



Angular 18 Online Training



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Sahosoft also provide free videos from my YouTube channel and source code and you are free to use it and make changes.

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Here is my YouTube channel link:

<https://www.youtube.com/channel/UCcsUx7ZOL1Sa3oylC29VseA/video>





Course Introduction

In this course, you will learn how simple it is to use Angular to create maintainable and testable single page applications. You will learn how to: bootstrap your Angular application; use services and create custom services; turn your application into a SPA using routing; and create your own custom elements and handle events using directives.

In this course, you will learn Angular and build responsive, enterprise-strength applications that run smoothly on desktop and mobile devices. Angular provides a robust framework that facilitates the development of richly interactive applications running on multiple platforms. You will also learn how to building components, creating directives, modularizing applications, and building template-driven forms.

You will also learn how to address the challenges you encounter in developing single-page applications with the help of this Angular online class. It will not only make your work easier but be of great help in the advancement of your web development career. Prior to taking this course, you need to have experience in web development as well as in coding with JavaScript

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Course Introduction

By the end of attending this online class, you'll be able to:

- Build real client apps with Angular on your own
- Troubleshoot common compile-time and run-time errors
- Write clean and maintainable code like a professional
- Apply best practices when building Angular apps

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Where to find the Course Source Code

We will provide source on portal/app

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What is Angular

The Angular is the newest form of the AngularJS, developed by Google, which is an open-source front-end development platform used for building mobile and desktop web applications. Angular is rewritten by the same team that built AngularJS.

It is a JavaScript framework for building web applications and apps in JavaScript, HTML, and Typescript, which is a superset of JavaScript. The Angular now comes with every latest feature you need to build a complex and sophisticated web or mobile application. It contains features like component, Directives, Forms, Pipes, HTTP Services, Dependency Injection and many more.

Angular is one of the most popular frameworks for building client apps with HTML, CSS and Typescript.



Why Angular

Angular is the next big deal. Being the successor of the massive successful AngularJS framework it's bound to frame the future of frontend development in a similar way. The powerful features and capabilities of Angular permit you to build complex, customizable, modern, responsive and user-friendly web applications. It also enables you to create software quicker and with less effort.

As your application grows, structuring your code in a clean and maintainable and more importantly, testable way, becomes more complex. But your life becomes far easier using a framework like Angular.

Angular 18 is the latest version of the Angular framework and simply an update to Angular 2.

Angular is faster than AngularJS and offers a much more flexible and modular development approach. After studying this course you become proficient and able to take full advantage of all those features and start developing incredible applications in a reasonable time.

Due to the drastic change between Angular 1 and Angular 7 you don't need to have knowledge about AngularJS to be able to benefit from this course and build your futures projects with Angular.



What You Should Already Know

Before you start studying Angular, you must have basic knowledge of

- HTML, Document Object Model (DOM), CSS, but isn't a must-have
- JavaScript
- Typescript
- It also requires the basic concept of OOPs
- NO Angular 1 or Angular 2 or Angular 4 or Angular 5 or Angular 6 or Angular 7,8, 9,10,11,12,13,14,15,16,17 knowledge is required

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Building Blocks of an Angular Application

Following are building blocks of Angular. These are:

- **Modules – No need in Angular 17, 18**
- Components
- Templates
- Metadata
- Data binding
- Directives
- Services
- Dependency Injection

we will discuss one by one in subsequence chapter in this course.



Basic Architecture of an Angular Application

Angular is a platform for developing web and mobile applications. Angular 2 is not just an update of Angular 1.x but Angular 2.0 and higher is re-written and has many breaking changes. It is completely written in Typescript (to meet ES 6 specifications). There will be a huge learning curve for the developers of Angular 2 and higher. And also, architecture of the Angular 2 and higher is different than Angular 1.x.

Angular is a most popular web development framework for developing mobile apps as well as desktop applications.

Angular framework is also utilized in the cross platform mobile development called IONIC and so it is not limited to web apps only.

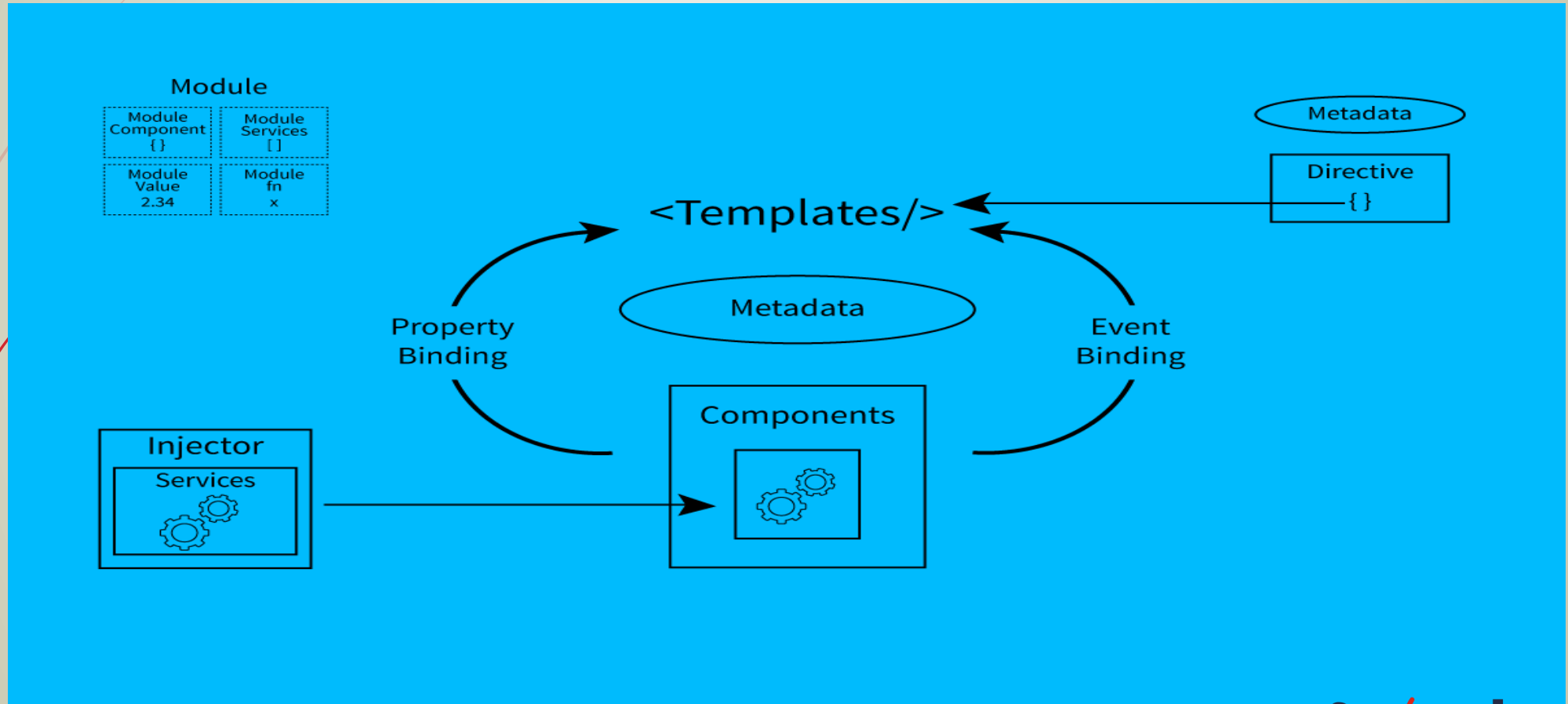
Angular is an open source framework written and maintained by angular team at Google and the Father of Angular is Misko Hevery.

Now, we will discuss the architecture of the Angular 2 and higher.



Basic Architecture of an Angular Application

The following diagram shows the architecture of Angular 2 and higher.





Module

Module is the block of code which is designed to perform a single task. We can export the module in form of class. Angular 2 applications have one or more modules. Every Angular application must have at least one module. If Angular application contains only one module, it is referring as root module. Every Angular application has one root module and many more featured modules.

Angular module is a class which is decorated with `@NgModule`. `NgModule` takes a single metadata object and its properties describe the module. Following are the important properties of `NgModule`.

- **exports** - It is the subset of declarations which would be used in the component template of other module.
- *imports* - imports other modules
- **providers** - It is a creator of services. They can be accessible in all the parts of the application.
- **bootstrap** - The root module has to set the bootstrap property. It is used to host all other views.
- **declarations** - It declare the view class that belong to current module. There are three type of view classes supported by Angular components, directives, and pipes..



Component

The component is class with the template that deals with the View of application and it's containing the core logic for the page. We can compare it with the Controller in Angular 1.x. We need to write the application logic inside the class which is used by the View. The component class interacts with the View through Methods and Properties of API.

Component Example

```
1. import { Component } from '@angular/core';
2. @Component({
3.   selector: 'test-app',
4.   template: '<h1>This is my First Angular 2 Application</h1>' +
5.     '<br/>' +
6.     '<input #txtName type = "text" (keyup)="0" />' +
7.     '<br/>' +
8.     '<p>You have Enter: {{txtName.value}}</p>'
9. })
10.   export class AppComponent {
11.
12.   }
```




Metadata

Metadata is the way of defining the processing of a class. In TypeScript, we can define metadata by using decorator. For example, if we define any component in Angular application, we need to tell Angular that this is the component, by using metadata of the class (using @Component decorator).

Metadata example

```
1. @Component({
2.   selector: 'test-app',
3.   template: '<h1>This is my First Angular 2 Application</h1>' +
4.     '<br/>' +
5.     '<input #txtName type = "text" (keyup)="0" />' +
6.     '<br/>' +
7.     '<p>You have Enter: {{txtName.value}}</p>'
8. })
```



Template

The template is the component View that tells Angular how to display the component. It looks like normal HTML.

```
3. template: '<h1>This is my First Angular 2 Application</h1>' +  
4. '<br/>' +  
5. '<input #txtName type = "text" (keyup)="0" />' +  
6. '<br/>' +  
7. '<p>You have Enter: {{txtName.value}}</p>'  
8. })
```



Data Binding

Data binding is a powerful feature of software development technologies. Data bind is the connection bridge between View and the business logic (View Model) of the application. Data binding in AngularJS is the automatic synchronization between the Model and View.

There are four type of binding supported by Angular 2 application,

- **Interpolation** - It displays the component value within the HTML tags which is also referred as Expression in Angular 1.x.
- **Property Binding** - It passes the value of property from the parent to the property of the child.
- **Event Binding** - It fires the event when we click on the components method name.
- **Two-way Binding** - It is an important form that combines event and property binding in single notation by using ngModel directive.



Service

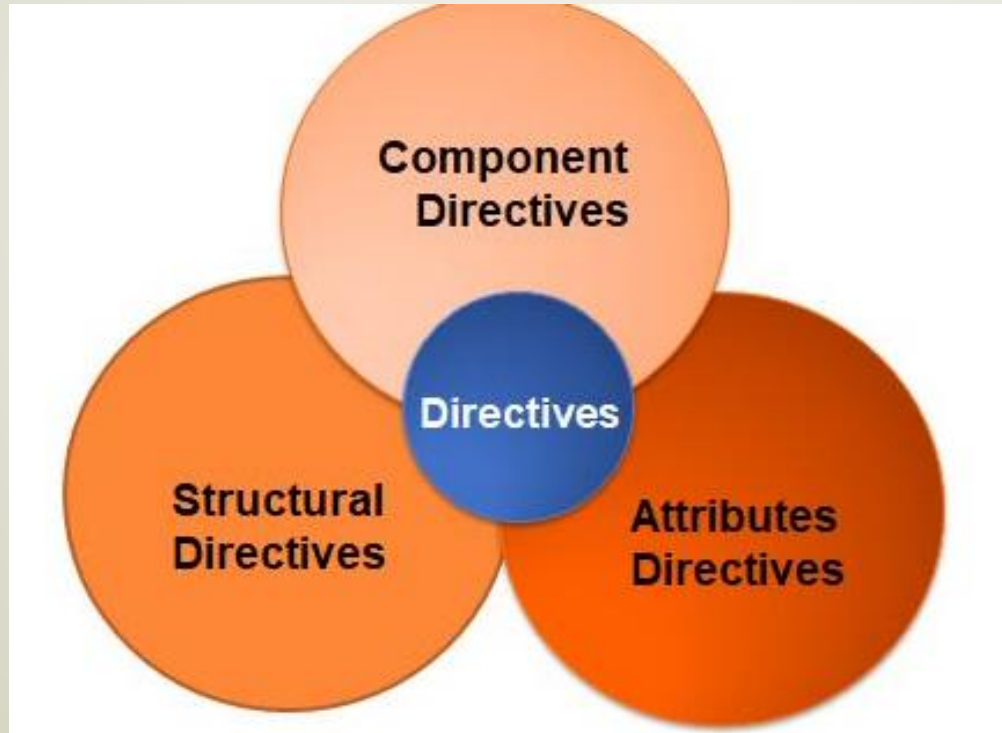
Service in Angular is a function or an object that can be used to share the data and the behavior across the application. It is JavaScript function which is used to perform a specific task. It includes the function, values, or any other feature required by the application. Typical examples of services are logging service, data service, message service etc. There is no base class for service.



Directive

Basically, directives are used to extend the power of the HTML attributes and to change the appearance or behavior of a DOM element.

Directive in Angular is a javascript class, which is declared as `@directive`. Angular has 3 types of directives, which are listed below –





Component Directives

This is the special directive which is always present in an angular app where each of our HTML page associated with this directive.(The directive with a template.)

Component Directive is a class with @Component decorator function. As we know that angular app contains at least one component called AppComponent which is present inside the App-compoennt.ts file.

In this file, we see with the help of selector, @Component which is a decorator function is used to create a component directive.

Even if we create our own component, we will use this decorator function and creating a component directive. It is not possible to render our template without using “selector”property, so with the help of this property, we will create a component directive.

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Structural Directives

Structural directive modifies or manipulates the structure of DOM by adding or removing DOM elements. We can say that basically, it works on the structure of a DOM.

Angular provides several structural directives which have a * sign before the directive.

For example, *ngIf and *ngFor, *ngSwitch.

@if @else, @elseif

@for

@switch



Dependency Injection

Dependency Injection is a software design pattern in which objects are passed as dependencies. It helps us remove the hard coded dependencies, and makes dependencies configurable. Using Dependency Injection, we can make components maintainable, reusable, and testable.

Point to remember about Dependency Injection,

- It is stimulated into the Angular framework so that it can be use anywhere in an application.
- The injector is a main mechanism to maintain the service instance and can be created using a provider.
- The provider is the way of creating a service.
- We can register the providers along with injectors



Angular JS 1.x

- AngularJS is also referred to as “Angular.js” or Angular 1.x
- It is a JavaScript-based framework which is open-source and used in front-end web application development.
- It is mainly maintained by Google and by a community of individuals and corporations to address many of the problems faced in developing single-page applications.
- It mainly built to simplify both the development and the testing of applications by providing a framework for client-side model–view–controller (MVC) and model–view–ViewModel (MVVM) architectures, along with components commonly used in rich Internet applications.
- The current stable version is 18
- Angularjs development code is written in JavaScript



Angular 3 was skipped

The reason behind this is that version mismatch between @angular/core, @angular/compiler and @angular/router libraries. The core and router for Angular 2 version are like following:

Name	Version
@angular/core	v2.3.0
@angular/compiler	v2.3.0
@angular/compiler-cli	v2.3.0
@angular/http	v2.3.0
@angular/router	v3.3.0



Angular 3 was skipped

Now the problem is with @angular/router, which is already in a 3.X version. These problems occur because of some active and huge developments on the router section, like route-preload.

Now, the launch of Angular as version 3, with its path in version 4 will create confusion.

To avoid this confusion, they decided to skip version 3 and release it with version 4.0.0 so that every major unit was on the right track.



Angular 4

For most applications, this release is backward compatible with 2.x.x. Angular 2 was released in March 2018 and there is no major change in Angular 4 from Angular 2. Angular 4 is not the complete rewritten form of Angular 2.

The Angular team has laid emphasis on making angular apps faster and compact.

- **Under the hood changes:** By the new changes, the size of the generated code for your components is reduced by around 60% in most cases.
- Faster Compilation
- Better Bug fixes Alert.
- **TypeScript 2.1 and 2.2 compatibility:** Finally We can use typescript 2.1 or earlier only upto typescript 1.8 was supported.
- ***ngIf/else:** Now the feature to use else clause is also available.
- For email validation in angular 4, there is No need to write a pattern.



Angular 5

Angular 5 was launched in Nov 2018. According to its speed and size, It was way faster and of smaller size than that of Angular 4. Here's the failure of some of the biggest changes in v5. For the full list, please see the [changelog](#). Following features were introduced in Angular 5.

HttpClient API – HttpClient API was introduced to simplify the HTTP library for Angular applications that rest on the XMLHttpRequest interface exposed by browsers. It is much secure, faster, efficient than HTTP library and provides additional features like testability, typed request and response objects

Multiple export aliases – To ease the migration process a component can be exported with the help of multiple aliases.



Angular 5

Internationalized Pipes for Number, Date, and Currency – Earlier Angular versions were dependant on the browsers to get the number, date and currency format. This resulted in inconsistency for users but in v5 pipes were updated for better standardization.

Lambda support – lambda expressions with proper names can be used in place of functions.

Build Optimizer - Build Optimizer is also introduced. It contains Angular optimizations applicable to JavaScript code as a TypeScript transform pipeline which optimizes the build size and improves the application speed. Angular CLI uses Build Optimizer automatically.

Improved Compiler – Angular 5 onwards, the compiler supports incremental compilation leading to faster compilation. The compiler uses TypeScript transforms, a new feature of TypeScript 2.3 available onwards.



Angular 6

Angular 6.0.0 was launched on May 4th, 2018. Angular 6 was released with Angular CLI 6 and Material 6. Here's a breakdown of some of the biggest changes in v6.

- **Updated Angular CLI (Command Line interface)** – New commands added, like **ng-update** to migrate from the previous version to current version. **ng-add** to quickly add application features to make application progressive web apps.
- **Updated CDK, Component Development Kit** – Supports creating custom UI elements without the need of the angular material library. Supports responsive web design layouts. Supports overlay packages to create pop-ups.
- **Updated Angular Material** – New Tree component added, **mat-tree**, a styled version, and **cdk-tree**, an unstyled version, to represent a hierarchical structure like a tree.



Angular 6

- Usage of RxJS, a reactive JS library
- **Angular Element** -They are angular Components packaged as custom elements which then used for defining new HTML elements.
- **Multiple Validators** –Validating user input for accuracy and completeness multiple validators are applicable on a form builder.
- **Tree Shaking on Services** – Now tree shaking can be applied on services to remove the dead code, which means removes the code from the final bundle if that code not referenced in an application.



Angular 7

Angular 7 was released in Oct 18, 2018. Let's see the new features added to Angular 7 – Here's a breakdown of some of the biggest changes in v6. For the full list,

- How to upgrade to Angular 7
- Angular 7 CLI Prompts
- Application Performance
- Documentation Updates
- Dependency Updates
- Drag and Drop
- Virtual Scrolling
- Improved Accessibility of Selects
- Partner Launches
- Angular Elements
- Angular Do-Bootstrap
- Angular 7

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Angular 8

Angular 8 was released in May 28, 2019. Let's see the new features added to Angular 8 –

- **Angular Versions**
- **Angular 8 Overview**
- **Upgrading to Angular 8**
- **Creating New Projects with Angular v8**
- **What's New in Angular 8 and How to update to version 8**
- **Differential Loading by Default in Angular 8**
- **Dynamic Imports in Angular 8**
- **Builder APIs in the CLI in Angular 8**
- **Workspace APIs in the CLI**
- **Web Worker Support**
- **Use Analytics Data**
- **Bazel Support**
- **Bye Bye @angularhttp**
- **Changes in ViewChild and ContentChild**
- **Support SVG Template**
- **Ivy Rendering Engine**
- **AngularJS Migration Improvements**

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Angular Semantic Versioning

We recognize that you need stability from the Angular framework. Stability ensures that reusable components and libraries, tutorials, tools, and learned practices don't become obsolete unexpectedly.

Angular version numbers indicate the level of changes that are introduced by the release. This use of semantic versioning helps you understand the potential impact of updating to a new version.



Angular Semantic Versioning

Angular version numbers have three parts : -

1. major
2. minor
3. patch

*For example, version **18.0.0** indicates major version **18**, minor version **0**, and patch version **0**.*

The version number is incremented based on the level of change included in the release



Angular Semantic Versioning

- **Major** releases contain significant new features, some but minimal developer assistance is expected during the update. When updating to a new major release, you may need to run update scripts, refactor code, run additional tests, and learn new APIs.
- **Minor** releases contain new smaller features. Minor releases are fully backward-compatible; no developer assistance is expected during update, but you can optionally modify your apps and libraries to begin using new APIs, features, and capabilities that were added in the release. We update peer dependencies in minor versions by expanding the supported versions, but we do not require projects to update these dependencies.
- **Patch** releases are low risk, bug fix releases. No developer assistance is expected during update.



Angular Semantic Versioning

If you are updating within the same major version, then you can skip any intermediate versions and update directly to the targeted version. For example, if you want to update from 5.0.0 to 5.2.9, then you can update directly; you do not need to update from 5.0.0 to 5.1.0 before updating to 5.2.9.

If you are updating from one major version to another, then we recommend that you don't skip major versions. Follow the instructions to incrementally update to the next major version, testing and validating at each step. For example, if you want to update from version 4.x.x to version 6.x.x, we recommend that you update to the latest 5.x.x release first. After successfully updating to 5.x.x, you can then update to 6.x.x.



Angular Release frequency

Angular Team recognize that all angular developer need stability from the Angular framework.

We work toward a regular schedule of releases, so that you can plan and coordinate your updates with the continuing evolution of Angular.

In general, you can expect the following release cycle:

- A major release every 6 months
- 1-3 minor releases for each major release
- A patch release almost every week

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This cadence of releases gives you access to new features as soon as they are ready, while maintaining the stability and reliability of the platform for production users.



Angular Release Schedule

The following table contains our current target release dates for the next two major versions of Angular:

DATE	STABLE RELEASE	COMPATIBILITY
Nov 23	16.0.0	15.0.0
Nov-Dec 24	19.0.0	18.0.0



Angular Preview Releases

We let you preview what's coming by providing Beta releases and Release Candidates (rc) for each major and minor release:

Beta: A release that is under active development and testing. A Beta release is indicated by a release tag appended with the beta identifier, such as 8.0.0-beta.0.

Release candidate: A release that is feature complete and in final testing. A release candidate is indicated by a release tag appended with the rc identifier, such as version 8.1.0-rc.

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The next version of the documentation is available at next.angular.io. This includes any documentation for Beta or Release Candidate features and APIs.

:



Support policy and schedule

All of our major releases are supported for 18 months.

6 months of active support, during which regularly-scheduled updates and patches are released.

12 months of long-term support (LTS), during which only critical fixes and security patches are released.

The following table provides the status for Angular versions under support.

Angular versions ^16.0.0 and ^18.0.0 are no longer under support.

:



Angular Environment Setup

In this class we will learn how to configure an Angular 2 + application development environment.

To Set up Development Environment for Angular 2+, we require the following-

- IDE for writing your code (Editor)
- Nodejs
- Npm
- Angular CLI
- :

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IDE for writing your code (Editor)

There are many editors that can be used for Angular 8 development such as Visual Studio code and WebStorm. In this course, we will use the Visual Studio code, which is free from Microsoft.

Installation of Visual Studio Code

- Some features of Visual Studio Code are following–
- Light editor as compared to the actual version of Visual Studio.
- It can be used for coding languages such as Clojure, Java, Objective-C, and many other languages.
- It supports built-in Git extension so that you can work with source control without leaving the editor.
- It includes built-in support for IntelliSense code completion, rich semantic code understanding and navigation, and code refactoring.
- It includes an interactive debugger, so you can step through source code, inspect variables, view call stacks, etc.
- Many more extensions for development.

Note: The link of official site for Visual Studio code is <https://code.visualstudio.com/>



IDE for writing your code (Editor)

<https://code.visualstudio.com/>

The screenshot shows the Visual Studio Code website and the IDE interface. The website has a dark blue background with the text "Code editing. Redefined." and "Free. Built on open source. Runs everywhere." Below this is a green button labeled "Download for Windows" with a dropdown arrow, and a link to "Other platforms and Insiders Edition". A small text at the bottom says "By using VS Code, you agree to its license and privacy statement." The IDE interface shows the "EXTENSIONS" sidebar with a list of popular extensions: C# 1.2.2 (356K), Python 0.10.0 (211K), Debugger for Chrome 1.48, C/C++ 0.7.0 (143K), Go 0.6.39 (99K), and ESLint 0.10.0 (88K). The main editor area shows a TypeScript file named "app.ts" with code for a web server using Express and TypeScript. The status bar at the bottom indicates "Ln 9, Col 21", "Spaces: 2", "UTF-8", "LF", and "TypeScript".

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Nodejs

Download Nodejs from <https://nodejs.org/en/download/> , and click on the windows installer. you can show here both the LTS and the current version of the node from where the you can download the recommended version or the current version.

The screenshot shows the Node.js website's 'Downloads' section. At the top is the Node.js logo and a navigation bar with links: HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, NEWS, and FOUNDATION. The 'Downloads' section highlights the 'Latest LTS Version: 10.16.0 (includes npm 6.9.0)'. Below this, it instructs users to 'Download the Node.js source code or a pre-built installer for your platform, and start developing today.' The page is divided into two main columns: 'LTS Recommended For Most Users' and 'Current Latest Features'. Under the 'LTS' column, there are three options: 'Windows Installer' (with a Windows logo and file name 'node-v10.16.0-x64.msi'), 'macOS Installer' (with an Apple logo and file name 'node-v10.16.0.pkg'), and 'Source Code' (with a cube icon and file name 'node-v10.16.0.tar.gz').

LTS Recommended For Most Users	Current Latest Features	
 Windows Installer node-v10.16.0-x64.msi	 macOS Installer node-v10.16.0.pkg	 Source Code node-v10.16.0.tar.gz

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Nodejs

After installing the node, open the Visual Studio integral terminal and type node -v to verify the installed version of the node. This will help you to see the version of nodejs currently installed on your system.

EXAMPLE

```
C:\>node -v
```

```
v18.11.3
```

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Angular CLI

Angular CLI is very important in the setting of Angular, visit the homepage <https://cli.angular.io/> of angular to get the reference of the command.



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Angular CLI

To install angular cli globally on your system type `npm install -g @angular/cli`. It installs Angular CLI globally where g is referred to globally.

EXAMPLE

```
npm install -g @angular/cli
```

.

If you want to make sure you have correctly installed the angular CLI, open the Visual Studio integrated terminal and type `ng -v`. If you can see the cli version as shown below, then installation is complete.



Angular CLI

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Angular CLI
Angular CLI: 6.2.3
Node: 10.13.0
OS: win32 x64
Angular: 6.1.8
... animations, common, compiler, compiler-cli, core, forms
... http, language-service, platform-browser
... platform-browser-dynamic, router

Package                                Version
-----
@angular-devkit/architect              0.7.5
@angular-devkit/build-angular          0.7.5
@angular-devkit/build-optimizer        0.7.5
@angular-devkit/build-webpack          0.7.5
@angular-devkit/core                   0.7.5
@angular-devkit/schematics              0.8.3
@angular/cli                           6.2.3
@ngtools/webpack                       6.1.5
@schematics/angular                    0.8.3
@schematics/update                      0.8.3
rxjs                                    6.3.2
typescript                             2.7.2
webpack                                4.9.2
```



Summary:

- Verify if npm is installed or not: `npm -v`
- verify the installed version of the node: `npm -v`
- Verify if node is installed or not: `node -v`
- verify the installed version of the node: `node -v`
- To install angular cli globally on your system type: `npm install -g @angular/cli`
- To check correctly installed the angular CLI: `ng v`

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