

# JMeter: Visualizing Server Performance

Brandon, Joe, Steve



# JMeter's Goal

- Test performance on static and dynamic resources
  - Static: Presents the same information to all users (Wikipedia)
  - Dynamic: Users receive individualized information (Facebook)
- Simulate heavy loads on servers/networks
  - Determine strength of server/network
- Analyze performance under different load types
  - Loads may be adjusted



# JMeter Features

- Full Feature Test IDE
- Command Line mode to test from any Java compatible OS
- Complete portability and 100% Java purity
- Complete and ready to present HTML report
- Caching and offline analysis/replaying of test results
- Highly Extensible



# JMeter's Application

JMeter can test several application/server/protocol types:

- Web - HTTP, HTTPS (Java, NodeJS, PHP, ASP.NET, ...)
- SOAP / REST Webservices
- FTP
- Database via JDBC
- LDAP
- Message-oriented middleware (MOM) via JMS
- Mail - SMTP(S), POP3(S) and IMAP(S)
- Native commands or shell scripts
- TCP
- Java Objects



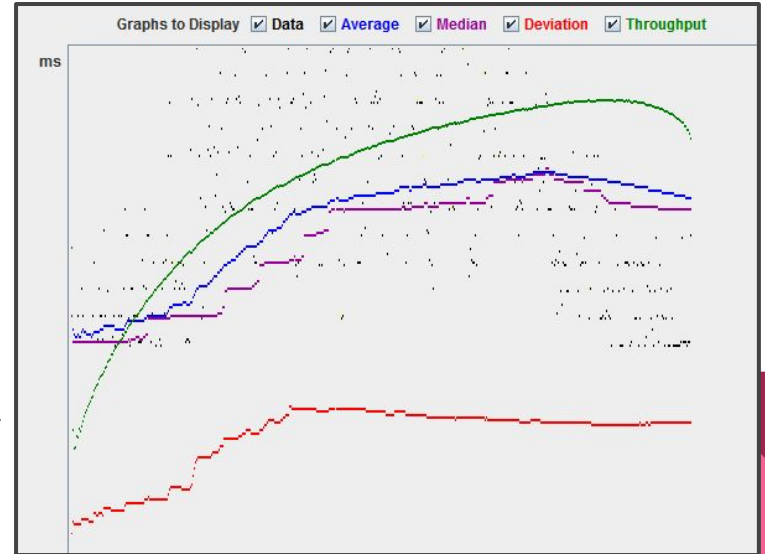
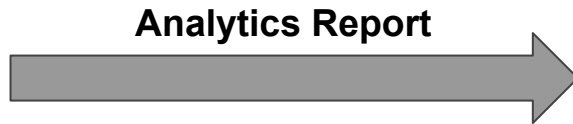
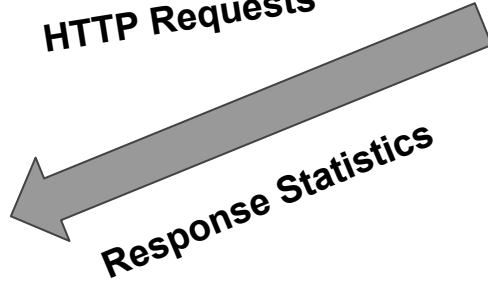
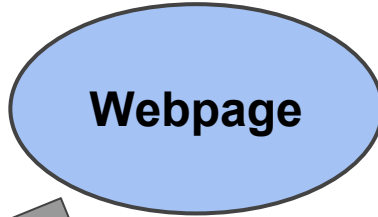
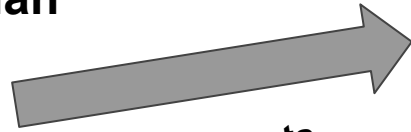
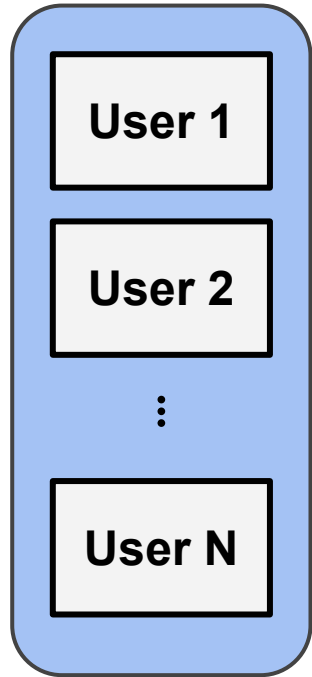
# JMeter Limitations

- NOT A BROWSER
  - Works at protocol level
  - Appears similar to a browser to web services
  - Does not perform browser functionality
  - Can not execute JavaScript found in HTML
  - Renders HTML different from a browser



# Load Testing Structure

JMeter Test Plan



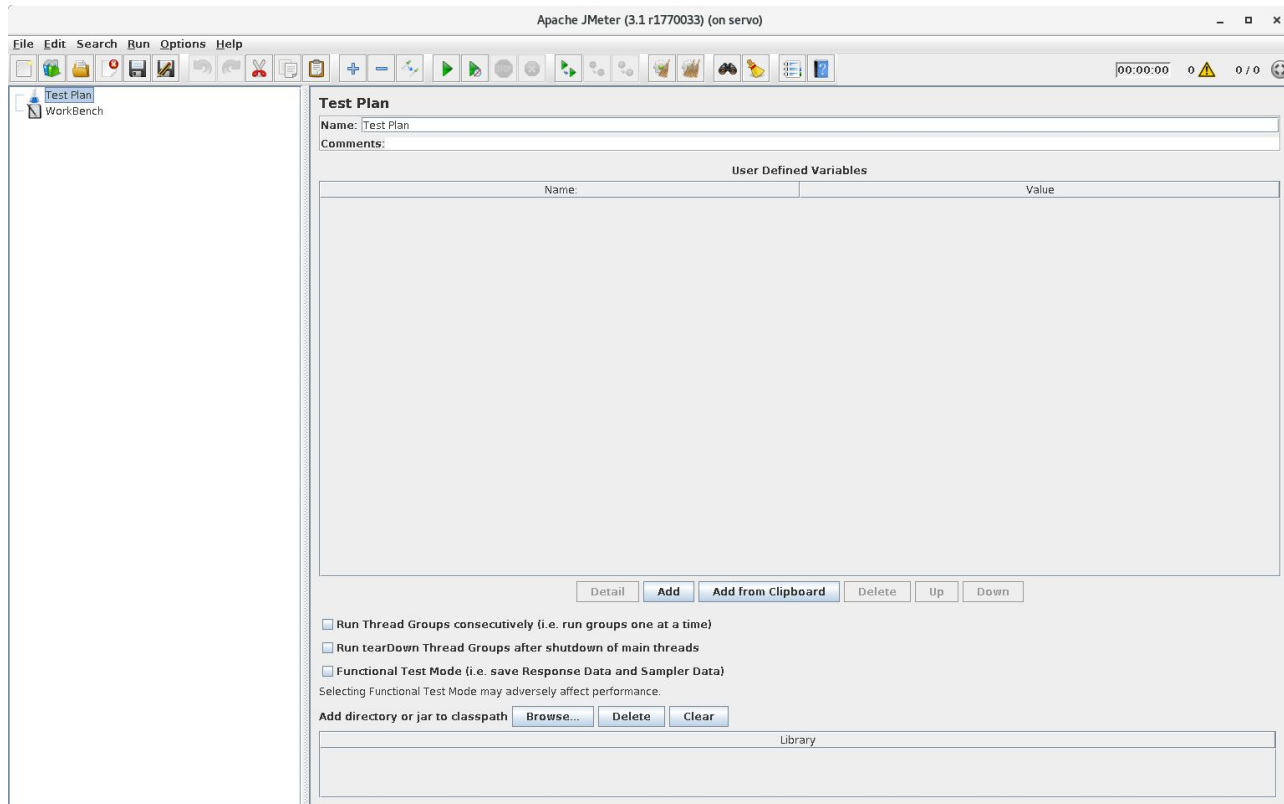
# JMeter Demo

Commands:

- Go to `cs397/shared/JMeter`
- Run: `bash open_jmeter.sh`



# JMeter Demo





# JMeter Demo

1. Create Thread Group
  - a. Each run on own thread
2. HTTP Request Default
  - a. Constants throughout requests in thread group
3. HTTP Cookie Manager
  - a. Enables the clearing of Cookies
4. HTTP Request
  - a. Path and operations for individual requests
5. Graph Result
  - a. Listener to display test results



# JMeter Demo

## Commands:

- Run: `bash run_test.sh testplan_name results_filename`
- After the test finishes, return to the GUI

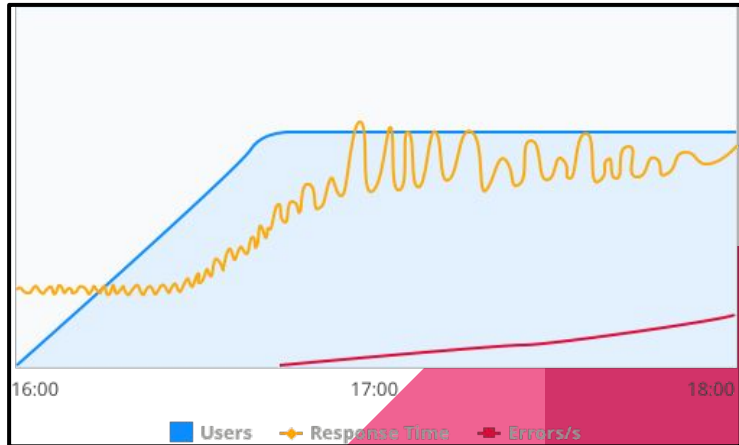
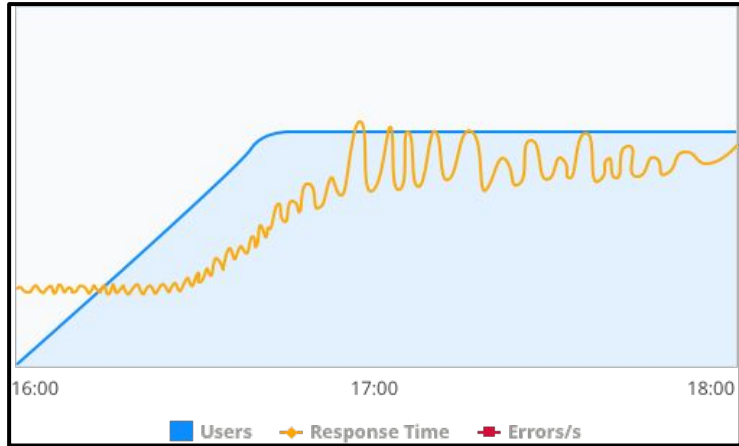
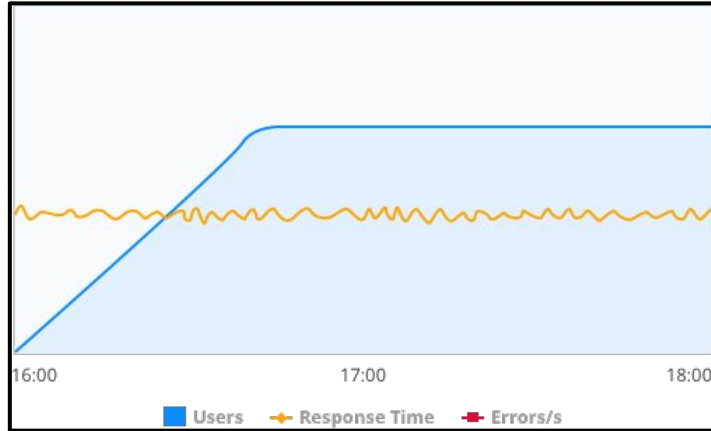


# Test Plan Components

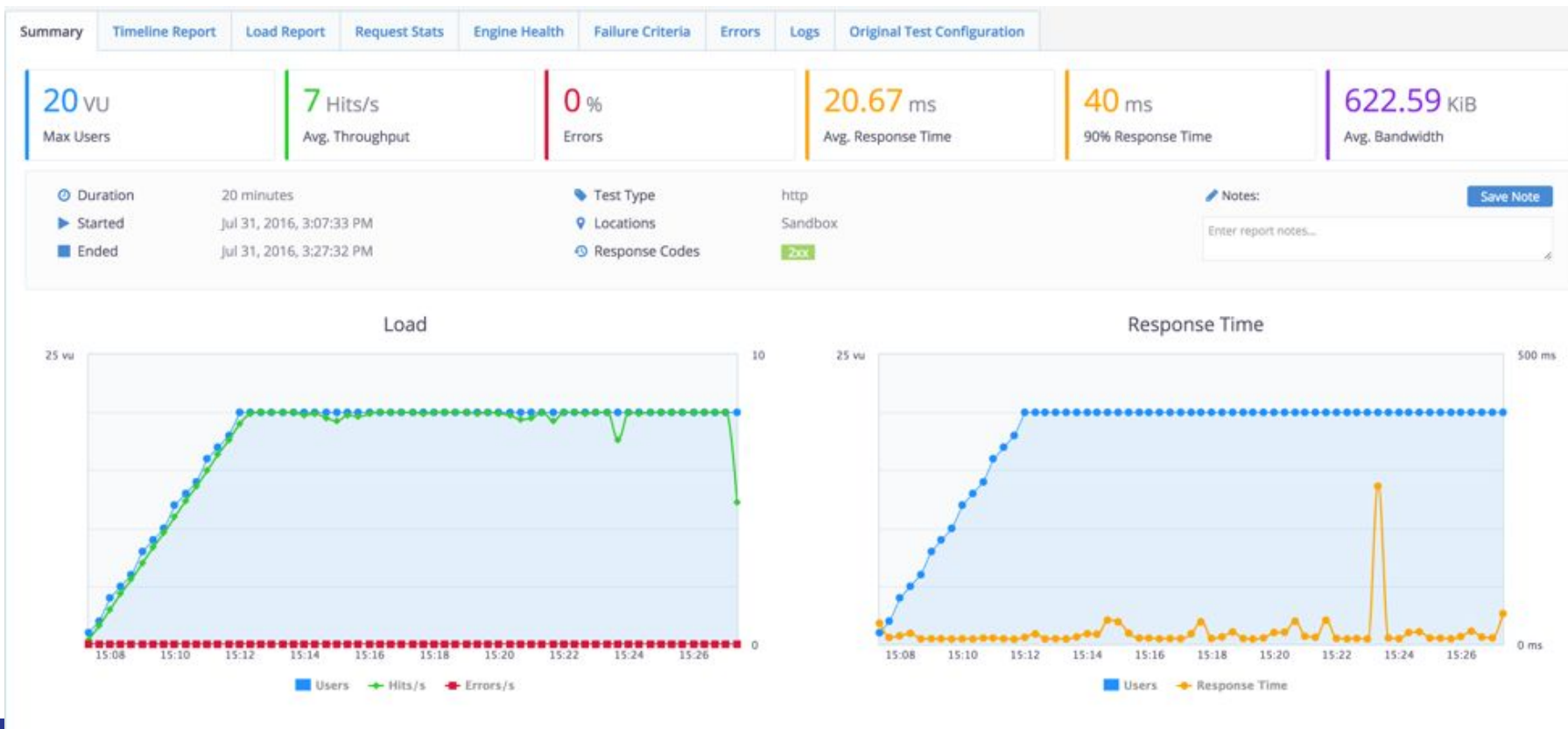
- Config Elements
  - Request defaults, Cookie Manager, Login manager, etc.
- Threads
- Samplers
  - Request type (HTTP, FTP, JUnit, etc.)
- Logic Controllers
- Listeners



# Extension - BlazeMeter Composite Timeline Report



# Extension - BlazeMeter Summary Report



# Extension - BlazeMeter Test Plans

- Web Driver Sampler: Execute JavaScript
- Network Emulation: model your load profile to reflect real-world connection types like 3G, LTE, WiFi
- Free-Form Thread Group: configure threads to start by bunches, or to create complex load supply scenario

jp@gc - Free-Form Arrivals Thread Group

Name: jp@gc - Free-Form Arrivals Thread Group

Comments:  
[Help on this plugin](#) v1.4.0

Action to be taken after a Sampler error  
 Continue  Start Next Thread Loop  Stop Thread  Stop Test  Stop Test Now

Threads Schedule

	Start Value	End Value	Duration
1	100	100	2
100	100	120	5
120	120	125	10
125	125		15

■ Arrival Rate (~3676 total arrivals) jp@gc - Free-Form Arrivals Thread Group

Number of arrivals/min

Elapsed Time

Time Unit:  minutes  seconds

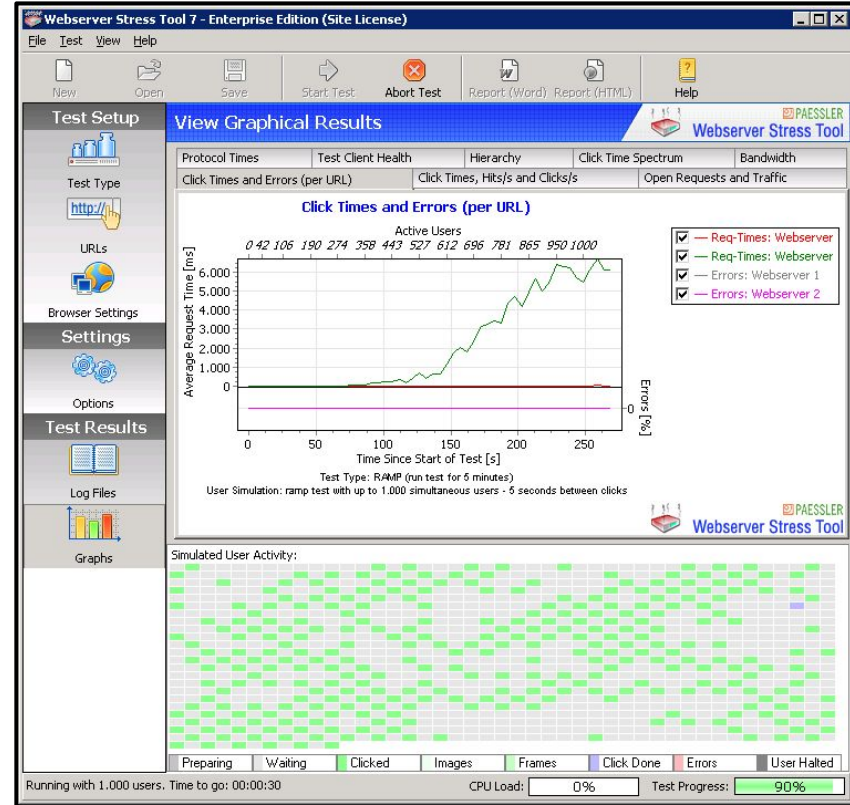
Thread Iterations Limit:

Log Threads Status into File:

Concurrency Limit: 1000

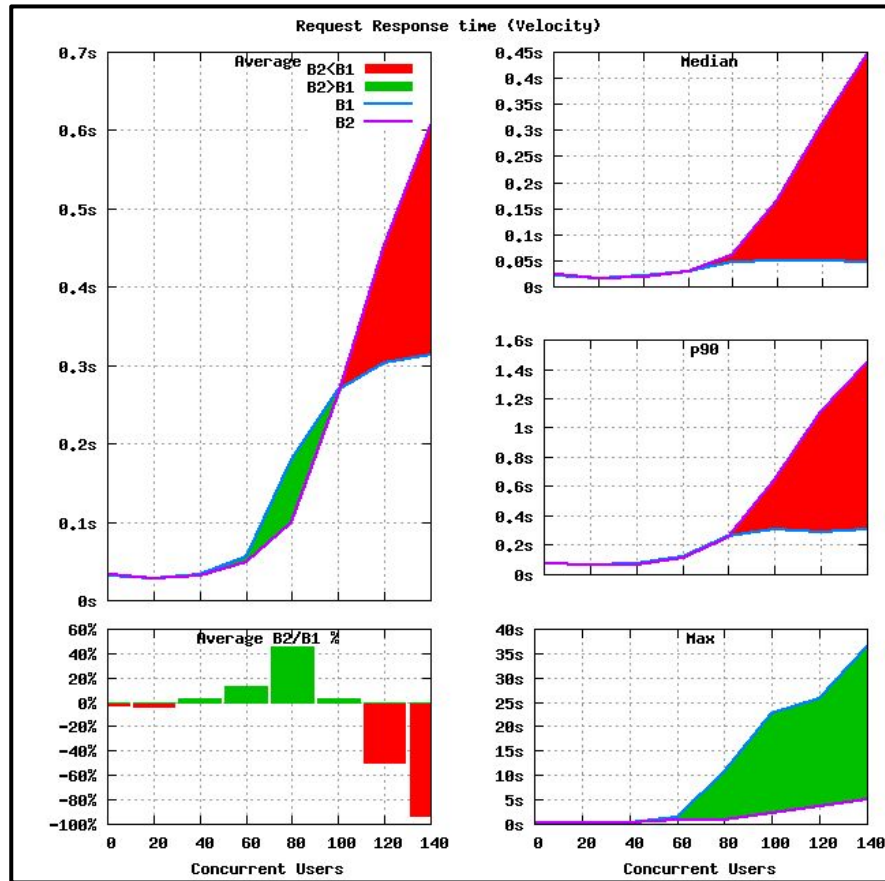
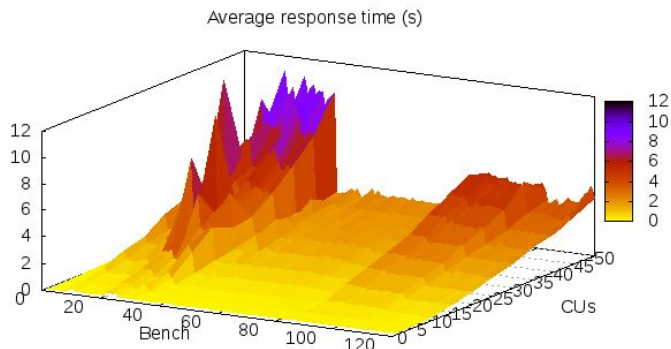
# Paessler Webservers Stress Tool

- Generating Stress
  - Over 1 Gigabit/s network throughput
  - Over 1,000,000 page views per hour
  - Up to 10,000 threads (JMeter suggests 1k)
- Reported Readings
  - Page load time (including javascript and image loading)
  - Server connect time
  - Bandwidth achieved by server & available for each user
  - Error rates



# FunkLoad

- Reports
  - Benchmark report: default report
  - Differential report: compares 2 reports
  - Trend report: Analyzes many benchmark reports to display evolution of the statistics over time





# Sources

- <http://jmeter.apache.org/>
- <http://www.codeaffine.com/2011/11/28/stressload-testing-of-asynchronous-httprest-services-with-jmeter/>
- <https://www.paessler.com/tools/webstress/features>
- <http://funkload.nuxeo.org/intro.html>
- <https://www.blazemeter.com/>
- <https://jmeter-plugins.org/>

