JavaSCRIPT

Async Await

- Async and Await are extensions of promises.
- More recent additions to the JavaScript language are async functions and the await keyword, part of the so-called ECMAScript 2017 JavaScript edition
- async keyword, which you put in front of a function declaration to turn it into an async function.
- Async functions enable us to write promise based code as if it were synchronous, but without blocking the execution thread. It operates asynchronously via the event-loop. Async functions will always return a value. Using async simply implies that a promise will be returned, and if a promise is not returned, JavaScript automatically wraps it in a resolved promise with its value.
- Basically async functions will always return a promise and we can use await inside async.

JavaScript Modules

- Split up your code into separate components
- Therefore easier to maintain and organize
- Supported in major browsers (excl. IE)

What is jquery

- jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

jQuery selectors

- $(this).hide() - hides the current element.
- $("p").hide() - hides all <p> elements.
- $(".test").hide() - hides all elements with class="test".
- $("#test").hide() - hides the element with id="test".

More Selectors

Syntax	Description
$("*")	Selects all elements
$(this)	Selects the current HTML element
$("p.intro")	Selects all <p> elements with class="intro"
$("p:first")	Selects the first <p> element
$("ul li:first")	Selects the first element of the first
$("ul li:first-child")	Selects the first element of every
$("[href]")	Selects all elements with an href attribute
$("a[target='_blank']")	Selects all <a> elements with a target attribute value equal to "_blank"
$("a[target!='_blank']")	Selects all <a> elements with a target attribute value NOT equal to "_blank"
$(":button")	Selects all <button> elements and <input> elements of type="button"
$("tr:even")	Selects all even <tr> elements
$("tr:odd")	Selects all odd <tr> elements

The Document Ready Event

- $(document).ready(function(){

  // *jQuery methods go here...*

  });

- This is to prevent any jQuery code from running before the document is finished loading (is ready).

Events

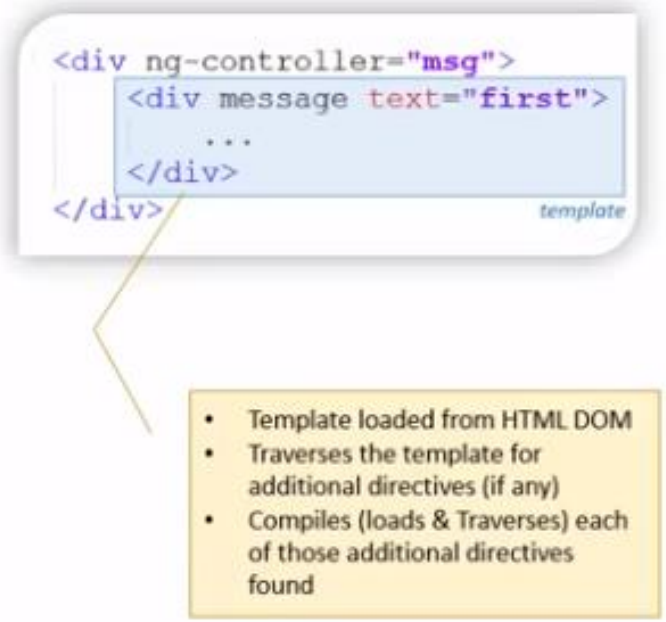
Mouse Events	Keyboard Events	Form Events	Document/Window Events
click	keypress	submit	load
dblclick	keydown	change	resize
mouseenter	keyup	focus	scroll
mouseleave		blur	unload

jQuery Animations

- The jQuery animate() method is used to create custom animations.
- $(*selector*).animate({*params*},*speed*,*callback*);
- The required params parameter defines the CSS properties to be animated.
- The optional speed parameter specifies the duration of the effect. It can take the following values: "slow", "fast", or milliseconds.
- The optional callback parameter is a function to be executed after the animation completes.

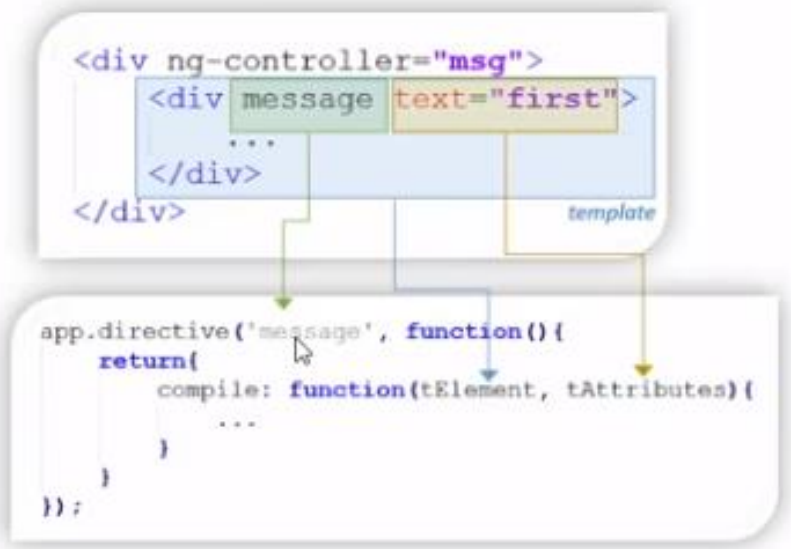
Compile

- The first step of execution/processing a directive for rendering.
- Loads and traverses the DOM (of template)
  - Compiles each of the directives collected thereafter (ex: nested directives)
- Happens for both existing Angular Directives or Custom Directives



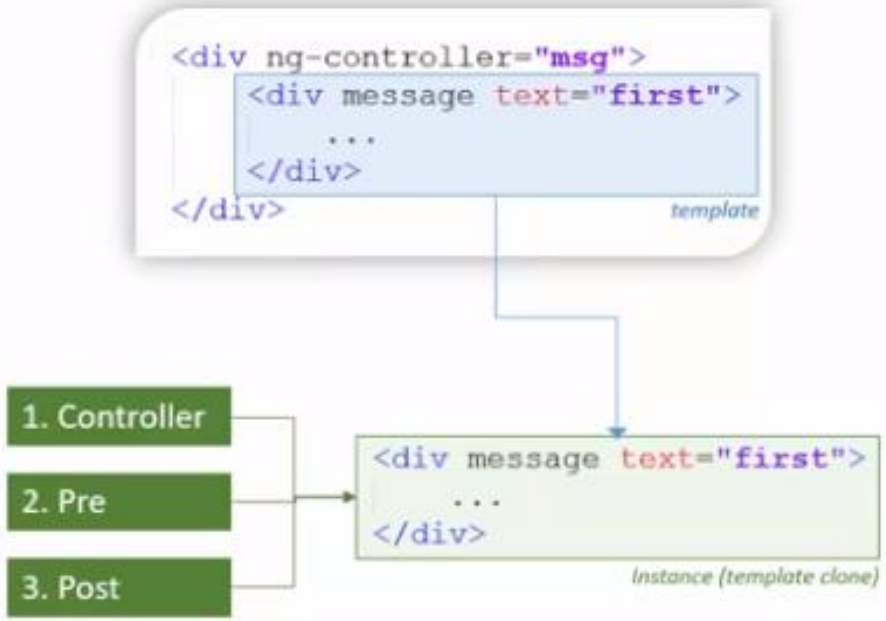
Compile

- The first step of execution/processing a directive for rendering.
- Loads and traverses the DOM (of template)
  - Compiles each of the directives collected thereafter (ex: nested directives)
- Happens for both existing Angular Directives or Custom Directives
- "compile" function: executes code during compilation phase of a template

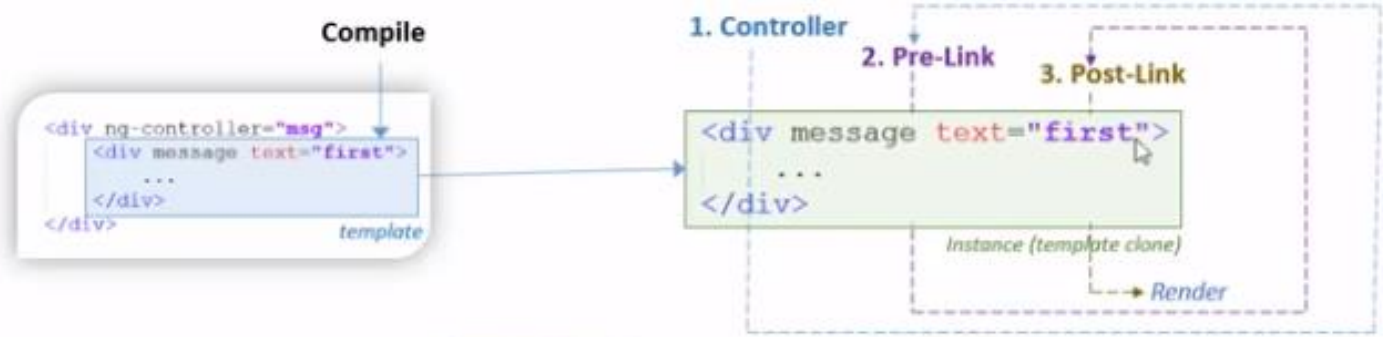


Link

- The next phase after Compile
  - Carried out in various steps
- Works on an instance of a Template (previously "compiled")
- 3 internal phases of template instance (executed in sequence):
  - Controller (of directive)
  - Pre
  - Post (aka. "Link")
- Gets rendered after Link phase



Compile & Link



Compile

- Loads & traverses Template DOM
- Executes only once
- Returns link function
  - Or object (containing pre, post (or link) etc.)
- No Scope present
- No instances/clones (of template) created yet
- Do operations which can be shared among all instances/clones of template
- Can manipulate DOM of template
- Cannot play with data/events of clones
- No DOM of clones available

Controller

- The first to execute for every instance/clone of template
- Creates scope (scope initialization) for the template instance
- Can manipulate data for template instance
- Not recommended to access instance DOM

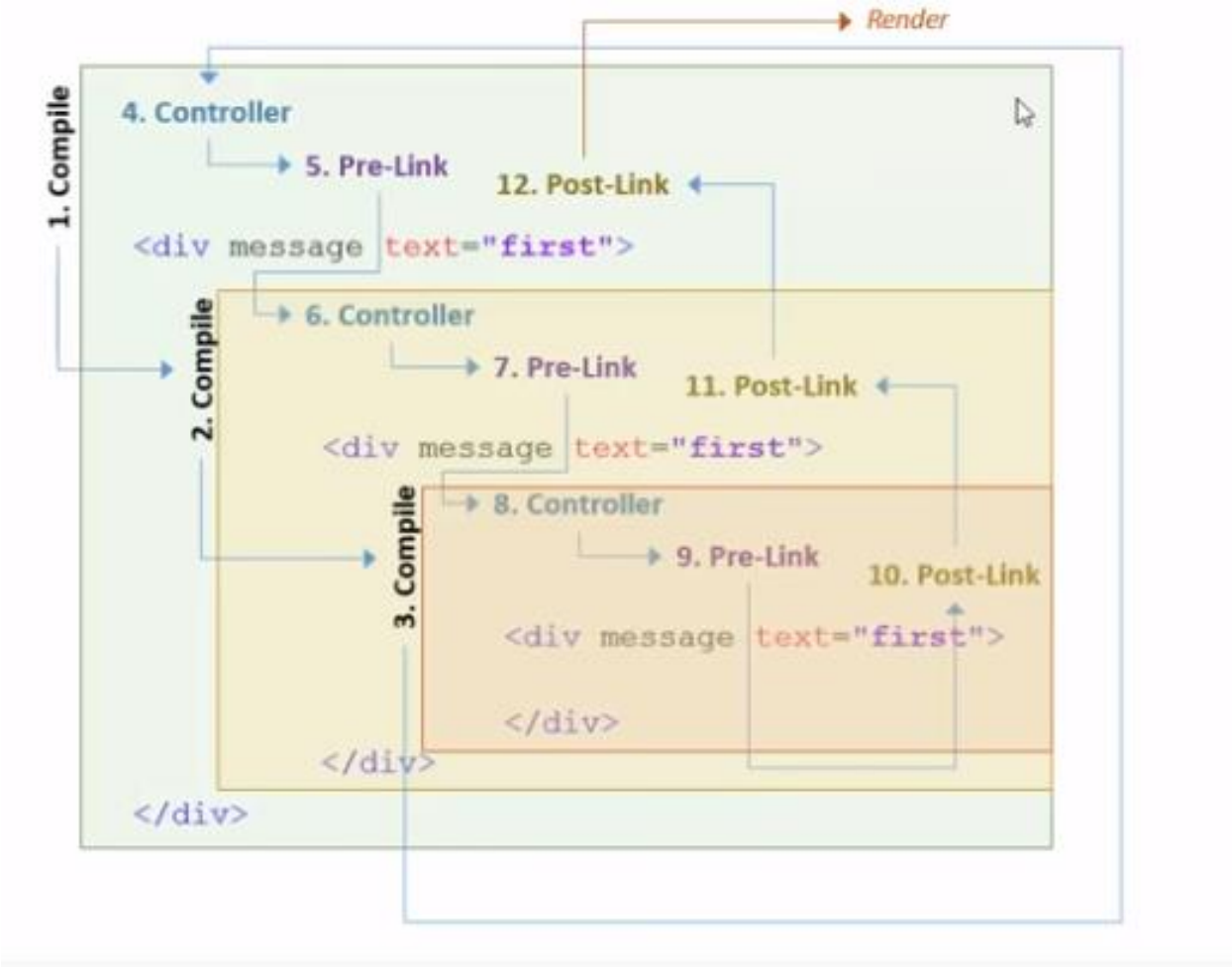
Pre

- Executes immediately after controller phase (for every instance)
- Ref. to DOM template instance is available
- Scope for the instance is ready
- Instance is not linked to scope yet (no bindings are setup)
- Child elements/directives not ready
- Scope can be manipulated
- Safe to set data and even child data
- Not safe to manipulate DOM template instance
- No access to child elements

Post

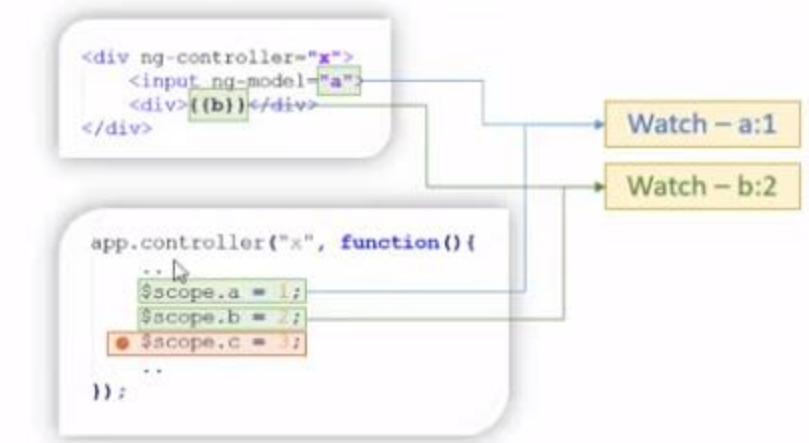
- The last phase (of every instance), usually called "linking" (or link function etc.)
- Ref. to DOM template instance is available
- Scope and instance linked (and data bound)
- Child elements/directives are ready (and already linked)
- Scope can be manipulated
- Safe to attach event handlers, inspect child elements
- Safe to manipulate DOM template instance
- Not safe to set data for child elements

Order of execution



Watchers

- Nothing but monitoring: keeping track of (or watching) scope variables and the changes of their values.
- Watch:
  - keeps track of a variable and its value
  - Watched by angular framework (specifically, ***digest cycle loop***)
  - Some variables may not be watched
  - If the value gets changed, angular performs necessary updates (propagations to DOM, UI update etc.)
  - Angular can execute our custom functions (watch listeners) on value changes
- Used heavily in data-binding
  - Bindings are associated with Watches.
  - Even, internally in AngularJs Framework.

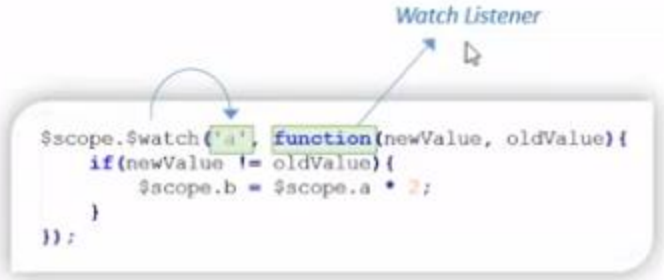


Note

- The above watches are automatically created by AngularJS framework (behind the scenes)
- Usually done for data-bindings

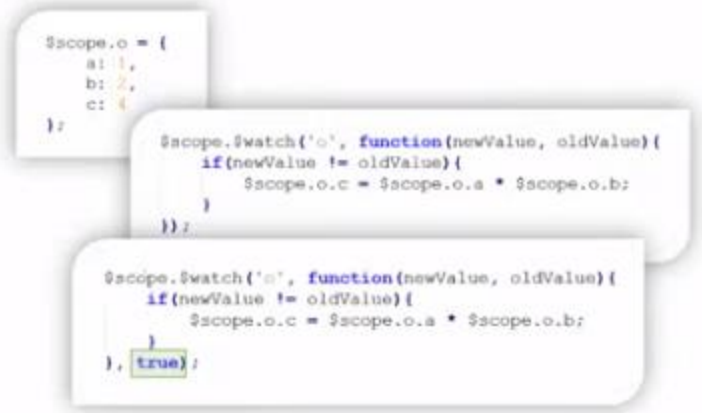
Watch Listener

- We can add our own "watch" (manually) using "$watch" function available through "$scope" object.
  - Available at $rootScope as well
- Used when AngularJS does not consider scope variables for watching
  - Ex: scope variables not being used in data-binding
- Watch Listener: a function which gets executed when a "watch" detects a value change.



Reference Listener

- $watch - Reference watch
- $watch with "true" – Equality watch

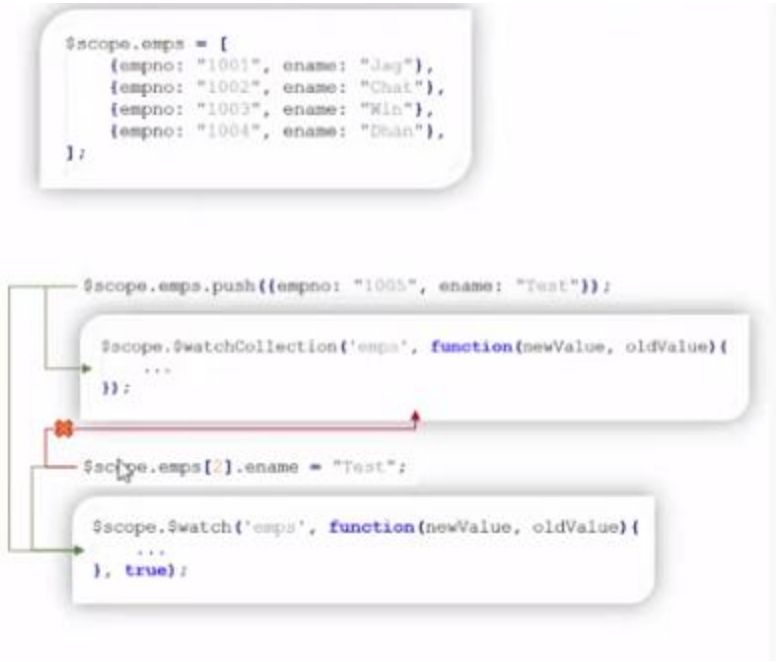


Equality Listener

- $watch - Reference watch
- $watch with "true" – Equality watch
- $watchGroup – Reference watch for multiple variables

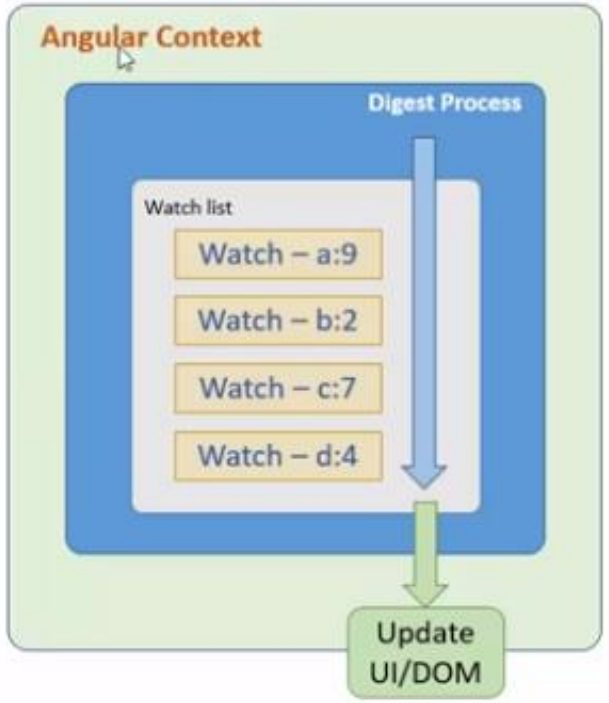
Collection Listener

- $watch - Reference watch
- $watch with "true" – Equality watch
- $watchGroup – Reference watch for multiple variables
- $watchCollection – Collection watch
  - Used to watch arrays
  - Detects modifications to arrays (ex: adding or deleting elements)
  - Does not detect modifications to array items (ex: modifying an object in an array)
    - To achieve this, use **Equality watch**

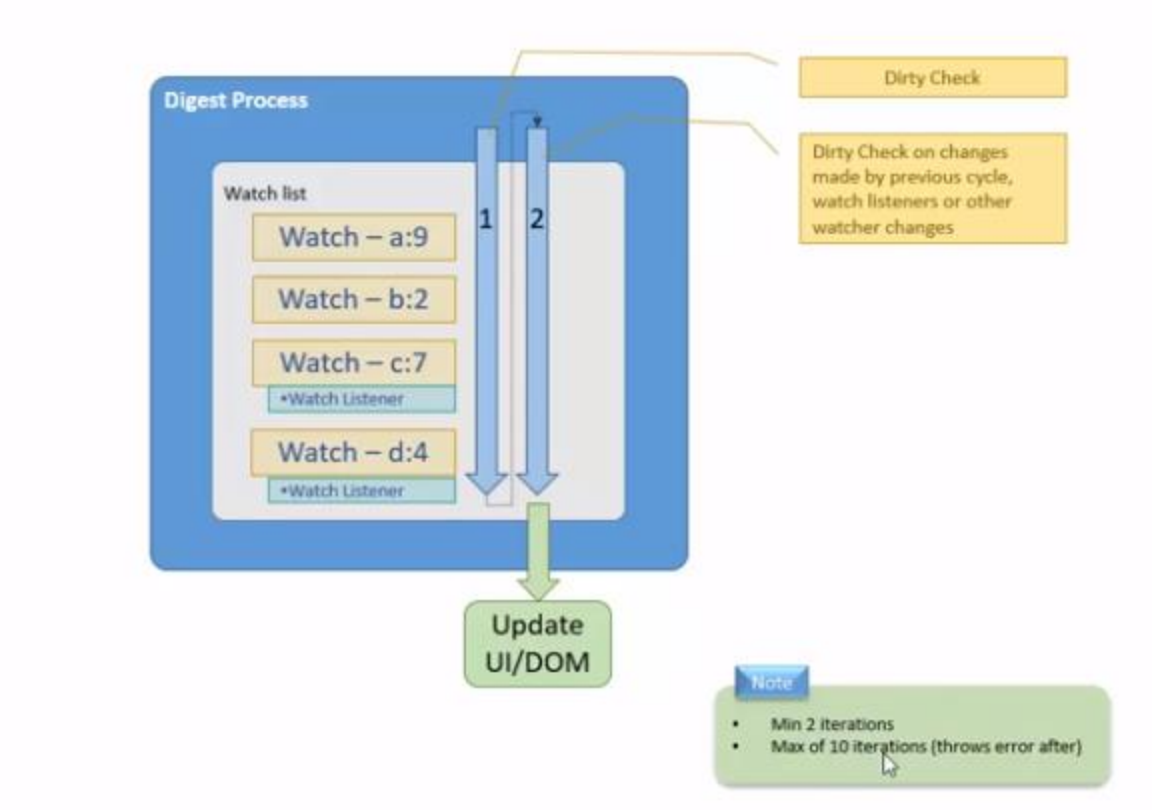


Digest Process

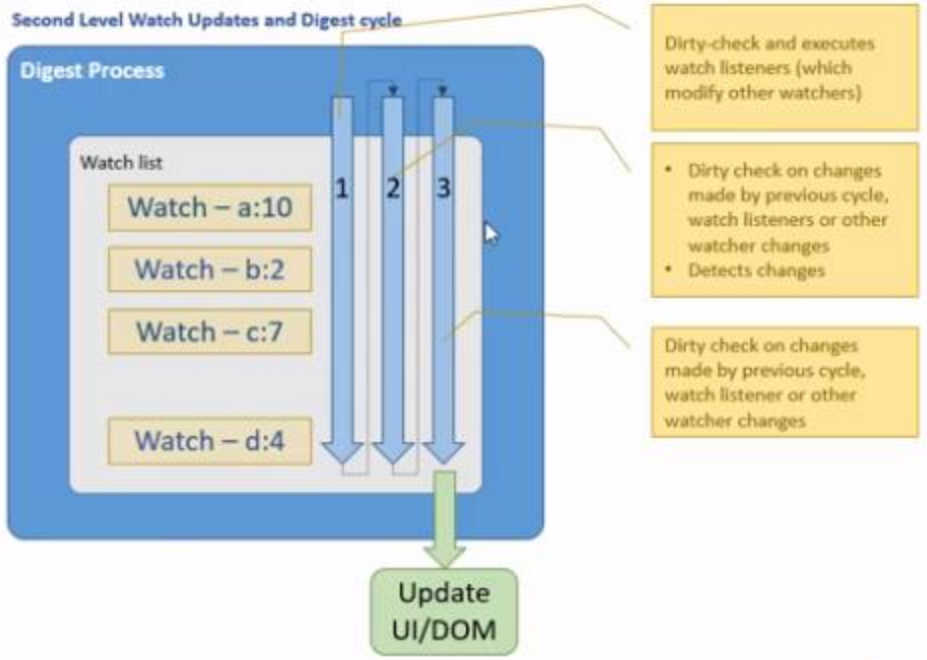
- Digest Process (in simple words):
  - Responsible to walk-through entire watch list for modifications
    - Also called "dirty-checking" (the process of checking the current values of scope variables with their previous values)
  - Exists modifications? Execute Watch Listeners, if any.
  - Keeps note of all modifications and notifies Angular JS framework to update DOM
- In general, DOM gets updated after Digest Process.
- Digest Process runs as part of Angular Context
  - **Angular Context**: run-time env. of AngularJS Framework



Digest Cycle




First Level Watch Updates and Digest cycle
Digest Process
Watch list
Watch – a:9
Watch – b:3
Watch – c:7
•Watch Listener
Watch – d:4
•Watch Listener
1
2
Update UI/DOM


Second Level Watch Updates and Digest cycle
Digest Process
Watch list
Watch – a:10
Watch – b:2
Watch – c:7
Watch – d:4
1
2
3
Update UI/DOM
Dirty-check and executes watch listeners (which modify other watchers)
• Dirty check on changes made by previous cycle, watch listeners or other watcher changes
• Detects changes
Dirty check on changes made by previous cycle, watch listener or other watcher changes

Angular Context