



# SESI *HANDS ON* PENGUJIAN PRESTASI MENGGUNAKAN JMETER (*BEGINNER LEVEL*)

26 – 28 JULAI 2021

Disediakan Oleh:  
Roshaimieza Mat Adam

# SYLLABUS

## 1. CREATING JMETER TEST PLAN

- ✓ [C1]Thread Group
- ✓ [C2]Config Element
- ✓ [C3]Controller
- ✓ [C4]Listener

## 2. RECORDING AND SCRIPTING

- ✓ [R1]Script Recording
- ✓ [R2]JMeter Certificate (https recording)

## 3. VERIFYING SCRIPT

- ✓ [V1]Record Transaction
- ✓ [V2]Running the Script
- ✓ [V3]View Result Tree
  - Regular Expression Extractor
  - Response Assertion

## 4. PERFORMING LOAD TEST

- ✓ [P1]CSV File
- ✓ [P2]Timer (Think Time)
- ✓ [P3]Plan your Load





01

# CREATING TEST PLAN

- ✓ Thread Group
- ✓ Config Element
- ✓ Controller
- ✓ Listener

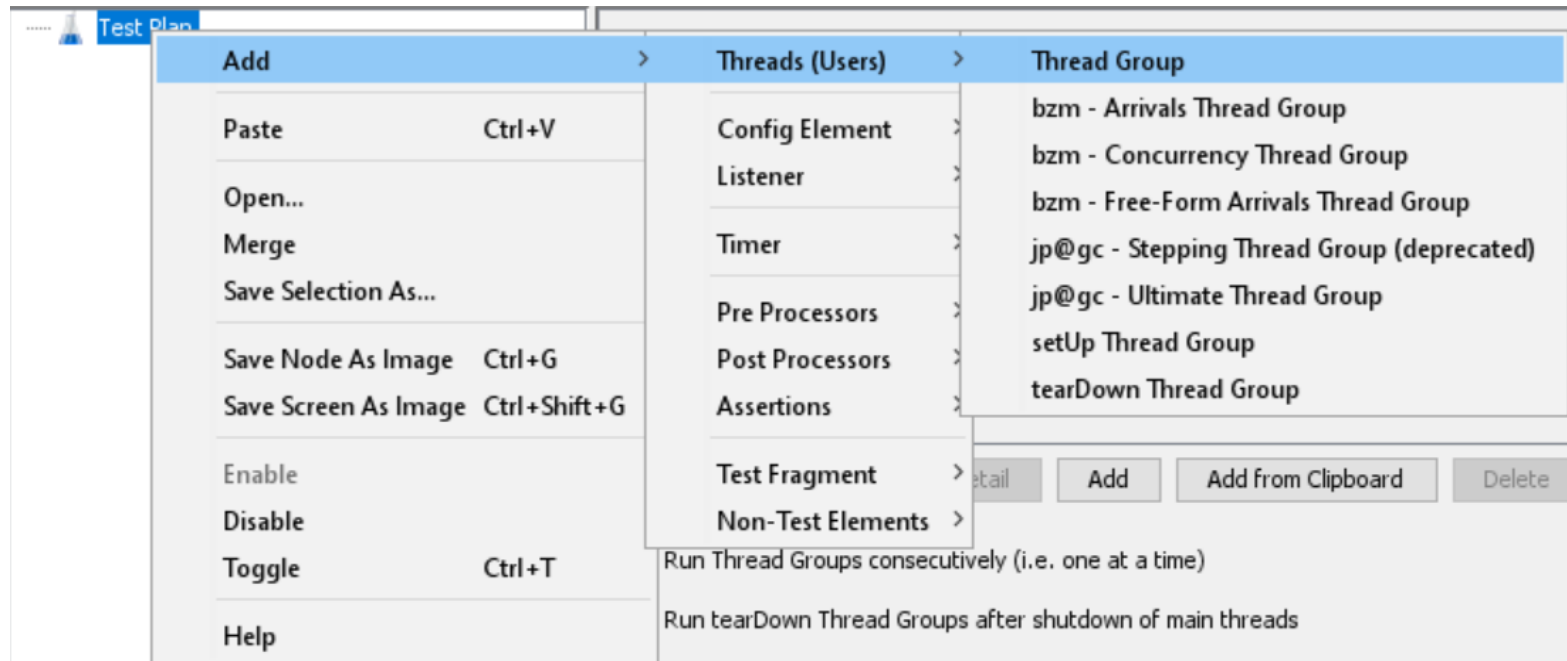
# CREATING TEST PLAN

## 1. Adding Thread Group

Thread group element controls the number of threads JMeter will use to execute your test.

The controls for a thread group allow you to:

- ✓ Set the number of threads
- ✓ Set the ramp-up period
- ✓ Set the number of times to execute the test
- ✓ Scheduler



# CREATING TEST PLAN

## 1. Adding Thread Group

Thread Group

Name:

Comments:

Action to be taken after a Sampler error

Continue  Start Next Thread Loop  Stop Thread  Stop Test  Stop Test Now

Thread Properties

Number of Threads (users):

Ramp-Up Period (in seconds):

Loop Count:  Forever

Delay Thread creation until needed

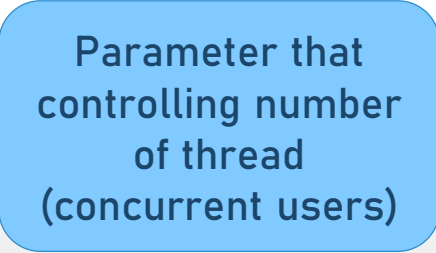
Scheduler

Scheduler Configuration

⚠ If Loop Count is not -1 or Forever, duration will be  $\min(\text{Duration}, \text{Loop Count} * \text{iteration duration})$

Duration (seconds)

Startup delay (seconds)



# CREATING TEST PLAN

## 1. Adding Thread Group

Thread Group

Name:

Comments:

Action to be taken after a Sampler error

Continue  Start Next Thread Loop  Stop Thread  Stop Test  Stop Test Now

Thread Properties

Number of Threads (users):


Ramp-Up Period (in seconds):

Loop Count:  Forever

Delay Thread creation until needed

Scheduler

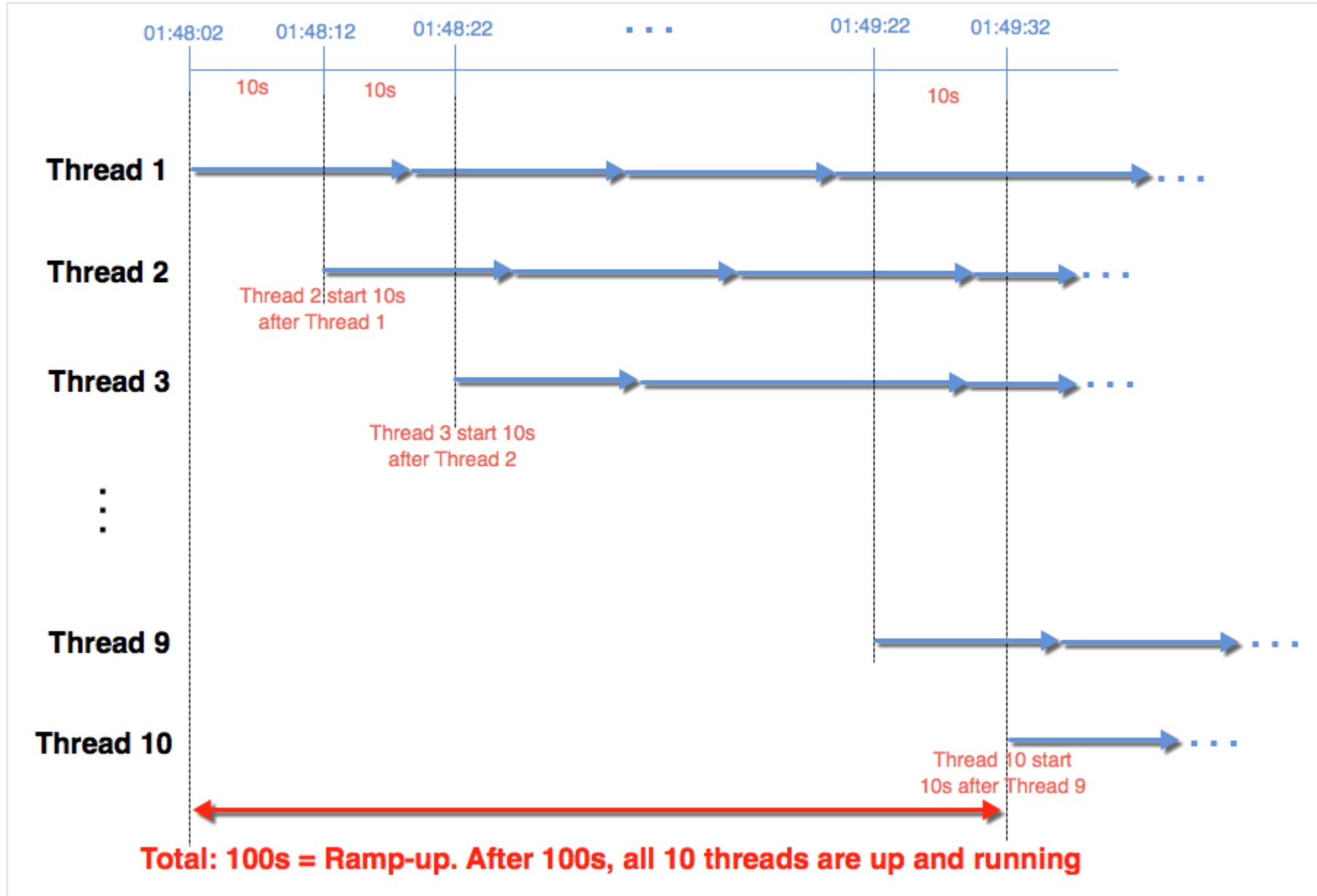
Scheduler Configuration

 If Loop Count is not -1 or Forever, duration will be  $\min(\text{Duration}, \text{Loop Count} * \text{iteration duration})$

Duration (seconds)

Startup delay (seconds)

# CREATING TEST PLAN



# CREATING TEST PLAN

## 2. Adding Config Element

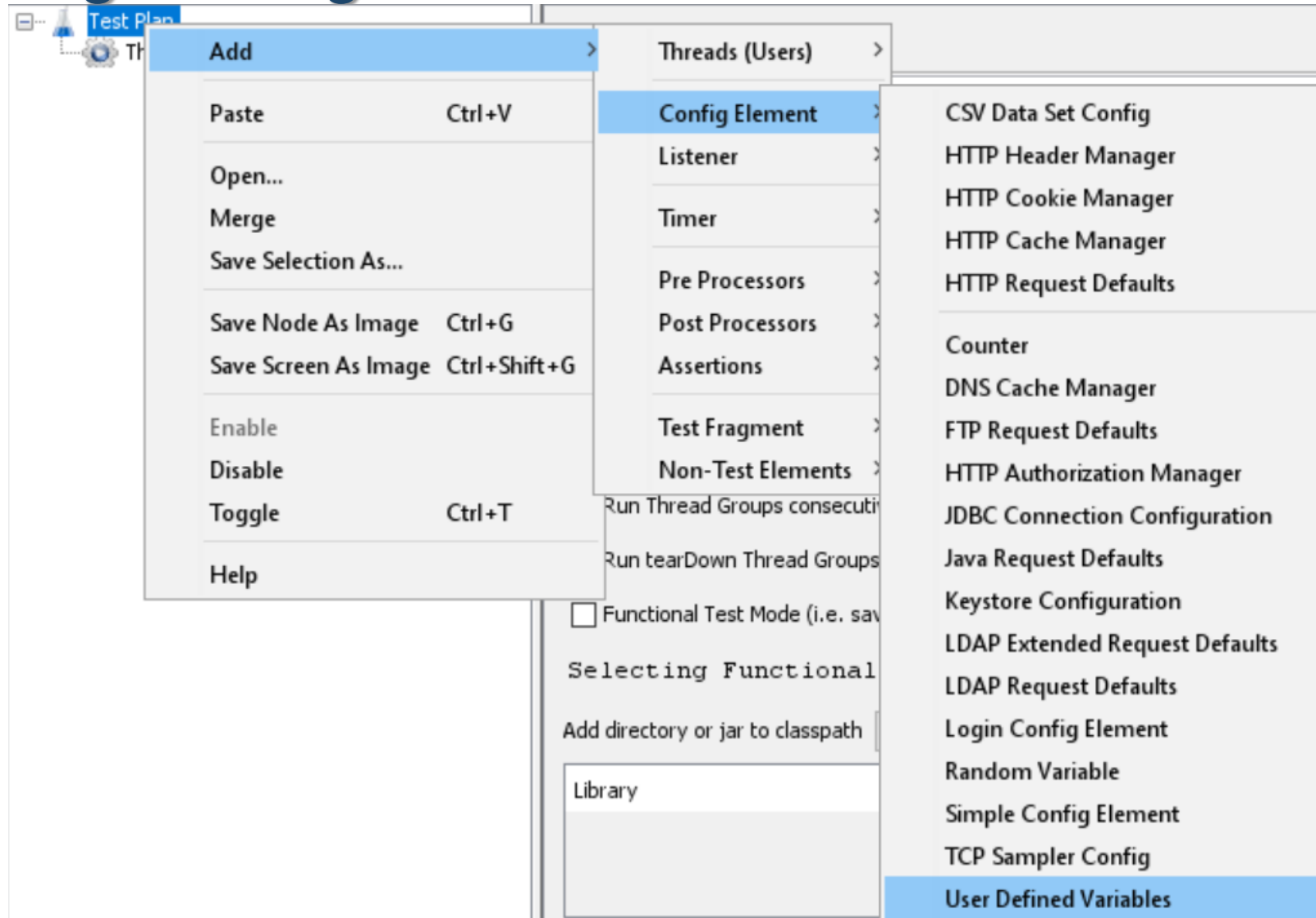
Config Element:

- ✓ User Defined Variables
- ✓ HTTP Request Defaults
- ✓ HTTP Cookie Manager
- ✓ HTTP Cache Manager



# CREATING TEST PLAN

## 2. Adding Config Element > User Defined Variables



# CREATING TEST PLAN

## 2. Adding Config Element> User Defined Variables

### User Defined Variables

Name: User Defined Variables

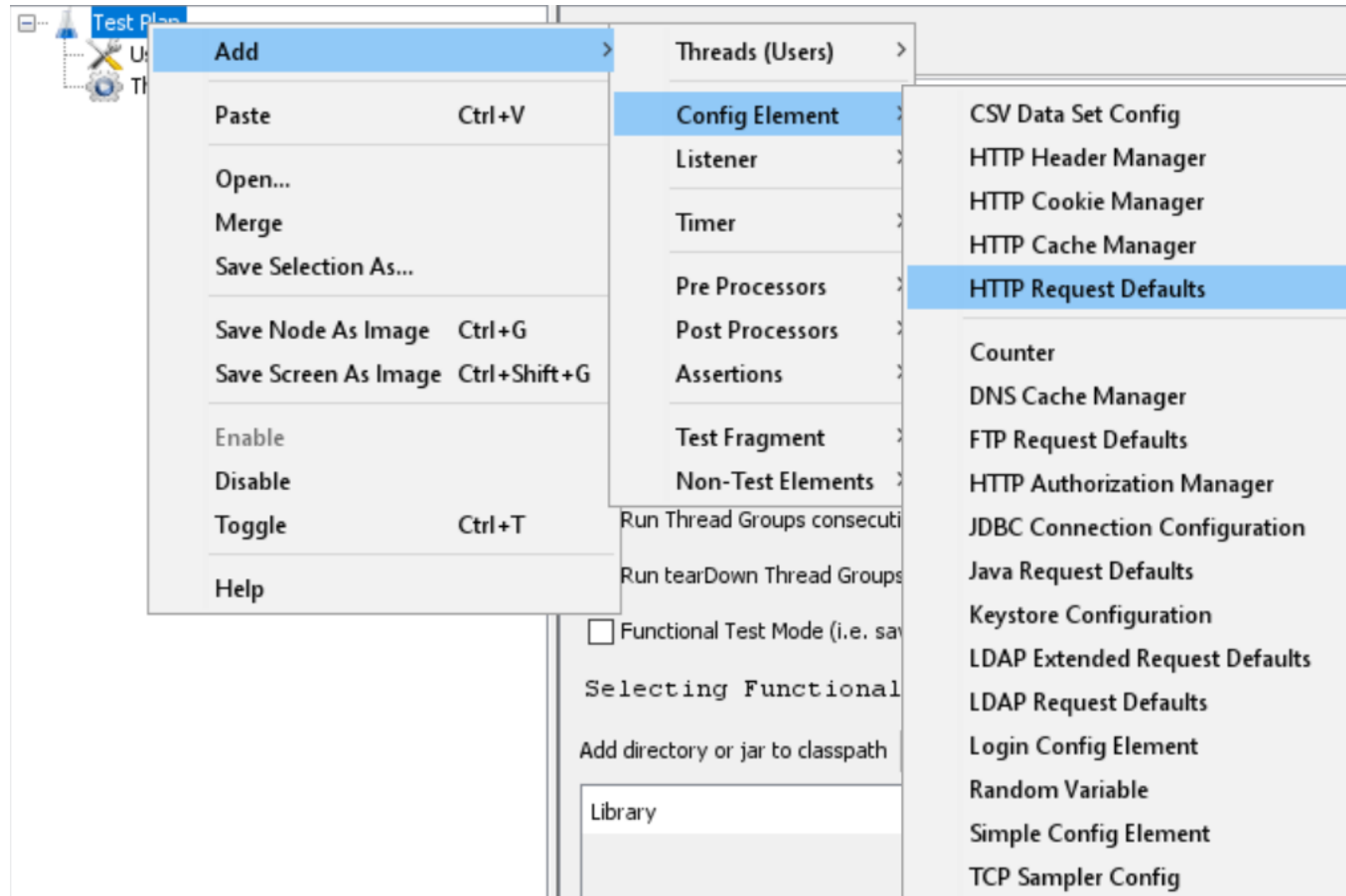
Comments:

### User Defined Variables

Name:	Value	Description
host	192.168.68.139	
scheme	http	
path	/	

# CREATING TEST PLAN

## 2. Adding Config Element > Http Request Default



# CREATING TEST PLAN

## 2. Adding Config Element > Http Request Default

HTTP Request Defaults

Name: HTTP Request Defaults

Comments:

Basic Advanced

Web Server

Protocol [http]:  Server Name or IP:  Port Number:

HTTP Request

Path:  Content encoding:

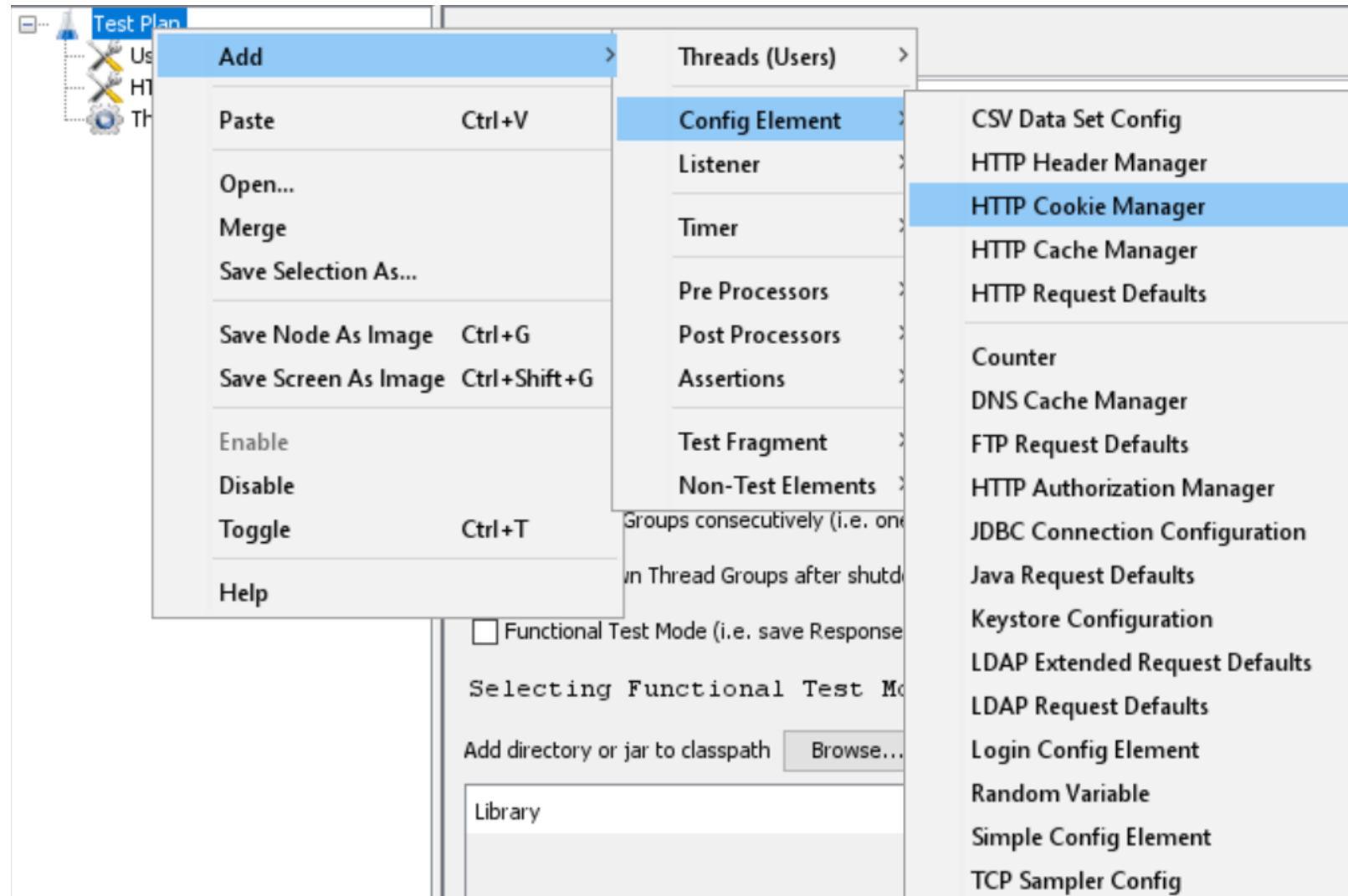
Parameters Body Data

The main goals of using the HTTP Default Request is to:

- ✓ Avoid data duplication in tests.
- ✓ Make test scripts more (easily) maintainable.

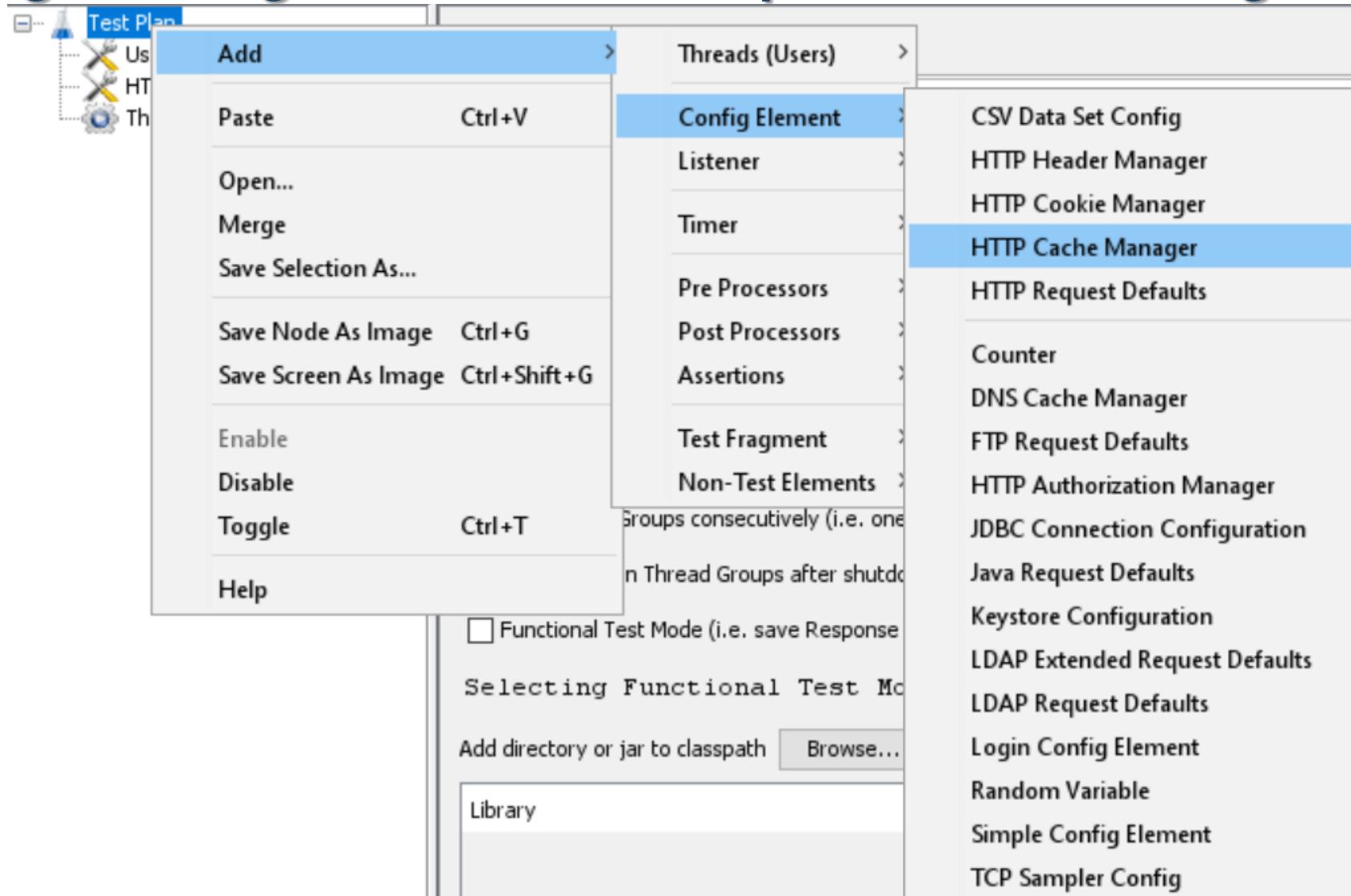
# CREATING TEST PLAN

## 2. Adding Config Element> Http Cookie Manager



# CREATING TEST PLAN

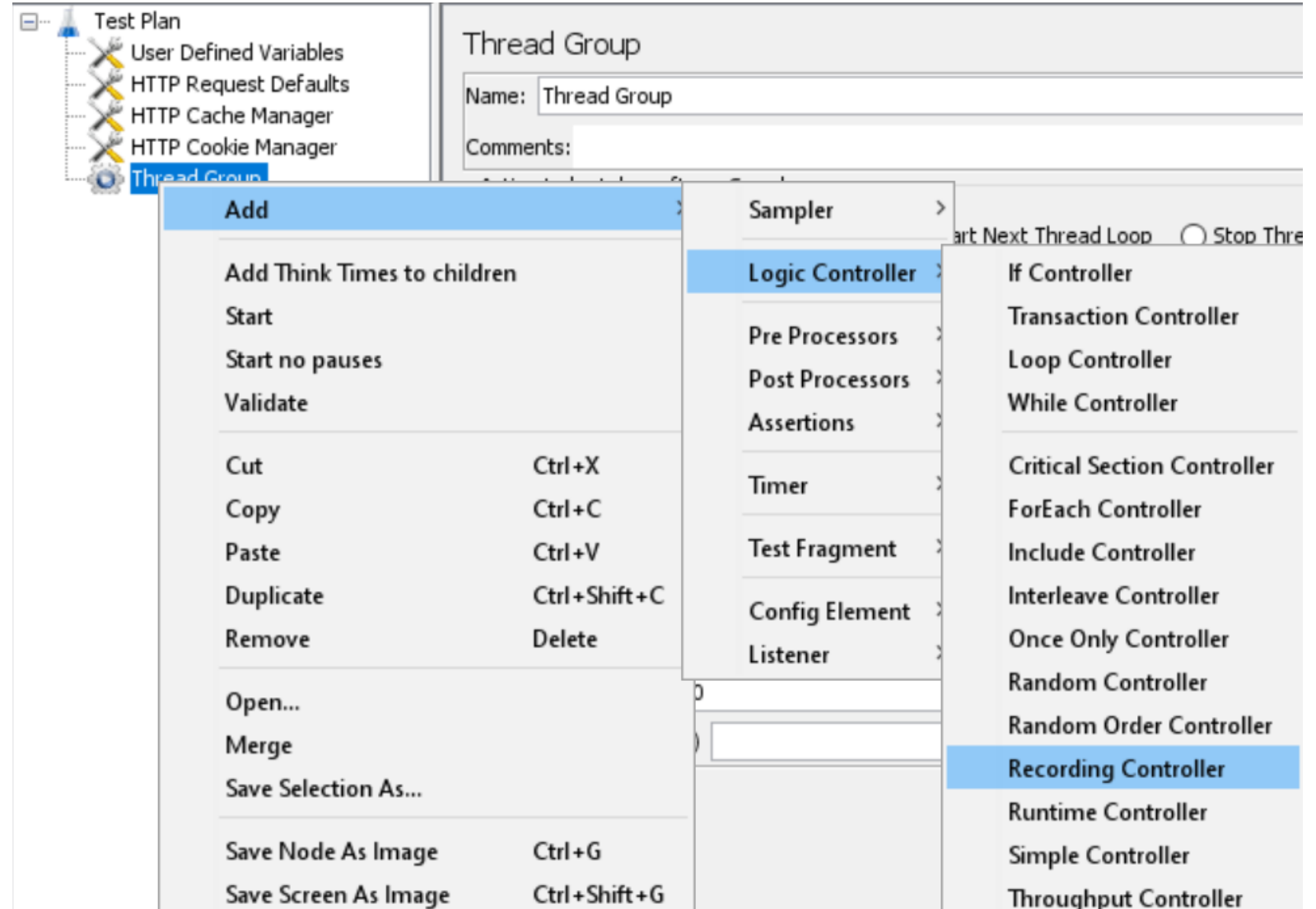
## 2. Adding Config Element > Http Cache Manager



# CREATING TEST PLAN

## 3. Adding Controller

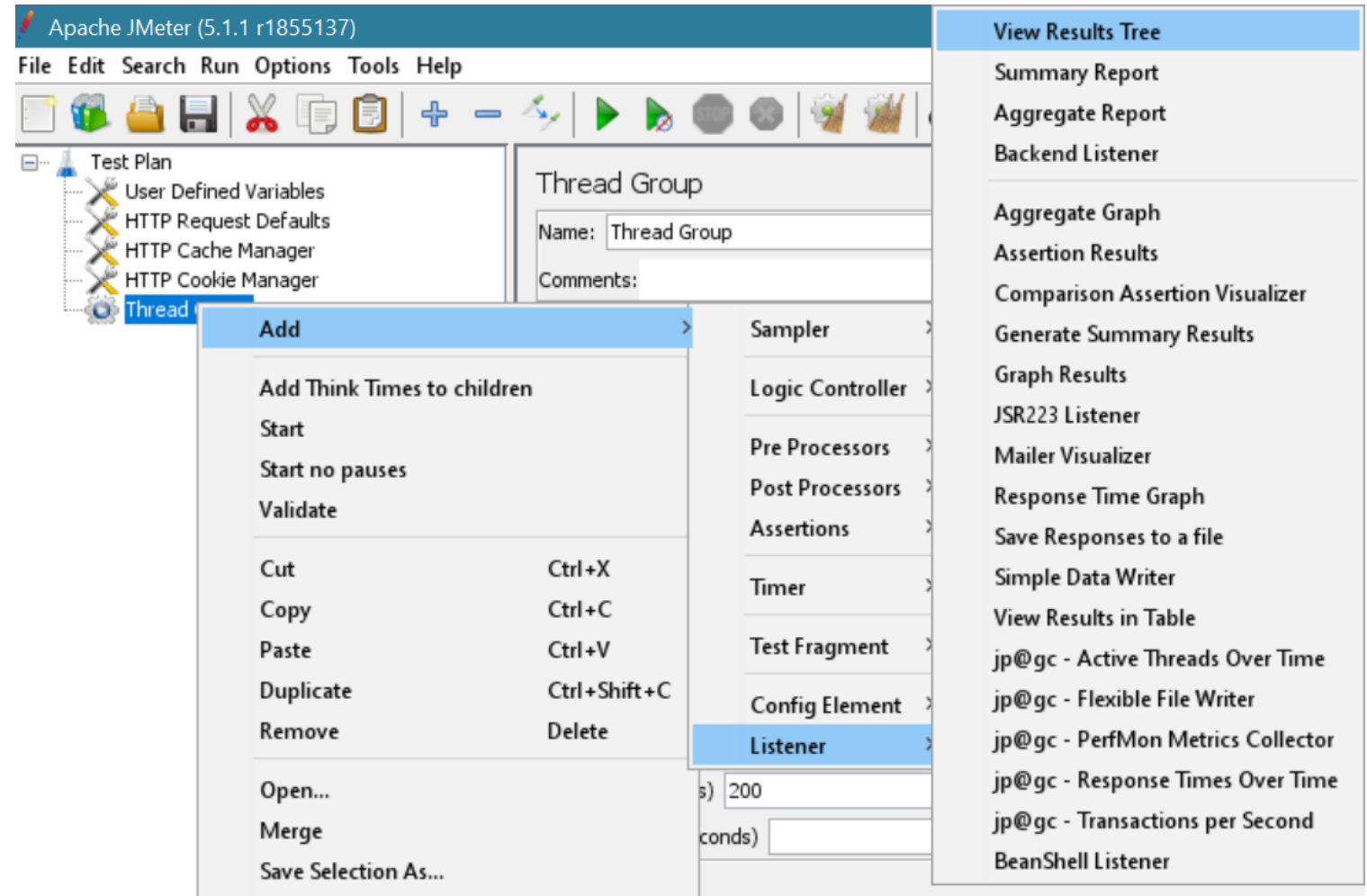
- JMeter can record your testing steps.
- Recording controller is a placeholder to store these recording steps.



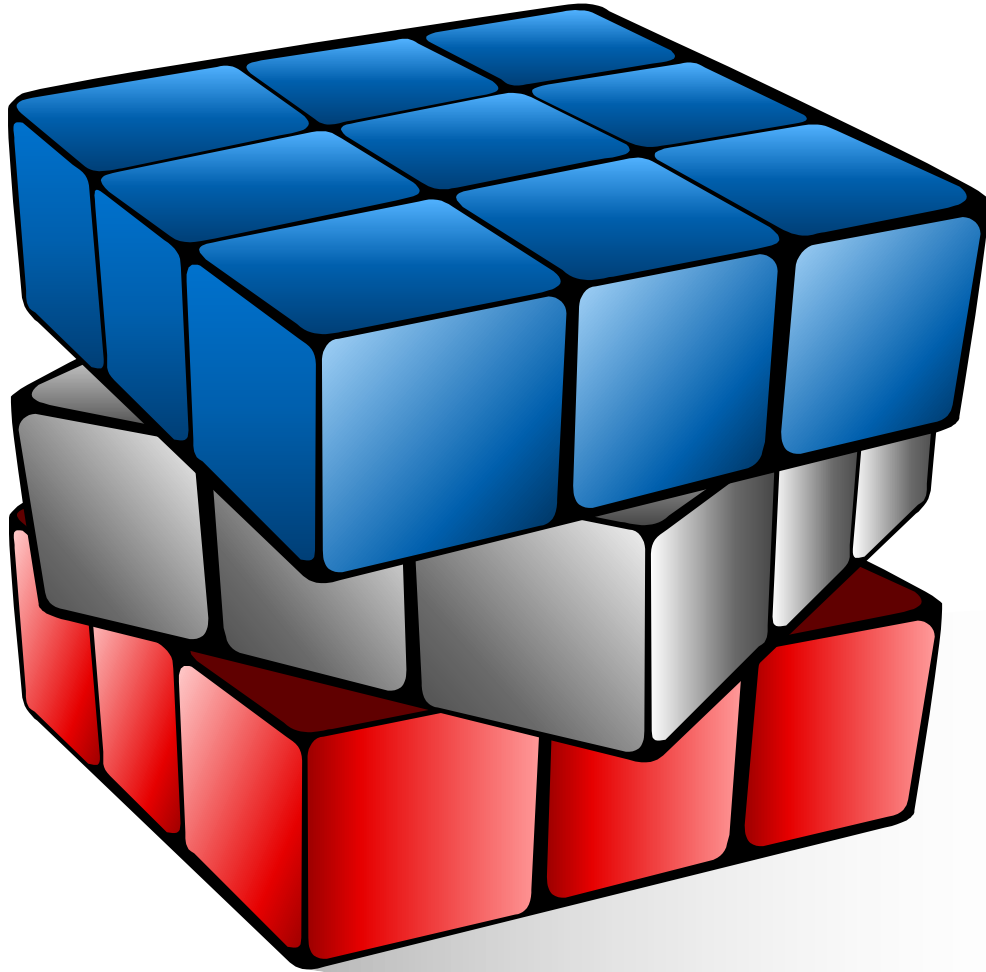
# CREATING TEST PLAN

## 4. Adding Listener

- A listener is a component that shows the results of the samples.
  - ✓ View Results Tree - to view the contents of a response from any given sampler
  - ✓ Summary Report - shows values about the measurement JMeter has done while calling the same page in tabular format







LET'S DO IT



02

## RECORDING

- ✓ Script Recording
- ✓ JMeter Certificate

# RECORDING

## 1. Script Recording

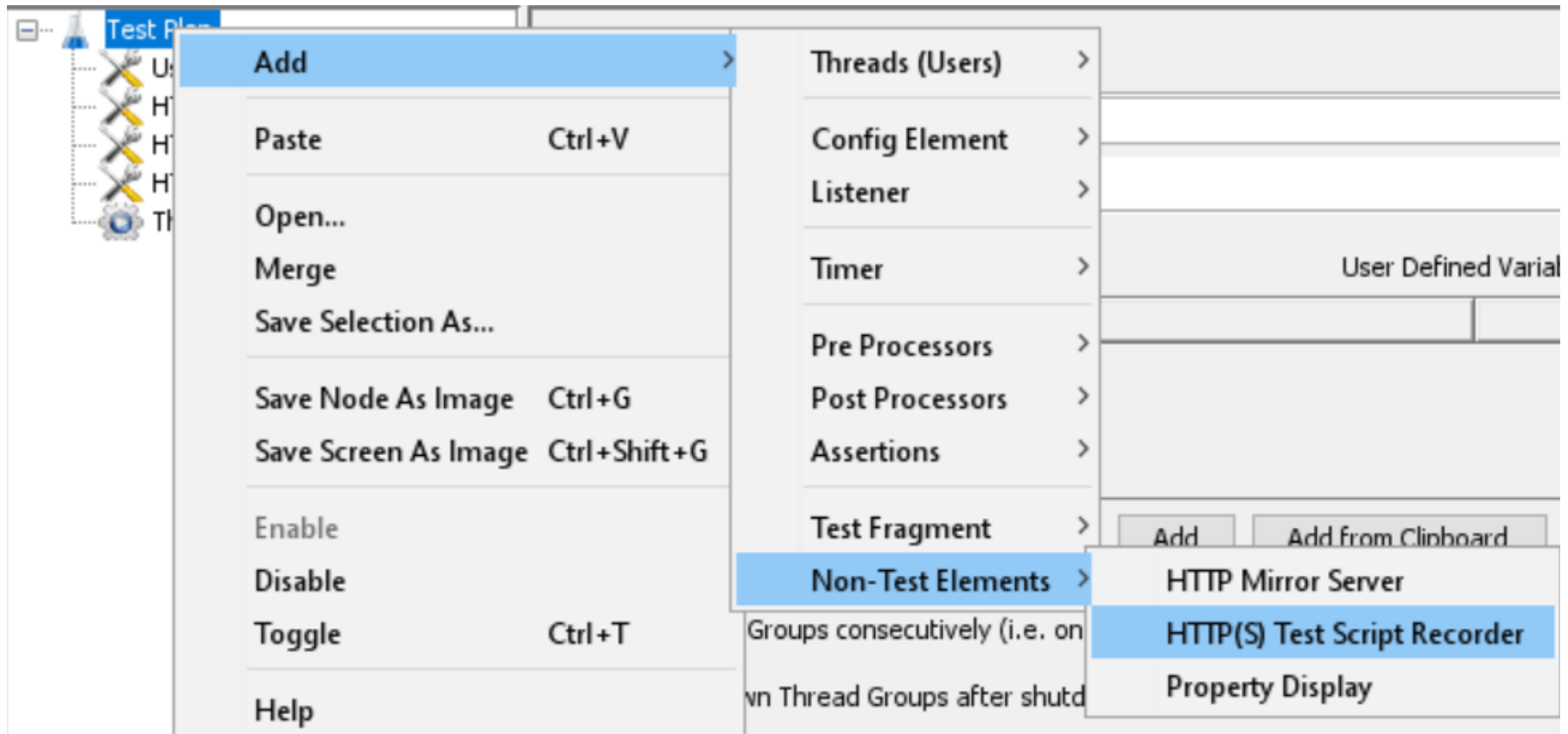
### Steps of Script Recording

- ✓ Add Non-Test Element HTTP(s) Test Script Recorder
  - ✓ Certificate Check
  - ✓ Enter the port number which is not in use. (8888)
  - ✓ Apply proxy on the browser you want to record and use the same port number.
  - ✓ Start the JMeter Proxy Server
  - ✓ Record the Actions > Transaction Control

# RECORDING

## 1. Add HTTP(S) Test Script Recorder

- Can be used to record all the requests which your web or mobile application is making to server.
- Capture the HTTP(s) requests.



# RECORDING

## 2. Add Port Number



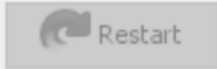
- Port - Ensure the port number is not being used and as same as stated in browser.
- Test Plan Creation:
  - Target Controller
  - Grouping
  - Transaction name
  - Regex matching

HTTP(S) Test Script Recorder

Name: HTTP(S) Test Script Recorder

Comments:

State

 Start  Stop  Restart

Global Settings

Port: 8888 HTTPS Domains:

Test Plan Creation Requests Filtering

Test plan content

Target Controller: sistemhesk > CreateNewUser > Recording Controller-CreateNewUser

Grouping: Put each group in a new transaction controller  Capture HTTP Headers  Add Assertions  Regex matching

HTTP Sampler settings

Transaction name createusers

Create new transaction after request (ms):

Retrieve All Embedded Resources  Redirect Automatically  Follow Redirects

Use KeepAlive

Type:

# RECORDING

## 3. Proxy Setting in Browser

- Firefox

-General -> Network Setting  
-> setting -> Manual proxy configuration



- Chrome

-Setting -> Proxy-> Setting ->

Manual proxy configuration :

**ON**

Address: <http://localhost>

Port: **8888**



Connection Settings

Configure Proxy Access to the Internet

No proxy

Auto-detect proxy settings for this network

Use system proxy settings

Manual proxy configuration

HTTP Proxy  Port

Use this proxy server for all protocols

SSL Proxy  Port

FTP Proxy  Port

SOCKS Host  Port

SOCKS v4  SOCKS v5

Automatic proxy configuration URL

No proxy for

Port number must same with HTTP(S) Test Script Recorder

# RECORDING

## 5. Start the JMeter Proxy Server

- Click “Start” to initial the recording

HTTP(S) Test Script Recorder

Name: HTTP(S) Test Script Recorder

Comments:

State

Global Settings

Port: 8888 HTTPS Domains:

Test Plan Creation Requests Filtering

Test plan content

Target Controller: sistemhesk > CreateNewUser > Recording Controller-CreateNewUser

Grouping: Put each group in a new transaction controller  Capture HTTP Headers  Add Assertions  Regex matching

HTTP Sampler settings

Transaction name

Create new transaction after request (ms):

Retrieve All Embedded Resources

Redirect Automatically  Follow Redirects

Use KeepAlive

Type:

Click Here

Choose the right one!

# RECORDING

## 6. Record the Actions

- Transaction Control
  - ✓ Use to name the transaction
  - ✓ Input the name before proceeding to next transaction

Global Settings

Port:  HTTPS Domains:

Test Plan Creation **Requests Filtering**

Test plan content

Target Controller:

Grouping:   Capture HTTP Headers  Add Assertions  Regex matching

HTTP Sampler settings

Transaction name

Create new transaction

Retrieve All Embedded Resources  Redirect Automatically  Use KeepAlive

Type:

Recorder: Transactions Control

HTTP Sampler settings

Create new transaction after request (ms):



# PERFORMING LOAD TEST

## 2. JMeter Certificate `ApacheJMeterTemporaryRootCA`

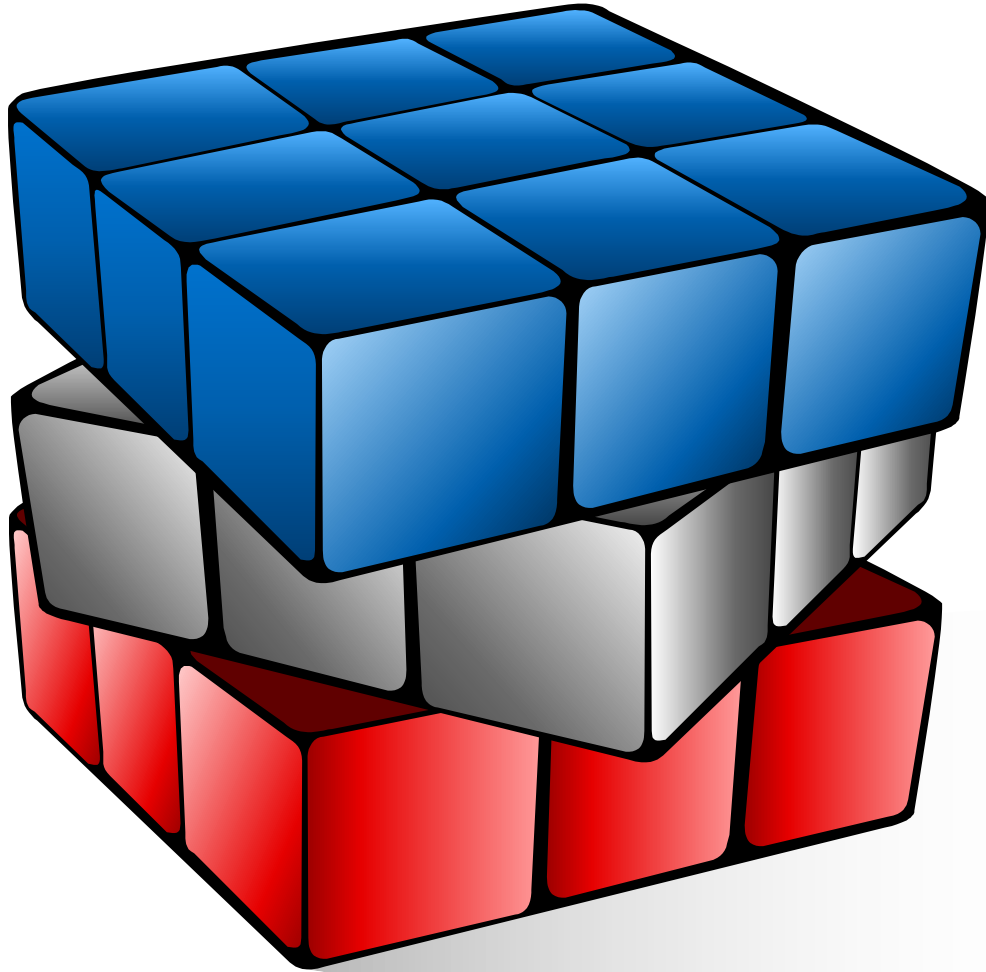
### Chrome:

Setting > Manage Certificate > Trusted Root Certification Authorities > Import >

browse file > ..\apache-jmeter-5.1\bin

### Firefox:

Option > Certificate > View Certificate > Authorities > Import



LET'S DO IT

Transaction Name/Prefix	Activities Create User
Landingpage	Type url <b>your_ip_address</b> /hesk/admin
Login	Fill up login credential <b>administrator, administrator</b>
Clickusers	Click tab <b>users</b>
	Fill up user info <ul style="list-style-type: none"> <li>• Fill up Profile Information               <ul style="list-style-type: none"> <li>✓ Real name: <b>pengguna01</b></li> <li>✓ Email: <b>pengguna01@gmail.com</b></li> <li>✓ Username: <b>pengguna01</b></li> <li>✓ Password: <b>password</b></li> <li>✓ Confirm password: <b>password</b></li> </ul> </li> <li>• Permission               <ul style="list-style-type: none"> <li>✓ Choose : <b>Staff</b></li> <li>✓ Choose : Can run reports (all)</li> </ul> </li> </ul>
Createuser	Click <b>Create User</b>
Logout	Click <b>logout</b>

Transaction Name/Prefix	Activities Create Ticket
Landingpage	Type url <b>your_ip_address</b> /hesk/admin
Login	Fill up login credential <b>pengguna01, password</b>
Newticket	Click tab <b>+New Ticket</b> Fill up the form
Createticket	Click <b>Submit Ticket</b>
Gohome	Click <b>Home</b>
Logout	Click <b>Logout</b>



03

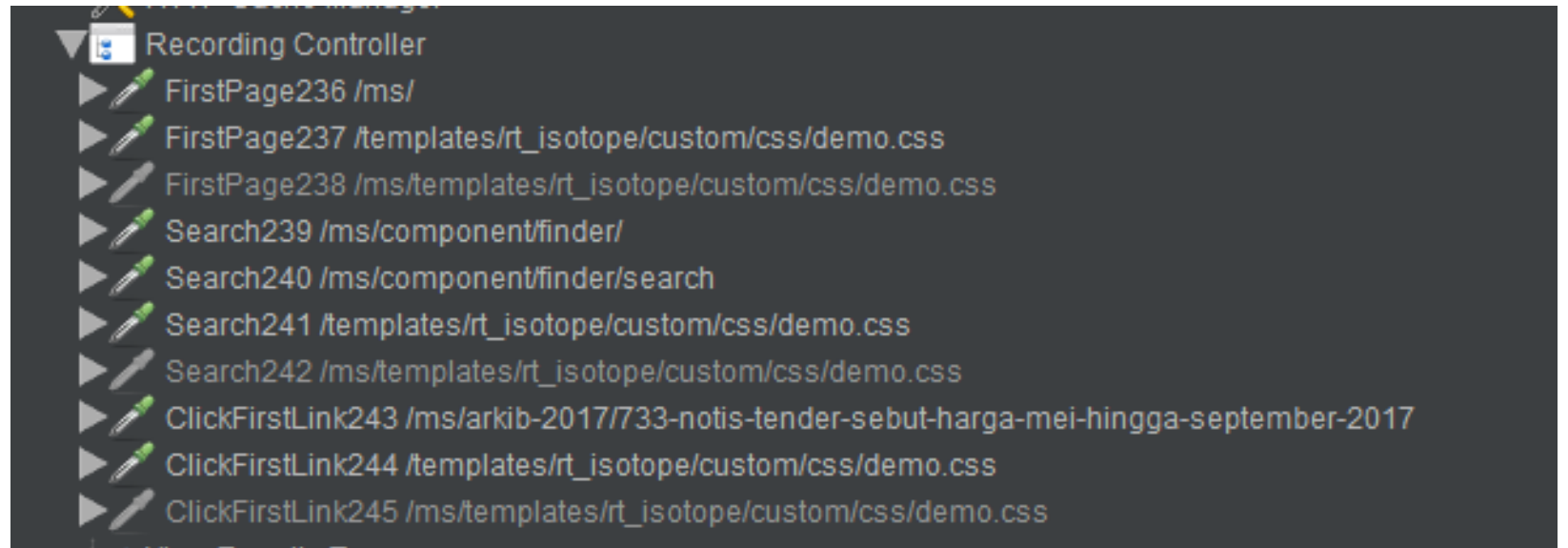
## VERIFYING SCRIPT

- ✓ Recorded Transaction
- ✓ Running the Script
- ✓ View Result Tree
  - Rectify Error Found
  - Response Assertion
- ✓ View Summary Report

# VERIFYING RESULT

## 1. Recorded Transactions

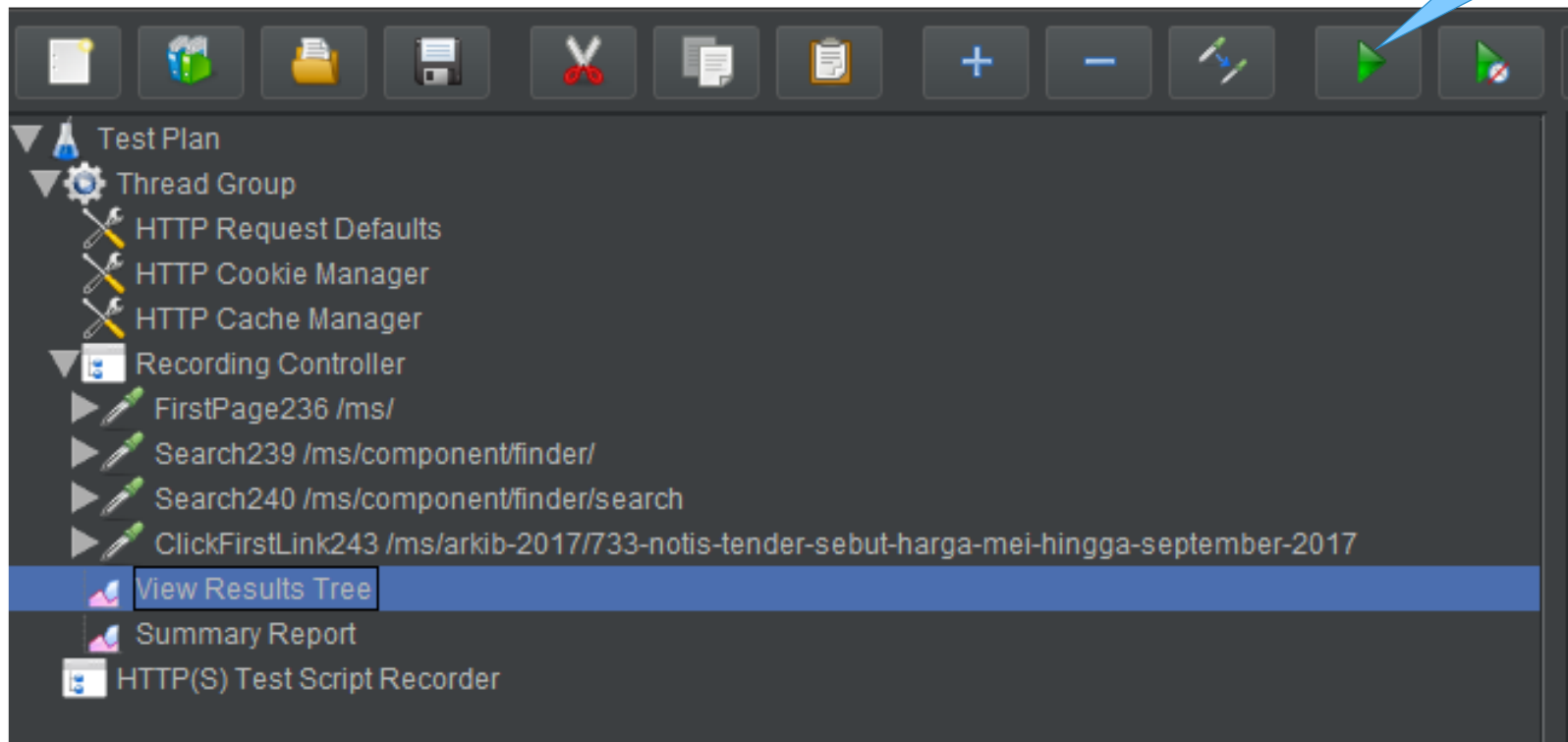
- All the transactions will be recorded under “Recording Controller”
- Can remove unnecessary component such as \*.css, \*.png, \*.txt and so on.



# VERIFYING RESULT

## 2. Running the Scripts

Click Start to run the script



# VERIFYING RESULT

## 3. View Result Tree

- The View Results Tree shows:
  - ✓ A tree of all sample responses
  - ✓ Response code
  - ✓ Assertion result
  - ✓ Time it took to get this response

No error found!!

The screenshot shows a web testing tool interface. The left pane, titled 'Text', displays a tree of test results. Each item in the tree is preceded by a green checkmark, indicating a successful assertion. The tree structure includes:

- FirstPage236 /ms/
- FirstPage236 /ms/ (selected)
- Search239 /ms/component/finder/
- Search239 /ms/component/finder/
- Search240 /ms/component/finder/search
- Search240 /ms/component/finder/search
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:
- FirstPage236 /ms/
- FirstPage236 /ms/
- Search239 /ms/component/finder/
- Search239 /ms/component/finder/
- Search240 /ms/component/finder/search
- Search240 /ms/component/finder/search
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:
- FirstPage236 /ms/
- FirstPage236 /ms/
- Search239 /ms/component/finder/
- Search239 /ms/component/finder/
- Search240 /ms/component/finder/search
- Search240 /ms/component/finder/search
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:
- ClickFirstLink243 /ms/arkib-2017/733-notis-tender-sebut-h:

The right pane, titled 'Sampler result', shows the details for the selected 'FirstPage236 /ms/' response:

- Thread Name: Thread Group 1-1
- Sample Start: 2018-11-28 00:49:45 SGT
- Load time: 6356
- Connect Time: 18
- Latency: 6326
- Size in bytes: 19465
- Sent bytes: 329
- Headers size in bytes: 525
- Body size in bytes: 18940
- Sample Count: 1
- Error Count: 0
- Data type ("text"|"bin"|"): text
- Response code: 200
- Response message: OK

Below the response details, the 'HTTPSampleResult fields' are listed:

- ContentType: text/html; charset=utf-8
- DataEncoding: utf-8



# VERIFYING RESULT

## If error found?

- Check error code (401, 404..) in Response Body, Sampler Result
- Check if token used (variable need to be declared)
- Authentication issue – user account

# VERIFYING RESULT

## If error found?

- Check if there any token used (variable need to be declared)
- Replace the token value with **(.+?)**
- Variable in JMeter

**$\${variable}$**

1. Check the body where the token is created

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta name="csrf-token" content="6d3U1svQtRb7fBQSDgvlm3pcjRhoXLhfQCiQM5dG">
  <meta http-equiv="content-type" content="text/html; charset=UTF-8" />
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0, maximum-scale=1.0, user-scalable=no, shrink-to-fit=no" />
  <link rel="shortcut icon" href="https://splask.mampu.gov.my/favicon.ico">

  <meta content="" name="description" />
  <meta content="" name="author" />
  <title>
    SPLaSK | Sistem Pemantauan Laman Web dan Servis Kerajaan
  </title>
  <link href="https://splask.mampu.gov.my/assets/plugins/pace/pace-theme-flash.css" rel="stylesheet" type="text/css" />
  <link href="https://splask.mampu.gov.my/assets/plugins/bootstrap/css/bootstrap.min.css" rel="stylesheet" type="text/css" />
  <link href="https://splask.mampu.gov.my/assets/plugins/font-awesome/css/font-awesome.css" rel="stylesheet" type="text/css" />
```

2. Right click page before token created

Click Add ->click Post Processors ->click Regular Expression Extractor  
Fill up the details:

Name of created variable:	token
Regular Expression:	"csrf-token" content="(.+?)"
Template (\$1\$ where i is capturing group number, starts at 1):	\$1\$
Match No. (0 for Random):	1
Default Value:	<input type="text"/> <input type="checkbox"/> Use empty default value

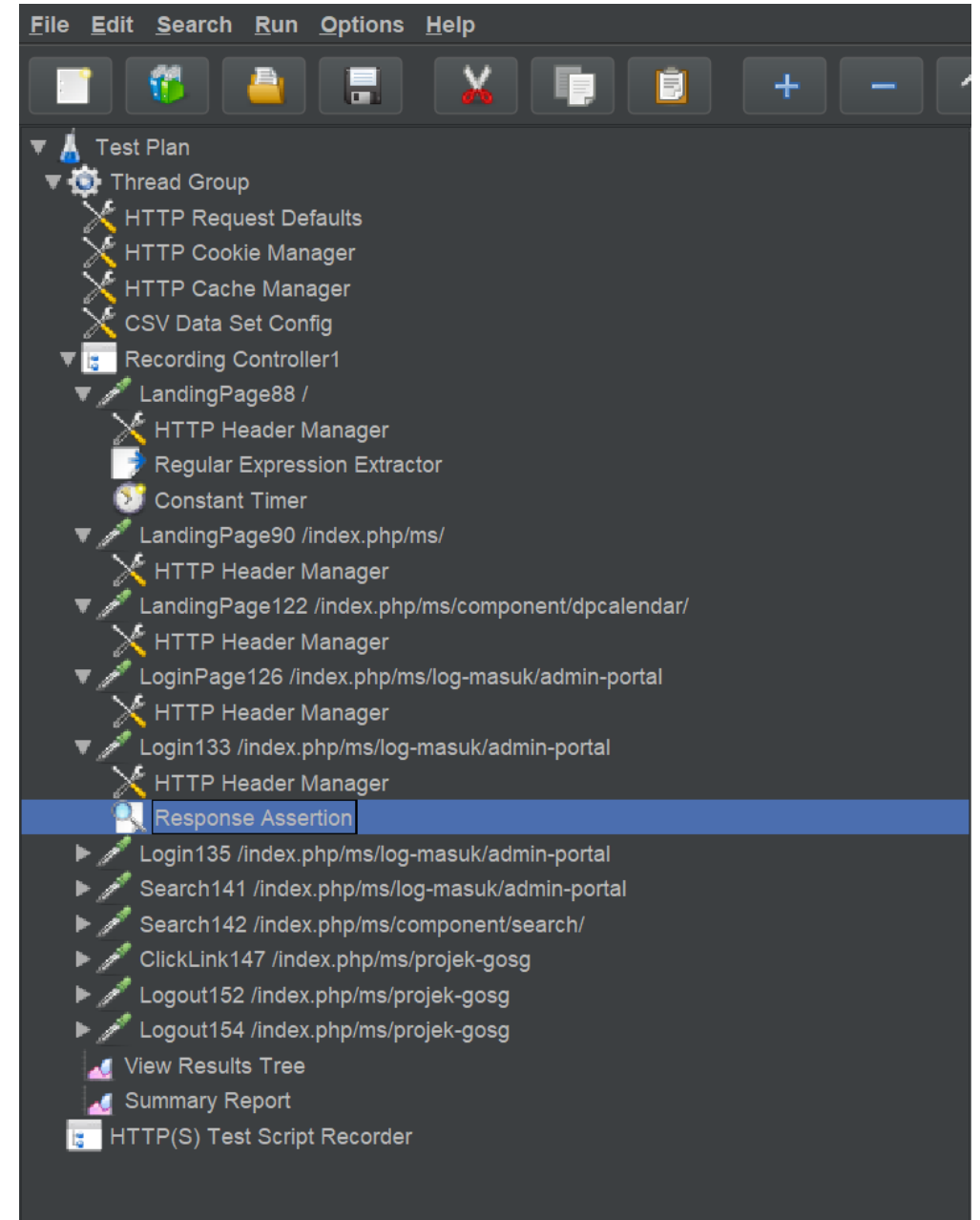
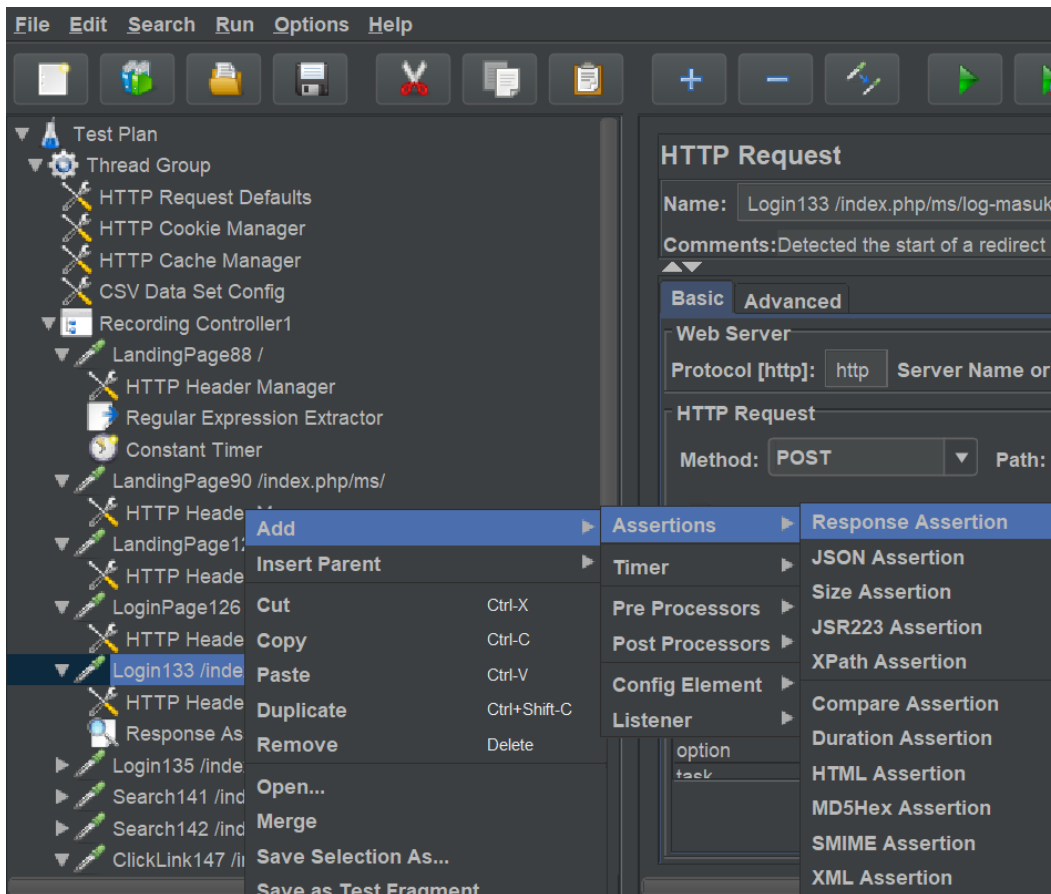
3. At the page where token is created, change the Value into variable defined as above.

Send Parameters With the Request				
Name:	Value	URL Encode?	Content-Type	Include Equals?
_token	$\${token}$	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
email	pat.splaskadm@gmail.com	<input checked="" type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
password	6WnpawAJkCS	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>

# VERIFYING RESULT

## Add Response Assertion

- This let you define the pass or fail criteria for your test



# VERIFYING RESULT

## Response Assertion, TIPS!!

- Go to View Result Tree
- Choose HTML
- Click Response Data
- Choose Unique Word..

The screenshot displays the 'View Results Tree' window of a testing tool. The tree view on the left shows a hierarchy of nodes under 'HTML', with '757 isimaklumatpenggur' selected. The main pane shows the 'Response Body' tab, which contains a yellow background with the following text:

**Pendaftar Akaun Baru SPA9 Berjaya.**

Pastikan anda membaca SOALAN LAZIM (FAQ) dan PANDUAN PENGGUNA Sebelum Menggunakan SPA9.  
Sila klik di sini untuk [Log Masuk](#)

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Pendaftaran Pekerjaan Dalam Perkhidmatan Awam Am Persekutuan (SPA9)

# VERIFYING RESULT

## Response Assertion

Response Assertion

Name: Response Assertion-BerjayaDaftar

Comments:

Apply to:

Main sample and sub-samples  Main sample only  Sub-samples only  JMeter Variable Name to use

Field to Test

Text Response  Response Code  Response Message  Response Headers

Request Headers  URL Sampled  Document (text)  Ignore Status

Request Data

Pattern Matching Rules

Contains  Matches  Equals  Substring  Not  Or

Patterns to Test

Patterns to Test	
1	Pendaftar Akaun Baru SPA9 Berjaya

Add Add from Clipboard Delete

# VERIFYING RESULT

## 3. View Summary Report

- The summary report creates a table row for each differently named request in your test
- JMeter takes into account the total time over which the requests have been generated

**Summary Report**

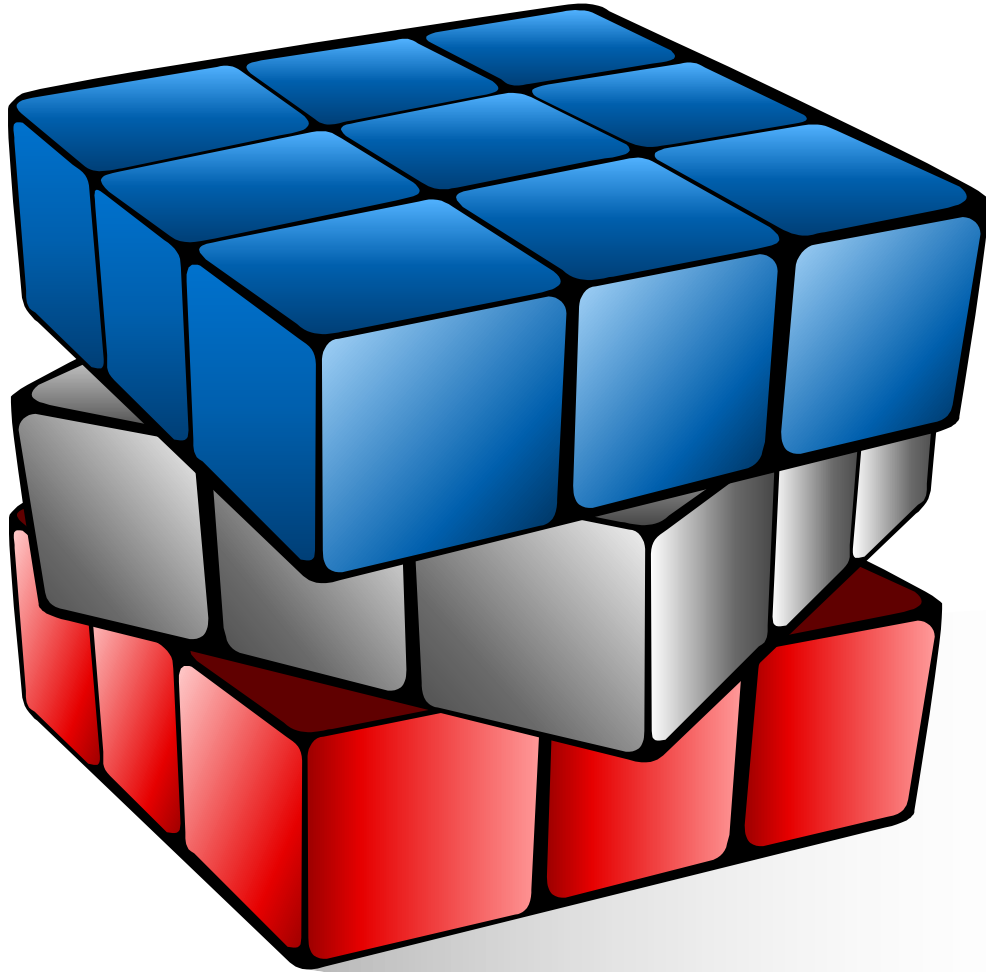
Name:

Comments:

Write results to file / Read from file

Filename   Log/Display Only:  Errors  Successes

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
FirstPage236 /ms/	8	5913	5011	7075	836.26	0.00%	8.2/min	2.60	0.05	19397.4
Search239 /ms/comp...	8	259	162	337	61.28	0.00%	9.2/min	0.07	0.07	435.0
Search240 /ms/comp...	8	5873	5145	6763	578.64	0.00%	8.4/min	1.92	0.07	14100.2
ClickFirstLink243 /ms...	8	5075	4614	5556	317.39	0.00%	8.5/min	2.47	0.08	17883.2
TOTAL	32	4280	162	7075	2405.41	0.00%	27.9/min	5.89	0.22	12954.0



LET'S DO IT

04

## PERFORMING LOAD TEST

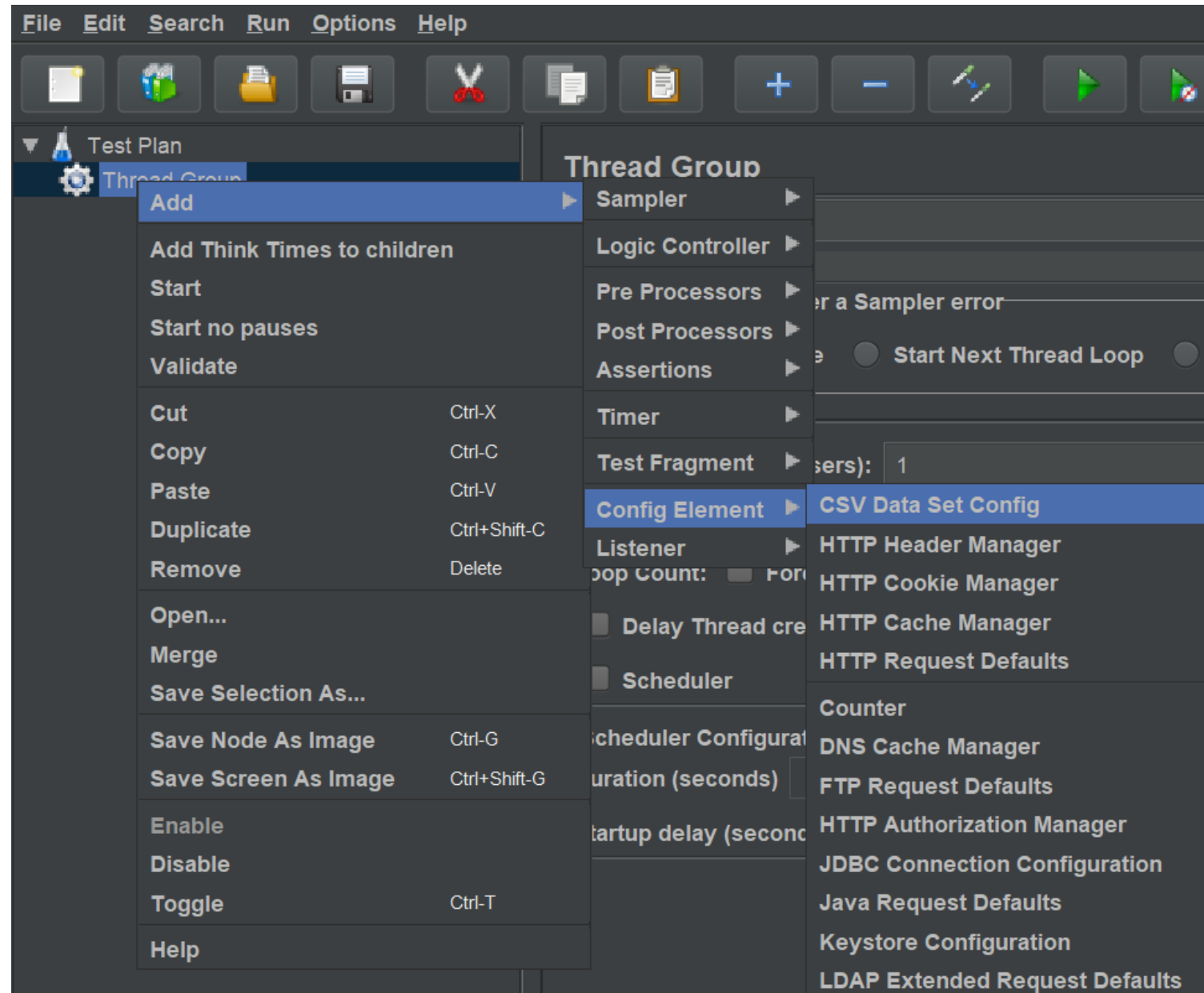
- ✓ CSV Data Set
- ✓ Timer (Think Time)
- ✓ Plan your Load



# PERFORM LOAD TEST

## 1. Add CSV File

- This element that allows you to use external data sets in a CSV format.



# PERFORMING LOAD TEST

## Add CSV File

The screenshot displays the Apache JMeter GUI. The left sidebar shows a tree view with 'Test Plan' expanded to 'Thread Group', where 'CSV Data Set Config' is selected. The main panel shows the configuration for this component. The 'Name' field is 'CSV Data Set Config'. The 'Comments' field is empty. The 'Configure the CSV Data Source' section contains the following settings:

Property	Value
Filename	C:/Users/mieza/Desktop/portalmtycoe.csv
File encoding	UTF-8
Variable Names (comma-delimited)	
Ignore first line (only used if Variable Names is not empty)	True
Delimiter (use '\t' for tab)	,
Allow quoted data?	False
Recycle on EOF ?	True
Stop thread on EOF ?	False
Sharing mode	All threads

A yellow box highlights the 'Filename', 'File encoding', 'Ignore first line', 'Delimiter', 'Allow quoted data?', 'Recycle on EOF?', 'Stop thread on EOF?', and 'Sharing mode' fields.

# PERFORMING LOAD TEST

## Add CSV File

### CSV Data Set Config

Name: CSV Data Set Config

Comments:

#### Configure the CSV Data Source

Filename	<input type="text" value="C:/Users/mieza/Desktop/datasetesk2.csv"/>	<input type="button" value="Browse..."/>
File encoding	UTF-8 <input type="button" value="v"/>	
Variable Names (comma-delimited)	realname,username	
Ignore first line (only used if Variable Names is not empty)	True <input type="button" value="v"/>	
Delimiter (use '\t' for tab)	,	
Allow quoted data?	False <input type="button" value="v"/>	
Recycle on EOF ?	False <input type="button" value="v"/>	
Stop thread on EOF ?	True <input type="button" value="v"/>	
Sharing mode	All threads <input type="button" value="v"/>	

# PERFORMING LOAD TEST

## Add CSV File

**HTTP Request**

Name: Login133 /index.php/ms/log-masuk/admin-portal

Comments: Detected the start of a redirect chain

Basic Advanced

Web Server

Protocol [http]: http Server Name or IP: Port Number:

HTTP Request

Method: POST Path: /index.php/ms/log-masuk/admin-portal Content encoding: utf-8

Redirect Automatically  Follow Redirects  Use KeepAlive  Use multipart/form-data  Browser-compatible headers

Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?
username	\${loginid}	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
password	\${password}	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
Submit		<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
option	com_users	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
task	user.login	<input type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>
task	user.login	<input checked="" type="checkbox"/>	text/plain	<input checked="" type="checkbox"/>

Detail Add Add from Clipboard Delete Up Down

# PERFORMING LOAD TEST

## Timer

- Timers are used to define the time period that you want to wait between requests
- By default, a JMeter thread sends requests without pausing between each request
- It is recommended that to specify a delay by adding one of the available timers to the Thread Group

The screenshot displays the Apache JMeter GUI. The left sidebar shows a tree view of the test plan structure. The 'Constant Timer' element is selected and highlighted in blue. The right pane shows the configuration for the 'Constant Timer' element. The 'Name' field is set to 'Constant Timer'. The 'Thread Delay (in milliseconds)' field is set to '300'. The 'Comments' field is empty.

File Edit Search Run Options Help

Test Plan

- Thread Group
  - HTTP Request Defaults
  - HTTP Cookie Manager
  - HTTP Cache Manager
  - CSV Data Set Config
  - Recording Controller1
    - LandingPage88 /
      - HTTP Header Manager
      - Regular Expression Extractor
      - Constant Timer**
      - LandingPage90 /index.php/ms/
        - HTTP Header Manager
      - LandingPage122 /index.php/ms/component/dpcalendar/
        - HTTP Header Manager
      - LoginPage126 /index.php/ms/log-masuk/admin-portal
        - HTTP Header Manager
      - Login133 /index.php/ms/log-masuk/admin-portal
        - HTTP Header Manager
        - Response Assertion
      - Login135 /index.php/ms/log-masuk/admin-portal
      - Search141 /index.php/ms/log-masuk/admin-portal
      - Search142 /index.php/ms/component/search/
      - ClickLink147 /index.php/ms/projek-gosg
      - Logout152 /index.php/ms/projek-gosg
      - Logout154 /index.php/ms/projek-gosg
      - View Results Tree
      - Summary Report
    - HTTP(S) Test Script Recorder

# PERFORMING LOAD TEST

## Plan your Load

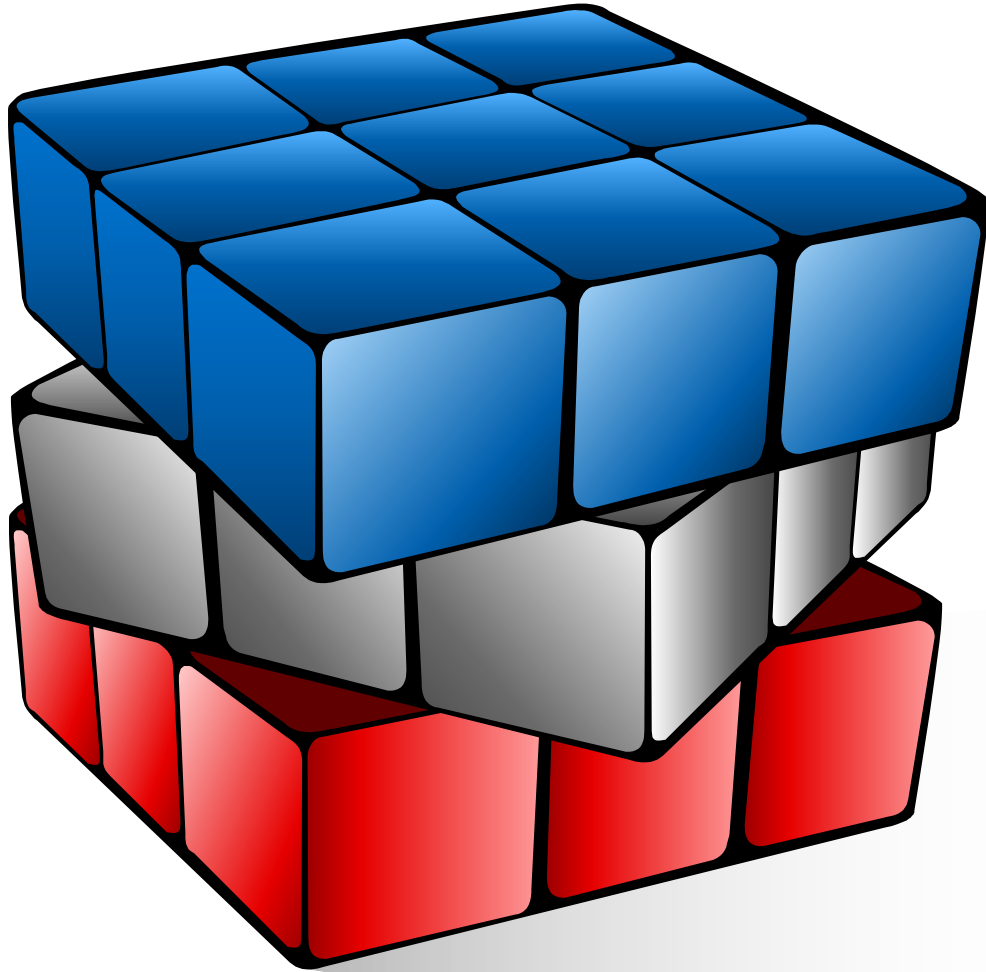
No	Business Transactions	Weightage (%)	No of Concurrent User			
			Iteration 1	Iteration 2	Iteration 3	Stress Test
1	<u>BizTxn 1:</u> Transaction 1	60	30	60	120	300
2	<u>BizTxn 2:</u> Transaction 2	10	5	10	20	50
3	<u>BizTxn 3:</u> Transaction 3	10	5	10	20	50
4	<u>BizTxn 4:</u> Transaction 4	20	10	20	40	100
	<b>TOTAL</b>	<b>100</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>

Transaction	Iteration 1	Thread Properties	Iteration 2	Thread Properties	Iteration 3	Thread Properties	Stress Test	Thread Properties
<u>BizTxn 1</u>	30	30 thread in 120 sec (2 min)	60	60 thread in 420 sec (7 min)	120	120 thread in 900 sec (15 min)	300	300 thread in 1800 sec (30 min)
<u>BizTxn 2</u>	5	5 thread in 10 sec	10	10 thread in 60 sec (1 min)	20	20 thread in 120 sec (2 min)	50	50 thread in 300 sec (5 min)
<u>BizTxn 3</u>	5	5 thread in 10 sec	10	10 thread in 60 sec (1 min)	20	20 thread in 120 sec (2 min)	50	50 thread in 300 sec (5 min)
<u>BizTxn 4</u>	10	10 thread in 60 sec (1 min)	20	20 thread in 240 sec (3 min)	40	40 thread in 600 sec (10 min)	100	100 thread in 1200 sec (20 min)
<b>Scheduler</b>	<b>50</b>	<b>180 sec (3 min)</b>	<b>100</b>	<b>720 sec (12 min)</b>	<b>200</b>	<b>1200 sec (20 min)</b>	<b>500</b>	<b>2400 sec (40 min)</b>

# PERFORMING LOAD TEST

Test plan > Add > Listener > jp@gc – Active Threads Over Time

Monitor thread using jp@gc – Active Threads Over Time



LETS DO IT





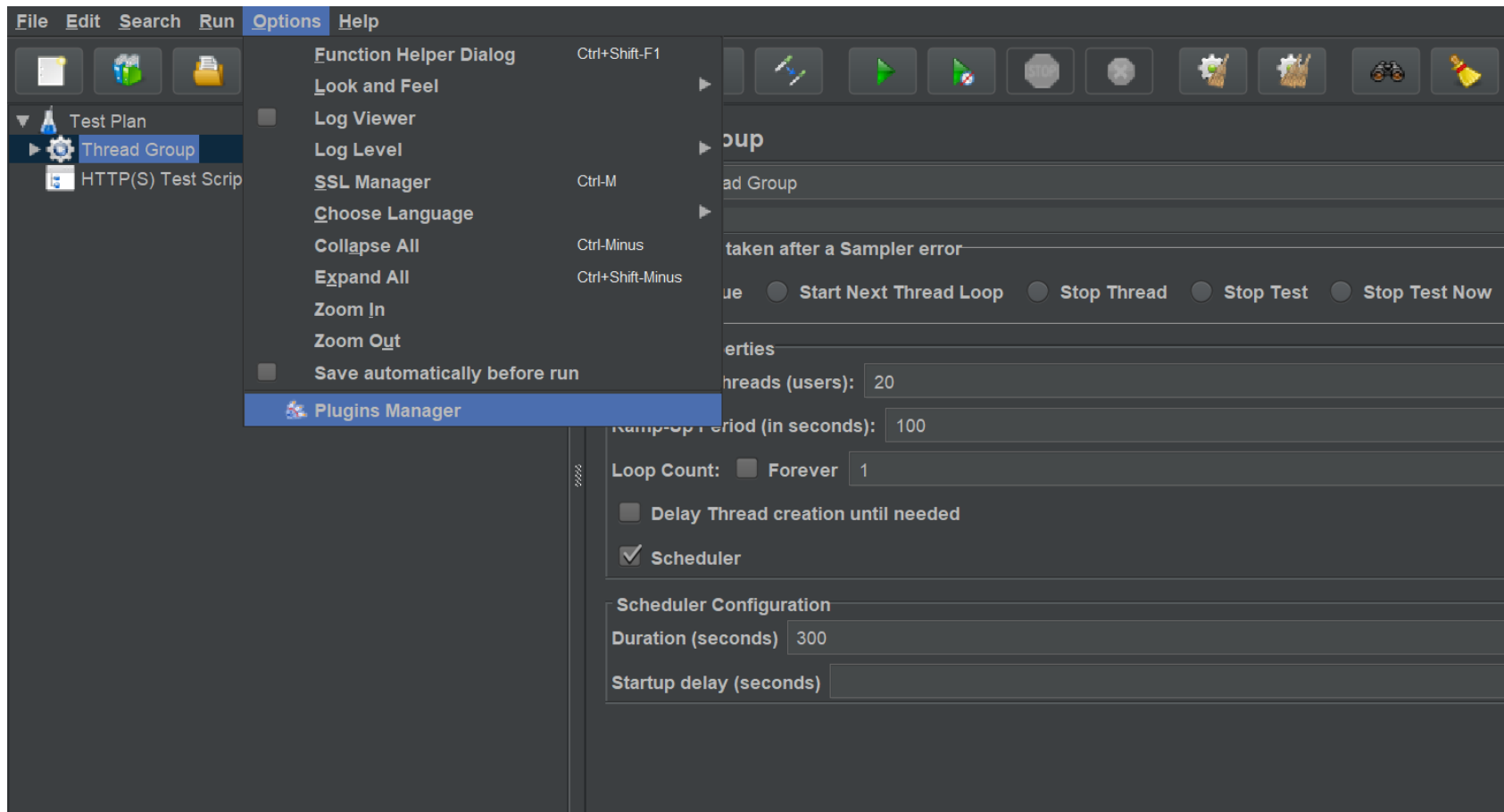
**SELAMAT  
MENCUBA!!**

**TERIMA KASIH**

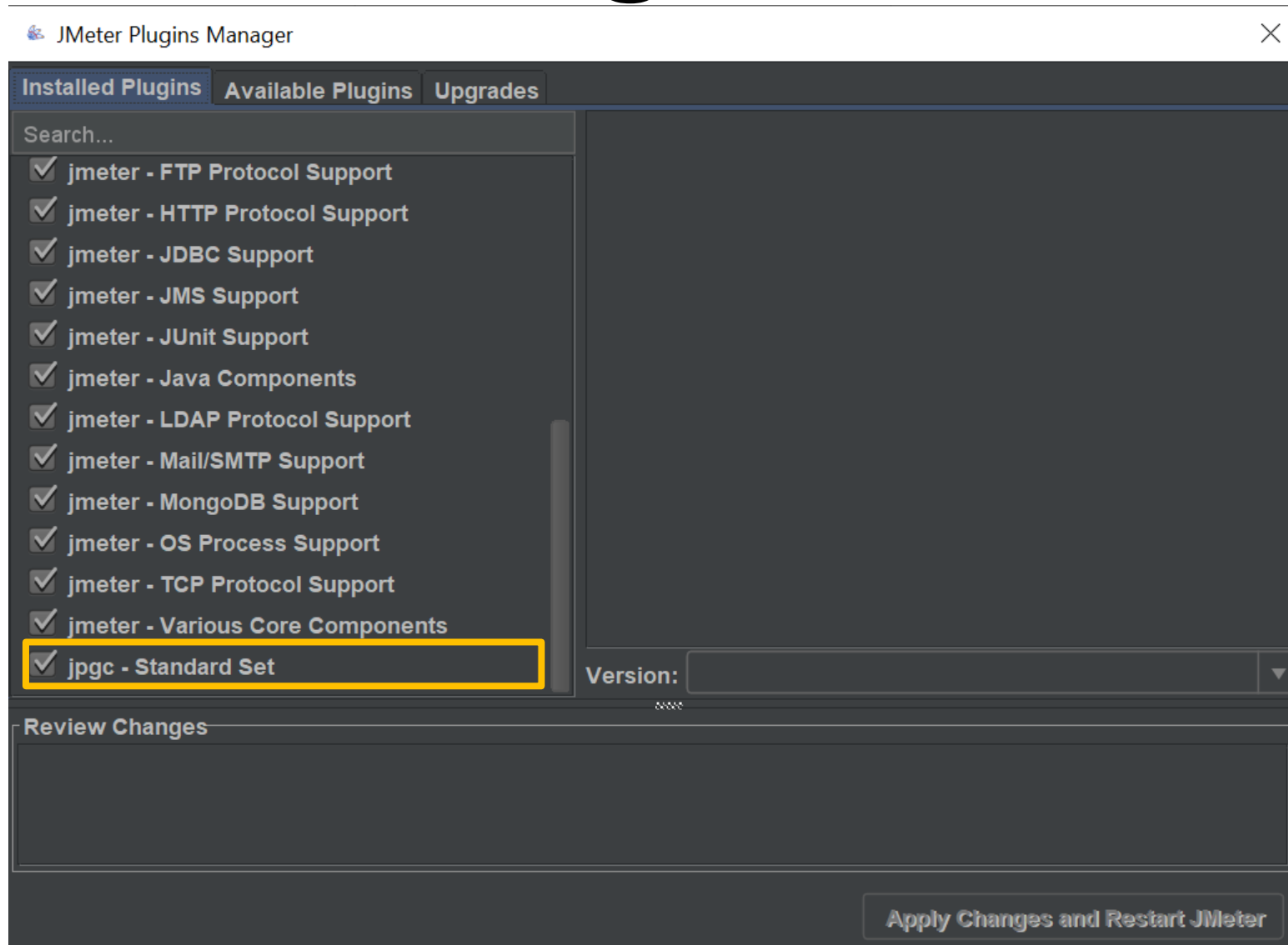


# JMeter Plugins Installation Guide

Download [plugins-manager.jar](#) and put it into `lib/ext` directory, then restart JMeter.



# JMeter Plugins Installation Guide



# JMeter Plugins Installation Guide

Available Plugin > select jpgc-Standard Set > Apply Changes and Restart JMeter

