



Bitnami Stacksmith

Evaluator Guide

Welcome to Stacksmith!

An increasing number of companies are moving their applications to the cloud and container platforms. As companies modernize their DevOps pipeline, Kubernetes is becoming an excellent solution for migrating legacy applications. One step in this modernization is to automate the application packaging for today's cloud and container platforms.

[Bitnami Stacksmith](#) helps you package, optimize, and maintain your applications for quickly moving them to container and cloud platforms. It generates **cloud images and deployment templates** ready to be deployed natively to the cloud as Virtual Machines or containers.

It can be used both in new application development (as shown here) and in legacy applications to prepare them for replatforming from your datacenter to the cloud.

Advantages

Application-centric Approach

Stacksmith's application-centric approach emphasizes the orchestration of applications and associated processes, instead of an infrastructure-centric approach which looks at the world through the lens of machines to which software is connected.

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- [Keep your application up to date](#)
- [What's Next](#)

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Continuous Maintenance

Stacksmith delivers monitoring, notifications, and a simple updating process to relieve the Ops burden and minimizes corporate risk / vulnerabilities.

Cloud and Format Agnostic

Stacksmith's uniform process of building containers and VM images in their assorted formats enables easy deployment on multiple clouds.

Pluggable

As many companies already have existing tooling in place for artifact storage, CI/CD, testing and more, Stacksmith is pluggable into your existing tooling and workflows.

Addresses industry standards

- Obtain immutable templates and images of your application that follow cloud providers best practices and policies.
- Simplify auditing, compliance, policy enforcement, and security thanks to Stacksmith continuous monitoring for updates and security events.

Supported Platforms

Stacksmith lets you package your applications for multiple targets / formats at the same time, in a single process, for when you need the same application running on different platforms. It creates all the assets you will need to deploy to various platforms, in the same packaging process:

- **AWS:** Amazon Machine Image (AMI), Cloud Formation Template (CFT).
- **Azure:** Virtual Machine image, Azure Resource Manager Template (ARM).
- **EKS:** Elastic Kubernetes Service (Helm chart).
- **AKS:** Azure Kubernetes Service (Helm chart).

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Stacksmith allows you to:

- target different clouds with the same application and application configuration scripts.
- start a gradual path for adopting Kubernetes in your company.
- implement a way to maintain applications quickly without tedious manual repackaging.

Goals

This guide shows you how to:

- Package a basic To-Do application that is made up of MongoDB, Express, Angular, and Node.js (MEAN). You can find the application in this [GitHub repository](#).
- Deploy it on your preferred target platform.
- Update your To-Do application.

Requirements

Before getting started, you should be prepared with the following:

- [Have a Bitnami account](#).
- Be logged in to stacksmith.bitnami.com with your Bitnami account.
- For AWS: [Have an AWS account connected with Stacksmith](#).
- For Azure: [Have an Azure account connected with Stacksmith](#).
- For Kubernetes: Have [Docker](#), [Helm](#), and the Kubernetes command-line tool, [kubect!](#), installed.

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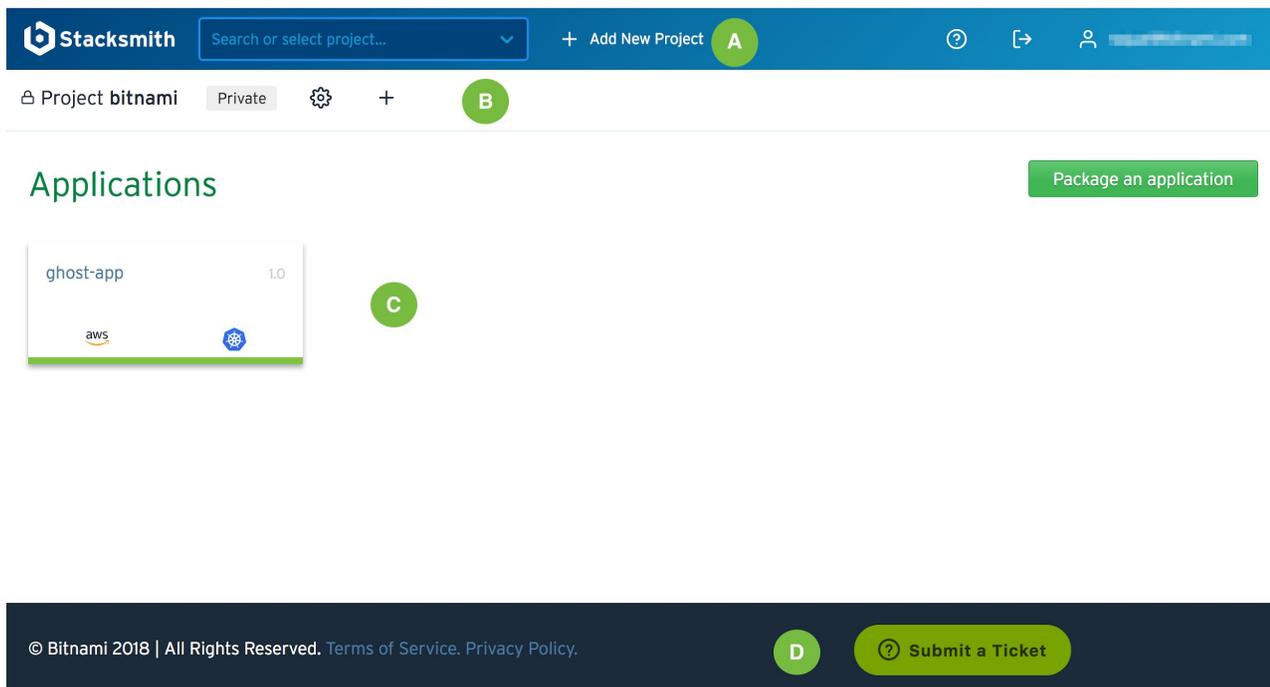


Getting Started with Stacksmith

Stacksmith UI overview

The Stacksmith user interface is very simple to use. It has four key components that allow you to follow the Stacksmith workflow: package, deploy, and maintain your application code.

When you first log in, Stacksmith opens in your project space. This area displays the applications you have packaged to date. Your project space contains the following components:



The screenshot shows the Stacksmith user interface. At the top is a blue navigation bar with the Stacksmith logo, a search bar, and a '+ Add New Project' button (labeled A). Below this is a breadcrumb trail: 'Project bitnami' (labeled B), 'Private', a gear icon, and a plus sign. The main content area is titled 'Applications' and features a 'Package an application' button. A single application card for 'ghost-app' version 1.0 is shown, with 'aws' and a gear icon below it (labeled C). The footer contains copyright information, a 'Submit a Ticket' button (labeled D), and a help icon.

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A- Project and user menu: Select the project in which you are working, create a new one, access Stacksmith documentation, and manage your user account from this menu.

B- Project settings: Check the privacy of your project, configure the project and stack templates settings, or add a new application to your project just clicking the plus sign.

C- Applications dashboard: Have an overview of your packaged applications or package a new one from this dashboard.

D- Support bar: Paid Stacksmith users (those using [Team or Enterprise tiers](#)), can access dedicated support by submitting a ticket to our Support team. Non-paying Stacksmith users (those using the [Public tier](#)) can join the Stacksmith community forum, where they can search for answers to questions or ask community forum experts for support.

Next Up

First, I will show you how easy it is to package an application with Stacksmith. Then, I'll show you how to keep it up-to-date. To do so, I will upgrade the MEAN application by adding new features and new versions of dependent packages to it.

Package your application with Stacksmith

1. [Download application source files](#)
2. [Package a new application](#)

Keep your application up to date with Stacksmith

3. [Update system dependencies](#)
4. [Update application code](#)

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Package your application with Stacksmith

Automate packaging and optimize your application for container and cloud platforms with Stacksmith.

Stacksmith provides a set of “stack templates” that provide reference architectures for various application requirements. In addition, Stacksmith generates all the dependencies required by the different cloud platforms. At the end of the packaging process, Stacksmith delivers all of the deployable artifacts needed to launch your application on the target platform of your choice.

See below how easy it is to start packaging applications with Stacksmith.

Download application source files

- **Application sources:** contains the application files needed to be deployed in the native deployment format. For example, the .tar file, Java .war file, etc., Build script: customizes the deployment with additional required libraries needed for the application to work. This is an optional script.
- **Boot script:** configures the application to work in a specific environment. For example, it connects the application instance to its backend database if needed.
- **Run script:** it runs each time the application needs to start. For example, for invoking a process supervisor at each boot if apply.

In this example:

- To get the application sources, use the following link: app.blue.tar.gz.
- Application scripts can be uploaded directly from the [Git repository](#).

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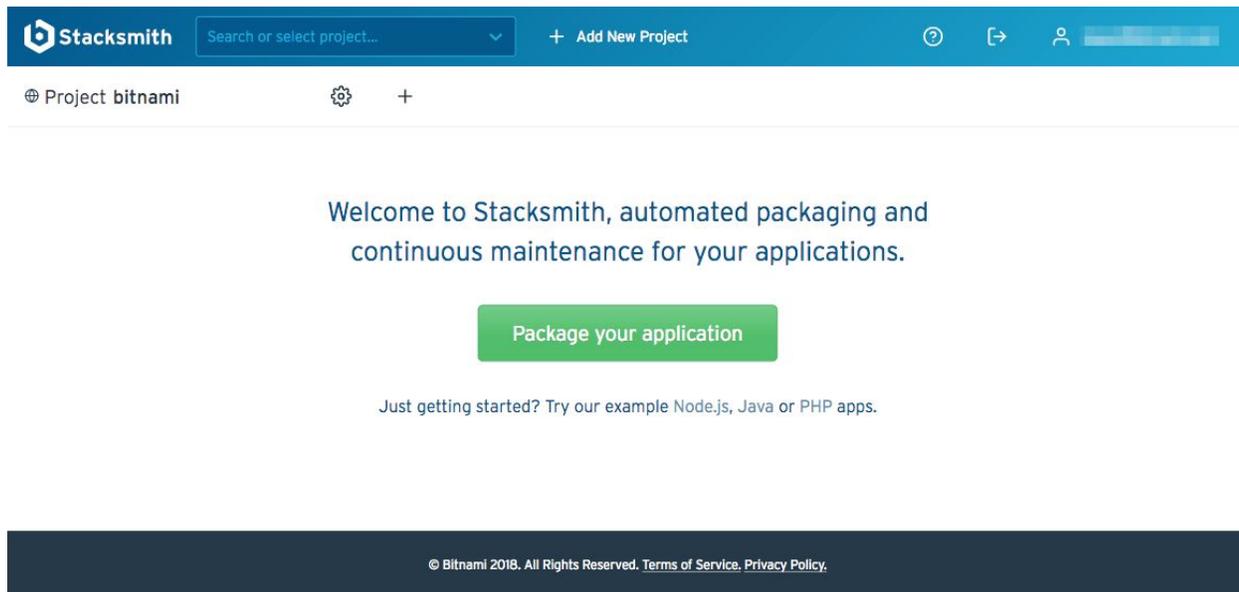
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Package the application

1. From the applications dashboard, click **Package your application**.



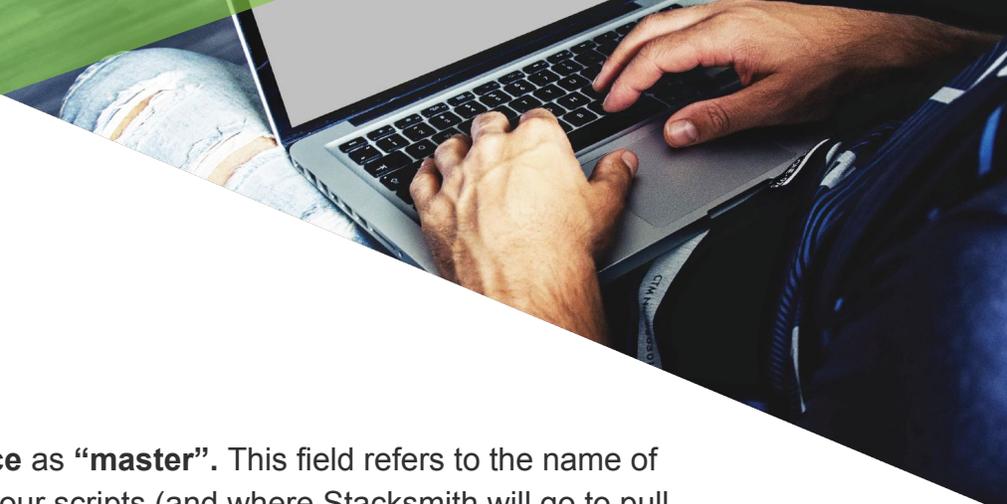
2. Fill in the resulting form as follows:

- Introduce a **name** for your app, and a **version number**.
- Select the appropriate stack template. Here, I will select the **Node.js application with NoSQL DB (MongoDB)** stack template.
- Select the target platforms you would like to package the app for (you can select several).
- Upload the application code files ([app.blue.tar.gz](#)).
- Select the **Script Location**. Your scripts can be uploaded manually, or you can direct Stacksmith to a Git repository that houses them, and Stacksmith will pull them from there. Here, I will pull from a Git repository, so will select “**Git repository**”.

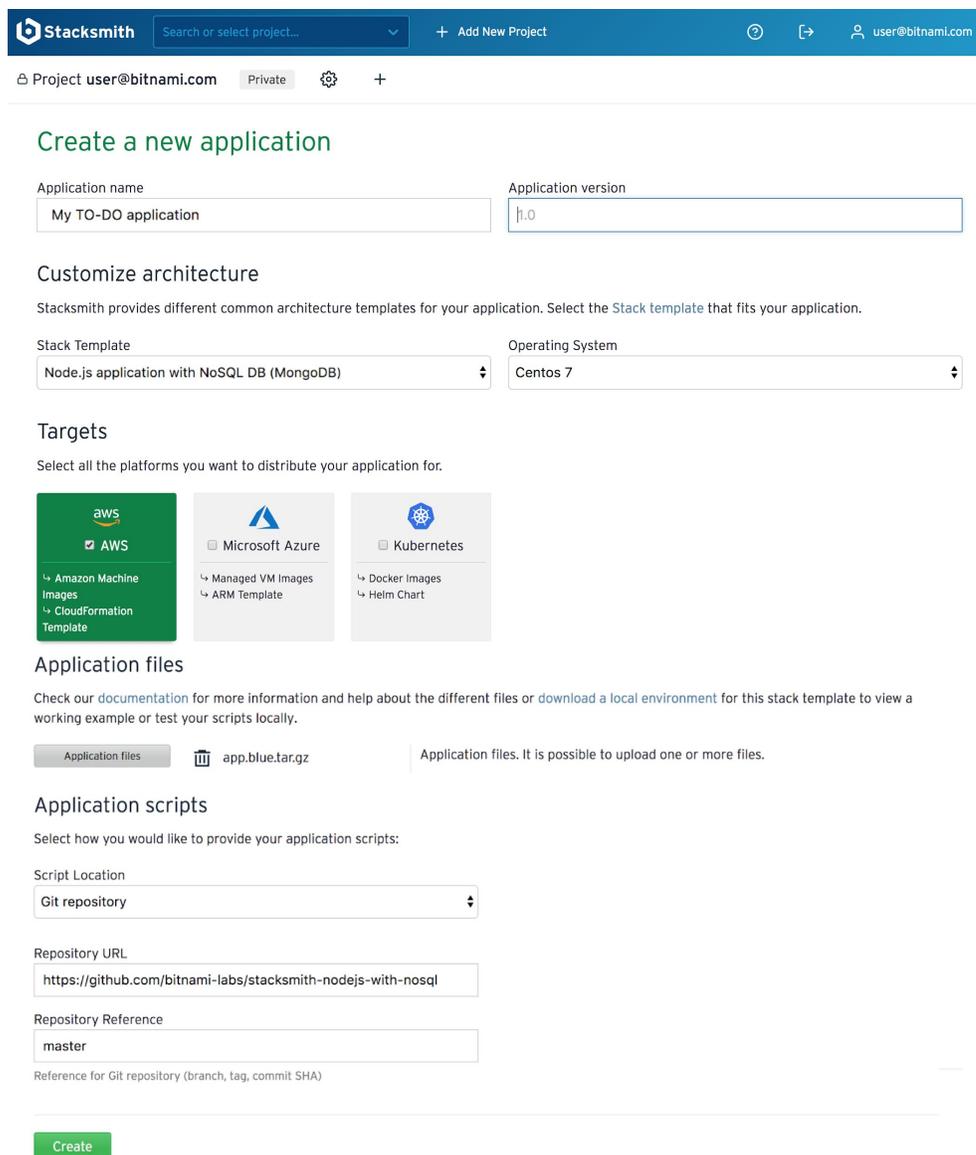
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- Paste the [Repository URL](#).
- Set the **Repository Reference** as “**master**”. This field refers to the name of the branch where you place your scripts (and where Stacksmith will go to pull them). By providing the branch name, Stacksmith is able to monitor the location, identify when the scripts have been updated, and provide alerts that the existing package is out of date.



The screenshot shows the Stacksmith web interface for creating a new application. The header includes the Stacksmith logo, a search bar, and a user profile for 'user@bitnami.com'. The main heading is 'Create a new application'. The form contains several sections: 'Application name' with the value 'My TO-DO application' and 'Application version' with '1.0'; 'Customize architecture' with 'Stack Template' set to 'Node.js application with NoSQL DB (MongoDB)' and 'Operating System' set to 'Centos 7'; 'Targets' with 'AWS' selected and sub-options like 'Amazon Machine Images' and 'CloudFormation Template'; 'Application files' with a file named 'app.blue.tar.gz' uploaded; 'Application scripts' with 'Script Location' set to 'Git repository', 'Repository URL' as 'https://github.com/bitnami-labs/stacksmith-nodejs-with-nosql', and 'Repository Reference' as 'master'. A 'Create' button is at the bottom.

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3. Click **Create** and wait for the build to complete.
4. Navigate to the **Log** tab to see the logs of the build live!

Details Repository Details System Packages **Log**

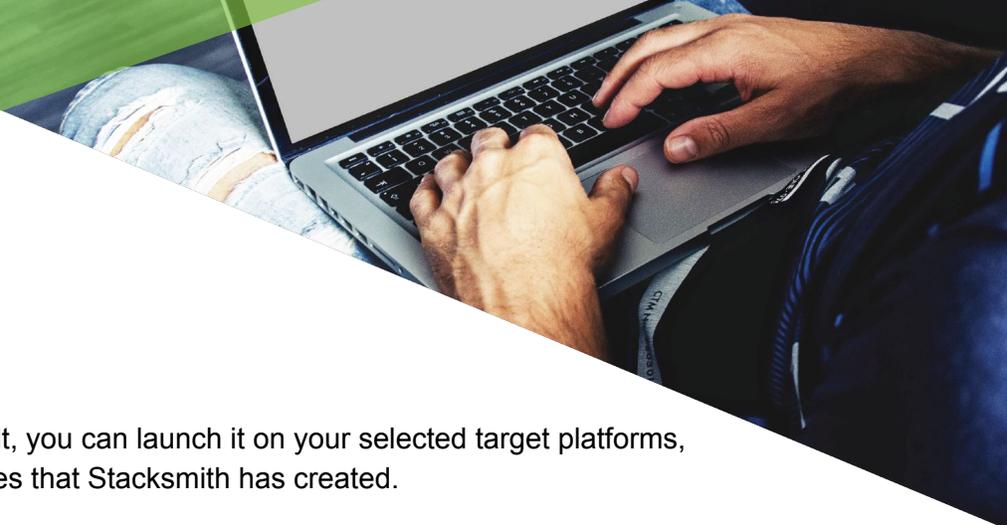
- Schedule image build
- Image build 👁
- Schedule template build
- Template build

```
149 Importing GPG key 0xF4A80EB5:
150 Userid      : "CentOS-7 Key (CentOS 7 Official Signing Key) <secu
151 Fingerprint: 6341 ab27 53d7 8a78 a7c2 7bb1 24c6 a8a7 f4a8 0eb5
152 Package    : centos-release-7-5.1804.4.el7.centos.x86_64 (@Updat
153 From       : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
154 Running transaction check
155 Running transaction test
156 Transaction test succeeded
157 Running transaction
158   Updating      : centos-release-7-5.1804.5.el7.centos.x86_64
159   Cleanup      : centos-release-7-5.1804.4.el7.centos.x86_64
160   Verifying    : centos-release-7-5.1804.5.el7.centos.x86_64
161   Verifying    : centos-release-7-5.1804.4.el7.centos.x86_64
162
163 Updated:
164   centos-release.x86_64 0:7-5.1804.5.el7.centos
165
166 Complete!
167 Loaded plugins: fastestmirror, ovl
168 Loading mirror speeds from cached hostfile
169 * base: mirror.ash.fastserv.com
170 * extras: mirror.ash.fastserv.com
171 * updates: centos.servint.com
172 Resolving Dependencies
173 --> Running transaction check
```

Kubernetes builds complete in 4-6 minutes.

Building a Virtual Machine takes longer, up to 20 minutes. During that time, you can navigate from the page, while the packaging process continues in the background.

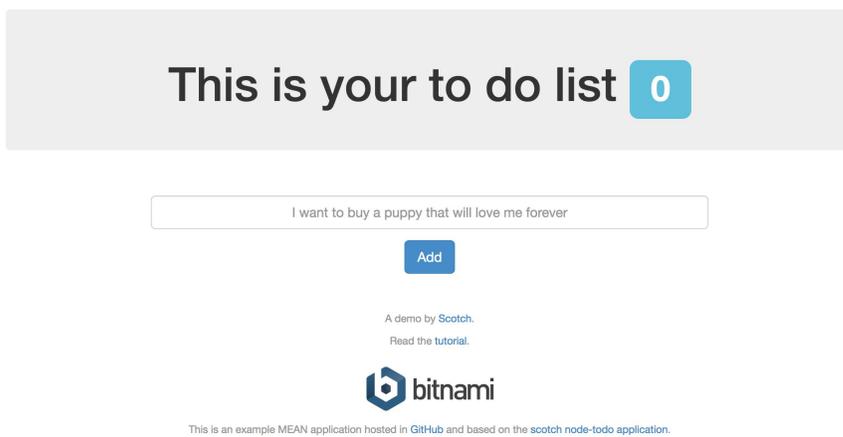
Once the build has finished, the status indicator will change from **In Progress** to **Successful**.



Once the application is successfully built, you can launch it on your selected target platforms, or download the corresponding templates that Stacksmith has created.

Check out our [Quickstart guides](#) to learn how to package and deploy your applications to the other platforms supported by Stacksmith.

Your deployed application should look like this when accessed through a web browser:



Output details and system packages

Need to go further? Stacksmith provides detailed information about the image, templates, and packages related to the recently packaged application. Let's see how to check them.

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Output details

From the Stacksmith UI:

Navigate to the **Details** tab to find a summary of the outputs that were created in the packaging process.

Details | Repository Details | System Packages | Log

Inputs

APPLICATION FILES	REPOSITORY URL
app.blue.tar.gz	https://github.com/bitnami-labs/stacksmith-nodejs-with-nosql
	REPOSITORY REFERENCE
	master (88329a038b698db28fa293b2a91cb27908b03008)

Outputs

IMAGE ID

```
ami-091bbcf6bff9c0062
```

S3 CLOUDFORMATION TEMPLATE URL

```
s3://bitnami-ss-builds-dev-outputs/cf/My%20T0-D0%20application/1.0/893cdd70-b382-0136-2c1d-7ec0cf1e238a/my-to-do-application-1.0-aws-755992020
```

HTTPS CLOUDFORMATION TEMPLATE URL

```
https://bitnami-ss-builds-dev-outputs.s3.amazonaws.com/cf/My%20T0-D0%20application/1.0/893cdd70-b382-0136-2c1d-7ec0cf1e238a/my-to-do-application-1.0-aws-755992020
```

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System packages

Navigate to the **System Packages** tab to see a list of the packages included in the image.

In the installed packages list, you can see:

1. A **history of all the system packages** that are included in the image, for audit and compliance purposes (including those brought in through customization scripts).
2. The **type of available updates**: new versions of the components, or security fixes.
3. Which **libraries changed** between the current and earlier versions of application. This can be valuable in regression scenarios.

Details Repository Details System Packages Log

[Download build spec](#)

Installed Packages

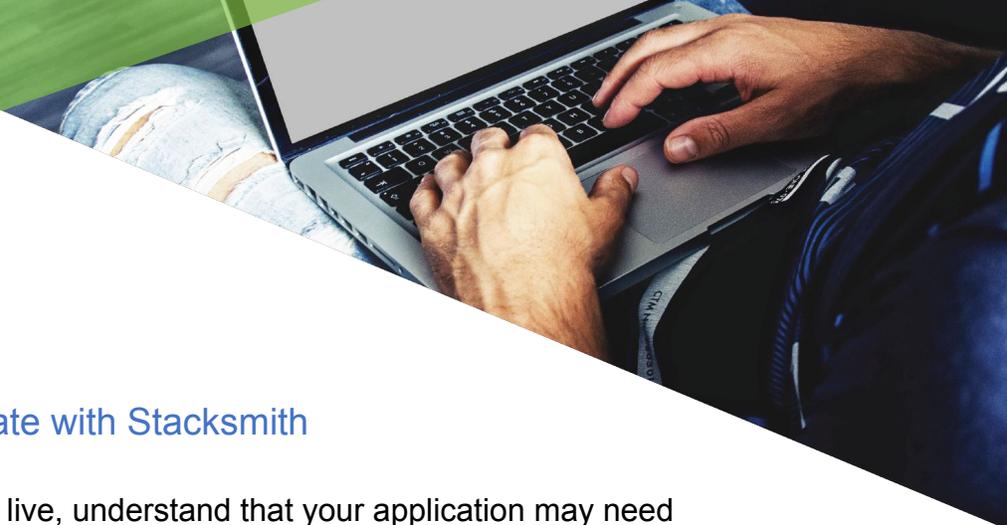
Name	Version	Architecture
acl	0:2.2.51-14.el7	x86_64
audit	0:2.8.1-3.el7_5.1	x86_64
audit-libs	0:2.8.1-3.el7_5.1	x86_64
audit-libs-python	0:2.8.1-3.el7_5.1	x86_64
authconfig	0:6.2.8-30.el7	x86_64
aws-cfn-bootstrap	0:1.4-31	noarch
basesystem	0:10.0-7.el7.centos	noarch
bash	0:4.2.46-30.el7	x86_64
bind-libs-lite	32:9.9.4-61.el7_5.1	x86_64
bind-license	32:9.9.4-61.el7_5.1	noarch

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Keep your application up to date with Stacksmith

Now that your MEAN application is live, understand that your application may need new features, bug fixes, or other updates in the future.

There are typically two reasons for repackaging your application: to include system package updates, and / or to update your application code.

Update system dependencies

During the packaging process, Stacksmith creates a component manifest, which lists all the system packages and version numbers that were used in the packaging process. You can view the components manifest by going to the **System Packages** tab.

There are 12 updates now available for this build none of which are security fixes. You can repackage now to include these updates. Image scans are **enabled**. Last scanned 2 hours ago.

Details **System Packages** Log

Download build spec

Installed Packages

Name	Version	Architecture	
<input type="checkbox"/> Show updates only (calculated 2 hours ago)			
centos-release	0:7-5.1804.4.el7.centos	→ 0:7-5.1804.5.el7.centos	x86_64
nss	0:3.36.0-5.el7_5	→ 0:3.36.0-7.el7_5	x86_64
nss-sysinit	0:3.36.0-5.el7_5	→ 0:3.36.0-7.el7_5	x86_64
nss-tools	0:3.36.0-5.el7_5	→ 0:3.36.0-7.el7_5	x86_64
systemd	0:219-57.el7_5.1	→ 0:219-57.el7_5.3	x86_64
systemd-libs	0:219-57.el7_5.1	→ 0:219-57.el7_5.3	x86_64
tomcat	0:7.0.76-6.el7	→ 0:7.0.76-8.el7_5	noarch
tomcat-el-2.2-api	0:7.0.76-6.el7	→ 0:7.0.76-8.el7_5	noarch
tomcat-jsp-2.2-api	0:7.0.76-6.el7	→ 0:7.0.76-8.el7_5	noarch
tomcat-jsvc	0:7.0.76-6.el7	→ 0:7.0.76-8.el7_5	noarch

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To update your application image with the latest dependencies, click the **Repackage** button.

That way, your application will be rebuilt with the same version of your codebase, but with fresh system packages.

Launch in AWS

Download CloudFormation

Repackage

Update application code

Now let's take a look at repackaging the application due to a change to the application itself. To do so, I am going to generate a new version of the application code.

1. [Download this tarball](#), which contains a patch to the original application code that changes the color of the counter in the application from blue to orange.
2. From the Stacksmith UI, click **Edit configuration**. You will see a form with the definition of the application already filled.

Edit configuration

Delete application

3. Change the version number from 1 to 2.



Edit application "My TO-DO application"

Application name	Application version
<input type="text" value="My TO-DO application"/>	<input type="text" value="2.0"/>

4. Delete the previous (now outdated) version of the application file, and upload the new one (that you downloaded in step 1 above).

Application files

Check our [documentation](#) for more information and help about the different files or [download a local environment](#) for this stack template to view a working example or test your scripts locally.



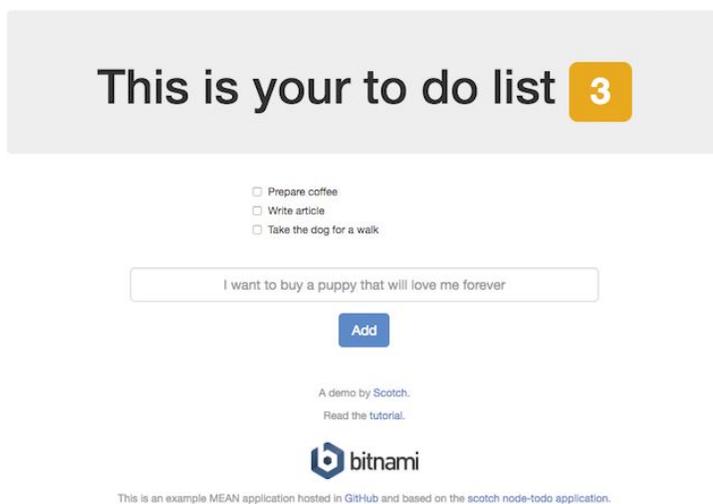
5. Click **Update** and wait for the new version to be built.

6. The process of deploying the new version depends on the target platform you have selected. Once you launch your updated application, you will see the application code updates that have been made.

Congratulations, you have successfully updated and deployed a new version of your To-Do app!



In the new application, the background color of the counter in the To-Do application should appear orange instead of blue.



What's Next

We encourage you to package more applications and try with different templates by cloning any of the ready-to-fork repositories that Bitnami offers you at its [GitHub Bitnami Labs](#) repository.

You can also continue building your Stacksmith knowledge with the following resources:

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Useful Guides

- [Package and deploy applications on AWS](#)
- [Package and deploy applications on Azure](#)
- [Package and deploy applications on Kubernetes](#)
- [Using a Git repository](#)
- [How to choose a Stack Template](#)
- [How to create a customized Stack Template](#)

Videos and webinars

- [Bitnami Stacksmith overview and live demonstration](#)
- [Learn how to package and maintain your applications with Bitnami Stacksmith](#)
- [Package and Deploy Your Custom App with Stacksmith and Optimize for the Cloud with Spotinst](#)

White papers and datasheets

- [Bitnami Stacksmith White Paper](#)
- [Bitnami Stacksmith Datasheet](#)

Stay tuned! New features are coming. See all the details at bitnami.com/stacksmith/!