**Introduction**

*In this document we will discuss on the Stale Element Reference exception, what is the root cause of occurring this particular exception, and how we can handle this exception.*

**What is Stale Element Reference Exception**

*To understand the exception lets split the words and understand the meaning of it*

1. **Stale:** *Stale means not fresh or old*
2. **Element:** *Element captured by the web driver*
3. **Reference:** *Reference of the element*

*Combining the above terms means an element whose reference is not fresh or got old. Consider an element is located using Web driver in a page and after some operation the DOM got changed due to which the reference to that element is lost.*

**Cause of Stale Element Reference Exception**

*There are few causes of the DOM getting changed*

1. *Due to page gets refreshed*
2. *The element is deleted*
3. *After performing an action, the element is refreshed*

*Let’s understand each of above statement a bit deeply.*

1. ***Due to page gets refreshed***

*Suppose we captured an element of a page using Web driver, after we interaction internally or externally the page got refreshed. If we now try to perform any interaction with that earlier founded element, then Stale Element Reference Exception is thrown.*

1. ***The element is deleted***

*Now suppose we captured an element of a page using Web driver, after certain operation on the same page the element got deleted. In this case if we perform any operation on the same element then Stale Element Reference Exception is thrown.*

1. ***After performing an action, the element is refreshed***

*Now days with the increase in use of AJAX in UI development this can be one cause of Stale Element exception. AJAX (Asynchronous JavaScript and XML) is used to update the small-small frames of the HTML page rather than updating entire HTML pages.*

*Consider an amazon page where we are trying to select an item we want to purchase. In that HTML page we have a textbox to enter the pin code or area code to check whether the item we desire to purchase is available at our location. Once we enter the pin code or area code the web frame associated to that portion of HTML is updated. This an AJAX operation at backend where the information is sent over a web service and corresponding to response element is changed.*

*Considering the above example whenever the elements reference changes in the same page, if that element is obtained before refreshment then Stale element exception will be thrown.*

**How to overcome Stale Element Reference Exception**

*There are many ways to overcome the Stale Element Exception, and we will discuss them one by one*

1. ***By refreshing the page and then finding the page***

*It is the most least used trick to capture the element by refreshing the page and then finding the element.*

*Suppose we are trying perform some action on the web element and stale element reference occurred. Then we can simply use try catch block to collect that exception and refresh the page and try to find the element again.*

**try** {

driver.findElement(By.xpath("xpath")).click();

}

**catch** (StaleElementReferenceException ex){

driver.navigate.refresh();

driver.findElement(By.xpath("xpath")).click();

}

1. ***By using for-loop to find the element***

*If the web element is not attached with the DOM, then we can use a for loop also to find the WebElement*

//For loop iterating 3 times

//If element is found then the loop breaks

**for** (**int** i=**0**;i<**3**;i++){

**try** {

driver.findElement(By.xpath("xpath")).click();

**break**;

}

**catch** (Exception ex) {

ex.printStacktrace();

}

}

1. ***Use of WebDriverWait to avoid StaleElementReferenceException.***

*Most classic and recommended way of handling Stale element exception is to use WebDriverWait class. This class handles the exception smoothly with adding proper wait time to find the element as well.*

**try** {

driver.findElement(By.xpath("xpath")).click();

}

**catch** (StaleElementReferenceException ex) {

WebElement element = new WebDriverWait().until(ExpectedConditions.elementToBeClickable(By.xpath("xpath")));

element.click();//Perform any operation

}

*Other ways of handling stale element exception are by using POM (Page Object Model). In POM we use one in-built method initElements(), which initialize the objects at that particular moment. However, the use of initElements() is not effective in many scenario’s as we use to keep this method in constructors. And it loads only when we initialize the page.*