## [Course Overview](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711)

### [Course Overview](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711)

[Hi, everyone.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=4.6) [My name is Philippe, and welcome to my course, Packaging](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=6.01) [Applications with Helm for Kubernetes. You need to install](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=9.61) [applications in Kubernetes and you are looking for the right tool](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=14.61) [to do it, you are at the right place.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=18.21) [Helm makes it much easier to install applications in](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=21.74) [Kubernetes and manage versions, so it's definitely worth learning.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=25.02) [This course teaches you to use Helm version 3 with a lot of comprehensive](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=30.33) [diagrams with a focus on understanding the basic concepts.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=35.02) [Moreover, you can practice with a set of 11 labs with source code,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=40.21) [where you'll learn to use Helm step by step to build a Helm chart](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=45.22) [and customize it with templates, and finally,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=49.75) [to install a production‑ready release of a real GuestBook](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=53.22) [application, or even a WordPress blog.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=56.58) [Some of the major topics we will cover include building a Helm](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=60.91) [chart, customizing a chart with Helm templates,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=65.35) [managing dependencies and versions, using Helm repositories.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=69.53) [By the end of this course,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=74.94) [you will be able to build your own Helm chart and install any application](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=76.79) [release in Kubernetes with Helm. Before beginning the course, you should be](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=81.37) [familiar with basic concepts related to Kubernetes,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=86.77) [but you don't have to be an expert.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=90.86) [In fact,](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=93.23) [you can also learn Kubernetes best practices by first learning](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=94.03) [Helm and using existing stable Helm charts.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=97.92) [I hope you'll join me on this journey to learn Helm with the Packaging Application with Helm for Kubernetes course at Pluralsight.](https://app.pluralsight.com/course-player?clipId=2520b147-fa0b-4866-8594-c7b2756c4711&startTime=102.24)

## [Course Introduction](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46)

### [Introducing the Course](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46)

[Hello.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=1.24) [My name is Philippe.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=1.95) [I have been working as a freelance DevOps for over 20 years.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=4.14) [I am a big fan of Helm, and I use it in all my Kubernetes projects.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=8.54) [I am a certified Kubernetes application developer,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=13.64) [and I will be your coach for this Helm course.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=17.03) [Let me introduce the course.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=20.74) [In real life, when you have a lot of files,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=23.29) [you try to be organized, and you classify them in archives.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=26.97) [In the IT world, you do the same.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=31.31) [You try to pack your resources and organize them with package managers.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=34.62) [Most of the time, Kubernetes applications contain many Kubernetes objects,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=40.66) [pods, services, ingress, persistent volumes.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=46.02) [So a tool is needed to package the definitions of those resources.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=49.86) [That tool is Helm.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=55.51) [Helm makes it much easier to install applications in Kubernetes and](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=57.15) [manage application dependencies and versions.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=61.56) [As you follow this course,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=65.64) [you might wonder what Helm is and how it works internally.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=67.05) [What is a Helm chart and how two charts depend on each other. Finally,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=71.34) [you might also have some questions about the Helm repository,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=77) [and of course,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=80.73) [you would like to know how to install your applications in Kubernetes with Helm.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=81.94) [This course answers all these questions.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=87) [In the Discovering Helm module, we answer the two first questions,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=89.78) [what Helm is and how it works.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=93.85) [In the following module,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=97.24) [you'll learn to build your first chart step by step from scratch.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=98.87) [Then, you'll learn how to customize a chart by writing a Helm template.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=104.44) [We go into detail in that module so that you can write a chart,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=109.27) [just like a Helm expert would do.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=113.47) [Then,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=115.94) [you'll learn how to manage dependencies between charts and deal with versions.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=116.43) [This is indeed one of the main features of package managers.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=121.94) [Finally,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=126.94) [you'll learn how to reuse existing charts from the Helm stable repository.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=127.93) [To complete the theoretical modules,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=132.8) [you are invited to practice with the 11 labs provided.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=136.07) [In these labs, you'll use Helm step by step from scratch to completed task.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=139.51) [First, you'll install the Kubernetes environment with Helm.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=146.84) [Then, you'll build your first Helm chart and a more complex umbrella chart.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=150.56) [Of course,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=155.46) [you will install an application release with Helm in your](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=156.46) [Kubernetes cluster and update it with new revisions.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=159.39) [In the following modules,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=163.18) [you'll customize your chart with Helm templates so that it's reusable.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=165.69) [Then, you'll learn to manage dependencies with your chart.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=170.49) [And finally you'll pack it, publish it to a repository,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=174.98) [and learn how to work with existing charts from the stable Helm repository.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=179.23) [The sample application you are going to install in Kubernetes with Helm](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=185.24) [is a guest book for events app where the event's participant can leave](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=188.91) [a message with feedback about an event.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=193.24) [The application has a common architecture that you](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=197.04) [can find nowadays in many projects,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=199.65) [a single page application for the front end built with Angular,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=201.91) [a JavaScript back‑end API running on Node.js,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=207.24) [and a NoSQL database hosted on MongoDB.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=210.19) [You can find all the source code and resources needed](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=214.27) [for the labs in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=217.7) [The set of labs follows a logical story,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=220.84) [which starts with Kubernetes YAML files and ends with a customizable chart](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=223.57) [ready for production depending on the stable MongoDB chart.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=228.63) [I recommend that you complete all the labs.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=233.34) [But if you want to skip some,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=236.29) [you can also run each lab independently as I provide](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=238.59) [begin files and final files when needed.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=243.06) [To successfully complete this course,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=246.66) [you should know the basic Kubernetes concepts,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=249.5) [what a pod is, what a service is.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=252.51) [However, you are not required to be a Kubernetes expert.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=255.42) [In fact, you can even learn Kubernetes by learning Helm.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=260.04) [In doing so, you'll learn Kubernetes best practices right away.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=264.49) [For example, when installing an application with Helm stable charts,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=270.04) [you use secrets for your passwords, readiness and liveness to control container](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=274.74) [restart, ingress to expose your services, and many other good Kubernetes](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=279.94) [designs you might miss if you start using Kubernetes without Helm stable](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=285.53) [charts. Hiding the complexity of application installation is one of the main](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=290.17) [advantages of using a package manager.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=295.95) [There are no programming skills required except if you](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=299.44) [want to modify the sample application.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=302.56) [Finally,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=305.34) [of course, you should be familiar with Unix shell. Although](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=306.23) [the Helm client can also be used on Windows,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=310.3) [I recommend using it with Linux or macOS shell.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=313.24) [The goal of this course is to ensure that each and](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=317.74) [every attendee has a great experience.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=320.88) [If you are a project manager,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=324.54) [you can learn to understand Helm concepts by watching this course. I](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=326.32) [will try to teach the main concepts with explicit illustrations so](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=330.33) [that you understand the main ideas of Helm.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=334.94) [If you are more dev than ops, you'll learn to build and customize a chart,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=338.54) [both in the course and in the labs. And if you are more ops than dev,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=343.73) [you'll learn how to install applications in Kubernetes with](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=349.64) [Helm and manage dependencies between versions, again both in](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=352.5) [the course and in the labs.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=357.15) [And now let's get to the heart of the subject, but a small](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=359.94) [note before we start. In this course,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=365.12) [we are talking about Helm 3. Thanks to Pluralsight team, the course](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=367.97) [is already up to date. Keep in mind that the architecture of Helm 2](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=372.74) [is different, and Helm 2 command line and chart structure might](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=376.8) [differ a little bit. But Helm 2 charts should be compatible with Helm](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=380.61) [3. So by learning Helm 3,](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=385.35) [you will be ready for any Helm project. But in case you're working](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=387.44) [on a project with Helm 2, I will mention what the differences are between the two versions in each module.](https://app.pluralsight.com/course-player?clipId=8f47d5ee-5fb4-440f-bbff-697d2b4a7c46&startTime=392.58)

## [Discovering Helm](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e)

### [Why Helm?](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e)

[Hi, this is Philippe.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=2.02) [In this module, we are going to discover this awesome tool named Helm.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=3.63) [First of all, we'll find good reasons why you should use Helm.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=9.12) [Then we'll define what Helm is and go over the main concepts,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=14.72) [including charts, templates, and repositories.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=18.92) [And, finally, I'll show you the big picture of how Helm works.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=23.26) [If you are taking this course,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=28.3) [you may have already installed or you might be planning to](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=30) [install some applications in Kubernetes.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=32.8) [Here is the default way to do it.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=36.64) [First, you build your application in the container.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=38.9) [Then, you wrap that container in a pod,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=41.89) [and you run that pod in a Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=45.14) [But that's not enough.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=48.04) [You'll need more Kubernetes objects for your application.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=50.24) [As you might know, the pod's IP can change, and the pod can be replicated.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=53.8) [So if you want to access your application,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=58.31) [you need a service that is going to load balance external traffic to your pods.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=61.75) [If you want to expose that service to the world, you can use an ingress.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=67.74) [It's a reverse proxy that maps URLs to your](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=71.96) [application using the service's definitions.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=75.01) [You might also need other objects like ConfigMap to store](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=78.02) [configuration parameters or a secret to store some passwords.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=82.32) [And if your application is stateful,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=87.48) [you'll need even more Kubernetes objects to define a volume.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=90.43) [As you can see,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=95.14) [that's really a lot of objects just to install a single application.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=96.63) [But how do you install those objects?](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=102.44) [The entry point to a Kubernetes cluster is the Kubernetes API.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=106.03) [You can access this API either directly with a REST](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=110.29) [client or with a higher‑level client, such as a Go Client,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=114.35) [or with the command line tool kubectl.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=118.93) [To install an application with kubectl,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=122.45) [you first have to define the descriptions of your Kubernetes objects in YAML](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=124.74) [files, and then install them with kubectl create commands.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=130.95) [Usually, there is one file for each object.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=137.04) [So far, so good.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=140.94) [But that method has some limitations. With kubectl, you don't install the](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=142.84) [application as an atomic set of Kubernetes objects.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=149.03) [Rather,](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=152.72) [you deploy each object separately. However, these objects](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=153.75) [may depend on each other, and the order in which you install](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=158.35) [them is usually also important.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=161.31) [So we would like to group these related objects in a package and](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=164.33) [install that package as one single entity.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=168.91) [Let's now imagine that you have a second version of your application.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=173.39) [That version has a new pod that relies on the ConfigMap and](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=177.81) [secrets. One more time, with kubectl, the Kubernetes objects](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=181.4) [in each version are independent.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=186.47) [You don't have the concept of an application's version.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=188.61) [What if you want to roll back from this application version to that version?](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=192.94) [You can't do that easily with kubectl unless you keep track of your](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=198.47) [installation history and roll back each object by hand.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=203.46) [This can be hard work.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=207.94) [Helm gives an answer to those limitations. And even more, it also](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=209.98) [allows you to customize deployments for different releases and manage dependencies between applications.](https://app.pluralsight.com/course-player?clipId=697451eb-085e-40db-b36d-612cbcc9265e&startTime=215.34)

### [Demo: Working without Helm](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e)

[To convince you how useful Helm is,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=2.44) [let me show you how hard it is to install and](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=5.63) [upgrade an application with kubectl.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=9.36) [The Globomantics company has just released the first version](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=12.84) [of the application Guestbook for Events.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=16.07) [DevOps want to install it right away in Kubernetes by hand with kubectl.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=19.39) [Later in the course, they will learn how to install it with Helm.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=24.15) [Here is the application.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=29.63) [It's a simple guestbook for events where participants](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=31.54) [can leave a message about the event.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=35.23) [The first version of the application is just a front](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=38.34) [end that stores messages locally.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=41.07) [Globomantics DevOps just have to install a pod, a service, and the ingress.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=44.02) [If you already have a Kubernetes environment, you can do the lab.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=56.79) [You will find all the necessary files in my GitHub](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=61.04) [repository at the following location.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=63.89) [If you don't have a Kubernetes environment, don't worry.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=66.57) [We are going to install one together in the next module,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=69.83) [and you can do the lab after completing that module.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=73.04) [Now, we can check that the pod is already running and test this](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=76.36) [first version of the application. But a new version has already](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=81.97) [been released by the dev team.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=89.68) [It's more realistic with a back‑end API and a database.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=92.12) [Globomantics DevOps still want to install it with kubectl. Let me](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=96.84) [show you all the hard work that will take.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=102.18) [First,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=106.48) [we install the ConfigMap containing the back‑end API URL, and](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=107.54) [we update the front end to a new version.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=113.13) [The service and the ingress are the same as in version 1.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=118.73) [Then we install the back end that consists of a secret with database URI,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=123.42) [a pod containing the application, and a service to access the pod. Note](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=129.78) [that the order is important. We have to create the secret before the pod.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=139.34) [Finally, we install the database.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=144.63) [The secret contains the credentials,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=148.14) [the persistent volume, and persistent volume claim](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=153.52) [that are needed for persistence, and, of course,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=158.57) [a pod and its service.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=163.24) [Okay, DevOps did it.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=167.14) [The new version of the application is up and running.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=169.51) [You can also do it.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=172.74) [The needed resources are in my GitHub repository. Again, if](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=174.18) [you don't have a Kubernetes environment yet,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=178.78) [don't worry.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=181.28) [Wait a little bit, and we'll install one in the next module. We can check](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=182.44) [that everything is running in the Kubernetes dashboard,](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=187.89) [and we can test the new version of the application.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=191.84) [And now guess what?](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=200.91) [The project manager asks them to roll back. All those kubectl commands can](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=203.37) [quickly become boring and error prone. Globomantics DevOps understand they](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=209.56) [need a tool for packaging and versioning their app. That tool is Helm.](https://app.pluralsight.com/course-player?clipId=ed17d979-0e17-4ffe-b832-8238d5dfdd2e&startTime=215.25)

### [What Is Helm?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989)

[But tell me, what is Helm?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=2.34) [Helm is a package manager for Kubernetes.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=5.91) [Whatever IT field you work in,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=10.24) [you have probably already worked with a package manager.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=12.44) [When you have to deal with a lot of resources,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=16.19) [source codes, or binary files in computer science,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=19.81) [you usually use packages.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=23.74) [And when you have to deal with a lot of packages which have dependencies,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=25.23) [you need a package manager.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=30.89) [Whether you have a system or development background,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=34.24) [you have probably already used such tools.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=37.78) [In the system world,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=40.58) [you use apt to install Debian binaries or](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=42.33) [applications or yum to install RPM packages.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=45.15) [If you are Java developer, you use Maven to build and deploy your artifacts.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=49.54) [As a JavaScript developer,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=55.94) [you use npm to install your node modules or pip if you develop in Python.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=57.65) [In the Kubernetes world, you have the equivalent tools.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=63.23) [The packages are called charts.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=69.14) [There are a bunch of Kubernetes resources definitions,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=72.29) [the YAML files, and Helm is the package manager that manages those charts.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=76.24) [To continue with the analogy, in short,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=83.25) [we can summarize Helm with the following comparison.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=86.66) [If you want to install MySQL database on a Linux Debian box,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=90.77) [you run apt install mysql.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=94.97) [It will install all dependencies, needed libraries, and the database itself.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=98.93) [And it can also be used to update your database software in the future.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=104.9) [When you want to install MySQL in a Kubernetes cluster,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=110.7) [you can similarly run helm install mysql stable/mysql.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=113.66) [And all needed pieces of software are going to be installed in your](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=117.46) [Kubernetes cluster so that you get your database up and running.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=124.6) [Later, you can update your database instance with the helm upgrade command.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=128.72) [As you can see, it's quite similar.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=136.5) [If you take a broad point of view,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=138.88) [it's not surprising. Kubernetes can be seen as an](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=141.77) [operating system for a cluster of machines.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=145.63) [It completely abstracts the infrastructure so any useful](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=149.1) [technology for an operating system, such as package manager,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=153.55) [can be replicated to it.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=157.17) [How does Helm work?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=162.04) [Instead of using kubectl command for each Kubernetes object,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=164.28) [we embed the Kubernetes object definitions in a package called a chart.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=169.29) [That chart is then passed to Helm,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=175.65) [and Helm connects to the Kubernetes API to create the Kubernetes](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=178.86) [objects that your application release will run.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=183.11) [The Helm library uses the Kubernetes client to](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=187.02) [communicate with the Kubernetes API.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=189.81) [So it uses the REST Kubernetes API and its security layer](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=192.07) [as any other Kubernetes client would do.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=197.21) [This is true in Helm 3.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=200.48) [Helm 2's architecture is different, and we'll talk about it later on.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=202.38) [So with Helm,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=207.04) [you install your application as an entity defined by your chart and](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=208.78) [not as a set of independent Kubernetes objects.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=213.92) [The chart is the definition of your application,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=217.04) [and the release is an instance of that chart.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=220.37) [But where does Helm store the release configuration and history?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=223.94) [Helm stores released manifests inside Kubernetes as secrets.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=228.24) [If you are curious, we'll look at them in one of the next modules.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=235.53) [This provides a kind of persistence and history for all the](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=240.29) [different releases installed with Helm.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=243.76) [It's centralized in the cluster,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=245.64) [and it's stored in the same namespace as your application.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=248.27) [So if you or someone else uses the Helm client somewhere else,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=252.48) [you will have access to the configuration of the previously installed release.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=257.31) [You might have another question in mind.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=263.12) [What if I modify the Kubernetes objects with a tool other than Helm?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=265.64) [Helm 3 gives a great answer to that question.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=269.79) [Helm 3 compares the three manifests: the old chart,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=274.94) [the new chart, and live state.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=279.59) [And it creates a patch that merges the updates as best as possible.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=283.38) [I'll give you two examples.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=290.39) [First, imagine that you have installed a release of a chart.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=293.24) [Then,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=296.73) [someone else updates a ConfigMap with the kubectl command](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=297.7) [represented by the small part in green here.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=301.64) [Now imagine that you decide to install a new version of the chart.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=306.84) [By comparing the old chart, the new chart,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=312.39) [and the live state,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=317.4) [Helm is able to deduce that it should keep the manual changes and the](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=318.87) [new chart updates as long as they don't conflict.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=324.72) [The result is a running instance combining both updates.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=329.73) [That's what is called a three‑way merge patch.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=335.34) [This is very useful, for example,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=339.24) [if you're working with Helm at the same time as other tools](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=341.66) [that inject Kubernetes object themselves,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=345.25) [like logging software or service meshing software.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=347.95) [A second example.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=352.84) [Imagine you update your chart,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=355.74) [then a third party changes the configurations with kubectl.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=360.34) [What happens if you do a rollback?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=364.82) [Are those changes lost?](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=370.5) [Again,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=373.11) [Helm 3 compares the three states and applies a patch](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=373.86) [update with a nice merge of both updates.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=377.95) [Let's now talk about namespaces. In Kubernetes, you can group resources in](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=382.04) [virtual clusters called namespaces. By default, Helm installs Kubernetes](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=388.31) [objects in the default Kubernetes namespace.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=394.59) [But if you specify it,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=397.54) [it can install objects in other namespaces. In Helm 3, as I](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=399.57) [mentioned before, the configuration of your release is stored in](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=404.71) [the same namespace as your release.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=408.86) [In this course, we will use the default namespace.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=411.72) [But just keep in mind that you can use Helm with different namespaces just](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=416.62) [like you do it with kubectl. What about Helm 2? There is a big difference](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=422.39) [in the Helm architecture between Helm 2 and Helm 3. Helm 2 consists of two](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=429.55) [components, a client‑side command line tool, helm, and a server‑side](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=435.12) [component called tiller. The Helm command line app communicates with tiller](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=441.79) [using a gRPC protocol. The tiller component runs inside a pod in your](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=448.14) [Kubernetes cluster and calls the HTTP Kubernetes API just like any other](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=456.09) [client.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=462.5) [That tiller component manages your releases and stores the](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=463.13) [Helm charts and installation history in a ConfigMap by](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=467.87) [default in the system namespace.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=471.98) [But as you can imagine,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=474.09) [the tiller component needs a lot of rights to create,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=476.01) [delete, update Kubernetes objects.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=479.46) [For that reason,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=482.8) [the Helm 2 installation had to be secured both in the cluster by](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=484.42) [restricting the tiller's rights with a service account and by encrypting](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=489.43) [the gRPC course. Helm3's architecture is simpler.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=496.33) [In Helm 3, there is no more tiller, no more gRPC communication.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=502.57) [The Helm library simply uses the Kubernetes client to communicate with the](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=508.98) [Kubernetes API. So it uses the REST Kubernetes API and its security layer as](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=514.08) [any other Kubernetes client would do. And Helm 3 stores the release manifests](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=521.27) [inside the Kubernetes namespace as secrets.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=528.02) [This was a short introduction,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=533.64) [so don't worry if you find it a little bit abstract. We will](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=535.54) [go more into the practical Helm world in the next modules. In](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=539) [the module, Building Helm Charts,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=544.48) [you'll learn how to create a chart and how to use Helm to install](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=547.34) [an application in Kubernetes. In the module, Customizing Helm](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=551.53) [Templates, you'll learn how to customise those charts so that you](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=556.3) [can reuse them in many cases.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=559.98) [And, finally,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=563.29) [in the last two modules, we'll see how to manage dependencies between](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=564.61) [charts and how to store or retrieve them from repositories.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=568.47) [But first things first,](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=574.14) [let's install a local Kubernetes cluster with the latest Helm version for the demo.](https://app.pluralsight.com/course-player?clipId=5345b50f-b924-4903-bb6d-d867667a7989&startTime=576.73)

## [Installing a Local Kubernetes Cluster with Helm](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0)

### [Discovering Lab Environment](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0)

[Hi.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=0.74) [This is Philippe.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=1.17) [In this module, we are going to install this awesome tool named Helm.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=2.73) [We need a Kubernetes environment to run Helm and run our demo.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=8.14) [Here is the environment for our labs. Our Minikube Kubernetes](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=12.28) [cluster with one node runs in Docker.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=17) [On the Kubernetes client side, we have two main tools, the minikube command](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=21.44) [line tool to start and manage the Kubernetes cluster and the kubectl command](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=26.49) [line tool to install and manage the Kubernetes objects. On the client side, we](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=32) [will, of course, also install Helm to package and manage our application in the](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=37.34) [Kubernetes cluster, and we will configure Helm to use the official Helm stable charts repository.](https://app.pluralsight.com/course-player?clipId=d23b4e33-1e3c-4e64-b2f9-0cd3b5153bc0&startTime=42.34)

### [Installing Kubernetes and Kubectl](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43)

[Let's install a local Kubernetes cluster with the](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=2.12) [minikube and kubectl command line.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=5.19) [If you already have such an environment on your computer or on a cloud provider,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=8.54) [you can use the one you have and move on to the next](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=14.25) [section to install Helm directly.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=17.58) [But if you don't have a Kubernetes cluster,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=20.74) [I'll show you how to install one in this demo.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=24.22) [So first,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=27.64) [make sure you have Docker version 18.09 or higher installed on your host.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=28.58) [If not, go to the Docker website and install it.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=35.24) [Next, download minikube. Choose the link corresponding to your platform on](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=39.24) [the minikube site and don't load it. Install it to your local binaries](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=45.62) [directory and check its version Then, start it with the minikube start](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=52.33) [command. By default, it should use the Docker driver. It can take a long](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=59.07) [time because it has to download images,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=65.91) [start containers, and configure your Kubernetes cluster. This is](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=68.49) [indeed a Kubernetes cluster running in Docker. Then, install kubectl](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=73.9) [if you don't have it already installed,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=80.09) [download it, make it executable, and move it to your bin folder. Check that](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=82.54) [the client and server versions of Kubernetes are compatible.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=89.01) [You can also check that the cluster is running with minikube status command.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=95.24) [Next, we add the ingress support because we need it to access the demo. And](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=103.14) [finally, we configure the name resolution for the demo by first getting the](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=108.93) [cluster node's ID with minikube ip command and then reserving the two domain](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=114.8) [names to that IP in the hosts file, one for the front end and one for the](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=122.46) [back‑end API. A small note for macOS users. As the ingress is not exposed on](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=130.2) [the minikube IP,](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=141.19) [you'll have to run minikube tunnel and map localhost IP to the two domain names in your host file.](https://app.pluralsight.com/course-player?clipId=729a887c-2c58-4491-9591-3500d94c4c43&startTime=142.74)

### [Installing Helm](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf)

[Now that you have a Kubernetes cluster with ingress](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=1.44) [support and a kubectl command line tool,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=4.45) [let's install Helm.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=7.64) [First, we will install the Helm command line tool,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=10.01) [and then we will configure it to use the official Helm stable charts repository.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=13.45) [This is required because since Helm version 3,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=19.54) [there is no repository configured by default.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=23.73) [Installing Helm is quite straightforward.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=26.92) [Go to the Helm website, helm.sh, and search for the installation documentation.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=30.84) [You can choose the installation file specific to your](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=37.84) [platform or simply install the binary.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=40.75) [I recommend that you install the binary as in the Docker and Kubernetes world,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=44.34) [most tools are Go binaries.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=49.13) [They are very lightweight and include all dependencies](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=51.3) [so they run right out of the box.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=54.63) [Copy the link of the Helm library corresponding to](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=57.1) [your platform and download it.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=60.47) [When it's downloaded, extract it.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=64.24) [You should have a README and one Helm binary file.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=67.44) [Copy the Helm binary file to the bin folder.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=71.58) [And now if we run helm version ‑‑short,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=75.83) [we can see that the Helm client is installed.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=79.51) [But you might be wondering,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=83.23) [in which Kubernetes cluster will Helm install the packages?](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=85.95) [Well, Helm is, in fact, using the same configuration as the kubectl command line,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=91.84) [and the kubectl config view shows that we only have one](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=98.06) [Kubernetes cluster called minikube.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=102.79) [And of course, the current‑context refers to that unique cluster.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=104.92) [So, Helm is going to install the packages to that minikube cluster.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=109.31) [Now, Helm is installed.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=114.54) [But by default, Helm 3 is not configured to use any repository.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=116.53) [So, if you want to install existing packages,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=122.84) [you have to add at least one repository containing some charts.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=126.1) [Let's install the official Helm charts repository](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=130.94) [with the helm repo add command.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=134.37) [We will examine Helm repository commands more in detail later.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=138.34) [As a small preview, let's jump ahead a bit into the course and install a](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=143.54) [MySQL demo in our cluster with the helm install command using the](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=148.36) [stable/mysql chart from the official Helm repository.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=154.43) [That's it.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=159.84) [We already have MySQL database server running in our Kubernetes cluster Great,](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=161.14) [isn't it?](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=167.64) [Don't worry if it went too fast. We are going to learn that stuff in detail in the following modules.](https://app.pluralsight.com/course-player?clipId=caf38e51-b754-44b0-be1d-b069b8070ccf&startTime=169.24)

### [Cleaning Helm](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f)

[Everything is installed. That's nice,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=2.21) [but how can we uninstall and clean a Helm installation?](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=4.69) [There are several components to delete, the sample release we](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=8.96) [have installed, the Helm releases's configuration stored in](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=13.01) [secrets, and eventually the Helm binary itself and its local](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=16.52) [configuration and cache files.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=20.9) [So, let's see how we can clean what we did in the previous lab.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=23.44) [As you can see,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=30.14) [there are some Kubernetes objects installed in the cluster,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=32.04) [including a pod, a service, and a deployment.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=34.98) [And there are also some secrets in which Helm stores the configuration history.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=38.95) [We could, of course,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=45.04) [delete those Kubernetes resources by hand with kubectl delete commands,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=45.95) [but it's not advisable to do so.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=49.85) [Instead,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=52.54) [we'll go a little bit further in the course and use the helm uninstall command.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=53.56) [Now we can see that the pod is terminating and the release's](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=58.74) [configuration is no longer stored in secrets in the cluster.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=65.24) [By this demo, we have shown that Helm is not very intrusive.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=69.64) [It just stores some configuration secrets in the namespace of your](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=73.96) [application and deletes them when you uninstall it. Note that this is](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=77.65) [true only for Helm 3. Helm 2 was more intrusive with a server‑side](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=83.46) [component called Tiller. Also, note that Helm stores some configuration](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=87.96) [and cache data on the client side.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=93.47) [If you are curious,](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=95.4) [you can find out their location with the helm env command.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=96.22) [To achieve a complete cleaning, you could also delete those directories in the helm binary.](https://app.pluralsight.com/course-player?clipId=95ca9afd-8d27-4560-910b-ce2d91d75c6f&startTime=100.59)

### [A Word About Helm 2](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44)

[Before going further, let's have a word about Helm 2.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=1.28) [As I said in the introduction, this course is about Helm 3,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=5.3) [but many projects still use Helm 2,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=9.12) [so it's worth knowing a little bit about how it can be installed.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=11.82) [First,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=15.88) [we'll see how to install Helm 2 and then how to configure Tiller's security.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=16.42) [As we saw previously, Helm 2 is composed of two components,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=22.04) [a command line tool, Helm, and a server‑side component,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=26.4) [Tiller, running in a pod in your Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=30.49) [If you want to install Helm 2,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=34.78) [you have to download it and run the helm init command.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=36.62) [That helm init command automatically installs Tiller](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=41.04) [in your default Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=44.58) [But that's not enough because Tiller runs inside](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=47.64) [your Kubernetes cluster as a pod.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=50.83) [That pod runs with some privileges, the privileges of a service account.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=53.55) [By default,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=57.82) [Tiller runs under the kube‑system namespace's default service](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=58.86) [account and the kube‑system namespace's default service account has](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=62.53) [the cluster‑admin role. In other words,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=67.8) [Tiller has all the rights to the whole Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=70.66) [If you are running in a dev or a secured and trusted](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=74.92) [environment, that's not an issue.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=78.4) [But if you want to go into production with Helm 2, you'll](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=80.78) [have to restrict Tiller's rights by creating and](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=84.15) [configuring a Tiller service account.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=87.9) [Moreover,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=91.89) [because the communication between Helm 2 and Tiller is](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=92.64) [a non‑encrypted gRPC communication,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=96.11) [you have to secure it with SSL certificates and keys on both sides.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=99) [So, Helm 2 installation is not that complicated,](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=103.92) [but configuring the Tiller security needs some work and has to be](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=107.51) [done with care. With Helm 3, it's much easier because we rely on](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=111.59) [the default Kubernetes client and its security layer. In Helm 3, there is no more Tiller, so no more security issues.](https://app.pluralsight.com/course-player?clipId=65128ac3-ad7b-4c4e-ab47-6f99486f3f44&startTime=116.88)

### [Summary](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43)

[In this module, you learned how to install a Kubernetes environment with Helm.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=1.38) [You then learned how to clean everything in the last section.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=6.64) [And finally, we briefly discussed Helm 2 installation in which the](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=11.24) [security configurations for Tiller are a little bit trickier.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=15.93) [In the last demo,](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=20.54) [I installed the guestbook application with kubectl](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=21.85) [and raw Kubernetes YAML files.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=24.36) [Now that your environment is running, you can do the labs if you want.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=27.64) [But in the next module,](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=32.24) [you are going to learn how to pack those YAML files in a Helm chart and](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=34.04) [install the same guestbook application with Helm. That's more interesting.](https://app.pluralsight.com/course-player?clipId=60d28720-3e95-41e5-809f-5ace69efed43&startTime=38.38)

## [Building Helm Charts](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607)

### [Helm Chart Structure](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607)

[Hi, this is Philippe.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=0.59) [In this module, we're going to learn about Helm charts.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=2.26) [We'll learn how to build a Helm chart and how to](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=6.24) [install a release of that chart.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=9.31) [I mentioned in the introduction that a Helm chart is a package.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=12.9) [As with any package, it's always interesting to open it and see what it contains.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=17.24) [Here is a chart structure.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=23.34) [We'll first have a preview of it and then go more](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=25.14) [into detail in the later modules.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=27.78) [The chart is a folder that can also be compressed as an archive.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=30.99) [By convention, the folder name has the name of the chart.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=35.94) [The chart properties are stored in a chart.yaml file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=41.24) [In it you can find the chart name, chart version, and other metadata.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=43.92) [We'll look at this file later.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=51.24) [The chart folder has a templates subfolder.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=54.14) [That template subfolder contains your Kubernetes object definition files,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=58.34) [so your YAML files.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=63.01) [Why is that folder called templates then?](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=65.43) [Well, it's rarely raw YAML files that are inside.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=69.44) [Instead,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=73.68) [there are customizable templates with placeholders that are](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=74.66) [replaced by values sometimes using helper functions.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=78.62) [We'll learn about that templating feature in detail in the](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=82.56) [next module called Customizing Helm Charts.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=87.03) [If your chart has subcharts or depends on external charts,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=91.24) [you can either add them as archives in the charts subfolder](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=95.89) [or reference them as dependencies in the chart.yaml file or](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=100.99) [in the requirements.yaml file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=106.62) [But note that the requirements.yaml file is only there for Helm 2 compatibility.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=108.73) [It's still supported in Helm 3,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=115.46) [but the recommended way to do it in Helm 3 is to add the](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=118.03) [dependencies in the chart.yaml file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=122.29) [We'll examine this more in detail in the module named Managing Dependencies.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=125.8) [How can you document a chart?](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=131.54) [The chart can be documented in a README markdown file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=134.54) [The LICENSE file, which is optional, of course contains the license of the chart.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=138.21) [And if you want to display some information to the user](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=144.5) [after your chart is installed or updated,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=148.7) [for example, some useful information such as what to do next,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=152.34) [the URL and port numbers of your services,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=156.54) [or a quick howto, this can be added in the NOTES.txt file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=158.91) [Finally,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=164.62) [another component that could be considered part of the](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=167.08) [documentation is the values.schema.json file,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=169.67) [which defines the structure of the values.yaml file.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=173.84) [We'll talk about it in the next module.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=178.08) [So that's the preview of the full chart structure,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=181.09) [the chart.yaml file with the metadata,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=184.85) [what is related to the templates with YAML files shown in purple,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=188.24) [what is related to the dependencies in orange,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=191.55) [and what is related to the documentation in green.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=197.13) [To be complete, let me mention two additional folders,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=202.2) [the tests subfolder, which contains pod definitions used for testing,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=206.11) [and the crds folder,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=211.14) [which is used to create Kubernetes custom resources definitions.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=212.36) [They are treated separately from other Kubernetes objects](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=218.43) [because they are installed before other Kubernetes objects](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=221.57) [and are subject to some limitations.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=224.92) [Let's now go deeper into the chart.yaml file. This file contains the](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=228.8) [name of the chart and an optional description.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=235.72) [You can also add some keywords that would be useful to](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=240.33) [search for the chart in a repository.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=244.22) [What is the type property for? As you will see in the next module, a chart](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=247.84) [can contain helper files that have some logic functions that help to build a](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=253.41) [chart but do not create any Kubernetes artifacts.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=258.33) [Sometimes you may want to have a chart that exclusively](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=262.54) [contains such abstract functions.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=267.17) [In other words,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=269.36) [a chart that would be a library of functions, functions](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=270.24) [that could be shared or reused but not used to create](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=274.55) [release artifacts on their own.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=278.25) [In that case, you can tag your chart as a library with the type attribute.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=281.53) [This is a new feature in Helm 3, and to be honest,](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=287.34) [we don't find a lot of library charts yet. Most of the time, you will](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=290.14) [tag your chart not as a library but as an application.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=295.37) [There are also several properties related to versions.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=299.64) [Be sure not to confuse the following.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=304.1) [First, the apiVersion.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=307.44) [This is the version of Helm API, v2 for Helm 3, v1 if you are still using](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=310.34) [Helm 2. Be careful because it's not very intuitive.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=316.09) [There is a shift between the apiVersion number and the](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=319.62) [Helm version number, v2 is for Helm 3.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=322.54) [Next, the appVersion.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=327.34) [This is a version of the application you plan to install with Helm.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=330.34) [It can be any version number or string.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=333.52) [Last but not least, the version is the version of the chart.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=337.34) [It has to follow semantic version 2.0 specifications](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=341.28) [with a patch, minor, and major number.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=345.25) [Note that the appVersion and chart version are not related. You could have](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=350.34) [a new appVersion if your app changes but keep the same chart version](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=355.47) [because the chart structure and templates remain the same. Or you could](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=360.16) [have the opposite, the same application version but a new chart version](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=365.2) [because the chart files changed.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=369.9) [Finally, the chart.yaml file also contains the dependencies configuration.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=373.24) [We'll look at this in the module named Managing Dependencies. Now that we have an overview of chart structure, let's create our first chart.](https://app.pluralsight.com/course-player?clipId=863e9ea7-96ef-40df-95f9-db762cef2607&startTime=378.68)

### [Demo: Building a Helm Chart](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3)

[Globomantics DevOps want to learn Helm,](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=0.54) [so this time they install the application with Helm.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=3.04) [They structure the YAML files into a Helm chart and use Helm to install a](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=7.43) [new release. Remember the first version of the application was just a](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=12.96) [front end, storing messages locally. Globomantics DevOps need to install a](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=17.96) [pod, a service, and an ingress. All files needed for the demo can be found](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=24.18) [in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=29.78) [First, they create a directory for the chart.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=32.64) [Inside that directory, they add a Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=36.39) [The apiVersion is v2 because they are using Helm 3. The](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=42.38) [name of the chart is simply guestbook,](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=47.42) [and it's the first version of the chart, so they set the version number](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=50.24) [to 1.0. As this is the first version of the guestbook for event](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=54.81) [application, the app version is 1.0, and the description refers to](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=59.1) [guestbook 1.0. Then, the DevOps create a template directory inside the](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=65.6) [chart and copy the files definitions of the Kubernetes object to that](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=73.56) [templates directory.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=80.82) [If we look at those YAML files, we see that they are standard](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=83.84) [Kubernetes YAML file definitions, one for the pod,](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=87.43) [one for the service, and one for the ingress.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=91.84) [That's it.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=96.14) [Globomantics DevOps have created their first chart,](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=97.44) [one of the simplest charts man can make.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=101.04) [They are ready to install that chart, but first we need to understand the concept related to Helm release.](https://app.pluralsight.com/course-player?clipId=6281269d-6c52-4898-a02c-ac88032370c3&startTime=104.74)

### [Defining Helm Concepts](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920)

[In this section, we're going to define some important Helm concepts.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=0.69) [The chart is the definition of our application.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=7.11) [When the chart is installed in the Kubernetes cluster by hand,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=11.64) [we say that a release is running,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=15.26) [so the chart is the definition of the application and the release](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=18.04) [is an instance of the chart running in the Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=22.91) [Usually we install one release of a chart,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=26.65) [but in some cases you might need to install multiple releases of the same chart.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=30.1) [For example,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=37) [a dev and test release of the same application on different](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=37.78) [clusters, or two releases of a database in the same Kubernetes](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=41.77) [cluster. If you want to install two releases of the same chart on](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=46.18) [the same Kubernetes cluster,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=50.65) [it's possible, but your Kubernetes objects must not conflict.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=52) [For example,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=56.74) [the name of each release's service must be different and](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=57.63) [the exposed ports should not be the same.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=61.58) [This is why the official charts from the Helm](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=64.54) [repository are highly customizable.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=67.79) [The names of the objects, for example, are all based on the release name.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=69.79) [We'll see how to do that later in the course.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=75.23) [If you made some change in your application and want to install](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=78.28) [it, you don't have to install a new release.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=81.75) [Instead,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=85.29) [you can update an existing release and make a new revision of that release.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=86.2) [This is another important concept in Helm, release revision.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=91.34) [This is not considered as a new release, it's a new revision of the](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=96.74) [same release. Don't confuse release revision with the chart version](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=100.99) [that we saw previously in the Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=107.56) [The chart version refers to a change in the chart's file structure,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=111.14) [meaning a change in the application definition.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=116.83) [For example,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=120.2) [if there are new Kubernetes objects like a service account](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=120.88) [and a persistent volume, the chart structure changes so the](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=124.2) [chart version should also change.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=128.88) [On the other hand,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=132.44) [a release revision refers to a change in the running instance of that chart,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=133.9) [either because the chart itself changed and the release was updated](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=139.47) [or simply because the chart did not change, but the same chart](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=143.52) [version is installed with different values.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=147.45) [Now that you know the Helm architecture and concepts, and](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=152.64) [before using Helm to install our first chart,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=156.08) [let's list the main commands we need in the next demo.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=159.12) [Helm install installs a chart as a release. Helm upgrade](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=163.44) [upgrades a release to a new revision.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=168.64) [Helm rollback rolls backs a release to a previous revision.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=171.68) [For example,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=176.1) [if you find a bug and want to go back to the previous revision.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=176.74) [Helm history lists the revision history of a releas. Helm status](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=180.93) [displays the status of a release,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=187.98) [which objects are installed, and their running status. Helm get shows](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=189.62) [the details of a release manifest and current values.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=196.23) [Helm uninstall uninstalls a release from the Kubernetes](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=201.64) [cluster. Note that in Helm 2 we use helm delete instead](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=205.96) [of helm install. And finally,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=210.97) [helm list lists all release names with some basic information.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=214.34) [There are also some other commands more relevant to the next modules that](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=219.49) [we'll see later. If you are used to Helm 2, note that there some small](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=223.63) [differences compared to Helm 3 commands. First,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=228.95) [when you install a chart,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=233.74) [the name was, by default, auto generated in Helm 2. If you want a custom](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=235.5) [name in Helm 2, you have to specify it with ‑‑name.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=241.22) [Conversely,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=245.94) [if you want to generate a release name in Helm 3, you have to set](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=246.99) [it with ‑‑generate‑name parameter. The Helm 2 helm delete command](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=251.22) [has been renamed helm uninstall, and by default it now purged the](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=257.41) [Helm history in the cluster. In Helm 2, we had to add ‑‑purge to](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=263.04) [get the same result.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=269.23) [If you want to keep the Helm history in Helm 3, you](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=271.2) [have to use ‑‑keep‑history parameter.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=274.98) [A final difference in the helm command is the helm get command. In Helm](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=279.42) [2, it could be directly followed by the release name and would get all](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=285.33) [the information about the release. In Hem 3, you have to write helm get](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=289.61) [all to have the same behavior,](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=294.91) [or you can be more precise and get only the manifest, the values or other things like notes and hooks.](https://app.pluralsight.com/course-player?clipId=bf6afbe0-a038-48b2-8225-1c6fb5e44920&startTime=297.29)

### [Demo: Installing a Helm Chart](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6)

[Now that they have all the Helm concepts and commands in mind,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=1.24) [Globomantics DevOps will install the first version of guestbook for events,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=5.35) [but this time with Helm.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=10.01) [Then, they will upgrade, roll back, and delete the release.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=12.89) [Installing the application with Helm is not a hard job.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=19.04) [They go one directory up the chart further and run helm](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=22.47) [install followed by the name of the release](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=27.08) [demo‑guestbook and the name of the chart,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=29.39) [guestbook.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=32.88) [That's it.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=35.14) [One command, one line.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=35.87) [Helm reads the chart and asks the Kubernetes API to create a release.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=38.44) [And soon, the application is running.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=44.51) [Globomantics DevOps can check this with the kubectl get](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=48.2) [pod command or with some Helm commands.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=51.8) [Helm list gives the names of the installed releases.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=56.15) [The name of this first release is demo‑guestbook,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=61.84) [and they can get the release manifests with helm get](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=64.92) [manifest followed by the name of the release.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=69.53) [It has a service and, as part of the deployment, a pod and an ingress.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=72.64) [Finally, they can enjoy testing their first application installed with Helm.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=80.14) [This is the guestbook for the Concert For Climate 1.0.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=84.74) [Now a minor change occurred, and the Globomantics dev team built a](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=90.34) [new version, Guestbook 1.1. Let's see how DevOps install this new](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=93.95) [version They open the chart file,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=100.1) [change the appVersion to 1.1, and update the description. But](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=104.04) [they do not change the chart version because the chart is the](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=109.82) [same. In the Pod definition,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=113.28) [they change the image version to frontend:1.1. And to upgrade the release,](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=117.9) [DevOps chose to run helm upgrade demo‑guestbook and guestbook, the name of the](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=125.44) [chart. And soon, the 1.1 version of Globomantics guestbook for the Concert For](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=131.7) [Climate is running. DevOps can use kubectl to check that the new image is used.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=138.91) [They can see that this is the second revision of the demo‑guestbook release.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=145.34) [Here's the new version.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=150.86) [If you refresh the browser, the version number has changed. Great.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=153.42) [Now, there is a bug in this new version, and Globomantics manager](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=160.64) [asks to roll back. This is quite easy with Helm.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=165.89) [DevOps run helm rollback, the name of the release, and the revision](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=171.04) [number. In this case, they want to roll back to the first one. To get](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=176.66) [a history of all the changes, they can run helm history with the name](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=182.95) [of the release, and we can see that this is already the third](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=187.47) [revision of our release, one install, one upgrade, and one rollback](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=191.63) [to revision 1.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=197.22) [Finally, if they have to delete the release, they could run helm](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=199.54) [uninstall name of the release, which will delete all Kubernetes](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=205.11) [objects and Helm release configuration from the Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=209.37) [As usual, if you want to do this lab, you can find the resources in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=959eec3f-1e71-41b2-8884-17d7a05774c6&startTime=214.24)

### [Demo: Building an Umbrella Helm Chart](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf)

[Now remember,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=0.72) [there was a more advanced version of the application, version 2.0. In this demo,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=1.81) [we learn how to build a more advanced chart called an](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=7.75) [umbrella chart for that version.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=11.18) [That new version has a front end, a back end API, and a](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=14.28) [database, so many more Kubernetes objects. Globomantics DevOps](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=17.99) [now want to install them with Helm.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=24.03) [Let's first create the chart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=27.5) [If you want to follow this demo, all the files are in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=30.14) [Globomantics DevOps have to do exactly the same job](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=36.43) [as they did for the front end.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=40.08) [They have to create a chart for the front end, one for](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=42.44) [the back end, and one for the database.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=45.99) [Then, those three charts are embedded into a wrapping guestbook chart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=49.74) [This can be done by moving them into the charts subdirectory.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=55.75) [That kind of chart is commonly named an umbrella chart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=62.74) [You can do the demo yourself as self‑learning or watch following recording.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=67.89) [First, DevOps creates a guestbook directory and, inside that directory,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=74.54) [a new Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=80.25) [As it is a new version of the application,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=83.74) [the app version changes. And it's also a major change for the chart itself, so](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=86.39) [the major number of the version of the chart also changes.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=92.65) [Inside the charts directory, they create a front end subchart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=96.91) [It has its own definition,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=103.14) [referring to version 2 of the front end because the front end](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=105.47) [application changed. And as we already had a chart for the front](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=109.39) [end, the chart version also changes for 1.1.0.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=114.78) [They just copy the YAML files related to the front end to the](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=120.44) [templates directory and also the ingress definition.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=123.88) [They do exactly the same for the back end.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=128.84) [The back end is the first version as an application and as](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=131.84) [a chart. The back end files are copied,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=136.23) [including a pod, a secret, and an ingress.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=141.02) [And finally, a chart is created for the database.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=145.04) [The app version is here along with the version of the MongoDB image used,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=150.46) [and it is the first version of the chart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=155.97) [It contains a templates directory where all MongoDB YAML files are](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=160.72) [copied, one for the pod, one to expose it as a service, and one for](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=165.04) [the secret containing the password.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=171.89) [It also has two persistent volume and persistent volume](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=174.8) [claim files to define the storage.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=178.67) [Here is a quick review of the new chart structure.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=182.31) [The main umbrella chart guestbook with the chart definition](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=185.94) [contains three subcharts, one for the front end,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=191.01) [one for the back end, and one for the database.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=195.23) [All these subcharts contain their respective Chart.yaml file](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=198.93) [and some Kubernetes objects, definitions, and YAML files. Now](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=203.94) [back to the root folder as they are ready to install the new](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=209.52) [version of the application.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=213.98) [First,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=215.84) [the helm list ‑‑short to see which release is running. And now Globomantics](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=216.68) [DevOps are very excited because they can install the new version of the](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=222.11) [guestbook with just one command line, helm upgrade with the name of the](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=226.61) [release followed by the name of the chart.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=233.23) [They can check that everything is up and running with kubectl or look](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=236.89) [at all the manifests of the installed Kubernetes objects with helm get](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=241.9) [manifest and the name of the release, We can see the secrets,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=246.92) [the persistent volumes, the services, and if we go down,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=252.83) [the deployments and the ingress. All Kubernetes objects are there,](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=258.3) [installed and running. Globomantics DevOps are happy. They test this version 2 of the guestbook for the Concert For Climate.](https://app.pluralsight.com/course-player?clipId=bfc6a7bc-f396-4f55-b794-b46431df8ebf&startTime=263.56)

### [Summary](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6)

[In this module, you started by learning the chart structure.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=1.14) [Then, you built your first chart for the guestbook application.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=5.44) [We then defined some important Helm concepts,](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=10.19) [release, revision, and chart version and reviewed some Helm commands.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=13.42) [With this knowledge, we were able to install, upgrade, roll back, and](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=19.48) [delete applications in Kubernetes with Helm.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=24.87) [In the last module,](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=27.84) [we installed the guestbook application with kubectl and](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=29.84) [Kubernetes YAML files. In this module, you learned how to](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=33.86) [pack YAML files in a Helm chart,](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=38.7) [build an umbrella chart, and install the guestbook application with Helm.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=41.34) [But we just copied the raw YAML files without any changes. All values are](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=47.24) [hard‑coded. In the next module, we'll build some templates with values that](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=53) [can be replaced and functions that add some logic. With these, your charts will not be hard‑coded any more, and they can be reused for other projects.](https://app.pluralsight.com/course-player?clipId=02a4a4f0-f265-4b79-bf41-8c80c8a301d6&startTime=59.45)

## [Customizing Charts with Helm Templates](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115)

### [Why Helm Templates?](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115)

[Hi, this is Philippe.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=0.44) [In this module, we learn how to customize Helm charts with Helm templates.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=2.64) [First, we'll explain why we need Helm templates.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=8.94) [Then we'll discover how the Helm template engine works,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=13.54) [what it is based on, and when it runs. Later, we'll](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=17.24) [go through a couple of sections,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=22) [some about the Helm template values and others about the Helm template logic.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=24.14) [So first, let's find two good reasons why we need Helm templates.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=31.74) [Remember what we did to release a new version of the](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=37.94) [application in the previous module?](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=41) [Well,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=43.64) [it was not a state‑of‑the‑art work for DevOps. We edited the](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=44.39) [frontend.yaml file by hand and changed the hard‑coded image version](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=48.7) [from 1.0 to 1.1. What do you think about this?](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=54.13) [Personally, I had hate hard coding values that are supposed to be changed.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=60.02) [Instead,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=64.58) [they should be externalized and automatically replaced](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=65.4) [when we call the helm install command.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=68.68) [That's exactly what using a Helm template aims for.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=72.74) [Here is a second reason why we need Helm templates.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=78.54) [Remember that we should be able to install two releases off the same](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=83.41) [chart on different clusters, on the same cluster, or even in the same](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=87.42) [namespace. But in the same namespace,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=93.52) [the name of all the Kubernetes resources must be unique.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=98.24) [So, if you want to install two releases of the same application,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=102.91) [we need a way to generate unique names for each of the Kubernetes objects.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=109.14) [The solution is to generate the names of the Kubernetes](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=115) [objects based on the Helm release name.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=118.28) [For example, here are two Kubernetes service definitions for the front end.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=122.04) [The service name is prefixed with the name of the release,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=128.08) [one for our dev release, and one for our test release.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=132.54) [To generate those names based on the release name, we need a tool.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=137.88) [That tool is the Helm template engine. Of course, you may say, yes,](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=142.24) [but I can just in start the releases on different namespaces or on](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=147.78) [different clusters instead. You are right, but the goal of a good Helm](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=152.49) [chart is to make it completely configurable and make sure it can be](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=157.76) [installed in any cases without any name conflicts, even if it's installed as two different releases in the same namespace.](https://app.pluralsight.com/course-player?clipId=eca46100-c087-4648-a35e-77c86f136115&startTime=163.05)

### [What Is Helm Template Engine?](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3)

[Helm templates are processed by your template engine.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=1.88) [You may have already used other template engines in IT projects.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=6.94) [If you're from the system world,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=11.58) [you often use a directive to inject environment](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=13.84) [variables' values into your shell scripts.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=16.44) [This can be considered a kind of template, even if there is no rendering.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=20.24) [As a web developer, you often use directives to display data in HTML pages.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=26.14) [Solutions are available in many languages,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=32.94) [including PHP, JSP, ASP, and Express view engine. And finally,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=35.92) [as a lazy but smart developer,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=42.88) [you may have used a code generator, like Velocity from Apache](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=45.47) [or the JavaScript Yeoman code generator, or,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=49.82) [more recently, Go templates.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=52.69) [The principle is always the same.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=55.64) [You insert directives in your code.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=58.24) [The directives are distinguished from the rest of the code with some](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=61.39) [characters by convention, percent or curly braces. And those directives](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=65.12) [are replaced by values or execute some code when they are processed by](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=71.17) [the temperate engine. For example,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=75.61) [here's how the Go template engine works. In a template,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=78.73) [you place some directives between curly braces.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=83.97) [Just for the record,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=87.84) [that convention is called the mustache syntax because if you rotate it by 90](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=89.02) [degrees, you get a mustache. When the template engine runs, those directives](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=93.64) [execute code or are replaced by values set in objects.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=99.93) [Here,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=104.94) [the .name directive is replaced by the value of the name property of the object,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=105.55) [which is myservice.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=111.94) [The result is a manifest where the directive has been](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=114.94) [replaced by the value of the name property.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=118.49) [If you are interested in using Go template,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=122.24) [you can have a look at the Go template documentation or see some](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=124.94) [examples in my HitHub repository in the Go‑Template project. The Helm](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=129.13) [template engine is actually based on the Go template engine. The](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=134.92) [difference is that the values used to replace the directives can come](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=139.44) [from different sources.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=143.46) [Some values are defined in a values.yaml file, and](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=145.54) [some are predefined data that are, for example,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=150.67) [in the chart definition or part of the release runtime metadata.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=154.01) [We'll look at all those values in more detail later on.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=159.03) [The Helm template also provides additional functions,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=163.54) [some from the Helm project itself and some that are part of the Sprig project.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=167.94) [Except for those add‑ons,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=174.48) [the Helm template engine works the same as the Go template engine.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=176.63) [In fact,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=181.24) [it is the Go template engine. Not surprising if you know that Helm](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=181.87) [is written in Go. And the process is the same.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=186.33) [The template contains directives,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=189.84) [and those directives are executed or replaced by values to generate a manifest.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=192.45) [But where and when does the Helm template engine run? It runs on the client](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=199.24) [side. When you lunch the helm install or helm upgrade command, before](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=206.07) [sending the file definition to the Kubernetes API,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=211.73) [Helm first processes your temperate with the template engine,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=214.35) [which executes the directives or replace them with values to create a manifest.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=219.04) [Then Helm sends the result to the Kubernetes API. Note that](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=224.54) [this is also true for Helm 2. Even though Helm 2 has a Tiller](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=230.27) [server‑side component, the execution of the Helm template also](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=234.86) [happens on the client side, so the template remains on the client side.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=239.57) [It's not stored in the Helm secrets on the service side.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=247.04) [That means that you have to version or back up your template](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=251.34) [file somehow with a versioning system like Git,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=255) [for example. Helm doesn't store a history of the templates on the](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=257.94) [server side. It only stores a history of the processed templates, so](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=262.85) [the manifest, in some secrets in the Kubernetes server. But for](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=268.45) [information and debugging purposes,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=273.87) [Helm also stores the values that have been used to generate the manifest so](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=276.11) [that you can check the current values for a given release.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=280.81) [Just for your information, let me show you where Helm hides the data.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=284.78) [The manifest files and values are stored in Kubernetes secrets in the Base64](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=289.89) [encoded gzip archive. You can try to decode It by hand.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=295.31) [Let's do it for fun.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=300.84) [The Helm release name is test‑demo.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=303.09) [If we look at the secrets in our Kubernetes cluster,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=306.63) [we can see one secret that has been created by hand for the test‑demo release.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=309.75) [And with this tricky long command,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=317.69) [which gets the data of the secrets, decodes it twice from Base64, and unzips it,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=319.59) [you can get the content.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=329.13) [Those are manifest files encoded in JSON and also their values.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=331.7) [This is the hard way, and it's just for instructive purposes.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=338.69) [In practice, if you want to get the values or the manifest of your release,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=342.74) [you can use the helm get manifest or helm get values command.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=348.02) [So we learned that a Helm template is executed when the](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=354.84) [chart is installed, but is there any way to test our](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=358.66) [templates before installing the chart?](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=363.35) [Yes,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=367.14) [there are two ways, a static one that can run offline without a Kubernetes](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=367.71) [cluster, helm template followed by the name of the chart, and a dynamic one,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=373.57) [helm install with two options ‑‑dry‑run and ‑‑debug, which makes some](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=380.74) [requests to the Kubernetes API like a normal installation, but asks it to](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=387.8) [not actually commit any changes.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=393.82) [It's called dry run. And the debug flag allows you see the result](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=396.84) [of the template engine execution in the console.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=402.91) [There are some differences between the two.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=407.09) [The static method works locally and does not contact the Kubernetes API,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=409.76) [so it has fewer features,](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=414.37) [such as generating release names and some runtime checks.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=415.94) [I would suggest using the static method in the first stages of your](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=421.14) [development and the dynamic one later when you want to test in more](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=425.12) [detail against the real cluster. Note that the dynamic method debug](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=430.35) [parameter outputs in the standard error, so you have to redirect as shown on this slide.](https://app.pluralsight.com/course-player?clipId=a9d7bfb0-ea8a-4c87-be7d-4236ce2057b3&startTime=435.68)

### [Playing with Helm Template Data](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203)

[So, the template contains directives that are](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=2.14) [replaced by values or that execute code.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=5.6) [First,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=10.94) [let's focus on the values. Which data are available in the Helm template?](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=11.71) [Values for templates can be supplied in different ways.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=18.84) [They can be defined in the values.yaml file located at the root of](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=23.19) [the chart directory or in any other YAML file.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=27.46) [But in that case, you have to set it with ‑f parameter.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=31.86) [Finally,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=37.04) [you can also set custom values in the command line with ‑‑set name=value.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=37.92) [Note that when the user sets a custom value, that value overrides](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=44.74) [the values defined in the chart's values file.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=49.66) [Those values are organized in a nested way,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=53.77) [and you can access them with .Values, dot, refers to the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=56.89) [root, and Values to the value's data.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=61.44) [Then add .property to access the child, add](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=65.14) [.subProperty for the grandchild, and so on.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=69.84) [You can also set the value of a child property directly by separating](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=75.44) [parent and child properties with a dot. For example,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=80.17) [here we set the name property of the service property.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=84.03) [Note that values can also contain arrays or objects. Here, the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=88.68) [multiple labels are part of an array, an array off maps. The key of](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=96.27) [the first and unique element of each map is name.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=102.02) [So you can set the value of that element with the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=106.08) [following syntax: setting the first element,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=109.18) [then the map key. When there is a structured data in an IT field,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=113.09) [there is usually a way to define that structure. That's called a](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=118.77) [schema, database schema, XML schema, and so on. Here, we would also](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=123.16) [like to define the structure of the Helm values.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=130.5) [There is a way to do this.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=133.96) [Every YAML file can be written in a JSON format.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=136.24) [For example,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=140.44) [the YAML file on the previous slide can be written as this JSON file.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=141.26) [And for this JSON file, there is a way to define the structure,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=146.81) [which is the JSON schema.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=151.04) [You can find the full specification of JSON schema at the following address.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=153.23) [Here is an example of a JSON schema that defines the structure of our JSON file.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=158.94) [As you can see,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=165.28) [there is a service object that contains three required properties,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=166.74) [type, name, and port.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=172.34) [If we look further down in the schema file,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=175.07) [there is also one non‑required property named labels. That labels](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=178.74) [property is an array of objects that have a property called name.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=184.9) [That schema has to be stored at the root of your chart in a file](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=189.39) [named values.schema.json.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=196.14) [What is it useful for?](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=200.14) [The advantage of this schema is that it allows Helm](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=202.99) [to validate the value.yaml file,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=206.25) [The validation occurs each time you call helm install, helm update, or helm](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=209.34) [template. Helm validates the structure and the types,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=215.06) [and it also validates the required values.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=220.38) [For example,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=224.64) [if you remove the port property from the values file and run helm template,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=225.58) [you get the following error message: service: port is required,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=231.64) [because that part property is defined as required in the JSON schema.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=237.04) [Another example, if you put a string for the port number,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=242) [you also get an error message, Invalid type. Expected:](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=246.94) [integer, because according to the schema,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=250.46) [the port value type must be in an integer. Note that the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=254.4) [schema feature is only supported since Helm version 3. As](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=258.99) [said in the beginning of the module,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=265.92) [data can come from other sources than the values file. They can](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=268.41) [come from the chart file. Note that in this case we access the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=273.02) [data with .Chart and not .Values.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=278.46) [And also note that the first letter of the chart's](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=282.24) [property is in uppercase in the template.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=285.37) [Or they can come from the release's runtime data and be accessed with .Release.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=289.34) [There you can get the release name, revision number, and other useful data.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=295.24) [You can also get the data about the Kubernetes cluster with .Capabilities.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=302.44) [It can be useful if you want your Helm chart to be](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=309.14) [different depending of the Kubernetes versions.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=311.77) [You can also include the content of files in your template with .Files object.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=316.24) [Note that the file path is relative to the root of your chart and that the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=323.64) [files cannot be located in the template directory.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=328.87) [And finally, you can access some data about the template itself,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=333.14) [such as its name.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=337.73) [Here is a simple Helm template example using different data sources. That](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=341.04) [template has several directives, two directives to replace data from the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=346.94) [Values, service.type and service.port, and two directives to build the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=352.52) [service name from the release name and the chart name by using the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=358.66) [.Release and .Chart built‑in objects. So that, if we have two releases of](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=363.15) [the same chart, the service name is going to be different.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=369.33) [Note that the label also is based on the chart name,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=373.81) [and the selector matches that label.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=377.84) [The manifest should be the following file,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=382.44) [based on the values that are in the values.yaml file and the name](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=385.24) [of the release and the name of the chart coming from built‑in](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=389.69) [objects. In all the following slides,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=393.28) [the same color convention will be used: the template in](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=397.54) [orange, the values in blue, and the manifest,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=402.26) [which is the output of the Helm template engine, in green.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=406.76) [That output is usually a Kubernetes object definition that](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=410.11) [is also called a manifest.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=415.15) [Now, what about the values in the case of an umbrella chart?](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=417.84) [As a reminder, an umbrella chart is a parent chart containing sub‑charts.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=424.24) [Note that we also have parent and sub‑charts when charts depend](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=430.64) [on each other. We'' see that more in detail in the next module.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=435.05) [Keep in mind that every sub‑chart can be used as a standalone](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=438.05) [chart or as a sub‑chart.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=444.2) [So each sub‑chart contains its own values.yaml file,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=447.88) [which contains the default values for that chart.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=452.42) [The parent chart also has a values.yaml file with its own properties,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=456.34) [but it can override the values from a child chart under a](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=462.24) [property that has the name of that chart. Here,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=467.95) [for example,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=472.19) [we'll override the MongoDB username and password](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=472.91) [properties of the back‑end chart.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=476.98) [The way to do this is by adding a back‑end property in the parent](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=479.94) [chart, and nested in that back‑end property, we redefine the](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=484.44) [MongoDB secret property of the child chart.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=489.61) [In fact, internally,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=495.44) [Helm merges all those values into one single entity. If you are curious,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=497.94) [you can have a look at the values compiled by Helm. Run](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=504.64) [helm get all and the release's name,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=510.04) [and you'll see that Helm computes a set of values containing values](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=514.44) [from the parents chart and its children's charts.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=519.23) [But tell me, what is that global property? A reserved](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=524.14) [name for a property is the name global.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=528.99) [A global property, when defined in a parent chart,](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=532.04) [is available in the chart and all its sub‑charts. It can be accessed with](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=536.01) [the same .Values.global directive whether you are in the parent or](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=542.68) [sub‑chart template. This is a convenient way to declare a common property](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=547.79) [for a parent chart and all its sub‑charts.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=553.34) [Note that the global property will be passed downward](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=556.94) [from the parent to the sub‑charts, but not upward from the child chart to the parent chart.](https://app.pluralsight.com/course-player?clipId=13f773d7-db56-466e-9628-115982116203&startTime=559.9)

### [Demo: Customizing Frontend Chart Values](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a)

[Globomantics DevOps are now big Helm fans and already plan to](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=2.34) [reuse their charts for other applications.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=7.6) [For that reason,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=10.6) [they customized their Helm chart templates so that they are reusable.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=13.11) [Globomantics DevOps edit their chart.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=18.5) [First, they customize the front end.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=22.88) [Let's start with a config map.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=27.54) [As you can see, there are hardcoded values in this manifest.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=30.86) [The name of the config map is accurate, and the config data are hardcoded.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=36.12) [If DevOps want to install the chart as several releases,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=43.44) [they need to make that name dynamic rather than static.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=47.1) [A solution to make it unique is to base it on the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=53.04) [release name and the chart name. So,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=56.65) [Globomantics DevOps replace it with the Release.Name dash the Chart.Name.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=59.62) [Like this,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=66.03) [they are sure that the config map has a unique name among all the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=67.39) [releases config maps in the Kubernetes namespace.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=71.47) [Next, to make that chart reusable,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=74.98) [they externalize the values to a values.yaml file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=79.24) [Here is how to do so.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=83.31) [First, create the values.yaml file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=85.53) [Then, in that file, add a config object with two properties,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=89.92) [guestbook‑name and backend‑uri.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=96.34) [Note that the template properties do not support the dash,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=100.38) [so we'll replace it with an underscore.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=105.28) [Then, back to the config map definition,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=109.12) [replace the hardcoded strings with the directive that will](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=113.91) [generate the values from the values file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=117.66) [The first one can be accessed from the root,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=122.04) [.Values.config.guestbook\_name, and the second one from the backend\_uri.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=125.06) [As you can see, in this template, we have properties from the built‑in values,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=134.18) [Release and Chart,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=140.93) [and some from custom values from the values.yaml file. The](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=142.64) [other templates can be updated the same way.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=150.1) [The front end also contains hardcoded strings frontend for the deployment,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=154.04) [the labels, and the container.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=160.23) [Let's replace it with a dynamically generated name.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=164.04) [Again, the name of the release dash name of the chart.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=168.24) [And we can replace the front‑end string with the same generated](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=174.58) [name anywhere as it is needed in the file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=180.44) [For the label, not for the image,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=183.14) [but for the container name and the reference to the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=186.7) [config map that we have just changed.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=190.3) [There are other hardcoded values Globomantics DevOps would like to externalize,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=193.54) [for example the replicas number if they want to scale the application easily.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=199.47) [So,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=206.64) [let's create a replica count value in the values.yaml file and](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=207.5) [use a directive to replace it in the template.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=214.08) [Also,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=218.65) [they would like to change the image easily if a new version of the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=219.97) [application has been deployed The image name has two parts,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=225.03) [the repository and the tag.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=230.98) [So, let's create an image object in the values.yaml file with two properties,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=234.74) [the Docker Hub repository, phico/frontend, and the tag,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=242.25) [2.0.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=249.41) [Note that the tag must be a string.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=250.31) [If it's a number, the .0 would be removed by the template engine.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=253.16) [And again, two directives are used to replace those values in the template.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=259.49) [That way, if the Globomantics dev team releases a new version of the application,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=266.72) [DevOps do not have to edit the decrement file anymore.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=273.14) [They just change the image tag in the values.yaml file and run and upgrade.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=277.04) [What's next?](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=283.98) [The service.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=286.16) [The service also has a hardcoded front‑end name that can be replaced](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=287.84) [the same way with our dynamic name Release‑Chart.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=292.97) [The port number is hardcoded, and it might change in the future.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=299.84) [So, it has to be externalized to the values.yaml file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=304.27) [DevOps would like to be able to change the service type to](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=309.73) [nodeport when they are in a development environment instead](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=313.78) [of the default cluster IP.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=317.67) [So,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=319.9) [they add a service object with the port property and a](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=320.88) [type property in the values.yaml file.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=325.97) [And they replace the values with directives in the template,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=327.38) [one for the port and one for the service type.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=333.59) [Last, the ingress.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=339.39) [As you can see for now,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=342.13) [we have one ingress for both the front end and the back end.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=344.08) [This is not a good design.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=349.84) [A chart should be standalone and should not depend on other charts.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=351.74) [So, DevOps decide to split it between the back end and the front end.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=356.52) [They cut the part corresponding to the back end and pass it](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=362.74) [back into a new ingress in the back‑end chart,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=366.36) [and they only keep the part related to the front‑end chart.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=370.23) [The ingress also has string hardcoded.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=377.04) [Let's change this with a dynamic name.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=381.14) [And the host name is a variable that could change.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=384.32) [So, an ingress subject with the host property is added to the YAML file,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=388.44) [and a directive is used to inject that value into the template.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=394.48) [That's it for the front end.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=401.14) [DevOps have achieved the first step of a template build,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=403.84) [which is to replace hardcoded values.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=408.06) [In the next module, they will add some logic to the template with functions.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=411.35) [But before, they have to do the same job for the back end and for the database.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=417.53) [We are not going to follow along because it's quite long,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=423.6) [but you are free to try it.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=427.69) [The initial resources are in the lab7 begin folder,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=431.04) [and the result is in the lab7 final folder.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=434.86) [When this is done,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=439.78) [DevOps first checks the templates with the command helm template name of the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=443.44) [chart. It prints the manifest built by the template engine.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=448.8) [We see the secret and the config maps. Notice that the name is the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=455.54) [concatenation of the release name and the chart name.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=461.03) [RELEASE‑NAME is the default name used by helm template command, which, as a](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=465.04) [reminder, is a static template rendering, not calling the Kubernetes API.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=471.22) [All resources are generated. The persistent volumes, the services, and](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=475.88) [notice that, in the deployment, the image is based on the repository and tag](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=483.52) [coming from the values.yaml file. DevOps can run a second check with helm](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=489.47) [install ‑‑dry‑run ‑‑debug. Notice that they now have more data, including](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=496.79) [debug data where you can find bugs in your template, computed values as they](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=504.95) [are seen by the template engine, and the generated manifest. Notice that the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=511.31) [release name is now demo‑guestbook. If everything is okay,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=518.55) [DevOps can run a helm install without a dry‑run to install the actual release.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=526.44) [All the resources are being created. And if we wait a little bit, we](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=533.34) [can check that the services are available and that the pods are](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=538.71) [running. There is an error with the back end. Let's look at the](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=542.69) [minikube dashboard to analyze this.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=549.21) [The back end is failing.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=552.64) [Let's check the logs. MongoDB not found.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=555.14) [Ah yes,](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=560.14) [we get it. Now, the database service name is dynamically](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=560.82) [generated based on the release name, so it's not MongoDB anymore](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=565.46) [as I called it in the MongoDB URI in the back‑end secret. We'll solve that issue in the next demo.](https://app.pluralsight.com/course-player?clipId=bb92273e-8fc9-4dc2-8f4f-3f44022dd40a&startTime=570.14)

### [Adding Logic to Helm Template](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb)

[Our templates have not been very clever so far.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=0.74) [They have just replaced some directives in templates](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=4.98) [with values in manifest files.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=8.39) [But they can be much more clever if they use functions and logic.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=11.78) [In the following sections,](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=18.81) [you'll learn how to use functions or pipelines, how to](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=21.14) [modify the scope with the with function, and how to](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=25.52) [control white space and indentation.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=29.39) [Then we'll list the logical operators and use them in flow controls.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=34.42) [Finally,](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=41.44) [you'll learn how to use variables, and we'll conclude by examining modularity with helper functions and some templates.](https://app.pluralsight.com/course-player?clipId=2cdf147d-d911-40aa-ab4e-19d1b8e9b5fb&startTime=42.69)

### [Using Functions and Pipelines](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89)

[In this section, you'll discover functions and pipelines.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=2.08) [They are two different syntaxes to achieve the same goal,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=7.71) [namely, run simple logic in your template.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=11.84) [With the function syntax, you write the function name first,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=16.04) [then the argument. For example, quote value is a](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=20.84) [function that puts the value in quotes.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=25.98) [In fact,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=29.74) [you can see that this syntax is similar to what you can](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=30.57) [find in any function and language,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=33.73) [but without the parentheses. Pipeline works the opposite way.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=36.23) [You write the value first, and that value is trimmed from one pipe to another.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=41.37) [A pipe applies a transformation to the value,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=47.54) [which is equivalent to the function's implementation. For example,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=50.9) [here the value is trimmed to the quote pipe.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=55.36) [The result is the value in quotes.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=60.11) [In fact, you can see that it works exactly the same as a Unix shell pipe.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=63.44) [Both functions and pipelines can be used with more than one argument.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=69.14) [For functions, you separate the arguments with spaces. For example,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=75.44) [here the default function takes two arguments,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=81.94) [a default value and a value.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=84.96) [If the value is null or empty, the default function returns the default value.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=89.01) [This is equivalent to a function with multiple arguments in](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=95.24) [many other languages where arguments are separated by](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=98.5) [commas. With the pipeline syntax,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=101.95) [the last argument becomes the value trimmed to the pipe, and the others](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=106.74) [follow the pipeline name. Here's how to call the same default function](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=111.11) [with pipeline syntax. The advantage of pipelines over functions is that](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=116.3) [they can be changed easily.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=123.39) [For example, here is a pipe of a pipe that turns a value](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=125.44) [into uppercase and puts it in quotes.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=130.09) [Here is a pipeline example named default.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=135.04) [It generates a default value if the value does not exist.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=139.21) [If there is a value for services named property, the output is that](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=144.34) [value as, by default, the output is the chart name,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=149.79) [which is the default value.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=155.51) [Where is the list of available functions and pipelines?](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=160.04) [Some are built in in the text/template package, but not very many are there.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=165.11) [Most of them come from the Sprig project, and the Helm](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=172.18) [project also brings a few add‑ons.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=176.71) [Note that you cannot build your own custom template](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=180.44) [function as you can would Go template.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=183.47) [This is a limitation of Helm, but it's not a big issue because there](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=186.74) [are a lot of functions available, and they can be combined in helper](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=191.22) [functions to make a more advanced one.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=195.66) [Here are the main functions available in Helm templates.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=199.44) [As I mentioned in the introduction, most functions are from the Sprig project.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=203.68) [The Sprig project has many more functions,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=209.82) [and you can, of course, use them in your Helm templates.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=212.74) [But here I have only listed the functions most commonly used in Helm.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=216.64) [You have here both the function syntax and the pipeline syntax.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=222.04) [We already saw the default function before. The quote function or](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=228.31) [pipeline puts the value in quotes, upper in uppercase, lower in](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=233.62) [lowercase. Trunc truncates a value to a number of characters. Trunc](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=240.89) [63 is often used in Helm charts because Kubernetes letters are](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=248.34) [limited to 64 characters.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=252.95) [This is a nice way to avoid names that are too long,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=256.24) [but sometimes it may cut a long name just before a dash. So you can](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=260.34) [use trimSuffix ‑ followed by the value to remove it.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=266.52) [If you want to store some passwords in Kubernetes secrets, b64enc is](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=272.61) [useful to encode them in B64, and those passwords can be generated](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=277.99) [previously with a random randAlphaNum function.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=283.55) [Another function that you might see quite often is toYaml. It's](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=288.09) [used to copy a YAML snippet to the template.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=292.95) [Most often, it's used to generate Kubernetes annotations.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=296.54) [Finally,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=302.04) [the Go template's function printf is available to output a formatted string.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=303.34) [Note that it's not used with pipeline syntax, but Sprig provides other](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=309.24) [functions to build strings, for example the list function followed by a](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=314.2) [list of strings that are joined with the join type.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=320.09) [An example of that technique is in the lab.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=324.53) [Here is an example of trunc and trimSuffix. As you can see, the trunc](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=328.54) [pipeline truncates the very long name of the service,](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=335.74) [and trimSuffix ensures that there is no trailing dash. Including a](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=339.46) [password in a secret and putting it in quotes can be achieved with two](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=346.4) [chained pipes, a Base64 pipe chained to a quote pipe.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=351.98) [Here is the secret file resulting from that template and the following password value.](https://app.pluralsight.com/course-player?clipId=949d90c9-b294-4453-8f4c-695ad7cd1e89&startTime=358.94)

### [Modifying Scope with "With"](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46)

[We saw that values are organized in a nested way.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=1.88) [Sometimes you may want work with a subset of the values without](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=6.04) [repeating the complete path from the root to the value every time.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=10.9) [Here is how to do it using scopes. Without specifying the scope or](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=16.89) [template looks like this.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=23.16) [Each property is accessed from the root value,](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=26.19) [and you have to repeat the full path in each directive.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=30.04) [By defining the scope with the with function,](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=36.28) [you can restrict the scope to the service property. And from there,](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=39.64) [all properties are accessed relative to that service](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=46.04) [property without specifying the parent path.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=49.01) [The manifests generated by the two templates are the same, well](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=53.14) [almost the same. There is once more difference because the with](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=58.46) [and end directives generate additional carriage returns that are](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=63.99) [found in the manifest file. This is an issue, but don't worry because the solution is in the next section.](https://app.pluralsight.com/course-player?clipId=7bfbae94-5cb1-4a1c-80a3-1004dd23ef46&startTime=69.74)

### [Controlling Space and Indent](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d)

[Here we learn how to control whitespaces, carriage returns, and indents.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=1.74) [So here is our template with the with scope function.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=10.44) [Here I showed the additional carriage returns and](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=15.74) [where they are found in the manifest.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=18.84) [To solve that issue,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=21.84) [we can remove one carriage return with a dash at the beginning of the directive.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=23.55) [In fact,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=29.94) [we could also remove the carriage return by adding a](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=31.24) [dash at the end of the directive.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=34.54) [This is more logical,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=38.09) [but as we have two carriage returns, one after the spec line and one after](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=39.51) [the with line, removing the first one has the same effect.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=45.12) [The dash removes all spaces and carriage returns before the directive if](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=51.04) [it's located at the beginning of the directive and all spaces and carriage](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=57.13) [returns after the directive if it's placed at the end of the directive.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=62.09) [Let's consider this second example. Here we would like to insert a port](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=68.49) [number and use a with function.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=74.19) [This time,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=77.54) [we have to remove three carriage returns so that the port is next to](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=78.88) [the port label. So we'll add three dashes, one at the beginning and](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=83.07) [one at the end of the with function and one more at the beginning of](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=89.74) [the end directive. But be careful not to add a fourth one because if](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=95.47) [you add one more dash, the output will be wrong.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=102.95) [It looks like this.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=107.34) [Note that by default, all the indentations from the template are preserved.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=110.74) [But if for some reason you want to modify the indentation,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=117.54) [you can do it with the indent function.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=121.84) [Let's consider this example. It's not very useful, but it's explicit enough.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=125.64) [A property named tcp contains the string value protocol: TCP. And](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=131.34) [we want to generate it in the manifest. Without indentation, the](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=140.46) [manifest is not what we are expecting.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=146.65) [The indentation is wrong.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=149.34) [The protocol is not aligned with the other ports properties.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=151.44) [To solve that issue,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=156.51) [we can use the indent function to align the protocol](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=158.14) [property with the other properties.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=160.98) [We could also, of course, have indented the directive in the template](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=164.49) [without using the indent function. But in some cases,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=168.83) [the indent function might still be needed, for example if you are](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=173.49) [using dashes to remove carriage returns because,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=177.65) [as we said in the previous slide,](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=180.75) [the dashes also remove spaces, so they have an impact on the indentation.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=183.34) [Some functions are inherited from Go template package.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=190.47) [One of them is often used in Helm templates, specifically the printf function.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=195.14) [It generates a formatted string with some values.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=201.84) [Here we use it to print a string that consists of the release name and the chart name separated by a dash.](https://app.pluralsight.com/course-player?clipId=d8fff5b4-eb00-440e-9225-8627009a3c1d&startTime=205.84)

### [Logical Operators and Flow Control](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224)

[The Helm template, of course, also allows you to compare](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=1.02) [and combine values. In other languages, there are operators for that purpose.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=4.89) [But in Helm templates, operators are functions.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=12.44) [You can compare values with equal, not equal,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=18.24) [greater than, and lower than functions.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=21.6) [And you can define logical expressions with or, and, and not. For](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=25.74) [all of them, note that the syntax is the function name followed](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=33.38) [by the two values to be compared.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=37.86) [Here are some examples of logical operator usage taken from](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=41.64) [this table of Helm templates from the main Helm repository.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=45.46) [A combination of and and or,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=49.21) [if, adminEmail exists and either serviceAccountJson or](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=53.34) [existingSecret exists, then the content is rendered.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=58.43) [This is taken from the OAuth2 proxy chart in the deployment.yaml file.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=65.14) [Another example here uses the empty function to check](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=70.64) [that a list of values is empty.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=74.86) [The not negates the result of the empty function.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=77.54) [It's taken from the nfs‑server chart. And, finally, another combination](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=82.18) [of or and and from the grafana chart that I let you discover. Most of](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=88.26) [the time, operators are used in conditions.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=95.12) [Let's learn now how to control flows in Helm](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=100.24) [templates with conditions and loops.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=103.55) [Here is the syntax of the conditions directive in Helm templates.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=108.34) [The if function contains the value to evaluate.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=114.34) [It is terminated by the end directive,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=119.24) [and it can contain an embedded else or even other nested if directives.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=122.64) [If the evaluated value is true,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=129.14) [the inner content is rendered. A common method to make some Kubernetes](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=131.32) [resources optional is to evaluate a property named enabled in an](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=137.26) [encapsulating if directive as shown in this example. To loop around the](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=142.44) [list of values coming from a YAML array,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=150.02) [you can use the range function terminated by an end directive.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=152.67) [Note that the scope inside the range is restricted to the values you are](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=158.68) [iterating on. Here, the first range loops on the hosts items and is](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=162.98) [scoped to the host items. So all evaluations in the range are done](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=169.82) [relative to the content of the host items.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=176.59) [That's why we have relative paths like .hostname to access](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=180.64) [the properties of the different hosts.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=185.01) [And the embedded loop iterating on the path items is](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=187.89) [restricted in scope to those path items.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=192.29) [You can pause the video.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=196.24) [I'll let you analyze this example and how the template loops on the arrays](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=197.85) [defined in the YAML file to generate the following manifest file.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=203.06) [Because the value is scoped to the range,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=209.74) [you might be wondering,](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=213.24) [how can I access the parent's values when I am inside a range? The solution is in the next section.](https://app.pluralsight.com/course-player?clipId=6d973518-ebfa-49dd-8b31-6d03bdc24224&startTime=214.89)

### [Using Variables](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42)

[Using Variables.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=1.94) [When do you need variables?](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=5.04) [You can use variables to store some data and organize your](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=7.54) [code like you do in any other language.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=11.01) [But they are especially useful as a workaround of scope](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=14.14) [restrictions. Inside a with or range directive,](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=17.76) [you cannot access value from the root as shown in this example with .Values.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=22.54) [This syntax does not work because the scope is restricted to inside the with,](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=28.79) [so all references are relative to that scope.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=34.58) [And in our range example, you cannot access the host item properties](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=39.74) [like .hostname from the inner loop iterating on path.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=44.97) [You also cannot access the release properties from the releases built‑in object.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=50.24) [To get around this,](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=56.84) [you can define a variable before the with or range directive. Prefix](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=58.44) [the variable name with the dollar sign followed by a colon and equals](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=64.25) [sign and the value set to the variable.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=68.91) [That variable is accessible anywhere in the scope where it is defined.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=72.74) [So you can refer to it inside the with function.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=77.62) [That's how you can bypass the scope restriction of the with function.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=81.44) [Same for the range.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=86.84) [We can define a temporary variable with the host item.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=88.23) [That variable can be used inside the subrange. And](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=92.69) [for the release or chart data, you can use dollar sign.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=96.85) [The dollar is called the global variable.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=100.52) [It refers to a built‑in variable that allows you to access the root](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=103.15) [data. Note that the common practice consists of declaring the variable inside a range directive as done here.](https://app.pluralsight.com/course-player?clipId=d7d4d9d2-ced8-43ff-a31b-4fd3736c0f42&startTime=107.47)

### [Calling Helper Function and Sub Templates](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd)

[As a smart and lazy DevOp, you always try to reuse your code.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=1.92) [Let's imagine that the logic needed to build the label becomes more and](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=7.9) [more complex and ends up looking like this. You don't want to copy‑paste](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=11.77) [that big piece of code over and over again in your templates. The way](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=17.66) [you can reuse code in Helm templates is by using sub‑templates, also](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=23.18) [named helper functions.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=28.71) [Helper functions are Helm snippets that are located in helper](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=31.74) [files. So the code is copied in that \_helpers.tpl file and](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=35.68) [wrapped with a define function.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=43.54) [The define function takes the name of the sub‑template as argument.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=46.67) [Be aware that sub‑template names are global,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=51.89) [so to guarantee that the name is unique,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=55.27) [it's recommended to prefix that name with the name of the chart.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=57.82) [It can be useful, for example,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=62.34) [in the case of an umbrella chart to avoid a conflict between](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=64.33) [functions defined in the parent chart and the sub‑charts.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=67.9) [When that sub‑template is defined,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=73.84) [you can reuse it anywhere in your chart with an include function,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=76.63) [which takes, as arguments, the name of the sub‑template and the scope.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=80.97) [The scope is the default scope that is used as the root in the sub‑template.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=86.24) [Here we pass the root object of the template,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=91.37) [but we could pass a more restricted scope.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=94.84) [Where do you store that helpers file? In the templates directory. Why isn't it](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=99.04) [processed by the Helm template engine to generate a manifest then? The answer](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=105.7) [is because it is prefixed with an underscore.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=110.62) [Files prefixed by an underscore are not rendered as Kubernetes objects.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=115.04) [In fact,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=121.08) [you could put functions in any files prefixed with](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=121.88) [an underscore, but by convention,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=124.89) [the Helm community often uses \_helpers.tpl files. By the way,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=127.5) [if you want Helm to completely ignore some files](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=133.58) [that are in your chart directory,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=136.46) [you can add their name with or without wildcards in a](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=138.64) [.helmignore file in the root of your chart.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=142.54) [But now,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=147.04) [imagine that you want to create a chart that](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=147.98) [contains only sub‑templates like this,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=150.44) [a chart that would not create any Kubernetes manifest, rather an](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=153.44) [abstract chart that only contains functions that could be shared and](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=159.13) [reused by other charts. Using Helm 3, there is a way to do this](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=163.96) [other than using \_helpers files.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=169.64) [You can tag the chart as a library.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=173.54) [A chart that has the type property set to library in the](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=176.54) [Chart.yaml file will not render any of its templates.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=179.76) [So this is a chart that is used only to define](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=184.88) [sub‑templates that can be reused and shared.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=188.63) [It's not used to create Kubernetes objects on its own.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=191.67) [For your information, Go Templates also has a sub‑templates feature.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=196.24) [You could perfectly use the Go Templates syntax with the template directive,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=202.54) [but there is a subtle difference between the two directives.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=208.24) [A common need in Helm templates is to indent the output of the helper functions.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=213.08) [To achieve this, you need to pass the output to an indent pipeline.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=219.6) [But because the template directive has no output,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=225.44) [there is no way to pass the output of a template function to](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=228.92) [the indent function or any other function.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=232.55) [This is the reason why the Helm team introduced an include](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=236.19) [directive that returns an output. With the include directive, you](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=240.91) [have the same behavior as with the template directive, plus the](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=246.21) [possibility to indent your code.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=250.52) [Last, but not least, the NOTES.txt file.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=254.54) [As I mentioned in the beginning of the course,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=259.14) [this is a nice way of documenting your chart. Each time a user installs your](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=261.93) [chart, the content of that file is printed in the console. And,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=267.94) [of course,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=273.1) [that file is also a template so you can build its](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=274.14) [content dynamically. For example,](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=278) [you can display the list of URLs to access your application as](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=280.52) [shown in this example. It loops on the hosts items defined in](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=284.85) [the value.yaml file and builds a list of URLs that can be used to access the application.](https://app.pluralsight.com/course-player?clipId=5e87feb1-621f-4797-bc66-6c2084d519cd&startTime=289.66)

### [Demo: Adding Template Logic](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e)

[In this demo, Globomantics DevOps upgrade and](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=2.44) [improve the chart with some functions.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=6.16) [When first looking at the backend deployment template, you'll notice that the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=10.14) [name of the Release.Name of the chart is used in many places.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=14.57) [If it has to change, that means you have to change it everywhere.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=19.99) [It would be better to externalize it.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=24.59) [So first, DevOps create an \_helpers.tpl file inside the templates directory.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=28.84) [They open that file, copy the code snippet, and embed it](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=37.54) [in a define directive with a name.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=41.99) [Keep in mind that this name is global to the parent chart and all](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=46.14) [sub‑charts, so, to avoid any conflict, they prefix the name with the name](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=49.72) [of the chart. Then, that code snippet can be included in the templates by](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=56.11) [substituting it with the include directive,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=62.94) [which takes two arguments, the function name and the scope.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=66.34) [Now DevOps can freely change the content of the function and the new](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=72.94) [implementation is automatically going to be used in the templates.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=78.36) [For example,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=84.44) [they can add an if/else directive to allow the user to override the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=85.94) [fullname in the values.yaml file. And they also choose to use the printf](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=92.06) [formatting function with two arguments. The result is transformed with two](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=98.77) [pipes, 1 to truncate the fullname if it's larger than 63 characters, and 1](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=106.83) [to trim the dash if the truncated name finishes with the dash. This complex](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=113.99) [logic can now be reused in all the other backend templates. We substitute](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=121.76) [the include directive in the service.yaml, in the ingress, and in the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=128.42) [secret.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=135.83) [Now let's come back to the bug we had in the last demo.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=138.44) [The backend cannot access the database because the database](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=144.24) [services name now depends on the release name, and if we look at](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=147.85) [the decoded MongoDB URI, it looks like this.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=153.65) [The host name is hard‑coded MongoDB.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=158.19) [Globomantics DevOps are going to solve this issue by dynamically](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=162.94) [building this URI with the release name. First, they split the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=167.28) [URI data into a username, a password,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=173.84) [a chart name used to define the host, and a port and a database](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=180.24) [connection string. Then, instead of using hard‑coded string,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=185.67) [they build it dynamically in the secret.yaml file.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=192.54) [They restrict the scope to the MongoDB URI object with a with directive.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=197.84) [Then they list the items needed to build the URI, the protocol, the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=204.84) [username, and the password coming from the values file, followed by the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=211.11) [host name, but now the host name is dynamically built from the release](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=217.56) [name and the chart name database.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=222.39) [Finally, the port and the database connection string.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=226.34) [All those strings are joined with the join pipeline,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=232.74) [and that string is encoded in base64 and put in quotes as](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=236.38) [is required for Kubernetes secret files.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=241.86) [This implementation might not be the best,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=246.54) [but it gives an example of the with function and some pipelines.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=249.35) [It uses the list function and the join pipeline to construct a string.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=254.64) [Quite a nice complete example.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=261.54) [Note that the username and password are useful here if the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=265.44) [backend chart is used as a standalone chart.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=268.79) [But here the backend and database are part of a umbrella chart,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=272.34) [so it is more convenient to define them in the top chart value file.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=276.94) [Look at how Globomantics DevOps override those default values. They](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=283.74) [go in the top chart values.yamlfile, they create a backend](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=289.58) [property, and as a child of this property,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=295.45) [they copy the block with the secret property object.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=300.94) [That way they can override the username and password from the parent chart.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=305.54) [This is a common practice when you reuse existing](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=311.84) [charts from the Helm repository.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=315.19) [We'll see that in the next module.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=317.79) [Now the bug should be fixed. First,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=321.54) [a quick helm template guestbook to check whether everything is okay.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=325.84) [We see that the fullname is built from the release and chart's names, as before,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=333.14) [but this time by the helper function. We have the MongoDB URI string built and](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=338.01) [encoded. And all the other manifests are the same.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=345.88) [Now we can have upgrade the release with helm upgrade, name of](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=351.94) [the release, name of the chart to fix the bug.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=356.91) [Let's check that the pods are running and open the](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=361.24) [default browser to test the application.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=365.19) [Everything seems to be okay.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=368.74) [We can leave some messages and they are stored in the database by](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=371.04) [the backend. Globomantics DevOps are excited.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=375.02) [They can reuse their charts for a frontend, a backend API,](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=380.54) [or a database in other applications.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=383.55) [If you want to test this yourself, all the files are in my GitHub repository. Start with the lab 8 begin folder and the solution is in the lab 8 final folder.](https://app.pluralsight.com/course-player?clipId=7183b651-02f2-4882-8345-304a9d044f8e&startTime=388.84)

### [Demo: Installing Dev and Test Releases](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85)

[The Globomantics dev and test team have one special request.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=2.31) [For now,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=7.14) [the hosts mapped in the ingress are defined in the chart's values files. And](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=8.49) [if they want to install two releases of the same chart,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=15.47) [one for the dev and one for the test,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=18.56) [they have to change the host in the values.yaml file.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=21.52) [They would like something more flexible where the host name is also](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=26.14) [dynamically generated from the release name. Let's do this in the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=31) [next demo, and, at the same time, learn how to loop through a list](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=35.62) [of values in a Helm template.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=40.81) [First, I have to tell you a bit more about the architecture of the application.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=45.44) [The frontend is a single page application built with Angular.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=51.94) [When the user connects, the page and its JavaScript are](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=57.08) [downloaded. Then, the page itself calls the backend API with HTTP](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=60.82) [requests launched by the JavaScript code.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=66.88) [Those requests also come from the external world,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=72.04) [so they also have to be done through the ingress.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=75.88) [That's why we have two ingresses, one for the frontend and one](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=80.64) [for the backend API. In the first part of the demo,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=84.8) [Globomantics DevOps will disable the ingress that was defined](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=88.57) [in the frontend and backend charts.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=92.91) [Then, they'll build a new ingress in the umbrella chart.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=96.94) [To disable the ingress for the backend, they add an if directive.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=103.44) [If the ingress enabled value is true, the content is rendered.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=110.04) [This is a common practice in Helm templates to make some features](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=115.74) [optional. Then, in the values.yaml file for the backend,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=119.37) [they set that enabled property to true by default. Why true?](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=125.79) [Because that way we get an ingress by default if the chart is used as a](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=132.14) [standalone. They do exactly the same for the frontend; add an if directive and](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=137.68) [activate the ingress by default for a standalone frontend.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=148.39) [But those values are going to be overridden and set to false at](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=154.54) [the top level in the parent chart to disable the ingress. At the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=159.41) [top level, in the umbrella chart,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=165.71) [we create a templates directory and add an ingress.yaml file.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=169.34) [Then, we edit the values.yaml file of that umbrella chart and first](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=175.44) [disable the backend ingress by overriding the enabled property, and](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=181.99) [then do the same for the frontend ingress.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=188.42) [Then we add an ingress object with two host definitions,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=192.94) [one for the frontend, the domain of that host is](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=199.54) [frontend.minikube.local, and it refers to the frontend chart, and one](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=203.58) [for backend, accessisble at the domain backend.minikube.local,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=210.62) [referring to the backend chart.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=216.05) [Now, let's build the ingress manifest from that ingress object.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=220.08) [We first set the ingress file definition header with the name built from the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=225.98) [release and the chart's names. Note that we could use the frontend helper](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=231.4) [function because helper functions are global, but it isn't very nice to use](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=237.01) [children functions in the parent chart.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=241.73) [It would be better to use a library chart.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=244.31) [Then, we build the ingress rules. We loop on the hosts and build the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=248.64) [host name dynamically as the release name followed by a dot and the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=256.61) [domain name. As so, our frontend is accessible with a URL that looks](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=262.51) [like releasename.frontend.minikube.local. And the root path request is](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=270.15) [forwarded to the backend service, so either the frontend service or the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=278.24) [backend API service.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=283.39) [Both are named according to the release.name‑ name](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=285.84) [of the chart for a given host.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=291.09) [By the way, don't confuse here ingress's backend and our backend API.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=293.94) [Finally, before testing this new chart,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=301.34) [let's add a NOTES.txt file to explain to the user which URLs he can access.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=304.98) [the application from. This file is part of the templates directory.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=311.27) [This is a text file containing some directives,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=317.15) [which are also evaluated by the Helm template engine. And the result is](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=320.24) [displayed at the end of a helm chart install command.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=326.57) [If you want to run this demo yourself,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=332.84) [you first have to configure your DNS and host file so that the dev](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=335.23) [and test sub‑domains point to the minikube IP.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=339.87) [One way to do this is to add mappings for each dev and test release in](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=343.94) [the hosts file. Globomantics DevOps are now proud to announce to the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=349.17) [dev and test team that they can deploy two independent releases of the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=356.75) [same chart, one for dev release and one for test release, and access](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=361.83) [them separately.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=367.06) [They first test the template rendering.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=370.74) [We can check whether the ingress is dynamically](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=374.64) [configured by looping through the host values.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=377.64) [Okay, ready to install.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=382.14) [First,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=385.14) [let's delete the previous release with helm uninstall to](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=386.34) [free some memory in our Kubernetes cluster.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=389.6) [Then, install a dev release with helm install dev. And to](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=393.44) [customize it without editing the values.yaml file,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=399.99) [we can add a ‑‑set to override the value.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=403.94) [Here we override the guestbook name to DEV.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=407.94) [Note that we see the result of our NOTES.txt template,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=413.04) [which shows us where to access the applications.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=416.83) [Now let's install a test release the same way,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=421.59) [overriding the guestbook\_name to TEST.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=426.66) [We can check that all the pods are running, three for the dev](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=433.99) [release, and three for the test release. And finally,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=437.96) [let's test the dev release at dev.frontend.minikube.local.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=443.34) [The name of the guestbook is DEV,](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=449.6) [but if we request test.frontend.minikube.local, the](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=452.34) [name of the guestbook is TEST.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=456.97) [So we really have two different releases, one for dev and one for test, running](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=459.18) [in the same Kubernetes cluster and in the same namespace.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=464.27) [All names are dynamically built.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=469.44) [If you want to test this by yourself, all the files are in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=473.14) [Start in the lab 9 begin folder and the solutions are in the lab 9 final folder.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=478.94) [Note that you will have to build the backend URI dynamically in](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=485.84) [the frontend chart as we did in lab 8 for the MongoDB URI. I did not show that part in this demo.](https://app.pluralsight.com/course-player?clipId=a55c4832-af30-4d18-a55d-d4d4eba2dc85&startTime=490.5)

### [Summary](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371)

[Here is a small summary of this quite long module.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=2.04) [After defining the template engine itself,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=6.64) [we used it to replace simple values in Helm templates.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=9.31) [Then, we added some logic to the template with functions and pipelines.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=14.38) [We learned how to restrict the value's scope with the width directive.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=20.69) [That directive included unwanted spaces and carriage returns,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=26.14) [so we learned how to delete them. Then, I listed the logical operators,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=30.92) [and we used them in flow controls, conditions with if](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=38.34) [directives, and loops with range directives.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=42.62) [Range introduced another scope issue because we were](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=48.24) [not able to access the parent values.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=51.85) [So we introduced the concept of variables.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=55.04) [Finally, we learned how to create sub‑templates with helper functions.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=59.78) [So, in this module,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=66.34) [you learned how to customize a chart. You now have all the](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=68.17) [knowledge you need to build a Helm chart.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=72.41) [After you build your first chart,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=76.08) [you'll probably want to share it and reuse it with or without other charts.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=78.2) [This is the subject of the next two modules, where we talk](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=83.18) [about dependencies and repositories.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=86.81) [In the previous module,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=91.04) [we created Helm charts with raw Kubernetes YAML files. Those](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=92.52) [charts are not reusable. In this module,](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=97.18) [we built some templates with values that can be](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=100.95) [replaced and functions to add some logic.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=103.84) [Now our charts are not hard‑coded anymore, and they](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=107.64) [can be reused with other projects.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=111.79) [We are ready to share them, so in the next module, we'll](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=115.44) [learn how to manage dependencies between charts and how to publish them in Helm repositories.](https://app.pluralsight.com/course-player?clipId=7a040477-f646-41ca-8972-3435a499e371&startTime=119.46)

## [Managing Dependencies](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63)

### [Packaging a Chart](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63)

[Hi, this is Phillippe.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=1.34) [In this module,](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=3.43) [we are going to manage Helm charts dependencies and work with repositories.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=4.53) [First, we'll describe how to package a chart in a compressed archive.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=11.04) [Then, we'll learn what a Helm repository is and how to](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=16.44) [publish a chart in a repository.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=20.68) [Finally,](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=24.14) [I show you how to define dependencies between charts and how to make](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=25.03) [dependencies optional with tags and conditions.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=29.49) [In this section, we learn how to package our chart in an archive.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=35.51) [It's more convenient to build an archive before](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=41.34) [publishing a chart in a repository.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=44.39) [Until now, we have only worked with exported forms of charts as unpacked folders.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=47.82) [But before publishing a chart in a repository, it has to be packed.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=56.24) [Helm chart packages are simple Unix tar gzip compressed archives.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=62.04) [You could build it with the tar command line,](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=67.8) [but you should not do this because Helm provides a special command](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=70.53) [for that task, helm package name of the chart. This command](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=74.92) [compresses your chart folder in a tar.gz archive,](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=81.4) [but it also adds the chart version number to the archive file name. That chart version number comes from the Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=c8ec283a-4ca1-4f7e-8948-8428d91dec63&startTime=86.04)

### [Publishing Charts in Repository](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219)

[Now that we have some chart packages,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=2.44) [we want to share them by publishing them in a repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=4.81) [To make a chart available for other projects,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=9.44) [you have to publish it in a Helm repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=12.54) [But what is a Helm repository?](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=15.94) [A Helm chart repository is a location where packaged](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=19.54) [charts can be stored and shared.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=23.21) [It's a simple HTTP server containing package chart files and](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=26.14) [an index.yaml file describing these charts.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=32.11) [The index.yaml file can be created with the helm repo index command in the](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=36.84) [folder containing the compressed charts. When the archives and index.yaml](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=42.29) [file already you can upload them to any HTTP server,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=48.1) [or you can also use ChartMuseum.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=53.21) [ChartMuseum is an HTTP server that is a dedicated Helm repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=57.24) [It provides a nice API to interact with the repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=62.94) [We are going to use ChartMuseum in the demo.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=67.34) [The repository server can also host provenance files.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=71.04) [They provide a way to sign a chart to verify its origin and trust it.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=75.54) [It's not used often, but if this is required by your security policies,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=80.74) [be aware that you can sign a chart with the helm package ‑‑sign command](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=86.33) [as long as you provide a valid PGP key and that a chart can be verified](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=93.29) [locally with helm verify plus the name of the compressed chart as long as](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=99.44) [the provenance file is provided.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=105.28) [A chart can also be verified during installation with ‑‑verify.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=108.04) [So we have briefly learned how to create a repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=114.44) [I'll show a real example in the next lab.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=118.34) [But once the repository has been created and some charts have been published,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=121.42) [how can the Helm client use those charts?](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=128.04) [This can be done in two steps.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=132.64) [The first step is to define the repository in the Helm configuration.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=136.14) [I'll show you right now.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=140.54) [The second step is to define the dependencies.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=142.04) [We'll see this later.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=145.01) [Helm maintains a list of repositories.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=148.14) [Helm can work with more than one repository at a time,](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=151.56) [and you can add or remove repositories from the repository list.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=154.98) [A custom repository can be added to the list with the helm repo add](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=160.14) [command followed by the name given to the repository and its server's](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=165.14) [URL. You can also remove a repository from the list with helm repo](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=169.61) [remove name of the repository.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=175.14) [It's no more complicated than that.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=177.54) [Note that there is no deferred repository in the list when you install Helm.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=180.74) [That's why one of the first things we did when we installed Helm](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=186.54) [was to add the official stable Helm repository with the helm repo](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=190.51) [add command. Unless you only want to work with private charts, you](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=195.3) [will have to do this step.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=200.24) [Unfortunately, that Helm stable repository is not maintained anymore.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=203.14) [So you'll have to rely on third‑party repositories.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=208.34) [We'll look at it in the next module.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=211.83) [Note that in Helm 2, this step was not required. The stable Helm repository was already included in the default repository list.](https://app.pluralsight.com/course-player?clipId=475efee0-1bb9-4730-870b-03b6eee97219&startTime=215.74)

### [Demo: Packaging and Publishing Charts](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2)

[Globomantics DevOps want to make it easier to reuse](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=1.09) [their charts in other projects.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=4.65) [So they are going to pack them into archives and publish them in a repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=7.28) [Then,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=15.24) [they will modify the umbrella chart so that it depends on the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=16.34) [three subcharts published in the repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=20.06) [Let's do it.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=23.64) [First, they move the subcharts to a dist directory.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=25.68) [So there is no chart in the charts subdirectory for now.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=30.69) [Then, they go in the dist directory,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=35.74) [which contains the unpacked content of the charts,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=39.05) [back end, database, and front end and run helm package on those three subcharts.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=42.22) [That command creates three archives that are ready](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=51.14) [to be uploaded to a repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=54.86) [But before doing so, those charts archives must be defined in an index.yaml file.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=57.94) [That file can be generated in the folder containing the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=65.74) [archives by using the helm repo index command.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=69) [If we look at it, we can see some entries describing the packed charts.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=74.54) [Now they are ready to upload the archives and the index file to an HTTP server.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=81.34) [They decide to install ChartMuseum Server.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=89.04) [ChartMuseum is an HTTP server that is a dedicated](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=92.84) [Helm repository with a nice API.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=96.76) [First, they download ChartMuseum binary. You can find the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=100.34) [link in the GitHub ChartMuseum project. Make it executable](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=105.76) [and save it to the local bin folder.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=112.11) [ChartMuseum needs a storage location for the repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=115.74) [For this demo,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=120.58) [it will be stored locally in the home directory, helm/repo. Then,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=122.38) [ChartMuseum can be started with the following parameters to use the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=130.61) [local storage. It runs and listens on port 8080.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=135.18) [For the demo, we'll leave this window open. Finally, in another](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=142.19) [window, the repository can be populated by just copying the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=149.47) [chart archives to the local storage.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=154.68) [You could also upload them with HTTP upload request to the ChartMuseum API.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=158.24) [And now, let's make an HTTP request to ChartMuseum to get the](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=166.04) [list of charts. We can see that the charts have been published.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=172) [In your own projects, you'll set up and use a cloned Helm](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=178.57) [repository or use an existing one.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=182.5) [But in this demo,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=185.14) [you have learned how to do it yourself locally with ChartMuseum. It's](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=186.84) [a good way to understand how the process works.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=191.53) [Great. Globomantics DevOps have packed and published](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=196.08) [their charts to a local repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=199.87) [Now they can build the umbrella chart, as well as any other charts with](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=203.58) [dependencies to the charts available in the repository.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=209.39) [If you want to run this lab,](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=214.34) [all the files are in my GitHub repository. Start with the lab\_10 begin folder, and the solution is in the lab\_10 final folder.](https://app.pluralsight.com/course-player?clipId=2437f8f8-21e4-49e9-9f1f-af5881dec1d2&startTime=216.64)

### [Defining Dependencies](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d)

[And here is the second step that will allow us to use charts from repositories,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=1.23) [defining the dependencies.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=8.04) [How can we define dependencies between charts?](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=10.64) [The guestbook and \_\_\_\_\_ chart that we built in the](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=15.74) [demo depends on three subcharts, the frontend,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=18.63) [backend, and database charts.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=23.25) [The way we managed the dependencies in the previous modules was by](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=27.44) [copying the unpacked subcharts into the charts subfolder.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=31.78) [We could also copy the charts as compressed archive in the charts folder.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=36.34) [This is a manual way of managing dependencies.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=40.9) [But sooner or later,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=45.34) [we'll have to deal with a lot of dependencies between versions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=46.87) [So we need an automatic way to manage dependencies between charts.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=50.56) [The dependencies can be defined in a Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=56.84) [Add a dependencies property, and under that property,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=60.61) [set one or multiple dependency definitions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=65.81) [A dependency block defines the subchart name,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=70.74) [the version range compatible with your chart,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=75.44) [and the repository URL where the archive of the chart can be downloaded.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=78.43) [Note that the version property is a version number or a range of](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=85.14) [version numbers following SemVer 2.0 syntax.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=90.08) [The chart is supposed to be compatible with any versions of the](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=95.34) [subchart that are in the specified range.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=99.15) [In this example,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=102.22) [our chart is compatible with backend 1.2.2 and all backend 1.2.2 patch versions](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=104.69) [because of the tilde character before the version number.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=111.95) [It's also compatible with all the minor changes to the front end](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=117.14) [because of the caret character before the version number.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=121.18) [Another way to define version ranges is by using x as a wild card.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=126.04) [For example, here,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=131.23) [our chart is compatible with any 7.8.x version of the database.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=133.8) [The ability to define the dependencies in the Chart.yaml](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=139.94) [file came about with the release of Helm 3,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=143.4) [but most existing charts have been written for Helm 2.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=147.42) [This is the reason you will not find them in the Chart.yaml file,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=151.94) [but rather in a requirements.yaml file.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=155.8) [Don't worry.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=159.25) [This is still compatible with Helm 3.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=160.82) [So in Helm 2, the dependencies were not defined in the Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=164.44) [Instead, they are in the requirements.yaml file located at the root of the chart.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=169.87) [It contains exactly the same content and uses the same syntax as](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=176.74) [the dependencies property in the Chart.yaml file.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=181.54) [Note that Helm 2 charts are compatible with Helm 3.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=186.14) [So defining the dependencies in the requirements.yaml](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=190.54) [file is still supported in Helm 3.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=193.37) [However,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=197.14) [defining the dependencies in the Chart.yaml file is](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=198.24) [recommended if you are working with Helm 3.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=201.9) [For your information,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=205.2) [here are some range notations with the corresponding versions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=206.87) [A tilde or x wildcard defines the range of patch versions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=211.84) [A caret or double x.x wildcard defines the range of minor versions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=216.69) [And you can also define your own custom ranges of versions that way.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=225.13) [More information can be found in the documentation of](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=232.34) [Go's implementation of SemVer 2.0.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=235.46) [You might have already used the same conventions if](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=237.81) [you have worked with Node.js, for example.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=244.26) [The npm JavaScript package manager uses the same](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=247.24) [SemVer syntax in the package.json.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=251.02) [So,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=256.34) [once the dependencies are defined in the Chart.yaml file or in the](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=257.02) [requirements.yaml file if you are working with Helm 2,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=261.67) [how can you download them from the repository to your charts directory?](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=265.04) [You can do this by running helm dependency update on your chart.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=271.44) [Helm looks for dependencies defined in the Chart.yaml file and](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=278.76) [downloads the required charts in your charts directory.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=283.06) [You can check which charts are available by running helm](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=287.09) [dependency list name of your chart.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=292.02) [And if there are some changes in the required charts,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=295.59) [you can run helm dependency update again to sync the changes.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=299.45) [But sometimes you don't want to retrieve new subchart versions](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=305.09) [because you would like to avoid compatibility issues between](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=310.84) [your chart and new subchart versions.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=314.08) [In that case,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=317.74) [you can work with the frozen list of dependencies with the same version numbers.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=319.34) [They are defined in the chart.log file.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=324.46) [This file is automatically generated when you run helm dependency update,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=329.74) [and it contains only the dependencies with fixed](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=336.14) [version numbers rather than ranges.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=339.89) [Note that in Helm 2, this file is named requirements.lock.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=343.84) [If you need to stick with the same subchart versions,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=349.19) [you can run helm dependency build followed by the name of your chart.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=354.58) [Note that this command uses build instead of update.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=360.74) [This command is based on the Chart.lock file instead](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=366.04) [of the Chart.yaml file That way,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=369.72) [you are sure to get the same versions of the subcharts](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=372.73) [and avoid any compatibility issues.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=375.85) [Again,](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=379.84) [there is an analogy with Node.js and npm with package.json and package‑lock.json files.](https://app.pluralsight.com/course-player?clipId=003a7c2e-2823-4091-84e1-f3798f832e0d&startTime=380.6)

### [Adding Conditions and Tags](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9)

[Okay,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=2.08) [now tell me, what if I want certain subcharts to be option because I](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=2.51) [want to install dependencies in some releases,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=9.28) [but I don't need them in other releases.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=12.14) [This can be done with conditions and tags.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=16.24) [In the chart.yaml file,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=20.44) [you can add a condition property for each dependency. That condition](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=22.15) [property contains the names of the properties that will be evaluated to](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=28.42) [determine if the chart is optional and or not. The condition properties](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=32.64) [are values within the chart.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=38.67) [If one of the properties does exist and is a boolean value,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=41.07) [it is evaluated, and the condition is applied.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=45.54) [If it's true,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=50.08) [the dependency is included as it's rejected. Note that only](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=51.3) [the first valid property is evaluated.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=57.2) [If none of the properties exist, the condition is ignored.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=61.34) [So in this example, if you run helm install,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=67.64) [the back end is installed because the condition property,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=71.71) [backend.enabled, exists and is true.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=75.77) [The front end is also installed because there is no condition](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=81.14) [associated to it. And the database is not installed because the](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=85.24) [property database.enabled exists and is set to false. But note that](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=90.23) [if the database property does not exist,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=99.1) [the database will be installed by default.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=102.32) [If multiple subcharts have an optional feature and don't](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=106.94) [need to be installed, there is another,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=111.02) [more convenient way to do a partial installation.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=113.4) [Instead of using conditions,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=117.44) [you can tag the subcharts with the same tag and use that tag to make them all](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=119.46) [optional at once. For example, here we would like to make all charts related to](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=125.38) [the API optional, so the back end and the database.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=131.5) [The way to do this is to tag those two subcharts with a tag property](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=136.24) [named api and set that api property to true or false. Note that](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=140.72) [conditions override tags. So the tag only works if the condition](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=149.22) [properties do not exist. Don't get confused.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=155.12) [The condition and tags are not evaluated during dependency update. When you run](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=160.57) [helm dependency update, Helm just unloads all the charts,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=166.46) [no matter what their conditions, tags, and values are.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=171.49) [Conditions and tags only have a role when you install a chart.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=176.19) [If you run helm install demo guestbook, some charts are installed](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=181.44) [and others are not depending on the conditions,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=186.42) [tags, and values. Keep in mind that you can modify the values with ‑‑set.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=189.63) [In this first example,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=196.25) [we'll make the database chart required. The second example does](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=198.24) [not install charts tagged with the api property.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=203.78) [So the back end and the database are not installed.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=206.94) [Well,](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=210.74) [they are not installed as long as there are no conditions set for those subcharts because remember conditions override tags.](https://app.pluralsight.com/course-player?clipId=19658dde-93ea-4aa6-bf21-8a7ae1fbc9f9&startTime=211.42)

### [Demo: Managing Dependencies](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d)

[In this demo, Globomantics DevOps are going to build the umbrella chart.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=0.54) [However, this time instead of copying the subcharts to the charts folder,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=6.04) [they will use Helm dependencies.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=11.44) [First, they have to configure Helm to use the new ChartMuseum repository.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=15.14) [This can be achieved by running helm repo add command and](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=21.14) [passing the repository name ChartMuseum and the URL of the](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=25.98) [local ChartMuseum repository.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=31.35) [Then,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=34.64) [they run helm repo list to check that the repository is](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=35.25) [available and helm repo update to get the latest Helm chart](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=39.38) [information from the repository.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=45.95) [Let's check which charts are available inside the ChartMuseum repository.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=49.14) [Great, the backend, frontend, and database charts are available.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=54.24) [Now, the dependencies have to be defined.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=61.15) [So,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=65.94) [Globomantics DevOps go upon directory to where the umbrella](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=66.57) [guestbook chart is located and edit the chart.yaml file.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=70.31) [Inside that file, they define the dependencies.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=74.75) [For each subchart, they include the name of the chart,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=78.7) [its range of compatible versions, and the repository where it's located.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=84.34) [All charts are published on the localhost server at port 8080.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=90.94) [They save that file and run helm dependency update on the guestbook chart.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=97.34) [Helm first connects to the repository to get the latest chart definitions](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=104.56) [and then downloads the subchart archives that are defined in the](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=110.58) [dependencies from the repository to the charts directory.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=114.79) [We can check this.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=120.54) [The charts folder was empty,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=122.34) [and now it contains the archives of the three dependencies.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=124.12) [And the template directory only contains the ingress.yaml and NOTES.txt file.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=128.62) [We can also list all current dependencies with helm dependency list guestbook.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=136.74) [A detailed view of the dependencies with the version](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=143.38) [range and repository URL is displayed, and their status is ok.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=147.28) [Finally,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=153.76) [Globomantics DevOps are ready to install a new development](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=155.59) [release of the guestbook application,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=159.07) [but this time with a number of charts which uses Helm](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=160.67) [dependencies rather than subfolders.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=164.47) [As you can see, the chart is installed.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=168.44) [We can check with helm list kubectl or helm get manifest commands.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=171.74) [The result is the same as before.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=181.04) [The only difference is that this time,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=183.18) [Globomantics DevOps have used subcharts published in](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=186.34) [the repository as dependencies,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=189.53) [and they could easily do the same for other projects.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=191.61) [Okay, let's delete that release for the next demo.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=196.54) [If we look at the content of the chart,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=201.94) [we see that the Chart.lock file has been created.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=204.74) [Let's view that file.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=208.94) [Well, it's the same as the Chart.yaml file except that it contains](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=210.84) [fixed version numbers instead of ranges of versions.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=216.78) [Now, let's imagine that the dev team has released a new version of the](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=221.84) [front end, and a patch chart is packed and published in the local](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=226.24) [repository. But Globomantics DevOps might not want to run helm](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=230.88) [dependency update because it could break the guestbook application if](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=235.97) [the new subchart is not compatible.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=240.03) [Instead, they can run helm dependency build guestbook, build instead of update,](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=243.74) [which is based on this Chart.lock file with fixed version](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=250.92) [numbers for all subcharts. If you want to run this lab, all](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=255.65) [the files are in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=261.11) [Start with the lab10 begin folder, and the solutions is in the lab10 final folder.](https://app.pluralsight.com/course-player?clipId=2159849b-f7da-452b-b49b-71a80345973d&startTime=263.74)

### [Demo: Controlling Dependencies with Conditions and Tags](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072)

[Now the Globomantics Dev team has a special request for a](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=2.77) [lightweight release containing only the front end to test](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=7.21) [the UI on the local cluster.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=10.95) [Globomantics DevOps need to provide a Helm chart to install the](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=13.17) [umbrella chart without the back end and the database.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=19.19) [For that purpose,](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=24.27) [they added the Chart.yaml file and added condition and tag properties.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=25.88) [The back end is not installed if the backend.enabled](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=32.44) [property exists and is set to false.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=37.03) [They also add an api tag to that subchart.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=42.49) [And it's the same for the database.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=47.44) [It's not installed if the database.enabled exists and is set to false.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=49.94) [The database chart is also part of the API, so it's also tagged with an api tag.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=56.94) [Let's now define the values in the values.yaml file.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=64.44) [All conditions and tags are true by default,](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=68.34) [the back end enabled condition, the database enabled condition,](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=71.68) [and the api tag.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=77.22) [So using helm install guestbook would install the full](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=81.44) [application with the three subcharts.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=85.56) [But if DevOps need to install a partial guestbook application,](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=89.24) [they can do it by setting the conditions to false for](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=93.01) [the back end and for the database.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=97.52) [Look, this time, only the front end has been installed.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=101.04) [Here, this was done by setting conditions,](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=105.51) [but the same result can be achieved with a single tag.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=110.46) [First, edit the values.yaml file.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=114.34) [I'll erase the properties evaluated for conditions](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=117.27) [because the conditions would override tag.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=121.02) [Let's delete the release and run helm install while](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=125.44) [setting the tag api to false.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=131) [That command achieves the same partial installation.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=135.34) [It installs only the front end.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=139.14) [Globomantics DevOps have now mastered Helm dependencies and are ready to](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=142.12) [provide many charts reusing their existing charts.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=148.17) [If you want to run this lab, all the files are in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=152.54) [Start with the lab\_10 begin folder, and the solution is in the lab\_10 final folder.](https://app.pluralsight.com/course-player?clipId=550f8cfa-c3b5-4372-b9c1-f964770eb072&startTime=157.74)

### [Summary](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2)

[In this module, you learned how to packaged your chart in an archive.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=1.04) [This is indeed needed to publish a chart in a Helm repository.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=6.58) [Then you have learned how to define and manage dependencies between charts.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=11.44) [And I have shown how to use conditions and tags to make some charts](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=16.94) [optional. In the previous modules, the charts were stored in the charts](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=21.53) [subfolder as unpacked charts. In this module,](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=27.23) [you have learned how to pack them into archives and](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=32.74) [publish them to the local Helm repository.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=37.14) [And we have configured the umbrella chart so that it depends on those subcharts.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=40.9) [Now the charts are automatically downloaded each](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=46.94) [time we run helm dependency update, and we can reuse them in other projects.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=50.41) [As you can imagine,](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=58.14) [all the DevOps have already built nice charts for well‑known products.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=59.45) [In the next demo, we'll change our database chart for the official stable](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=65.14) [MongoDB chart from the stable Helm repository. We learned how to depend on it and how to customize its values for our application.](https://app.pluralsight.com/course-player?clipId=be34260c-504d-4fdf-8c0e-564ea9bf97a2&startTime=70.54)

## [Using Existing Helm Chart](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13)

### [Using Existing Helm Charts](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13)

[Hi.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=1.04) [This is Philippe.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=1.62) [You've learned how to build Helm charts in the previous module.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=3.14) [But as you can imagine,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=7.94) [other DevOps might have already done the same work for well‑known products.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=9.76) [In this module,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=14.77) [we'll see what the Helm stable repository is and how](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=16.81) [to search for existing charts.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=20.74) [Once you have found a chart that fits your needs,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=23.84) [you'll learn how to use it and set up its values.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=26.8) [In this course, we have followed the path that you come across in many IT fields.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=30.69) [You start with some source code files, here, the Kubernetes YAML files.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=36.66) [And when you have a lot of sources or compiled files,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=41.72) [you package them usually in archives, here the Helm charts.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=45.85) [When you want to share the archives, you publish them to repositories,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=51.44) [here the Helm repository.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=55.5) [And when you have to deal with a lot of repositories,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=58.34) [you use a repository hub, like GitHub or Docker Hub for example.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=61.47) [Here is a table with some analogies with other IT fields.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=67.84) [Sometimes the analogy is perfect, and sometimes it doesn't completely match.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=71.89) [Helm takes the best of all words.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=77.46) [Its packaging feature looks like Maven with Java or npm JavaScript package](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=81.14) [managers with great version dependency support. Plus,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=87.46) [remember, it has the whole template support,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=92.37) [and the repository and hub part looks more like what you can](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=95.78) [find in the Docker world with Docker Hub.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=100.35) [We already saw how to add the Helm stable repository with helm repo add command.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=104.16) [But keep in mind that this repository is no longer maintained,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=111.54) [and its charts are deprecated . So, where can you find the latest Helm charts?](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=114.99) [Well, you can search the Helm repository hub.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=123.04) [The Helm repository hub can be accessed at one of the following addresses.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=126.64) [This is a registry with a lot of third‑party Helm repositories.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=131.3) [You can just search for a project,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=136.64) [and you get the list of charts available for that](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=138.94) [project and their repositories.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=142.48) [For example,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=145.44) [here we found the MongoDB chart maintained by the Bitnami](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=146.42) [organization in the bitnami repository,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=151) [and you get the nice documentation of that chart and how to install it.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=153.8) [To install that chart,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=158.88) [you first have to add the bitnami repository to Helm. Then, install the](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=161.04) [chart. If you prefer the command line, here are the main options, helm](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=166.54) [repo list retrieves the list of repositories,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=173.66) [their names and their URLs.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=177.16) [As a reminder, you can add or remove repositories from the](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=179.94) [list with helm repo add and helm repo remove commands. To](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=183.93) [search a repository for a chart,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=189.01) [use helm search and a keyword. Since Helm 3, you have to](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=191.02) [specify whether you want to search in the list of repositories](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=196.33) [with the repo command or in the hub.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=199.84) [Once you have found the chart you are interested in, you can view its](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=203.74) [documentation with the helm inspect command, either a global one with all](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=208.38) [commands or others limited to the chart or values.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=215.42) [If you have the choice,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=220.44) [I recommend that you look at formatted documentation either in the](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=222) [Helm GitHub repository or in the Helm help website rather than the](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=226.16) [raw documentation in the console. To download a chart directly](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=231.09) [without using dependencies, you can run help fetch.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=235.95) [It's useful if you want to look at the chart source](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=240.04) [code before using it as a dependency.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=242.7) [Then, once you have added the stable chart as a dependency in the Chart.yaml](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=246.54) [file or in the requirements.yaml file if you're working with Helm 2, you can](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=251.55) [run helm dependency update chart\_name to download the stable dependency in](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=256.19) [your chart subfolder. Of course,](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=262.6) [all these commands can also be used for custom charts from other repositories](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=266.14) [besides the stable repository. Just make sure that the third‑party repository has been previously added to the list of repositories.](https://app.pluralsight.com/course-player?clipId=1d716f72-1ce6-498e-b993-d99aa2913d13&startTime=271.12)

### [Customizing Existing Charts](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62)

[When you reuse an existing chart,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=0.84) [you often need to customize it to meet your needs.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=3.46) [We have already seen how to overwrite child charts values](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=7.24) [with the values in the parent chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=11.29) [But as we said in the previous module, there are other](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=15.14) [techniques. We'll see about them in this section.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=18.03) [In the previous module,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=22.93) [we copied the values from the child chart to the parent chart and moved them](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=25.04) [under a property that has the name of the child chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=31.39) [In other words,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=35.79) [we overrode the values from the child chart with](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=37.14) [values defined in the parent chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=40.98) [This is the default way for customizing existing charts. But](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=43.66) [sometimes you might want to do the opposite, export values from the](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=48.45) [child chart so that they are available in the parent chart. To be](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=53.91) [honest, this is not done often,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=58.78) [but there are two ways to do it, and it's good to know. The first way](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=61.38) [is to define an exports property in the child chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=66.54) [To make that exports property available in the parent chart,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=72.14) [you can add import‑values property in the dependency section of the](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=76.57) [Chart.yaml file in the block corresponding to the child chart or in the](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=82.41) [requirements.yaml file if you are still working with Helm 2.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=88.4) [That way, you can access any values from that child chart as](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=92.6) [if they were defined in the parent chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=97.31) [For example,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=100.44) [MongoDB URI can be accessed as .Values.mongodb\_uri without](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=101.68) [specifying that it's from the child chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=108.75) [Note that the data property it's used to embed the exported property,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=112.74) [mongodb\_uri. This technique has some limitations.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=117.76) [First, it requires values of the child chart to be under an exports property.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=122.92) [Secondly, it might cause name conflicts if it's used with multiple child charts.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=128.74) [Fortunately, there is another way that we'll see in the next slide.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=134.94) [If you want to have a look at an example,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=139.78) [go to my GitHub repository in the bonus section of](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=142.74) [lab 10, helm\_dependencies\_export.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=146.1) [The other technique is to use a child parent mapping.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=150.74) [This time,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=155.94) [you can export any property from the child to the parent by defining a mapping](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=156.68) [in the Chart.yaml file or in the requirements.yaml file if you are still](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=162.66) [working with Helm 2. In the block corresponding to the child chart, add an](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=166.91) [import‑values property with two subproperties,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=173.92) [a child property containing the name of the child property that has to](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=179.44) [be exported and a parent property containing the name of the parent](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=184.14) [property mapped to the exported child property.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=189.08) [In this example,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=193.18) [you can access data from the child property with the mapped](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=194.94) [frontend\_data property in the parent chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=198.88) [If you want to see an example of that code,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=203.84) [have a look at the bonus section of lab10\_helm\_dependencies\_child‑parent in my](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=206.56) [GitHub repository. I find those techniques quite tricky,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=213.04) [and maybe you do too. And that might be the reason](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=218.67) [why these methods are rarely used,](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=222.72) [even if they could add a nice chart introspection feature to Helm.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=224.81) [I don't think you absolutely need to use these methods.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=231.19) [You can do everything by overwriting child values from the parent chart, and](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=234.64) [also using global variable can help in many situations.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=239.98) [We already saw it in one of the last modules. But as](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=245.14) [a reminder, here is how it works.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=248.67) [A reserved name for a property is the name global. A global](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=251.48) [property, when defined in the parent chart, is available in](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=256.65) [the chart and all its subcharts.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=261.45) [It can be accessed with the same .Values.global directive whether you](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=264.44) [are in a parent or in a subchart template. This is a convenient way to](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=270.52) [declare a common property for a parent chart and all its subcharts.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=275.54) [And note that the global property will be passed downward from the parent to the subcharts, but not upward from the child chart to the parent chart.](https://app.pluralsight.com/course-player?clipId=339769ab-01f5-4bf6-a94a-bef94a815a62&startTime=281.04)

### [Demo: Using Stable MongoDB Charts](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e)

[Globomantics DevOps can scale the guestbook app by editing](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=0.74) [the replicas in the values.yaml file.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=4.75) [So they are ready for production except for the MongoDB database.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=8.03) [To be ready for production with the database,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=13.02) [they need to provide a production‑ready MongoDB](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=15.9) [replica set with the primary instance, secondary replicas,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=19.4) [and an arbiter.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=23.67) [They are not MongoDB experts,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=26.14) [but they can accomplish that task easily with MongoDB stable Helm chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=28.35) [This is one of the main advantages of using a package manager.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=34.94) [You can install a complex project and the package manager hides the complexity.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=38.39) [For now, they are using a single MongoDB server chart built from scratch.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=44.14) [That chart was called database.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=50.4) [Let's remove it.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=53.42) [Within the list of default repositories, they search for a MongoDB chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=55.88) [There are several results.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=62.34) [Let's choose the first stable/mongodb chart for the demo.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=63.95) [They first inspect the documentation with the command line](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=70.44) [and inspect readme name of the chart, but it's not very readable.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=73.9) [So,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=81.04) [they go to the Helm help website and search for MongoDB chart to](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=81.57) [access a nicely formatted version of the document.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=87.36) [Here is the stable /mongodb chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=90.77) [Note that it can now be found in the bitnami repository.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=94.68) [What is important for Globomantics DevOps at first is](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=99.94) [the version of the chart, 7.8.4, the mongodbRootPassword property,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=103.74) [the replicaSet.enabled property that they must set to](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=112.54) [true because it is false by default,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=115.72) [and the key for authentication in the replicaSet.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=119.22) [All the other properties are set by default for now.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=123.62) [We just set the persistent.size to less than 8Gi because we don't](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=128.26) [want to fill up all the minikube host storage.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=133.57) [This is just an initial test.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=137.64) [And afterward, they would be able to tune the chart for security,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=139.31) [monitoring with Prometheus, and other configurations.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=144.45) [Then, they edit the chart file to add a dependency to the MongoDB chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=151.24) [The name of the chart is mongodb.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=158.44) [The application should be compatible with current version, 7.8.4.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=160.98) [And the repository URL is the URL of the stable Helm repository.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=167.17) [The condition property changes to mongodb.enabled.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=175.14) [Now the command helm dependency update downloads the MongoDB chart from](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=181.94) [the stable Helm repository to the chart directory.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=188.41) [Let's check this by looking in the directory or by](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=192.94) [running helm dependency list on the chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=198.6) [Okay,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=203.94) [now it's time to customize the stable MongoDB chart for the application.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=205.14) [Let's open the chart's values.yaml file, change the database property for](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=210.59) [mongodb, which is the new name of the new subchart, and enable the replicaSet](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=217.82) [feature, giving it a key, which is the string password. Then, also set the](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=224.89) [mongodbRootPassword to the string password. And finally, limit the persistent](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=233.17) [volume size to 100Mi. The backend mongodb\_uri connection string also has to](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=241.14) [be updated.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=249.81) [The admin username is root for this new chart.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=252.04) [The name of the chart is mongodb, and the connection string](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=256.84) [must include the replicaSet's name. That's it.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=261.38) [The new MongoDB chart is configured for an initial test.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=266.24) [Globomantics DevOps launch helm install guestbook with the dev release](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=272.09) [name and wait a while because the MongoDB instances have to be created.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=277.16) [After a couple of minutes, they check whether everything is running with](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=282.91) [kubectl get pods. Look at that, our backend API, our frontend, a](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=288.35) [mongodb‑primary instance,](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=296.46) [a secondary replica, and more replicas can be managed by the arbiter.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=298.74) [Globomantics DevOps have come a long way from simple YAML files up to a](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=305.24) [production‑ready chart with a MongoDB replica set. Congrats. They can](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=311.65) [be proud, and you can be proud if you followed them all the way](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=316.91) [through. If you want to run this lab, all the files are in my GitHub repository.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=320.84) [Start with the lab11 begin folder, and the solutions are in the lab11 final folder.](https://app.pluralsight.com/course-player?clipId=4afa6202-c4fc-4da2-b1bb-a50b4643058e&startTime=327.34)

### [Demo: Installing Wordpress in Kubernetes in 1 Minute](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac)

[And now a small bonus as icing on the cake.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=0.41) [We are going to install a WordPress site with a MariaDB](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=4.64) [database in Kubernetes with Helm.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=8.11) [How long do you think this will take?](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=11.44) [Less than 1 minute. Welcome to the magic of Helm. Look at this. First,](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=14.29) [look for a WordPress chart in the stable repository.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=22.44) [There is one chart available, stable/wordpress.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=26.64) [Open the Helm hub website to learn a little bit more about it.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=31.44) [Search for WordPress.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=35.99) [Here is the official WordPress chart.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=38.94) [It has the name bitnami/wordpress, but it's exactly the same.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=41.94) [Look at the documentation.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=47.24) [We can install it from the stable repository.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=48.76) [It's just that the chart can be published in more than one repository.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=51.6) [We could also add bitnami repository to our config and install if](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=56.52) [from there. The documentation shows all the available values to](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=60.35) [customize the WordPress installation.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=66.42) [We'll leave all the defaults for this demo. Run helm install](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=71.04) [demo‑wordpress stable/wordpress. And that's it.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=76.65) [Check with kubectl that the pods are running.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=83.04) [The MariaDB database and the WordPress site are both running. To](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=86.74) [access the site, you can use the default user user and to retrieve the](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=91.96) [password as described in the NOTES.txt file. Kubectl gets the secret,](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=97.15) [and then you decode that secret.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=104.12) [Here is the password. As we don't have an external load balancer with](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=108.04) [our Minikube instance, we can access the service using a node port. Run](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=113.27) [kubectl get service. The WordPress service is running on port 31822,](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=119.78) [and the IP of the node is retrieved by minikube ip command. Open the](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=127.64) [browser, add the node's IP with the node pod port, and your WordPress](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=134.43) [blog is ready.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=140.25) [Connect to the editing console with the default user and](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=142.44) [the password that we decoded before.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=147.45) [Copy it, and you can add or update a post in the blog.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=150.34) [Let's congratulate Globomantics DevOps.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=156.44) [Even if, let's be honest, it was not a hard job.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=159.38) [They just reused an existing chart.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=163.8) [But that's also one of the main advantages of a package manager, isn't it?](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=167.14) [It allows clever DevOps to be lazy, but still efficient.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=172.94) [Of course,](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=178.84) [you can now read the doc and customize the installation](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=180.04) [as needed and scale the application.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=183.39) [You don't need any files to run this lab.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=186.94) [You just need a Helm environment. So just do it.](https://app.pluralsight.com/course-player?clipId=9c0d5e21-50d7-4182-9488-c1f4864593ac&startTime=189.94)

### [Summary](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef)

[In this module, you've learned how to use existing](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=2.44) [charts from the stable Helm repository.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=6) [We have reviewed some useful Helm commands and discovered the Helm hub website.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=10.04) [Then, you've learned how to customize an existing chart by](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=16.44) [overwriting the values and exporting them or exporting](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=21.27) [with a child‑parent mapping.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=25.09) [Finally,](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=27.84) [we'll start a stable MongoDB chart in our guestbook demo application and,](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=28.55) [as a bonus, we installed a WordPress blog in](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=34.31) [Kubernetes with Helm in less than 1 minute.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=37.23) [In the previous module, we were using MongoDB running on a singer server.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=42.6) [We built that simple MongoDB chart from scratch.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=49.02) [But for production, a more advanced MongoDB configuration is needed.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=52.36) [As you can imagine,](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=58.84) [all the people have already built nice charts for MongoDB. In this](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=60.34) [module, we've exchanged our database charts with the MongoDB chart](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=65.44) [available in the stable Helm repository.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=70.97) [We configured the dependencies for that chart and customized its values.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=75.14) [That way, we can configure it as a MongoDB replica set with a primary server,](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=81.08) [secondary servers, and arbiter. Well,](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=86.7) [we have come a long way from kubectl commands and simple YAML files up](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=90.54) [to a production‑ready chart with MongoDB replica set. Congratulations, and thank you for joining me on this Helm journey.](https://app.pluralsight.com/course-player?clipId=df5a2900-b16b-49fe-8de1-ad17fe548aef&startTime=96.55)