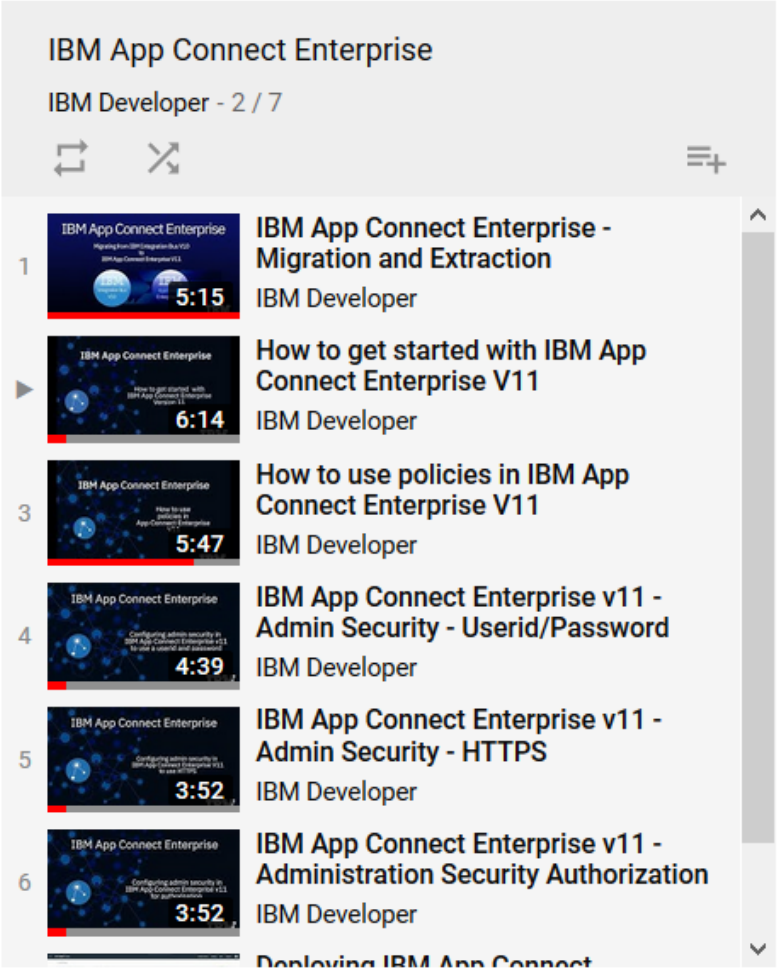


UNZIP and GO !



Getting Started – Tutorials and Youtube Videos





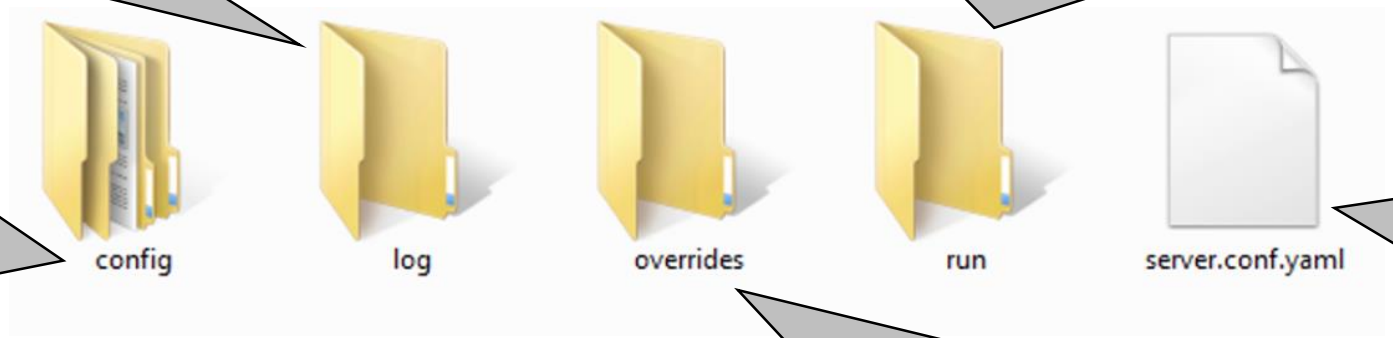
https://www.youtube.com/playlist?list=PLzpeuWUENMK3ttFsZraPRNN4XhkoS2Hte

```
C:\Program Files\IBM\ACE\11.0.0.4>  mqsicreateworkdir C:\myServer
```

```
IntegrationServer
          --work-dir C:\myServer
          --admin-rest-api 7600
          --http-port-number 7900
          --name myServer
          --mq-queue-manager-name myServerQMgr
          --console-log
```

The ***log*** directory holds event files containing BIP messages.

The ***run*** directory contains the unzipped deployed content from BAR files.

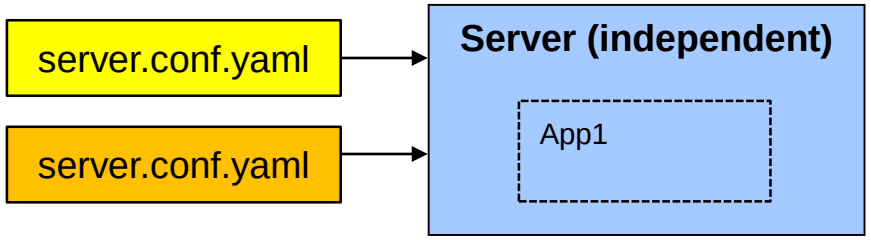


server.conf.yaml contains configuration for how the Integration Server should run.

The ***config*** directory holds configuration files (eg for loopback, switch, security config etc.)

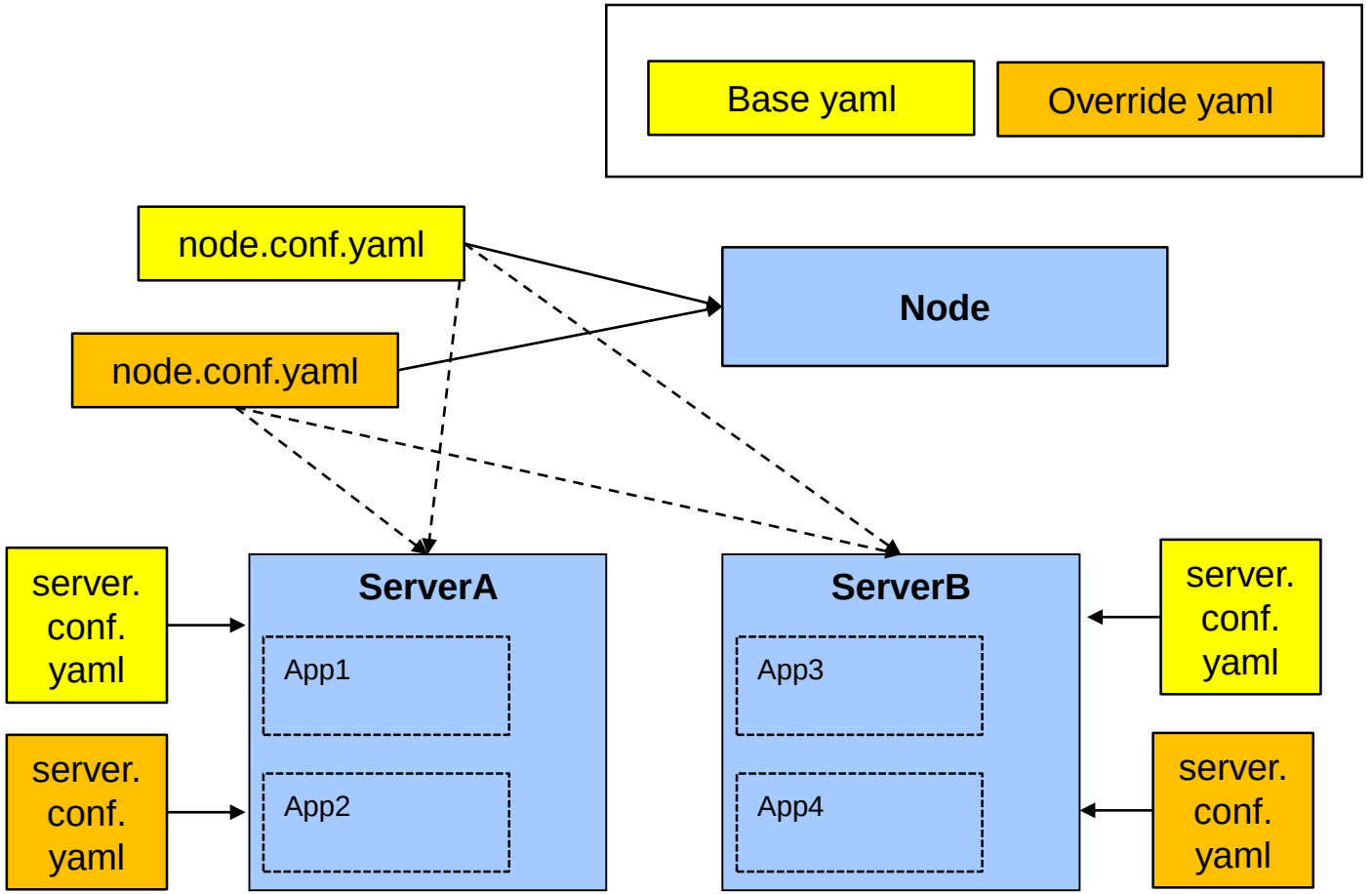
The ***overrides*** directory holds files which override server configuration or policies.

Configuration of Servers using YAML Files

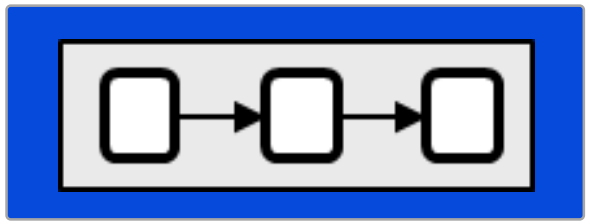


- overrides/server.conf.yaml are provided so that you can maintain a “template” for behavior which can also be overriden
- Node.conf.yaml provides a limited set of node wide options
- Node-owned servers inherit settings from the node.conf.yaml
- When you create an integration node, the node.conf.yaml file is located at:

  `$MQSI_WORKPATH/components/<Node name>/node.conf.yaml`



Exploring the ACEv11 server.conf.yaml



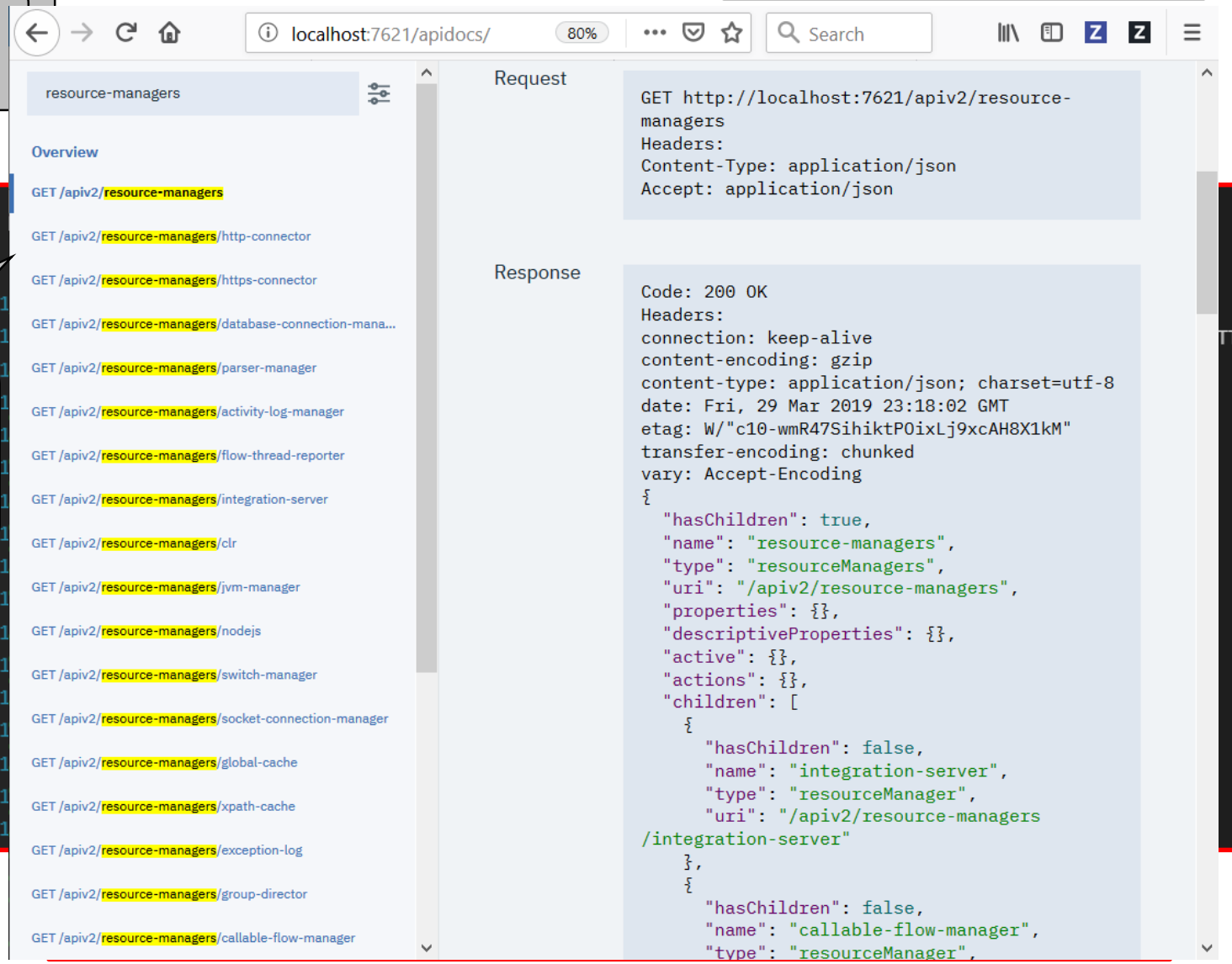
- Log
- RestAdminListener
- Security
- Defaults
- Events
- Monitoring
- Statistics
- UserExits
- BrokerRegistry
- ResourceManagers
  - JVM
  - HTTPConnec
  - HTTPSConne
  - ActivityLogM
  - DatabaseCo
  - SocketConnectionManager
  - ContentBasedFiltering
  - FTEAgent
  - ConnectorProviders
    - SAPConnectorProvider
    - SiebelConnectorProvider
    - PeopleSoftConnectorProvider
- UserVariables

Rest

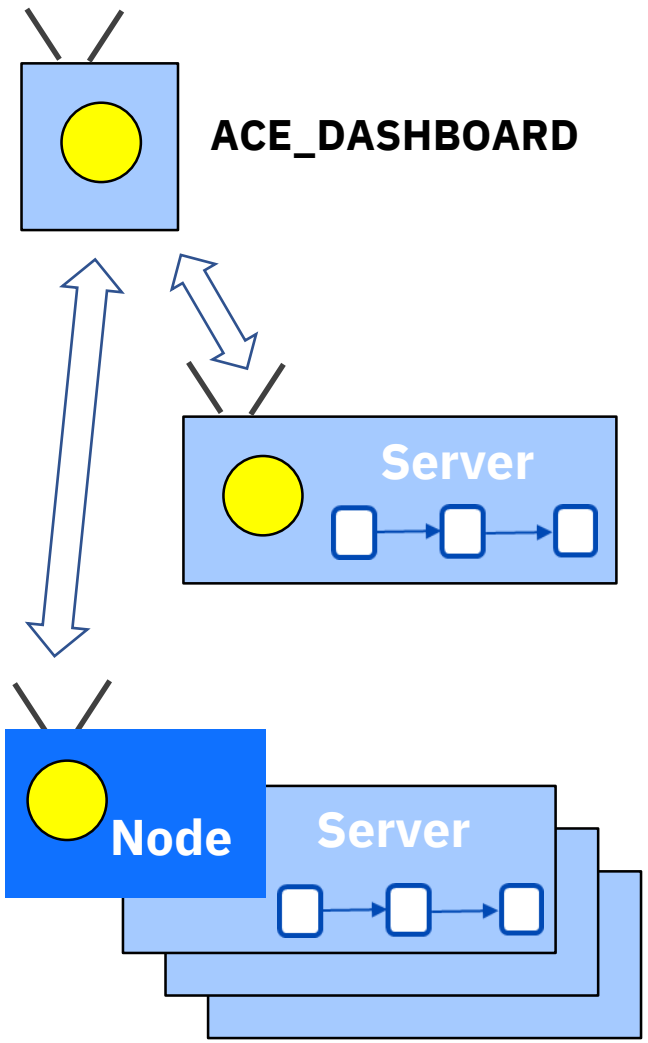
Statistics

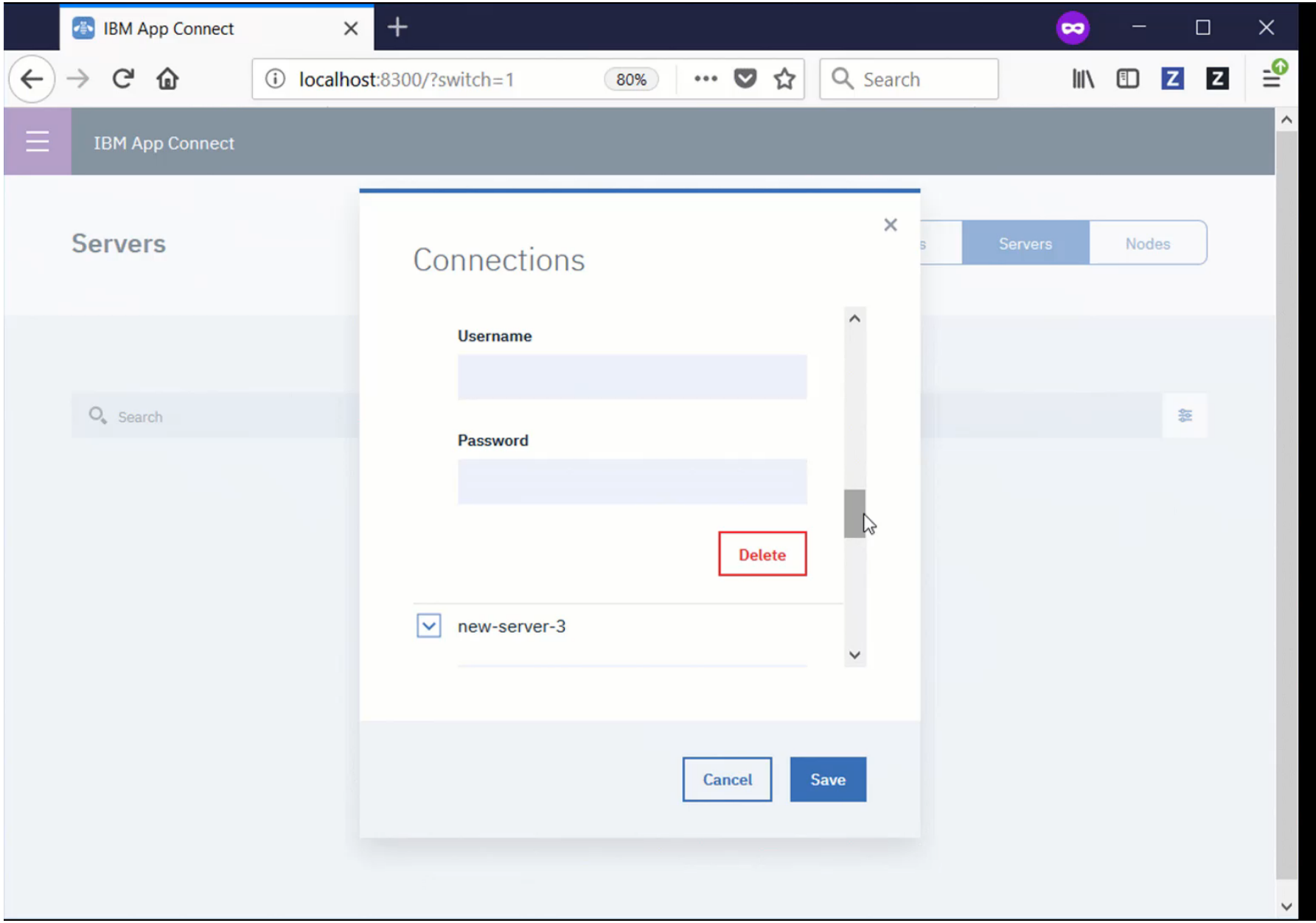
JVM ResourceManager

The resource managers are available to view using a GET method.

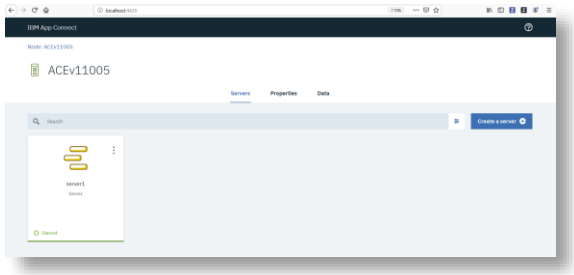


The Administration Web User Interface

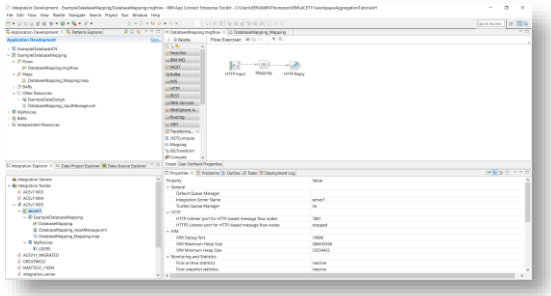




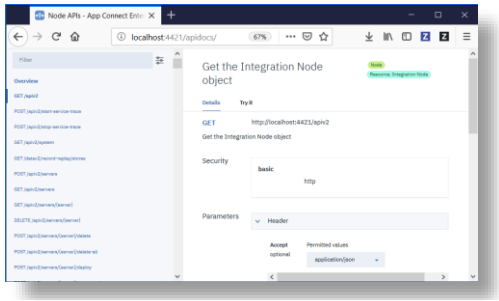
ACE Web UI



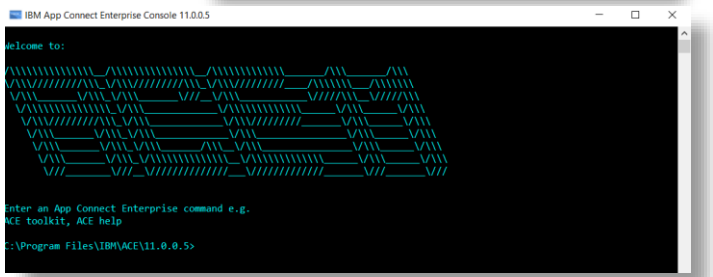
ACE Toolkit



ACE REST API



Commands



HTTP / S

HTTP / S

HTTP / S

Unix Domain Sockets / Windows Name Pipes

bipbroker.exe

NodeJS web application

NodeJS Express Server

REST Handler

REST Forwarding

Authorization

Unix Domain Sockets / Windows Named Pipes

REST Handler

DataFlowEngine.exe

HTTP / S

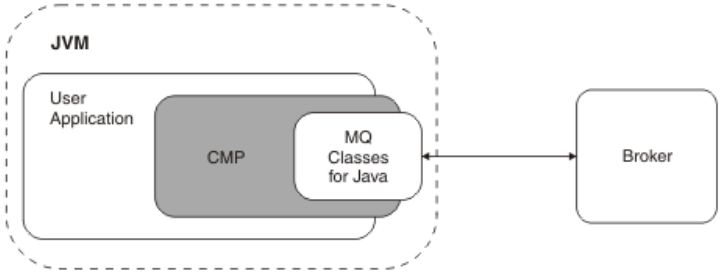
UDS / Win Pipes

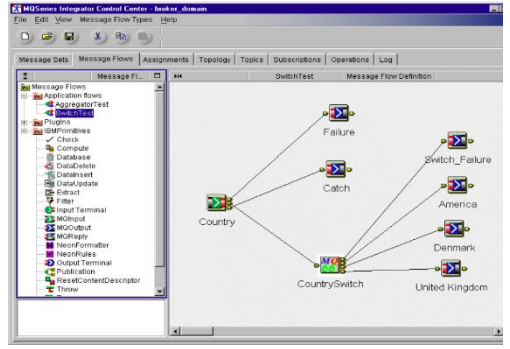
IntegrationServer.exe

REST Handler

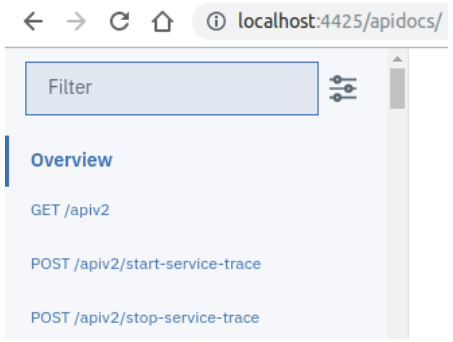
The Evolution of the Integration API

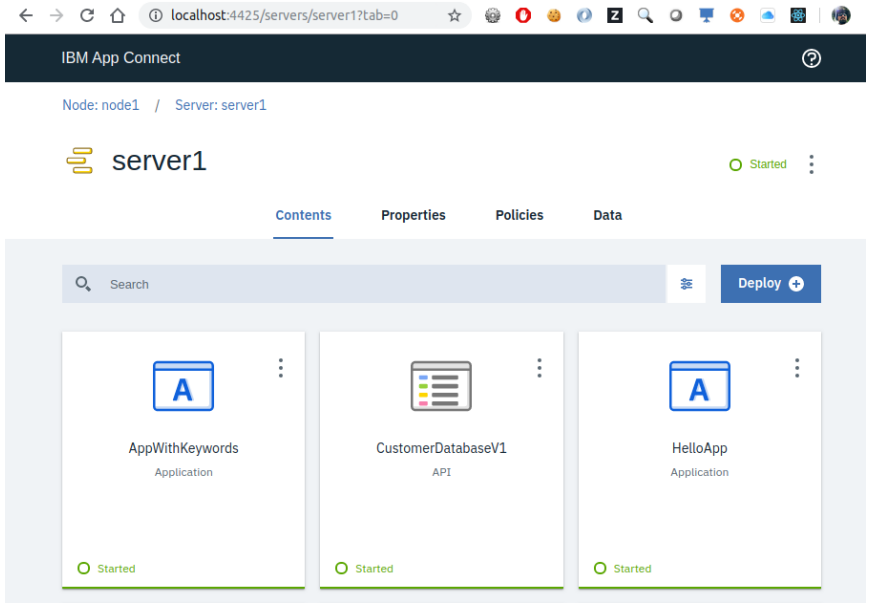
- **Configuration Manager Proxy (CMP)**
  - Used internally in WBIMB V5 released in 2003
  - Externalised in WMB V6, V6.1 released in 2005
  - Configuration Manager hosted inside the Broker
  - Eclipse admin toolkit used it for all communication
  - Comms using custom XML format over MQ Queue Managers
  - Could be used inside Java Compute Node for dynamic administration





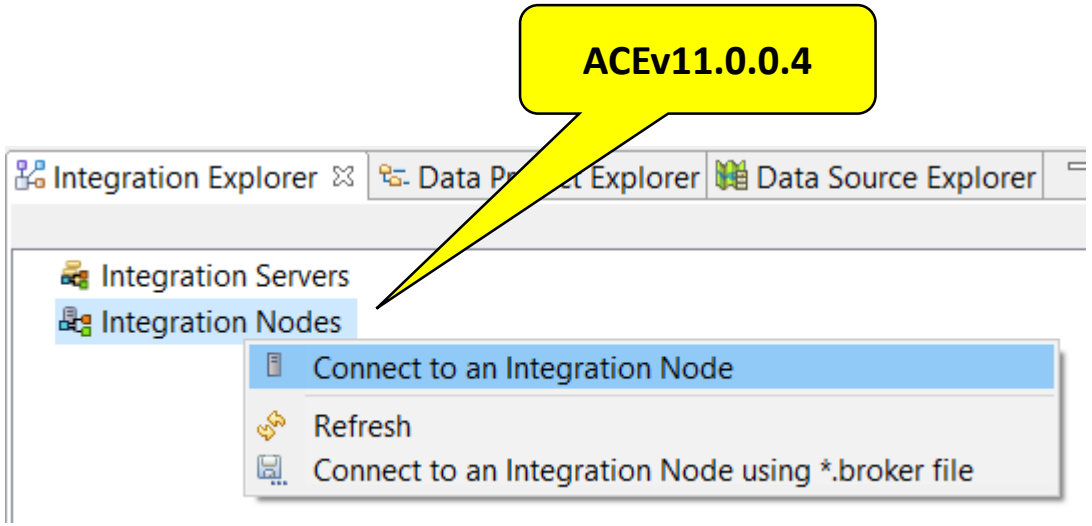
- **REST admin**
  - First used in IIB v10 (2015) by the web ui
  - No longer MQ dependent
  - Cloud driven, programming language agnostic
  - Use any language you want with a HTTP Client



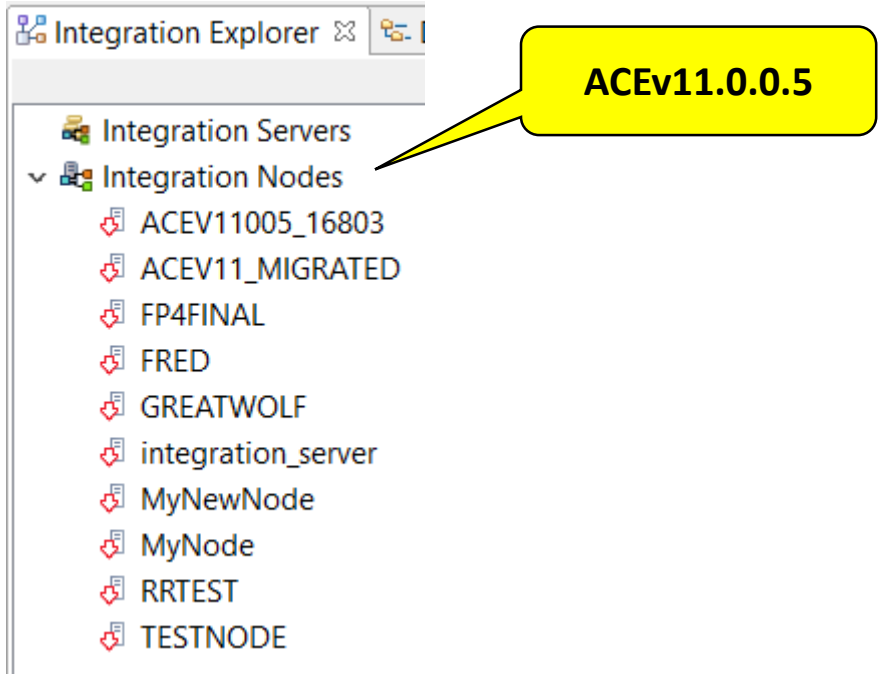


- **Integration API**
  - ACE v11 (2019)
  - Java administration interface backed by our Integration Admin HTTP Client
  - Uses same REST admin layer as the web ui (/apiv2)
  - Local direct connection to an Integration Server via unix domain sockets and named pipes (user access needed to the pipe)
  - Remote `web` style connection using security as previously available

Toolkit Enhancements driven by the Integration API

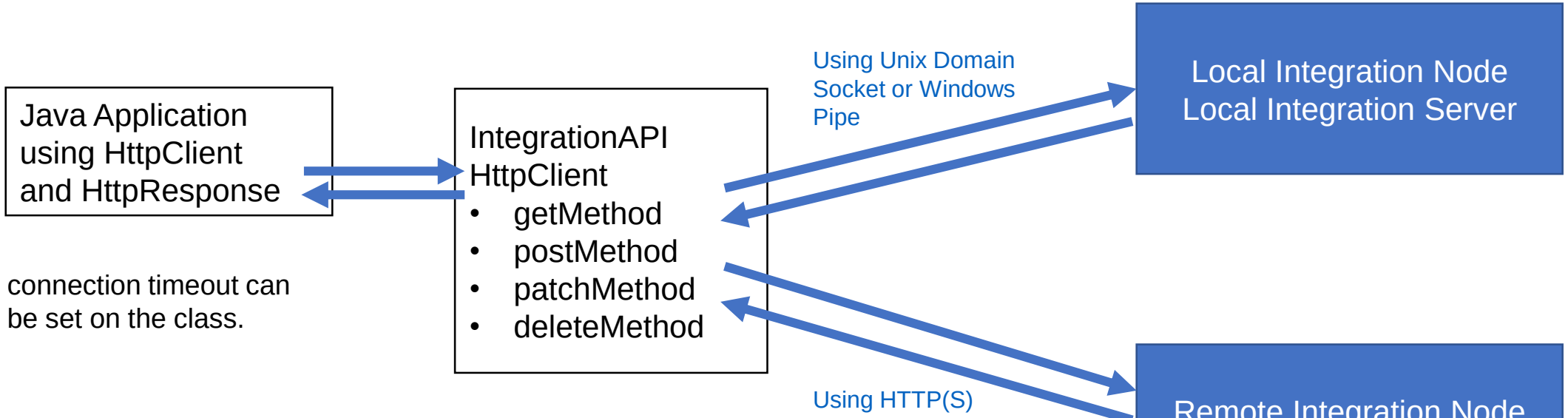


- ACEv11.0.0.4 Toolkit connects to local and remote Integration Nodes and Integration Servers using the HTTP administrative REST API



- ACEv11.0.0.5 Toolkit will display local integration nodes without requiring connection details, through restructuring based upon Integration API enhancements

The HttpClient and HttpResponse Overview



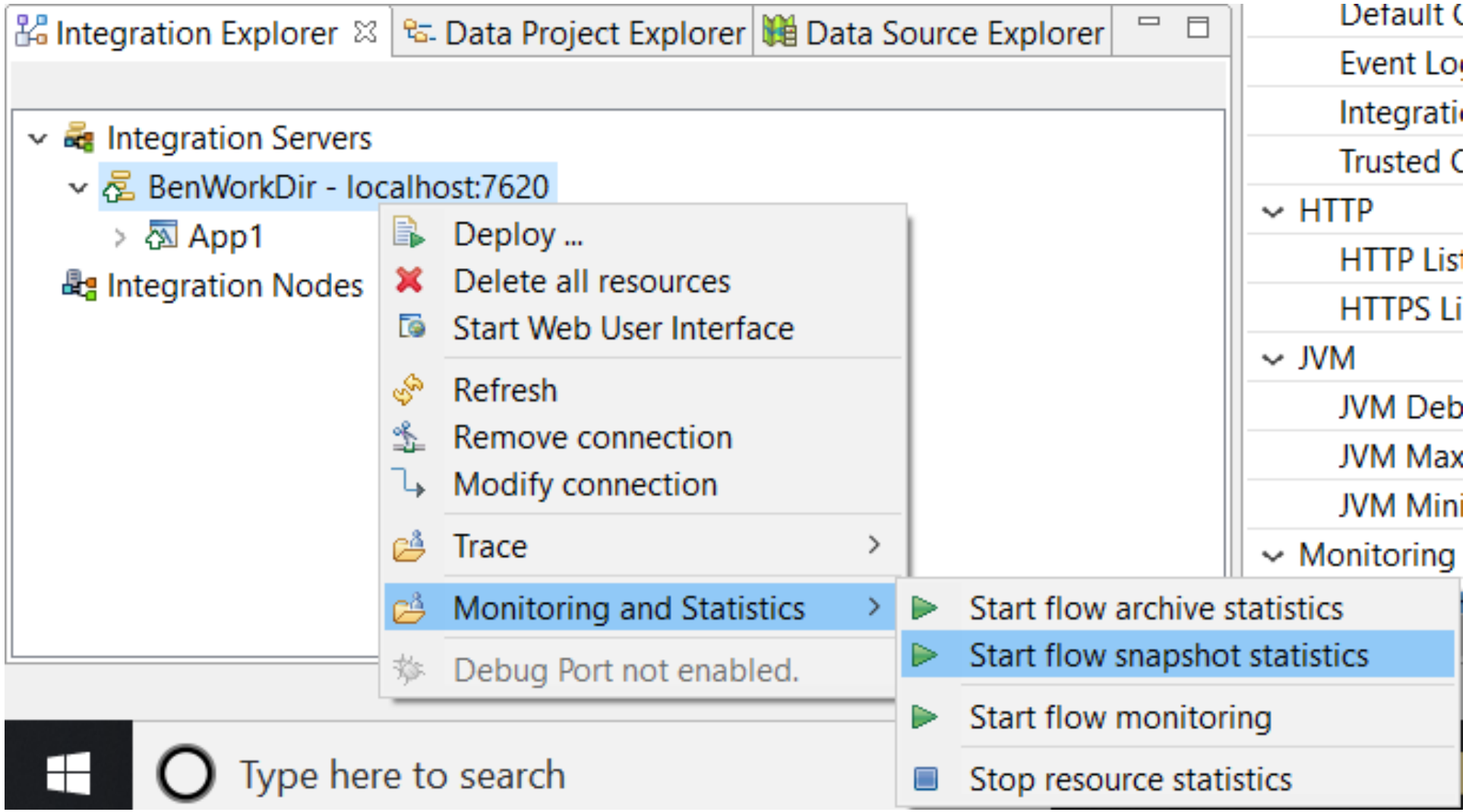
- connection timeout can be set on the class.

[Content-Type: application/json; charset=utf-8, Content-Length: 368, ETag: W/"170-CT8Knn/BTUaSyOA2LeRLdp0yWbM", Vary: Accept-Encoding, Date: Mon, 10 Jun 2019 16:48:09 GMT, Connection: close]
HTTP/1.1 200 OK
Content-Length: 368

HttpResponse can be used to access the status code, reason, header and body.

{"type":"integrationServers","children":[{"name":"server1","hasChildren":true,"uri":"/apiv2/servers/server1","type":"integrationServer","active":{"processId":43573,"isRunning":true,"state":"started"}},{"name":"serverBeta","hasChildren":true,"uri":"/apiv2/servers/serverBeta","type":"integrationServer","active":{"processId":78716,"isRunning":true,"state":"started"}}]}

Sticky Monitoring and Statistics



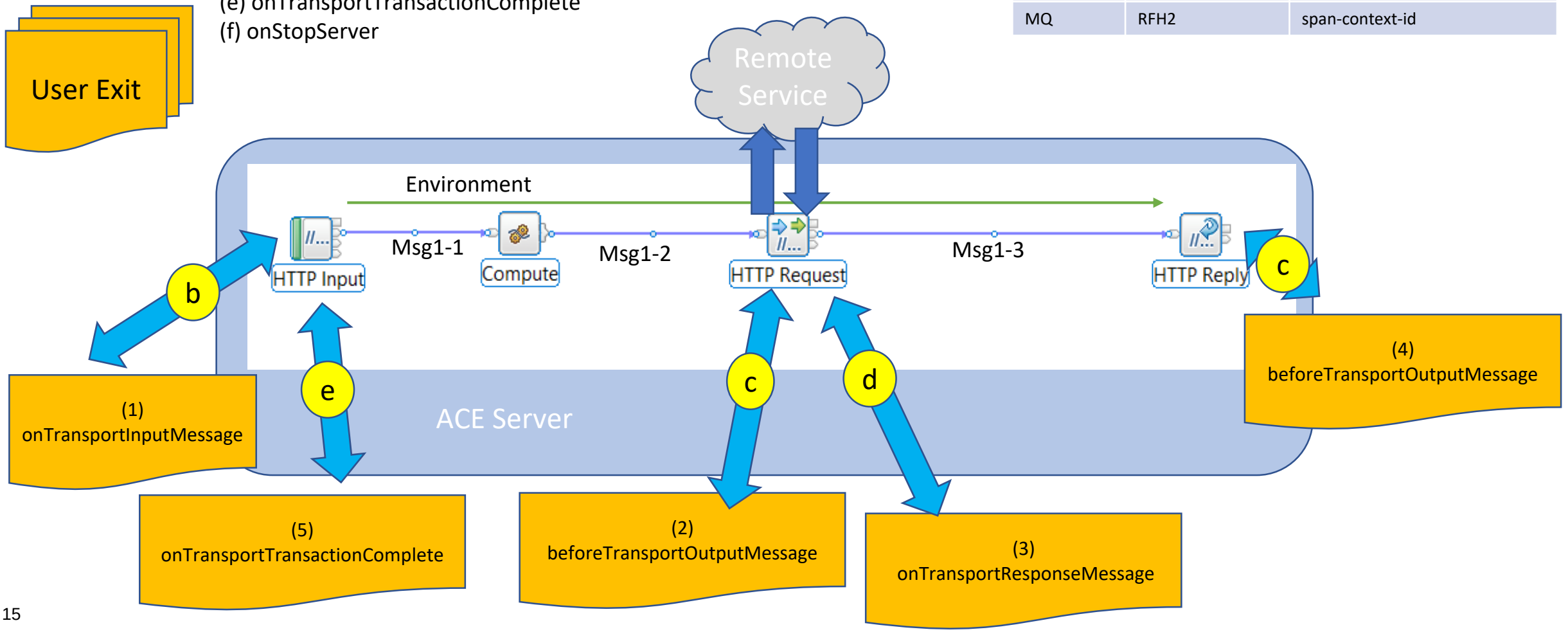
```
{
  "hasChildren": false,
  "name": "snapshot",
  "type": "snapshot",
  "uri": "/apiv2/statistics/snapshot",
  "properties": {
    "accountingOrigin": "inherit",
    "name": "Snapshot",
    "nodeDataLevel": "inherit",
    "outputFormat": "inherit",
    "publicationOn": "inherit",
    "threadDataLevel": "inherit",
    "type": "Snapshot"
  },
  "descriptiveProperties": {},
  "active": {
    "accountingOrigin": "none",
    "nodeDataLevel": "none",
    "outputFormat": "usertrace",
    "publicationOn": "inactive",
    "threadDataLevel": "none"
  },
  "actions": {
    "available": {
      "start-collection": "/apiv2/statistics/snapshot/start-collection"
    },
    "unavailable": {
      "stop-collection": "/apiv2/statistics/snapshot/stop-collection"
    }
  },
  "children": {},
  "links": []
}
```


- mqsichangeflowstats is now persisted (sticky) by default
- A new --non-persist option preserves old behaviour if desired
- mqsireportflowstats mirrors the same options
- Note the 2 line Active / Configured reporting layout shown on the next chart
- There is also a verbose option to show thread level and accounting origin

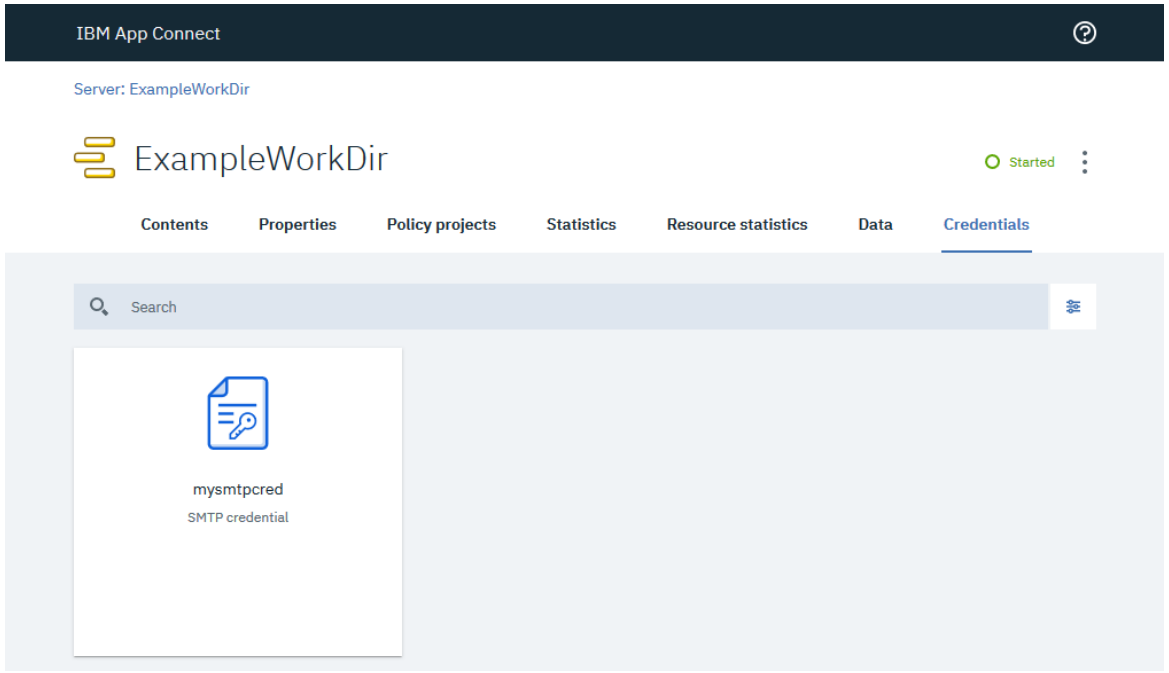
User Exit Callback Invocations for an HTTP Sync Flow

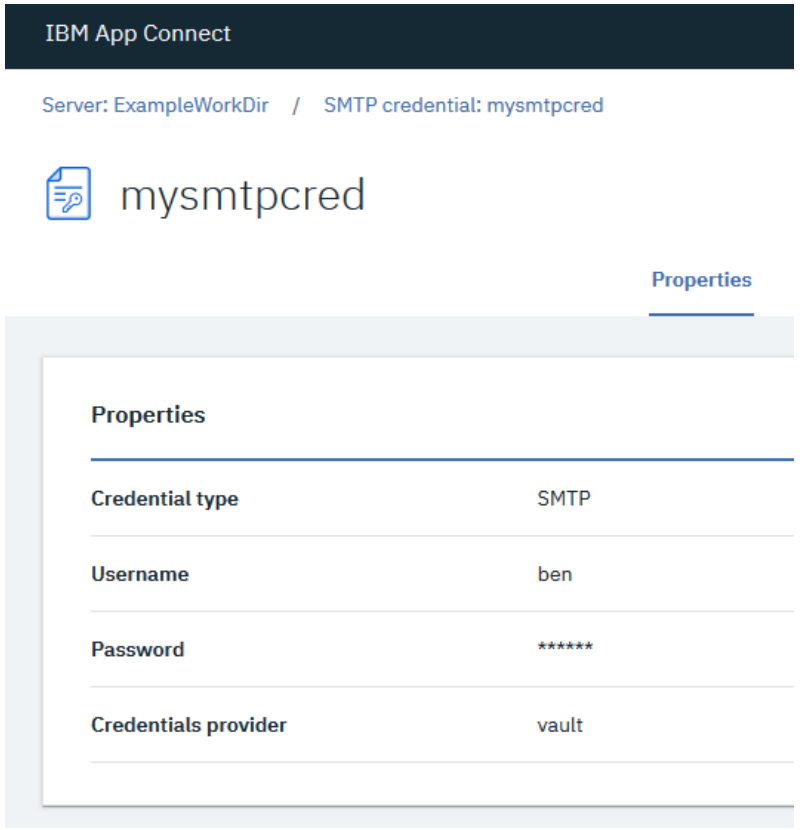
(a) onStartServer
(b) onTransportInputMessage
(c) beforeTransportOutputMessage
(d) onTransportResponseMessage
(e) onTransportTransactionComplete
(f) onStopServer

Transport	Location	FieldName
HTTP	HTTPHeader	span-context-id
HTTP	HTTPHeader	X-Remote-Addr
MQ	RFH2	span-context-id



The ACE vault and Encrypted Credentials

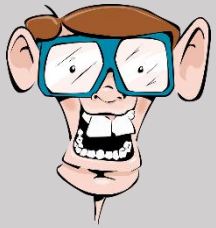




- Create a working directory for an independent integration server:
  `mqsicreateworkdir C:\ExampleWorkDir`
- Create a vault which will hold the encrypted credentials:
  `mqsivault --work-dir C:\ExampleWorkDir --create --vault-key myvaultkey`
- Start the independent integration server (remembering to pass in the value of your vault key!):
  `IntegrationServer --work-dir C:\ExampleWorkDir --vault-key myvaultkey`
- Create a credential in the vault:

```
mqsicredentials --work-dir C:\ExampleWorkDir --vault-key myvaultkey -create
--credential-type smtp --credential-name mysmtpcred --username ben --password
mysmtppassword
```

Configuration of LDAP Authorization

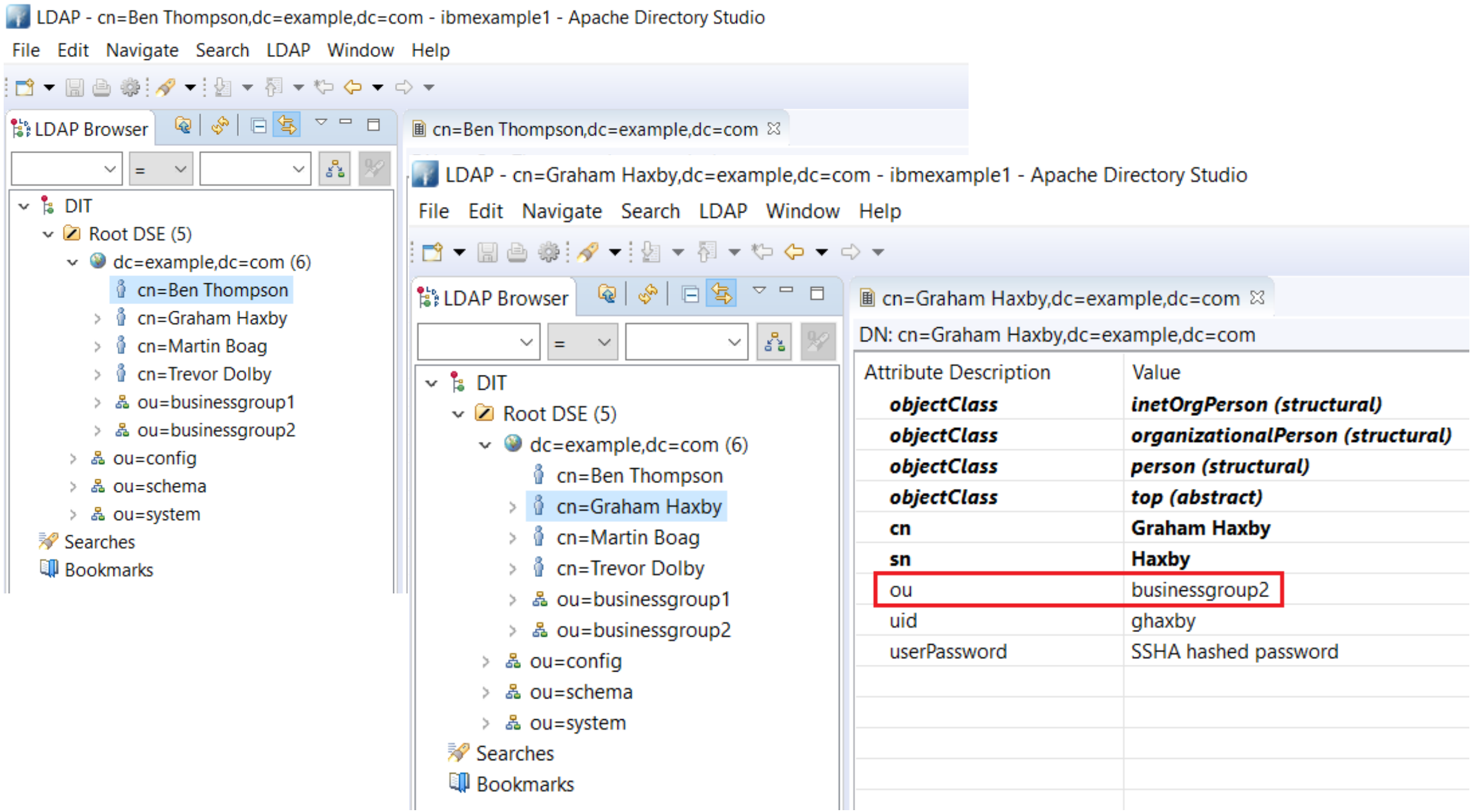
ACE WEB USERS	LDAP USERS LDAP GROUPS	ACE ROLES	ACE PERMISSIONS
 webuserterry	**AUTHENTICATE + AUTHORIZE**	MAP →  aceuser	**read+** *View integration server properties*
 webuserben	**AUTHENTICATE +AUTHORIZE**	MAP →  aceadmin	**read+** *View integration server properties*; **write+** *Set integration server properties*; **execute+** *Start or Stop integration server*
 webusertrevor	**AUTHENTICATE +AUTHORIZE**	MAP →	

SYSTEM.BROKER.AUTH.EG

SYSTEM.BROKER.AUTH.EG

Configuration of LDAP Authorization

```
57    # Admin Security
58    #  Authentication
59    basicAuth: true                                    # Clients web user name and password will be authenticated when set true
60    ldapUrl: ldap://ibmexample1:10389/dc=example,dc=com  # ldap authentication url
61    ldapBindDn: ldap::alias                            # Resource alias or full bind dn
62    ldapBindPassword: ldap::alias                      # Resource alias or bind password
63    #  Authorization
64    authorizationEnabled: true     # Clients web user role will be authorized when set true
65    authorizationMode: 'ldap'       # Set authorization mode. Choose 1 of : ldap, file or mq
66    ldapAuthorizeUrl: ldap://ibmexample1:10389/dc=example,dc=com?ou?sub?(cn={{username}})  # ldap authorization search url
67
68  Security:
69    LdapAuthorizeAttributeToRoleMap:
70      # When 'authMode' is ldap, set the mapping from a matched LDAP authorization attribute, as
71      # configured in 'ldapAuthorizeUrl' to the ACE web user role name
72      # e.g. map the following LDAP group DNs to web user roles 'adminRole', 'viewRole'
73      'businessgroup1': 'adminRole'
74      'businessgroup2': 'viewRole'
75    Permissions:
76      # Set Admin Security Authorization file permissions by web user role using 'read+:write+:execute+' , or 'all+'
77      # '+' grants permission, '-' denies permission
78      # e.g. define the following web user roles 'viewRole' and 'adminRole'
79      viewRole:  'read+:write-:execute-'
80      adminRole: 'all+'
```


LDAP - cn=Ben Thompson,dc=example,dc=com - ibmexample1 - Apache Directory Studio
File Edit Navigate Search LDAP Window Help
LDAP Browser
cn=Ben Thompson,dc=example,dc=com
DIT
Root DSE (5)
dc=example,dc=com (6)
cn=Ben Thompson
cn=Graham Haxby
cn=Martin Boag
cn=Trevor Dolby
ou=businessgroup1
ou=businessgroup2
ou=config
ou=schema
ou=system
Searches
Bookmarks
LDAP - cn=Graham Haxby,dc=example,dc=com - ibmexample1 - Apache Directory Studio
File Edit Navigate Search LDAP Window Help
LDAP Browser
cn=Graham Haxby,dc=example,dc=com
DN: cn=Graham Haxby,dc=example,dc=com
Attribute Description
Value
objectClass
inetOrgPerson (structural)
objectClass
organizationalPerson (structural)
objectClass
person (structural)
objectClass
top (abstract)
cn
Graham Haxby
sn
Haxby
ou
businessgroup2
uid
ghaxby
userPassword
SSHA hashed password
DIT
Root DSE (5)
dc=example,dc=com (6)
cn=Ben Thompson
cn=Graham Haxby
cn=Martin Boag
cn=Trevor Dolby
ou=businessgroup1
ou=businessgroup2
ou=config
ou=schema
ou=system
Searches
Bookmarks

Record and Replay

/datav2/servers/{server}/record-replay/stores

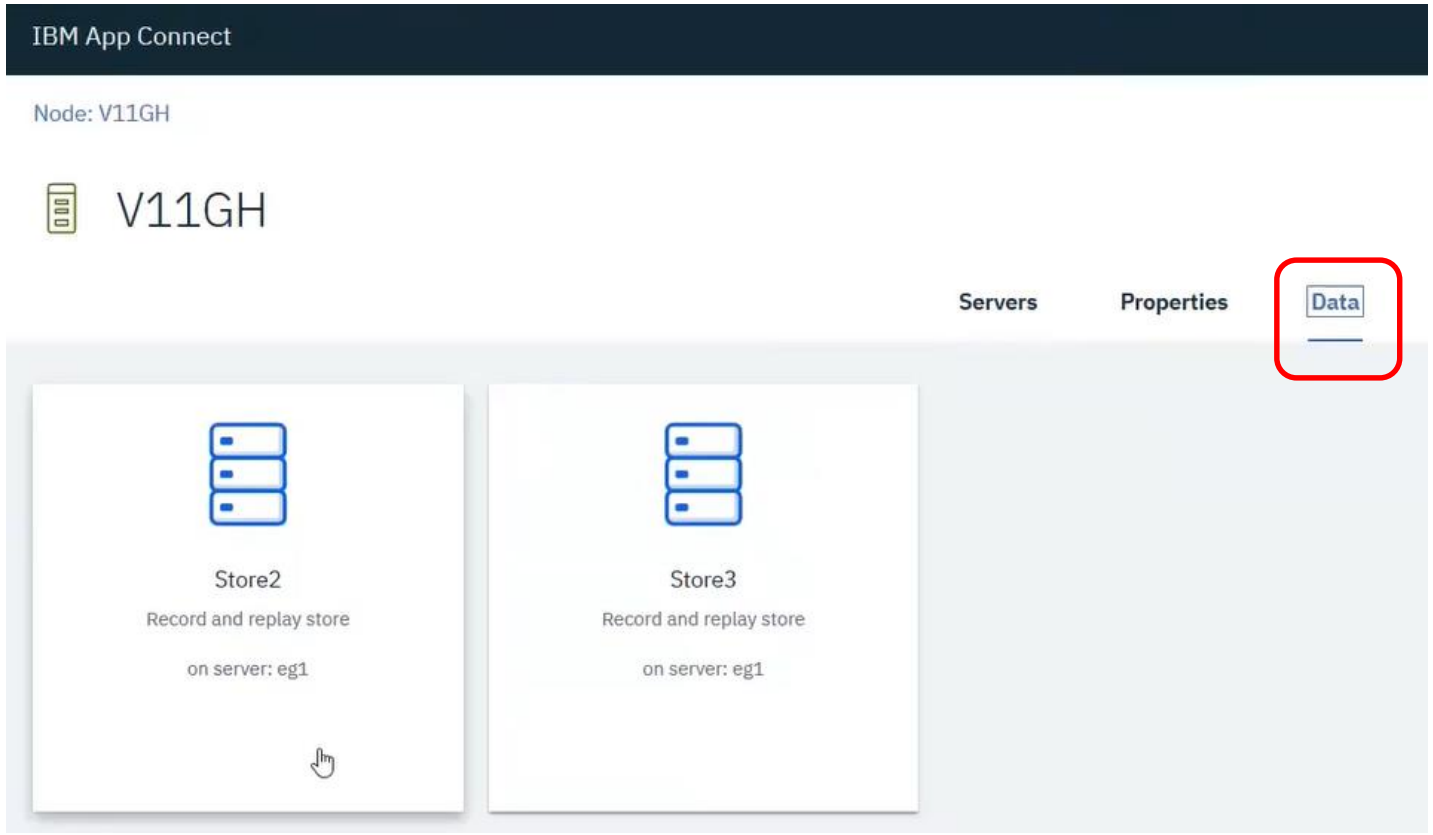
/datav2/servers/{server}/record-replay/destinations

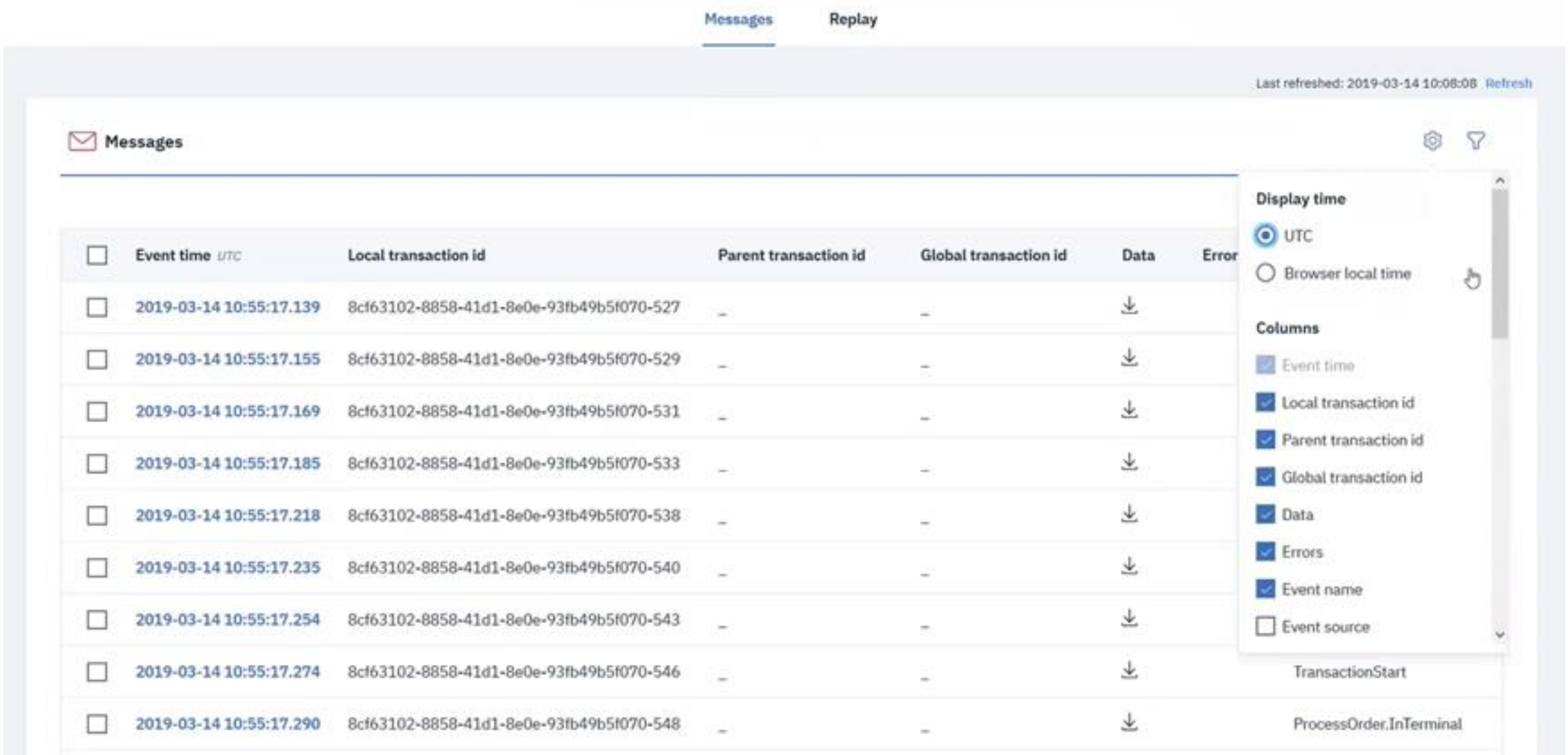
Stores

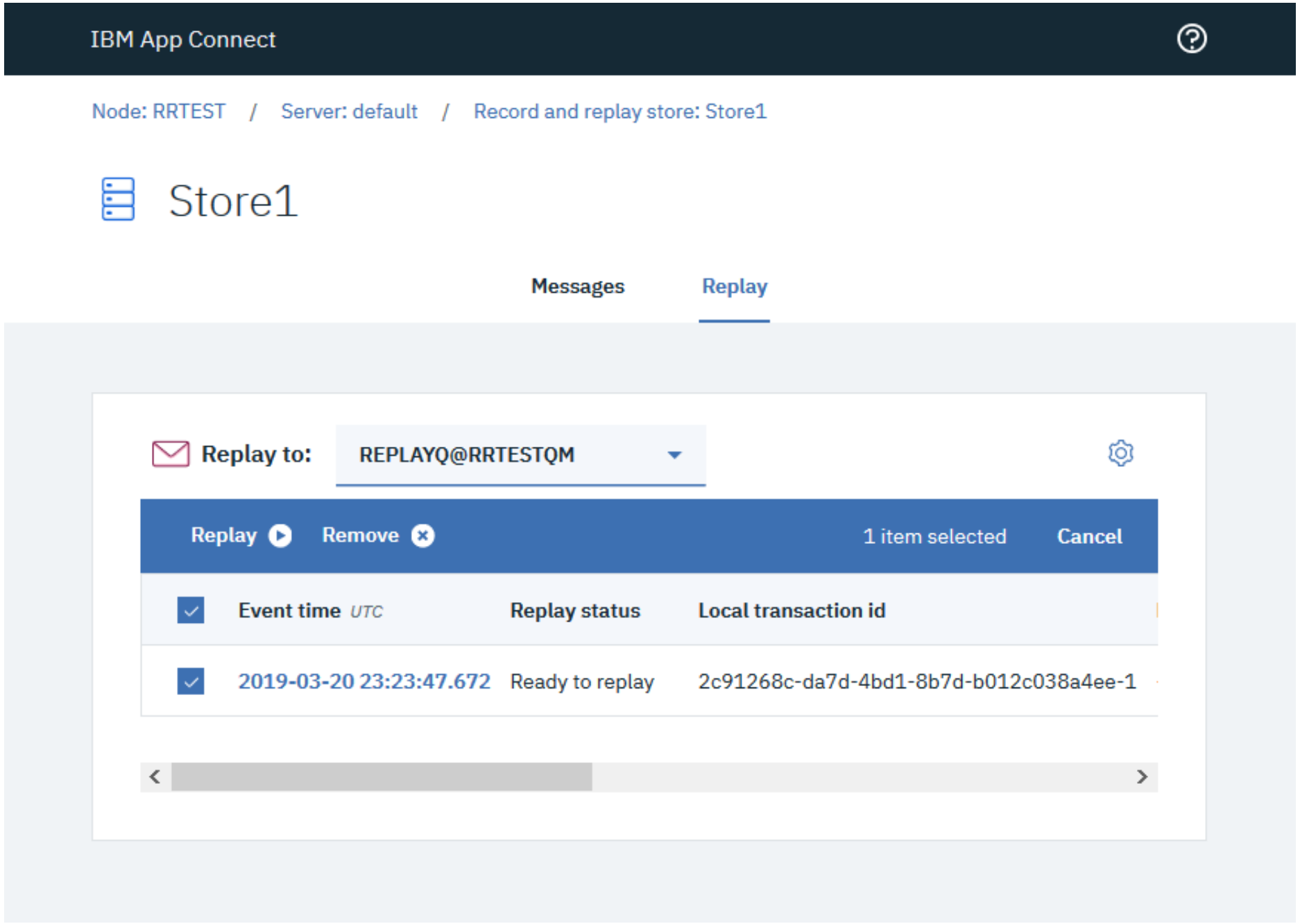
Sources

Destinations

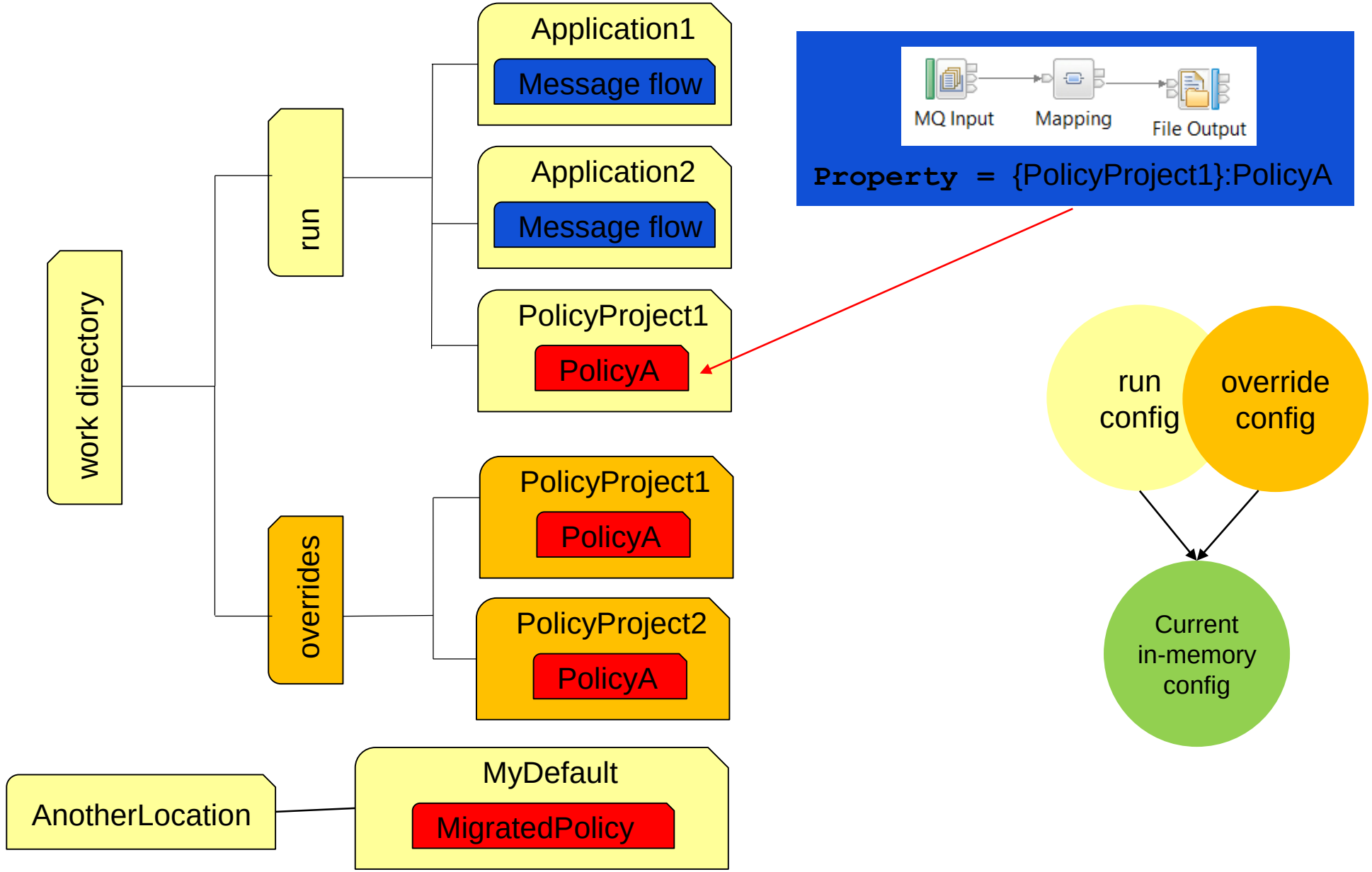
/datav2/servers/{server}/record-replay/sources




Messages
Replay
Last refreshed: 2019-03-14 10:08:08 Refresh
Messages
Event time UTC
Local transaction id
Parent transaction id
Global transaction id
Data
Error
2019-03-14 10:55:17.139 8cf63102-8858-41d1-8e0e-93fb49b5f070-527
2019-03-14 10:55:17.155 8cf63102-8858-41d1-8e0e-93fb49b5f070-529
2019-03-14 10:55:17.169 8cf63102-8858-41d1-8e0e-93fb49b5f070-531
2019-03-14 10:55:17.185 8cf63102-8858-41d1-8e0e-93fb49b5f070-533
2019-03-14 10:55:17.218 8cf63102-8858-41d1-8e0e-93fb49b5f070-538
2019-03-14 10:55:17.235 8cf63102-8858-41d1-8e0e-93fb49b5f070-540
2019-03-14 10:55:17.254 8cf63102-8858-41d1-8e0e-93fb49b5f070-543
2019-03-14 10:55:17.274 8cf63102-8858-41d1-8e0e-93fb49b5f070-546
TransactionStart
2019-03-14 10:55:17.290 8cf63102-8858-41d1-8e0e-93fb49b5f070-548
ProcessOrder.InTerminal
Display time
UTC
Browser local time
Columns
Event time
Local transaction id
Parent transaction id
Global transaction id
Data
Errors
Event name
Event source


IBM App Connect
Node: RRTEST / Server: default / Record and replay store: Store1
Store1
Messages
Replay
Replay to:
REPLAYQ@RRTESTQM
Replay
Remove
1 item selected
Cancel
Event time UTC
Replay status
Local transaction id
2019-03-20 23:23:47.672
Ready to replay
2c91268c-da7d-4bd1-8b7d-b012c038a4ee-1

Policy and Override Behaviour

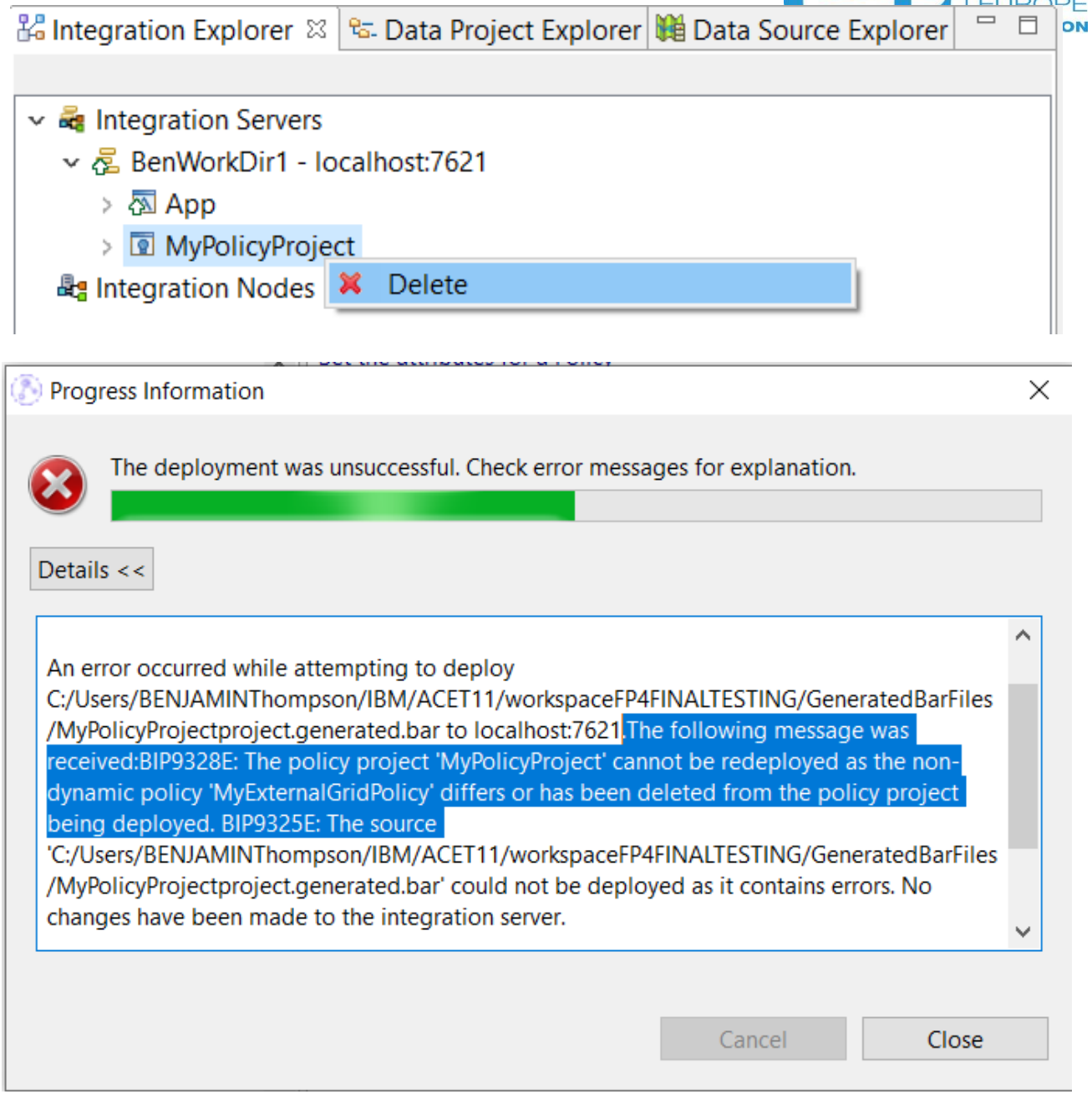


Redeploying Policies

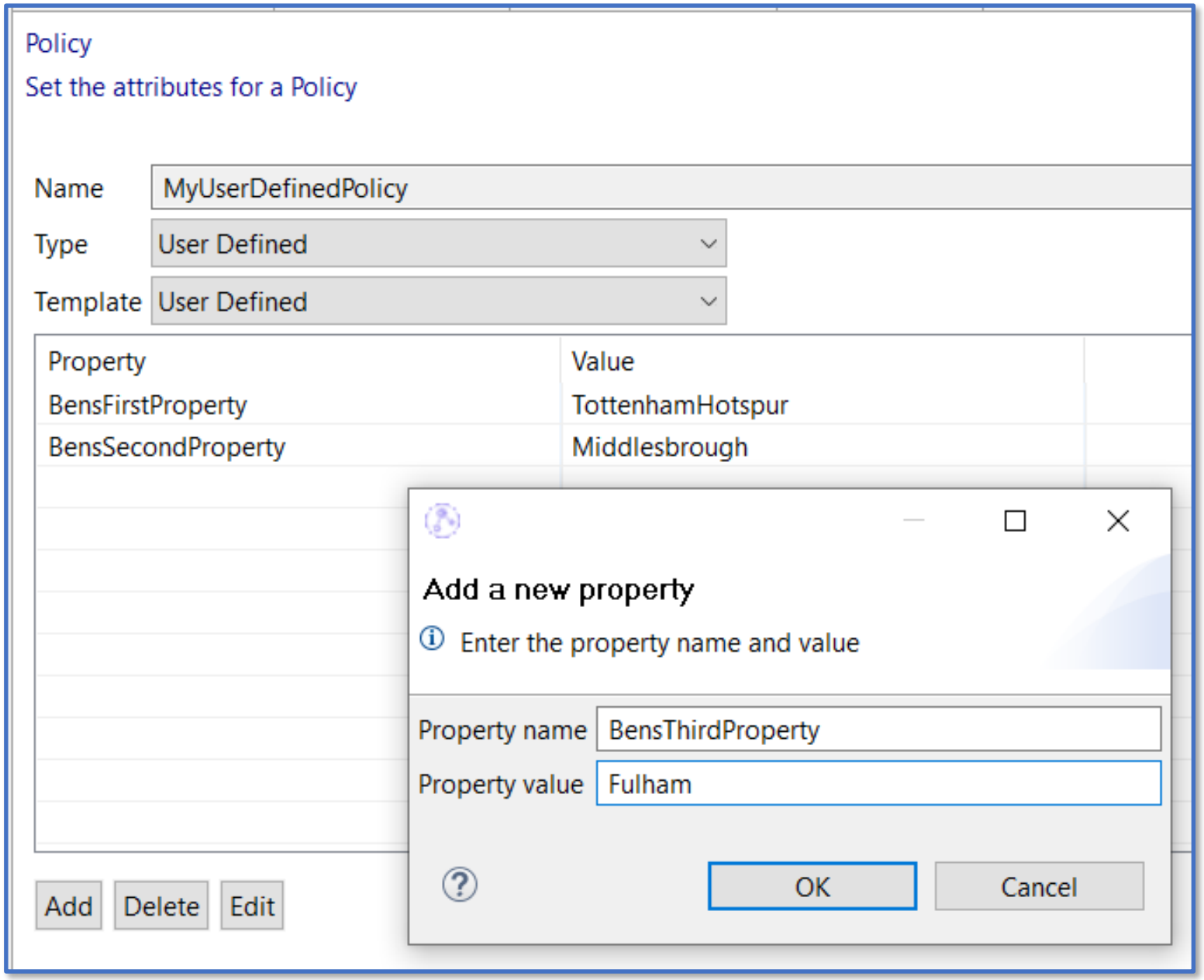
- The following policy types can be redeployed:
  - **Aggregation**
  - **CDServer**
  - **CICSConnection**
  - **Collector**
  - **EmailServer**
  - **FtpServer**
  - **Resequence**
  - **SAPConnection**
  - **SMTP**
  - **Timer**
  - **WorkloadManagement**
  - **ActivityLog (v11.0.0.5)**
  - **MQEndpoint (v11.0.0.5)**
  - **IMSRequest (v11.0.0.5)**
  - **CORBA (v11.0.0.5)**

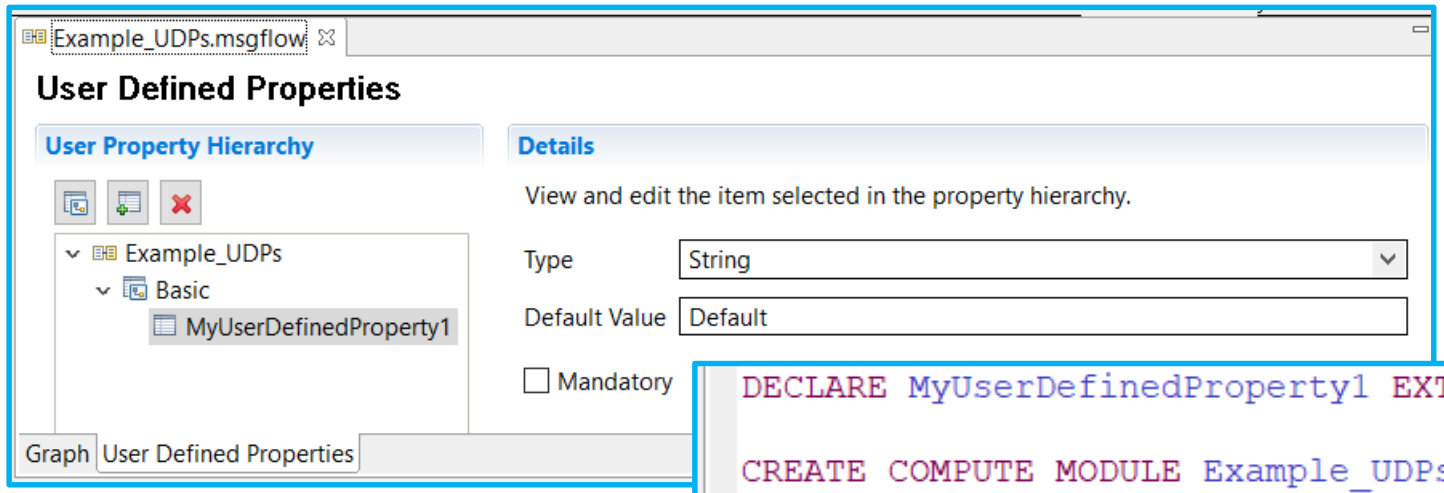
When you redeploy a policy project:

- All message flows using the policy are stopped and restarted.
- Other types of policy (not listed above) cannot be redeployed (yet!)
- In this situation you must delete all deployed resources from the integration server and then deploy a new version of the policy.



User Defined Policy

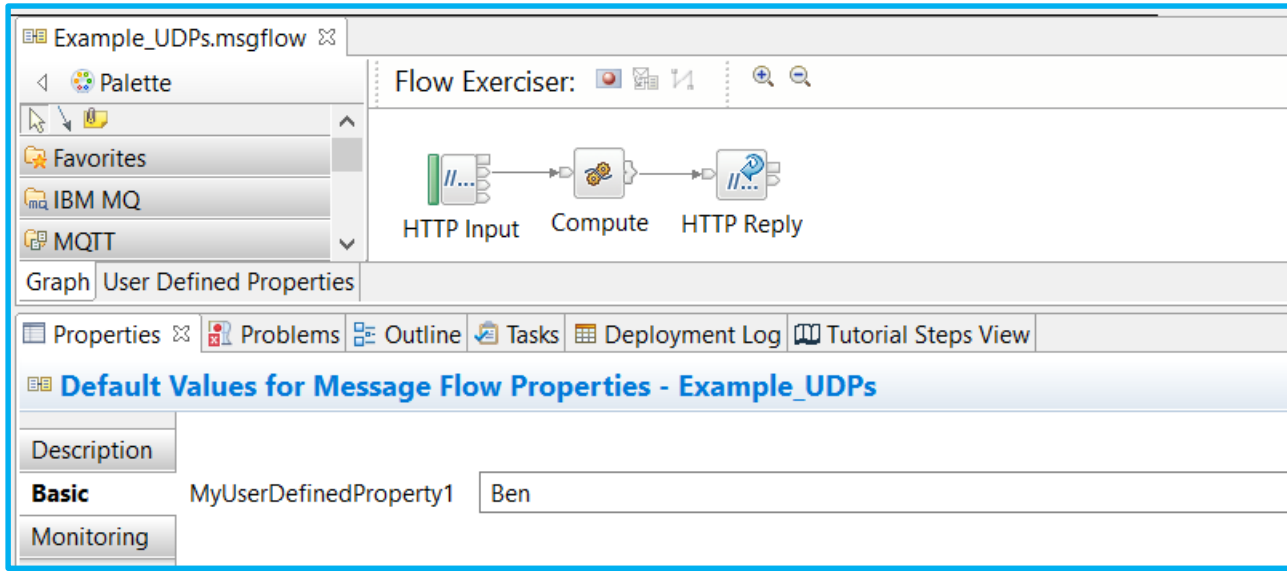




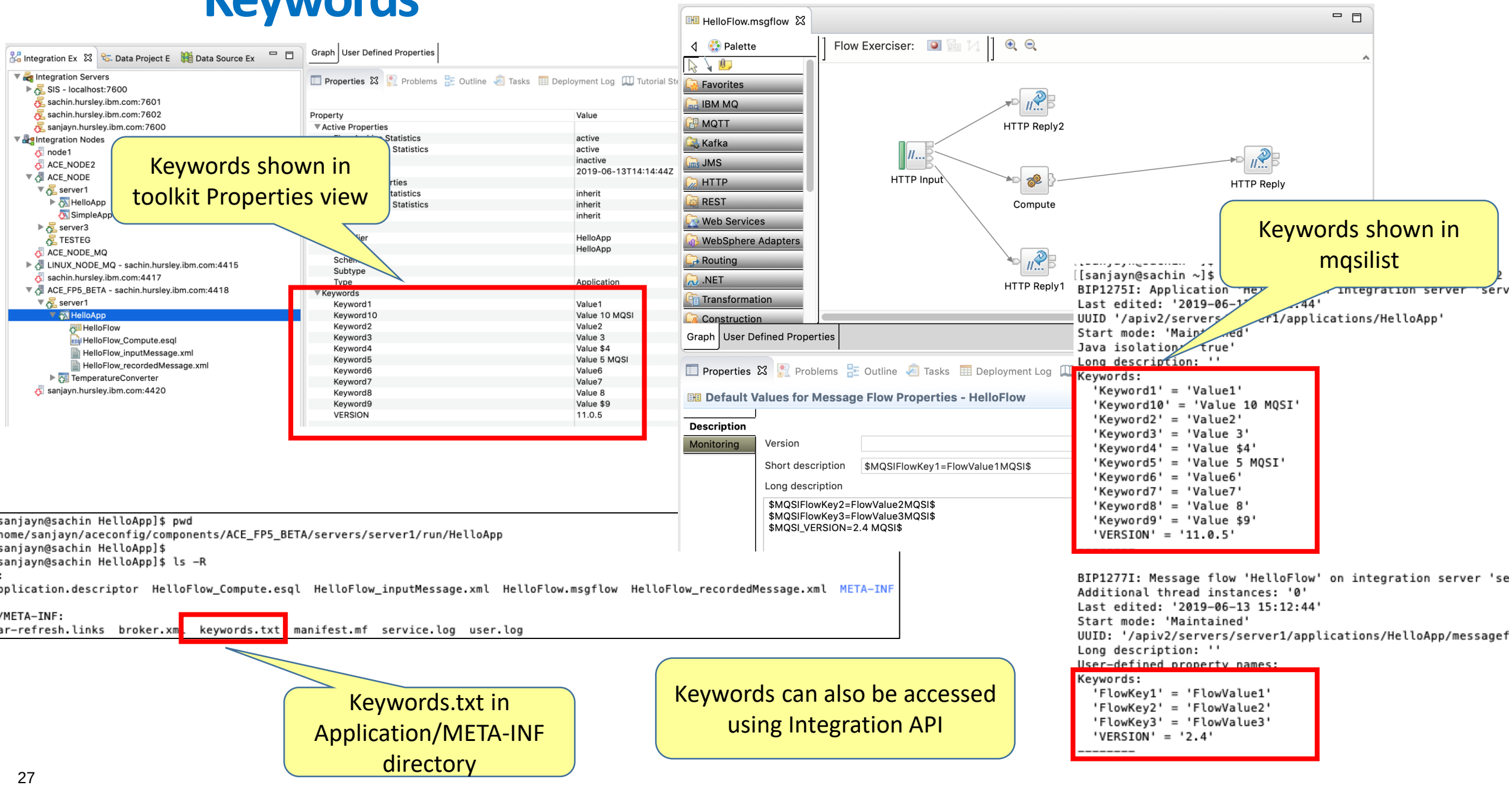

```
DECLARE MyUserDefinedProperty1 EXTERNAL CHARACTER 'Default';

CREATE COMPUTE MODULE Example_UDPs_Compute
    CREATE FUNCTION Main() RETURNS BOOLEAN
    BEGIN
        CALL CopyMessageHeaders();
        CREATE LASTCHILD OF OutputRoot DOMAIN('JSON');
        SET OutputRoot.JSON.Data.MyUserDefinedProperty1 = MyUserDefinedProperty1;
        RETURN TRUE;
    END;
```

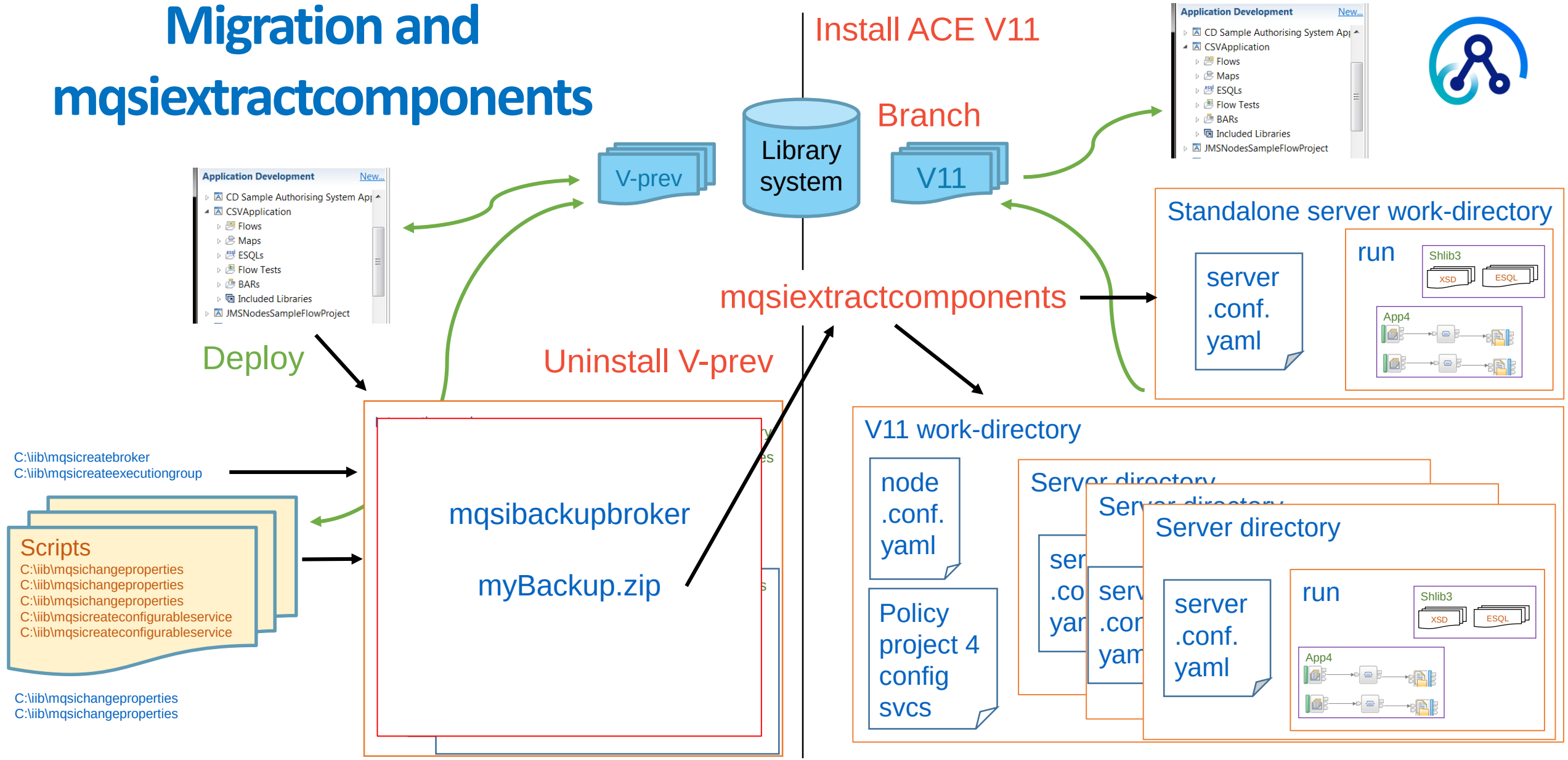
User Defined Properties



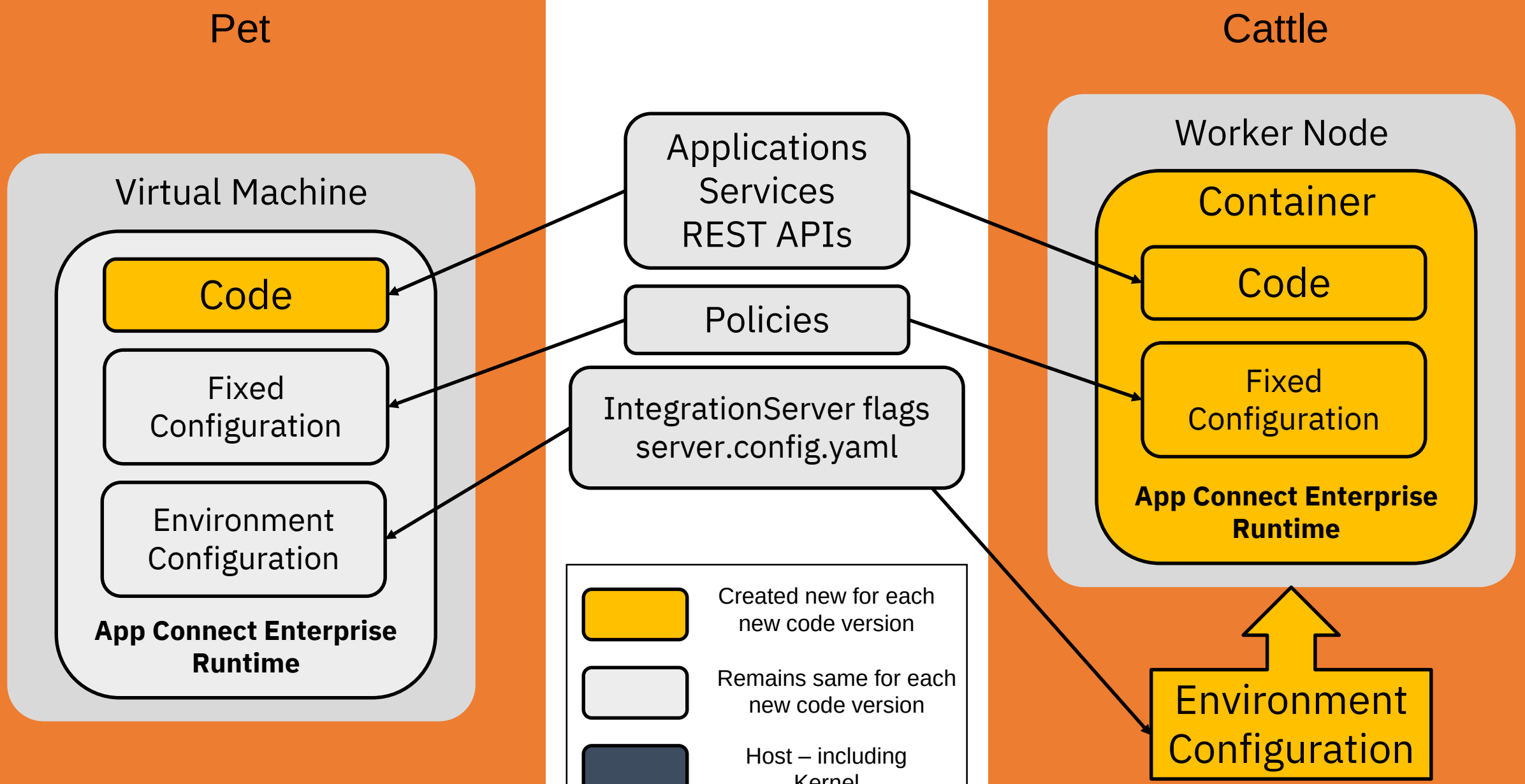
Keywords


Integration Ex
Data Project E
Data Source Ex
Integration Servers
SIS - localhost:7600
sachin.hursley.ibm.com:7601
sachin.hursley.ibm.com:7602
sanjayn.hursley.ibm.com:7600
Integration Nodes
node1
ACE_NODE2
ACE_NODE
server1
HelloApp
SimpleApp
server3
TESTEG
ACE_NODE_MQ
LINUX_NODE_MQ - sachin.hursley.ibm.com:4415
sachin.hursley.ibm.com:4417
ACE_FP5_BETA - sachin.hursley.ibm.com:4418
server1
HelloApp
HelloFlow
HelloFlow_Compute.esql
HelloFlow_inputMessage.xml
HelloFlow_recordedMessage.xml
TemperatureConverter
sanjayn.hursley.ibm.com:4420
Keywords shown in toolkit Properties view
Graph
User Defined Properties
Properties
Problems
Outline
Tasks
Deployment Log
Property
Value
Active Properties
active
active
inactive
2019-06-13T14:14:44Z
inherit
inherit
inherit
HelloApp
HelloApp
Subtype
Type
Application
Keywords
Keyword1
Value1
Keyword10
Value 10 MQSI
Keyword2
Value2
Keyword3
Value 3
Keyword4
Value $4
Keyword5
Value 5 MQSI
Keyword6
Value6
Keyword7
Value7
Keyword8
Value 8
Keyword9
Value $9
VERSION
11.0.5
HelloFlow.msgflow
Palette
Favorites
IBM MQ
MQTT
Kafka
JMS
HTTP
REST
Web Services
WebSphere Adapters
Routing
.NET
Transformation
Construction
Flow Exerciser:
HTTP Input
HTTP Reply2
Compute
HTTP Reply
HTTP Reply1
Graph
User Defined Properties
Properties
Problems
Outline
Tasks
Deployment Log
Default Values for Message Flow Properties - HelloFlow
Description
Monitoring
Version
Short description
$MQSIFlowKey1=FlowValue1MQSI$
Long description
$MQSIFlowKey2=FlowValue2MQSI$
$MQSIFlowKey3=FlowValue3MQSI$
$MQSI_VERSION=2.4 MQSI$
Keywords shown in mqsilist
[sanjayn@sachin ~]$
BIP1275I: Application
integration server
Last edited: '2019-06-
UUID '/apiv2/servers
/applications/HelloApp'
Start mode: 'Main
Java isolation
true'
Long description: ''
Keywords:
'Keyword1' = 'Value1'
'Keyword10' = 'Value 10 MQSI'
'Keyword2' = 'Value2'
'Keyword3' = 'Value 3'
'Keyword4' = 'Value $4'
'Keyword5' = 'Value 5 MQSI'
'Keyword6' = 'Value6'
'Keyword7' = 'Value7'
'Keyword8' = 'Value 8'
'Keyword9' = 'Value $9'
'VERSION' = '11.0.5'
[sanjayn@sachin HelloApp]$ pwd
/home/sanjayn/aceconfig/components/ACE_FP5_BETA/servers/server1/run/HelloApp
[sanjayn@sachin HelloApp]$
[sanjayn@sachin HelloApp]$ ls -R
.:
application.descriptor HelloFlow_Compute.esql HelloFlow_inputMessage.xml HelloFlow.msgflow HelloFlow_recordedMessage.xml META-INF
./META-INF:
bar-refresh.links broker.xml keywords.txt manifest.mf service.log user.log
Keywords.txt in Application/META-INF directory
Keywords can also be accessed using Integration API
BIP1277I: Message flow 'HelloFlow' on integration server 'se
Additional thread instances: '0'
Last edited: '2019-06-13 15:12:44'
Start mode: 'Maintained'
UUID: '/apiv2/servers/server1/applications/HelloApp/messagef
Long description: ''
User-defined property names:
Keywords:
'FlowKey1' = 'FlowValue1'
'FlowKey2' = 'FlowValue2'
'FlowKey3' = 'FlowValue3'
'VERSION' = '2.4'

Migration and mqsiextractcomponents



ACE Certified Containers

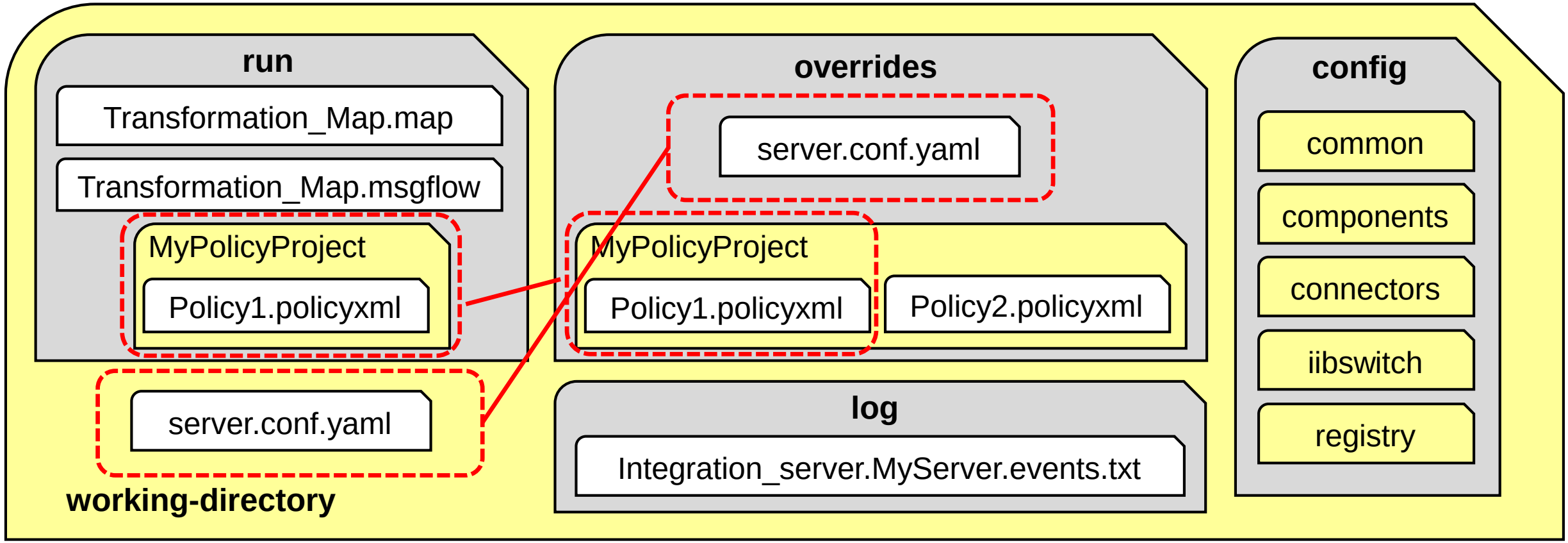


Controlling Container Config with App Connect Enterprise

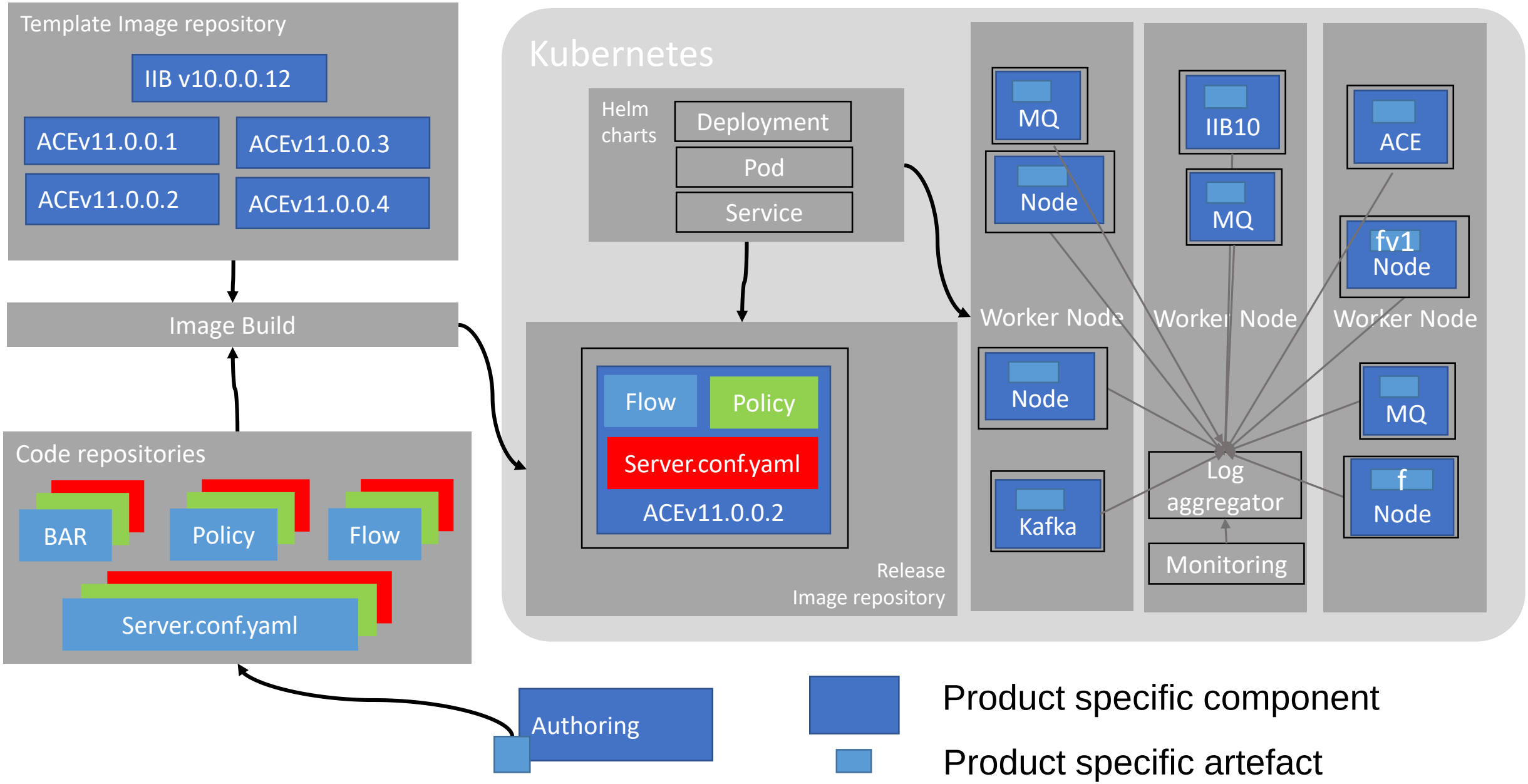
"Deploy" or unzip when building a Docker image using mqsibar

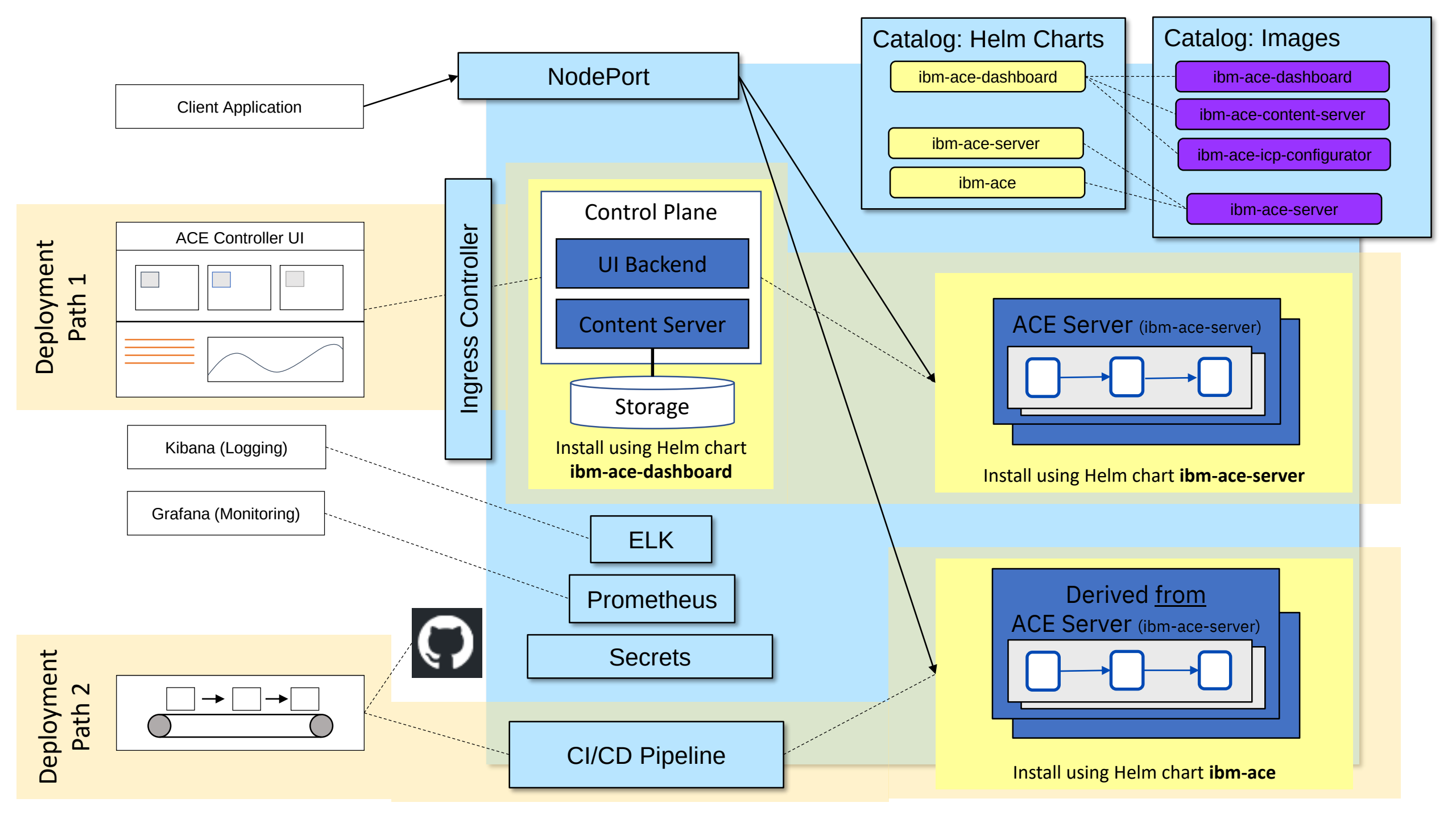
Overrides provide an easy method to customise environment configuration

REST admin API PATCH methods can persist changes to overrides



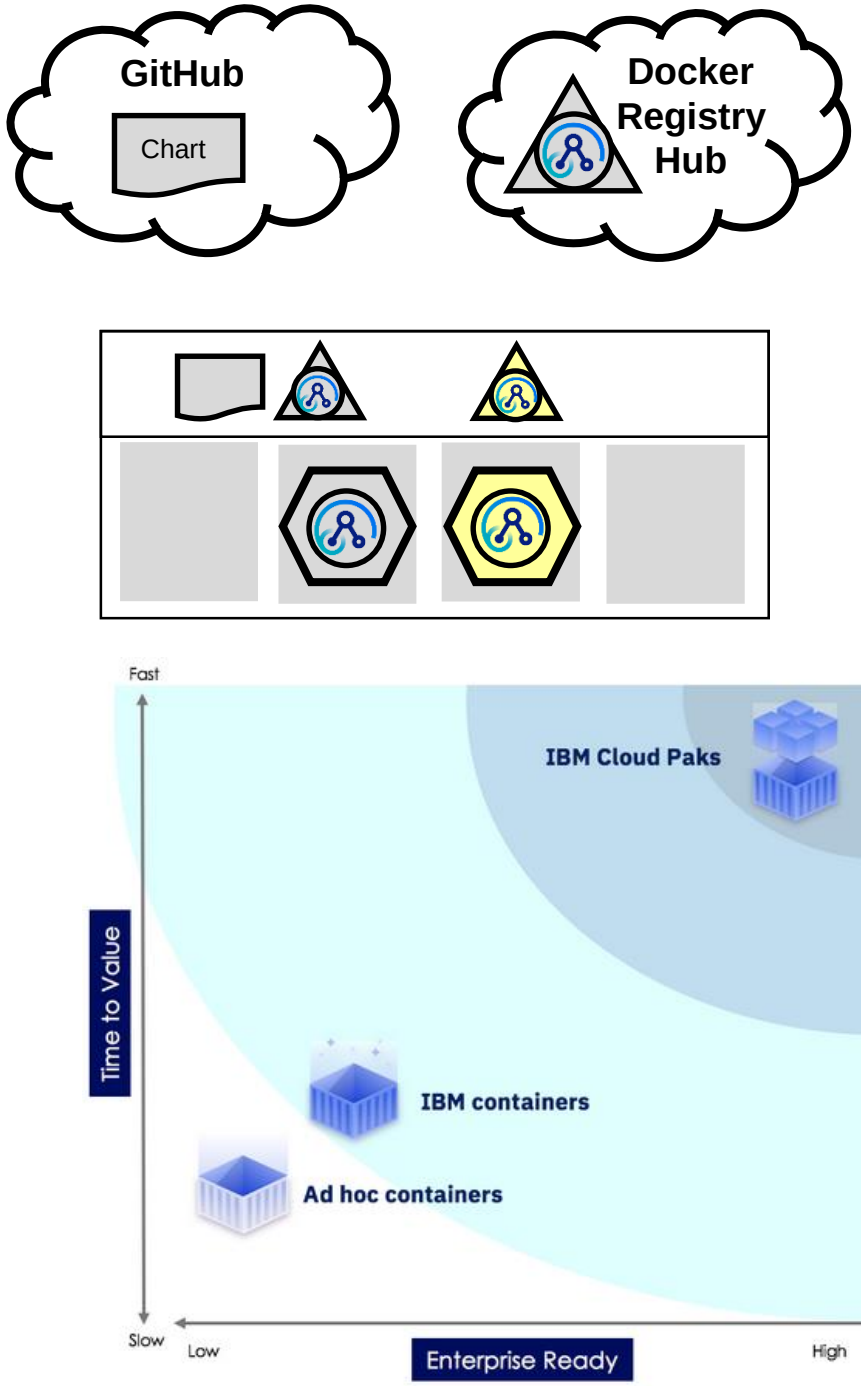
A Tangible Example




Catalog: Helm Charts
ibm-ace-dashboard
ibm-ace-server
ibm-ace
Catalog: Images
ibm-ace-dashboard
ibm-ace-content-server
ibm-ace-icp-configurator
ibm-ace-server
Client Application
NodePort
Deployment Path 1
ACE Controller UI
Ingress Controller
Control Plane
UI Backend
Content Server
Storage
Install using Helm chart ibm-ace-dashboard
ACE Server (ibm-ace-server)
Install using Helm chart ibm-ace-server
Kibana (Logging)
Grafana (Monitoring)
ELK
Prometheus
Secrets
Deployment Path 2
CI/CD Pipeline
Derived from ACE Server (ibm-ace-server)
Install using Helm chart ibm-ace

ACE Certified Containers and IBM Cloud Paks

Container delivery models Capabilities & Value	 Ad hoc containers Client takes software binaries, Creates their own containers	 IBM provided containers Client receives IBM Software in the form of container(s)	 Certified IBM Cloud Paks on IBM Cloud Private Easy, Enterprise grade, Fully supported
ACE Software supported	Yes	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	Tested upgrade & rollback


GitHub
Chart
Docker Registry Hub
IBM Passport Advantage
ACEv11
ACE Certified Container v2.1.0
IBM Cloud Pak for Integration
Helm Chart Catalog
Chart
Chart
Chart
Dashboard
ACE
ACE + MQ
Docker Images
Dashboard
ACE
ACE + MQ
ACE + MQClient
Dashboard
ACE
ACE + MQ
ACE + MQClient
Fast
Time to Value
Slow
IBM Cloud Paks
IBM containers
Ad hoc containers
Low
Enterprise Ready
High

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Apache Kafka for the Enterprise

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DataPower

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