**🧪 Helm Lab Guide: Tomcat Deployment with Bitnami**

**🔧 Prerequisites**

Ensure the following tools are installed:

* kubectl and access to a running Kubernetes cluster.
* Helm v3+ installed ([Install via script](https://helm.sh/docs/intro/install/#from-script)):

bash

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curl -fsSL -o get\_helm.sh https://raw.githubusercontent.com/helm/helm/main/scripts/get-helm-3

chmod 700 get\_helm.sh

./get\_helm.sh

**📦 Lab 1: Initial Deployment with Bitnami Tomcat Chart**

**🎯 Objective:**

Deploy a Tomcat application using Helm with:

* Persistence disabled
* 1 replica
* LoadBalancer service type

**🔁 Steps:**

1. **Add Bitnami Repo** (if not added):

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helm repo add bitnami https://charts.bitnami.com/bitnami

helm repo update

1. **Install with basic settings**:

bash

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helm install raman-tomcat bitnami/tomcat \

--set persistence.enabled=false \

--set replicaCount=1 \

--set service.type=LoadBalancer \

--version 11.7.9 \

-n raman --create-namespace

1. **Verify Deployment**:

bash

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helm list -n raman

k get all -n raman

**📦 Lab 2: Update Configuration (Second Revision)**

**🎯 Objective:**

Modify the deployment with:

* Replica count: 3
* Service type: NodePort
* Persistence still disabled

**✏️ Step 1: Create values.yml**

yaml

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replicaCount: 3

service:

type: NodePort

persistence:

enabled: false

Save as: values.yml

**🆙 Step 2: Upgrade the release**

bash

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helm upgrade raman-tomcat bitnami/tomcat -f values.yml -n raman

**✅ Step 3: Verify Changes**

bash

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k get all -n raman

helm history raman-tomcat -n raman

**🧾 Lab 3: View and Template Charts**

**🕵️‍♂️ Inspect default chart values:**

bash

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helm show values bitnami/tomcat > default-values.yaml

**📜 Render templates (dry-run):**

bash

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helm template raman-tomcat bitnami/tomcat --values values.yml -n raman > rendered.yaml

**🌀 Lab 4: Rollback Experiment**

**⏳ Step 1: Check revision history**

bash

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helm history raman-tomcat -n raman

**🔙 Step 2: Rollback to first revision**

bash

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helm rollback raman-tomcat 1 -n raman

**🔁 Step 3: Revert to second revision (optional)**

bash

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helm rollback raman-tomcat 2 -n raman

**🧰 Lab 5: Pull, Extract, and Customize Chart**

**🎯 Objective:**

Download chart locally to inspect or modify before installation.

bash

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helm pull oci://registry-1.docker.io/bitnamicharts/tomcat --version 11.7.9

tar -xvzf tomcat-11.7.9.tgz

cd tomcat/

You can now customize templates under the templates/ directory or modify values.yaml.

To install from local chart:

bash

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helm install raman-tomcat ./tomcat -n raman

**🔄 Clean Up**

bash

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helm uninstall raman-tomcat -n raman

kubectl delete ns raman

**🔍 Key Concepts Explained**

| **Concept** | **Explanation** |
| --- | --- |
| **Helm** | Kubernetes package manager for managing applications via Charts. |
| **Chart** | A collection of YAML templates and configuration files that define a Kubernetes application. |
| **OCI Chart** | Helm supports pulling charts from OCI-compliant registries like DockerHub. |
| **Dry Run** | --dry-run shows what will be deployed without making changes. Useful for debugging. |
| **Upgrade** | helm upgrade modifies an existing release with new settings or templates. |
| **Rollback** | Reverts a release to a previous state using a specific revision number. |
| **Persistence** | Determines if a PVC (PersistentVolumeClaim) should be created and attached. |
| **Service Types** | ClusterIP (default), NodePort, LoadBalancer — affects how the app is accessed externally. |