Performance Testing Course : JMeter - Assertion

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Agenda

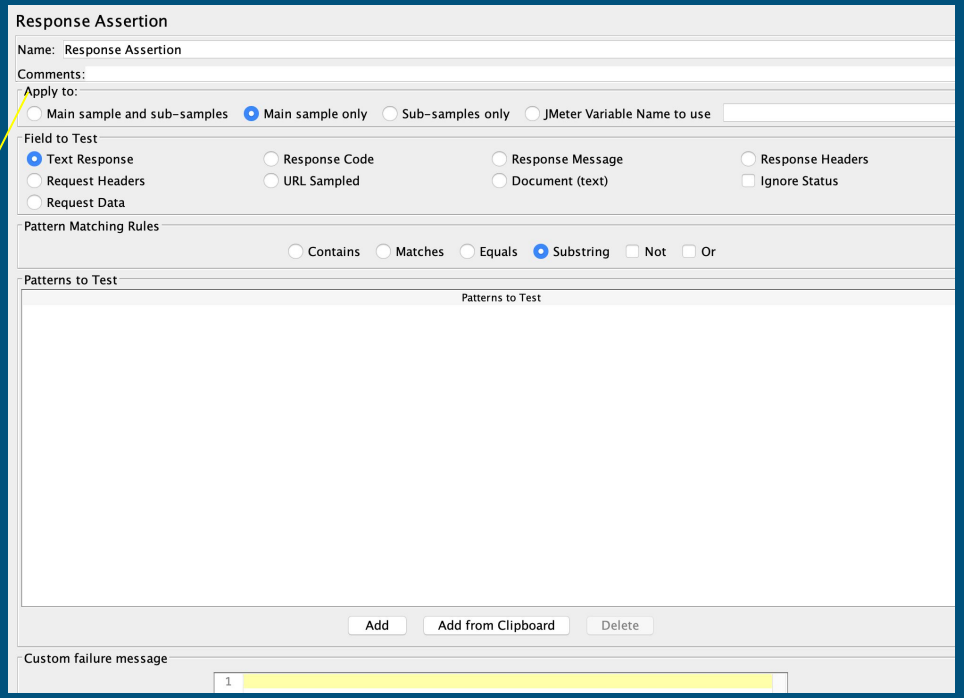
- Introduction about several popular assertion.
- Showcases.
- Exercises.

Definition

An assertion element is used as a validation component in JMeter. It validates the response on the basis of pre-defined condition and based on that make a decision to pass or fail the sampler.

If you need to apply assertion on a particular sampler, then add it as a child of that sampler.

Response Assertion



Attribute:

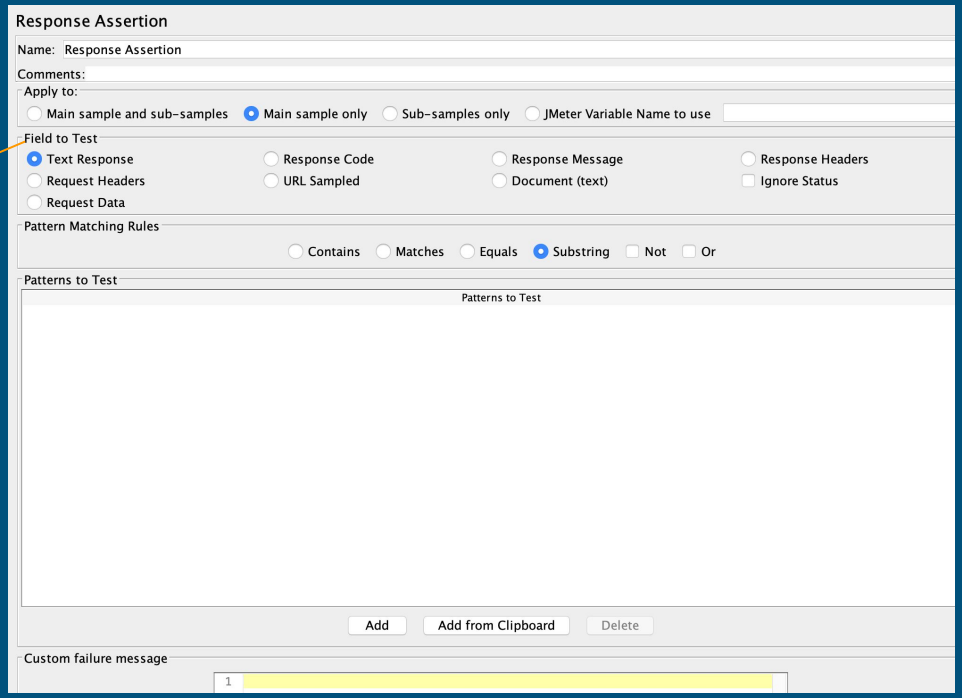
- Name: Name of assertion.
- Comments: Any description.
- Apply to: What do you want to assert:
  - Main samples and sub-samples:

(Search given string pattern in main request and

re-directed request)

  - Main samples(Only on main request)
  - Sub-samples only(Only in re-directed ones)
  - JMeter variable(Assert against a variable)

Response Assertion



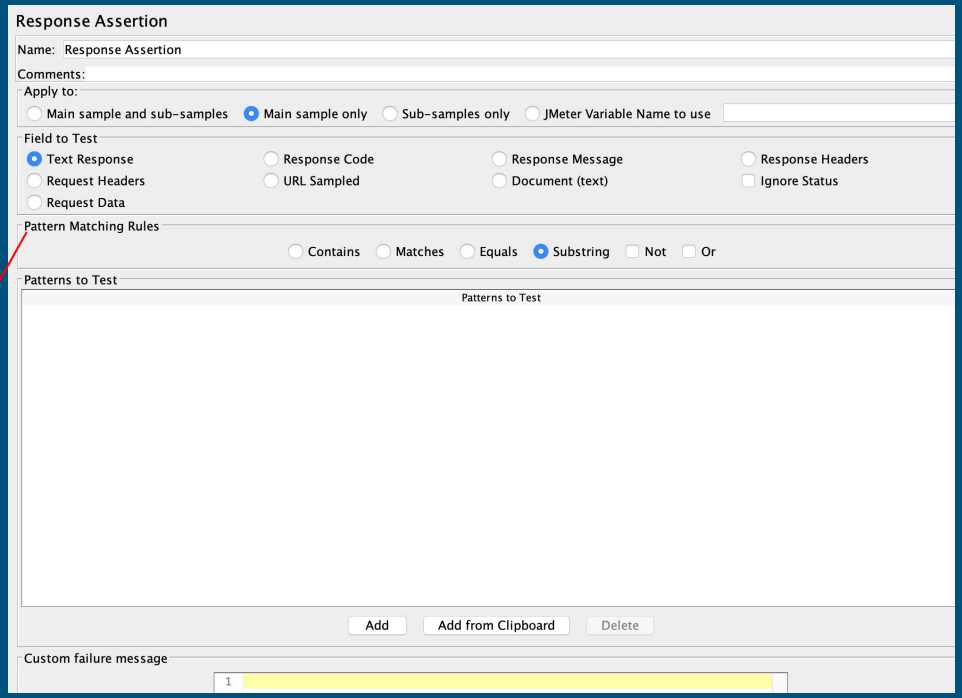
Attribute:

- Field to Test: Name of assertion.
  - Text Response: Search the given pattern

string in body of response.

  - Response Code : Validate response code.
  - Response Message: Validate response message.
  - Response Headers: Search given pattern string in response headers.
  - Request Headers: Search in the header part of the request.
  - URL Sampled: Search only in URL.
  - Document(text): Search in document returned by server.
  - Request Data: Validate string in request body sent to server.It doesn’t include request header.
  - Ignore Status: Force response status to successful.

Response Assertion



Attribute:

- Pattern Matching Rules: Rule to match.
  - Contains: “Field to Test” should contains

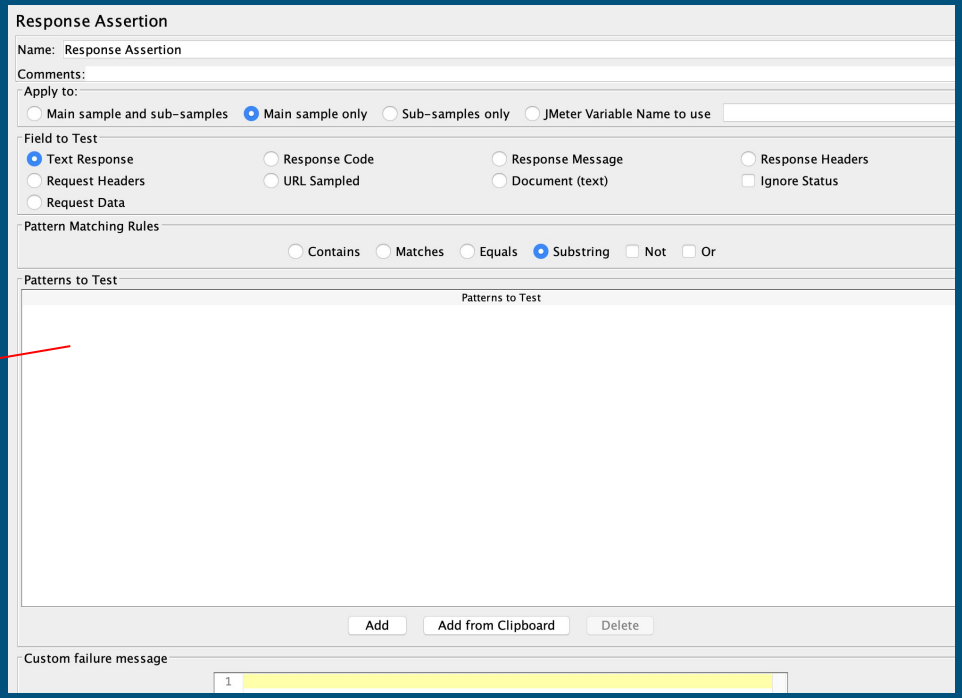
“Patterns to Test” string.(Regex OK)

  - Matches: “Field to Test” should have string

matched fully with “Patterns to Test” string.(Regex NOT OK)

  - Equals: Match exact text with case-sensitive feature.(Regex NOT OK)
  - Substring: Jmeter checks and validate the substring from captured string.(Regex NOT OK)
  - Not: String pattern should not be in the response.
  - Or: In case of multiple pattern, pass the sampler if any one of the pattern matched.

Response Assertion



Attribute:

- Patterns to Test:
  - Write a list of patterns to be tested.
  - Each pattern is tested separately.
  - If a pattern fails, then further patterns are not checked (if "Or" is not marked). There is no difference between setting up one Assertion with multiple patterns and setting up multiple Assertions with one pattern each (assuming the other options are the same).
- Custom failure message: A custom message can be written in this field which is displayed in case of the assertion failure.

Response Assertion

Showcase:

- Use Response Assertion to assert if we search weather for city London

Exercise:

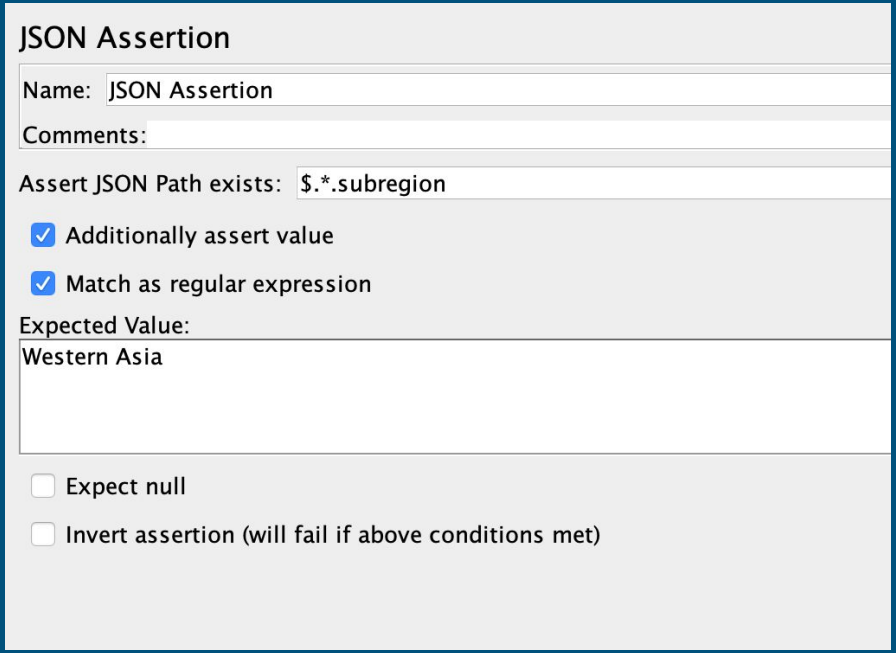
- Use Response Assertion to assert if we found Amsterdam as Netherlands capital city.

JSON Assertion

Definition:

- JSON Assertion is used to assert any particular string against JSON response data.

JSON Assertion



Attribute:

- Name: Name of the assertion
- Comment: Description of the assertion.
- Assert JSON Path exists: Input JSON Path here.
- Additional Assert Value: if checked,

also assert the value is equal to the **Expected Value**.

- Match as regular expression: Verify if response

value is matched against regular expression.

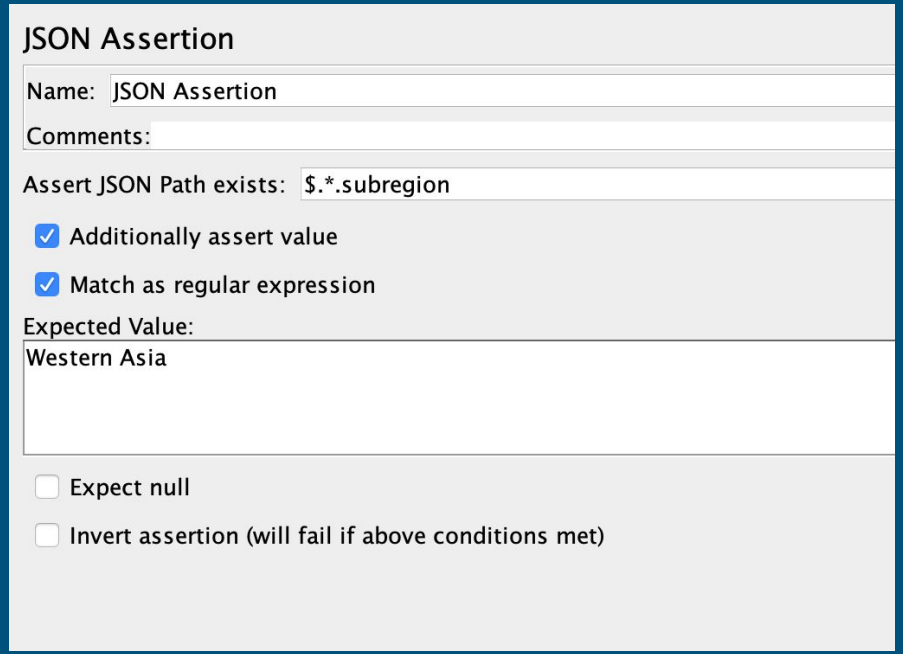
- Expected Value: Declare the expected value here.

JSON Assertion

Attribute:

- Expect null: Verify if response data is null.
- Invert assertion: Revert result of assertion.

(if passed -> make it to failed and vice versa).



JSON Assertion

Showcase:

- User JSON Assertion to verify if all countries belong to subregion.

Exercise:

- Do your own exercise.

Duration Assertion

Description:

The Duration Assertion is very simple. Used alongside the Response Assertion, it covers 90 percent of use cases where assertions are required. The usage is very straightforward: It provides the maximum duration in milliseconds, and, if any request lasts longer than the value specified, the sample is marked as failed.

Duration Assertion

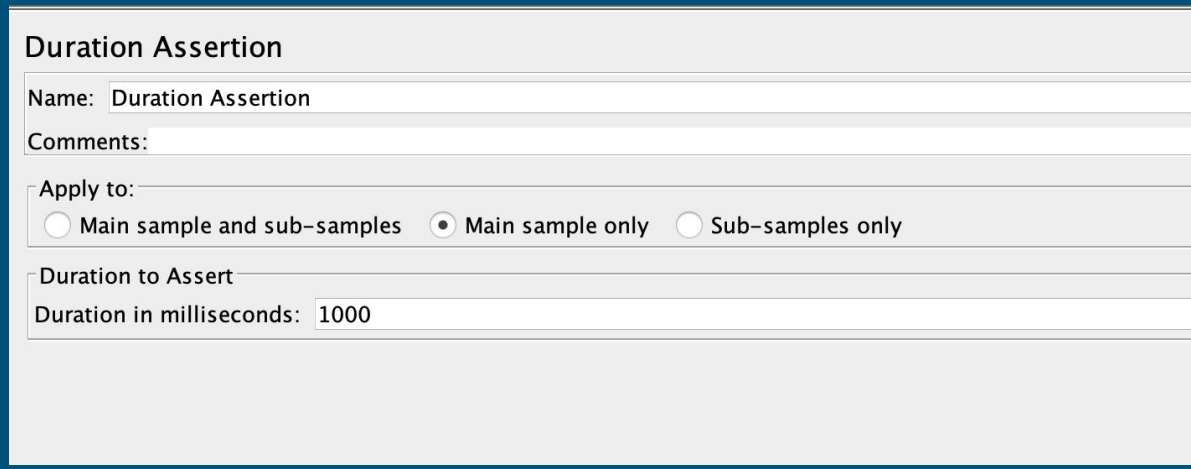
Description:

- Name: Name of assertion
- Comments: Any description.
- Apply to:
- Main samples and

sub-samples:(Assert the load time

against main and re-directed requests)

- Main samples(Only on main request)
- Sub-samples only(Only in re-directed ones)



Duration Assertion

Showcase:

- Use Duration Assertion to assert load time of 4 APIs: Get list of languages,get capital city of country knowing country ISO code, get list of countries using currencies and get country info by ISO code.

Exercise:

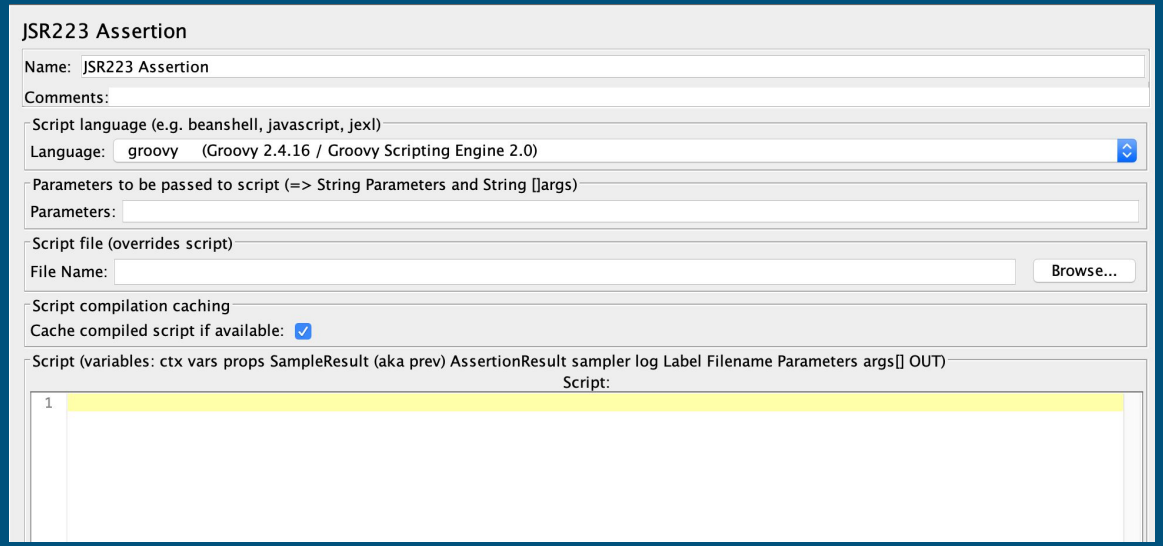
- Using this WSDL : http://webservices.daehosting.com/services/isbnservice.wso?WSDL , verify duration of each API IsValidISBN10 and IsValidISBN13 is less than 600 ms.

JSR223 Assertion

Description:

Same as JSR223 Pre-processor, JSR223 Post-processor and JSR223 Sampler, it helps to implements your custom assertion.

JSR223 Assertion



Attribute:

- Language : Choose your scripting language.
- Script file: Name of a file to be used as a JSR223 script.
- Parameters: List of parameters to be passed to the script file or the script.
- Cache compiled script if available: If checked and language supports Compilable interface(for now we only have Groovy in the list),JMeter will compile the script and cache it.
- Scripts(variables: xxx) : List supported variables by JMeter.

JSR223 Assertion

Showcase:

- Script file: Use JSR223 Assertion to assert all countries returned by API belongs to our expected sub-region.

Exercise:

- Use JSR223 Assertion to assert that API get country info by ISO code returns Amsterdam as capital city and euro as currency.

MD5Hex Assertion

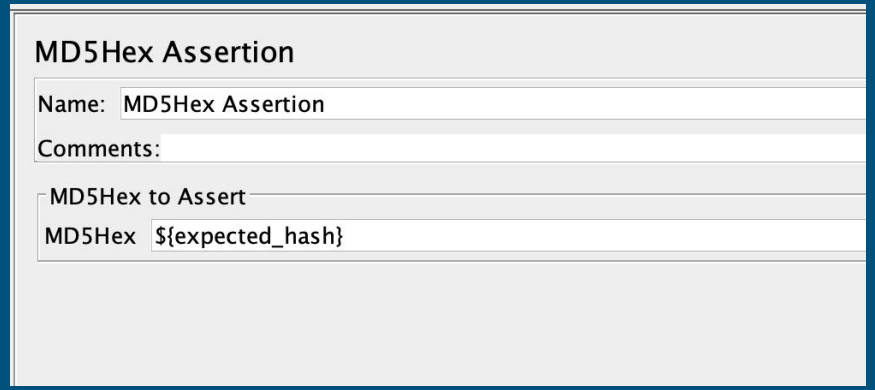
Description:

The MD5Hex assertion checks the MD5 checksum of the actual response against the expected MD5 hash. Content of any length, whether it’s one character or a full HD video file, will be represented as a 32-digit hexadecimal number. It is particularly useful for large data-integrity checks(especially when you need to load test file downloading feature).

MD5Hex Assertion

Attribute:

- Name: Name of assertion
- Comments: Any description.
- MD5Hex: Expected MD5Hex value



MD5Hex Assertion

Showcase:

- Use MD5Hex Assertion to verify against this API: https://file-examples.com/wp-content/uploads/2017/10/file-example_PDF_1MB.pdf

Exercise:

- Do it by your own.

Size Assertion

Description:

Size Assertion checks the response length to see if it's equal/not equal/greater/less than the expected size in bytes. It can be applied to:

1. Full response (body and headers)
2. Response headers
3. Response body
4. Response code
5. Response message

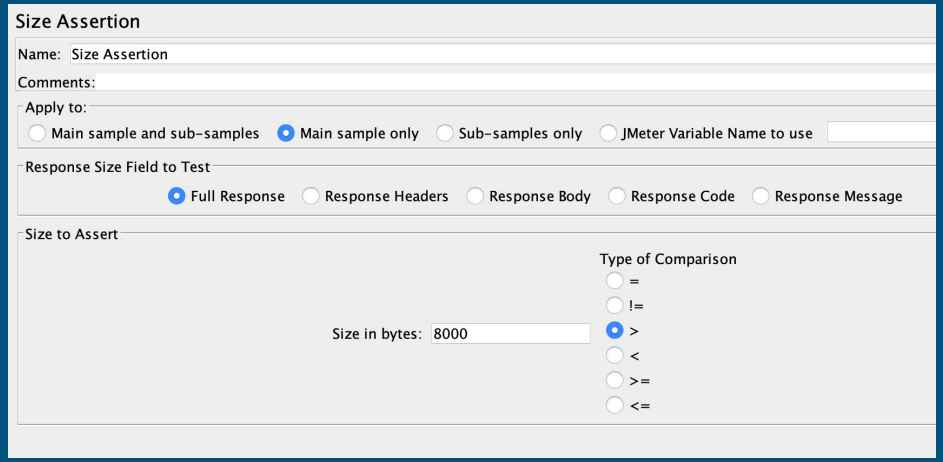
Size Assertion

Attribute:

- Name: Name of assertion
- Comments: Any description.
- Apply to: What do you want to assert:
  - Main samples and sub-samples:

(Assert response size of both main and re-directed samples)

- Main samples(Only on main request)
- Sub-samples only(Only in re-directed ones)
- JMeter variable(Assert against a variable)

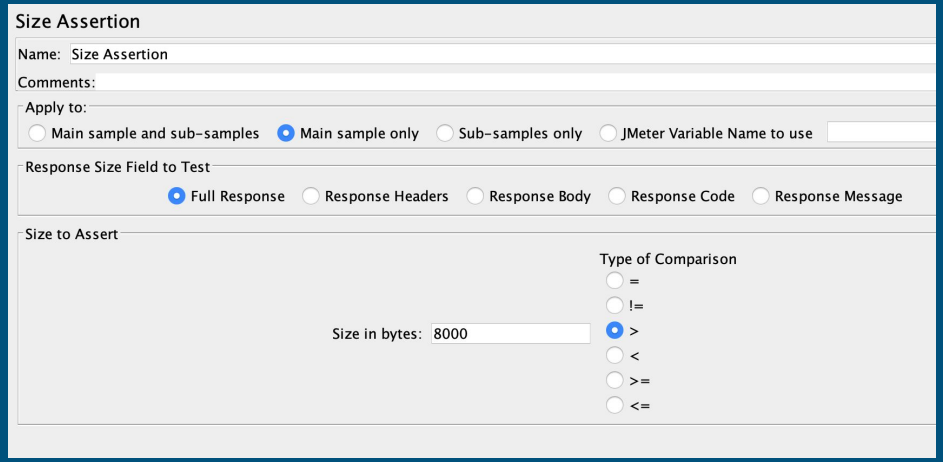


Size Assertion

Attribute:

- Size to Assertion:

Input expected value in bytes and select appropriate comparison operation.



Size Assertion

Showcase:

- Assert size of full response of API get all languages.

Exercise:

- Apply it to any API.

Some tips

- **The Cost of JMeter Assertions**
  - All assertions come with a cost, in terms of CPU or memory consumption. However, some assertions carry a greater cost than others. According to the JMeter Performance and Tuning Tips guide, the Response Assertion and the Duration Assertion are typically lower-impact choices, whereas Compare Assertion and other XML-based ones like the XPath Assertion consume more CPU and memory.

- **The Scope of JMeter Assertions**
  - You must also consider the scope when setting assertions. Assertions can be applied to a main sample and its subsamples, or only to subsamples. Some assertions, like the Response Assertion or the Size Assertion, can also be used against a JMeter Variable. Code-based assertions (such as Beanshell, BSF and JSR223) don’t have the GUI element that identifies scope. This means you must manually implement all assertion logic – including scope.

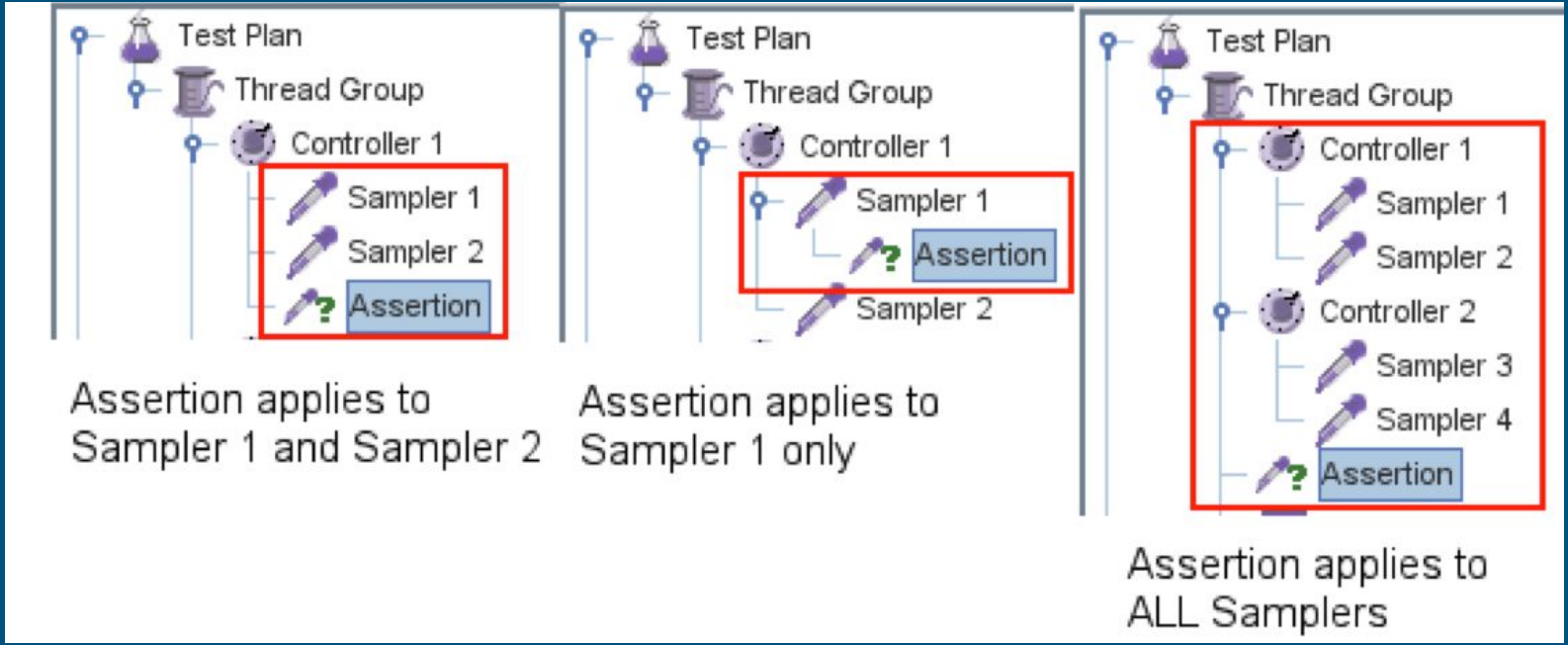
Some tips

- **Performance of each assertion:**

Assertion	CPU/Memory Usage	Notes
Response Assertion	Moderate	Regular Expressions
Duration Assertion	Low	
Size Assertion	Low	
XML Assertion	High	Builds XML DOM Documents
Beanshell Assertion	Variable	Depends on the script logic
MD5Hex Assertion	Low	
HTML Assertion	High	Parses the HTML Response
XPath Assertion	High	Builds XML DOM Documents
XML Schema Assertion	High	Builds XML DOM Documents
JSR223 Assertion	Variable	Depends on the script logic
Compare Assertion	High	Parses responses and compares them
SMIME Assertion	Moderate	
Json Assertion	High	Parses the Json document

Some tips

Example of scope:



Some tips

- **Combining Assertions**
  - You can add more than one assertion to the sampler, controller, thread group, or test plan. Failed assertions will cause all affected samples to fail, so caution is essential.