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Pushing Configuration Bundles in an Indexer Cluster

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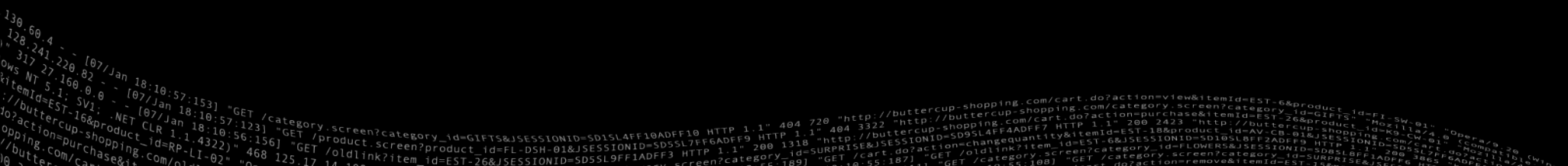
Agenda

- Overview of Indexer Clustering
- Configuration Management in an Indexer Cluster.
  - What is a bundle? And why should I care?
  - Creating and distributing the bundle to all peers
  - Other bundle operations (validate, check restart, and roll back)
  - To restart or not to restart
  - Phased bundle downloads
- Demo
- Troubleshooting and Best Practices
- QA



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Indexer Cluster Overview

Pushing Configuration Bundles in an Indexer Cluster

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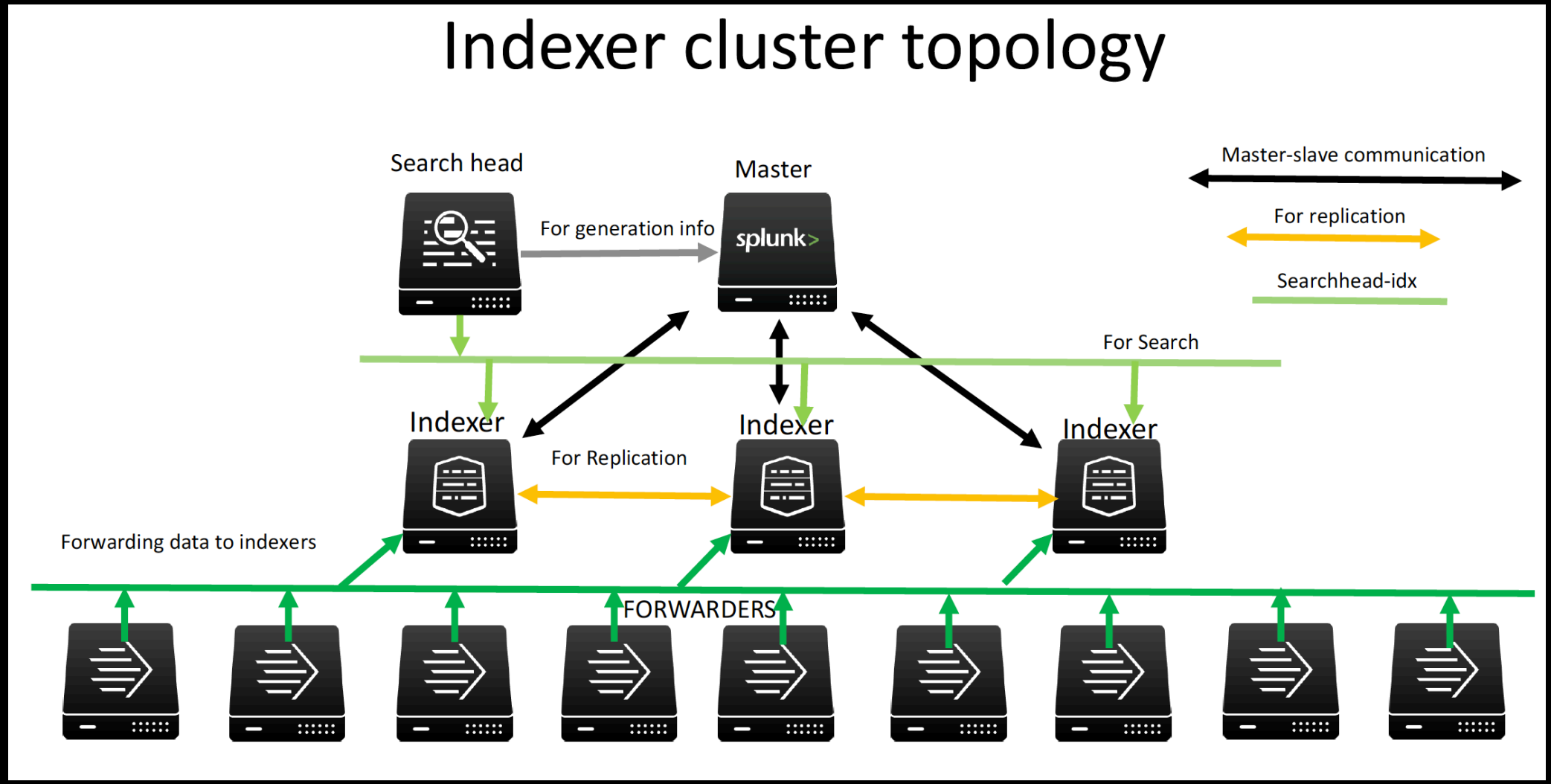
Indexer Clustering



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Why Use Clustering?

Index Replication, Of Course

Data Availability

Data Fidelity

Data Resiliency

Disaster Recovery

Search Affinity

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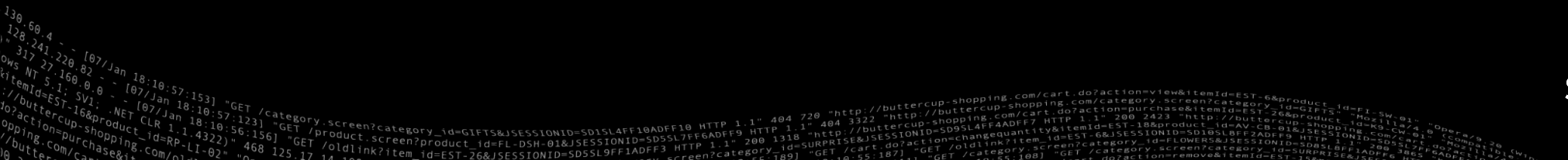
Elements of an Indexer Cluster

- Cluster Master
  - Manages the cluster activities (peer addition, configuration distribution)
  - Maintains an in-memory state of all the peers & their corresponding buckets, configs
  - Orchestrates remedial activities during peer failures
  - Tells search heads where to search
- Cluster Peer (Indexer)
  - Receive and index incoming data (typically from forwarders)
  - Replicate data to other peers for data availability
  - Respond to the incoming searches by providing search results
  - Update cluster master on any state change (peer, buckets, configs etc.)



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Configuration Management in the Cluster

Pushing Configuration Bundles in an Indexer Cluster

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Configuration Bundles

What is a bundle? And why should you care?

The Mysterious Bundle

- The set of configuration files and apps common to all peers
- Managed from the master
- Distributed to the peers in a single operation
  - i.e. indexes.conf, props.conf, and transforms.conf
  - apps will also include versions of these configuration files

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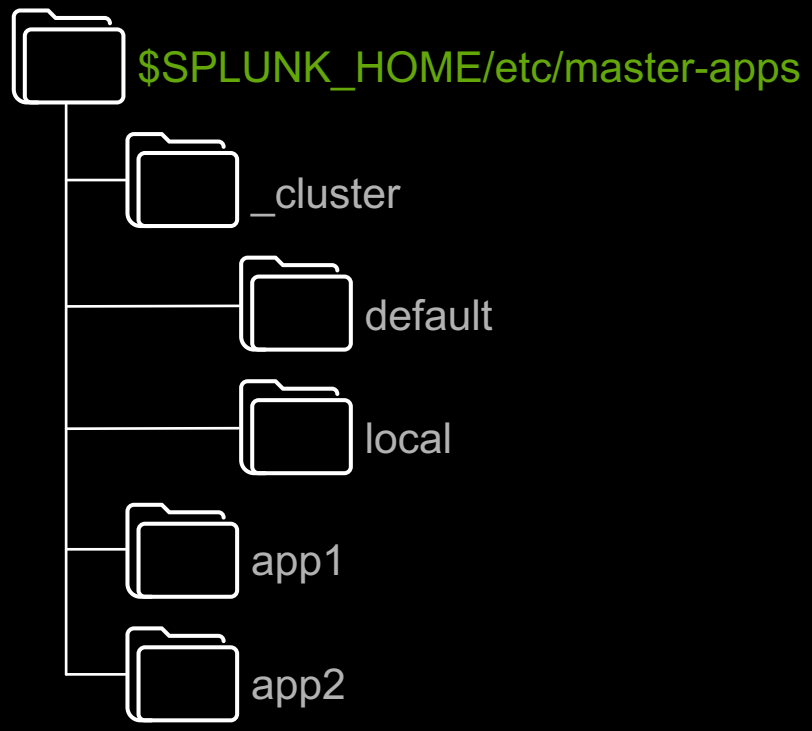
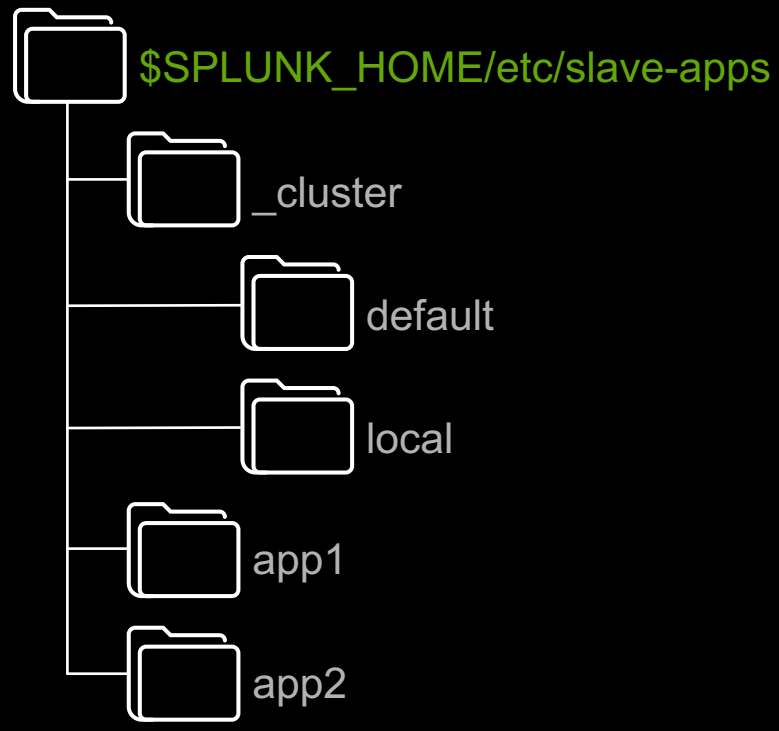
Where do the Bundles reside?

Both in the Cluster Master and the Cluster Peers

Cluster Master



Cluster Peer



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To distribute new or edited configuration files or apps across peers, execute a Bundle Push Operation.

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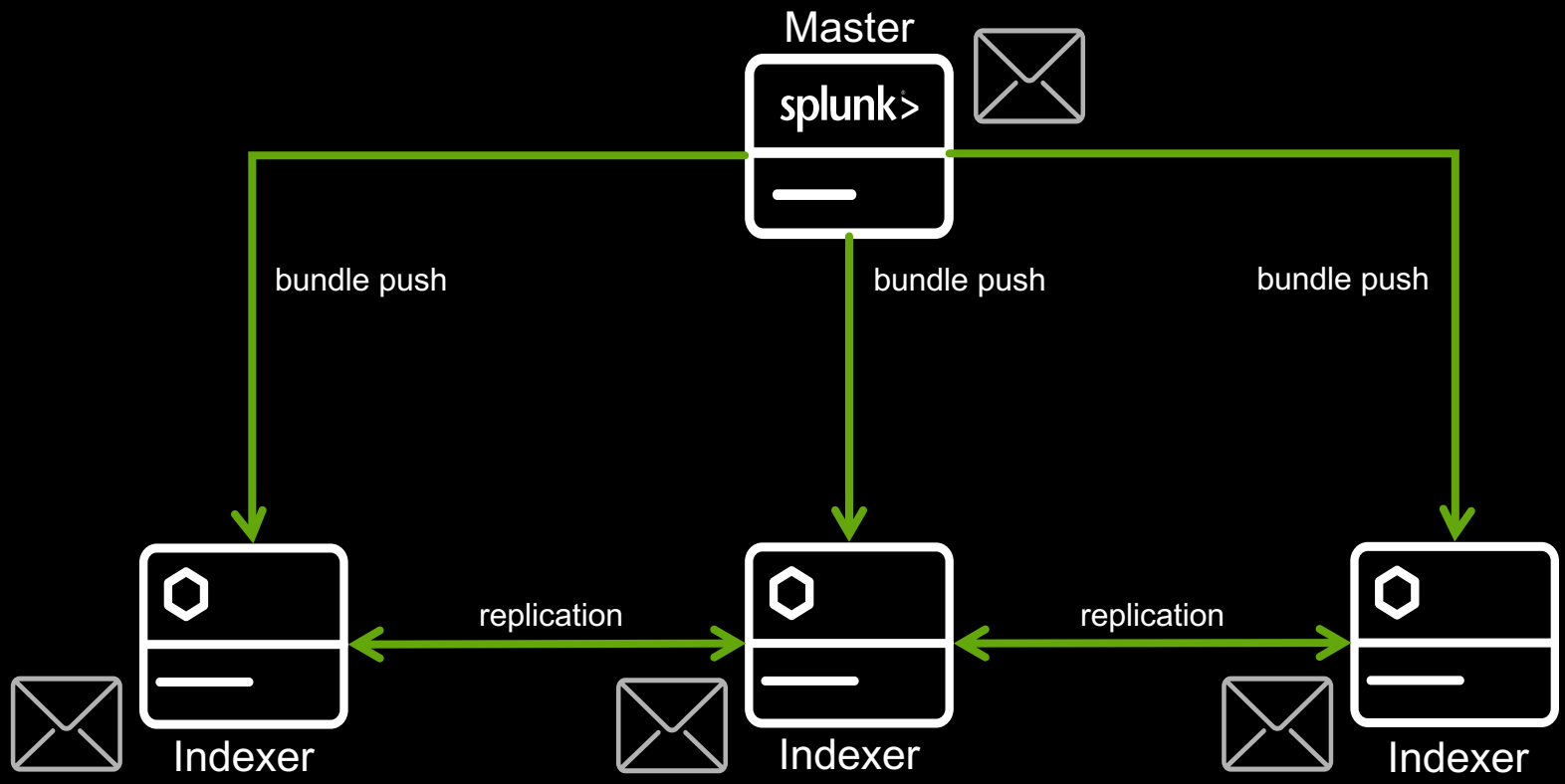
Bundle Pushing

It's not like replication



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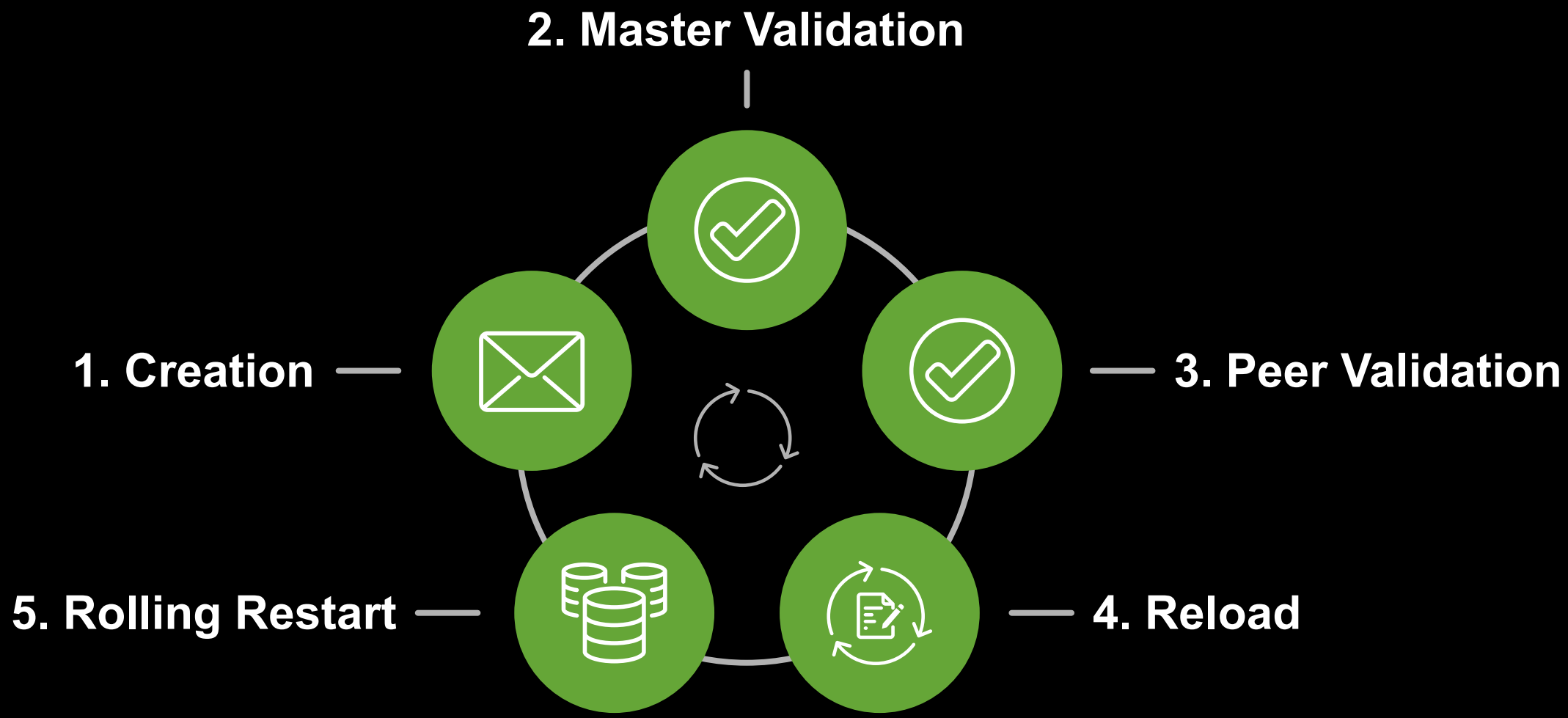
States of a Bundle Push

States in a Bundle Push Status Report



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Validating a Bundle

- Validate a bundle with the peers if bundle is acceptable
- $ ./bin/splunk validate cluster-bundle

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Rolling Back a Bundle

- Did something go wrong with the bundle that was just pushed? You can rollback the latest bundle
- $ ./bin/splunk rollback cluster-bundle

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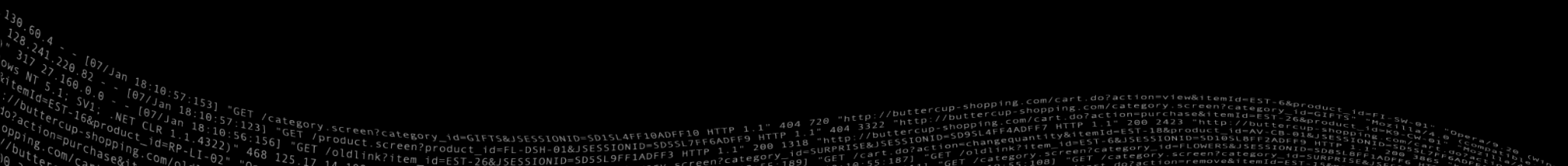
To Restart or Not To Restart

- Configuration changes which need a restart to apply
  - Changes to indexes.conf (deleting an index), inputs.conf
  - Change home path in index.conf
  - Delete an existing App
- Configuration changes which do not need a restart to apply
  - Adding a new index in indexes.conf, or a new app with reloadable configuration
  - Changes or additions to transforms.conf or props.conf



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Checking for Restart

- Do you want to know whether your config changes require a restart?
- Allows admins to plan ahead when the configuration changes will trigger a rolling restart.
- $ ./bin/splunk validate cluster-bundle –check-restart

Reload and Restart Simulation

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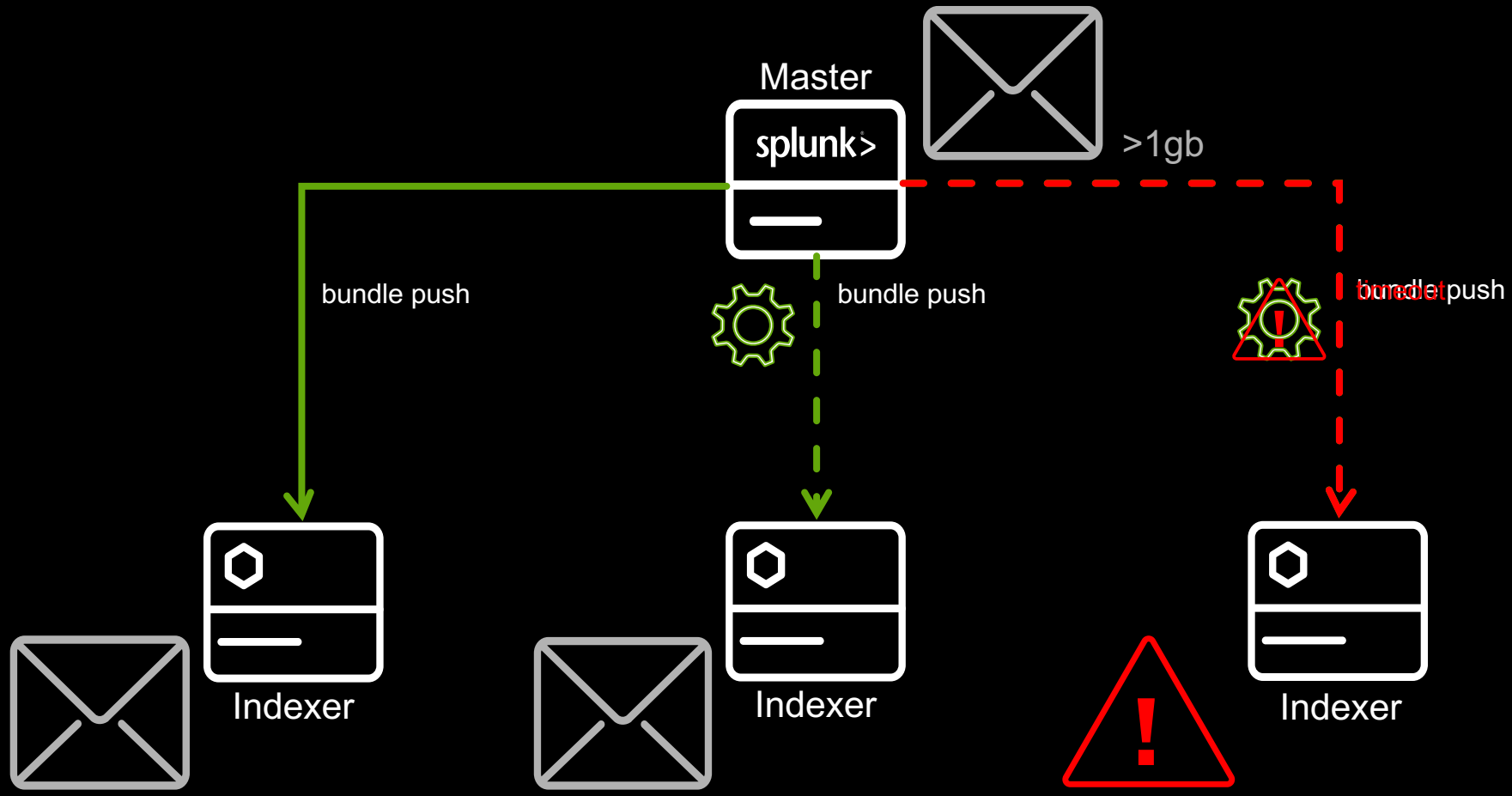
Oh No! Large Bundles

Network Congestion and Timeouts



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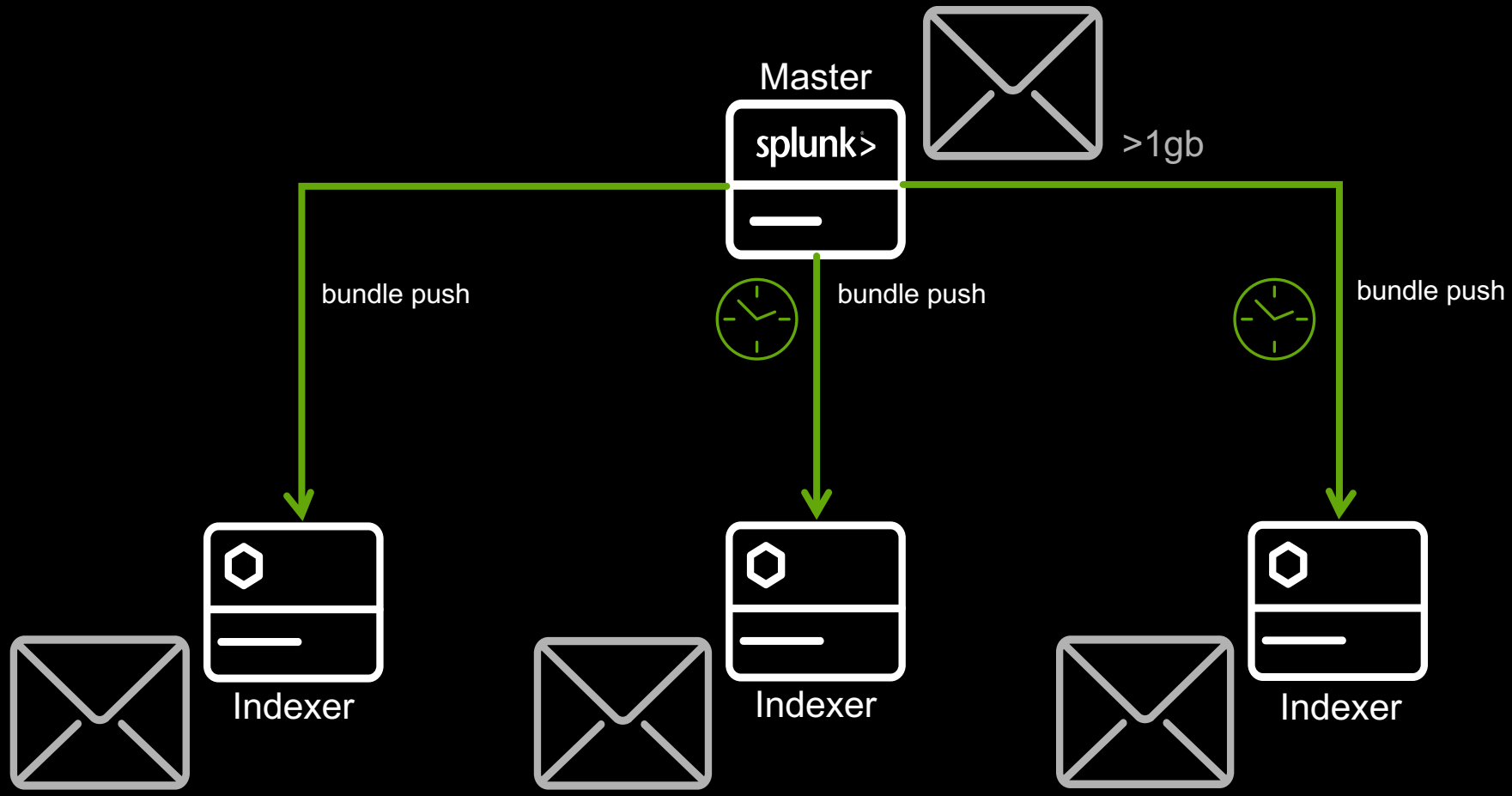
Phased Bundle Downloads

Sending to One Peer at a time



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Enabling Phased Bundle Downloads

- This is recommended if a cluster master is pushing large bundles or even a smaller bundle but to a large cluster (20 or more indexers).
- To enable, set the following configuration within server.conf

```
#inside server.conf
[clustering]
mode=master
max_peers_to_download_bundle = 1
```

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Recap

Bundle Push and Other Operations

1. Configuration Bundle
2. Bundle Operations: Apply, Validate, Check for Restart, Rollback
3. States during Bundle Push
4. Phased Bundle Downloads

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DEMO

Skip Screenshots

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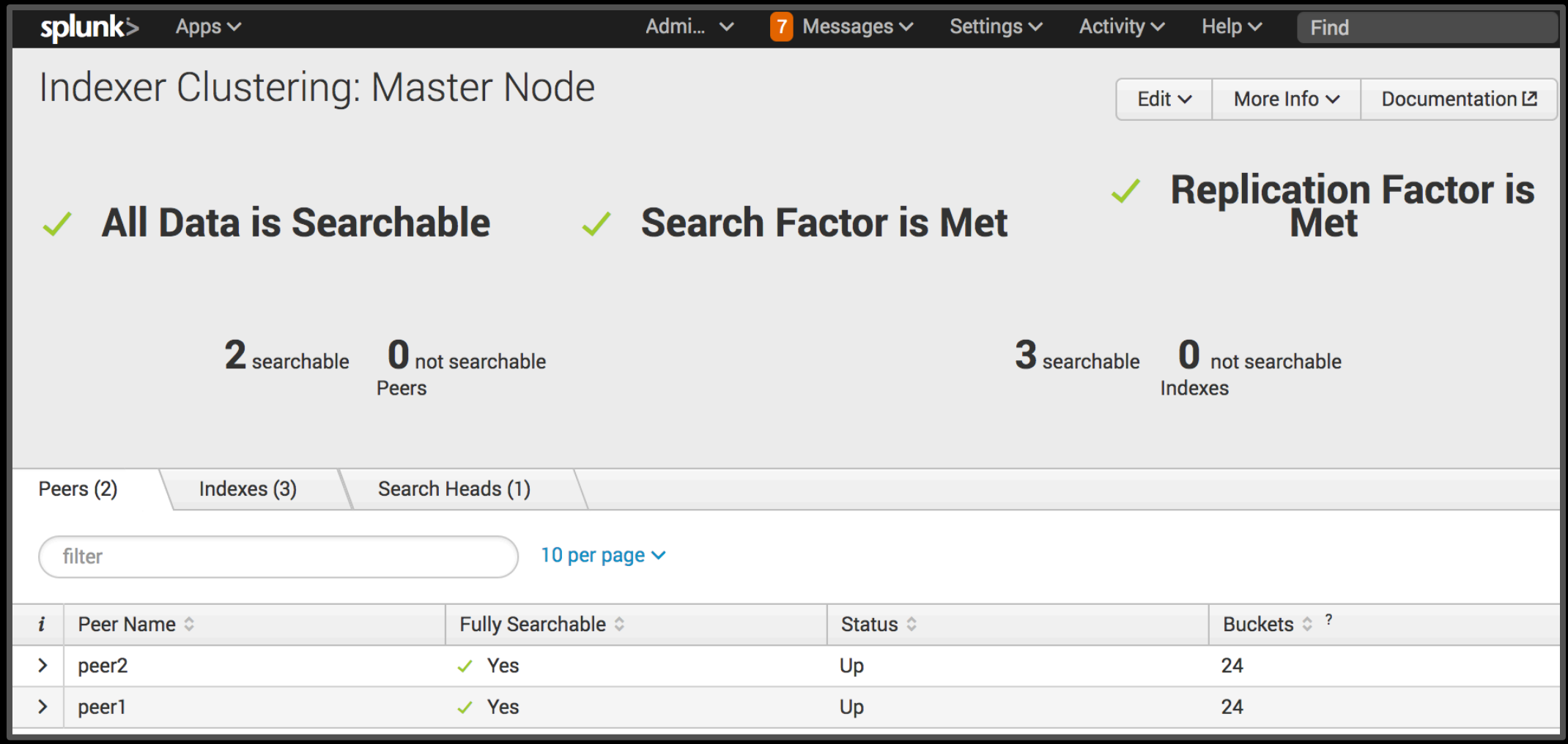
Bundle Operations

Cluster Master UI – Indexer Clustering



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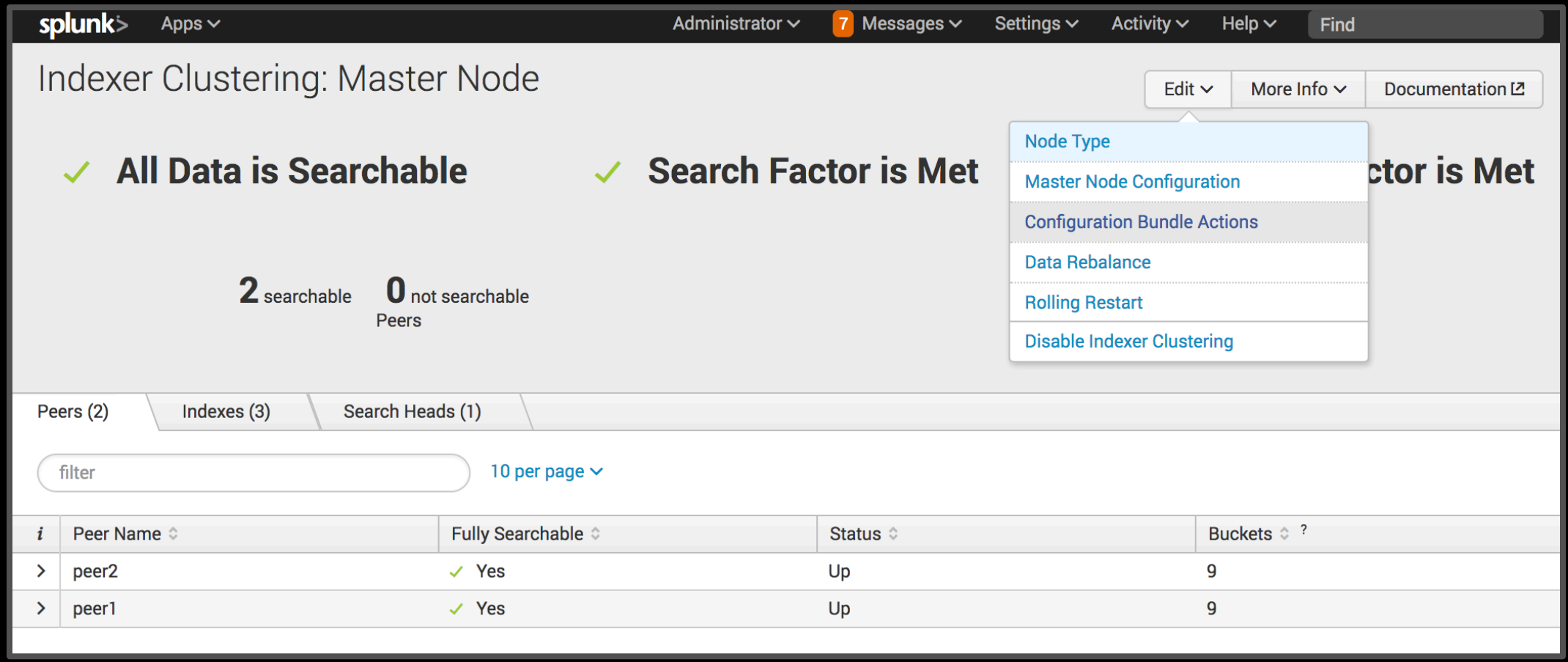
Bundle Operations

Configuration Bundle Actions



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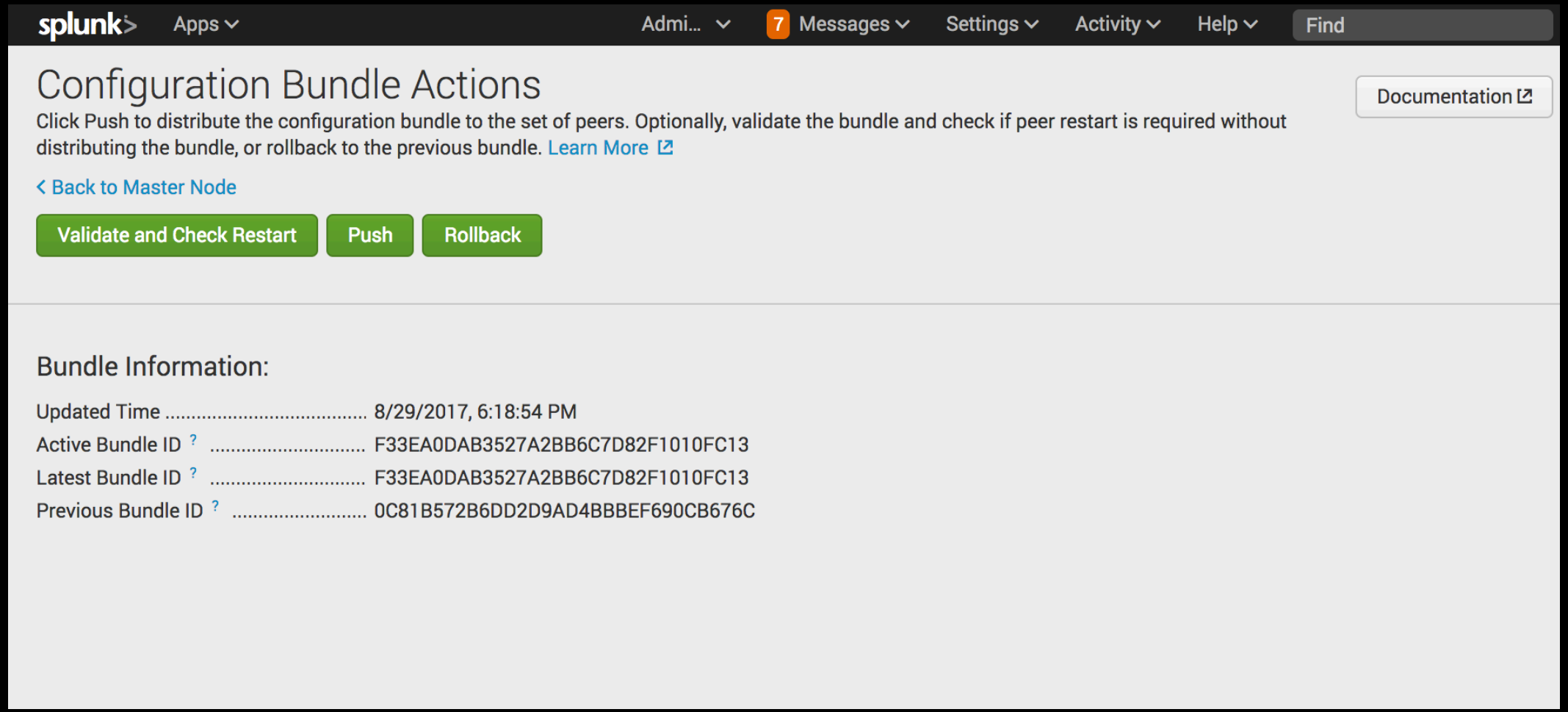
Bundle Operations

Configuration Bundle Actions



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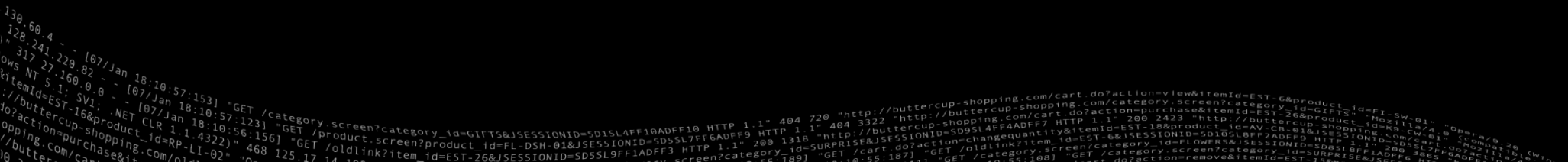
Bundle Operations

Configuration change to effect bundle push

```
kkolla@kkolla-HP:~/Work/instances/master/etc/master-apps/_cluster/local$ cat inputs.conf
[splunktcp://13452]
disabled=0
kkolla@kkolla-HP:~/Work/instances/master/etc/master-apps/_cluster/local$
```



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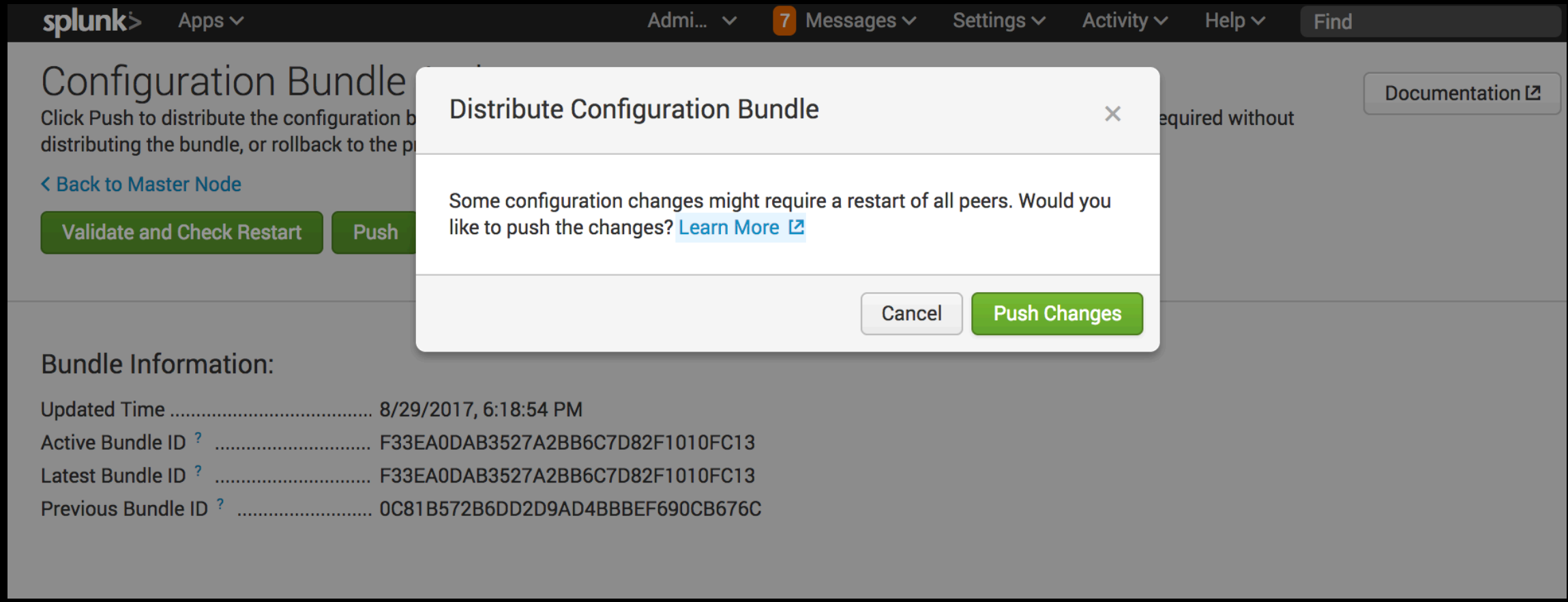
Bundle Operations

Bundle Push from the UI



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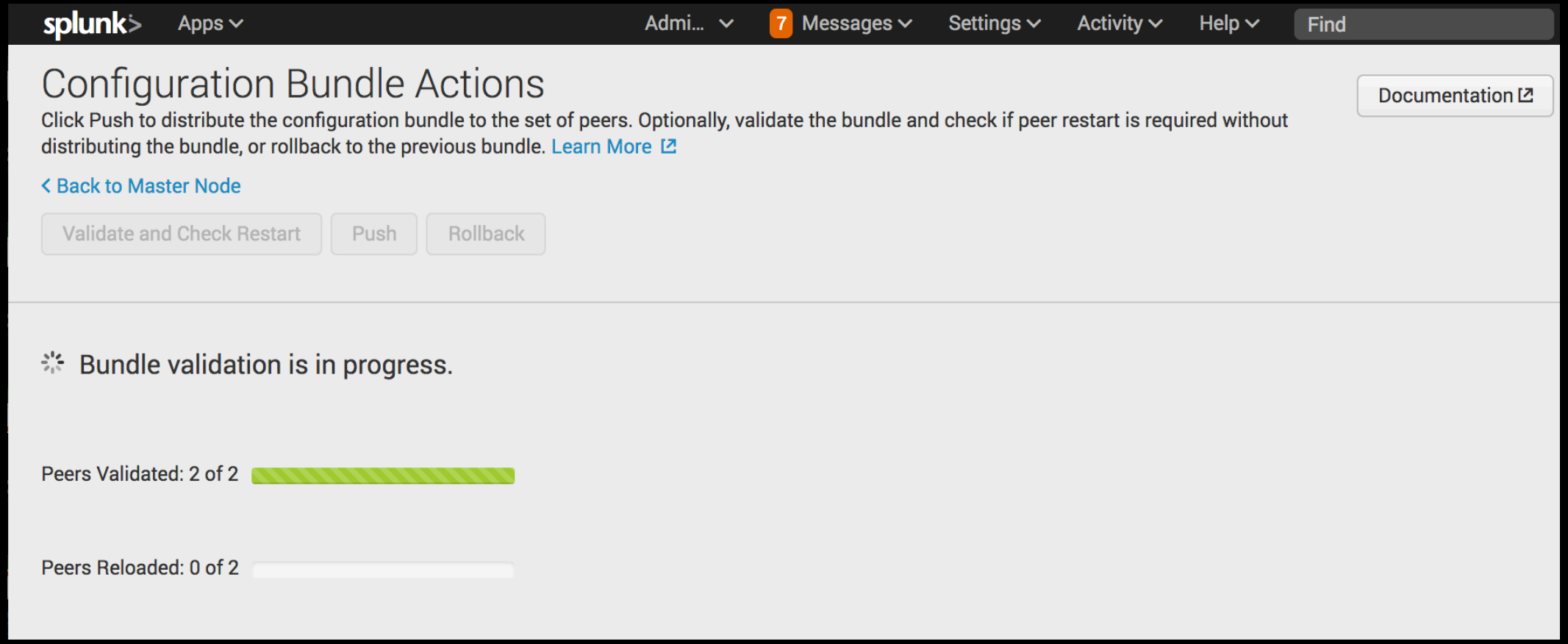
Bundle Operations

Bundle Push from the UI - Stages



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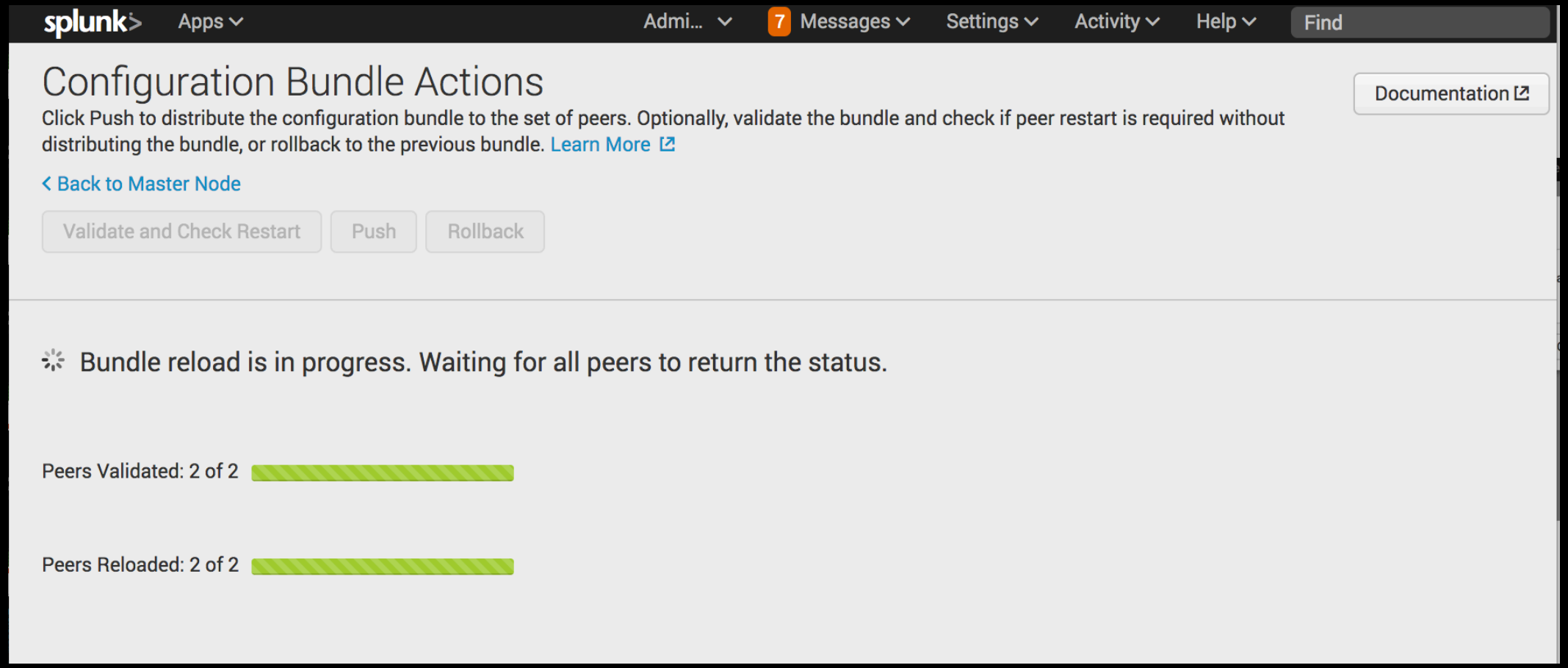
Bundle Operations

Bundle Push from the UI - Stages



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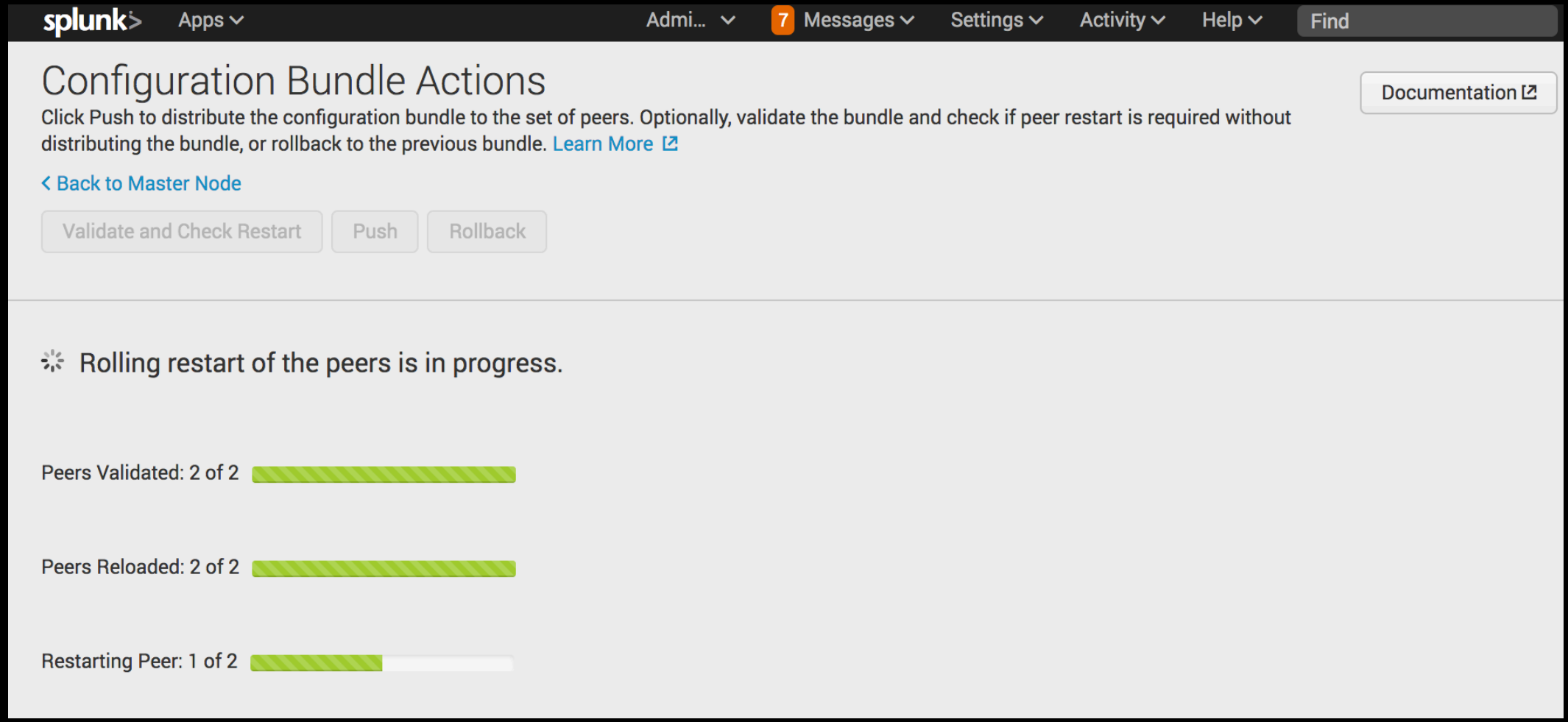
Bundle Operations

Bundle Push from the UI - Stages



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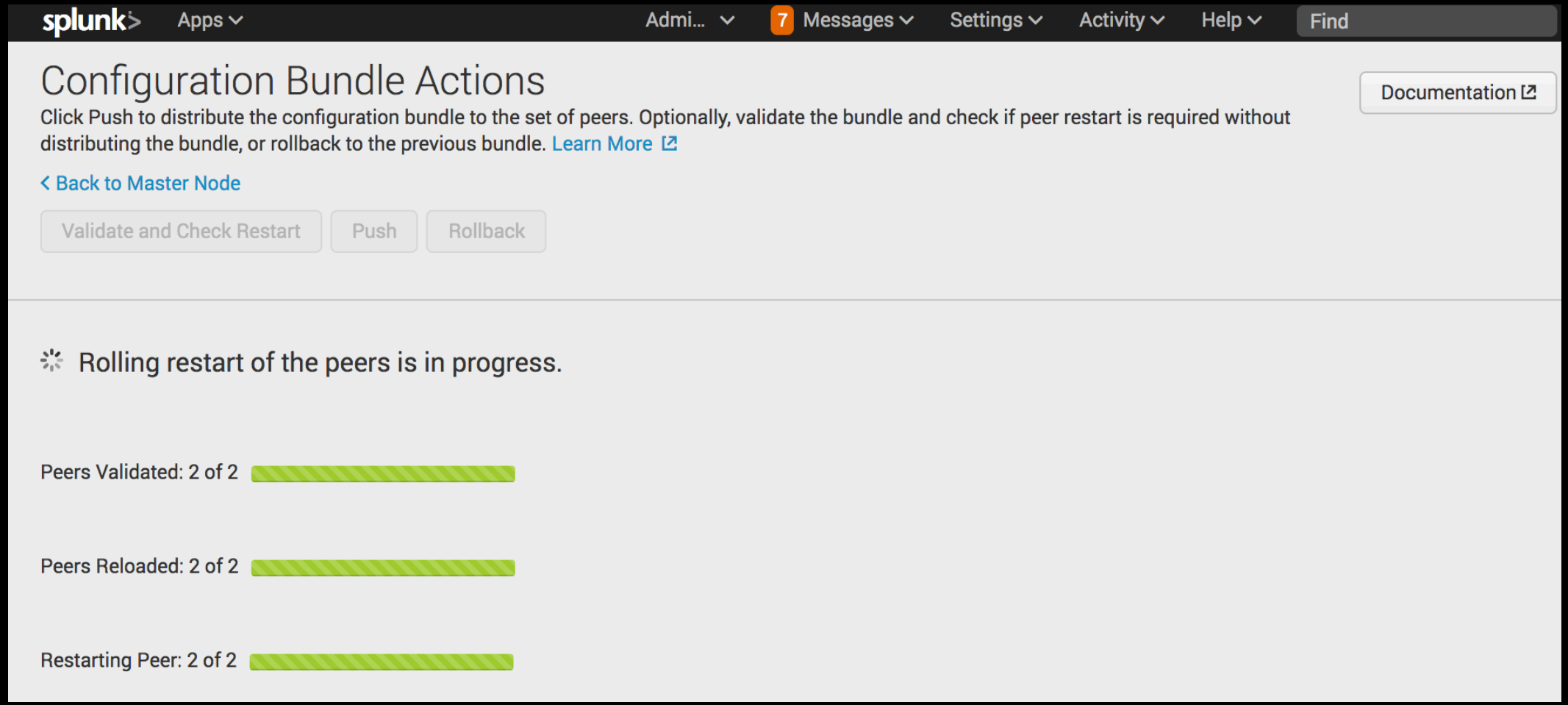
Bundle Operations

Bundle Push from the UI - Stages



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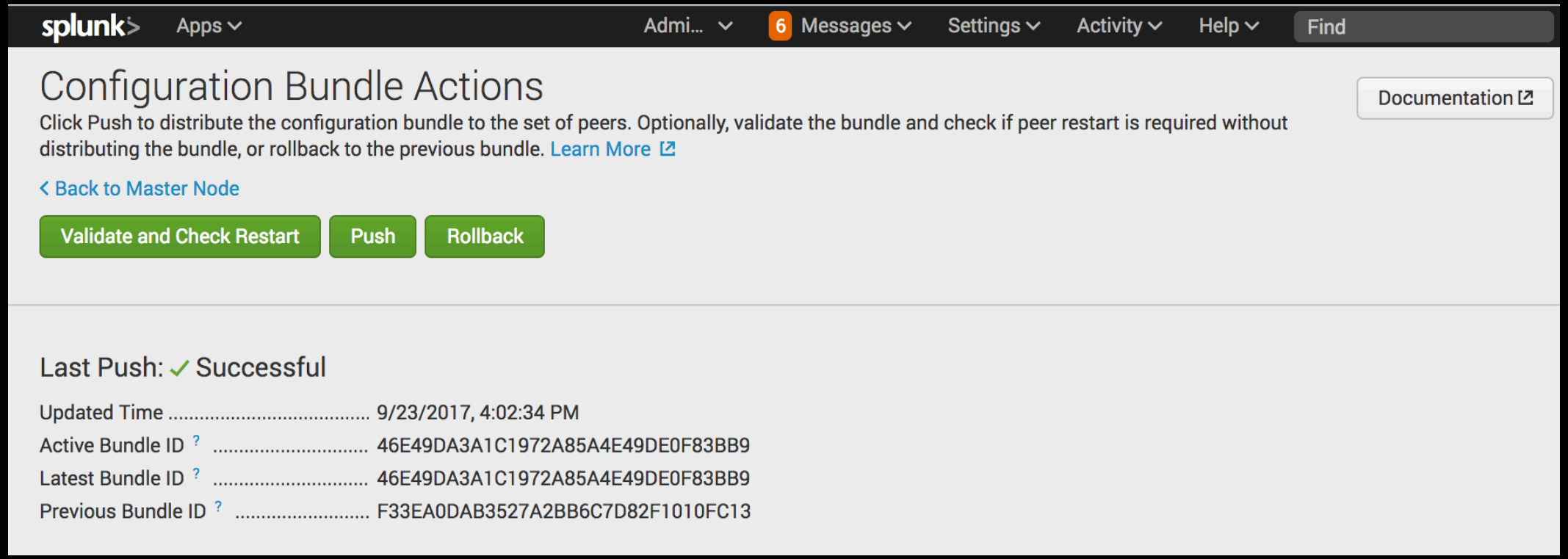
Bundle Operations

Bundle Push from the UI - Complete



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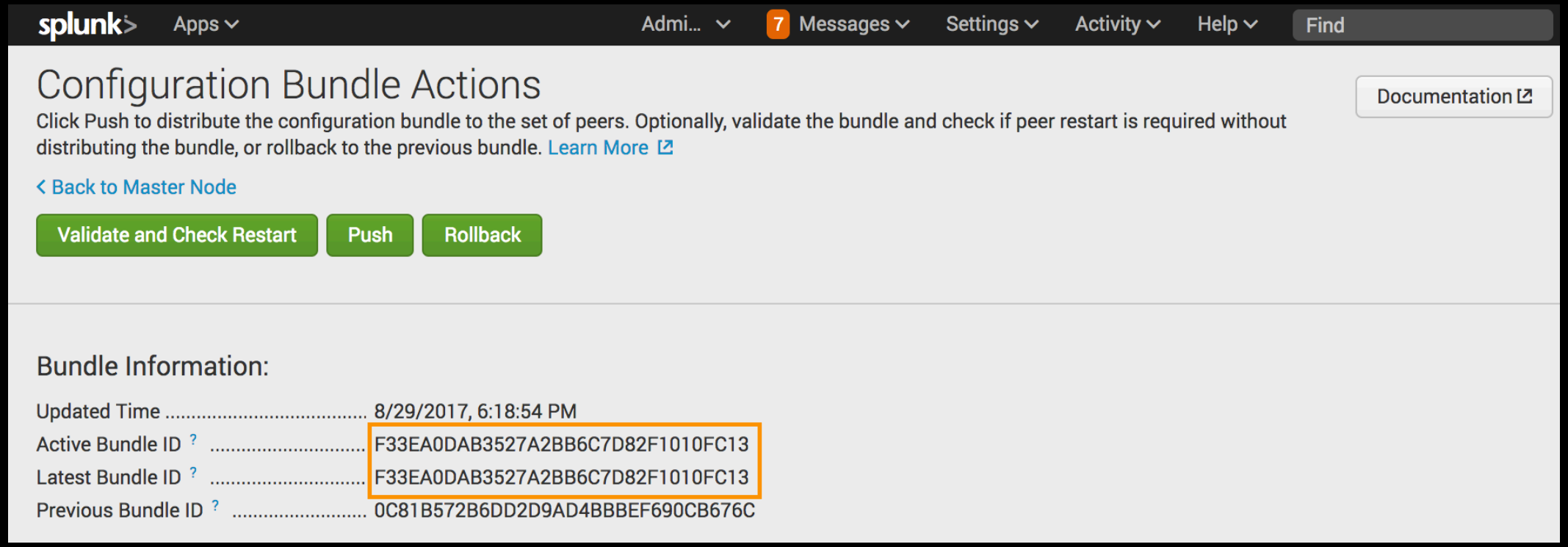
Bundle Operations

UI – Before Bundle Push



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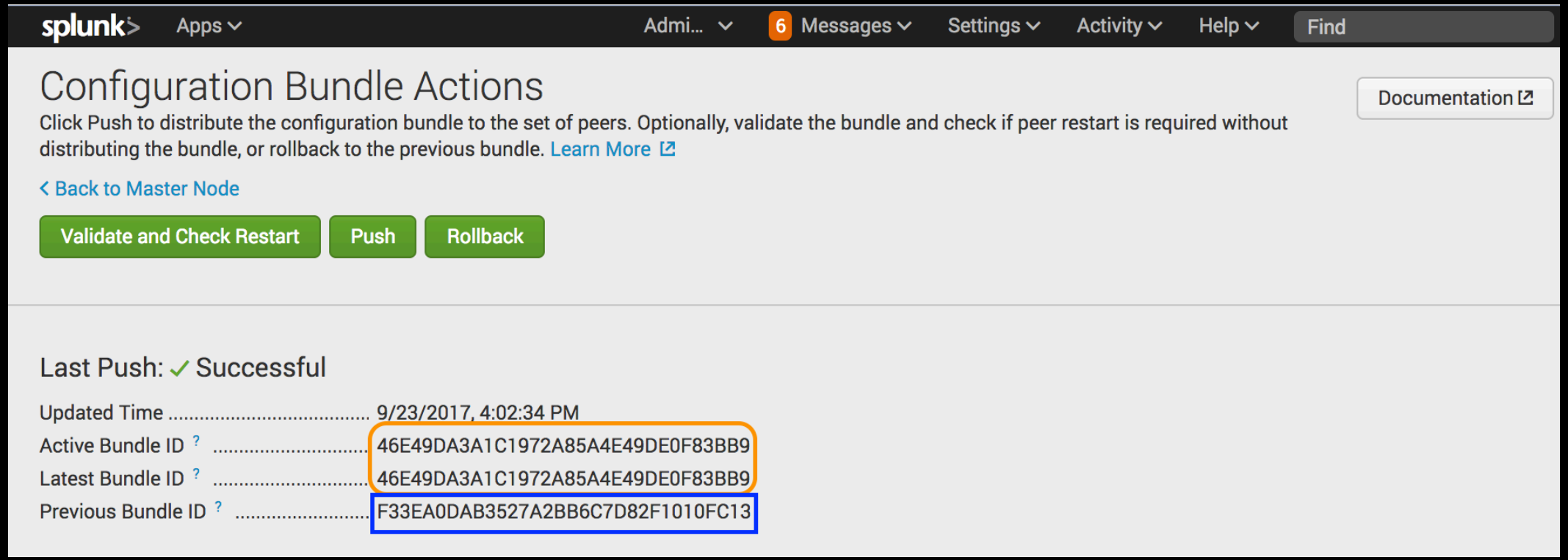
Bundle Operations

UI – After Bundle Push



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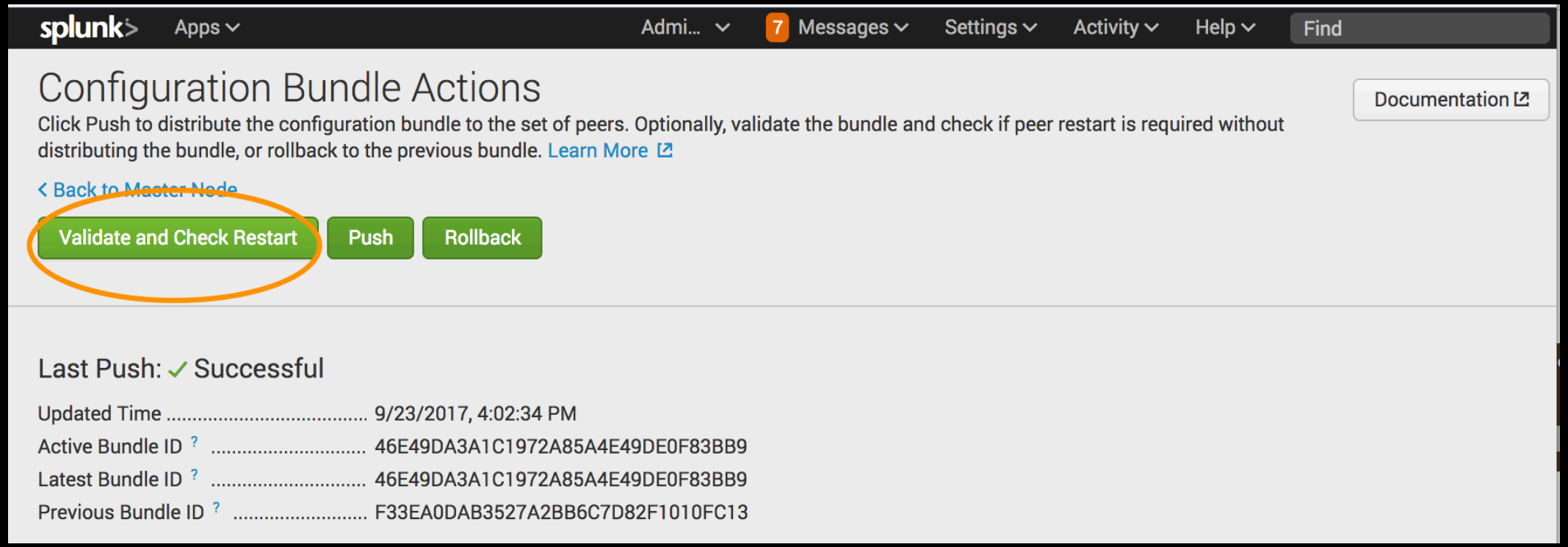
Bundle Operations

UI – Validate and Check Restart



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Bundle Operations

Configuration change to effect bundle Check Restart

```
kkolla@kkolla-HP:~/Work/instances/master/etc/master-apps/_cluster/local$ cat inputs.conf
[splunktcp://33452]
disabled=0
kkolla@kkolla-HP:~/Work/instances/master/etc/master-apps/_cluster/local$
```

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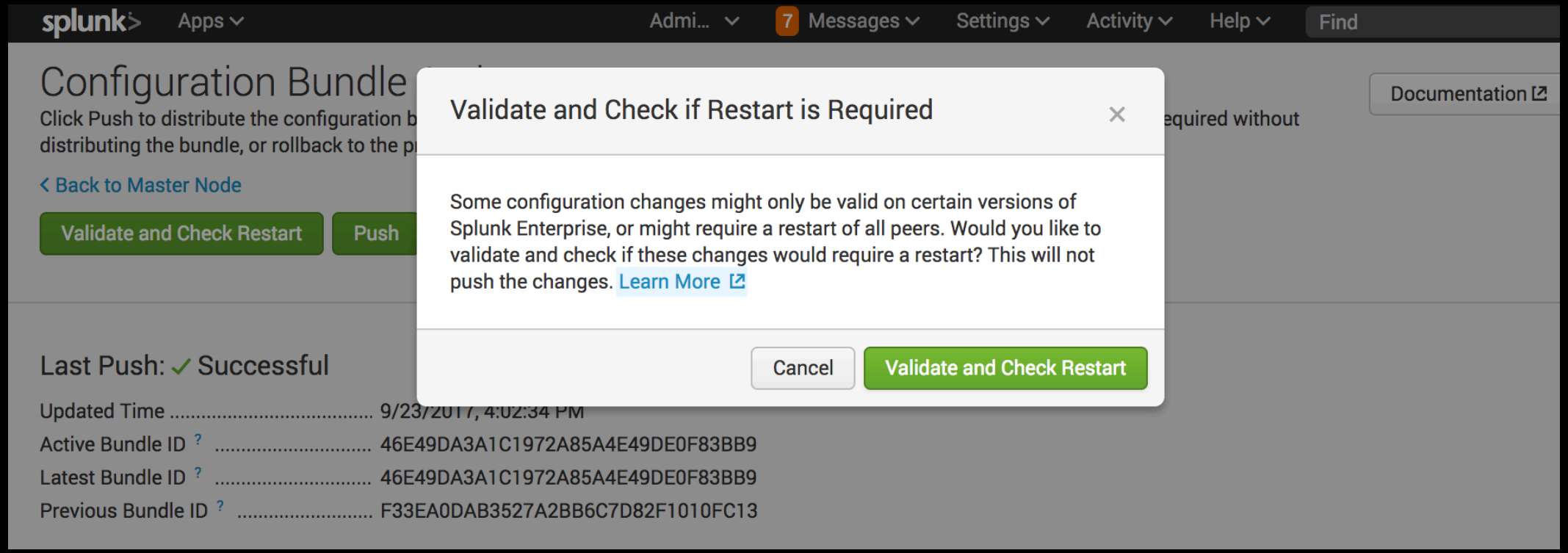
Bundle Operations

Validate and Check Restart from the UI



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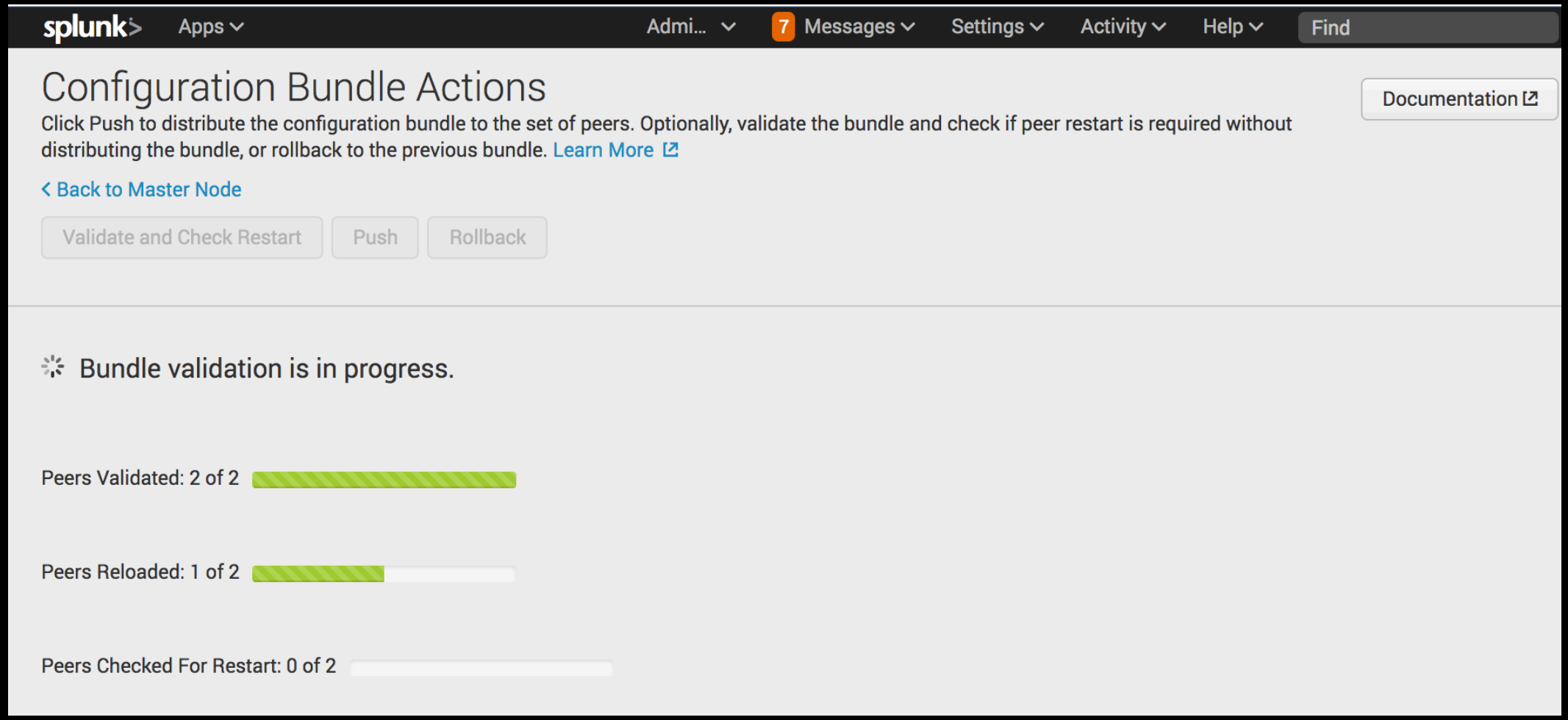
Bundle Operations

Validate and Check Restart from the UI



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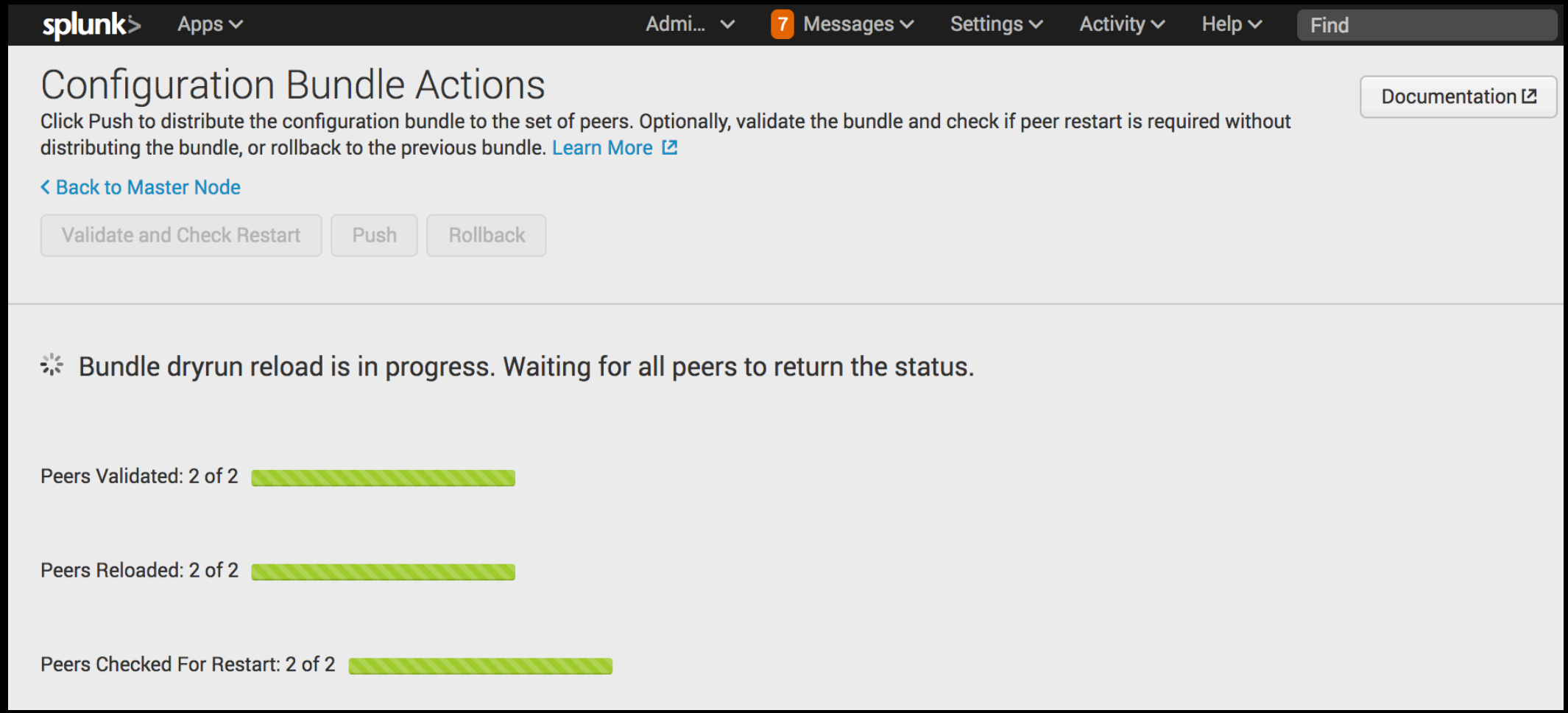
Bundle Operations

Validate and Check Restart from the UI



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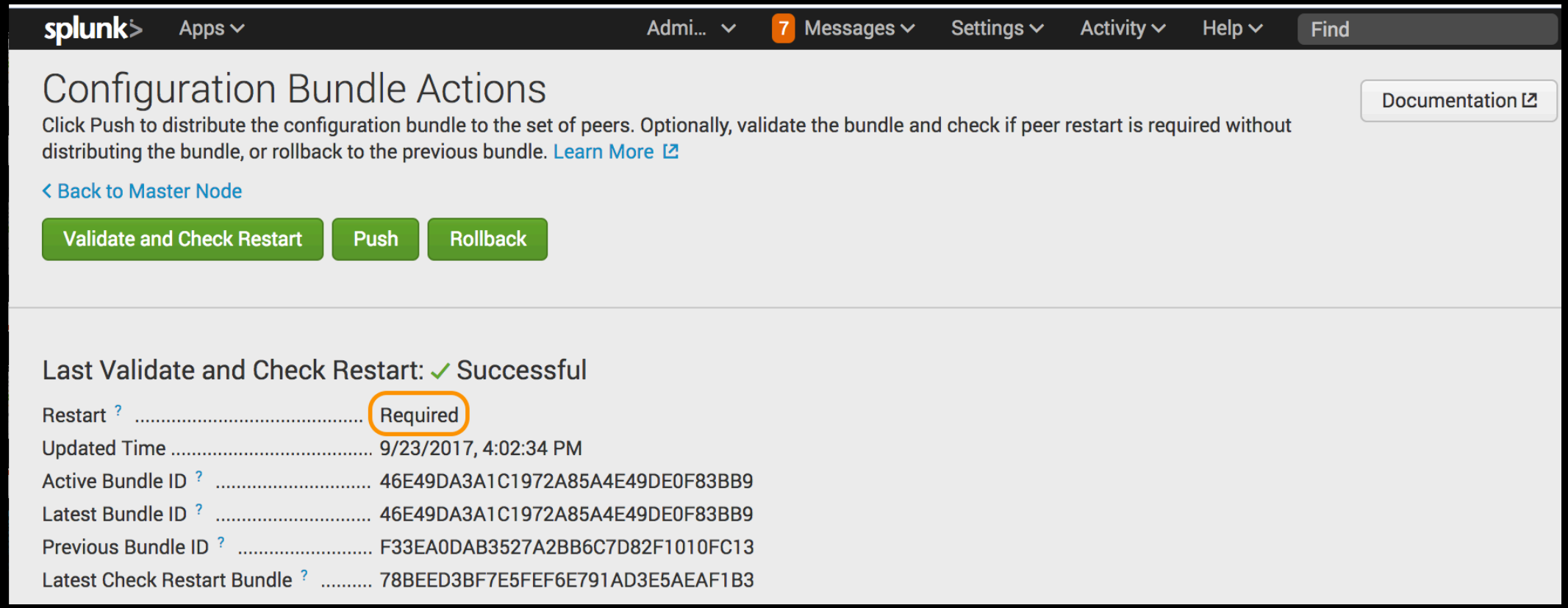
Bundle Operations

Validate and Check Restart from the UI



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Troubleshooting and Best Practices

Pushing Configuration Bundles in an Indexer Cluster

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Apply Bundle

Cluster Master – splunkd.log

```
INFO  CMBundleMgr - apply bundle status transitioning from='None', to='Bundle Creation is in progress.

INFO  CMMaster - Creating a new bundle on the master.

INFO CMBundleMgr - apply bundle status transitioning from='None', to='Bundle validation is in progress.'

INFO  CMMaster - Bundle validation is in progress for peers=8A0E551F-227C-48DC-9018-515A63F971E8,F78272B2-24DC-43BD-A402-A101123F2B4F.

Bundle validation success reported by [F78272B2-24DC-43BD-A402-A101123F2B4F peer_name=peer1] successful for bundleid=1E704E11131BC274111CD8991E0DE621

INFO  CMPeer - Bundle validation success reported by [8A0E551F-227C-48DC-9018-515A63F971E8 peer_name=peer2] successful for bundleid=1E704E11131BC274111CD8991E0DE621
```

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Apply Bundle

Cluster Master – splunkd.log

```
INFO  CMBundleMgr - apply bundle status transitioning from='Bundle validation is in progress.', to='Bundle reload is in progress. Waiting for all peers to return the status.'

INFO  CMMaster - Peers have indicated they are reload capable, issuing bundle reload.

INFO  CMPeer - Bundle reload status peer=8A0E551F-227C-48DC-9018-515A63F971E8 peer_name=peer2 restart_required=1 rolling_restart=1 dryrun=0 reasons=[One or more configs require a restart to take effect. Configs=inputs]

INFO  CMPeer - Bundle reload status peer=F78272B2-24DC-43BD-A402-A101123F2B4F peer_name=peer1 restart_required=1 rolling_restart=1 dryrun=0 reasons=[One or more configs require a restart to take effect. Configs=inputs]

INFO  CMMaster - Restart required to apply the bundle.

INFO  CMBundleMgr - apply bundle status transitioning from='Bundle reload is in progress. Waiting for all peers to return the status.', to='Rolling restart of the peers is in progress.'

INFO  CMMaster - Starting a rolling restart of the peers.
```

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Apply Bundle

Viewing the cluster bundle

- $ ./bin/splunk show cluster-bundle-status

```
17:03 $ splunk show cluster-bundle-status

master
        cluster_status=None
        active_bundle
               checksum=ED4C6043FBF5345DBDCD3DD304636F9C
               timestamp=1501714888 (in localtime=Wed Aug  2 16:01:28 2017)
        latest_bundle
               checksum=ED4C6043FBF5345DBDCD3DD304636F9C
               timestamp=1501714888 (in localtime=Wed Aug  2 16:01:28 2017)
        last_validated_bundle
               checksum=ED4C6043FBF5345DBDCD3DD304636F9C
               last_validation_succeeded=1
               timestamp=1501714888 (in localtime=Wed Aug  2 16:01:28 2017)

 peer2   8A0E551F-227C-48DC-9018-515A63F971E8    default
        active_bundle=ED4C6043FBF5345DBDCD3DD304636F9C
        latest_bundle=ED4C6043FBF5345DBDCD3DD304636F9C
        last_validated_bundle=ED4C6043FBF5345DBDCD3DD304636F9C
        last_bundle_validation_status=success
        restart_required_apply_bundle=0
        status=Up
```

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Check Restart

Cluster Master – splunkd.log

```
INFO  CMMaster - Changing the dryrun bundle on the master,
dryrun='815D4F439CA468F282164B7E456154E7'.

CMBundleMgr - apply bundle status transitioning from='None', to='Bundle validation is in
progress.'

CMMaster - Tracking bundle validation status for peers=F78272B2-24DC-43BD-A402-
A101123F2B4F,8A0E551F-227C-48DC-9018-515A63F971E8

INFO  CMPeer - Bundle validation success reported by [F78272B2-24DC-43BD-A402-
A101123F2B4F peer_name=peer1] successful for bundleid=815D4F439CA468F282164B7E456154E7

INFO  CMPeer - Bundle validation success reported by [8A0E551F-227C-48DC-9018-
515A63F971E8 peer_name=peer2] successful for bundleid=815D4F439CA468F282164B7E456154E7

INFO  CMMaster - CMMaster issuing a dry run of bundle push
```

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Check Restart

Cluster Master – splunkd.log

```
INFO  CMBundleMgr - apply bundle status
transitioning from='Bundle validation is
in progress.', to='Bundle dryrun reload
is in progress. Waiting for all peers to
return the status.'


INFO  CMMaster - Dry Run Complete
```

```
16:58 $ splunk show cluster-bundle-status

master
        cluster_status=None
        active_bundle
               checksum=1E704E11131BC274111CD8991E0DE621
               timestamp=1501715122 (in localtime=Wed Aug  2 16:05:22 2017)
        latest_bundle
               checksum=1E704E11131BC274111CD8991E0DE621
               timestamp=1501715122 (in localtime=Wed Aug  2 16:05:22 2017)
        last_validated_bundle
               checksum=815D4F439CA468F282164B7E456154E7
               last_validation_succeeded=1
               timestamp=1501716951 (in localtime=Wed Aug  2 16:35:51 2017)

 peer2  8A0E551F-227C-48DC-9018-515A63F971E8    default
        active_bundle=1E704E11131BC274111CD8991E0DE621
        latest_bundle=1E704E11131BC274111CD8991E0DE621
        last_validated_bundle=815D4F439CA468F282164B7E456154E7
        last_bundle_validation_status=success
        last_bundle_checked_for_restart=815D4F439CA468F282164B7E456154E7
        last_check_restart_result=restart required
        restart_required_apply_bundle=0
        status=Up
```

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Rollback

Cluster Master – splunkd.log

```
INFO  CMBundleMgr - apply bundle status transitioning from='None', to='Bundle Creation is in progress.'

INFO  CMMaster - Initiating rollback bundle process

INFO  CMBundleMgr - Rolling back bundle on the master to previousActive bundle=ED4C6043FBF5345DBDCD3DD304636F9C previousActive bundlePath=/Users/kkolla/Work/instances/master/var/run/splunk/cluster/remote-bundle/971e64c31b6bbb0c0e7479cf500e0647-1501714888.bundle

CMMaster - Tracking bundle validation status for peers=F78272B2-24DC-43BD-A402-A101123F2B4F,8A0E551F-227C-48DC-9018-515A63F971E8

INFO  CMBundleMgr - setting previousActive bundle=ED4C6043FBF5345DBDCD3DD304636F9C to active bundle=1E704E11131BC274111CD8991E0DE621

INFO  CMMaster - Peers have indicated they are reload capable, issuing bundle reload.

INFO  CMMaster - Starting a rolling restart of the peers.
```

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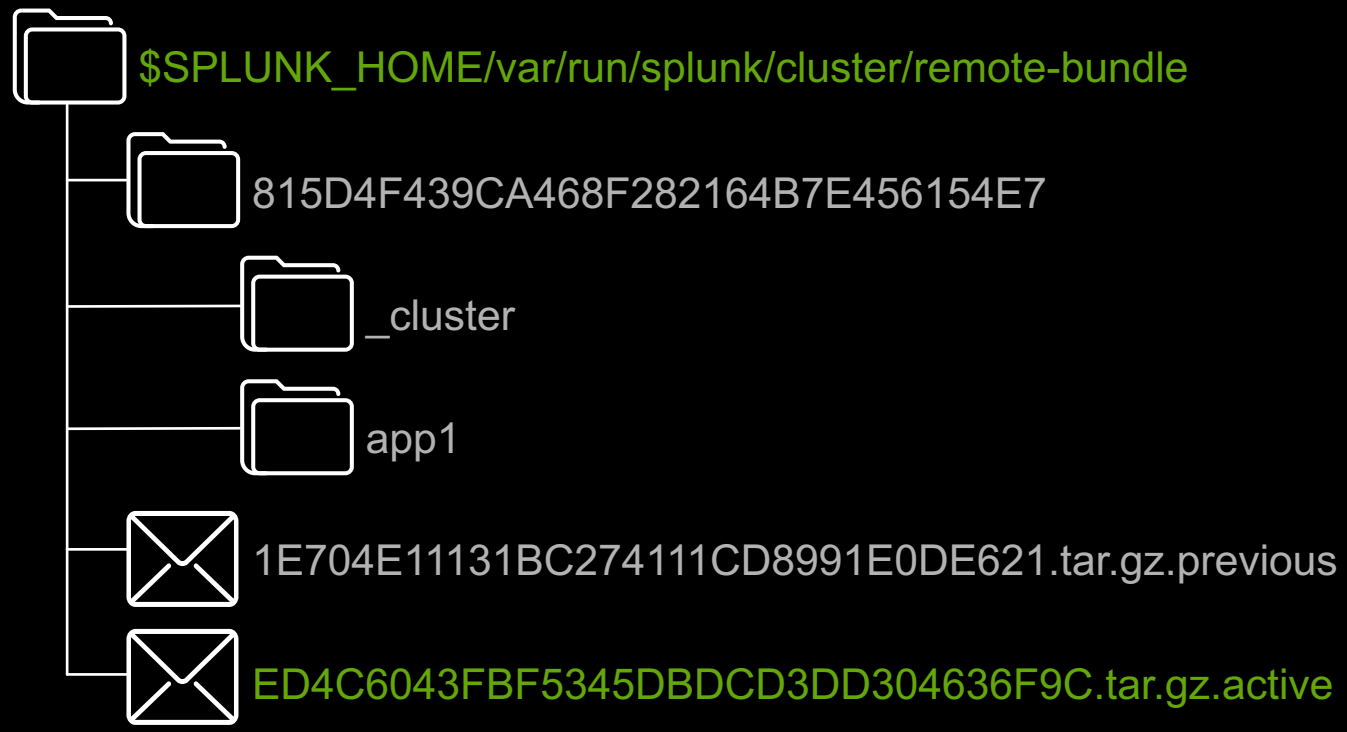
Keeping Track of Bundles

which bundle again?

- The bundles folder



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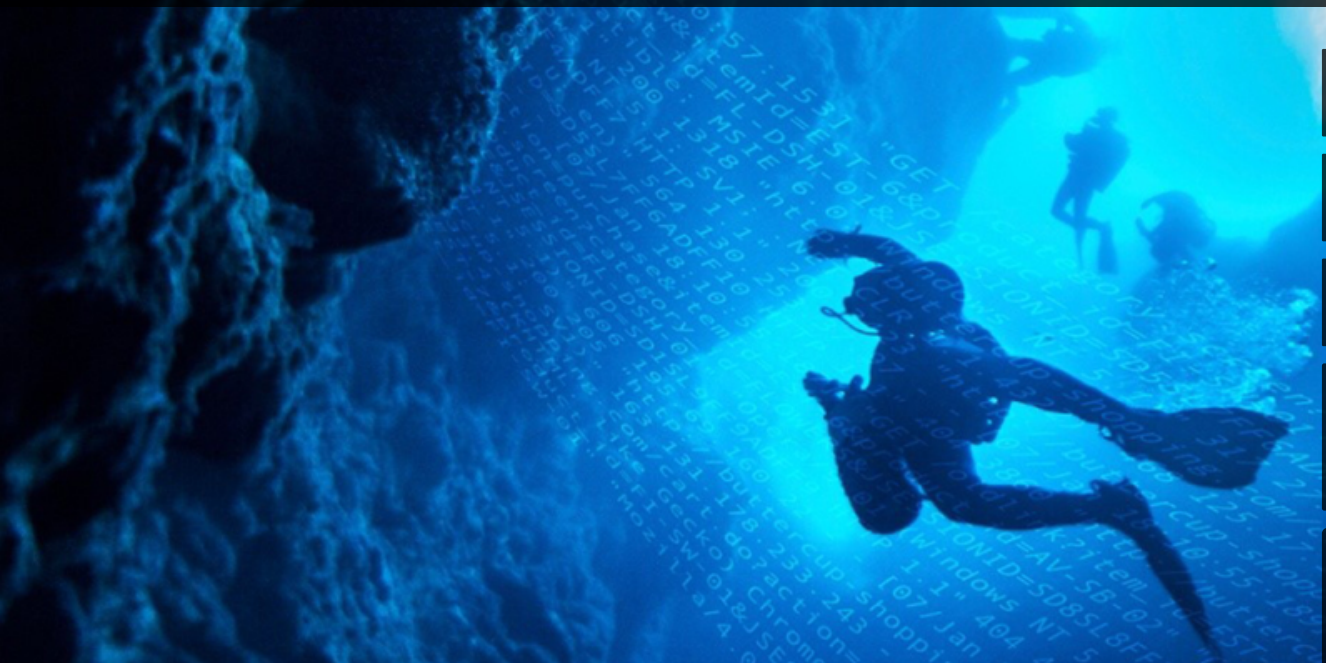
Best Practices



1. Find a reasonable time to do your bundle push
2. Do NOT change slave configurations locally
3. When in doubt, use “—check-restart”
4. Enable phased bundle downloads for large bundles or large clusters

URLs:

https://docs.splunk.com/Documentation/Splunk/6.6.3/Indexer/Managecommonconfigurations

https://docs.splunk.com/Documentation/Splunk/6.6.3/Indexer/Configurationbundleissues

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Thank You

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