



UNIT PEMODENAN TADBIRAN DAN
PERANCANGAN PENGURUSAN
MALAYSIA (MAMPU)



PERFORMANCE TEST REPORT HESK

Cycle 1

30 September 2020

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OBJECTIVE

What we want to do

Objective

To measure the performance of HESK under predefined transaction volumes from end-user perspective and test the system for responsiveness and reliability.



SCOPE

Our Agreement

Scope

- 1) Number of concurrent user **200**
- 2) Response time less than or equal to **5 second**
- 3) Server performance monitor by **PerfMon**
- 4) 1 business transaction
 - Login and create ticket
- 5) Run smoke test and load test
- 6) Run stress test for **300** concurrent user

Servers and Infra

- 1) 1 application/ web server/ DB
 - **2 Core CPU**
 - **8 GB Memory**
- 2) **1 Database Server**
 - **4 Core CPU**
 - **32 GB Memory**
- 3) **A10 Load Balancer (physical)**



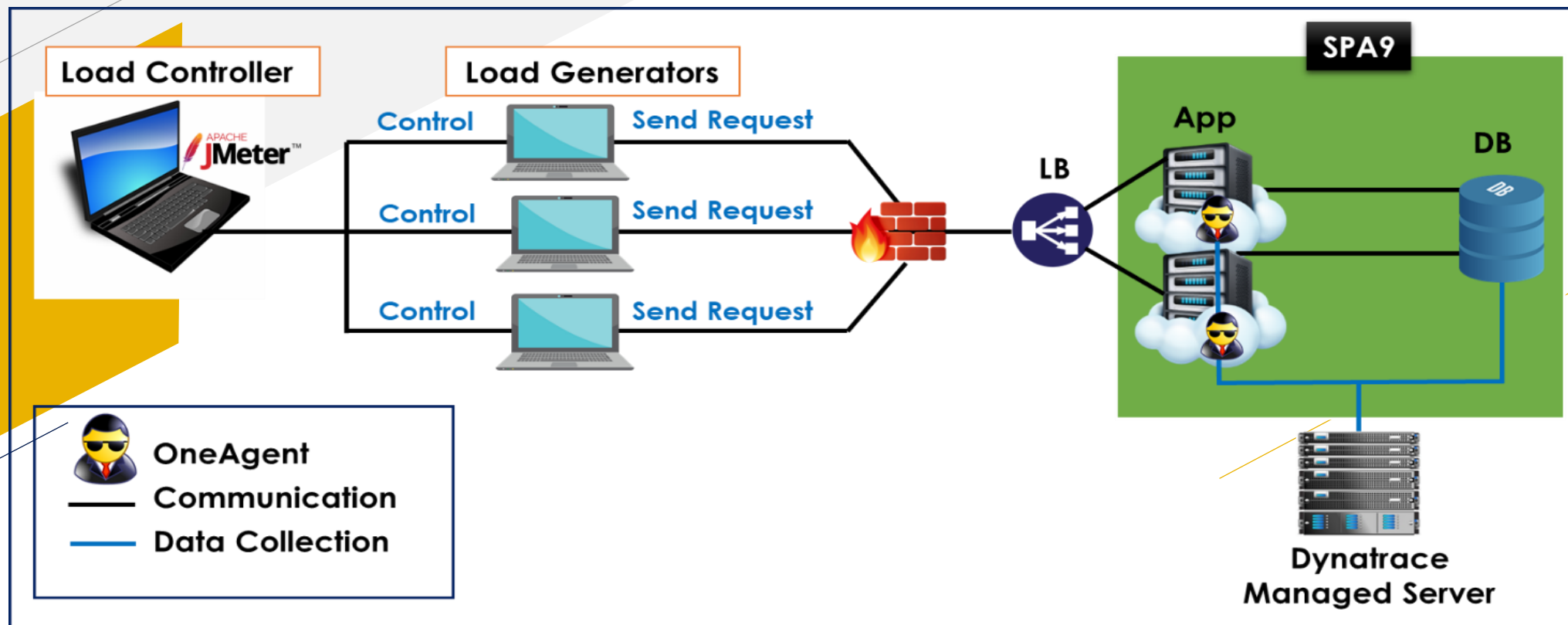
TEST DEPLOYMENT AND EXECUTION

How it works

Test Deployment

Training Lab (15 pc)

SPA Datacenter



Test Execution

No	Business Transactions	Weightage (%)	No of Concurrent User			
			Iteration 1	Iteration 2	Iteration 3	Stress Test
1.	BizTxn 1: Daftar Pengguna	30	300	1,500	3,000	4,500
2.	BizTxn 2: Kemaskini Permohonan	70	700	3,500	7,000	10,500
3.	Total	100	1,000	5,000	10,000	15,000



OBSERVATIONS

What we observe

Scripting

- 1) Scripting has been done from 29 to 30 Sept 2020
- 2) Script 1
 - Login
 - Create ticket for 5 times
 - Logout

Scripting Process



Load Testing Preparation

- 1) 1 laptop is used as Load Controller
- 2) Install Jmeter, JDK 8, Disable VM Network, Disable Firewall and Aset Antivirus

Data Preparation

- 1) Create 1,000 csv data to create staff account



EVALUATION CRITERIA

What we evaluate

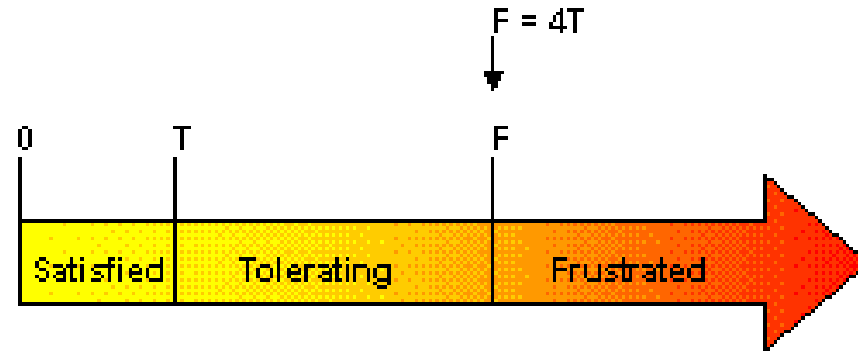
Evaluation Criteria

- 1) Transaction Response Time using Application Performance Index (APDEX)
- 2) Failure Rate
- 3) Systems Performances
- 4) Errors and Exceptions

Application Performance Index (APDEX)

- 1) Apdex (Application Performance Index) is an open standard developed by an alliance of companies that defines a standardized method to report, benchmark, and track application performance.
- 2) Apdex is a numerical measure of user satisfaction with the performance of enterprise applications. It converts many measurements into one number on a uniform scale of 0-to-1 (0 = no users satisfied, 1 = all users satisfied)
- 3) The index is based on three zones of application responsiveness:
 - **Satisfied:** The user is fully productive. This represents the time value (T seconds) below which users are not impeded by application response time.
 - **Tolerating:** The user notices performance lagging within responses greater than T, but continues the process.
 - **Frustrated:** Performance with a response time greater than F seconds is unacceptable, and users may abandon the process.

Application Performance Index (APDEX)



The Apdex formula is the number of satisfied samples plus half of the tolerating samples plus none of the frustrated samples, divided by all the samples:

$$\text{Apdex}_T = \frac{\text{Satisfied count} + \frac{\text{Tolerating count}}{2}}{\text{Total samples}}$$

For example, if there are 100 samples with a target time of 3 seconds, where 60 are below 3 seconds, 30 are between 3 and 12 seconds, and the remaining 10 are above 12 seconds, the Apdex is:

$$\frac{60 + \frac{30}{2}}{100} = 0.75,$$

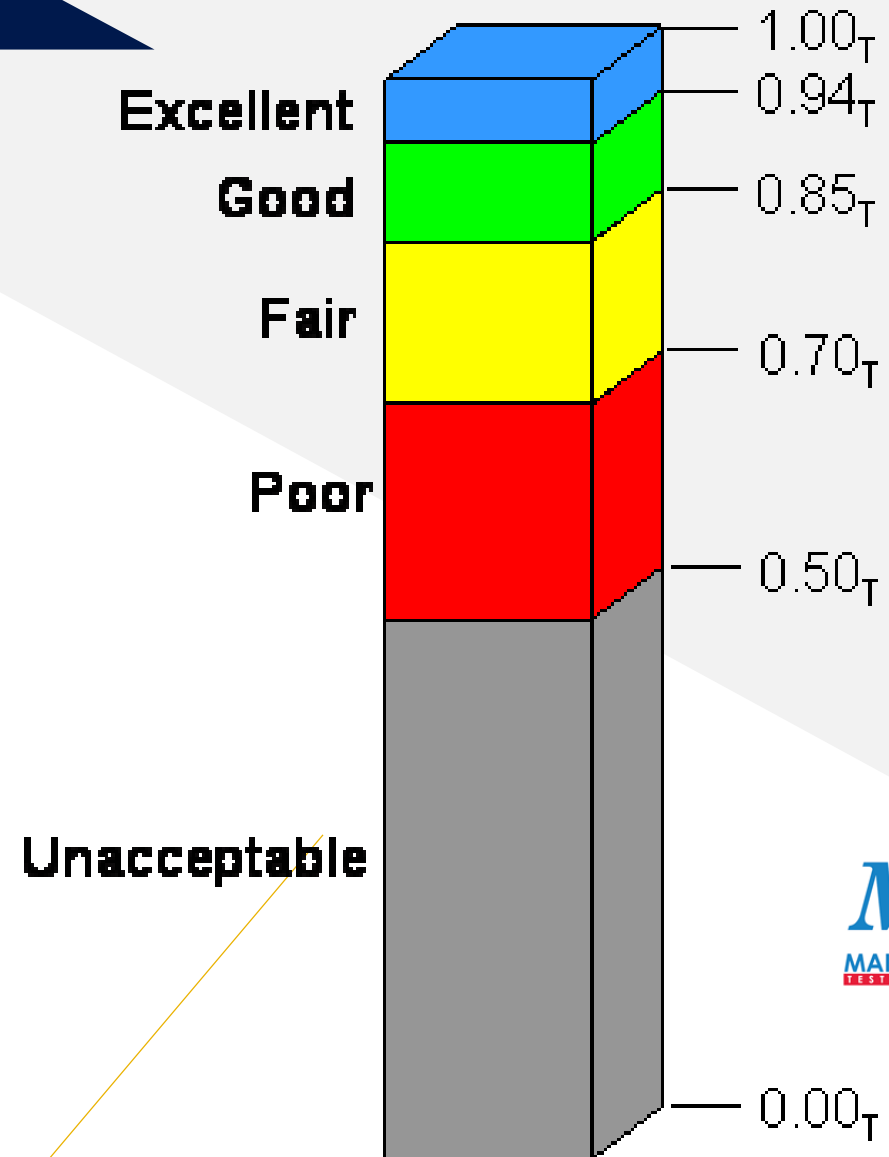
Application Performance Index (APDEX)

What is good APDEX value?

Apdex values fall between 0 and 1 where, 0 means that no users are satisfied and 1 indicates that all user samples were in the satisfied zone. Clearly, a higher number is better.



References: <http://www.apdex.org/>

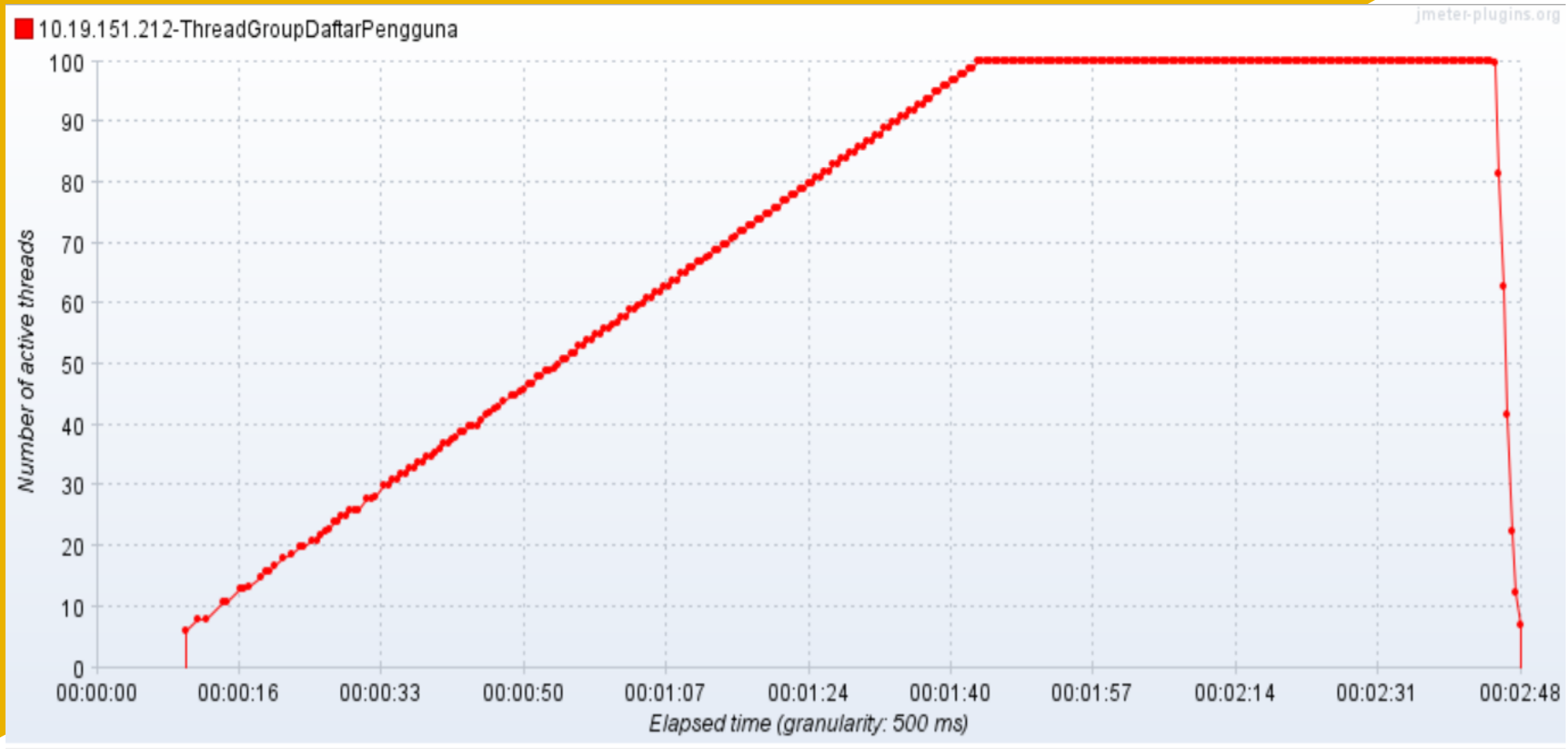




RESULTS

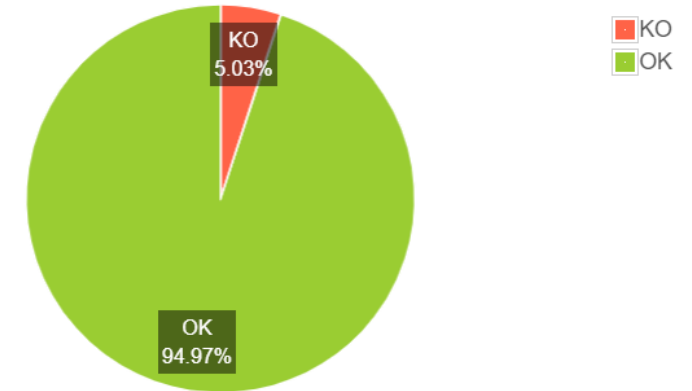
1st Iteration - 50

50 concurrent user



Result – 1st Iteration – 50 concurrent user

Requests Summary



APDEX (Application Performance Index)

APDEX : 0.982

Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
0.753	5 sec	7 sec	Total

Requests	Executions			Response Times (ms)						Throughput
	Label	#Samples	KO	Error %	Average	Min	Max	90th pct	95th pct	
Total	11638	585	5.03%	2970.84	0	127686	6291.10	7616.00	10882.37	76.24

Type of error	Number of errors	% in errors	% in all samples
Non HTTP response code: org.apache.http.conn.HttpHostConnectException/Non HTTP response message: Connect to 192.168.0.157:80 [V192.168.0.157] failed: Connection refused: connect	522	89.23%	4.49%
Non HTTP response code: java.net.URISyntaxException/Non HTTP response message: Illegal character in query at index 58: http://192.168.0.157/hesk/admin/index.php?a=logout&token=\${token}	63	10.77%	0.54%

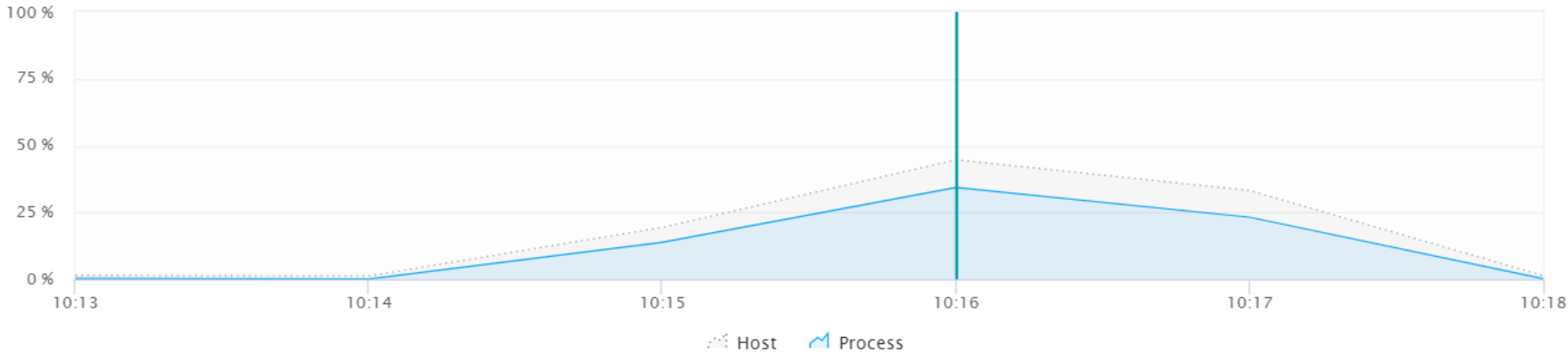
Dynatrace Analysis

Host Resources : Apps Server

Processes

showing values from today, 10:16

CPU 45 %	Memory 2.6 GB	Traffic 64.4 Mbit/s	Retransmissions 0.3 %
Connectivity 100 %	File descriptors	I/O	



Process	Type	CPU	Memory	Traffic	Retransmissions	Connectivity	File descriptors	I/O
PHP-FPM	PHP	34 %	740 MB	56.6 Mbit/s	0.03 %	100 %	2.67 %	4.06 MB/s
nginx	Nginx	1.21 %	223 MB	2.54 Mbit/s	1.82 %	100 %	2.15 %	7.41 kB/s

Dynatrace Analysis

Host Resources : Apps Server

Processes

showing values from today, 10:16

CPU 45 %

Memory 2.6 GB

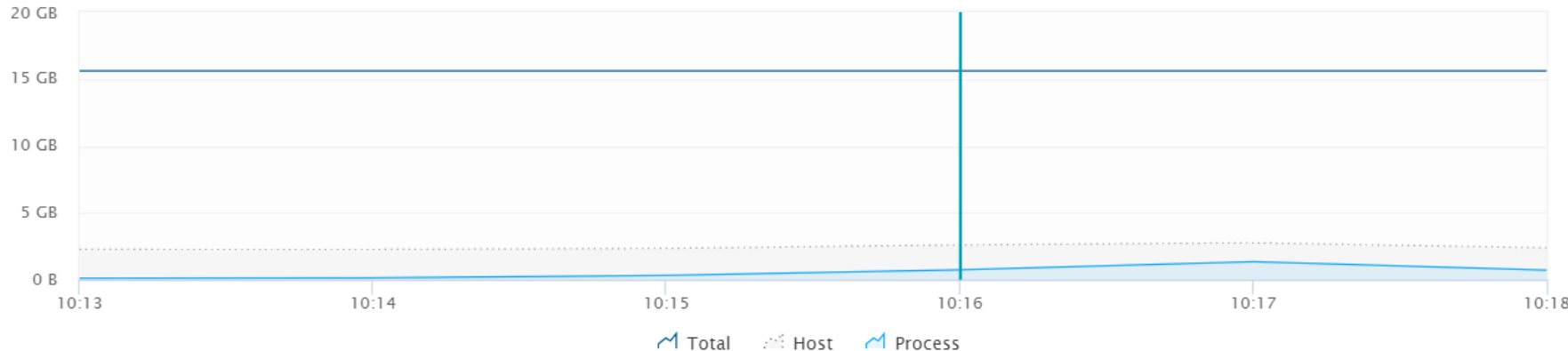
Traffic 64.4 Mbit/s

Retransmissions 0.3 %

Connectivity 100 %

File descriptors

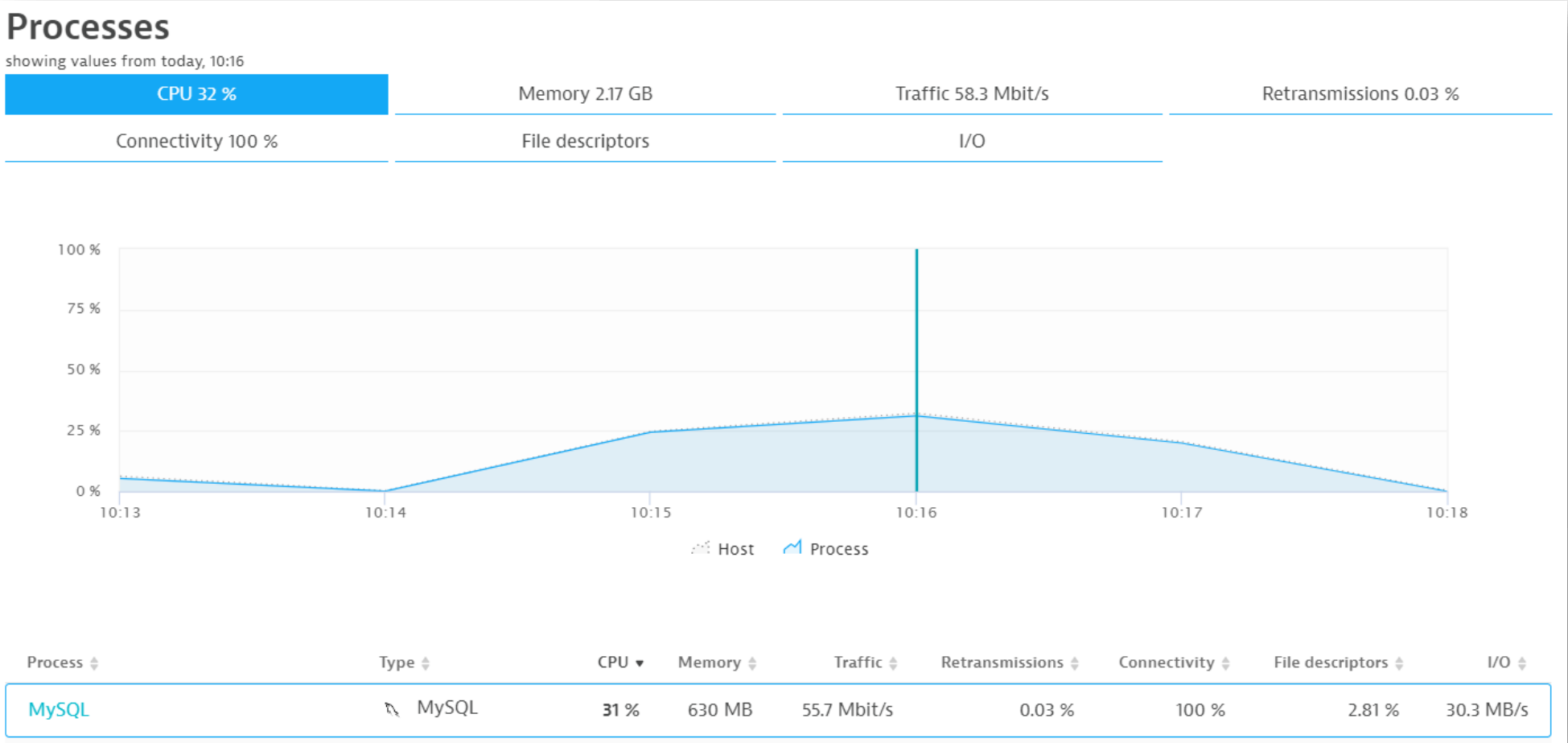
I/O



Process	Type	CPU	Memory	Traffic	Retransmissions	Connectivity	File descriptors	I/O
PHP-FPM	PHP	34 %	740 MB	56.6 Mbit/s	0.03 %	100 %	2.67 %	4.06 MB/s
nginx	Nginx	1.21 %	223 MB	2.54 Mbit/s	1.82 %	100 %	2.15 %	7.41 kB/s

Dynatrace Analysis

Host Resources : DB Server



Dynatrace Analysis

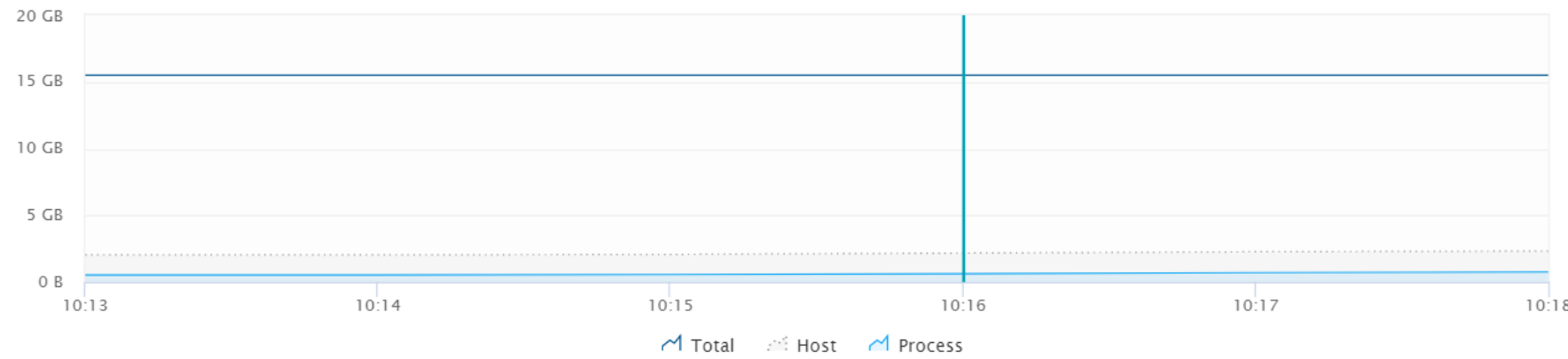
Host Resources : DB Server

Processes

showing values from today, 10:16

CPU 32 % **Memory 2.17 GB** Traffic 58.3 Mbit/s Retransmissions 0.03 %

Connectivity 100 % File descriptors I/O



Process	Type	CPU	Memory	Traffic	Retransmissions	Connectivity	File descriptors	I/O
MySQL	MySQL	31 %	630 MB	55.7 Mbit/s	0.03 %	100 %	2.81 %	30.3 MB/s

Result (50)

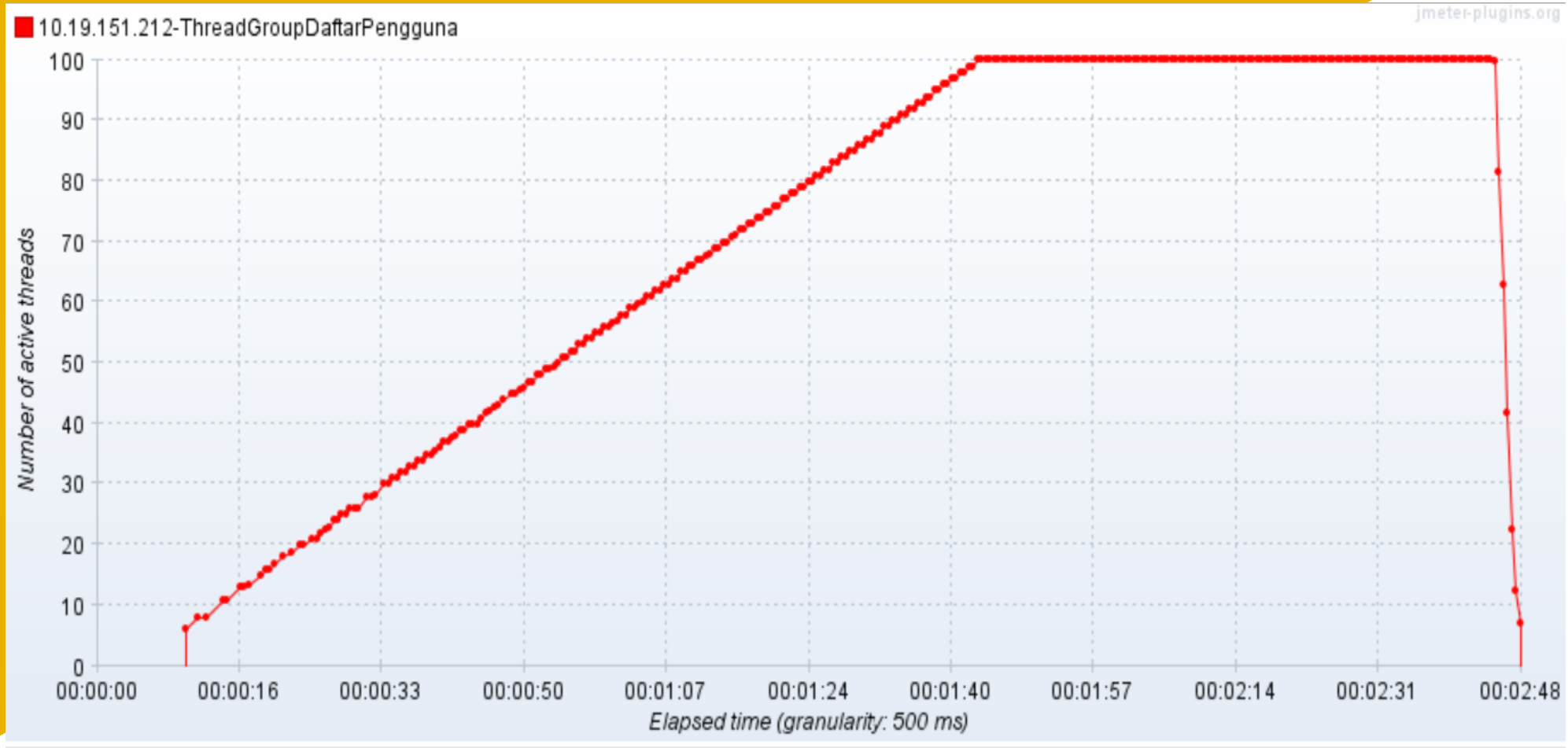
Evaluation Criteria	Cycle 2
APDEX	0.982
Average Response Time	0.352 second
Error rate	0.38 %
Infra utilization	
1) Apps Server (CPU)	45%
2) Apps Server (RAM)	16.25%
3) DB Server (CPU)	32%
4) DB Server (RAM)	14%
Result	PASS



RESULTS

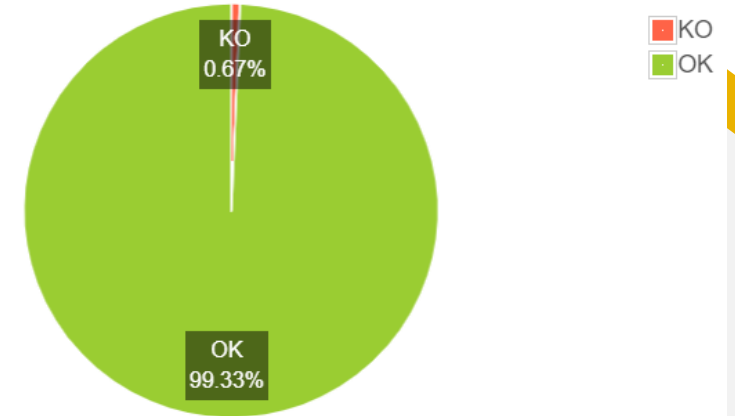
2nd Iteration - 100

100 concurrent user



Result – 1st Iteration – 100 concurrent user

Requests Summary



APDEX (Application Performance Index)

APDEX : 0.965

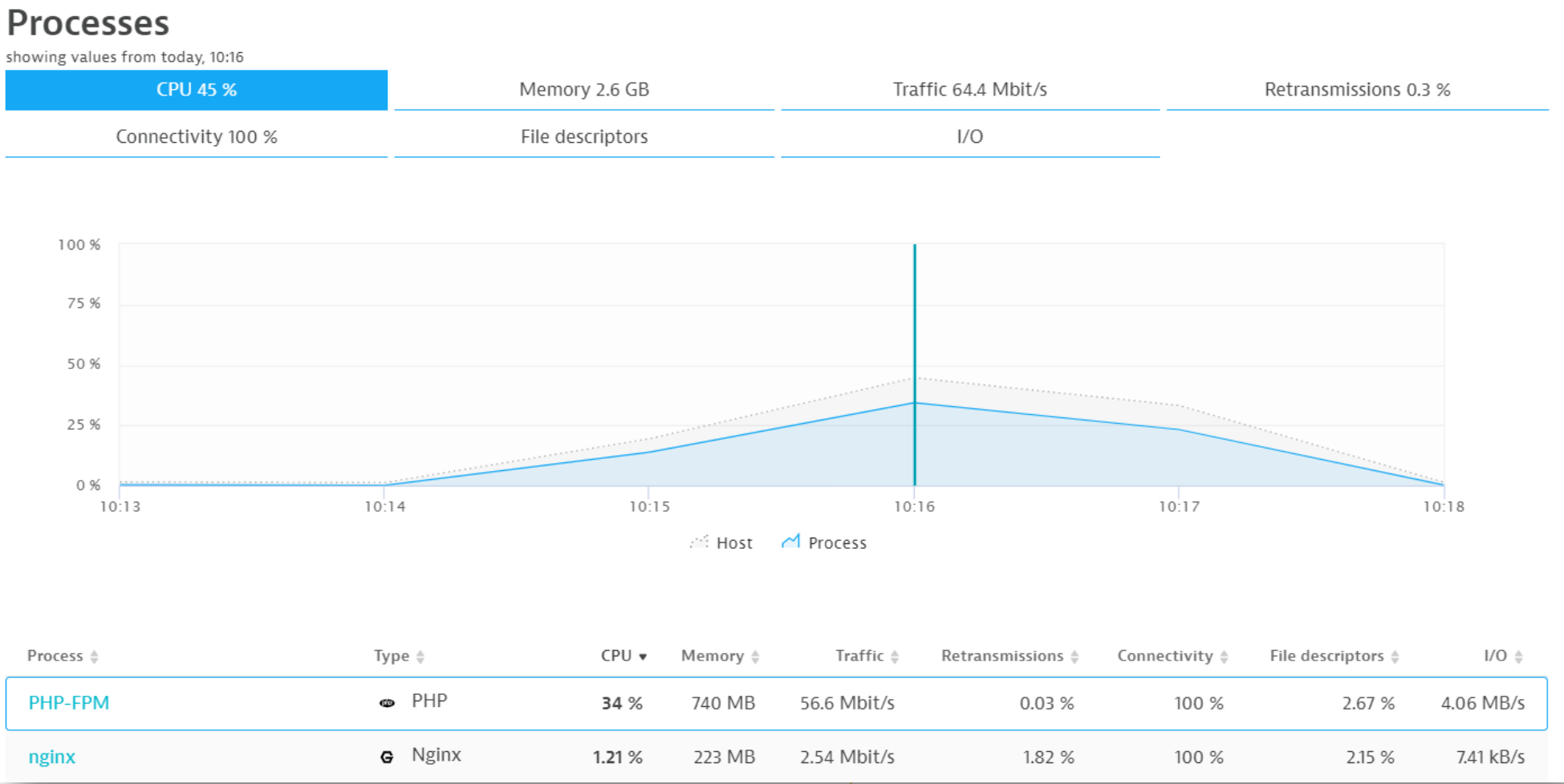
Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
0.991	5 sec	7 sec	Total

Requests	Executions			Response Times (ms)						Throughput	
	Label	#Samples	KO	Error %	Average	Min	Max	90th pct	95th pct	99th pct	Transactions/s
Total		3270	22	0.67%	509.67	37	3223	1475.00	1584.35	2618.44	20.73

Type of error	Number of errors	% in errors	% in all samples
Test failed: text expected to contain VPROFILV	22	100.00%	0.67%

Dynatrace Analysis

Host Resources : Apps Server



Dynatrace Analysis

Host Resources : Apps Server

Processes

showing values from today, 10:16

CPU 45 %

Memory 2.6 GB

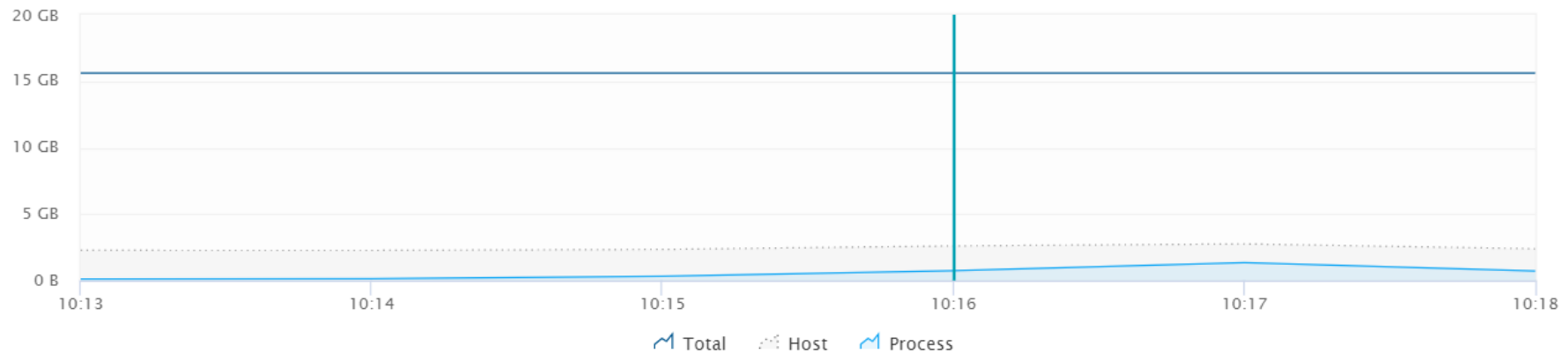
Traffic 64.4 Mbit/s

Retransmissions 0.3 %

Connectivity 100 %

File descriptors

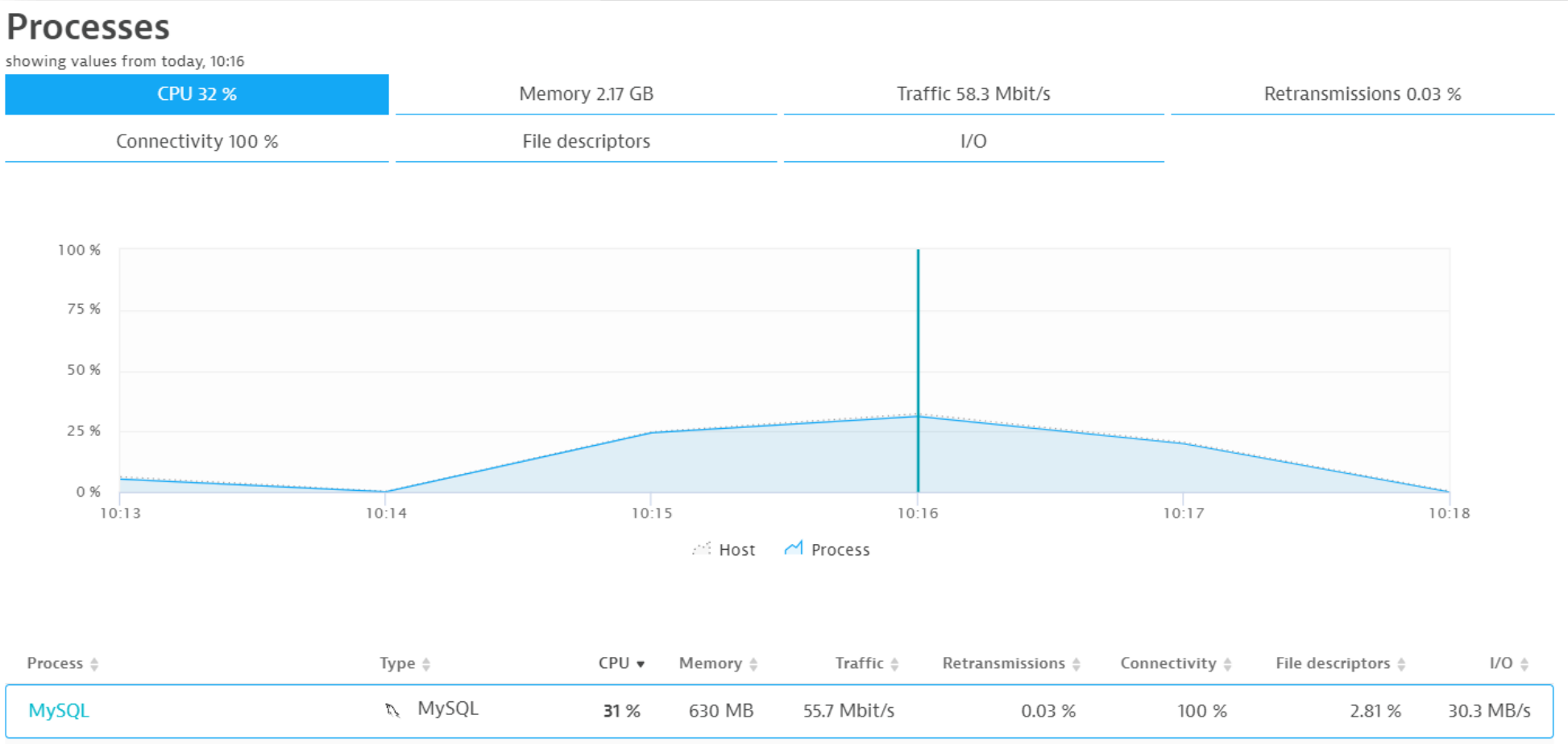
I/O



Process	Type	CPU	Memory	Traffic	Retransmissions	Connectivity	File descriptors	I/O
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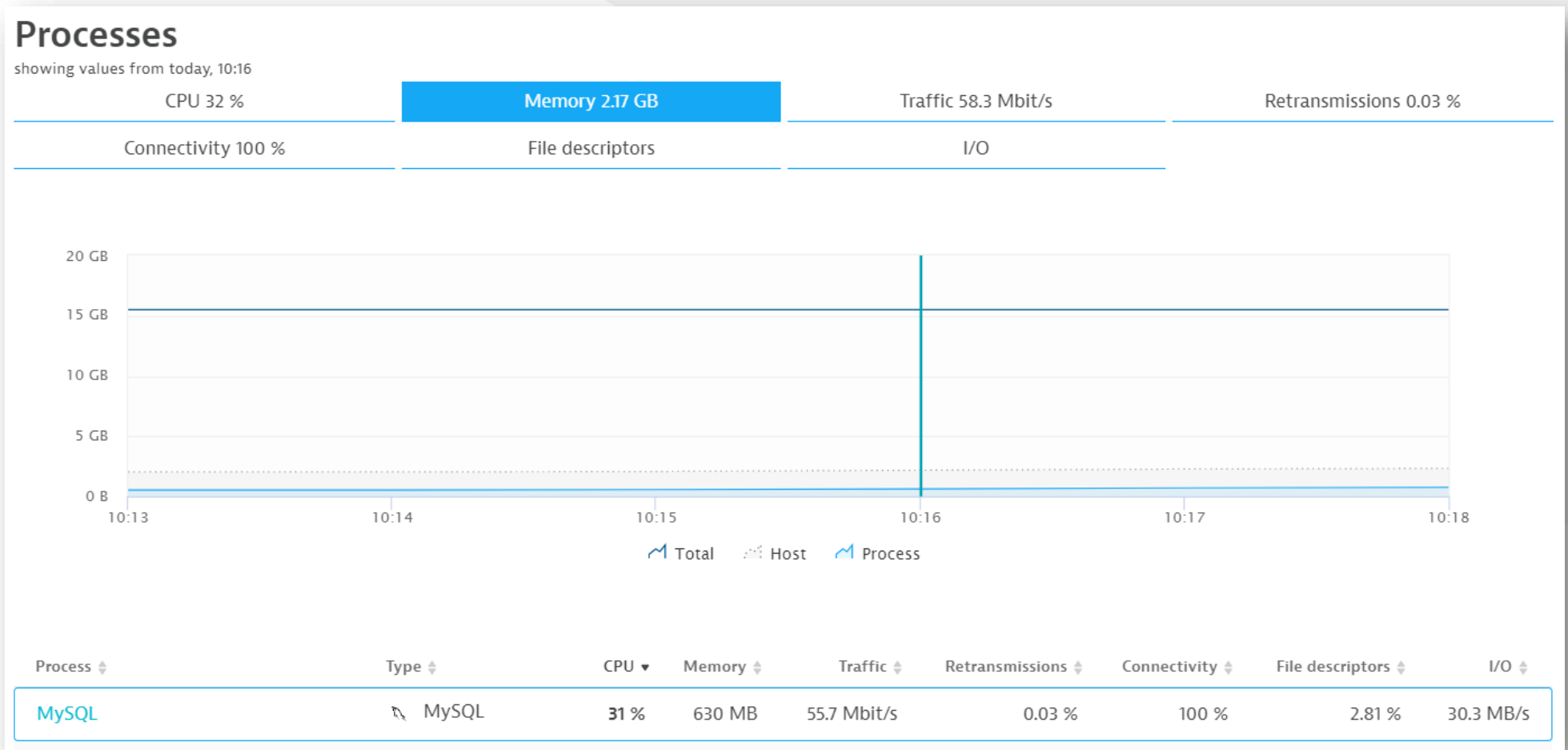
Dynatrace Analysis

Host Resources : DB Server



Dynatrace Analysis

Host Resources : DB Server



Result (100)

Evaluation Criteria	Cycle 2
APDEX	0.965
Average Response Time	0.794 second
Error rate	0.4 %
Infra utilization	
1) Apps Server (CPU)	45%
2) Apps Server (RAM)	16.25%
3) DB Server (CPU)	32%
4) DB Server (RAM)	14%
Result	PASS



FINDINGS AND RECOMMENDATIONS

What happen and How to improve

Findings

- 1) APDEX value for iteration 1 is **0.034**.
Based on APDEX value iteration 1 is **failed** because it is below than 0.85.
- 2) Average Response Time is **31 seconds**
- 3) Error rate is **3.86%**

Recommendations

- 1) Tuning up configuration and application setting
- 2) Upgrade infra resources (add on CPU)
- 3) Perform Cycle 2 performance test and repeat test for iteration 1, 2 and 3 after tuning up application and infra
- 4) DBA is involve or standby for data cleanup during performance testing



THE MAKING OF PERFORMANCE TEST

Proof and documentation

The Making







The Making





Thank You.

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