Automation Testing

XPath and CSS Selectors

A Day in the Life of an Automation Test Engineer

Joel has learnt about the basics of Selenium. To perform the automation testing, let us know more about web elements.

As an Automation Test Engineer and to automate and interact with web elements of an application, we need to identify these elements using advanced locators, like XPath and CSS Selectors.

For testing a web-based application, we need a perform specific actions, such as click, type, and so on, in the web elements.

In this automation tool, to identify on which web elements he needs to perform a particular operation.

To know about it, let us go through the lesson.

Learning Objectives

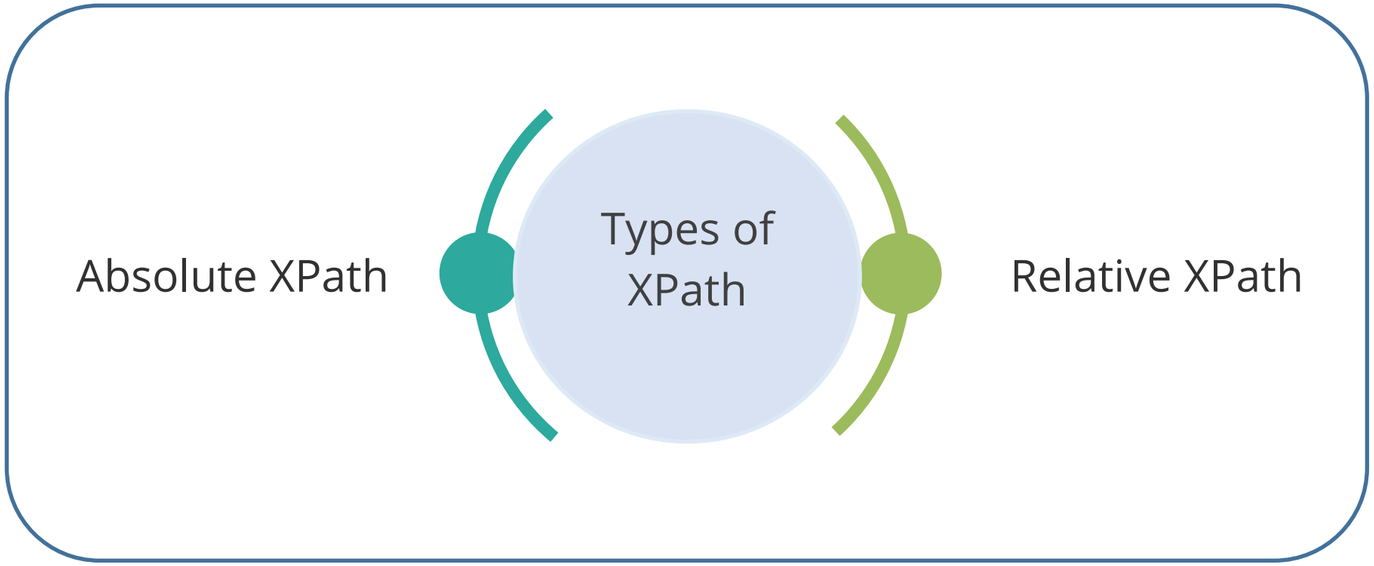
By the end of this lesson, you will be able to:

- Apply to locate elements using XPath
- Analyze Absolute XPath and Relative XPath
- Comprehend methods in XPath
- Comprehend locating elements using CSS Selector

Locating Element With XPath

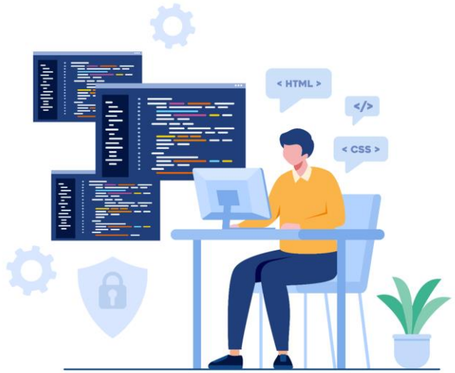
XPath

XPath is the path expression written using HTML tags (or XML tags) and their attributes to reach a node (or web element) in an HTML page or XML page.



Absolute XPath

Absolute XPath starts from the beginning of an an HTML page, and the first tag is HTML. So, all Absolute XPaths always begin with an HTML tag and then access the immediate child to reach a node.



- “/” is used to access an immediate child of the parent tag.
- **Example:** html/body/table/tbody/tr[2]/td/input

Relative XPath

Relative XPath starts from anywhere on the page. It doesn't have to write a lengthy XPath because it may begin from wherever in the HTML DOM structure.

- “//” is used to access any child of the parent tag.
- Basic syntax:

  //htmlTagname[@attribute=’value’]

- **Example:**

  //input[@type=’text’]: It represents the XPath of a Web Element, which is represented by an input tag and has an attribute type = ‘text’.

Which One Is Better?

Absolute XPath

- It is fast.
- It is long and challenging to maintain absolute XPath.
- One disadvantage is that if there is an addition or deletion of some nodes in between, they fail to work.

Relative XPath

- It is much faster.
- It is short.
- Instead of starting from the root node, the relative XPath starts with the element we want to identify.
- There are some methods, operators, and axes available in XPath which can help to locate elements uniquely.

How to Identify Dynamic Web Element?

Dynamic Web Elements change dynamically like their attributes such as Id, class name, or text associated change.

How to Identify Dynamic Web Element?

The best possible way to identify dynamic elements is:

- First, search for another web element that is stable and can be identified uniquely.
- Then use methods, operators, or axes to reach the desired node (or web element).

Methods in XPath

There are three main methods used in XPath:

text()

contains()

starts-with()

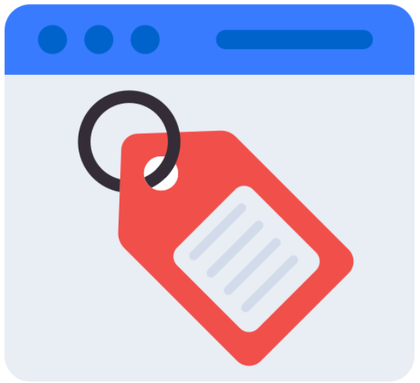
Text Method

text()

- text() method is used when we are searching for web elements with exact text.
- Example:

//a[text()='Mobile & Accessories']

Contains Method



contains()

- It is a method used when the value of any attribute changes dynamically. It can search an element with partial information
- Example: **//input[contains(@type='submit')]**
- It is a method that works with the text() method as an argument to the contains() method in XPath.
- Example: **//a[contains(text(), 'Mobile & Accessories')]**

Starts-with Method

Starts-with()

- Starts-with() method is used, while searching for web elements matching the start of the text of the attributes passed.
- The text() method can also be used which will match the starting of the text.
- Example: **//a[starts-with(text(),'Mobile')]**

Operators in XPath

AND operator:

- AND operator, when applied to multiple attributes, identifies web element only when all the attributes are pointing to that element.
- **Example:** //input[@type='text' and @name='uid']

OR operator:

- OR operator, when applied to multiple attributes, defines a web element only when any one of the attributes points to that element.
- **Example:** //input[@type='text' or @name='uid']

Axes in XPath

Axes

- Axes in XPath point the XPath processor to the direction in which it should navigate in the hierarchy of the HTML nodes.
- **Basic Syntax:** //html_tag[@attribute='value']//axes::html_tag

Frequently Used Axes in XPath

- **Ancestor:** It selects the ancestor of the context node.
- **Following:** It selects the elements which follow the context node.
- **Preceding:** It chooses the elements which precede before the context node.
- **Following-Sibling:** It chooses the sibling coming after the context node.
- **Preceding-Sibling:** It chooses the sibling coming before the context node**.**
- **Parent:** It contains the parent of the context node.

Locating Elements Using CSS Selectors

CSS Selector

CSS

- It is Cascading Style Sheets. It is defined to display HTML in structured and colorful styles are applied to the webpage.
- Selectors are patterns that match against elements in a tree and form one of several technologies that can be used to select nodes in an HTML or XML document.
- CSS is much faster and simpler than XPath.
- **Basic Syntax:** htmltag[attribute='value']

Operators in CSS Selector

There are five operators commonly used in CSS selectors:

- . (dot operator)
- # (hash operator)
- * (contains)
- ^ (starts-with)
- $ (ends-with)

Operators in CSS Selector

Using class in CSS:

- .(dot) operator is used in classes
- .small.cbx.btn.btn-s.btn-ter.tab.tgl_button.center_b

Using Id:

- # (hash) operator is used
- #ListViewInner -- example using Id

CSS Selector

^ (power symbol) -- starts with method

–starting of the string

input[id^=ema]

$ (dolar symbol) -- ends with method

–matches ending text

* (astrick) -- contains method

–matches some part of the string

Key Takeaways

- There are two types of XPaths that are Absolute XPath and Relative XPath.
- Absolute XPaths are fast but not reliable, however, relative XPaths if written well are reliable.
- Dynamic elements can be identified using Relative XPaths.
- Cascading Style Sheets are defined to display HTML in structured and colorful styles are applied to the webpage.

Thank You