MoSKito

for users.

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BEDCON 2013
@dvayanu

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Why MoSKito

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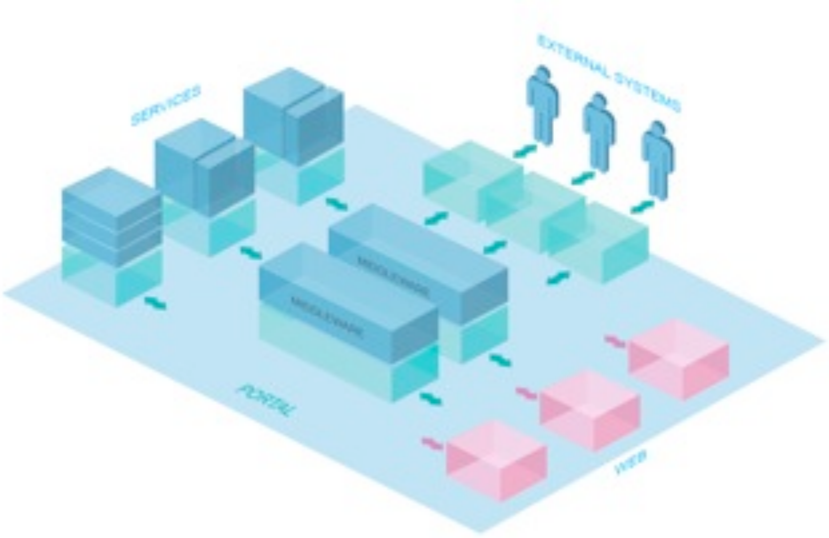
new features

BUGs

architectural changes

new markets

product pivots



Seasonal traffic

Service Level

Availability

Problem finding and fixing

Marketing campaigns

Disaster recovery

RAM/CPU Requirements

Hosting needs

Cost per user

Provider change

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new features

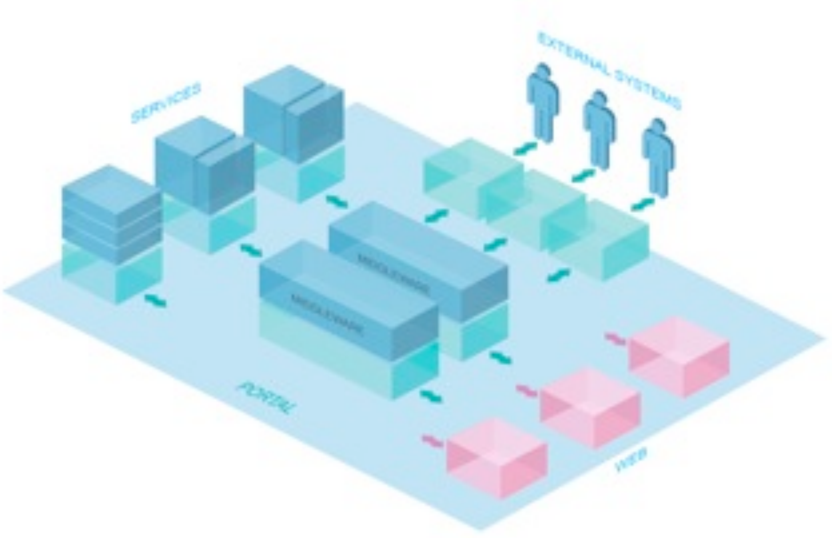
BUGs

architectural changes

Change Monitoring

new markets

product pivots



Seasonal traffic

Service Level

SLA Monitoring

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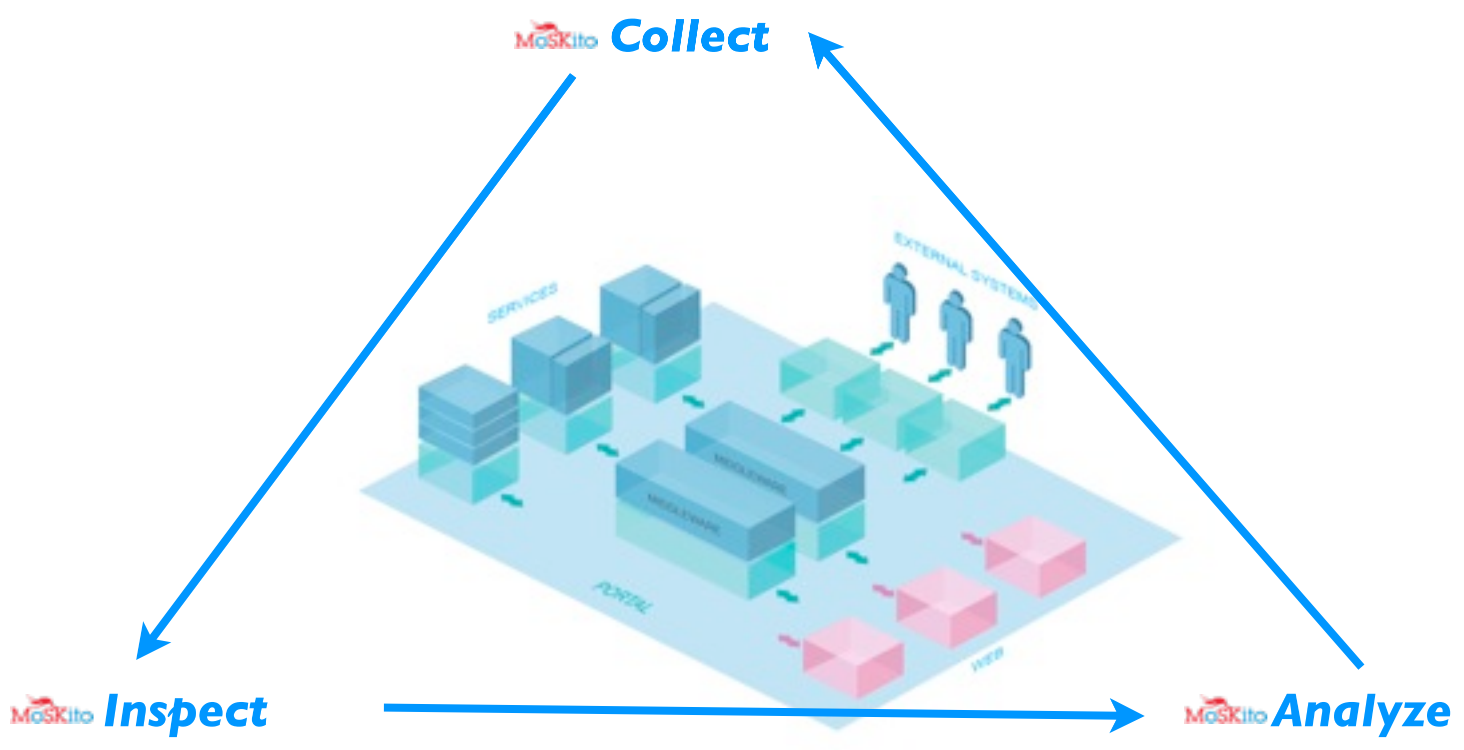

Seasonal traffic

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What is MoSKito

- MoSKito is a **multi-purpose**, **non-invasive**, **interval based monitoring system kit** for **collection**, **storage** and **instant analysis** of application’s performance and behavior data.

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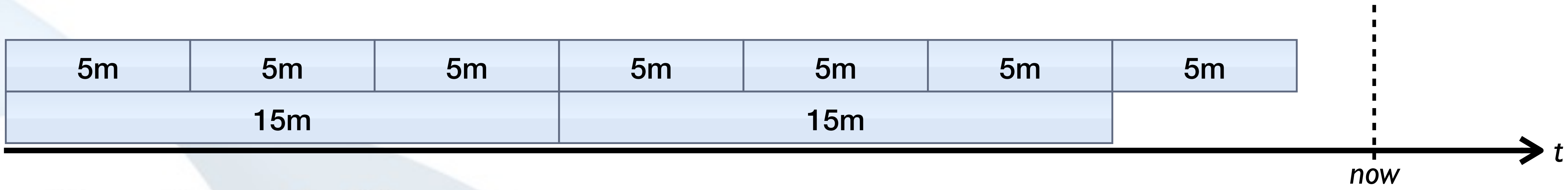
Key Features

- Collect and Store.
- Inspect and Monitor.
- Analyze and Alert.
- Continuos production profiling without performance impacts with Journeys.

Interval based.

- The behavior of a system depends on hour, weekday, weather, holidays and good karma.
- Large amounts of collected data make monitoring nonsensitive to anomalies.
- Inspection of short intervals offers more understanding about system’s behavior.



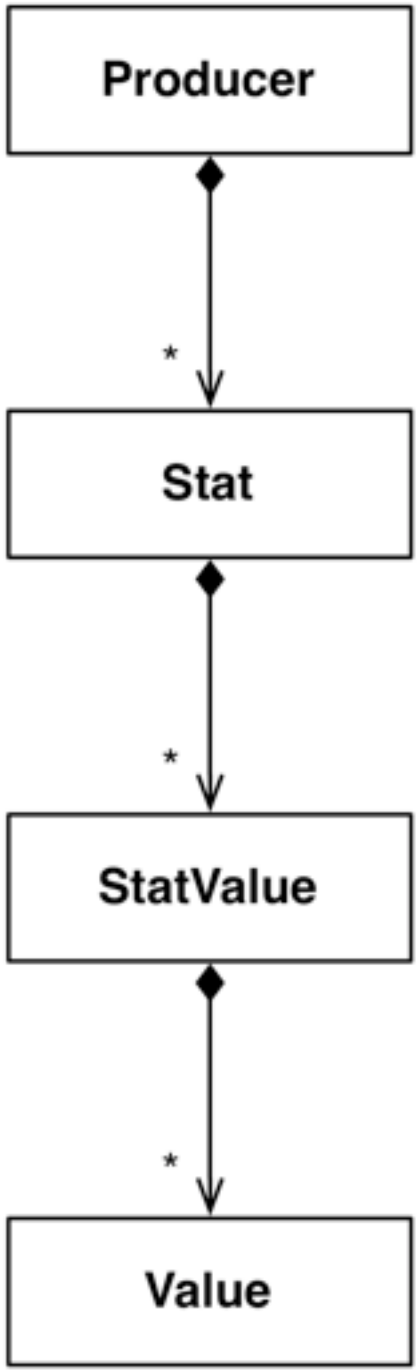
5m 5m 5m 5m 5m 5m 5m

15m 15m

now

t

Core Concepts



Do something measureable, produce stats.
Service, Filter, Action, Resource, Gateway, Payment Provider.

Statistic of a use case, i.e. method name, url,
cumulated producer statistics

Value type, i.e. request count, avg duration, error count,
cache hits, payments etc.

Container for different values for intervals

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Core Sections

- Producers and Stats - gather monitoring data.
- Thresholds - monitor changes in critical sections of the application.
- Accumulators - builds trends and allow visual analysis.
- Journeys - make inner life of the application visible.

- A picture is worth 1000 words...

  ... and live presentation is worth 1000 pictures.

Integration

- AOP / CDI
- Proxies
- WEB

- Guide: https://confluence.opensource.anotheria.net/display/MSK/Integration+Guide

AOP

```
@Monitor
public class YourClass {
```

```
public class YourClass {
  @Monitor public void firstMonitoredMethod(){...
  @Monitor public void secondMonitoredMethod(){...
  public void notMonitoredMethod(){...
```

```
@Monitor
public class YourClass {
  public void thisMethodWillBeMonitored(){...

  @DontMonitor public void thisMethodWillBeExcludedFromMonitoring(){
```

```
@Count
public class PaymentCounter {
```

```
@Count
public class PaymentCounter {
    /**
     * Electronic card payment (lastchrifteinzug in germany).
     */
    public void ec(){}
    /**
     * Credit card payment.
     */
    public void cc(){}
    /**
     * Payment via paypal.
     */
    public void paypal(){}
}
```

AOP + MAVEN

```
<dependencies>
    <dependency>
        <groupId>net.anotheria</groupId>
        <artifactId>moskito-core</artifactId>
        <version>2.2.2</version>
    </dependency>
    <dependency>
        <groupId>net.anotheria</groupId>
        <artifactId>moskito-aop</artifactId>
        <version>2.2.2</version>
 </dependency>
```

```
<build>
    <plugins>
        <plugin>
            <groupId>org.codehaus.mojo</groupId>
            <artifactId>aspectj-maven-plugin</artifactId>
            <version>1.4</version>
            <configuration>
                <aspectLibraries>
                    <aspectLibrary>
                        <groupId>net.anotheria</groupId>
                        <artifactId>moskito-aop</artifactId>
                    </aspectLibrary>
                </aspectLibraries>
                <source>1.6</source>
                <target>1.6</target>
            </configuration>
            <executions>
                <execution>
                    <goals>
                        <goal>compile</goal>
                    </goals>
                </execution>
            </executions>
        </plugin>
    </plugins>
</build>
```

Proxies

```java
public interface SimpleService{
    void doSomethingMethod();
}
```

```java
public class SimpleServiceImpl implements SimpleService{
    public void doSomethingMethod(){
    }
}
```

```java
SimpleService service = ProxyUtils.createServiceInstance(new SimpleServiceImpl(), "default", SimpleService.class);
```

```java
SimpleService unmonitoredInstance = new SimpleServiceImpl();
MoskitoInvokationProxy proxy = new MoskitoInvokationProxy(
        unmonitoredInstance,
        new ServiceStatsCallHandler(),
        new ServiceStatsFactory(),
        "SimpleService",
        "service",
        "test-sub-system",
        SimpleService.class
        );
SimpleService monitoredInstance = (SimpleService)proxy.createProxy();
```

WEB

```
<filter>
  <filter-name>RequestURIFilter</filter-name>
  <filter-class>net.anotheria.moskito.web.filters.RequestURIFilter</filter-class>
  <init-param>
    <param-name>limit</param-name>
    <param-value>1000</param-value>
  </init-param>
</filter>

<filter-mapping>
  <filter-name>RequestURIFilter</filter-name>
  <url-pattern>/*</url-pattern>
</filter-mapping>
```

```
<filter>
  <filter-name>DomainFilter</filter-name>
  <filter-class>net.anotheria.moskito.web.filters.DomainFilter</filter-class>
  <init-param>
    <param-name>limit</param-name>
    <param-value>50</param-value>
  </init-param>
</filter>

<filter-mapping>
  <filter-name>DomainFilter</filter-name>
  <url-pattern>/*</url-pattern>
</filter-mapping>
```

WebUI

```
web.xml
   <!--  MOSKITO UI-->
    <!--  Adding filter to moskito ui which redirects requests to /mui/* to moskito user interface -->
    <filter>
        <filter-name>MoskitoUIFilter</filter-name>
        <filter-class>net.anotheria.moskito.webui.MoskitoUIFilter</filter-class>
        <init-param>
            <param-name>path</param-name>
            <param-value>/mui/</param-value>
        </init-param>
    </filter>
    <filter-mapping>
        <filter-name>MoskitoUIFilter</filter-name>
        <url-pattern>/mui/*</url-pattern>
    </filter-mapping>
    <!--  / MOSKITO UI END -->

<!-- somewhere else --->

    <listener>
        <listener-class>
            net.anotheria.moskito.webui.util.StartStopListener
        </listener-class>
    </listener>
    <listener>
        <listener-class>
            net.anotheria.moskito.web.session.SessionCountProducer
        </listener-class>
    </listener>
    <listener>
        <listener-class>
            org.anotheria.moskitodemo.threshold.presentation.listener.SetupThresholds
        </listener-class>
    </listener>
```

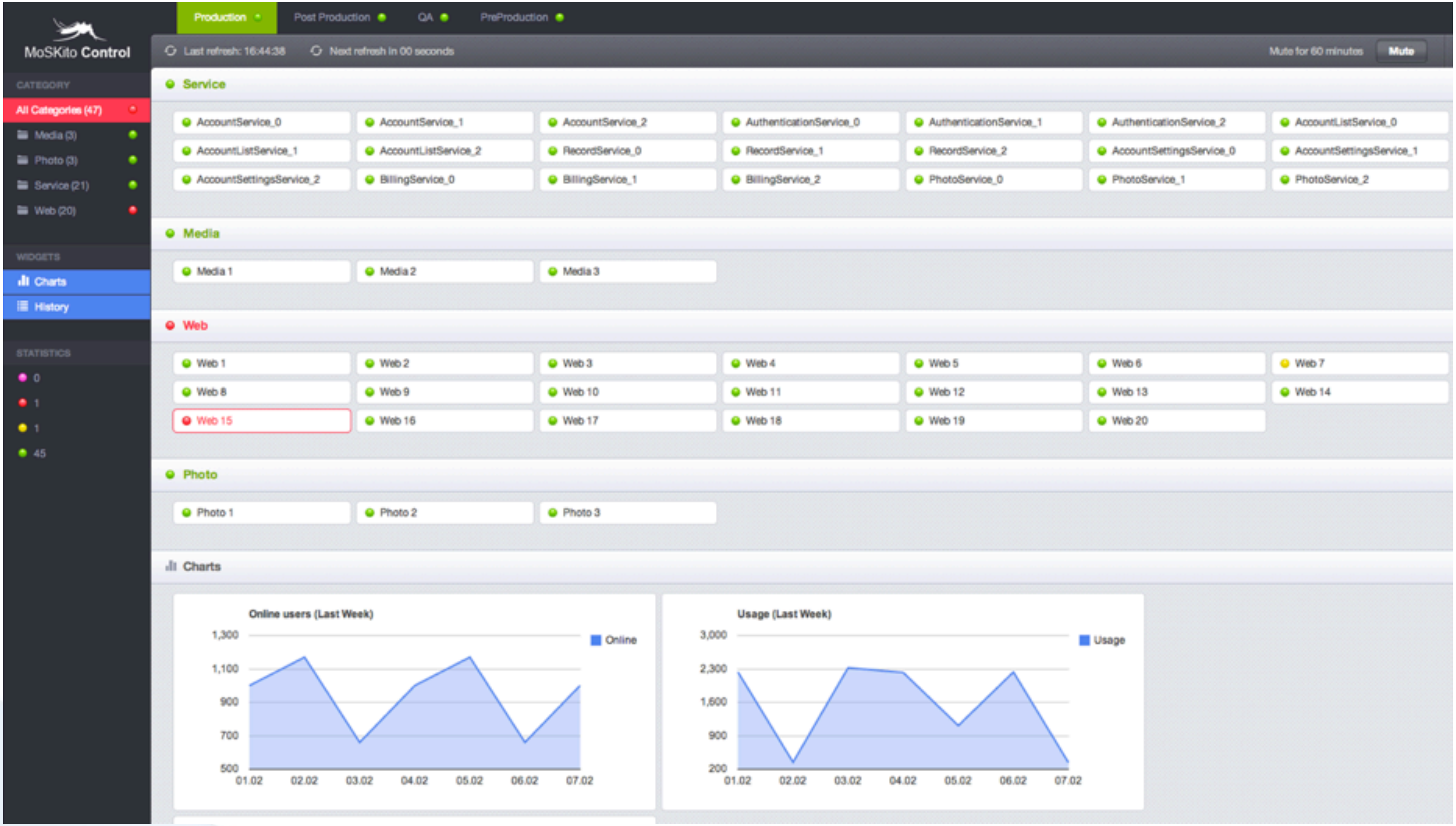
What else

- MoSKito Central
- MoSKito Control
- MoSKito @ Barbecue

MoSKito Central

- Central server for snapshot storage.
- Attachable storages can store data into sql- or nosql- based databases, xml/json files etc.
- Runs in remote or embedded mode.

MoSKito Control



● Service

● AccountService_0	● AccountService_1	● AccountService_2	● AuthenticationService_0	● AuthenticationService_1	● AuthenticationService_2	● AccountListService_0
● AccountListService_1	● AccountListService_2	● RecordService_0	● RecordService_1	● RecordService_2	● AccountSettingsService_0	● AccountSettingsService_1
● AccountSettingsService_2	● BillingService_0	● BillingService_1	● BillingService_2	● PhotoService_0	● PhotoService_1	● PhotoService_2

● Media

● Media 1	● Media 2	● Media 3

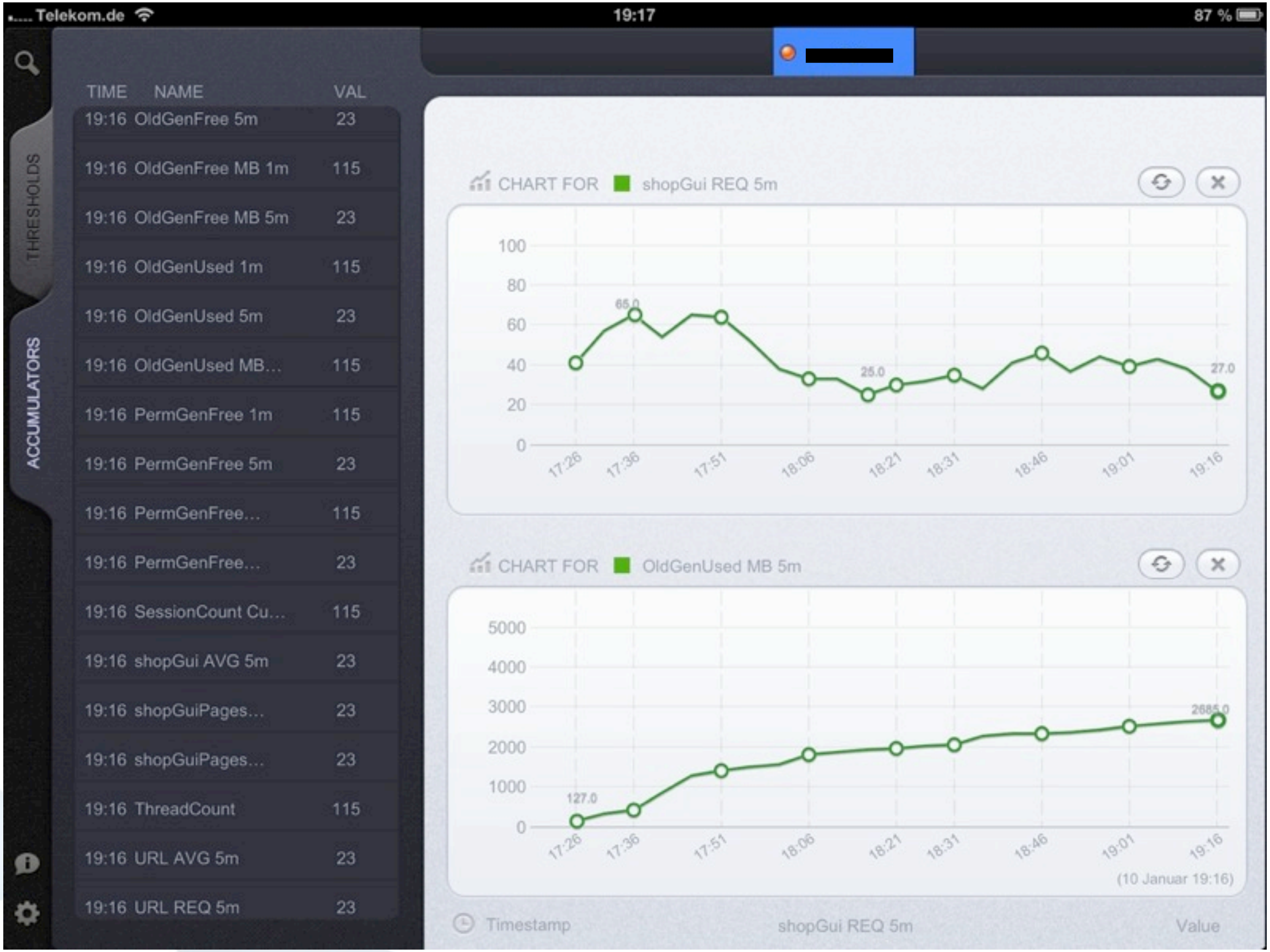
● Web

● Web 1	● Web 2	● Web 3	● Web 4	● Web 5	● Web 6	● Web 7
● Web 8	● Web 9	● Web 10	● Web 11	● Web 12	● Web 13	● Web 14
● Web 15	● Web 16	● Web 17	● Web 18	● Web 19	● Web 20	

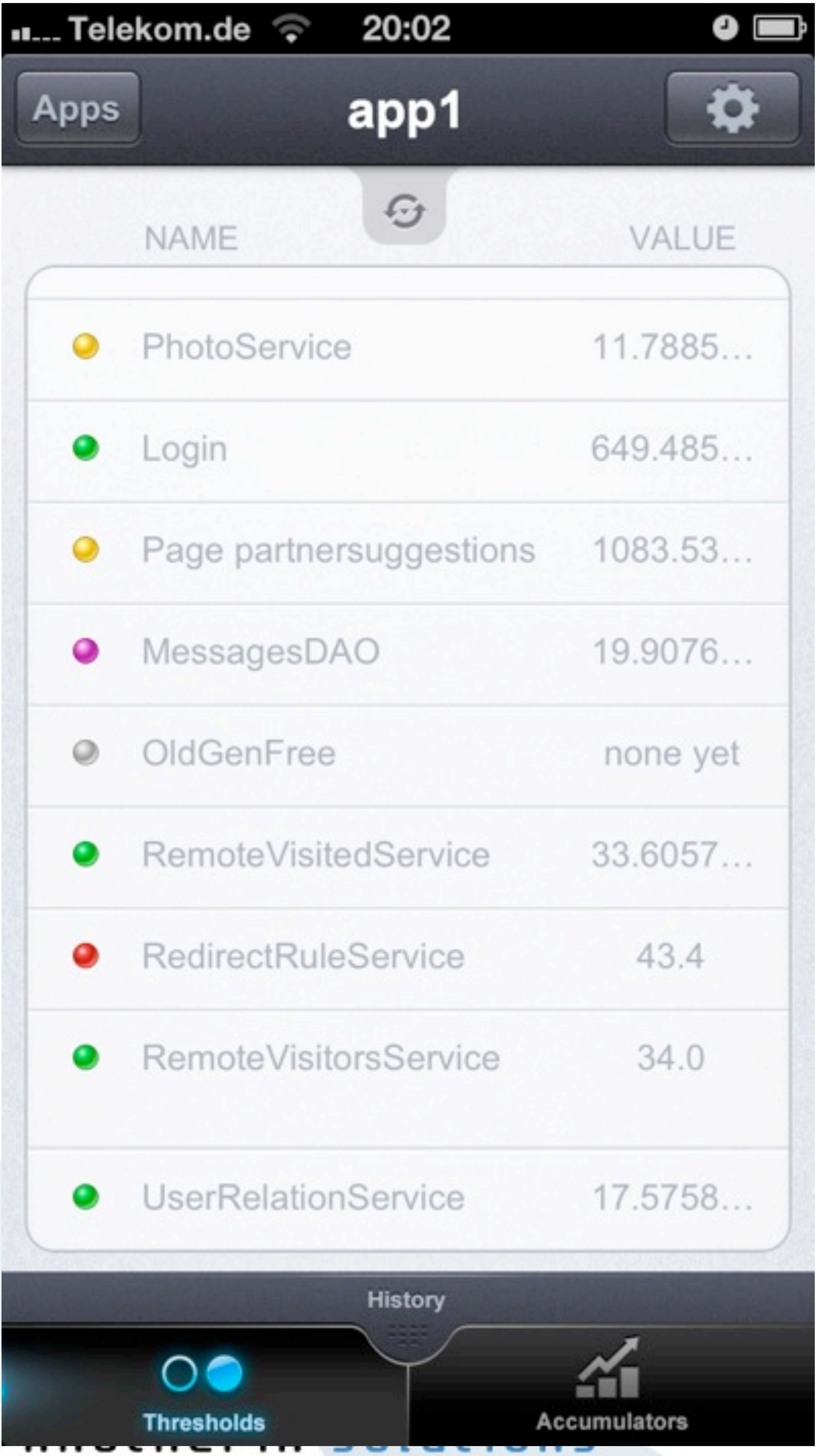
● Photo

● Photo 1	● Photo 2	● Photo 3

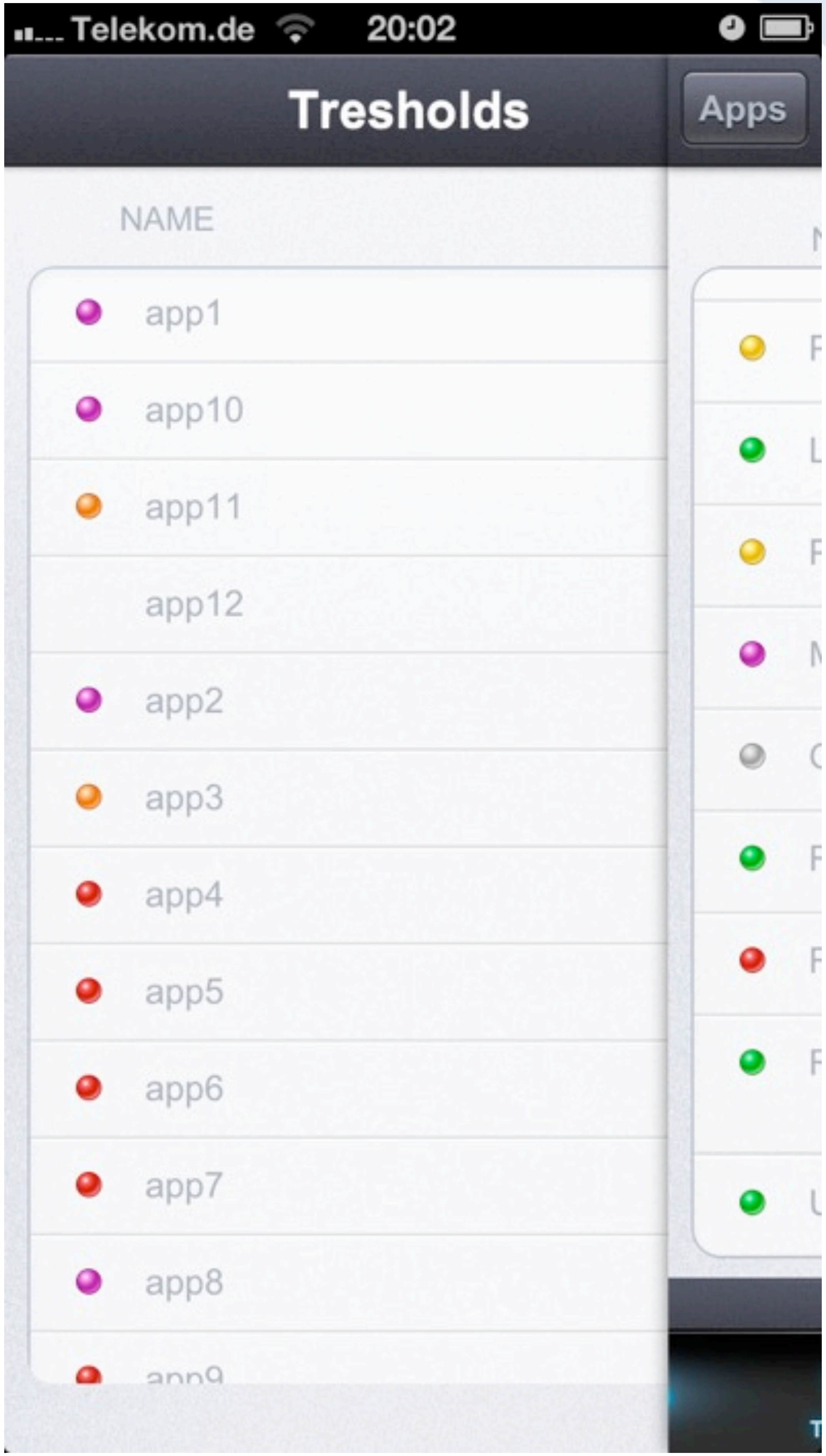
MoSKito To Go



TIME	NAME	VAL
19:16	OldGenFree 5m	23
19:16	OldGenFree MB 1m	115
19:16	OldGenFree MB 5m	23
19:16	OldGenUsed 1m	115
19:16	OldGenUsed 5m	23
19:16	OldGenUsed MB...	115
19:16	PermGenFree 1m	115
19:16	PermGenFree 5m	23
19:16	PermGenFree...	115
19:16	PermGenFree...	23
19:16	SessionCount Cu...	115
19:16	shopGui AVG 5m	23
19:16	shopGuiPages...	23
19:16	shopGuiPages...	23
19:16	ThreadCount	115
19:16	URL AVG 5m	23
19:16	URL REQ 5m	23



	NAME	VALUE
🟡	PhotoService	11.7885...
🟢	Login	649.485...
🟡	Page partnersuggestions	1083.53...
🟣	MessagesDAO	19.9076...
⚪	OldGenFree	none yet
🟢	RemoteVisitedService	33.6057...
🔴	RedirectRuleService	43.4
🟢	RemoteVisitorsService	34.0
🟢	UserRelationService	17.5758...



	NAME
🟣	app1
🟣	app10
🟠	app11
	app12
🟣	app2
🟠	app3
🔴	app4
🔴	app5
🔴	app6
🔴	app7
🟣	app8
🔴	app9

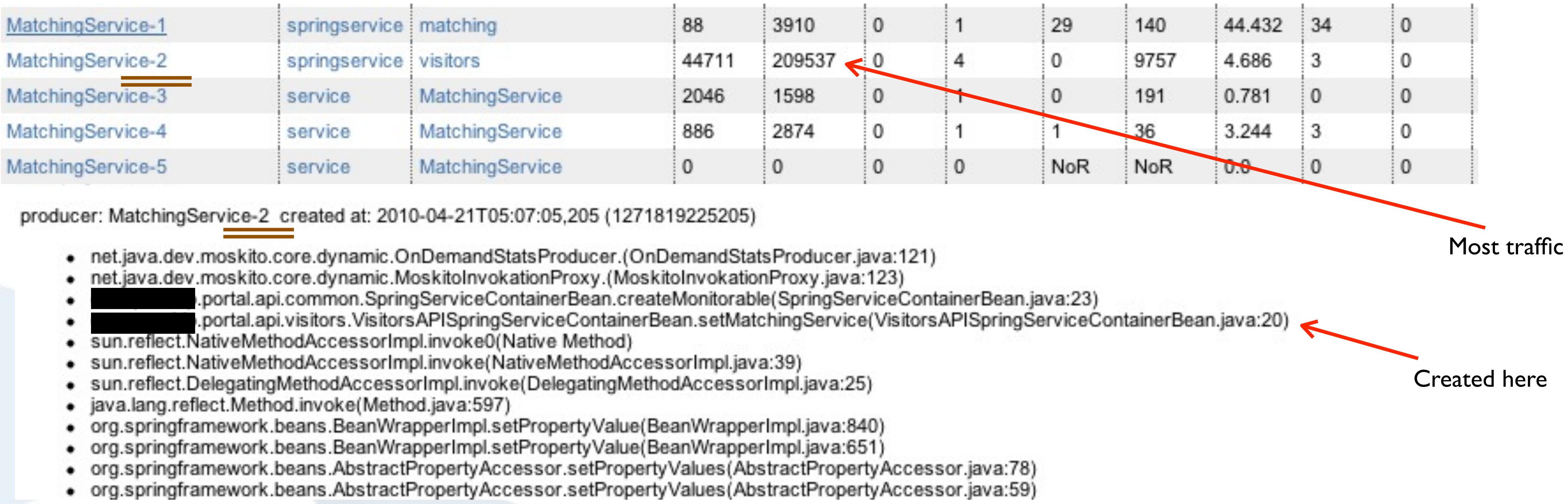
Success stories

- Far too many, but here are some :-)

I

- After a release of a new version huge traffic increase on one of the databases was detected.
- The database in question was used by a service. There were 20 clients (code components) using this service.
- MoSKito showed that 55% of the traffic to the service came from one client. With MoSKito inspection we were able to detect which client was producing most traffic.

- Closer inspection (code review) of the client revealed a bug which led to double calls to the service.
- Incident solved in 30 minutes.



MatchingService-1	springservice	matching	88	3910	0	1	29	140	44.432	34	0
MatchingService-2	springservice	visitors	44711	209537	0	4	0	9757	4.686	3	0
MatchingService-3	service	MatchingService	2046	1598	0	1	0	191	0.781	0	0
MatchingService-4	service	MatchingService	886	2874	0	1	1	36	3.244	3	0
MatchingService-5	service	MatchingService	0	0	0	0	NoR	NoR	0.0	0	0

producer: MatchingService-2 created at: 2010-04-21T05:07:05,205 (1271819225205)

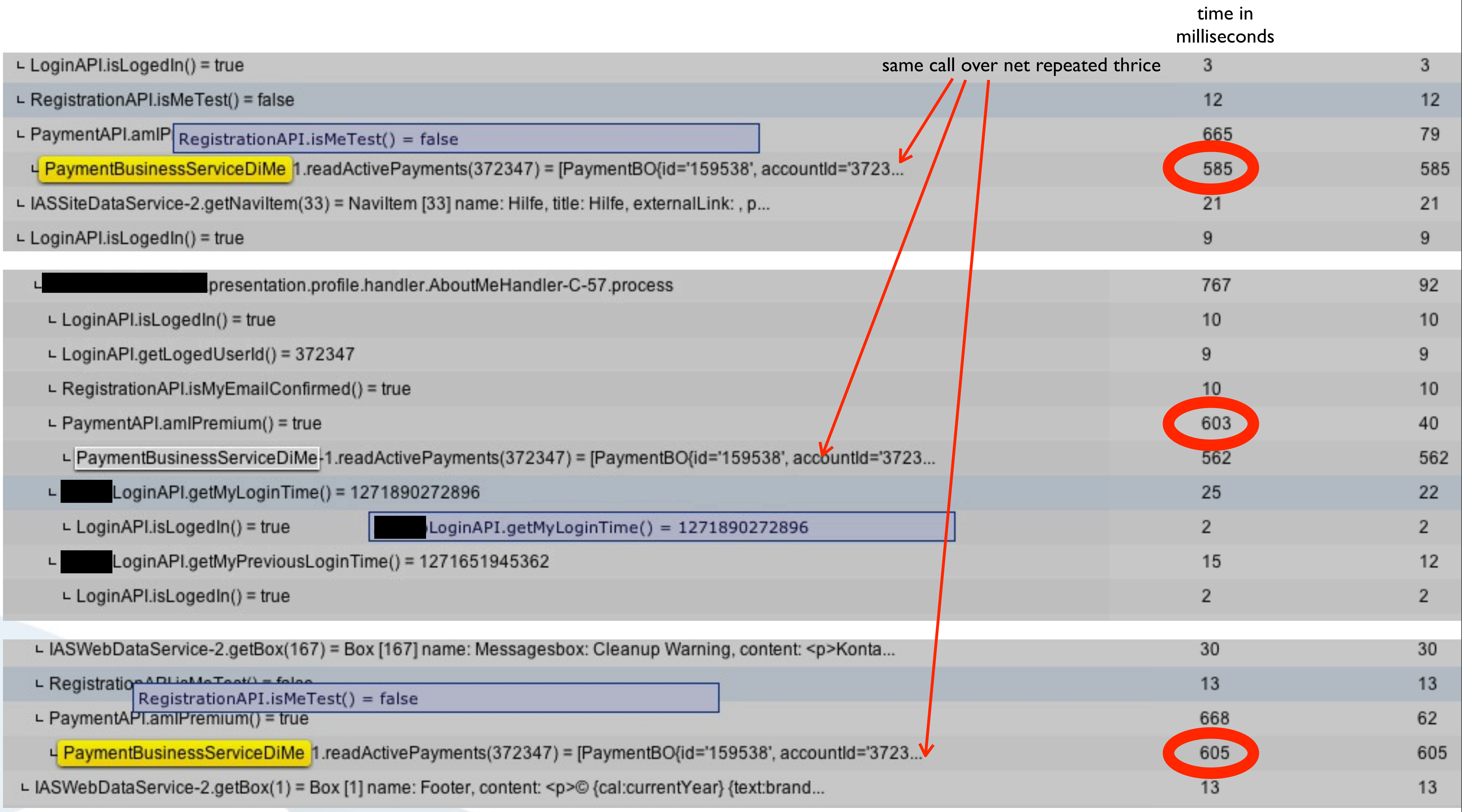
```
• net.java.dev.moskito.core.dynamic.OnDemandStatsProducer.(OnDemandStatsProducer.java:121)
• net.java.dev.moskito.core.dynamic.MoskitoInvokationProxy.(MoskitoInvokationProxy.java:123)
• [redacted].portal.api.common.SpringServiceContainerBean.createMonitorable(SpringServiceContainerBean.java:23)
• [redacted].portal.api.visitors.VisitorsAPISpringServiceContainerBean.setMatchingService(VisitorsAPISpringServiceContainerBean.java:20)
• sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
• sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:39)
• sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:25)
• java.lang.reflect.Method.invoke(Method.java:597)
• org.springframework.beans.BeanWrapperImpl.setPropertyValue(BeanWrapperImpl.java:840)
• org.springframework.beans.BeanWrapperImpl.setPropertyValue(BeanWrapperImpl.java:651)
• org.springframework.beans.AbstractPropertyAccessor.setPropertyValues(AbstractPropertyAccessor.java:78)
• org.springframework.beans.AbstractPropertyAccessor.setPropertyValues(AbstractPropertyAccessor.java:59)
```

Most traffic

Created here

II

- Application overall performance was insufficient.
- With moskito journeys and call tree analysis we were able to find redundant calls to the backend and remove them.
- Request duration reduced to 50% with 4 hours analysis and 4 hours coding effort.



time in milliseconds

same call over net repeated thrice

```
└ LoginAPI.isLogedIn() = true                                                                   3      3
└ RegistrationAPI.isMeTest() = false                                                           12     12
└ PaymentAPI.amIP  RegistrationAPI.isMeTest() = false                                         665     79
  └ PaymentBusinessServiceDiMe1.readActivePayments(372347) = [PaymentBO{id='159538', accountId='3723...   585    585
└ IASSiteDataService-2.getNaviItem(33) = NaviItem [33] name: Hilfe, title: Hilfe, externalLink: , p...   21     21
└ LoginAPI.isLogedIn() = true                                                                   9      9

  └ [redacted]presentation.profile.handler.AboutMeHandler-C-57.process                        767     92
    └ LoginAPI.isLogedIn() = true                                                              10     10
    └ LoginAPI.getLogedUserId() = 372347                                                        9      9
    └ RegistrationAPI.isMyEmailConfirmed() = true                                              10     10
    └ PaymentAPI.amIPremium() = true                                                          603     40
      └ PaymentBusinessServiceDiMe-1.readActivePayments(372347) = [PaymentBO{id='159538', accountId='3723...   562    562
    └ [redacted]LoginAPI.getMyLoginTime() = 1271890272896                                      25     22
      └ LoginAPI.isLogedIn() = true          [redacted]LoginAPI.getMyLoginTime() = 1271890272896   2      2
    └ [redacted]LoginAPI.getMyPreviousLoginTime() = 1271651945362                              15     12
      └ LoginAPI.isLogedIn() = true                                                             2      2

  └ IASWebDataService-2.getBox(167) = Box [167] name: Messagesbox: Cleanup Warning, content: <p>Konta...   30     30
  └ Registratio  RegistrationAPI.isMeTest() = false                                            13     13
  └ PaymentAPI.amIPremium() = true                                                            668     62
    └ PaymentBusinessServiceDiMe1.readActivePayments(372347) = [PaymentBO{id='159538', accountId='3723...   605    605
└ IASWebDataService-2.getBox(1) = Box [1] name: Footer, content: <p>© {cal:currentYear} {text:brand...   13     13
```

End of Data.

Thank you.

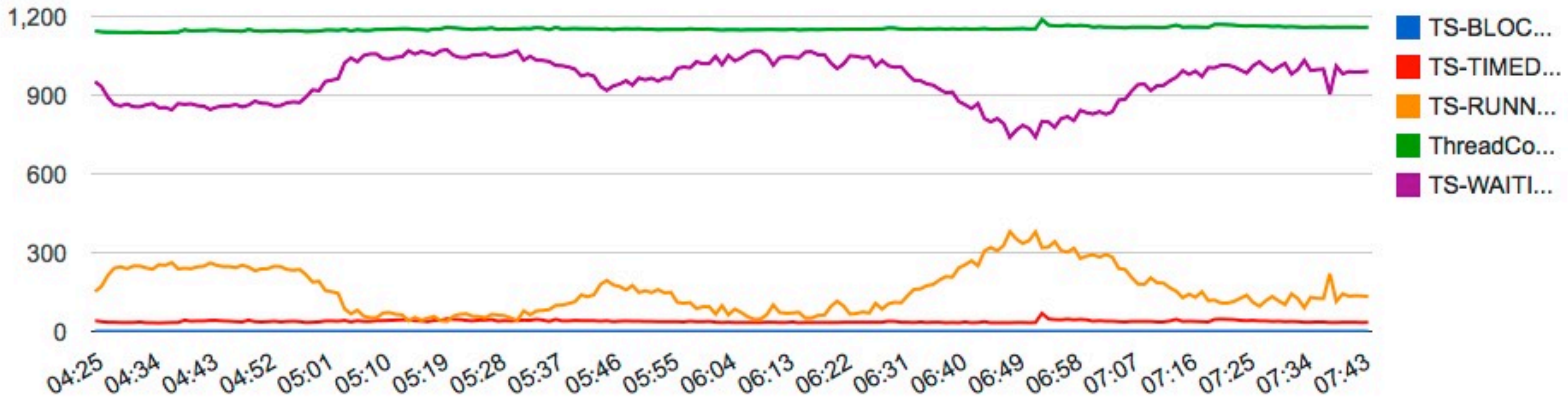
MoSKito http://moskito.anotheria.net/

Available on the App Store https://itunes.apple.com/de/app/moskito-ui/id531387262?l=en&mt=8

https://github.com/anotheria/moskito-examples

https://github.com/anotheria/moskito-jboss

Central http://search.maven.org/#search%7Cga%7C1%7Cmoskito


1,200
900
600
300
0
04:25
04:34
04:43
04:52
05:01
05:10
05:19
05:28
05:37
05:46
05:55
06:04
06:13
06:22
06:31
06:40
06:49
06:58
07:07
07:16
07:25
07:34
07:43
🟦 TS-BLOC...
🟥 TS-TIMED...
🟧 TS-RUNN...
🟩 ThreadCo...
🟪 TS-WAITI...

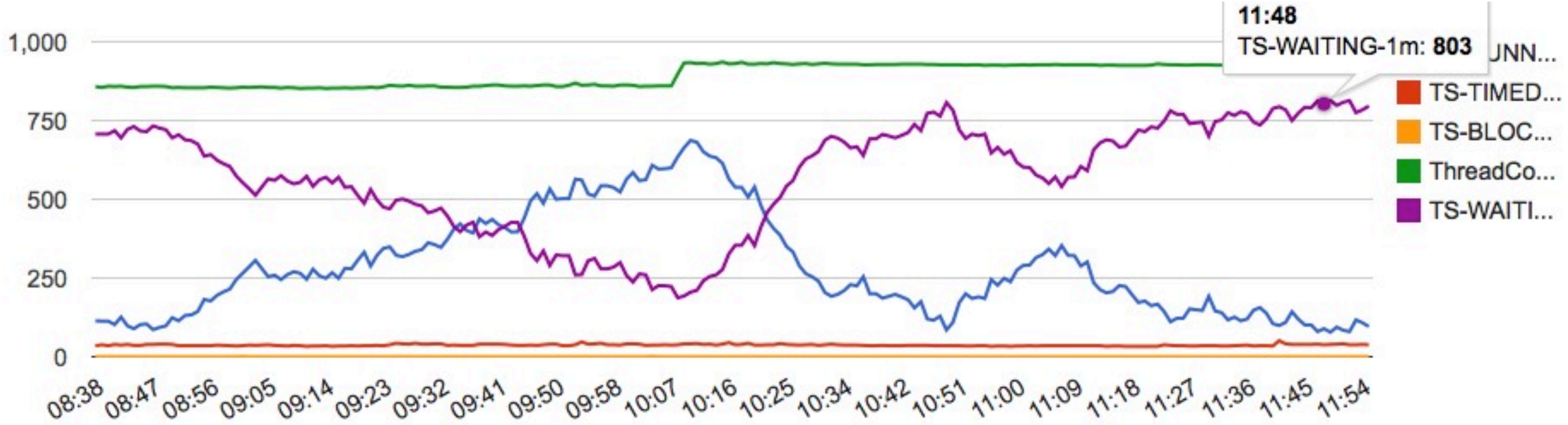

1,000
750
500
250
0
08:38
08:47
08:56
09:05
09:14
09:23
09:32
09:41
09:50
09:58
10:07
10:16
10:25
10:34
10:42
10:51
11:00
11:09
11:18
11:27
11:36
11:45
11:54
11:48
TS-WAITING-1m: 803
UNN...
🟥 TS-TIMED...
🟧 TS-BLOC...
🟩 ThreadCo...
🟪 TS-WAITI...

Chart for PhotoService REQ PhotoService AVG

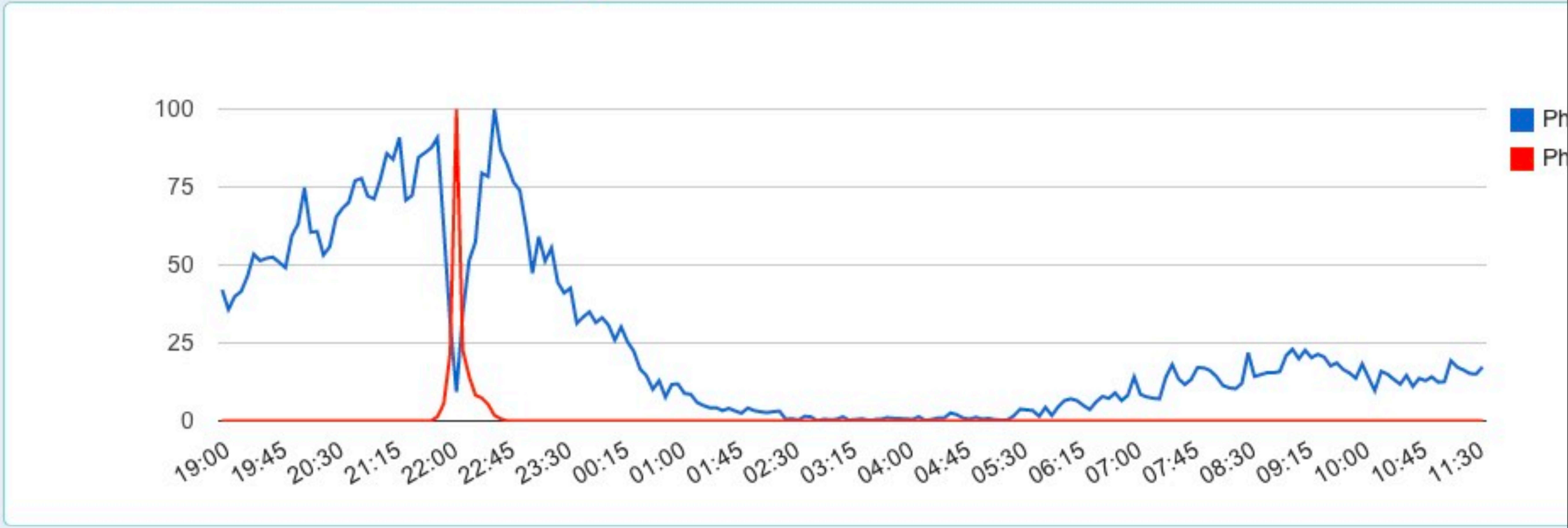
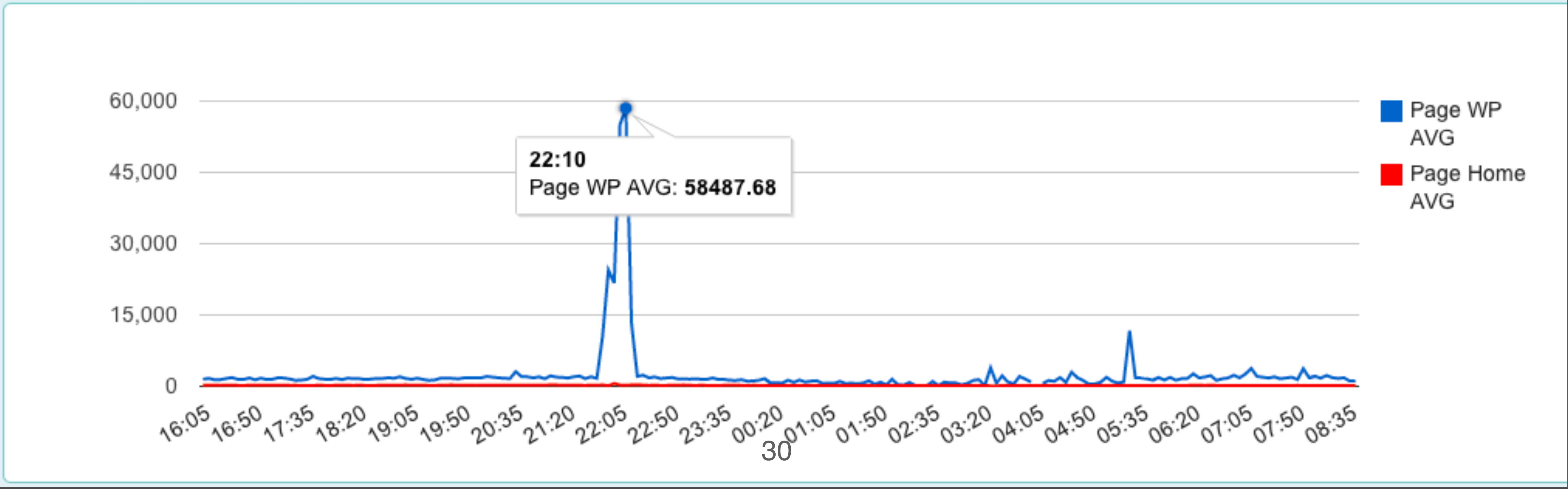


Chart for Page WP AVG Page Home AVG



22:10
Page WP AVG: **58487.68**

End of Data.

Thank you.

MoSKito http://moskito.anotheria.net/

Available on the App Store https://itunes.apple.com/de/app/moskito-ui/id531387262?l=en&mt=8

https://github.com/anotheria/moskito-examples

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Central http://search.maven.org/#search%7Cga%7C1%7Cmoskito

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