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Project Report

ID5.17: New LearnWeb tool v.0.3 evaluation outcomes

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Authors (Partner)	Alessandro Mazzetti (Giunti Labs), Mar Perez (UPF)
Contact Person	Alessandro Mazzetti (Giunti Labs).
WP/Task responsible	Giunti Labs
EC Project Officer	Martin Májek

Abstract (for dissemination)

This document describes the evaluation of the new version of LearnWeb2.0, called: LearnWeb v.0.3 and KRService v.0.3. After a brief introduction, the evaluation methodology is described, both in terms of functionality tests and of quality tests. Then the loadability tests are described along with the usability aspects. A summary of the functionality follows, with the final recommendations for future versions.

Keywords List   WP5, internal deliverable, evaluation, LearnWeb2.0, KRService, LearnWeb v.0.3, KRService v.0.3

1   Version History

Version	Status	Date	Author(s)
0.1	Draft	18.05.09	Alessandro Mazzetti, Giunti Labs
0.3	Draft	09.06.09	Mar Perez, UPF
1.0	Final	10.06.09	Alessandro Mazzetti, Giunti Labs

2   Summary of Changes

Version	Section(s)	Synopsis of Change
0.1	All	Draft: Table of Contents
0.3	All	All chapters filled
1.0	All	Final adjustments

3 Table of Contents

4 Introduction (Giunti)

This document describes the evaluation of the new version of LearnWeb2.0, here on called for convenience:

- LearnWeb v.0.3
- KRService v.0.3

This document refers to the following:

- ID5.13 (new requirements), delivered on 28-11-2008,
  http://hdl.handle.net/1820/1607
- Outcome of Sofia and Düsseldorf meetings, document of 15-12-2008
  http://docs.google.com/View?docid=ddhtqnsh_663c8h7vtfs
- DIP-4 objectives and tasks, document of 19-12-2008
  http://docs.google.com/Doc?id=ddsnp3t6_28hcxmxphf
- ID5.19.2 (Localized LearnWeb) delivered on 27-03-2009
  http://dspace.ou.nl/handle/1820/1889
- ID5.15 (New Core specifications v2) delivered on 10-04-2009
  http://dspace.ou.nl/handle/1820/1905
- ID5.16 (New version of LearnWeb tool v.0.3) delivered on 27-05-2009
  http://hdl.handle.net/1820/1943

5 Evaluation methodology (UPF)

In order to provide a complete analysis of all the system functionalities we have developed a Unit and Integration tests. The Unit testing searches for defects in, and verifies the functioning of software that is separately stable. It has been run by a software expert different from the developer. The Integration testing consists in verifying if the units work evaluated in the Unit testing are correctly integrated and related among them: interfaces between units, complete processing chain and relation controls within the system including several modules and /or in combination with database. We also performed a test of the functionality requirements established in deliverable ID5.15 and ID5.16. The results of these tests are indicated and explained in the following tables:

- **Table 1**: Unit and Integration Test: Calamities
- **Table 2:** Unit and Integration Test: Functionality
- **Table 3:** Unit and Integration Test: Integration
- **Table 4:** Unit and Integration Test: Storage
- **Table 5:** Functional Requirements Test

We haven't distinguish the aspects that correspond to the Unit test or the Integration test for providing an easy reading, however the distinctions and a more detailed description of each of them are explained in (D 4.1 Evaluation Plan, p. 118 and 119). In the observation column, we marked with Fail (in red) those aspects that doesn't work properly and have to be reviewed, with Ok (in green) those which work properly and with Ok (in orange) those which work fine but have to be reconsidered for different aspects.

5.1 Functionality Tests

Unit and Integration Test: *Calamities*	
Aspect: Monkey test	**Observations**
Authentication	
Authentication CAS	Ok. Not possible to test yet since Learnweb is not incorporated into Liferay at this moment. http://phpcake.it.fmi.uni-sofia.bg is a standalone application.
Registration	
Registration process	Ok. No problems with the registration process.
Single sign On	
Manage Resources	
Create a new group	Ok. ***Recommendation*** - Message needed for informing the user that has to accept the authorization required by the tool.
Upload a picture	Ok. Error message: "Warning 512" ***Recommendation*** - Message needed for informing the user that has to accept the authorization required by the tool. - When uploading a picture, a new window is opened. Once published the resource, all the process is done in this window and a new menu with the *home* access appear in the upper menu. The user has now two windows opened with the same window. Once uploaded the resource, the user should be redirected again to the main window with the main program page.
Upload an audio file	Fails. The system takes too long for uploading the resource and never finishes. There appears an error message "512". ***Recommendation*** - Message needed for informing the user that has to accept the authorization required by the tool.
Upload a video	Ok.
Upload a file	Ok. Explanation text if the field is too extensive.
My Resources	

My Bookmarks	Fails. Cannot connect to Delicious using the correct login credential.s
My LearnWeb Resources	Ok.
My Tags	Fails. Tags included when uploading a resource of any type are not included in my list of tags.
My Comments	Ok. Once introduced the comment it is not deleted from the text space for introducing the comments.
My Rates	Ok
My groups	Fails. Once *My groups* is opened the user is redirected directly to the GroupMe! Page and lose the context of the tool. ***Recommendation*** - Open the *My Groups* in another navigation page.
Home page and pages flow	
Welcome message	Fails. Welcome message displayed only in English and not in other languages.
Login and registration	Ok
Search	Ok
Help	Fails. ***Recommendation*** A help menu with manuals and user guides is missing
Navigation Buttons	Ok. ***Recommendations*** - Back button is not needed on front page, and the place and lay-out is not ideal. I would be better if locate in a place where always visible. - Missing forward button.
My profile	Fails. Functionality not available. ***Recommendation*** - Include a functionality My Profile in the top upper menu for allowing the user to manage his/her profile
Log files	Fails. Functionality not available.
Toolbars	
Toolbar on the web browser	Ok. Learnweb provides an extension of the tool that can be incorporated in the web browser of the user.
Tag Clouds	
Tag clouds in the home page	Ok. ***Recommendation*** - Differentiate the words also by colours.
Downloading	
Download from the search page	Ok. ***Recommendation*** - When downloading a video or an image a new image of the profile and *My resource* menu appear on the left hand.

	It should be deleted because the user can access always to this resources from the upper menu, always visible.
Supporting UoL	
Supporting a UoL as a zip file	Ok. The tool already accepts the UoL as a simple zip file. Waiting for the integration of the UoLs as a learning object in the Fedora repository.
Category Management	
Select a category for the search	Fails. The system doesn't seem to do anything when searching by categories.
Sharing	
Sharing resources with other users registered.	Fails. Not mail received when sharing a resource with another user using the e-mail address.
Integration with PDP	
Not provided yet	-
Integration with PCM	
Not provided yet	-
Integration with TenTube	
Integration when uploading a video	Ok.
Functionalities over resources	Functionalities related with the resources uploaded to the tool.
Comment Rating	Ok.
Managing Abuses	Ok.
Stimulating Users	*Not applicable here. This functionality will be analyzed when testing the tool with real users.*

Table 1 Unit and integration test: *Calamities*

Unit and Integration Test: *Functionality*	
Aspect	**Observations**
Field type	Which values are accepted or refused and which length is supported
Login field	Ok. All values and any length except spaces.
Pass field	Ok. All values and any length.
URL field	Ok. It only support strings with an URL format.
Other metadata fields	Ok. All values and any length.
Validity test date fields	
Date in the Upload a file option	Ok. The date the current day is automatically included in the description.
Checking the overview screens	Checking if all the overview screens are present.
Home overview	Ok. Welcome message not available when changing language.
My HomePage	Ok

Table 2 Unit and Integration test:*Functionalities*

Search	Ok. Only available in the home page. ***Recommendation*** Make the search bar available always from any of the overview pages.
My Profile	Fails. Page not available in the upper menu. ***Recommendation*** Include *My Profile* functionality in the upper menu at the same level of *My Home Page*.
Paging up and paging down on overview screens	
Home overview	Ok. Welcome message not available when changing language.
My HomePage	Ok
Search	Ok. Only available in the home page. ***Recommendation*** Make the search bar available always from any of the overview pages.
My Profile	Fails. Page not available in the upper menu. ***Recommendation*** Include *My Profile* functionality in the upper menu at the same level of *My Home Page*.
Completeness	Checking if all the buttons or fields are present
Athorizing	Fails. An error occurs when authorizing the accounts unless the accounts are authorized.
Change photo in the profile	Fails. Functionality not included.
Accessing to a resource from *My profile* page	Ok. When accessing to these resources they are opened in the same page and the user looses the context of the tool. ***Recommendation*** - Open the resources in another tab.
Upload modified version (in the Recourse overview)	Ok. Attention!!!!. Some sentences in German ...
Position on screen	Check if all the objects are on the right position on the screen
Searching bar	It should be located in the upper menu always.

Unit and Integration Test: *Integration*	
Aspect	**Observations**
Integration between different subsystems of the application	Ok.
Testing Broadcasts (internal messages) sent from one system to other systems	Ok. The users can search and visualize the public KRs uploaded by other users .

Table 3 Unit and Integration test: *Integration*

Unit and Integration Test: *Storage*	
Aspect	**Observations**
Deleting records	Ok.Users can delete a record in their personal page.
Deletion of multiple records at the same time	Fails. The system does not provide the option to delete a set of records at the same time.
Deletion of all records in one action	Fails. The system does not provide the option to delete a set of records in one action (with a unique button).
Check if the fields are stored correctly when storing a new record.	Ok. The system checks if the fields introduced are correct. The user can see this fields when press over the record.
Concurrent usage	Ok. The tool can be used for concurrent users.
Time out	Ok.

Table 4 Unit and Integration Test: *Storage*

Functional Requirements Test	
Aspect	**Observations**
Create a Knowledge Resource	Ok.Users can delete a resource in their personal page.
Deletion of multiple records at the same time	Fails. The system does not provide the option to delete a set of resources at the same time.
Deletion of all records in one action	Fails. The system does not provide the option to delete a set of resources in one action (with a unique button).
Check if the fields are stored correctly when storing a new record.	Ok. The system checks if the fields introduced are correct. The user can see this fields when press over the record.
Concurrent usage	See Loadability tests provided in sec. 6 and in the annex.
Time out	Ok.

5.2 Quality Tests

Quality test: Reliability *Maintain a specified level of performance when use under specified conditions*	
Aspect	**Observations**
Maturity	- Ok. The tool doesn't fall down when an error is produced.
Fault tolerance	- Ok. The tool maintain a level of performance in cases of software faults.
Recoverability	- Fails. The tool doesn't maintain the information and the data introduced by the user when
Reliability	- Ok

Quality test: Usability *Be understood, learner, used and attractive to the user, when used under specified conditions*	
Aspect	**Observations**

Understandability	The tool is easy to understand but some aspects have to improve: Fails.
	  - In the option: Upload a file, the first option "type of file" is not enough visible.
	  - The tree of the categories resource has to be clarified.
	  - When a user search a file in the main page, press over a KR and it is a file (pdf, word, …) the icon of the file is not enough clear to understand that the user can press over it to visualize the resource.

Learnability	The users have problems to know where they are or to return to previous steps: Fails.
	  - Add an option in each page to come back to the previous page.
	  - Add an option to know in which option (My favourites, My resources…) the user is in each moment.

Operability	Fails
	  - If the user presses over "My favourites" an error occurs.
	  - If the user presses over "My groups" the groupme.org webpage is opened in the same window, then if the user closes this window the user can not return to the learn webpage. (Open all the webpages in a new

	window) - In the main page, the user can visualize three white spaces and the first one only contains this sentence:"welcome_home_msg"
Attractiveness	- Ok

6 Summary of the Loadability tests (UPF)

This section presents the summary of the main results of the loadability tests. The aim of this evaluation is to analyze if the system is prepared to support a concurrent access of different users and its robustness when this occurs. The points here presented have been extracted from a document provided by Cornelia from the Sofia University and involved in TF15 here included as an appendix.

The load tests have been carried out using the JMeter (http://jakarta.apache.org/jmeter/) and over the LearnWeb tool installed in the following address: http://learnweb.it.fmi.uni-sofia.bg/. It has been used a ramp test with up to 300 simultaneous users for 10 minutes duration and 10 seconds between clicks. A test is set to continue when a sample error occurs. The tool measures the number of samples, the standard deviation, the throughput, the percentage of detected error, etc. There have been also analyzed the graph, aggregation and the summary results recorded by JMeter listeners: Graph results, Spine Visualizer, Aggregate Results, Summary results, View results in a Table and View Tree Results (see more information in the Annex).

From the analysis with the JMeter there have been extracted two main conclusions:
1. There are no requests with error.
2. Following links have average time more than 8 s and code should be improved:

URL	Response Time (ms)
/	134179
/users/logint?loginform=1	244129
/resources/view/favicon.ico	78171
/lang/eng	61171
/lang/bul	61896
/search	61494
/resources/view/resource:1042	63241

Table 5 Links with an average time of more than 8 seconds that should be improved.

7 Summary of the usability aspects evaluated (UPF)

This section presents a summary of the results extracted from the usability study of the interface according to the ID5.15 user interface chapter 3. We analyze for each of the main aspects documented in ID5.15 if they are correctly integrated in the actual too. We also provide a brief explanation of how they have been implemented in the

LearnWeb_v0.3 and some recommendations for improving their usability and functionality.

7.1 Home page and page flow

The information is organized in three main columns: (a) a welcome message on the left of the screen, (b) a recent uploaded files in the centre and (c) and a tag cloud with the main tags of the tool. All works properly except when the language is changed in the language selection. In this case, the application fails, the welcome message on the left hand of the screen disappears.

There is also in the main page a *back* button. When the user enters for the first time in the application, it doesn't make sense to include this button because the user cannot come back to anything. It should be hidden until the user performs an action in the page.

The registration functionalities are located on the right-hand of the upper menu together with the language functionalities.

Once the user is registered, appears in the upper menu the functionality *My Home Page*. It allows the user to access to all the functionalities related with the resource management.

When the user access to one of the functionalities in *My Resources* it appears on the left hand of the screen the profile and again the functionalities related with the resources. This should be deleted from this functionality overview pages and added as a new functionality in the upper menu for managing the profile and the accounts to the integrated tools called *My profile.*

Recommendations
- Solve the problem of the welcome message for the different languages.
- Introduce a title in the central column indicating that this corresponds to the last uploaded files. E.g. "Last resources!"
- Delete the functionality *Back* of the Home page when the user enters the application for the first time.
- Add the functionality *My profile* in the upper menu at the same level of *My home page* only for registered users.
- Delete the functionality of *My profile* in the overview pages of each of the functionalities in *My Resources.*

8 Summary of the functionalities evaluated (UPF)

This section presents a summary of the results extracted from the analysis of the functional evaluation, tables Table 1 and Table 2. We have organized them according with the basic requirements extracted from the description of the functionalities in documents ID5.15 and ID5.16.

8.1 Authentication

The authentication functionality has not been tested because the tool has been analyzed as a standalone application. We will provide the test outcomes when integrating the tool in the whole learning flow process.

8.2 Registration

No problems were detected with the registration process. More tests outcomes will be provided when integrating the tool in a framework such as LifeRay. The registration should be then through this tool and the user should access to the tool directly.

Just some recommendations about the registration to the tools integrated in the LearnWeb_v0.3 tool. Since *My profile* functionality is not included in the main upper menu, the user can only authorize the access to the rest of the tools from the overview pages of the *My Resources* functionality.

8.3 Single Sign On

The single sign on functionality has not been tested because the tool has been analyzed as a standalone application. We will provide the test outcomes when integrating the tool in the whole learning flow process. However, good results has been observed in the previous version of the tool LearnWeb_v0.2 when integrated in a LifeRay framework (Agora Pilot, 2nd cycle).

8.4 Home page and pages flow

See recommendations and comments in section 7.1.

8.5 Toolbars

The functionalities explained in the ID5.15 are correctly implemented. However, there should be a link in the Home Page for downloading this extension of the too.

Recommendations
- Add a link to the toolbar functionality from the Home page.
- Add a help tab in the main menu explaining how it works.

8.6 Tag Clouds

The tag cloud is visualized only in the home page. The user can link to the more used concepts from it. However, the tag cloud doesn't use colours. To add colours will improve the usability and the attractiveness of the tool.

Recommendations
- Add colours to the tag cloud

8.7 Downloading

The downloading functionality work properly. The user has two possibilities by searching a resource using the search bar and by using the extension of the web-browser of the LearnWeb_v03. Both cases work properly. Nevertheless, when using the web-browser bar the upload resource that appears doesn't correspond with the overview page of the upload resources of the tool. The different versions should coherent.

Recommendations

- Solve the incoherent version of the web-browser tool and the search functionality for uploading a resource.

8.8 Supporting UoL

This functionality is partially integrated. The current tool accept to load a zip file and mark it as a UoL, however, the integration with the UoL players still remain unsolved. This aspect should be discussed with the members from WP6.

Recommendation

- Contact the developers from WP6 for integrating the UoL players in the tool.

8.9 Category management

The user can use categories for searching and also for classifying the resources. However, this functionality seems not useful because the results of the search don't vary for the user.

Recommendation
- Add a help icon for explaining how to use the categories in the search for motivating its use.

8.10 Resource groups

The user can manage his/her groups through the GropMe! Web 2.0 tool. The groups are treated as resources and this facilitates the management of them for the user. Only one aspect should be improved in the current implementation: when accessing the functionality *My Groups* this is opened in the same page of the tool and the users looses the context.

Recommendation
- Open the *My Groups* functionality in another tap of the browser or include it as an integrated page in the tool.

8.11 Bookmark

The bookmark process is done using the Delicious tool. There are some problems when accessing the tool. An authorization form appears but, when introducing the login credentials, the tool does not accept it.

Recommendation

- Solve the integration problem with the Delicious tool.

8.12 Sharing

Sharing is defined in ID5_15 as the action that a user does when he/she wants to share a resource with others. Two different processes are distinguished when sharing a resource: a) sharing a resource with someone and b) accepting a resource.

Two possibilities were proposed in the ID5_15 for implementing the *sharing* functionality: recommending interested users and sending an e-mail. The current version of the tool implements the e-mail functionality. However, when including an e-mail address for sharing a particular resource, the system doesn't respond.

Recommendation

- Make the sharing functionalities more visible for the user. Use more attractive colours and typographies.

8.13 Integration with PDP

The current document treats the LearnWeb_v0.3 as a standalone application. This functionality will be tested when integrating the tool in a platform.

8.14 Integration with PC

The current document treats the LearnWeb_v0.3 as a standalone application. This functionality will be tested when integrating the tool in a platform.

8.15 Integration with TenTube

The user can connect directly to his/her account in TenTube by the functionality *Upload a Video*. The integration work properly. However, a manual explaining how to upload a video from TenTube will help in the comprehension of this functionality.

8.16 Comment rating

The user can comment and rate all the resources. This version also includes a vote system that allows the user to vote the comments of the different comments. All this functionalities work properly.

8.17 Managing abuses

The user can abuse separately a tag a comment or a resource. The tool work properly but it has to be tested if the messages has arrived to the administrator of the system.

Recommendation

- Check the data base for analyzing if the abuses are arriving to the administrator e-mail account.

8.18 Stimulating users

For stimulating the user to share resources it has been implemented the functionality of sending a mail to those persons that the user wants to share the resource with. The send mail functionality has to be reviewed because doesn't work properly.

Recommendation

- Solve the functionality system for sending an e-mail for sharing a resource.

9 Summary of quality of release v.0.3 and recommendations for v.0.4 (UPF)

Once analyzed the main functionalities and provided by the LearnWeb_v03 we can conclude that most of the requirements explained in ID5.15 and ID5.16 has been successfully implemented. In this section we summarize the most important aspects that still remain unsolved. All these aspects are classified into functionality, usability and loadability issues. For a more detailed description of the problems here mentioned see Table 1, Table 2, Table 3 and

Unit and Integration Test: *Storage*	
Aspect	**Observations**
Deleting records	Ok.Users can delete a record in their personal page.
Deletion of multiple records at the same time	Fails. The system does not provide the option to delete a set of records at the same time.
Deletion of all records in one action	Fails. The system does not provide the option to delete a set of records in one action (with a unique button).
Check if the fields are stored correctly when storing a new record.	Ok. The system checks if the fields introduced are correct. The user can see this fields when press over the record.
Concurrent usage	Ok. The tool can be used for concurrent users.
Time out	Ok.

Table 4 for the main functionalities and Table 5 for the loadability needs.

Functionality recommendations

- Solve the functionality problems detected in: *My Boockmarks, Upload a Video, Rating, Tags and e-mail.*

- Solve the pages work flow: *My Groups and My resources when accessing them from the personal profile overview page.*

- Add the non-existing functionalities: *My profile, and upload a photo in the prefile, Help tab.*

- Add welcome messages for all the languages.

Usability recommendations

- Add manuals and help icons for each of the functionalities.

- Add colours to the tag cloud.

- Add colours and change the typography of the functionalities for enhancing collaboration within users.

Loadability tests

- Solve the links time average access in Table 5.

10 Conclusions (UPF)

This document provides the main outcomes from the test of the LearnWeb_v03 consisting on the results from a complete Functionality test (sec. 5.1), a Quality Test (sec. 5.2) and a loadability test (sec. 6). We have also included a summary of the more relevant results of the test and a set of recommendations for the future versions.

11 References (UPF)

[1] D 4.1 Evaluation Plan, p. 118 and 119
[2] ID5.15
[3] ID5.16

Annex (TF-15)

We tested LearnWeb v 0.3 (http://learnweb.it.fmi.uni-sofia.bg/) with JMeter (http://jakarta.apache.org/jmeter/). For this purpose we used ramp test with up to 300 simultaneous users for 10 minutes duration and 10 seconds between clicks. Test is set to continue when a sample error occurs. The tool measures number of samples, standard deviation, throughput, percentage of detected error, etc. We analyzed graph, aggregation, and summary results recorded by JMeter listeners: Graph results, Spine Visualizer, Aggregate Results, Summary results, View results in a Table and View Tree Results.

Test of LearnWeb 2.0

Result from load test of LearnWeb are presented in next graphics. They represent main characteristics of the web client depending on the time from the beginning of the tests and number of active virtual users. Test represents usual user behavior recorded by integrated in the tool module HTTP Proxy Server.

Fig. 1 LearnWeb v 0.3 load test settings

Summary report represents basic data for the tested web client : number of samples for each URL (label), average elapsed time, minimum and maximum elapsed time the samples of the given URL , standard deviation of the sample elapsed time, percent of requests with errors, throughput measured in requests per second/minute/hour and in Kilobytes per second as well as average size of the sample response in bytes.

Times are measured in ms.

Summary Report

Name: Summary Report

Comments:

Write results to file / Read from file

Filename arta-jmeter-2.3.2\bin\learnweb\new\sum   Browse...   Log/Display Only: ☐ Errors ☐ Successes   Configure

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
/js/jscrypt/aes.js	175	491	11	2805	412,55	0,00%	24,9/min	8,64	21301,0
/js/jscrypt/aes...	175	290	4	1530	183,69	0,00%	24,9/min	1,01	2480,0
/js/jscrypt/entr...	175	298	5	1634	194,88	0,00%	24,9/min	1,89	4673,0
/js/jscrypt/arm...	175	319	6	1374	227,94	0,00%	24,9/min	4,12	10168,0
/js/jscrypt/lecu...	175	295	4	864	174,00	0,00%	24,9/min	0,97	2384,0
/js/crypter.js	175	336	6	1218	233,58	0,00%	24,9/min	3,91	9642,0
/css/resource...	175	309	3	856	181,90	0,00%	24,9/min	0,74	1826,0
/css/tree/defa...	175	304	3	798	170,33	0,00%	24,9/min	0,23	557,0
/css/resource...	175	304	3	823	180,39	0,00%	24,9/min	0,66	1632,0
/css/resource...	175	297	3	884	164,08	0,00%	24,9/min	0,67	1642,0
/js/resources/...	175	310	3	853	175,45	0,00%	24,9/min	0,90	2210,0
/js/resources/...	175	1221	35	6086	873,45	0,00%	24,9/min	51,14	126132,0
/js/resources/...	175	332	4	878	173,55	0,00%	24,9/min	1,08	2654,0
/js/resources/...	175	523	12	2740	377,82	0,00%	24,9/min	15,81	38986,0
/js/resources/...	175	336	5	2057	211,00	0,00%	24,9/min	1,93	4770,0
/js/resources/...	175	566	12	3580	469,54	0,00%	24,9/min	14,14	34868,0
/js/resources/l...	175	372	8	1377	230,97	0,00%	24,9/min	7,54	18590,0
/js/resources/t...	175	323	4	684	152,73	0,00%	24,9/min	1,42	3503,0
/js/resources/...	175	340	7	1200	196,06	0,00%	24,9/min	3,96	9759,0
/js/resources/...	175	390	10	1201	224,86	0,00%	24,9/min	9,17	22621,0
/img/header.jpg	175	367	5	2037	269,27	0,00%	24,9/min	1,12	2766,0
/media/image...	175	376	5	1666	274,86	0,00%	24,9/min	1,15	2845,0
/js/jquery.js	175	673	17	2407	486,76	0,00%	24,9/min	12,09	29821,0
/js/jquery.data...	175	602	20	2784	440,36	0,00%	24,9/min	28,35	69901,0
/media/css/de...	175	293	4	801	158,60	0,00%	24,9/min	2,01	4954,0
/css/resource...	175	282	3	1212	181,36	0,00%	24,9/min	0,29	722,0
/css/resource...	175	274	4	821	169,21	0,00%	24,9/min	0,40	979,0
/media/image...	175	306	5	2065	249,06	0,00%	24,9/min	1,16	2861,0
/img/load.gif	175	258	3	891	181,57	0,00%	24,9/min	0,30	734,0
/users/logint	175	363	75	1025	207,73	0,00%	24,9/min	0,69	1704,9
/js/communic...	175	238	5	983	176,94	0,00%	24,9/min	1,23	3035,0
/users/logint?l...	161	244129	160288	1349600	253251,99	0,00%	7,0/min	82,65	722088,4
/lang/eng	146	61171	51328	96376	7186,20	0,00%	54,6/min	0,02	19,6
/lang/bul	143	61896	51324	96386	8961,63	0,00%	49,6/min	0,02	19,6
/search	143	61494	51291	96311	7857,00	0,00%	40,8/min	0,01	19,6
/img/5.png	109	10	5	77	10,35	0,00%	1,8/sec	5,52	3076,0
/img/0.png	109	10	5	45	8,73	0,00%	1,8/sec	5,42	3020,0
/img/3.png	109	11	6	114	13,67	0,00%	1,8/sec	6,07	3383,0
/media/image...	109	16	3	913	86,82	0,00%	1,8/sec	1,10	612,0
/media/image...	109	8	3	48	9,60	0,00%	1,8/sec	1,14	635,0
/media/image...	109	39	19	170	32,88	0,00%	1,8/sec	33,55	18707,0
/media/image...	109	41	19	198	32,23	0,00%	1,8/sec	33,35	18596,0
/media/image...	109	10	3	64	11,08	0,00%	1,8/sec	1,53	852,0
/resources/vie...	108	63241	51295	96310	11234,94	0,00%	42,0/min	0,61	886,3
/resources/vie...	2	78171	60048	96295	18123,50	0,00%	1,2/min	0,05	2520,0
TOTAL	8896	15954	3	1433056	86002,79	0,00%	6,2/sec	141,09	23287,7

☐ Include group name in label?   Save Table Data

Fig. 2 LearnWeb Summary report

We analyzed 54 URLs:

1. /
2. /favicon.ico
3. /css/learnweb.css
4. /css/popup.css
5. /css/jtip.css
6. /popup/popup.js
7. /js/sign.js
8. /js/jscrypt/utf-8.js
9. /js/jscrypt/md5.js
10. /js/jscrypt/aes.js
11. /js/jscrypt/aesprng.js
12. /js/jscrypt/entropy.js
13. /js/jscrypt/armour.js
14. /js/jscrypt/lecuyer.js
15. /js/crypter.js
16. /css/resources/rating.css
17. /css/tree/default.css
18. /css/resources/lightbox.css
19. /css/resources/modalbox.css
20. /js/resources/add_resource.js
21. /js/resources/prototype.js
22. /js/resources/scriptaculous.js
23. /js/resources/effects.js
24. /js/resources/builder.js
25. /js/resources/controls.js
26. /js/resources/lightbox.js
27. /js/resources/tooltip.js
28. /js/resources/swfobject.js
29. /js/resources/modalbox.js
30. /img/header.jpg
31. /media/images/button.png
32. /js/jquery.js
33. /js/jquery.dataTables.js
34. /media/css/demos.css
35. /css/resources/i/loading.gif
36. /css/resources/i/closelabel.gif
37. /media/images/button_hover.png
38. /img/load.gif
39. /users/logint
40. /js/communicator.js
41. /users/logint?loginform=1

42. /lang/eng
43. /lang/bul
44. /search
45. /img/5.png
46. /img/0.png
47. /img/3.png
48. /media/images/back_disabled.jpg
49. /media/images/forward_disabled.jpg
50. /media/images/sort_both.jpg
51. /media/images/sort_desc.jpg
52. /media/images/forward_enabled.jpg
53. /resources/view/resource:1042
54. /resources/view/favicon.ico

For each sample JMeter summarized information about time for each sample (ms), its status and number of bytes.

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

Filename arta-jmeter-2.3.2\bin\learnweb\new\table | Browse... | Log/Display Only: ☐ Errors ☐ Successes | Configure

Sample #	Start Time	Thread Name	Label	Sample Time(ms)	Status	Bytes
8852	19:29:42.776	Thread Group 1-121	/resources/view/favic...	96295	⚠	2519
8853	19:29:42.997	Thread Group 1-187	/resources/view/reso...	96303	⚠	885
8854	19:27:53.433	Thread Group 1-8	/users/logint?loginfor...	216682	⚠	742086
8855	19:19:51.824	Thread Group 1-1	/	900519	⚠	1155
8856	19:19:52.543	Thread Group 1-12	/	905817	⚠	1155
8857	19:21:29.493	Thread Group 1-267	/users/logint?loginfor...	888612	⚠	3743
8858	19:19:53.684	Thread Group 1-30	/	989570	⚠	1153
8859	19:19:53.530	Thread Group 1-27	/	994373	⚠	1155
8860	19:19:52.198	Thread Group 1-9	/	1001215	⚠	1153
8861	19:19:51.883	Thread Group 1-5	/	1025647	⚠	1153
8862	19:19:51.993	Thread Group 1-6	/	1054982	⚠	1153
8863	19:19:52.638	Thread Group 1-15	/	1063344	⚠	1153
8864	19:19:52.530	Thread Group 1-11	/	1072453	⚠	1153
8865	19:19:54.404	Thread Group 1-42	/	1081000	⚠	1155
8866	19:19:56.374	Thread Group 1-64	/	1082243	⚠	1153
8867	19:19:52.640	Thread Group 1-13	/	1086738	⚠	1153
8868	19:19:56.976	Thread Group 1-71	/	1095066	⚠	1153
8869	19:19:52.686	Thread Group 1-17	/	1107888	⚠	1153
8870	19:19:53.373	Thread Group 1-23	/	1114864	⚠	1153
8871	19:19:53.400	Thread Group 1-18	/	1122348	⚠	1153
8872	19:19:58.998	Thread Group 1-103	/	1121646	⚠	1153
8873	19:19:53.477	Thread Group 1-26	/	1139480	⚠	1153
8874	19:19:53.638	Thread Group 1-28	/	1148388	⚠	1153
8875	19:19:54.253	Thread Group 1-35	/	1174839	⚠	1153
8876	19:19:53.420	Thread Group 1-25	/	1180255	⚠	1153
8877	19:19:53.692	Thread Group 1-29	/	1196507	⚠	1153
8878	19:19:51.871	Thread Group 1-4	/	1207653	⚠	1153
8879	19:19:52.964	Thread Group 1-14	/	1215568	⚠	1153
8880	19:19:54.311	Thread Group 1-40	/	1228890	⚠	1153
8881	19:19:54.758	Thread Group 1-41	/	1229237	⚠	1153
8882	19:19:55.122	Thread Group 1-45	/	1242526	⚠	1153
8883	19:19:55.120	Thread Group 1-46	/	1245923	⚠	1153
8884	19:19:55.138	Thread Group 1-44	/	1266925	⚠	1153
8885	19:21:04.733	Thread Group 1-131	/users/logint?loginfor...	1310376	⚠	371197
8886	19:20:52.130	Thread Group 1-119	/users/logint?loginfor...	1322980	⚠	379585
8887	19:19:59.708	Thread Group 1-109	/	1375380	⚠	1155
8888	19:21:17.809	Thread Group 1-159	/users/logint?loginfor...	1297276	⚠	379585
8889	19:20:55.744	Thread Group 1-169	/users/logint?loginfor...	1319365	⚠	371197
8890	19:21:04.891	Thread Group 1-126	/users/logint?loginfor...	1310124	⚠	371197
8891	19:19:55.588	Thread Group 1-56	/	1381900	⚠	1153
8892	19:19:56.060	Thread Group 1-63	/	1397755	⚠	1153
8893	19:21:08.758	Thread Group 1-135	/users/logint?loginfor...	1349600	⚠	379585
8894	19:21:24.141	Thread Group 1-196	/users/logint?loginfor...	1338314	⚠	371197
8895	19:19:52.009	Thread Group 1-7	/	1433056	⚠	1155
8896	19:21:24.011	Thread Group 1-188	/users/logint?loginfor...	1341726	⚠	371196

No of Samples 8896   **Latest Sample** 1341726   **Average** 15954   **Deviation** 86002

Fig. 3 Results summarized in table

Requests with are described in the View Results Tree listener with data for load time, latency, sample and error count as well as response code.
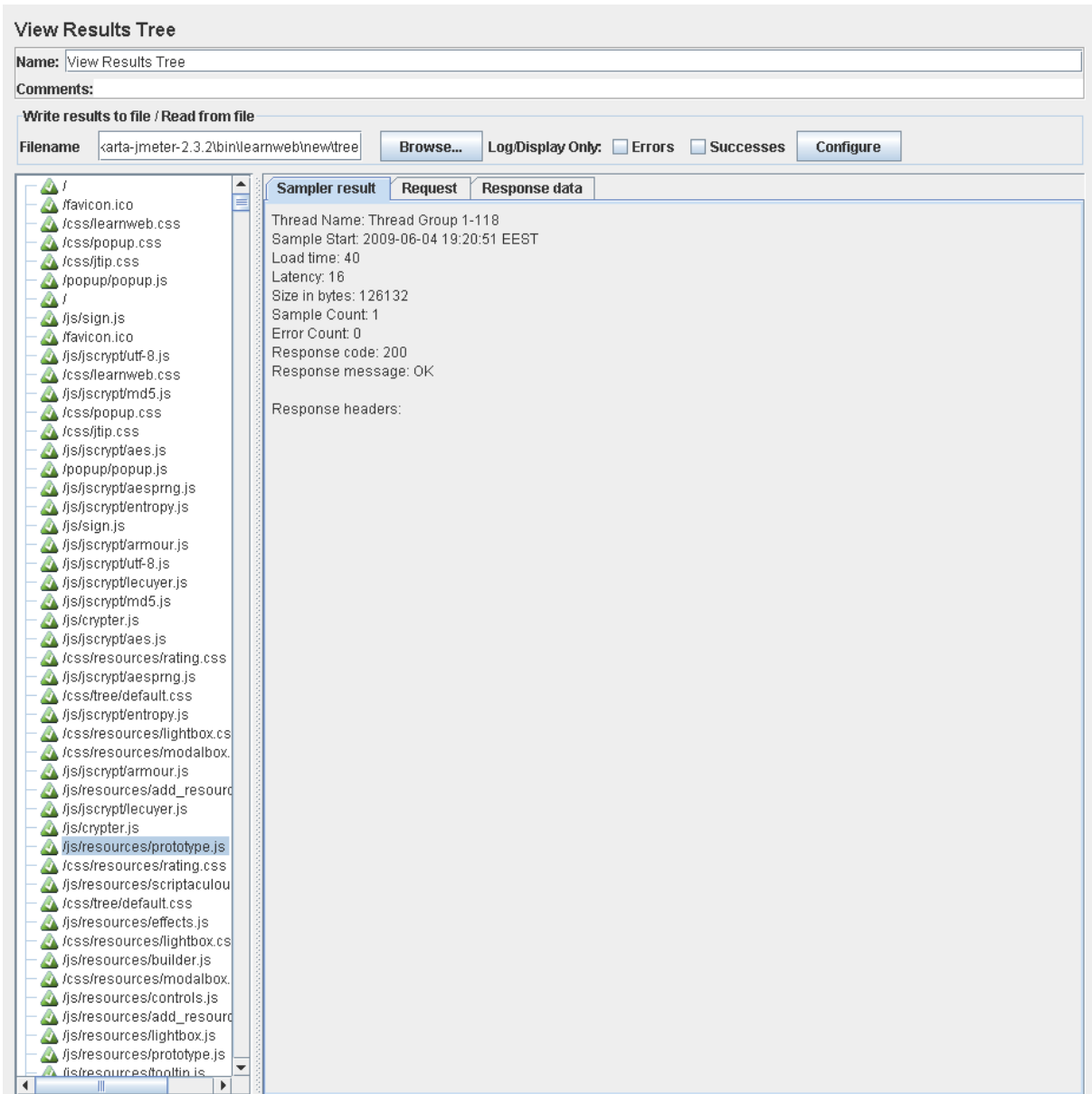
Fig. 4 Results summarized as tree

JMeter reported no requests with error.

Aggregate report summarizes information about number of sample for each URL, average time, minimum and maximum time for samples for a given URL, median (the time in the middle of a set of results, 50% of the samples took no more than this time; the remaining samples took at least as long) and 90 % line (90% of the samples took no more than this time, the remaining samples at least as long as this) information, level of detected errors, throughput measured in requests per second/minute/hour and in Kilobytes per second. Times are measured in milliseconds.

Aggregate Report

Name: Aggregate Report

Comments:

Write results to file / Read from file

Filename: ‹arta-jmeter-2.3.2\bin\learnweb\new\agg   [Browse...]   Log/Display Only: ☐ Errors ☐ Successes   [Configure]

Label	# Samples	Average	Median	90% Line	Min	Max	Error %	Throughput	KB/sec
/	496	134179	60051	72758	51290	1433056	0,00%	20,8/min	,0
/favicon.ico	175	424	409	816	9	1864	0,00%	24,9/min	2,0
/css/learnweb...	175	243	242	417	5	1180	0,00%	24,9/min	3,2
/css/popup.css	175	244	259	399	3	909	0,00%	24,9/min	,2
/css/jtip.css	175	229	233	416	3	664	0,00%	24,9/min	,6
/popup/popup...	175	244	253	425	4	762	0,00%	24,9/min	1,9
/js/sign.js	175	345	289	756	9	1204	0,00%	24,9/min	6,0
/js/jscrypt/utf-8...	175	254	271	423	4	606	0,00%	24,9/min	1,4
/js/jscrypt/md5...	175	288	327	459	6	1239	0,00%	24,9/min	3,9
/js/jscrypt/aes.js	175	491	395	1044	11	2805	0,00%	24,9/min	8,6
/js/jscrypt/aes...	175	290	323	439	4	1530	0,00%	24,9/min	1,0
/js/jscrypt/entr...	175	298	332	468	5	1634	0,00%	24,9/min	1,9
/js/jscrypt/arm...	175	319	340	471	6	1374	0,00%	24,9/min	4,1
/js/jscrypt/lecu...	175	295	340	470	4	864	0,00%	24,9/min	1,0
/js/crypter.js	175	336	360	506	6	1218	0,00%	24,9/min	3,9
/css/resource...	175	309	344	481	3	856	0,00%	24,9/min	,7
/css/tree/defa...	175	304	357	462	3	798	0,00%	24,9/min	,2
/css/resource...	175	304	353	474	3	823	0,00%	24,9/min	,7
/css/resource...	175	297	340	461	3	884	0,00%	24,9/min	,7
/js/resources/...	175	310	367	474	3	853	0,00%	24,9/min	,9
/js/resources/...	175	1221	1105	2082	35	6086	0,00%	24,9/min	51,1
/js/resources/...	175	332	363	486	4	878	0,00%	24,9/min	1,1
/js/resources/...	175	523	440	944	12	2740	0,00%	24,9/min	15,8
/js/resources/...	175	336	372	479	5	2057	0,00%	24,9/min	1,9
/js/resources/...	175	566	444	1029	12	3580	0,00%	24,9/min	14,1
/js/resources/l...	175	372	376	634	8	1377	0,00%	24,9/min	7,5
/js/resources/t...	175	323	359	501	4	684	0,00%	24,9/min	1,4
/js/resources/...	175	340	358	482	7	1200	0,00%	24,9/min	4,0
/js/resources/...	175	390	379	758	10	1201	0,00%	24,9/min	9,2
/img/header.jpg	175	367	341	535	5	2037	0,00%	24,9/min	1,1
/media/image...	175	376	331	728	5	1666	0,00%	24,9/min	1,2
/js/jquery.js	175	673	608	1249	17	2407	0,00%	24,9/min	12,1
/js/jquery.data...	175	602	486	1167	20	2784	0,00%	24,9/min	28,3
/media/css/de...	175	293	311	459	4	801	0,00%	24,9/min	2,0
/css/resource...	175	282	302	466	3	1212	0,00%	24,9/min	,3
/css/resource...	175	274	303	449	4	821	0,00%	24,9/min	,4
/media/image...	175	306	286	548	5	2065	0,00%	24,9/min	1,2
/img/load.gif	175	258	268	453	3	891	0,00%	24,9/min	,3
/users/logint	175	363	342	635	75	1025	0,00%	24,9/min	,7
/js/communic...	175	238	260	456	5	983	0,00%	24,9/min	1,2
/users/logint?l...	161	244129	180886	211236	160288	1349600	0,00%	7,0/min	82,6
/lang/eng	146	61171	60081	60325	51328	96376	0,00%	54,6/min	,0
/lang/bul	143	61896	60075	60169	51324	96386	0,00%	49,6/min	,0
/search	143	61494	60037	60291	51291	96311	0,00%	40,8/min	,0
/img/5.png	109	10	6	21	5	77	0,00%	1,8/sec	5,5
/img/0.png	109	10	6	26	5	45	0,00%	1,8/sec	5,4

☑ Include group name in label?   [Save Table Data]

Fig. 5 Aggregate report –part 1

Aggregate Report

Name: Aggregate Report

Comments:

Write results to file / Read from file

Filename: arta-jmeter-2.3.2\bin\learnweb\new\agg [Browse...] Log/Display Only: ☐ Errors ☐ Successes [Configure]

Label	# Samples	Average	Median	90% Line	Min	Max	Error %	Throughput	KB/sec
/js/jscrypt/aes.js	175	491	395	1044	11	2805	0,00%	24,9/min	8,6
/js/jscrypt/aes...	175	290	323	439	4	1530	0,00%	24,9/min	1,0
/js/jscrypt/entr...	175	298	332	468	5	1634	0,00%	24,9/min	1,9
/js/jscrypt/arm...	175	319	340	471	6	1374	0,00%	24,9/min	4,1
/js/jscrypt/lecu...	175	295	340	470	4	864	0,00%	24,9/min	1,0
/js/crypter.js	175	336	360	506	6	1218	0,00%	24,9/min	3,9
/css/resource...	175	309	344	481	3	856	0,00%	24,9/min	,7
/css/tree/defa...	175	304	357	462	3	798	0,00%	24,9/min	,2
/css/resource...	175	304	353	474	3	823	0,00%	24,9/min	,7
/css/resource...	175	297	340	461	3	884	0,00%	24,9/min	,7
/js/resources/...	175	310	367	474	3	853	0,00%	24,9/min	,9
/js/resources/...	175	1221	1105	2082	35	6086	0,00%	24,9/min	51,1
/js/resources/...	175	332	363	486	4	878	0,00%	24,9/min	1,1
/js/resources/...	175	523	440	944	12	2740	0,00%	24,9/min	15,8
/js/resources/...	175	336	372	479	5	2057	0,00%	24,9/min	1,9
/js/resources/...	175	566	444	1029	12	3580	0,00%	24,9/min	14,1
/js/resources/l...	175	372	376	634	8	1377	0,00%	24,9/min	7,5
/js/resources/t...	175	323	359	501	4	684	0,00%	24,9/min	1,4
/js/resources/...	175	340	358	482	7	1200	0,00%	24,9/min	4,0
/js/resources/...	175	390	379	758	10	1201	0,00%	24,9/min	9,2
/img/header.jpg	175	367	341	535	5	2037	0,00%	24,9/min	1,1
/media/image...	175	376	331	728	5	1666	0,00%	24,9/min	1,2
/js/jquery.js	175	673	608	1249	17	2407	0,00%	24,9/min	12,1
/js/jquery.data...	175	602	486	1167	20	2784	0,00%	24,9/min	28,3
/media/css/de...	175	293	311	459	4	801	0,00%	24,9/min	2,0
/css/resource...	175	282	302	466	3	1212	0,00%	24,9/min	,3
/css/resource...	175	274	303	449	4	821	0,00%	24,9/min	,4
/media/image...	175	306	286	548	5	2065	0,00%	24,9/min	1,2
/img/load.gif	175	258	268	453	3	891	0,00%	24,9/min	,3
/users/logint	175	363	342	635	75	1025	0,00%	24,9/min	,7
/js/communic...	175	238	260	456	5	983	0,00%	24,9/min	1,2
/users/logint?l...	161	244129	180886	211236	160288	1349600	0,00%	7,0/min	82,6
/lang/eng	146	61171	60081	60325	51328	96376	0,00%	54,6/min	,0
/lang/bul	143	61896	60075	60169	51324	96386	0,00%	49,6/min	,0
/search	143	61494	60037	60291	51291	96311	0,00%	40,8/min	,0
/img/5.png	109	10	6	21	5	77	0,00%	1,8/sec	5,5
/img/0.png	109	10	6	26	5	45	0,00%	1,8/sec	5,4
/img/3.png	109	11	7	25	6	114	0,00%	1,8/sec	6,1
/media/image...	109	16	4	26	3	913	0,00%	1,8/sec	1,1
/media/image...	109	8	4	24	3	48	0,00%	1,8/sec	1,1
/media/image...	109	39	24	93	19	170	0,00%	1,8/sec	33,5
/media/image...	109	41	24	94	19	198	0,00%	1,8/sec	33,3
/media/image...	109	10	4	26	3	64	0,00%	1,8/sec	1,5
/resources/vie...	108	63241	60044	72313	51295	96310	0,00%	42,0/min	,6
/resources/vie...	2	78171	96295	96295	60048	96295	0,00%	1,2/min	,0
TOTAL	8896	15954	354	60039	3	1433056	0,00%	6,2/sec	141,1

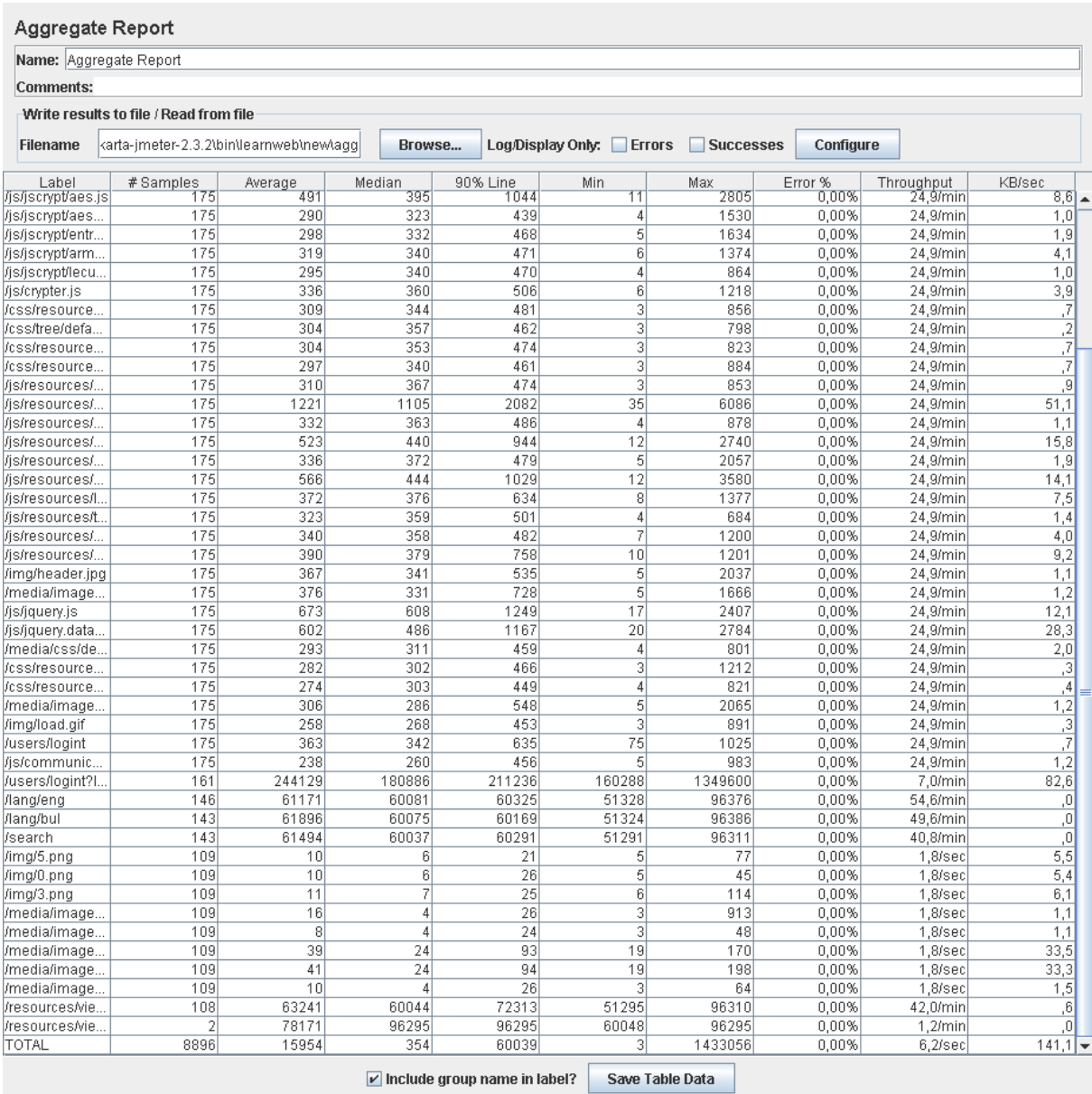☑ Include group name in label? [Save Table Data]

Fig. 6 Aggregate report –part 2

Average elapsed time is from 8 ms up to 244129 ms. Total percents of requests with errors is 0.0 %.
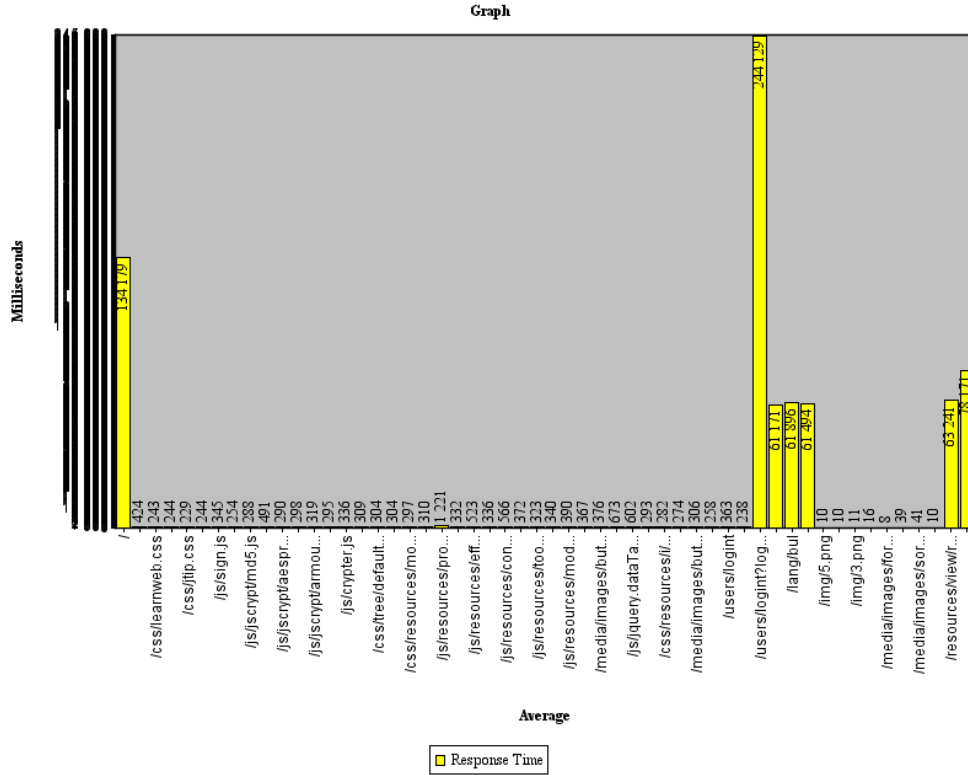
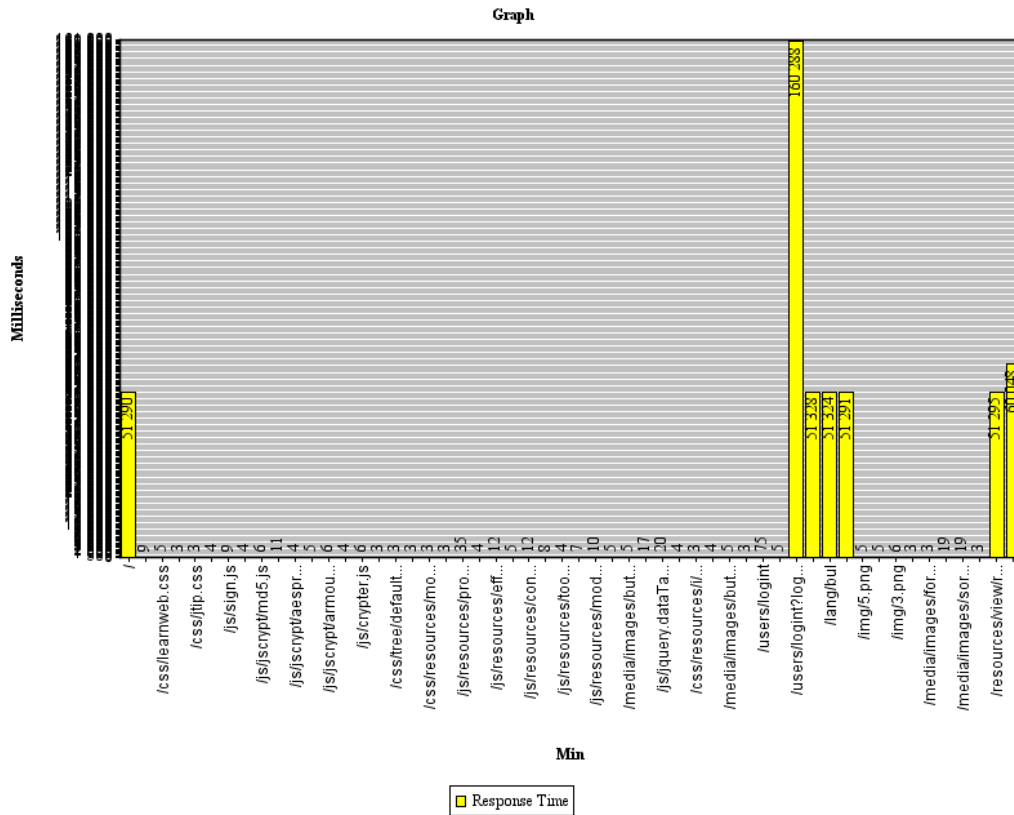Fig. 7 Aggregate graph – Average Response Time

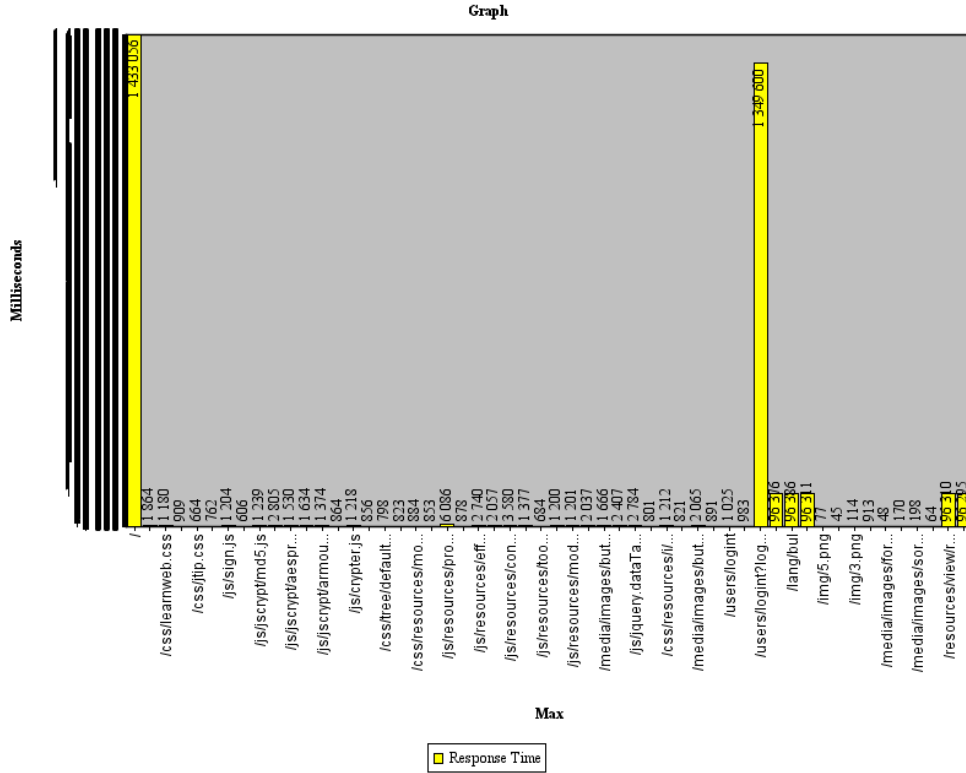Fig. 8 Aggregate graph – Minimum Response Time
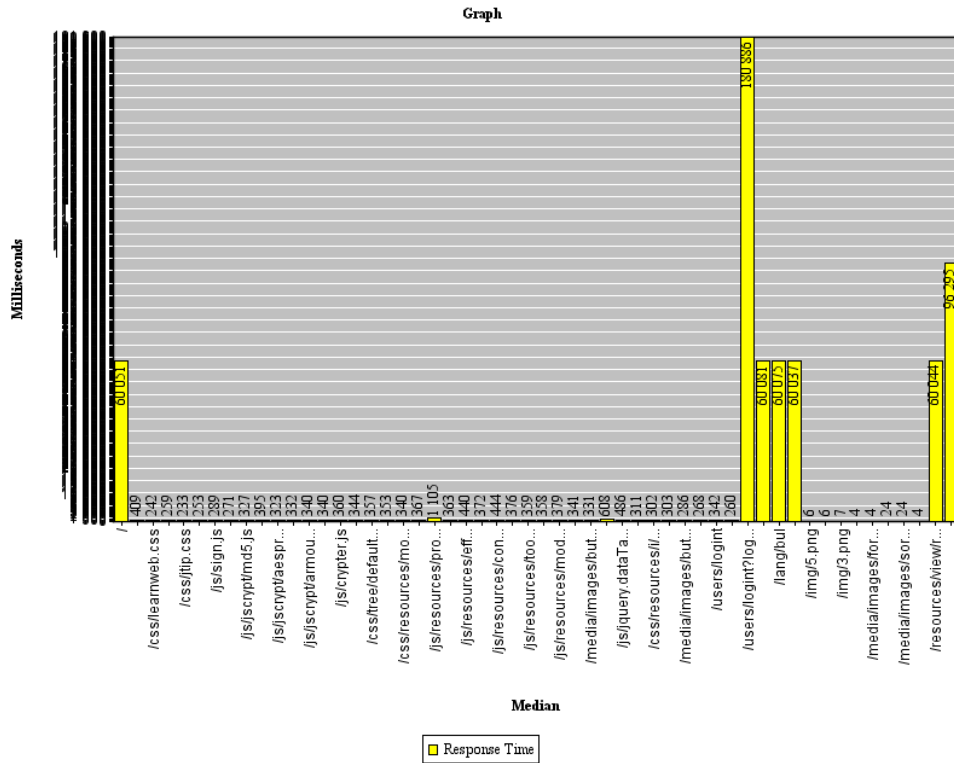
Fig. 9 Aggregate graph – Maximum Response Time

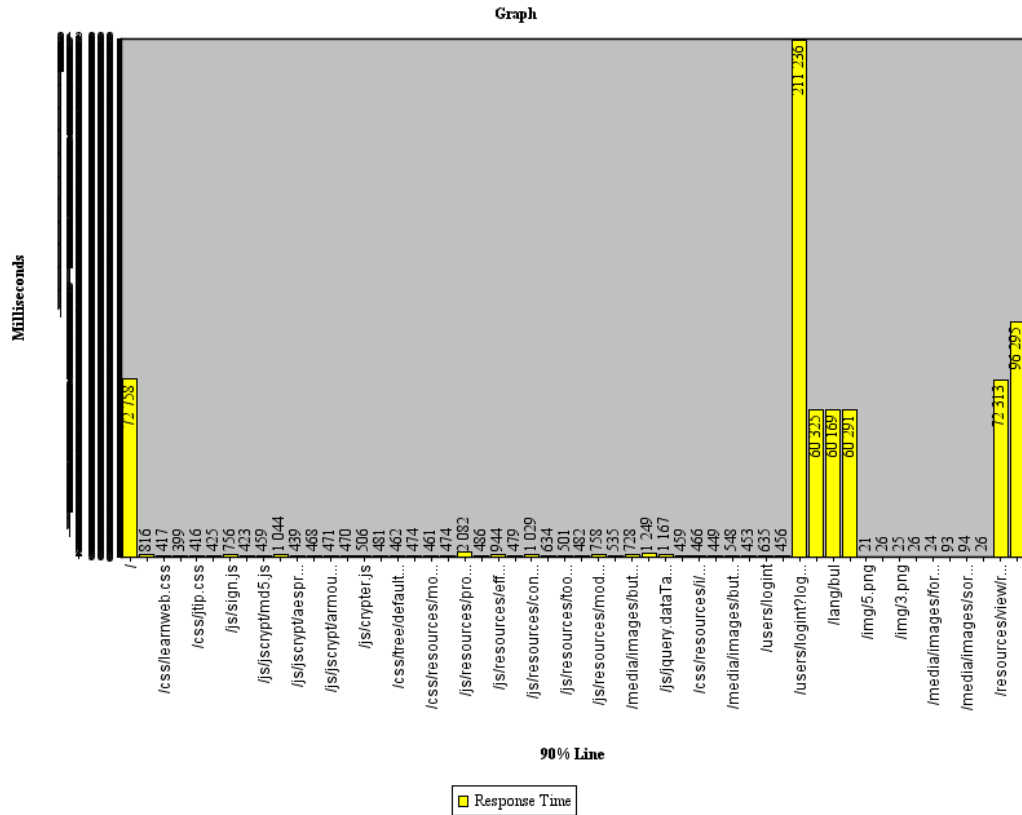Fig. 10 Aggregate graph – Median Response Time

Fig. 11 Aggregate graph – 90 % Line Response Time

The Graph Results listener generates a simple graph that plots all sample times with information about current sample, average of all samples, standard deviation , and throughput rate.
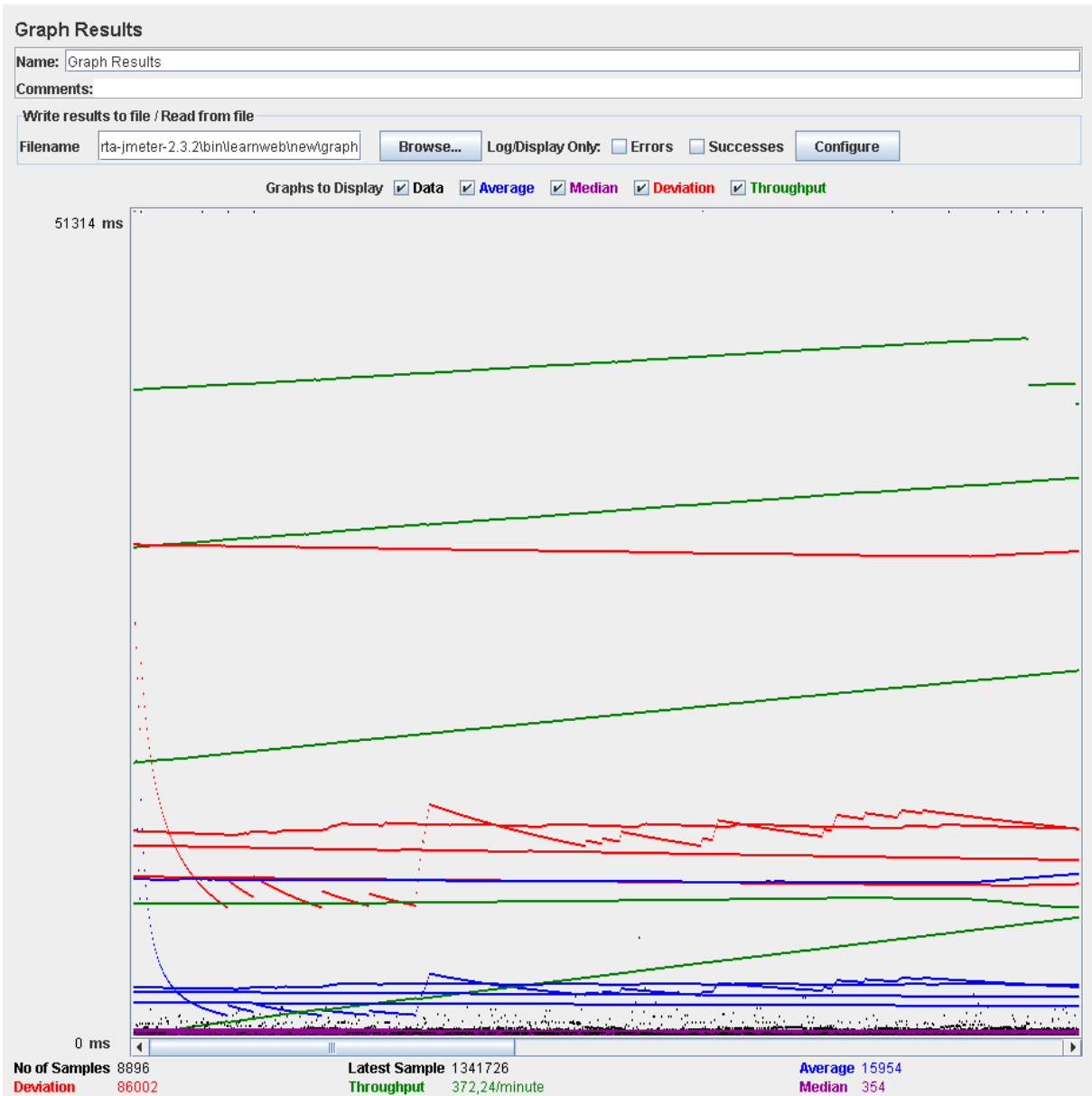
Fig. 12 Graph results –part 1

Average Response time graph (blue line) represents slight growth which means that increase of load on the server leads to slight growth of response time.

Graph Results

Name: Graph Results

Comments:

Write results to file / Read from file

Filename: rta-jmeter-2.3.2\bin\learnweb\new\graph   [Browse...]   Log/Display Only: ☐ Errors ☐ Successes   [Configure]

Graphs to Display ☑ Data ☑ Average ☑ Median ☑ Deviation ☑ Throughput

51314 ms

0 ms

No of Samples 8896   Latest Sample 1341726   Average 15954
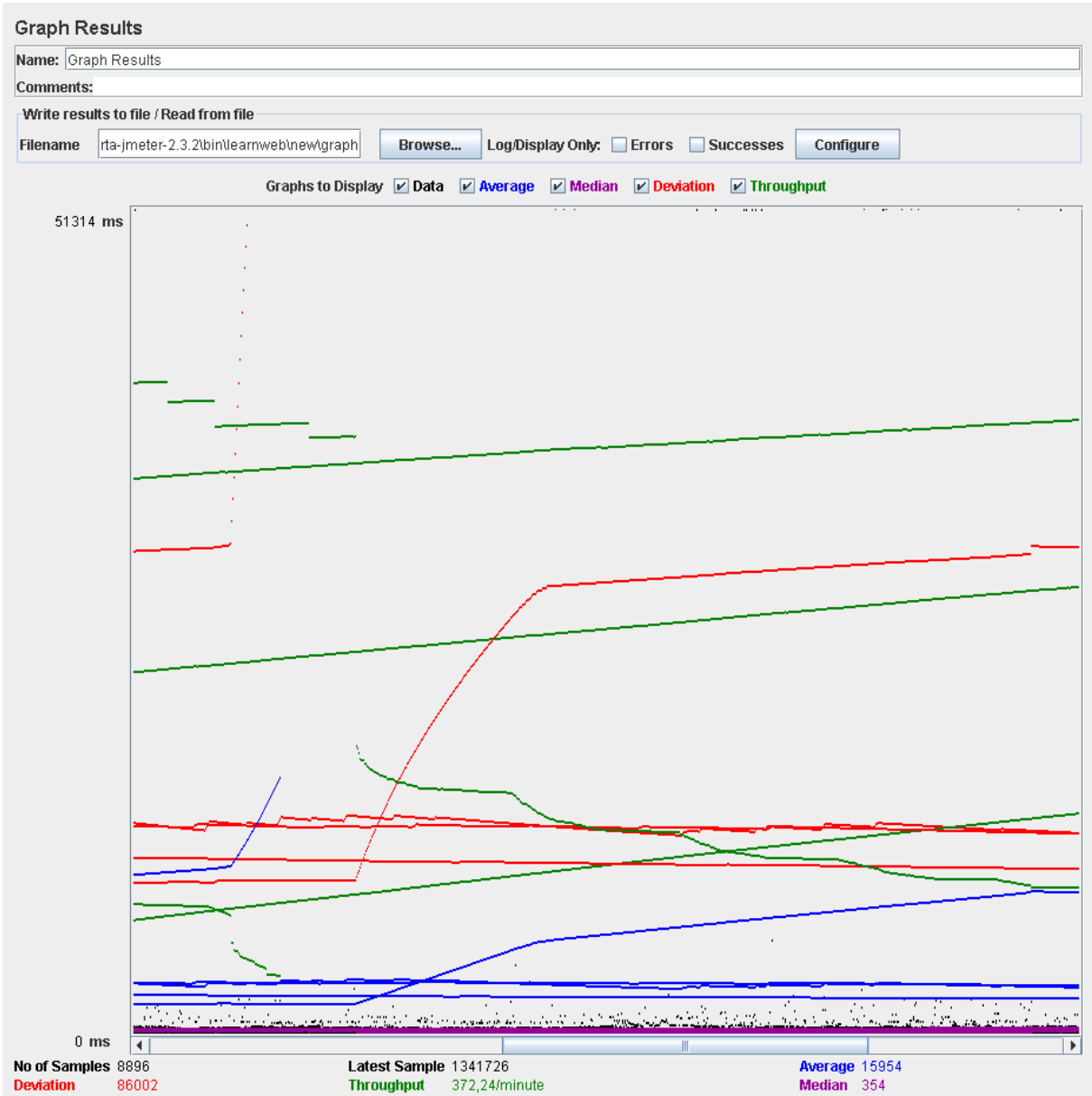Deviation   86002   Throughput   372,24/minute   Median   354
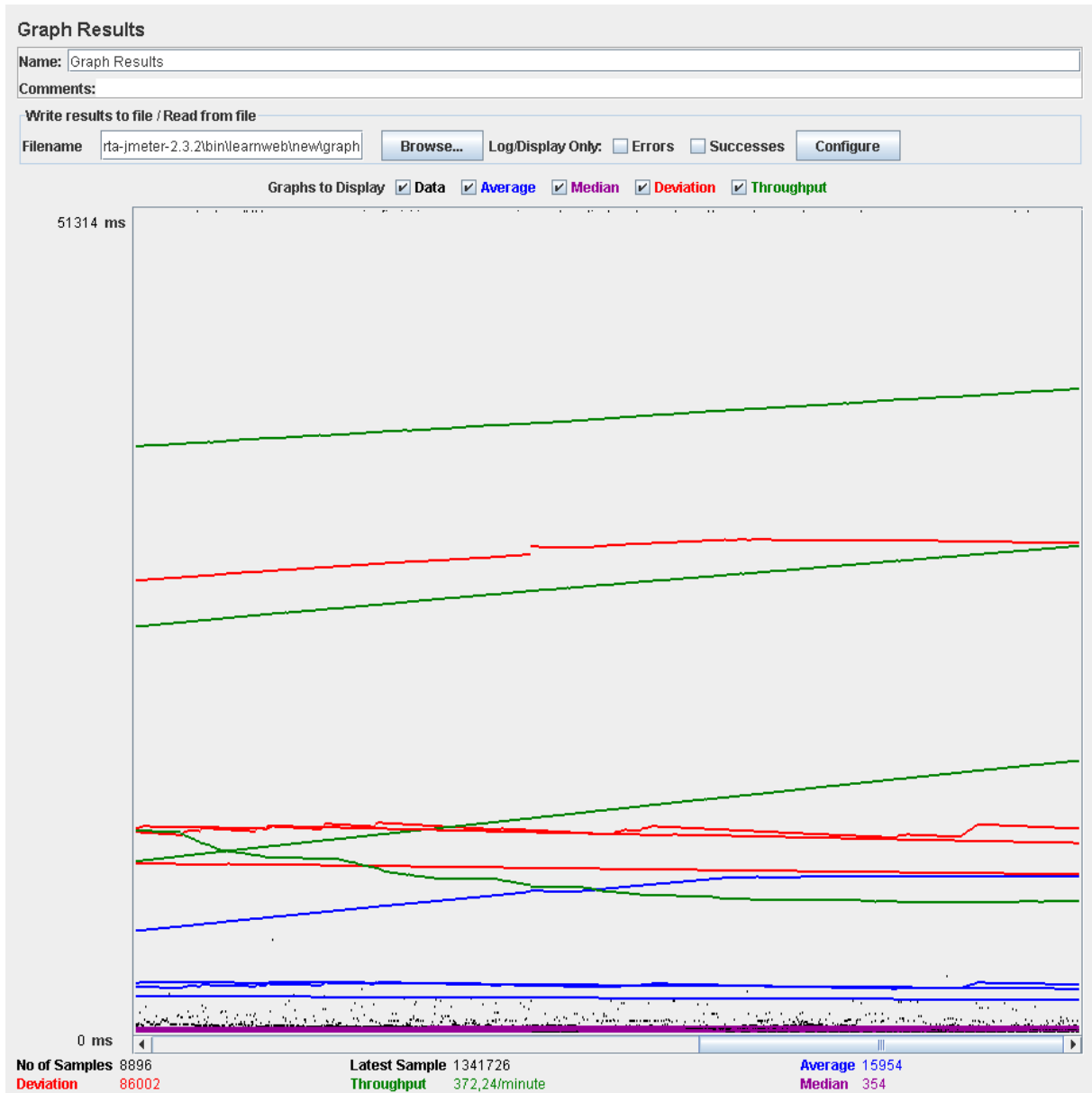
Fig. 13 Graph results –part 2

Fig. 14 Graph results –part 3

The Spline Visualizer provides a view of all sample times from the start of the test till the end, regardless of how many samples have been taken. The spline has 10 points, each representing 10% of the samples, and connected using spline logic to show a single continuous line.

Spline Visualizer

Name: | Spline Visualizer

Comments:

Write results to file / Read from file

Filename | ta-jmeter-2.3.2\bin\learnweb\new\spline | Browse... | Log/Display Only: ☐ Errors ☐ Successes | Configure

Maximum   1375380 ms

Average   15038 ms
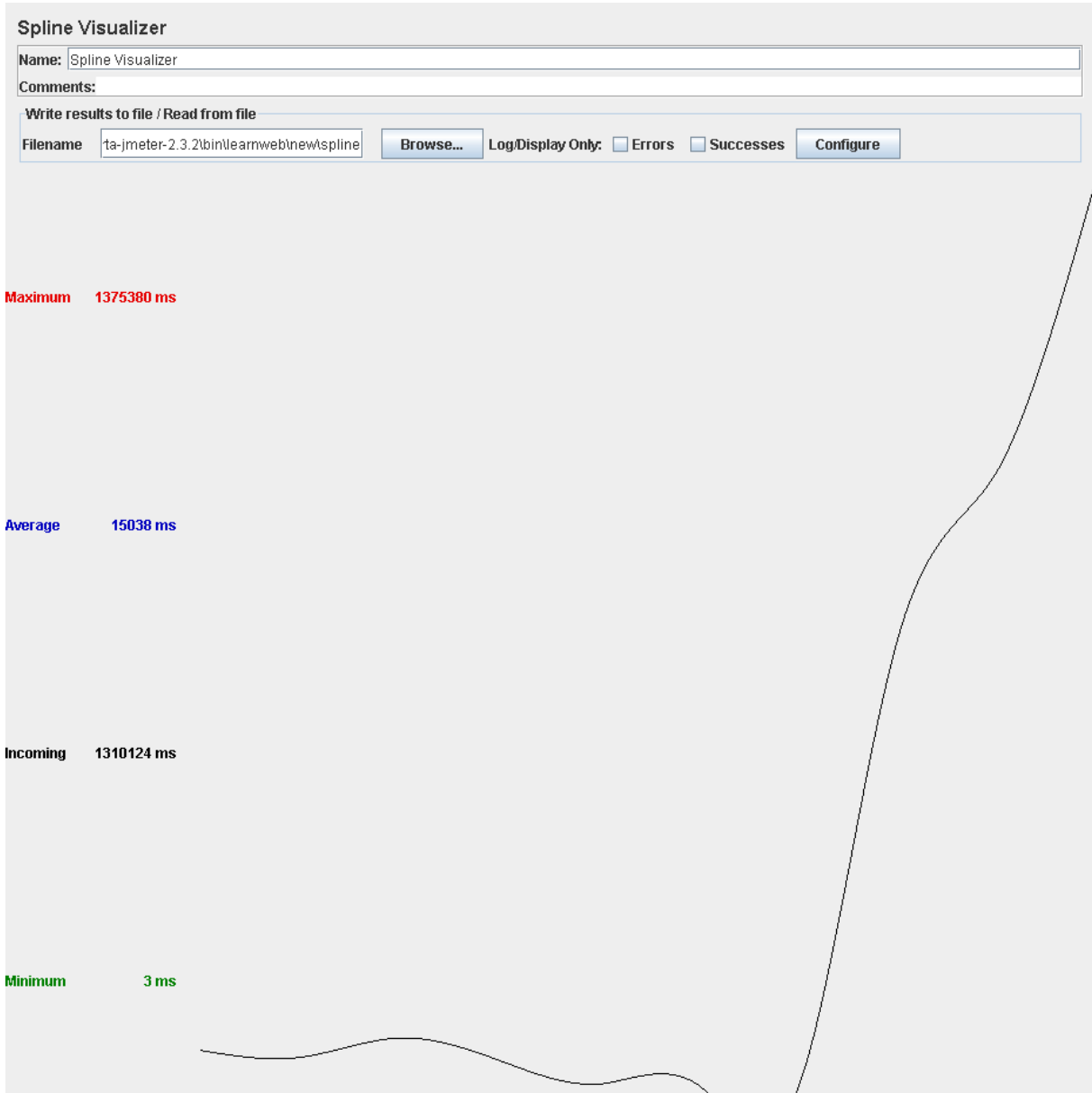
Incoming   1310124 ms

Minimum   3 ms

Fig. 15 Spline vizualizer

Conclusion

JMeter reported no requests with error. Conclusion from load tests is that tested web client LearnWeb 2.0 suits basic of the load tests requirements with following recommendations:

Following links have average time more than 8 s and code should be improved:

URL	Response Time (ms)
/	134179
/users/logint?loginform=1	244129
/resources/view/favicon.ico	78171
/lang/eng	61171
/lang/bul	61896
/search	61494
/resources/view/resource:1042	63241