

# PEN-3299 Lab Addendum

This is the addendum to the PEN-3299 lab, Building Your Own On-prem Cloud with Node.js and Java. This addendum extends the lab by adding an additional exercise to demonstrate administrative scaling for Node.js applications.

In this exercise you will perform the following tasks:

1. Initial setup
2. Administrative scale-out
3. Administrative scale-in

## Setup

Setup is simple. Just one command sets up the exercise. Just issue the following commands:

1. `cd ~/PEN-3299`
2. `./setup.sh`
3. restart controller
  - a. `cd ~/IBM/wlp/bin`
  - b. `./server stop controller1`
  - c. `./server start controller1`

The setup.sh command does the following for you:

1. Updates your WebSphere Liberty with some updates that didn't make it onto the original lab image in time. Yes, there are deadlines ☺
2. Updates the Collective Controller to mark the cluster named strongLoopCluster as enabled scaling. In the finished product this will be automatic. For the purposes of this exercise using the February 2016 Liberty Beta, we have to simulate it.
3. Creates a scaling policy for strongLoopCluster and adds it to controller1's configuration.
4. Enables the Config Tool for controller1 by enabling remote access for controller1.

**Important: ensure member1 and member2 are not running by issuing commands:**

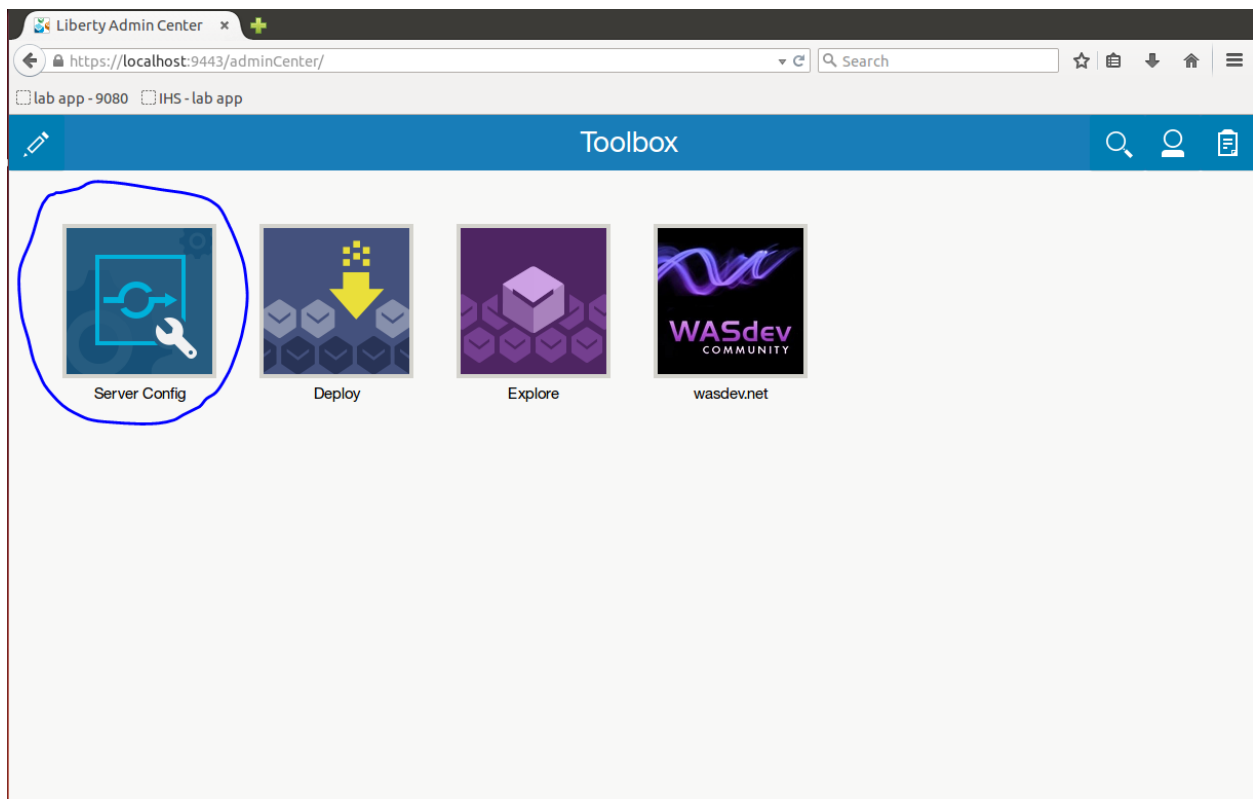
1. `wlpn-server stop member1`
2. `wlpn-server stop member2`

## Administrative Scale-out

For this task, you will update the scaling policy for strongLoopCluster to designate 2 instances are required. Do this by setting min and max both to 2 – e.g.

Do this in the Admin Center Config Tool. Open a new tab in your browser and start a new Admin Center session – e.g. <http://localhost:9080/adminCenter>

Select the Server Config tool:



Select controller1:

Liberty Admin Center

https://localhost:9443/adminCenter/#serverConfig

Search

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Server Config

Select Server

5 Servers

Search

Server Name	Cluster	Host	User Directory Path
autoScaled1	elastic	localhost	/home/was/IBM/wlp/usr
autoScaled2	elastic	localhost	/home/was/IBM/wlp/usr
controller1		localhost	/home/was/IBM/wlp/usr
member1	strongLoopCluster	localhost	/home/was/wlpn
member2	strongLoopCluster	localhost	/home/was/wlpn

Select strongLoopCluster.scalingPolicy.xml:

The screenshot shows the Liberty Admin Center interface. The browser address bar displays `https://localhost:9443/adminCenter/#serverConfig/localhost,/home/was/IBM/wlp/usr/controller1`. The page title is "Server Config" and the server name is "controller1". A "Change Server" button is visible in the top right. The "Primary" section shows the default configuration `server.xml` located at `$(server.config.dir)`. The "Overrides" section lists two files: `strongLoopCluster.scalingPolicy.xml` (highlighted with a blue circle) and `controller.fileAccess.xml`, both located at `$(server.config.dir)/configDropins/overrides`.

Use navigation bar on left to expand policy definition:

The screenshot displays the Liberty Admin Center web interface. The browser's address bar shows the URL `https://localhost:9443/adminCenter/#serverConfig/localhost:/home/was/IBM/wlp/usr,controller1/$s`. The page title is "Server Config". Below the title bar, the file path `strongLoopCluster.scalingPolicy.xml` is shown, with "Save" and "Close" buttons. The interface is divided into two main sections: "Design" and "Source". The "Design" section on the left contains a tree view with the following structure:

- Server
  - Scaling Definitions
    - Scaling Policy (expanded, showing `strongLoopCluster`)

The "Source" section on the right displays the configuration for the "Scaling Policy". It includes a description: "Defines criteria for starting or stopping Liberty servers based on demand for resources". There are "Add child" and "Remove" buttons. The configuration fields are as follows:

- ID**: `strongLoopCluster` (with a clear button).
- Enabled**: `true` (with a clear button and a "Select" button).
- Min**: `0` (with a clear button).
- Max**: `0` (with a clear button).
- Scaling preference**: `horizontal (default)` (with a "Select" button).

Each input field has a small "x" icon to clear the value. The "Min" and "Max" fields have descriptive text below them: "Minimum number of cluster members to start" and "Maximum number of cluster members that can be running at the same time" respectively.

Note in Admin Center Explorer tool that strongLoopCluster members are not running.

The screenshot displays the Liberty Admin Center Explorer interface. The browser address bar shows the URL `https://localhost:9443/adminCenter/#explore/clusters/strongLoopCluster/apps/express-example-ap`. The page title is "Explore". The breadcrumb navigation shows "strongLoopCluster" > "express-example-app".

The main content area shows the "express-example-app" on the "strongLoopCluster". The app status is "Stopped" (indicated by a red stop icon) and it has an "Auto scaling policy".

Below the app status, there is a summary bar showing the number of instances: 2 Instances. A bar chart indicates 0 Running instances (green dot) and 2 Stopped instances (black dot).

Two instance details are listed:

- express-example-app** (Stopped)
  - member1
    - /home/was/wlpn
    - localhost
- express-example-app** (Stopped)
  - member2
    - /home/was/wlpn
    - localhost

Go back to Admin Center Config Tool, set min and max to 2 and save:

The screenshot shows the Liberty Admin Center interface for configuring the `strongLoopCluster.scalingPolicy.xml` file. The page is titled "Server Config" and has tabs for "Design" and "Source". The left sidebar shows a tree view with "Server" expanded, containing "Scaling Definitions" and "Scaling Policy". The "Scaling Policy" section is selected, showing a list of policies with "strongLoopCluster" highlighted. The main content area displays the configuration for "strongLoopCluster" under the "Scaling Policy" section. The configuration includes fields for "ID" (strongLoopCluster), "Enabled" (true), "Min" (2), "Max" (2), and "Scaling preference" (horizontal (default)). The "Min" and "Max" fields are circled in blue, and the "Save" button in the top right corner is also circled in blue.

Liberty Admin Center x Liberty Admin Center x

https://localhost:9443/adminCenter/#serverConfig/localhost,/home/was/IBM/wlp/usr,controller1/\$s Search

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Server Config

strongLoopCluster.scalingPolicy.xml

Save Close

Design Source

Server

Scaling Definitions

Scaling Policy strongLoopCluster

**Scaling Policy**  
Defines criteria for starting or stopping Liberty servers based on demand for resources

Add child Remove

**ID**  
strongLoopCluster  
A unique configuration ID.

**Enabled**  
true  
Indicates whether the scaling policy is enabled

**Min**  
2  
Minimum number of cluster members to start

**Max**  
2  
Maximum number of cluster members that can be running at the same time

**Scaling preference**  
horizontal (default)

Go back to Admin Center Explorer Tool and note that strongLoopCluster members have now started.

The screenshot displays the Liberty Admin Center Explorer Tool interface. The browser address bar shows the URL `https://localhost:9443/adminCenter/#explore/clusters/strongLoopCluster/apps/express-example-ap`. The page title is "Explore". The breadcrumb navigation shows "strongLoopCluster" and "express-example-app".

The main content area shows the "express-example-app" on the "strongLoopCluster". It is in a "Running" state, indicated by a green play button icon. An "Auto scaling policy" is also shown. Below this, a summary bar indicates "2" instances are running and "0" are stopped. A progress bar shows 2 out of 2 instances running.

The "Instances" section lists two running instances:

- member1**: /home/was/wlpn, localhost
- member2**: /home/was/wlpn, localhost

The left sidebar contains a navigation menu with "Overview" (selected) and "Instances".



## Administrative Scale-In

For this task, you will update the scaling policy for strongLoopCluster to designate 1 instances is required instead of 2. Do this by setting min and max both to 1 – e.g.

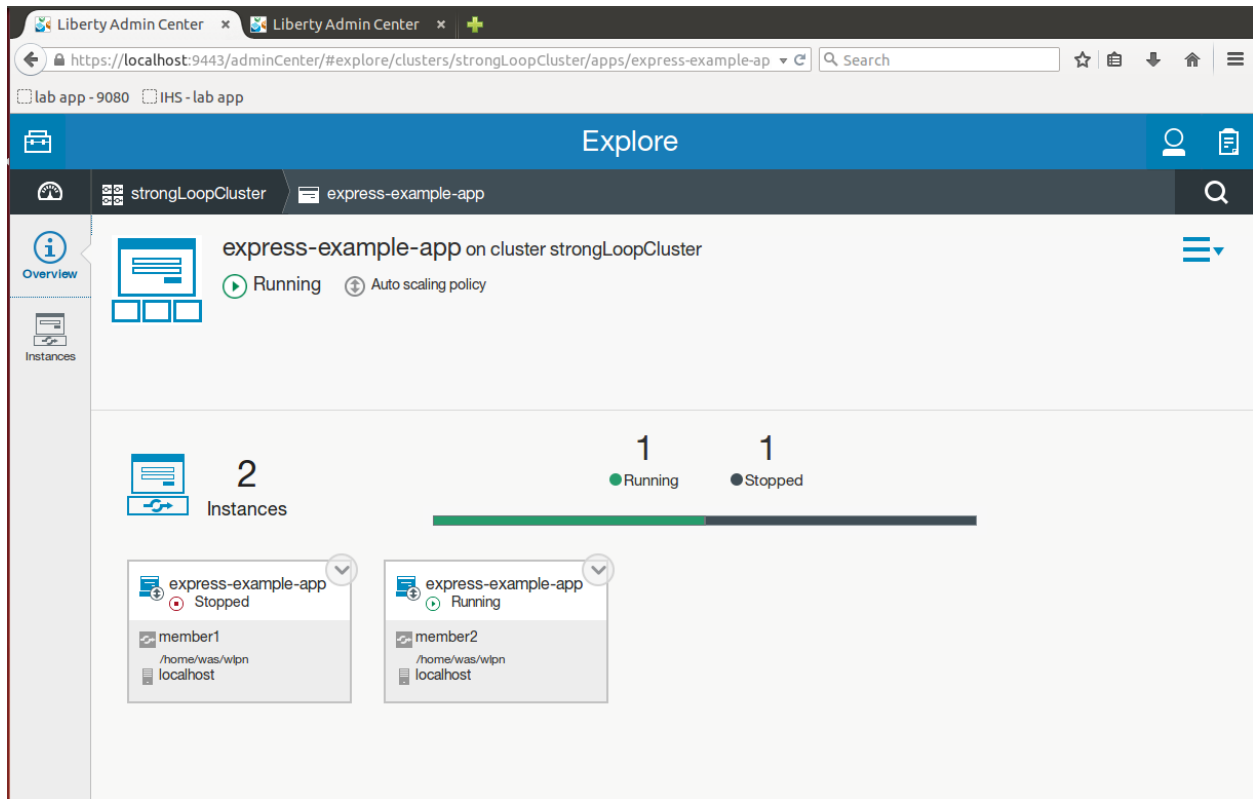
Go back to Admin Center Config Tool, set policy min and max back to one, and save.

The screenshot shows the Liberty Admin Center interface. The browser address bar displays `https://localhost:9443/adminCenter/#serverConfig/localhost,/home/was/IBM/wlp/usr,controller1/$[s`. The page title is "Server Config". Below the title bar, the configuration file path `strongLoopCluster.scalingPolicy.xml` is shown, with "Save" and "Close" buttons. The left sidebar has a tree view with "Server" expanded, showing "Scaling Definitions" and "Scaling Policy" (selected). The main content area is titled "Scaling Policy" and includes a description: "Defines criteria for starting or stopping Liberty servers based on demand for resources". It features "Add child" and "Remove" buttons. The configuration fields are as follows:

- ID**: `strongLoopCluster` (with a clear button).
- Enabled**: `true` (with a "Select" button).
- Min**: `1` (with a clear button).
- Max**: `1` (with a clear button).
- Scaling preference**: `horizontal (default)` (with a "Select" button).

Below each numeric field (Min, Max), there is a descriptive text: "Minimum number of cluster members to start" and "Maximum number of cluster members that can be running at the same time" respectively.

Go back to Admin Center Explorer Tool and note that only one strongLoopCluster member is now running



**Note: if member does not appear STOPPED immediately, it will take approximately 90 seconds to timeout and be marked STOPPED. This is a known issue with the beta.**

**End.**