



Adobe

Troubleshooting Sling Content Distribution

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Agenda

- Use cases

Quick overview of Apache Sling Content Distribution

- Configurations

Best practices for configuring Sling Content Distribution

- Troubleshooting

How to investigate and resolve issues

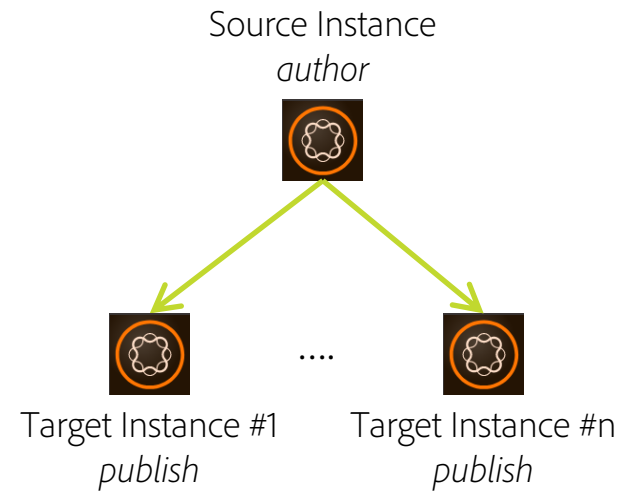
- Q & A

Use cases

Quick overview of Apache Sling Content Distribution

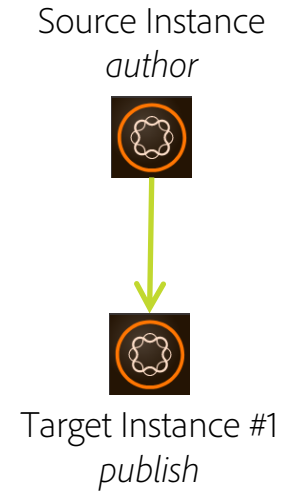
Use cases

Forward distribution



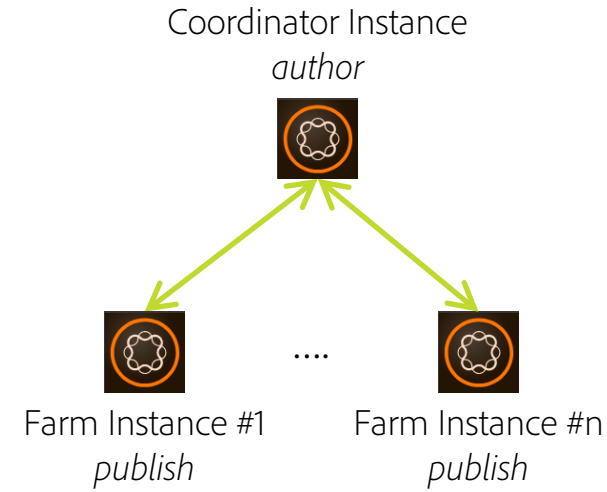
Push resources to n instances

Proxy WCM activations



Push resources to 1 instance as transport for AEM Replication agent

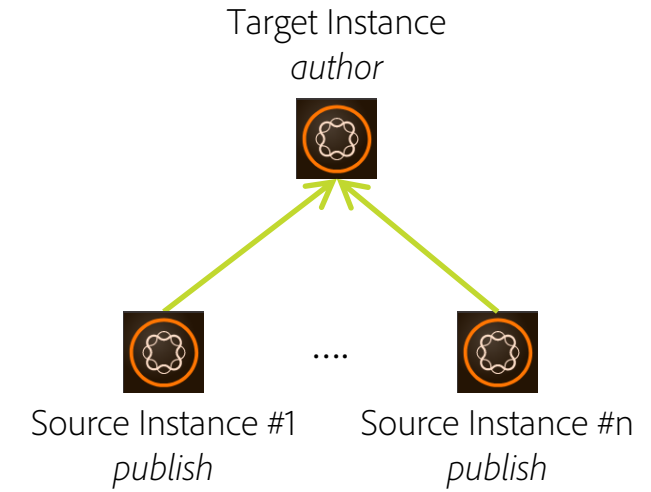
Sync distribution



Pull resources from n instances
Push them to n-1 instances

e.g. User Sync

Reverse distribution



Pull resources from n instances

Configurations

Best practices for configuring Sling Content Distribution

Configurations // Forward distribution

Source Instance
127.0.0.1:4502



`org.apache.sling.distribution.agent.impl.ForwardDistributionAgentFactory`

`packageImporter.endpoints=["endpoint0=http://127.0.0.1:4503/libs/sling/distribution/services/importers/default"]`

OSGi configuration



Target Instance #0
127.0.0.1:4503

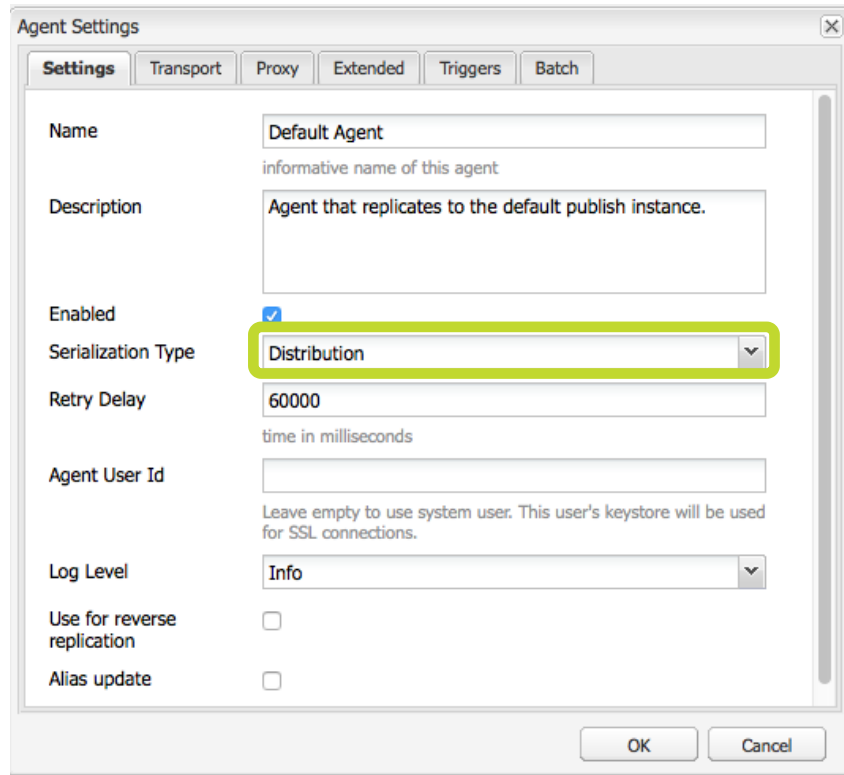
`org.apache.sling.distribution.packaging.impl.importer.LocalDistributionPackageImporterFactory`

`name="default"`

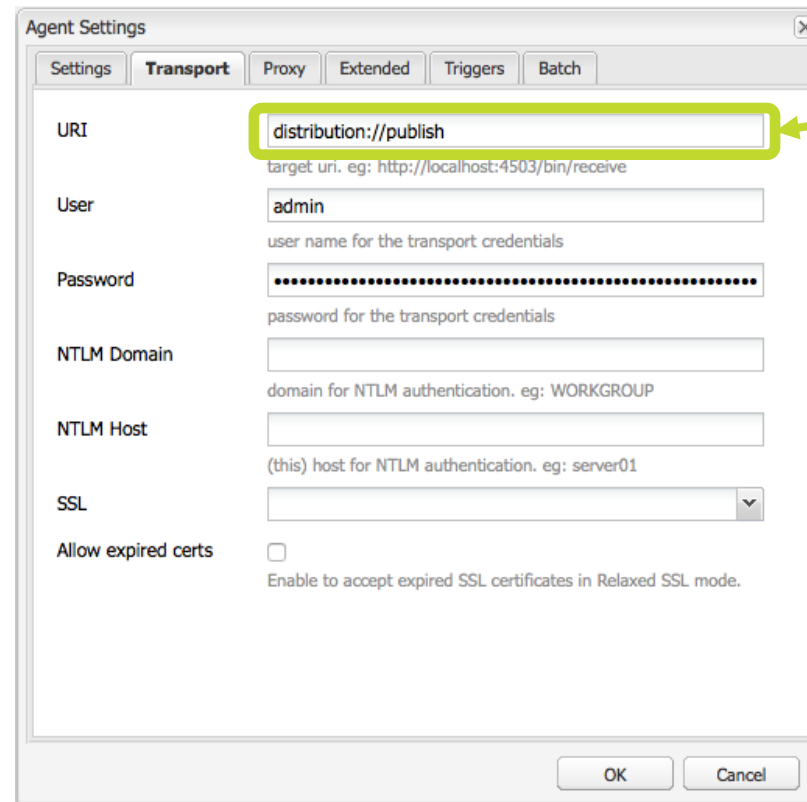
OSGi configuration

Configurations // Proxy WCM activations

1. Configure Forward distribution (author and publish)
2. Configure a Replication agent (author) that proxies to the author Forward distribution agent



The 'Agent Settings' dialog box is shown with the 'Settings' tab selected. The 'Name' field is 'Default Agent'. The 'Description' is 'Agent that replicates to the default publish instance.' The 'Enabled' checkbox is checked. The 'Serialization Type' dropdown is set to 'Distribution' and is highlighted with a yellow box. The 'Retry Delay' is '60000'. The 'Agent User Id' is empty. The 'Log Level' is 'Info'. The 'Use for reverse replication' and 'Alias update' checkboxes are unchecked.



The 'Agent Settings' dialog box is shown with the 'Transport' tab selected. The 'URI' field is 'distribution://publish' and is highlighted with a yellow box. The 'User' is 'admin'. The 'Password' is masked with dots. The 'NTLM Domain' and 'NTLM Host' are empty. The 'SSL' dropdown is set to 'Relaxed'. The 'Allow expired certs' checkbox is unchecked.

distribution://<forwardAgentName>

Configurations // Sync distribution

Coordinator Instance
127.0.0.1:4502



Farm Instance #0
127.0.0.1:4503

OSGi configuration

org.apache.sling.distribution.agent.impl.SyncDistributionAgentFactory

packageExporter.endpoints=["http://127.0.0.1:4503/libs/sling/distribution/services/exporters/sync-reverse"]

packageImporter.endpoints=[endpoint0="http://127.0.0.1:4503/libs/sling/distribution/services/importers/sync"]

OSGi configuration

org.apache.sling.distribution.agent.impl.QueueDistributionAgentFactory

name="sync-reverse"

OSGi configuration

org.apache.sling.distribution.packaging.impl.importer.LocalDistributionPackageImporterFactory

name="sync"


Configurations // Binaryless distribution

Supported for [vault package builder](#) and [shared data store](#) deployments

1. Setup a shared data store
<https://docs.adobe.com/docs/en/aem/6-3/deploy/platform/data-store-config.html>
2. Set the **useBinaryReferences** property to **true** in the **VaultDistributionPackageBuilderFactory** OSGi configuration referenced by the agent configuration

Use Binary
References



 If activated, it avoids sending binaries in the distribution package. (useBinaryReferences)


Configurations // Retry strategy

Suitable for scenarios which don't require strict distribution order

- 1. Set the agent's retry strategy to **errorQueue**
- 2. Configure the maximum number of attempts before moving a failing item to the error queue


Retry Strategy

errorQueue

 The strategy to apply after a certain number of failed retries. (retry.strategy)



Retry attempts

100

 The number of times to retry until the retry strategy is applied. (retry.attempts)



Retry strategy	Behaviour
none	Block the queue & retry forever
errorQueue	Block the queue & retry retry.attempts times (configurable) After retry.attempts failing attempts, move the blocking queue item to the error queue and process the remaining items

Queues 1 Item Pending

<input type="checkbox"/> Queue	Status	Last Item Processed	Items Pending
<input type="checkbox"/> endpoint0	 Running	dstrpck-2017--8--17--12--6--80621699-4c37-49ba-946f-775921c1e488_565 Aug 17 2017 12:06:34 CEST ADD	1
<input type="checkbox"/> error-endpoint0	 Passive		0



Queues 1 Item Pending

<input type="checkbox"/> Queue	Status	Last Item Processed	Items Pending
<input type="checkbox"/> endpoint0	 Idle		0
<input type="checkbox"/> error-endpoint0	 Passive	dstrpck-2017--8--17--12--6--80621699-4c37-49ba-946f-775921c1e488_566 Aug 17 2017 12:06:47 CEST ADD	1

Configurations // Filter distributed content

Configure properties and nodes to be filtered upon export (Jackrabbit FileVault feature)

Factory PID

`org.apache.sling.distribution.serialization.impl.vlt.VaultDistributionPackageBuilderFactory`

Package Node
Filters

`/home/users|-.*/.tokens`



`/home/users|-.*/.rep:cache`



The package node path filters. Filter format: path|+include|-exclude (package.filters)

Package Property
Filters

`/|-^.*cq:lastReplicated|-^.*cq:lastReplicatedBy|-^.*cq:lastReplicationAction`



The package property path filters. Filter format: path|+include|-exclude (property.filters)

Configurations // User session

Session exporting packages

The session is associated to either

- the caller resource resolver or
- the service user configured in the agent configuration (property **serviceName**)

Session importing packages

The session is associated to the transport user configured in the transport secret provider (**DistributionTransportSecretProvider**)

Configurations // Priority path Queue

Suitable for scenarios which require to prioritize one or more subtrees

Configure the agent's Priority queue prefix and path matcher

Queues 0 Items Pending

<input type="checkbox"/> Queue	Status	Last Item Processed	Items Pending
<input type="checkbox"/> endpoint0	✓ Idle		0
<input type="checkbox"/> french-endpoint0	✓ Idle		0

Priority queues

french=/content/fr.*

+

-

List of priority queues that should used for specific paths.The selector format is {queuePrefix}[{mainQueueMatcher}]= {pathMatcher}, e.g. french=/content/fr.* (priorityQueues)

Configurations // Processing queues in parallel

Suitable for scenarios which don't require strict distribution order and for which throughput is an issue and the root cause analysis identified the queue type as the bottleneck

1. Set the queue type to **Parallel**
2. Set the **queue.maxparallel** to the number or available processors

Apache Sling Job Queue Configuration

The configuration of a job processing queue.

Name:

Topics:

Type: (highlighted)

Maximum Parallel Jobs: (highlighted)

Maximum Retries:

Retry Delay:

Priority:

Keep History: ☐

Prefer Creation Instance: ☐

Thread Pool Size:

Ranking:

Configuration Information

Persistent Identity (PID)	org.apache.sling.event.jobs.QueueConfiguration.e4ab1b54-0e7b-4c5d-b6df-5a9f125c4108
Factory Persistent Identifier (Factory PID)	org.apache.sling.event.jobs.QueueConfiguration
Configuration Binding	Unbound or new configuration

Buttons: Cancel, Reset, Delete, Unbind, Save

Configurations // Agent Queue Provider

Suitable for scenarios for which throughput is an issue and the root cause analysis identified the queue throughput as the bottleneck and data loss is acceptable

1. Set the agent's queue provider implementation to **In-file**
2. Implement ad-hoc operation process

Queue Provider	Comment
Sling Jobs	Default queue implementation backed by Sling Jobs Pro: Stored in the repository as content (simple operations)
In-file	In memory with check points to File system Pro: Fast Cons: Non check pointed entries may be lost in case of crash Cons: Not stored in the repository (non standard operations)

Troubleshooting

How to investigate and resolve issues

Tools

AEM Content Distribution UIs

<http://<host:port>/libs/granite/distribution/content/distribution.html>

- Observe status of agent queues
- Observe agent logs
- Manage the queue
- Test the connection

The top screenshot shows the 'endpoint0' status page. It indicates the agent is 'RUNNING' with 319 items pending. The last item processed was on Jul 12 2017 11:15:57 CEST. Below this is a table of items in the queue:

<input type="checkbox"/>	Time	Status	Action	Path	User ID	Attempts
<input type="checkbox"/>	Jul 12 2017 11:15:57 CEST	QUEUED	ADD	/content/projects	admin	0
<input type="checkbox"/>	Jul 12 2017 11:15:57 CEST	QUEUED	ADD	/content/projects	admin	0
<input type="checkbox"/>	Jul 12 2017 11:15:57 CEST	QUEUED	ADD	/content/projects	admin	0
<input type="checkbox"/>	Jul 12 2017 11:15:57 CEST	QUEUED	ADD	/content/projects	admin	0
<input type="checkbox"/>	Jul 12 2017 11:15:57 CEST	QUEUED	ADD	/content/projects	admin	0

The bottom screenshot shows the 'publish' agent configuration page. The 'Publish Agent (publish - forward)' is 'Enabled'. Below this is a table of queues:

<input type="checkbox"/>	Queue	Status	Last Item Processed	Items Pending
<input type="checkbox"/>	endpoint0	Running	dstrpck-2017--7-12--11-15--db27296c-3a4f-41a3-bf85-fe926973fd0f_430 Jul 12 2017 11:15:57 CEST ADD	15

Tools

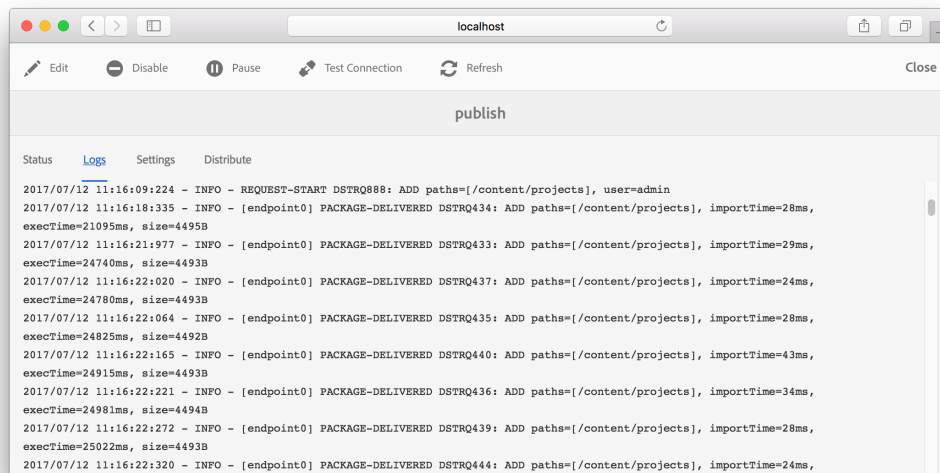
AEM Content Distribution JMX MBean and HealthCheck

Coordinates	Description
domain: org.apache.sling.distribution type: distributionpackage	MBean which provides the status (paths, processing time, identifier) of the last X distribution packages
domain: org.apache.sling.distribution type: agent	MBean which provides each agent configuration
domain: org.apache.sling.distribution type: queue	MBean which provides each queue status (state, type of queue, queue size, current head)
hc.name: SlingDistributionQueueHC domain: org.apache.sling.distribution type: queue	Health check for the queues

Tools

Observe the logs

Observe per agent logs in the UI



Capture all SCD logs by creating a Logger at **DEBUG** level for the package **org.apache.sling.distribution**

The screenshot shows the 'Apache Sling Logging Logger Configuration' dialog. The configuration is as follows:

- Log Level:** Debug
- Log File:** /gs/scd.log
- Message Pattern:** {0,date,dd.MM.yyyy HH:mm:ss.SSS} *{4}* [{2}] {3} {5}
- Logger:** org.apache.sling.distribution
- Additivity:** ☐

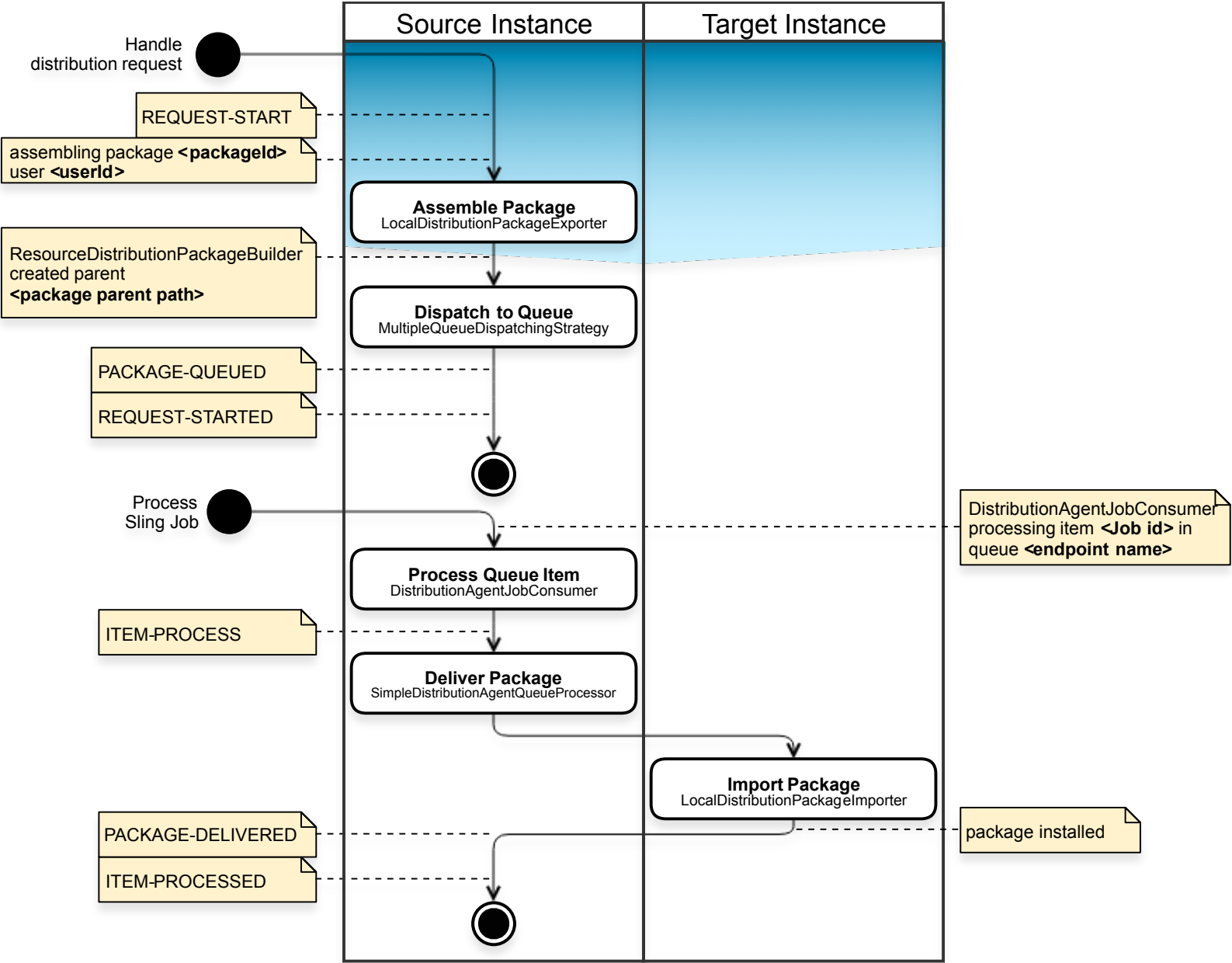
Configuration Information:

Persistent Identity (PID)	org.apache.sling.commons.log.LogManager.factory.config.0986c534-5d64-4022-b60f-3a78c9df909e
Factory Persistent Identifier (Factory PID)	org.apache.sling.commons.log.LogManager.factory.config
Configuration Binding	slinginstall:org.apache.sling.commons.log-5.0.0.jar
	Apache Sling SLF4J Implementation (Logback) (org.apache.sling.commons.log), Version 5.0.0

Buttons: Cancel, Reset, Delete, Unbind, Save

Making sense of the logs

Forward Distribution Processing Flow

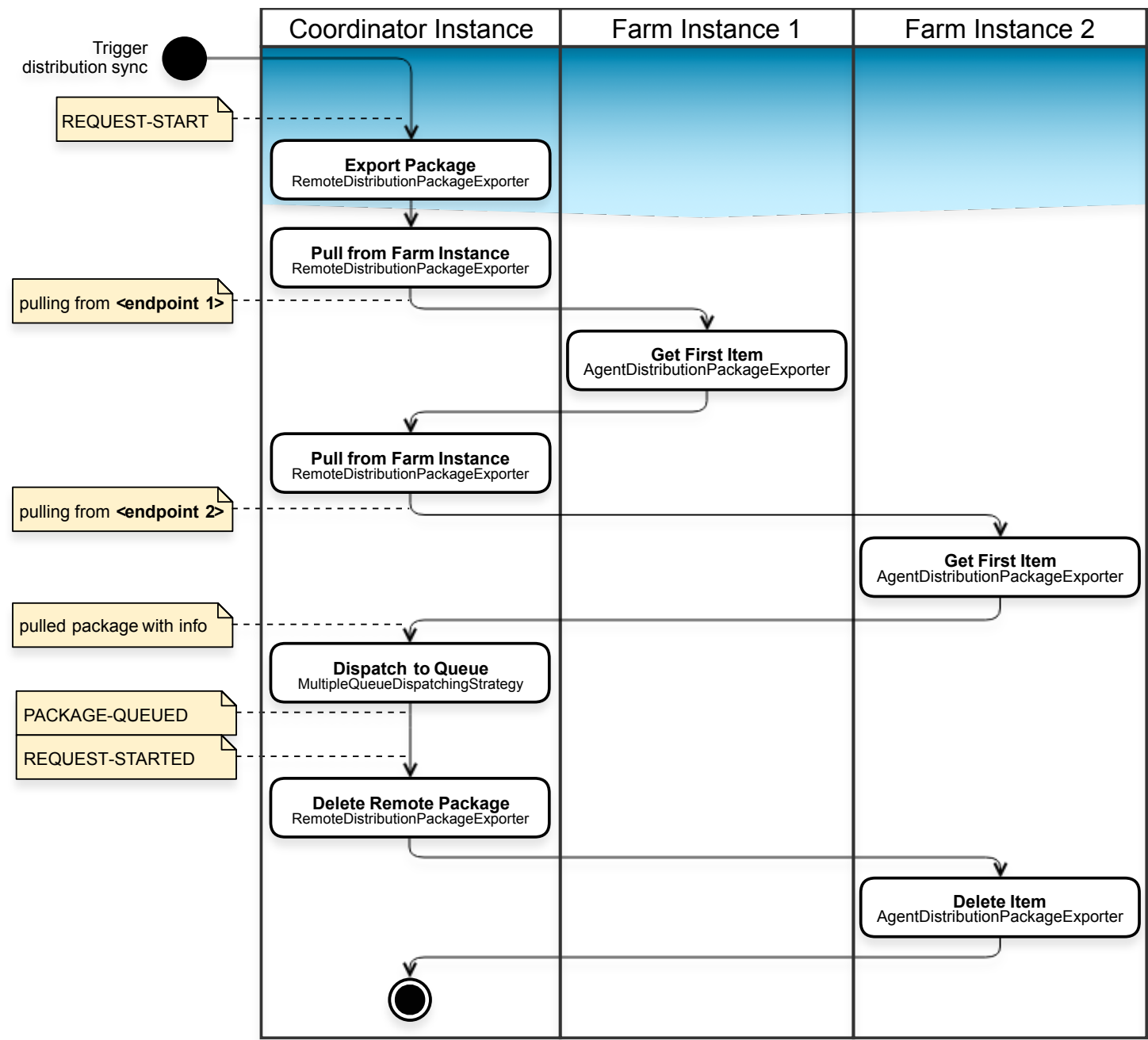


Making sense of the logs

Sync Distribution Processing Flow

Phase 1/2

Fetching packages from farm instances

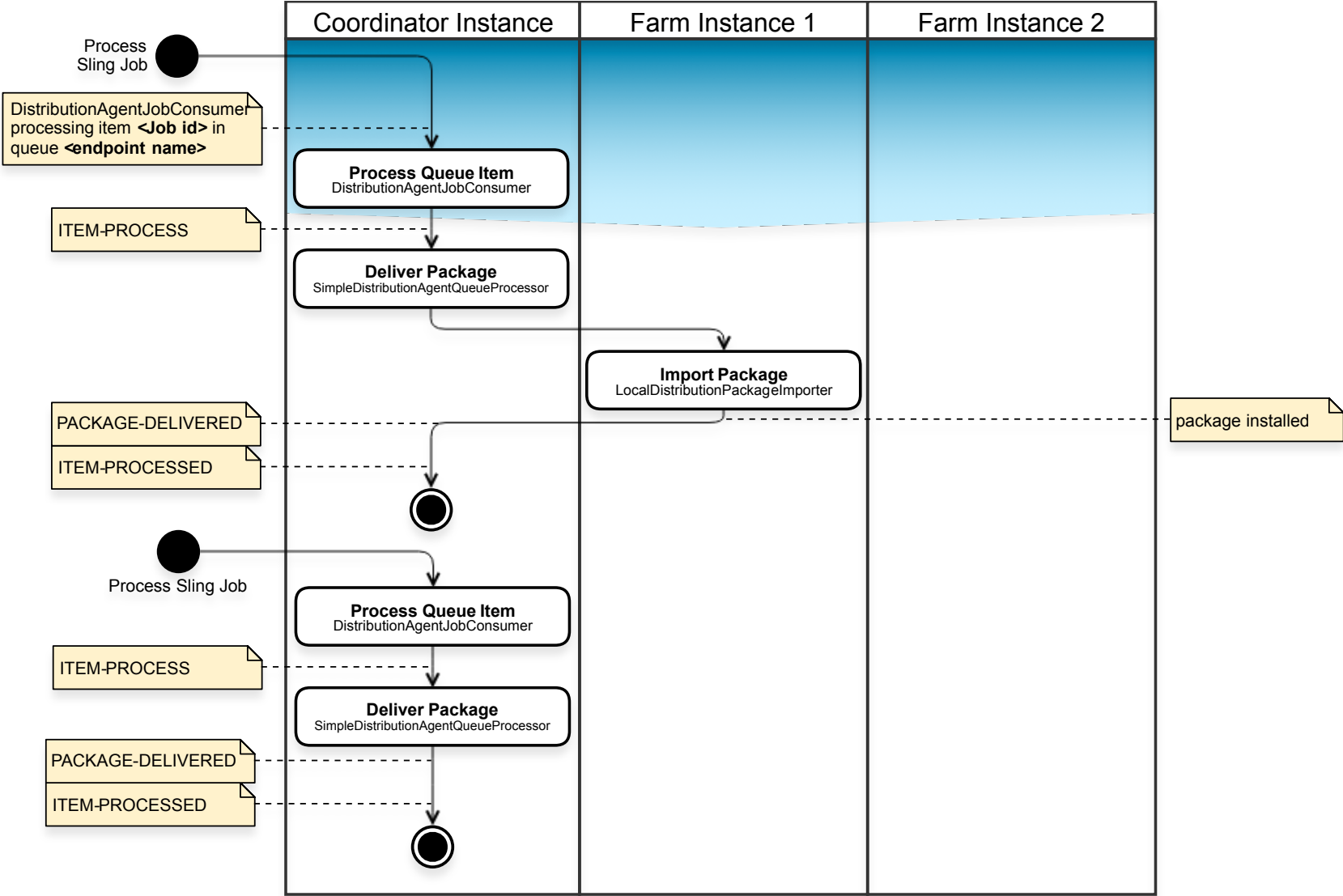


Making sense of the logs

Sync Distribution Processing Flow

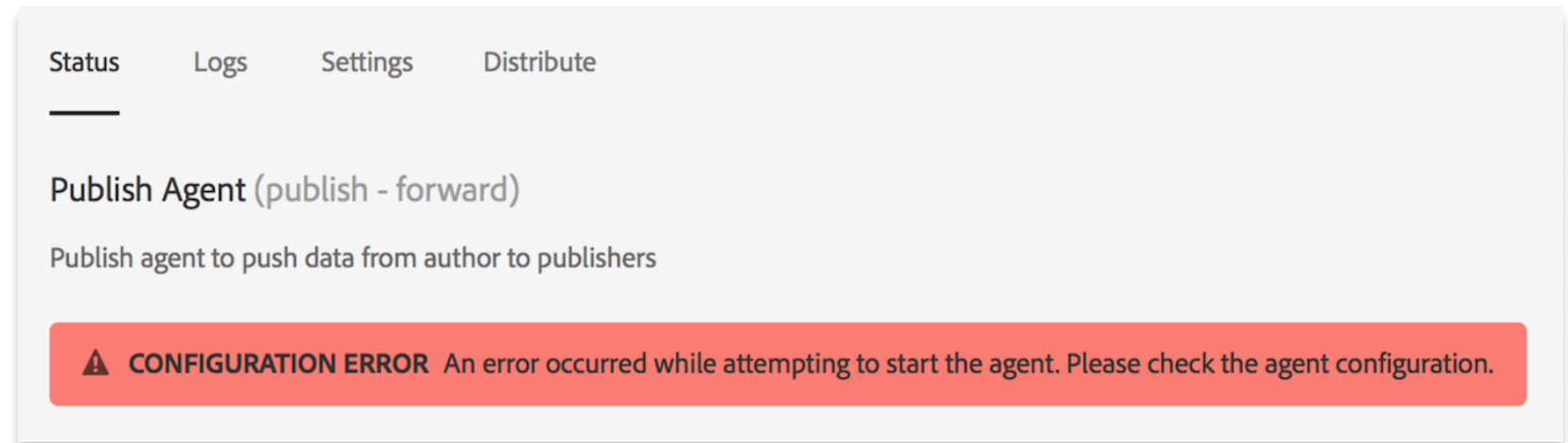
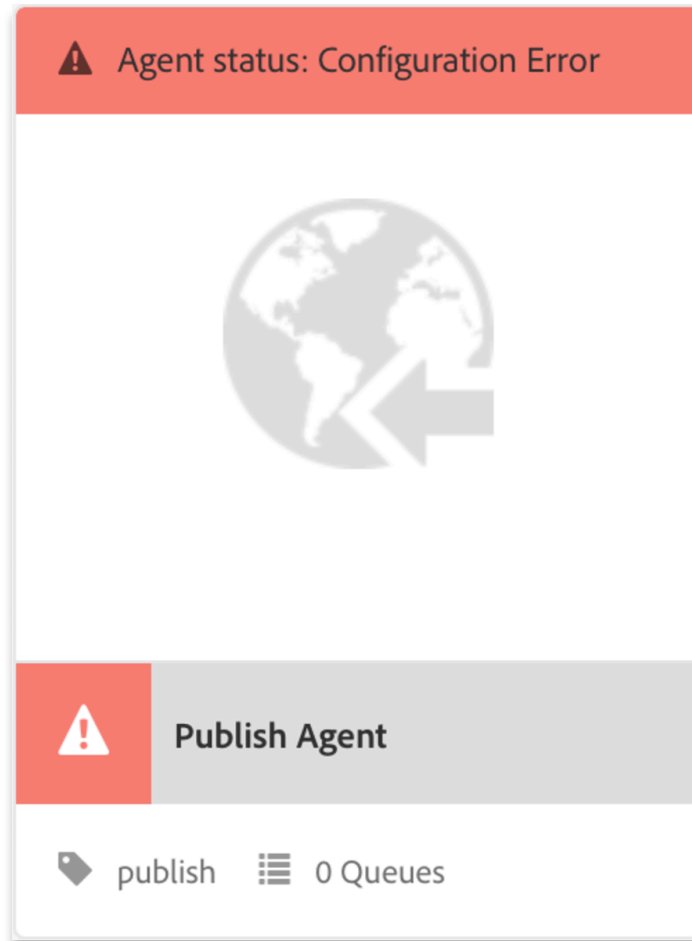
Phase 2/2

Export packages to farm
instances



Common Issue // Agent Configuration Error

Symptoms



On source instance

```
*ERROR* [127.0.0.1 [1490738408180] POST
/libs/sling/distribution/services/exporters/socialpubsync-reverse HTTP/1.1]
org.apache.sling.servlets.post.impl.operations.ModifyOperation Exception during response
processing java.lang.UnsupportedOperationException: create 'socialpubsync-reverse' at
/libs/sling/distribution/services/exporters
```

Common Issue // Agent Configuration Error

Cause

- Distribution Agent implemented as OSGi service referencing other services
Transport Secret Provider, Package Builder, Trigger, Request Authorization Strategy
- Service references targets (typically matching on **name** property)

Transport Secret
Provider

(name=default)

The target reference for the DistributionTransportSecretProvider used to obtain the credentials used for accessing the remote endpoints, e.g. use target=(name=...) to bind to services by name.
(transportSecretProvider.target)

- Agent components are activated only when all service references are satisfied

Common Issue // Agent Configuration Error

Investigation & Resolution

- Find the unresolved service references via the OSGi Components Web Console
- Configure the target to match an existing service or configure the missing service

The screenshot illustrates the process of identifying and resolving an OSGi service reference error. It consists of three parts:

- Table 1: Overview of Distribution Agent Factories**
- OSGi Components Web Console Search Results**
- OSGi Components Web Console Detailed View**

PID	Use case	Deployed on
org.apache.sling.distribution.agent.impl.ForwardDistributionAgentFactory	Forward distribution	Source instance
org.apache.sling.distribution.agent.impl.QueueDistributionAgentFactory	Sync distribution	Farm instance
org.apache.sling.distribution.agent.impl.SyncDistributionAgentFactory	Sync distribution	Coordinator instance

OSGi Components Web Console Search Results:

- Search query: `distribution` (94 matches)
- Highlighted entry (ID 2892): `org.apache.sling.distribution.agent.impl.ForwardDistributionAgentFactory` (unsatisfied (reference))

OSGi Components Web Console Detailed View (ID 2892):

- Bundle: `org.apache.sling.distribution.core (494)`
- Implementation Class: `org.apache.sling.distribution.agent.impl.ForwardDistributionAgentFactory`
- Default State: `enabled`
- Activation: `immediate`
- Configuration Policy: `require`
- Services: (empty)
- PID: `org.apache.sling.distribution.agent.impl.ForwardDistributionAgentFactory`
- Reference triggers: Satisfied, Service Name: `org.apache.sling.distribution.trigger.DistributionTrigger`, Cardinality: `0..n`, Policy: `dynamic`, Policy Option: `reluctant`
- Reference packageBuilder: Unsatisfied, Service Name: `org.apache.sling.distribution.packaging.DistributionPackageBuilder`, Cardinality: `1..1`, Policy: `static`, Policy Option: `reluctant`, No Services bound

Common Issue // Queue Blocked

1. Investigate common and known issues
2. If business & technical requirements permit
 - Backup the blocking package(s) for reporting then delete the blocking package(s)
 - Consider leveraging error strategy for the queue

Clear Queue

Delete Items

Refresh

Close

endpoint0

BLOCKED

273 Items Pending

Last Item Processed on Aug 16 2017 16:55:51 CEST ADD

dstrpck-2017--8--16--16--55--80621699-4c37-49ba-946f-775921c1e488_539

<div></div>	Time	Status	Action	Path	User ID	Attempts
<div><div></div></div>	Aug 16 2017 16:55:51 CEST	ERROR	ADD	/content/projects	admin	6
<div><div></div></div>	Aug 16 2017 16:55:54 CEST	QUEUED	ADD	/content/projects	admin	0
<div><div></div></div>	Aug 16 2017 16:55:56 CEST	QUEUED	ADD	/content/projects	admin	0

Common Issue // Queue Blocked // Endpoint not available

Investigation




Cause

Target instance is not reachable

Symptoms

Queues  1 QUEUE BLOCKED 1 Item Pending

 **ERROR** An error has occurred while attempting to deliver test package.
[org.apache.sling.distribution.common.RecoverableDistributionException:
endpoint not available
http://localhost:4503/libs/sling/distribution/services/importers/default]

On source instance

```
org.apache.sling.distribution.agent.impl.SimpleDistributionAgent  
[agent][publish] [endpoint0] PACKAGE-FAIL DSTRQ2: could not deliver  
dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99,  
endpoint not available  
http://localhost:4503/libs/sling/distribution/services/importers/default
```

Resolution

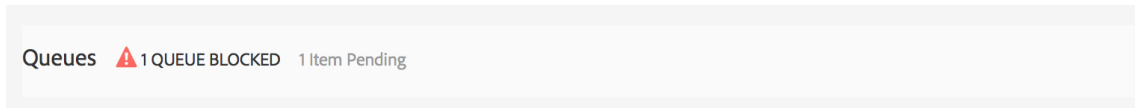
- Configure the agent endpoints on source instances to point to existing target instances
- Check/fix any network issues (Routing, FW, etc.)

Common Issue // Queue Blocked // Wrong or partial setup

Investigation



Symptoms



ERROR An error has occurred while attempting to deliver test package.
[org.apache.sling.distribution.common.DistributionException:
org.apache.http.client.HttpResponseException: Server Error]

On target instance

```
*ERROR* [127.0.0.1 [1502890522312] POST
/libs/sling/distribution/services/importers/default HTTP/1.1]
org.apache.sling.engine.impl.SlingMainServlet service: Uncaught
Problem handling the request org.eclipse.jetty.io.RuntimeIOException:
org.eclipse.jetty.io.EOFException
```

Cause

Target instance is reachable but authentication/authorization fail or target agent component does not exist

Resolution

- Check/fix transport user credentials on agent configuration on source instance ([DistributionTransportSecretProvider](#))
- Create transport user on target instance and give it access to the resources to be distributed (ACL, group membership)
- Check/fix endpoint configuration on source instance to match existing importer/exporter OSGi component on target instance
- Make sure the importer/exporter OSGi component on the target instance is active

Common Issue // Content partially distributed

Symptom

- Packages are distributed successfully but only partial content is distributed

Causes & Resolution

- The vault package builder is filtering out the missing content or the session exporting the package does not have sufficient authorization to access the missing content

Investigation & Resolution

- Check/fix **VaultDistributionPackageBuilderFactory** filter configuration
- Check/grant access to the missing content to the session exporting packages

Common Issue // Queue Blocked // Package could not be installed

Symptoms

Publish Agent (publish - forward) Enabled

Publish agent to push data from author to publishers

Queues 1 QUEUE BLOCKED 1 Item Pending

<input type="checkbox"/>	Queue	Status	Last Item Processed	Items Pending
<input type="checkbox"/>	endpoint0	Blocked	dstrpck-2017--8--10--16--39--e0a23772-c0f4-4244-9635-0b848375f50a_37 Aug 10 2017 16:39:19 CEST ADD	1

On source instance

org.apache.sling.distribution.agent.impl.SimpleDistributionAgentQueueProcessor could not deliver package [dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99, endpoint1] from queue
{org.apache.sling.distribution.common.DistributionException:
org.apache.http.client.HttpResponseException: **Server Error**

On target instance

javax.jcr.nodetype.ConstraintViolationException:
OakConstraint0022: Authorizable property rep:principalName may not be altered after user/group creation.

Causes & Resolution

Apache Oak constraint is violated upon import
<https://wiki.apache.org/jackrabbit/OakErrorCodes>

Cause	Resolution
Distributed content package does not contain required content	Grant enough access rights to the session installing the package (on target instance) Configure the Vault Distribution Package Builder filters to not exclude required content. PID o.a.s.d.s.i.v.VaultDistributionPackageBuilderFactory properties package.filters & property.filters
Session importing content package does not have sufficient access rights	Grant enough access rights to the session creating the package (on source instance)



Common Issue // Queue Blocked // Package could not be installed

Investigation

Where is the content package blocking the queue ?

could not deliver package [
dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99
endpoint0]

On source instance

BLOCKED 1 Item Pending

Last Item Processed on Aug 10 2017 16:39:19 CEST ADD

dstrpck-2017--8--10--16--39e0a23772-c0f4-4244-9635-0b848375f50a_37

	Time	Status	Action	Path	User ID	Attempts
<input type="checkbox"/>	Aug 10 2017 16:39:19 CEST	ERROR	ADD	/content/projects	admin	56

CRXDE Lite

Save All Create ... Delete Copy Paste Move ... Rename ... Overlay Node ... Mixins ... Tools

Administrator@crx.default

/var/eventing/jobs/assigned/e0a23772-c0f4-4244-9635-0b848375f50a/org.apache.sling.distribution.queue.publish.endpoint0/2017/8/10/16/39/e0a23772-c0f4-4244-9635-0b848375f50a_37

101639e0a23772-c0f4-4244-9635-0b848375f50a_37

19distribution.package.sizeLong4493

20distribution.item.idStringdstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99

21distribution.internal.request.userStringadmin

Name

TypeString

Value

Multi

Add

Clear

CRXDE Lite

Save All Create ... Delete Copy Paste Move ... Rename ... Overlay Node ... Mixins ... Tools

Administrator@crx.default

/var/sling/distribution/packages/default/data/dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99/bin/jcr:content

dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99

bin

jcr:content

refs

5jcr:data

Binaryview

fa

Name

TypeString

Value

Multi

Add

Clear

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Common Issue // Queue Blocked // Package could not be installed

Investigation

Inspect queues using the HTTP API <http://localhost:4502/libs/sling/distribution/services/agents/<agentName>/queues.json>

List queues for the agent **publish**

```
http://<host:port>/libs/sling/distribution/services/agents/publish/queues.json
```

```
{
  sling:resourceType: "sling/distribution/service/agent/queue/list",
  - items: [
    "endpoint0"
  ]
}
```

Get state of the **endpoint0** queue for the agent **publish**

```
http://<host:port>/libs/sling/distribution/services/agents/publish/queues/endpoint0.json
```

```
{
  sling:resourceType: "sling/distribution/service/agent/queue",
  state: "RUNNING",
  - items: [
    "dstrpck-2017--8--16--12--4--80621699-4c37-49ba-946f-775921c1e488_3"
  ],
  itemCount: 332,
  empty: false
}
```

Common Issue // Queue Blocked // Package could not be installed

Investigation

Package Id > Path

<http://<host:port>/bin/querybuilder.json?path=/var/sling/distribution/packages&nodename=dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99>

```
{
  success: true,
  results: 1,
  total: 1,
  more: false,
  offset: 0,
  - hits: [
    - {
      path: "/var/sling/distribution/packages/default/data/dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99",
      excerpt: "",
      name: "dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99",
      title: "dstrpck-1502375959688-b52c4e39-3dda-4335-9d32-26a449b01c99",
      created: "2017-08-10 16:39:19"
    }
  ]
}
```

Job Id > Path

http://<host:port>/bin/querybuilder.json?path=/var/eventing/jobs&nodename=e0a23772-c0f4-4244-9635-0b848375f50a_37

```
{
  success: true,
  results: 1,
  total: 1,
  more: false,
  offset: 0,
  - hits: [
    - {
      path: "/var/eventing/jobs/assigned/e0a23772-c0f4-4244-9635-0b848375f50a/org.apache.sling.distribution.queue.publish.endpoint0/2017/8/10/16/39/e0a23772-c0f4-4244-9635-0b848375f50a_37",
      excerpt: "",
      name: "e0a23772-c0f4-4244-9635-0b848375f50a_37",
      title: "e0a23772-c0f4-4244-9635-0b848375f50a_37",
      created: "2017-08-10 16:39:19"
    }
  ]
}
```


Known Fixed Issues

Symptom	Resolution
Some distribution packages are not cleaned up under /var/sling/distribution/packages	Deploy org.apache.sling.distribution.core-0.2.0 or greater version. HF NPR-15154
An agent can't connect to a remote agent over HTTPS	Deploy org.apache.sling.distribution.core-0.2.0 or greater version. HF NPR-16474
Inconsistent packages upon sync	Deploy org.apache.sling.distribution.core-0.2.0 or greater version. HF NPR-14989
Distribution stops over a slow/instable network	Deploy org.apache.sling.distribution.core-0.2.8 or greater version. HF NPR-16083

Search latest issues at <https://issues.apache.org/jira/browse/SLING> (component **Content Distribution**)

References

- Apache Sling Content Distribution
<https://sling.apache.org/documentation/bundles/content-distribution.html>
- User Synchronization
<https://docs.adobe.com/docs/en/aem/6-3/administer/security/security/sync.html>
- Data Replication in Sling
<https://www.slideshare.net/teofili/data-replication-in-sling>

Q & A



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