

# Ensuring Operational Performance of Mobile Applications



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# The Challenges of Today, and Tomorrow

## A Whole New Level of Complexity

- Support 3+ operating systems
- Rapid, uncontrolled OS, app updates
- Nearly unlimited range of hardware
- Many different form factors



## App Adoption & Management

- Very short dev lifecycles
- User controls updates
- Some apps target very large adoption and usage rates



## Usage Growing Exponentially

- Decentralized procurement
- Unmonitored usage & roaming
- Inconsistent policies



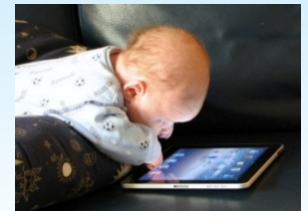
## The Primary Device of the Future?

- SLAs, Service Desk, Uptime oh-my!



## User Experience is King

- Simple, clean interfaces
- Simple, clean, fast processes
- Greater degree of control
- Anytime, anywhere



# IBM MobileFirst offering portfolio



# A holistic approach to managing the mobile environment

## Applications



native / hybrid



web

DISTRIBUTION

UPDATES

AVAILABILITY &  
PERFORMANCE

SECURITY

REMOVAL

## Devices



PROCUREMENT

CONFIGURATION

AVAILABILITY

SECURITY

INVENTORY  
MANAGEMENT

## Networks



PRIVATE WIFI

PUBLIC WIFI

CARRIER CELL

COST  
OPTIMIZATION

SERVICE DESK & SELF SERVICE



## Application Performance Management

### For Clients Who Need To:

- Optimize the performance of native, web, and hybrid apps . . .
- that integrate with Back-end services, CDNs, social, external services . . .
- running on 3+ operating systems, with many versions of each . . .
- some of which are customized by hardware and service providers . . .
- and operate on wifi, 3G, 4G, and LTE networks . . .
- requiring different toolsets for B2C and B2E apps

## IBM Mobile First Management

Monitor the real-user performance of mobile web applications, including REST web services

Synthetically monitor the performance of mobile web applications to identify issues *before* your users do.

Isolate and diagnose performance issues – app, device, wifi, a particular carrier, backend data source

IBM SmartCloud Application Performance Management  
IBM Worklight



## Mobile Device Management

### For Clients Who Need To:

- Manage and secure devices accessing the corporate network
- Implement BYOD with confidence
- Secure sensitive data, regardless of device
- Handle multi-platform complexities with ease
- Ensure compliance with corporate policies and data privacy regulations
- Deliver, update, and remove enterprise apps regardless of device, OS, or ownership
- Procure, stage, and kit enterprise devices

## IBM Mobile First Management

Centralize inventory management of all mobile assets

Optimize mobile and wireless usage and expenses

Ensure compliance with corporate mobile policies

Improve end-user experience via employee self-service telecom portal and advanced end-user help desk support for improved productivity and efficiency

**IBM Endpoint Manager for Mobile Devices**  
**IBM Enterprise Services Managed Mobility**



## Telecom Expense Management

### For Clients Who Need To:

- Manage the explosive growth of mobile devices, including BYOD, and mobile usage
- Rein in rampant mobile and wireless costs
- Gain holistic visibility and control over your mobile telecom environment for governance and policy compliance
- Perform advanced expense management around invoice processing, cost allocation, auditing and dispute management
- Manage the entire mobile device lifecycle from ordering, procurement and provisioning through to device recycling
- Transition telecom infrastructure from a cost containment model to a managed services revenue center model

## IBM Mobile First Management

Centralize inventory management of all mobile assets

Optimize mobile and wireless usage and expenses

Ensure compliance with corporate mobile policies

Improve end-user experience via employee self-service telecom portal and advanced end-user help desk support for improved productivity and efficiency

**IBM Emptoris Rivermine Telecom Expense Management**  
**IBM Telecom Expense Management Service**





## Enterprise Network Management

### For Clients Who Need To:

- Ensure availability of corporate WiFi networks
- Deploy and manage separate WiFi network(s) just for “guest” or unsecured mobile devices
- Easily identify the impact of any outages and highlight ongoing issues resulting from a lack of capacity or poor radio signals
- View current locations and connection points of mobile devices
- Gain visibility, control and automation of the network and service quality experienced by mobile users

## IBM Mobile First Management

Around-the-clock visibility, control and automation of network management tasks, both physical and virtual

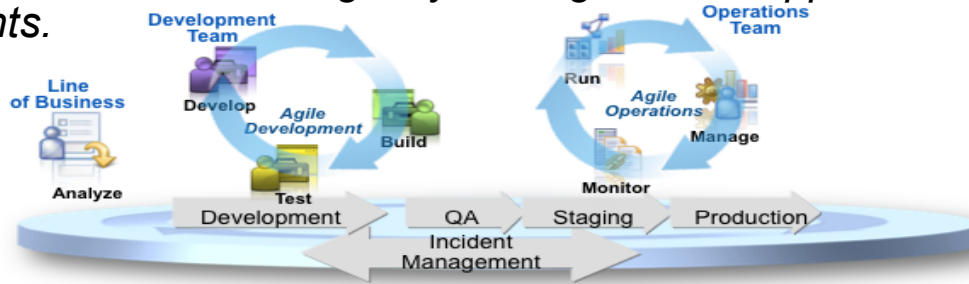
Integration with IBM Endpoint Manager & SmartCloud Application Performance Management for a complete picture of the mobile environment

Strategy, assessment, design, and management services to optimize network performance and reduce costs

**IBM Netcool Network Management and Netcool/Impact  
IBM Mobile and Wireless Network Management**

# What is Application Performance Management?

*Visibility, control and automation to intelligently manage critical applications in cloud, physical and hybrid environments.*



*shared data & common services*

Understand the end-user experience

Follow changing workloads

See steps across the cloud

*Mobile devices & smart endpoints*

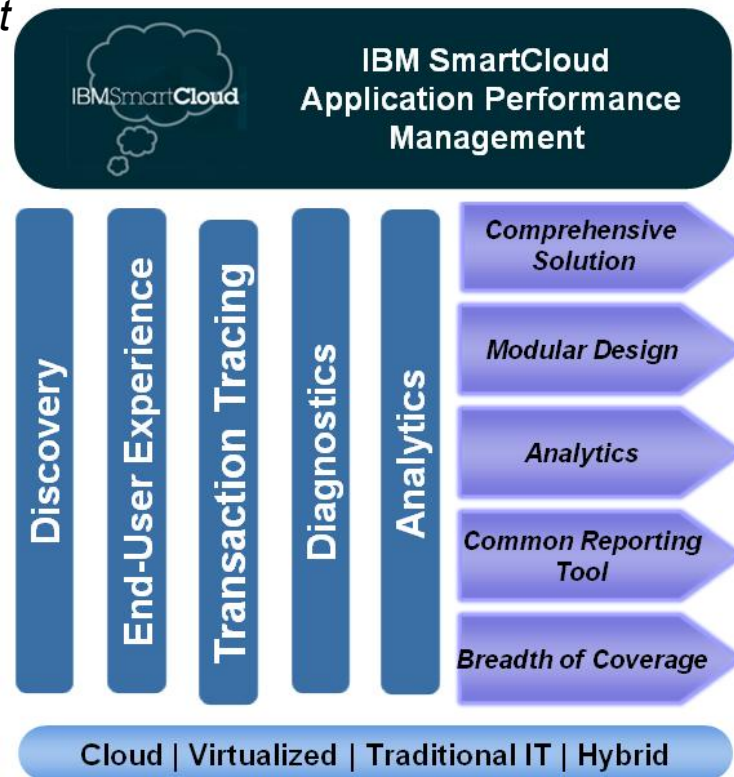
*Highly virtualized applications, storage & networks*

*Private, public & hybrid clouds*

# IBM SmartCloud Application Performance Management

*A single solution that intelligently manages Performance, Availability, and Capacity for complex application infrastructures in cloud and hybrid environment*

- **Modular design** to get started quickly and add capabilities as needed.
- **Dramatically reduce time** to see where the *bottlenecks* are in your mission critical applications – *no more blind spots!*
- **Analytics to...**
  - Optimize performance
  - Minimize false alerts with Auto-baselining and dynamic threshold setting
  - Improve capacity utilization (reducing your hardware & software costs)
- **Simple to use reporting analytics** tool, based on Cognos
- **More accurate** and faster problem diagnostics
- **Differentiated configurations**
  - Production & non-production editions
  - Entry Edition available for smaller environments



# What is unique about APM for **mobile** applications?

## Client Environment



Web/hybrid/native apps  
Worklight platform

## Server Environment



Systems of engagement, DevOps  
Cloud operating environment

## Integration



Systems of record, CDNs,  
social, external services

## Target Users

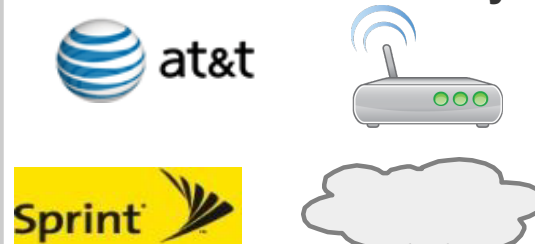
**B2C vs B2E**

## OS and Device Types



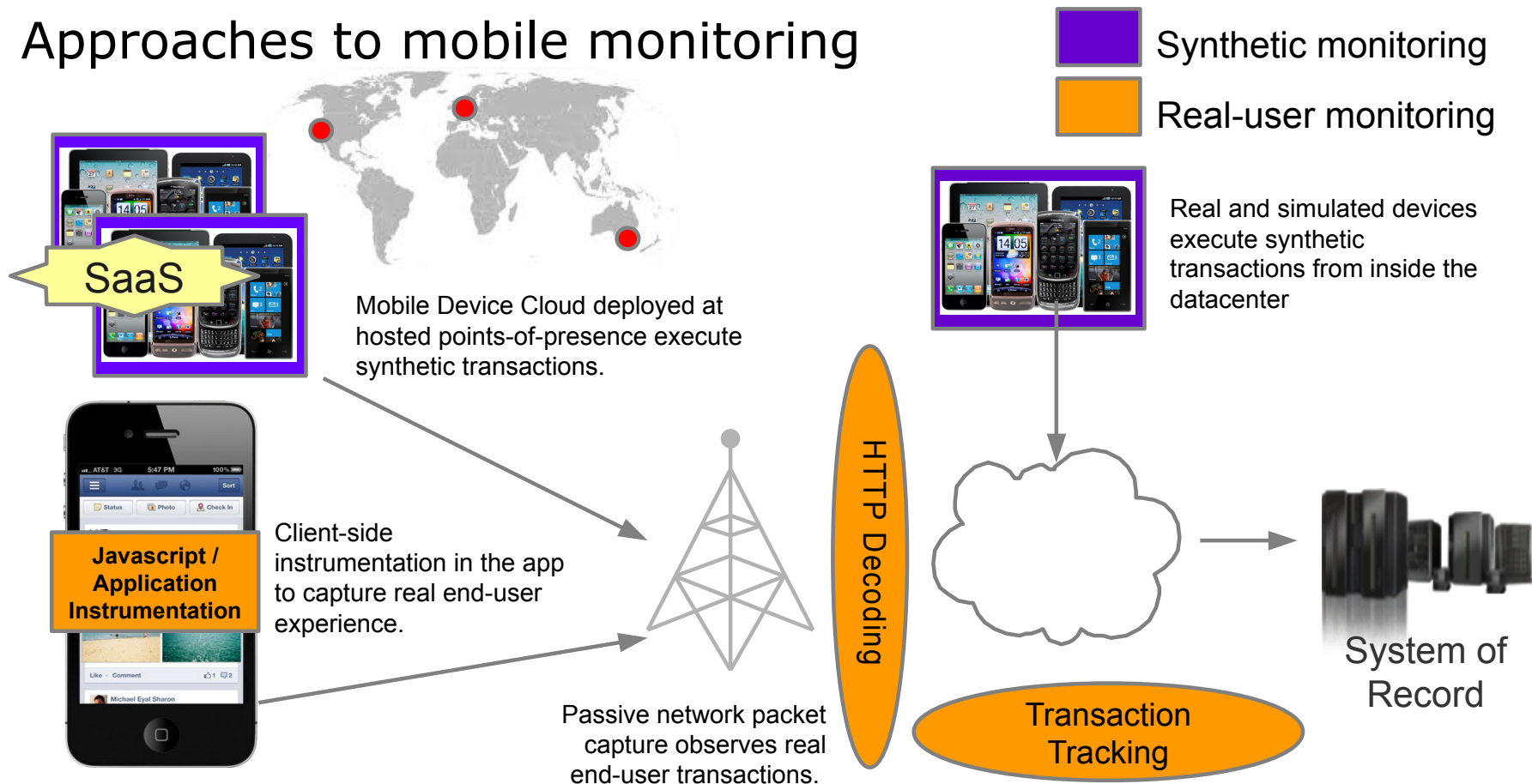
IOS, Android, Blackberry, Windows  
Apple, Samsung, Nokia, Blackberry  
Laptops, Tablets, Phones, Sensors

## Network Connectivity



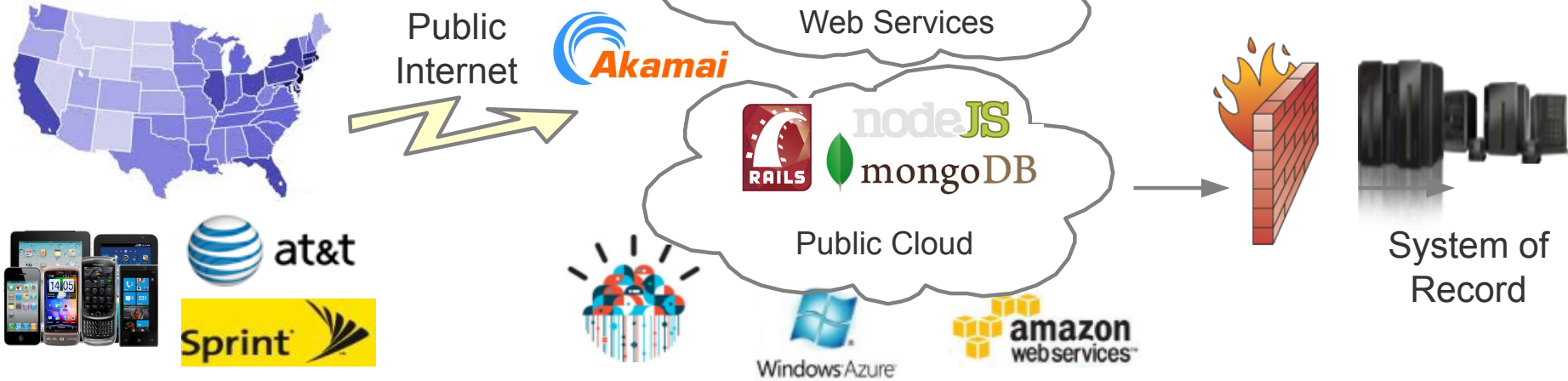
Carriers, corporate wi-fi, public  
internet

# Approaches to mobile monitoring

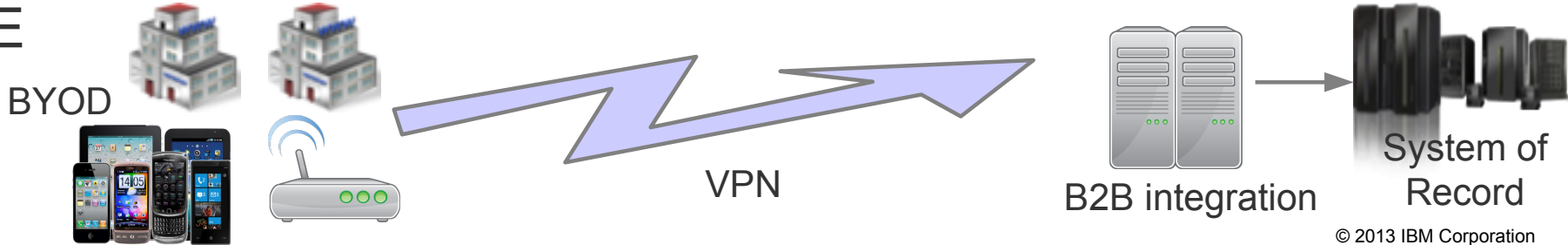


# The target user determines the monitoring solution

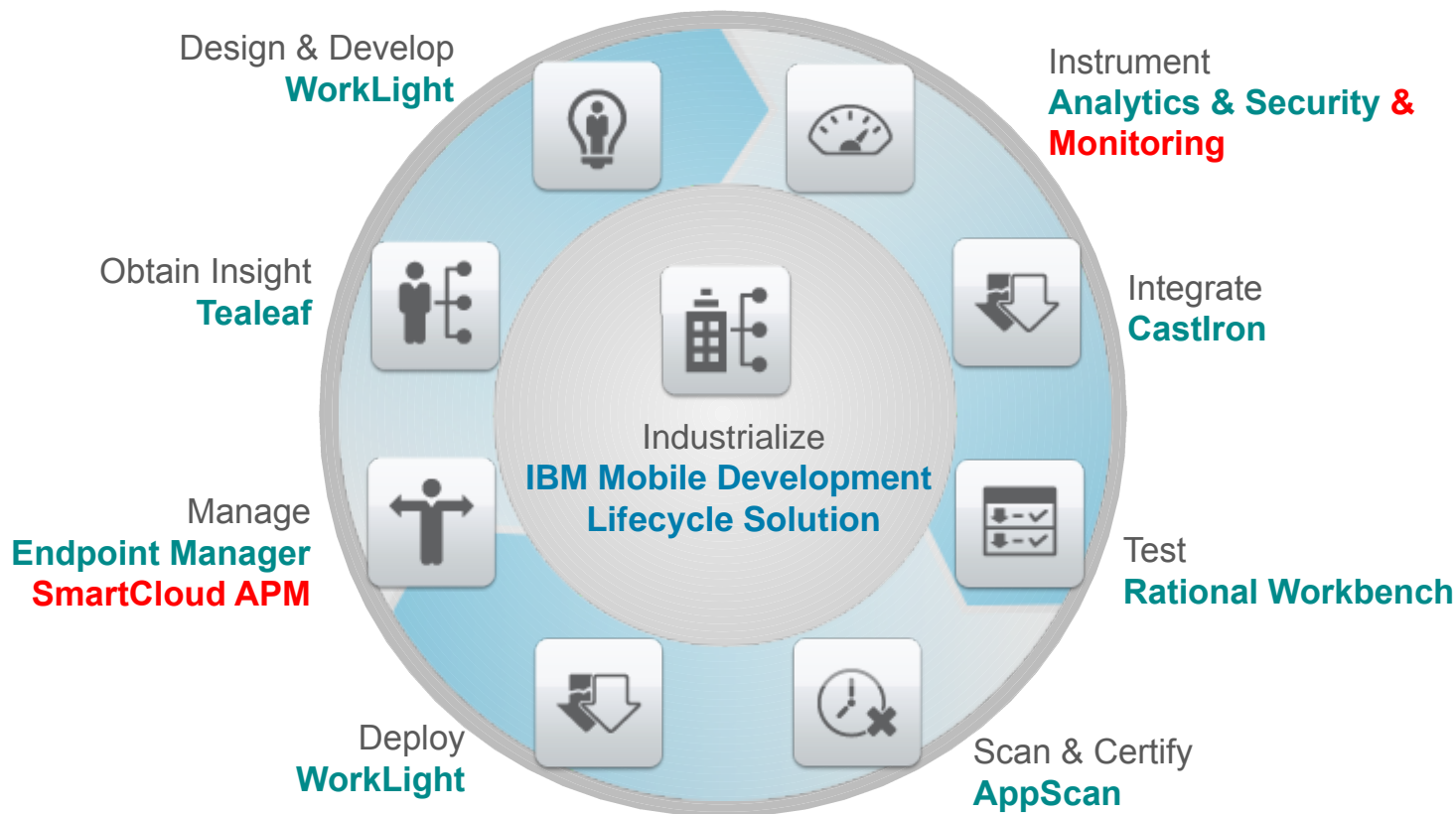
## B2C



## B2E

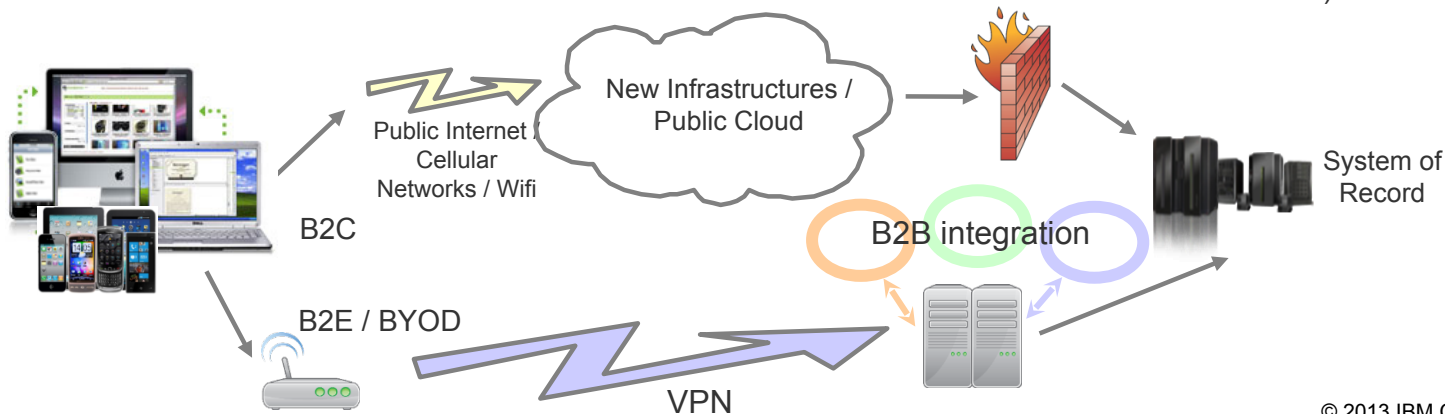


# APM will be incorporated into the IBM MobileFirst Development Lifecycle



# Mobile Application Monitoring Strategy

- |  |  |  |  |
|--|--|--|--|
| <p><b>1</b> Visibility to Client Experience</p> <ul style="list-style-type: none"> <li>• Differentiate if a particular device type, OS, location, or application type is having issues</li> <li>• Integrated visibility to mobile sessions</li> <li>• Understand performance on the client device</li> </ul> | <p><b>2</b> Visibility to Connectivity</p> <ul style="list-style-type: none"> <li>• Holistic end to end view of application</li> <li>• Application + Network breakdown</li> <li>• Isolate problem to network or not</li> <li>• Differentiate connectivity method (wifi, carrier, VPN, location)</li> </ul> | <p><b>3</b> Visibility to Back-end</p> <ul style="list-style-type: none"> <li>• Identify and isolate application back-end and infrastructure problems</li> <li>• Integrated visibility into Worklight Monitoring Platform</li> <li>• Monitor other Mobile Application Platforms</li> </ul> | <p><b>4</b> Synthetic Monitoring</p> <ul style="list-style-type: none"> <li>• Proactively monitor the application and infrastructure</li> <li>• Identify any particular location or device type that is going to have issues</li> <li>• Integration with Developer Test Tools (eg. Rational Test Workbench)</li> </ul> |
|--|--|--|--|





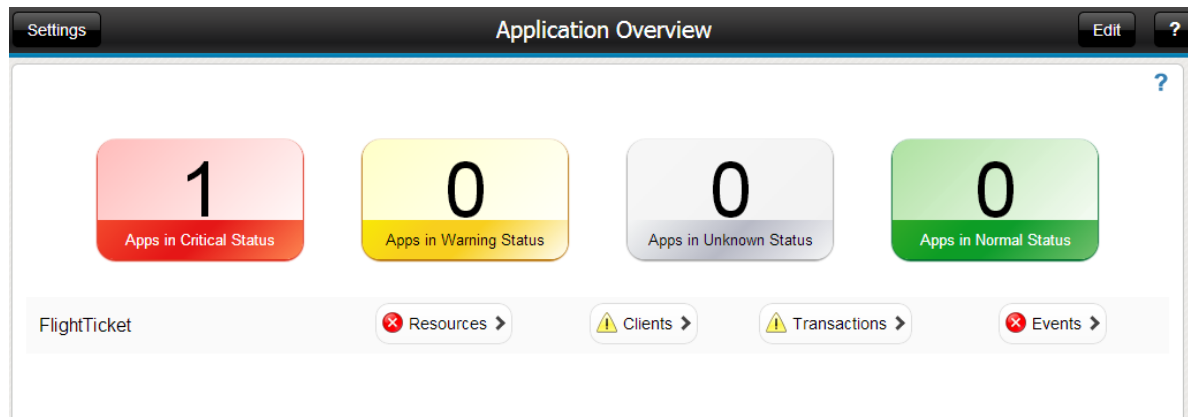
# Current Worklight Support

Newly published whitepaper:

<http://www-304.ibm.com/software/brandcatalog/ismlibrary/details?catalog.label=1TW10MP06>

The whitepaper will focus on how to exploit the following capabilities in SmartCloud APM 7.6:

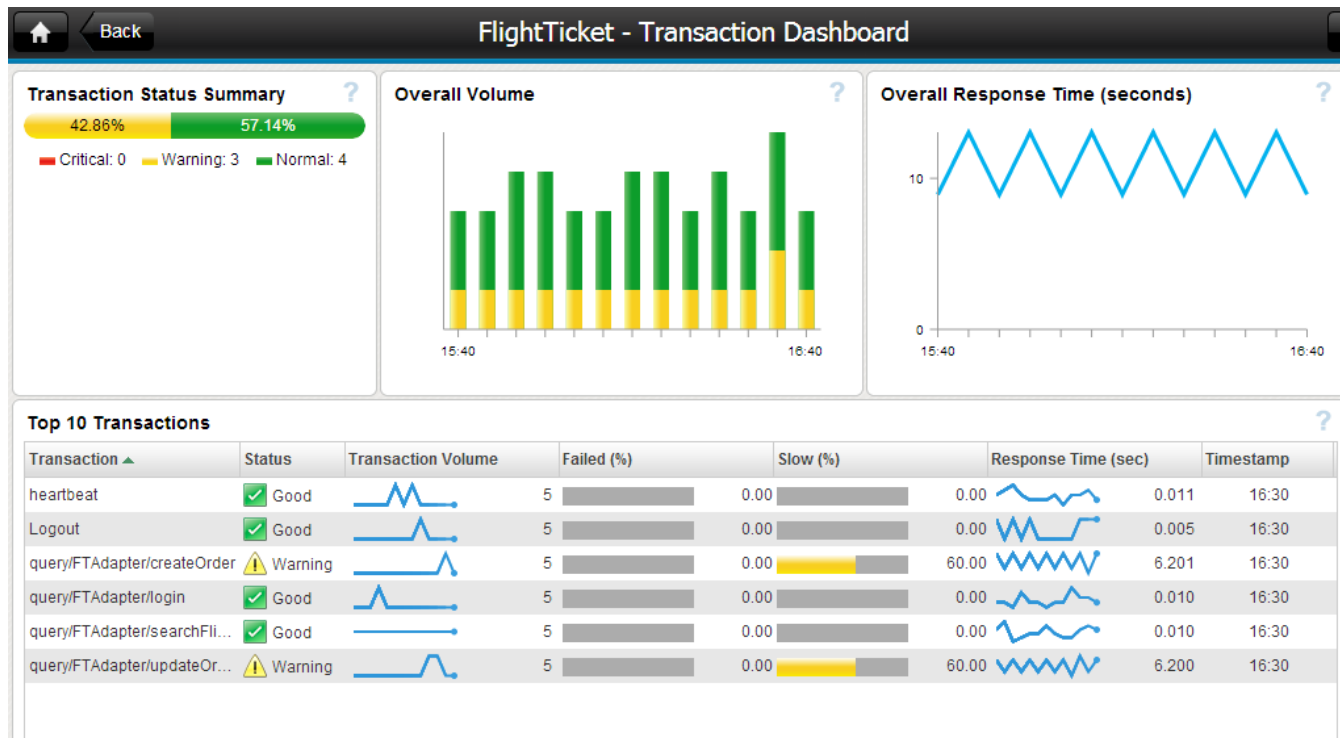
- Measuring the end-user response time of mobile devices connecting to the Worklight server
- Recording and playing back synthetic transactions using Rational Performance Tester
- Monitoring the performance and availability of infrastructure that Worklight runs on (application server, database, OS etc) and
- Presenting in an APM UI dashboard



# Worklight Support – Real User Monitoring

## Covers:

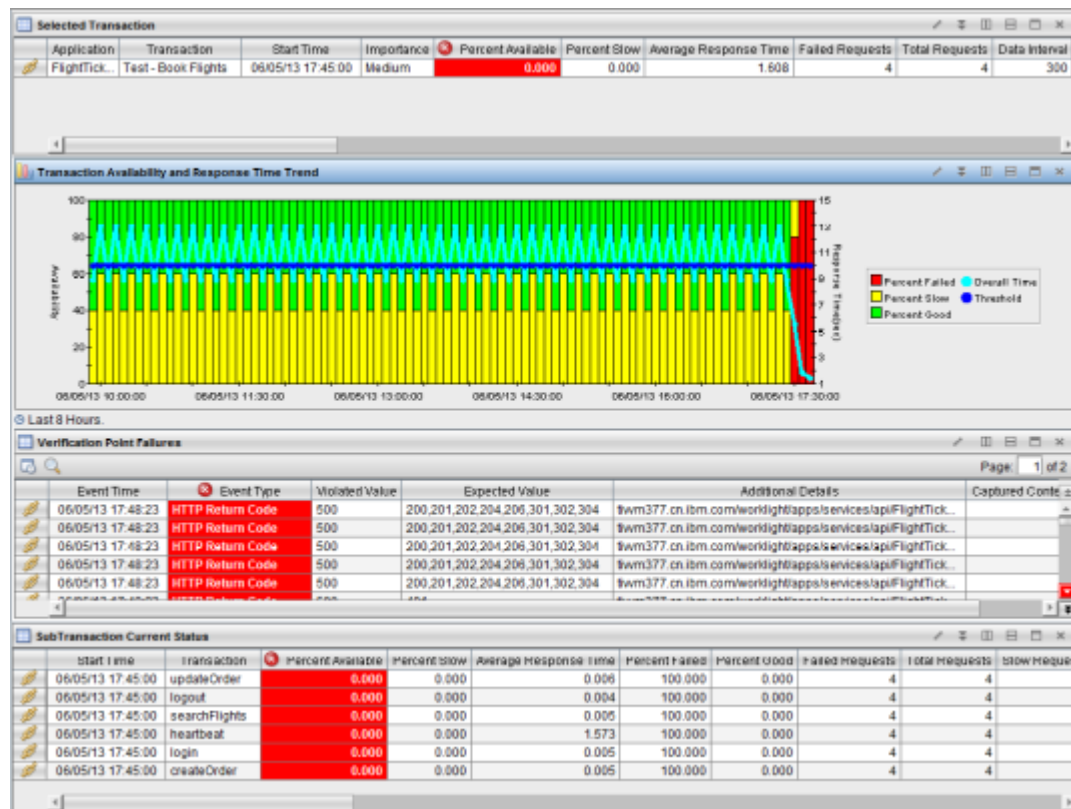
- Measure User Transaction Performance
  - Availability
  - Volume
  - Response Time
- Create Client view, group on Device OS
- Creating monitoring profiles customized to Worklight applications and transactions



# Worklight Support – Synthetic Monitoring

## Covers:

- Installing Worklight Application on the Test Device
- Configuring Test Device to use Rational Performance Tester
- Recording the test script in Rational Performance Tester
- Modifying the script for playback
- Uploading and scheduling robotic playback in ITCAM for Transactions



# Worklight Support – Resource Monitoring

## Covers:

- Creating APM UI Dashboards
- Required agents and configuration
- Workflows from Transaction problem to isolating against resource metrics

Back
FlightTicket - Resource Dashboard
Edit ?

**Transaction Performance** ?

Response time (sec) 13.060

Requests 0

Percent failed

Percent slow

Transaction status

Client status

**WAS Cluster** ?

Server status

Average response time

Server JVM CPU

Request completion

Top 5 Servers With Highest Average Response Time

Server Instance	Server Name	Request Detail	Average Response Time (ms)
tiwvm401Node02WS-1:TIVVM401:KYNS	WS_Cluster_Me...	/worklight/apps/services/api/FlightTic...	5,156
tiwvm401Node02WS_C:TIVVM401:KY...	WS_Cluster_Me...	/worklight/apps/services/api/FlightTic...	2

**HTTP** ?

Web server status Running

Web server name	WorkLight-HTTP
Request rate (per sec)	0.133
Failed requests rate (per min)	0.000
Server failures rate (per min)	0.000
Failed login rate (per min)	0.999

**DB2 HA** ?

Instance status

DB failed SQL stmts

DB BP hit ratio

DB deadlock

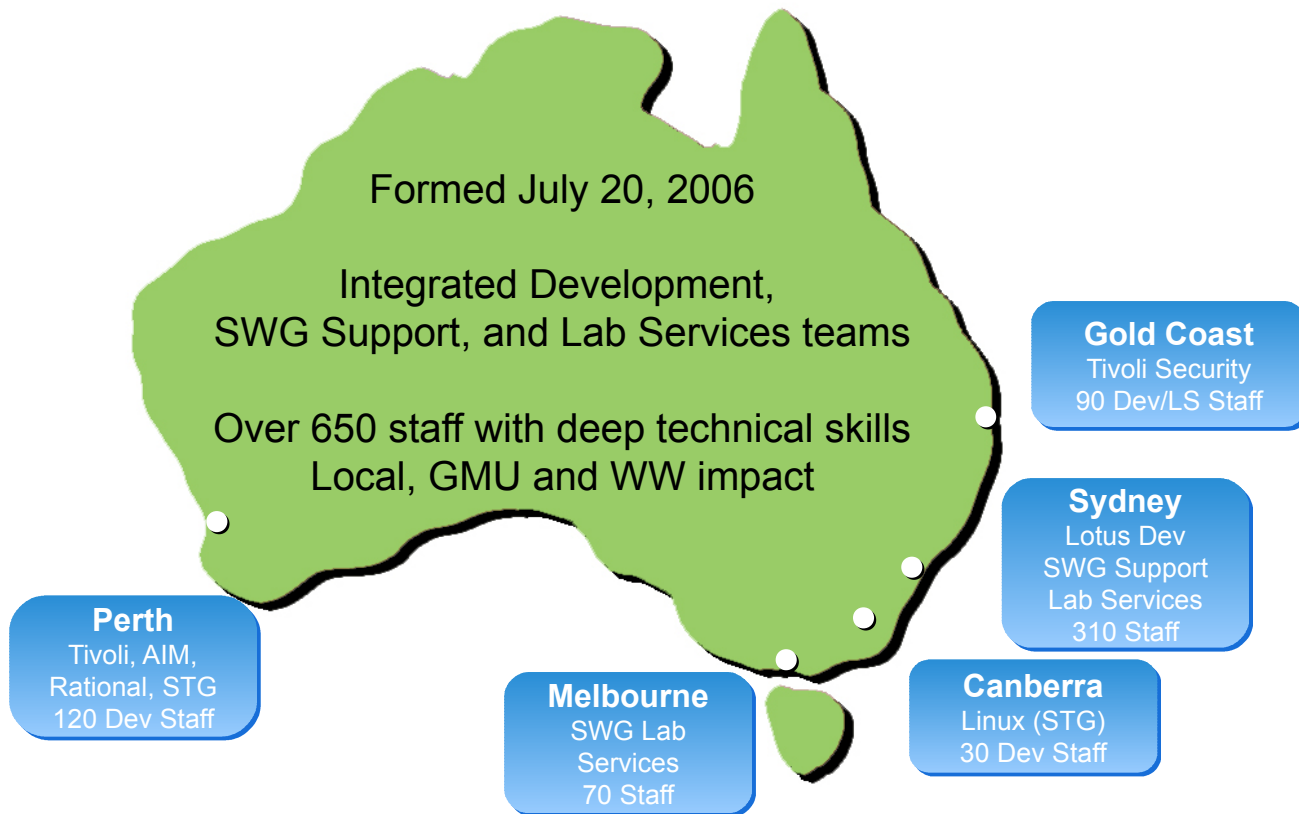
Top 5 Sort Heap Used:

Instance Name	Sort heap used (%)
DB2INST3:v525400f7aa1...	0.00%
DB2INST3:v5254006a70...	0.00%

Top 5 Connections:

Instance Name	DB Name	Connections
DB2INST3:v525400f7aa14:UD	FLIGHTTICKET	0
DB2INST3:v5254006a706f:UD	FLIGHTTICKET	0

# Australia Development Lab



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1  
Apps in Critical Status

0  
Apps in Warning Status

0  
Apps in Unknown Status

0  
Apps in Normal Status



FlightTicket

Resources >

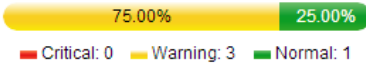
Clients >

Transactions >

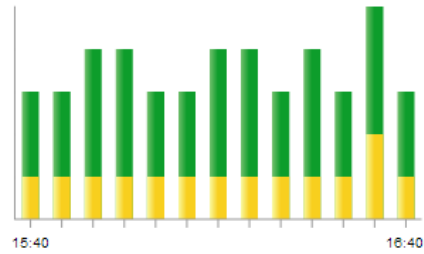
Events >



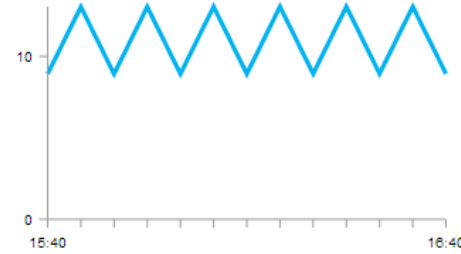
Client Status Summary ?



Overall Volume ?



Overall Response Time (seconds) ?



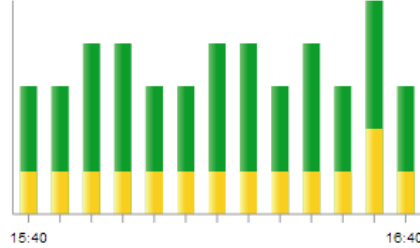
Top 10 Clients ?

Client Group ▲	Status	Transaction Volume	Failed (%)	Slow (%)	Response Time (sec)	Timestamp
iOS	⚠ Warning	→	0	0.00	0.00	13.049 16:35
Android	⚠ Warning	→	30	0.00	13.33	1.385 16:35

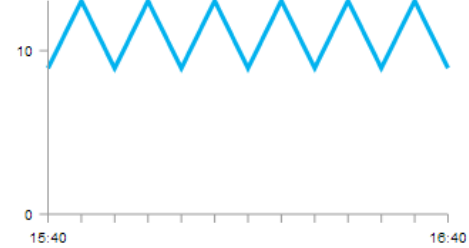
Transaction Status Summary ?



Overall Volume ?



Overall Response Time (seconds) ?

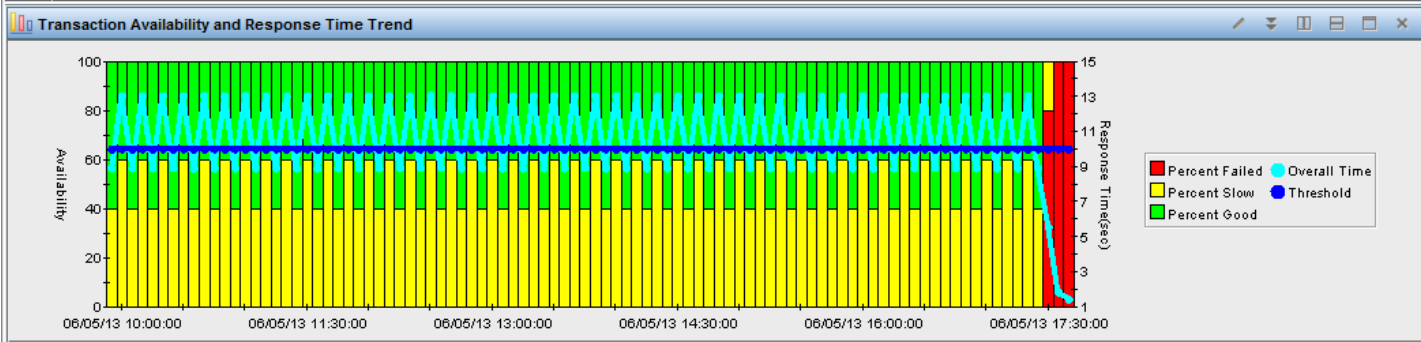


Top 10 Transactions ?

Transaction ▲	Status	Transaction Volume	Failed (%)	Slow (%)	Response Time (sec)	Timestamp
heartbeat	✓ Good		5	0.00	0.00	0.011 16:30
Logout	✓ Good		5	0.00	0.00	0.005 16:30
query/FTAdapter/createOrder	⚠ Warning		5	0.00	60.00	6.201 16:30
query/FTAdapter/login	✓ Good		5	0.00	0.00	0.010 16:30
query/FTAdapter/searchFil...	✓ Good		5	0.00	0.00	0.010 16:30
query/FTAdapter/updateOr...	⚠ Warning		5	0.00	60.00	6.200 16:30

Total: 7

Selected Transaction										
Application	Transaction	Start Time	Importance	Percent Available	Percent Slow	Average Response Time	Failed Requests	Total Requests	Data Interval	
FlightTick...	Test - Book Flights	06/05/13 17:45:00	Medium	0.000	0.000	1.608	4	4	300	



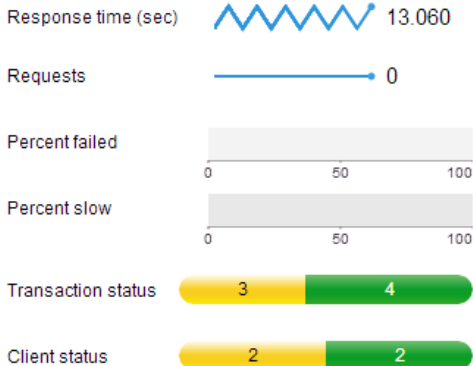
Last 8 Hours.

Verification Point Failures						
Event Time	Event Type	Violated Value	Expected Value	Additional Details	Captured Conte	
06/05/13 17:48:23	HTTP Return Code	500	200,201,202,204,206,301,302,304	tiwm377.cn.ibm.com/worklight/apps/services/api/FlightTick...		
06/05/13 17:48:23	HTTP Return Code	500	200,201,202,204,206,301,302,304	tiwm377.cn.ibm.com/worklight/apps/services/api/FlightTick...		
06/05/13 17:48:23	HTTP Return Code	500	200,201,202,204,206,301,302,304	tiwm377.cn.ibm.com/worklight/apps/services/api/FlightTick...		
06/05/13 17:48:23	HTTP Return Code	500	200,201,202,204,206,301,302,304	tiwm377.cn.ibm.com/worklight/apps/services/api/FlightTick...		
06/05/13 17:48:23	HTTP Return Code	500	200,201,202,204,206,301,302,304	tiwm377.cn.ibm.com/worklight/apps/services/api/FlightTick...		

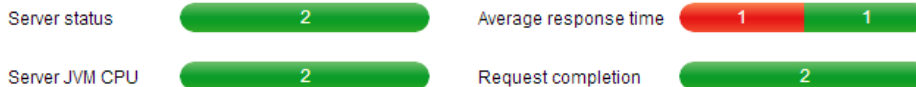
SubTransaction Current Status										
Start Time	Transaction	Percent Available	Percent Slow	Average Response Time	Percent Failed	Percent Good	Failed Requests	Total Requests	Slow Reques	
06/05/13 17:45:00	updateOrder	0.000	0.000	0.006	100.000	0.000	4	4		
06/05/13 17:45:00	logout	0.000	0.000	0.004	100.000	0.000	4	4		
06/05/13 17:45:00	searchFlights	0.000	0.000	0.005	100.000	0.000	4	4		
06/05/13 17:45:00	heartbeat	0.000	0.000	1.573	100.000	0.000	4	4		
06/05/13 17:45:00	login	0.000	0.000	0.005	100.000	0.000	4	4		
06/05/13 17:45:00	createOrder	0.000	0.000	0.005	100.000	0.000	4	4		



Transaction Performance ?



WAS Cluster ?



Top 5 Servers With Highest Average Response Time

Server Instance	Server Name	Request Detail	Average Response Time (ms)
tiwm401Node02WS-1:TIVM401:KYNS WS_Cluster_Me...		/worklight/apps/services/api/FlightTic...	5,156
tiwm401Node02WS_C:TIVM401:KY... WS_Cluster_Me...		/worklight/apps/services/api/FlightTic...	2

HTTP ?

Web server status Running

Web server name	WorkLight-HTTP
Request rate (per sec)	0.133
Failed requests rate (per min)	0.000
Server failures rate (per min)	0.000
Failed login rate (per min)	0.999

DB2 HA ?



Top 5 Sort Heap Used:

Instance Name	Sort heap used (%)
DB2INST3:v525400f7aa1...	0.00%
DB2INST3:v5254006a70...	0.00%

Top 5 Connections:

Instance Name	DB Name	Connections
DB2INST3:v525400f7aa14:UD	FLIGHTTICKET	0
DB2INST3:v5254006a706f:UD	FLIGHTTICKET	0

[Back](#)

## WAS Instances ?

Server	Server status
tiwm401Node02WS-1:TIVVM401.K...	<span style="color: green;">✔</span>
tiwm401Node02WS_C:TIVVM401:...	<span style="color: green;">✔</span>

## Top 5 Worst Response Time ?

Request detail	Response time (ms)
getShaHash	1
isStale	0
getSingletonId	0
getUniqueName	0
getGadgetApplicationMap	0

## JVM GC (Last Hour) ?

Kbytes free	<i>Dataprovider error</i>
Kbytes used	<i>Dataprovider error</i>
GC rate (per min)	<i>Dataprovider error</i>
Heap used (%)	<i>Dataprovider error</i>

## Datasources ?

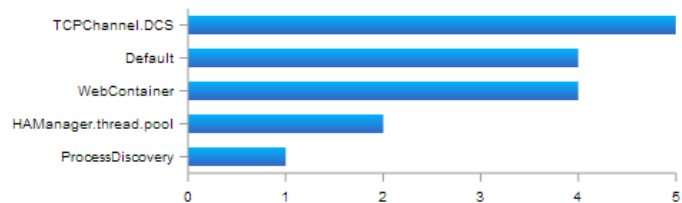
Average query proc time (ms)



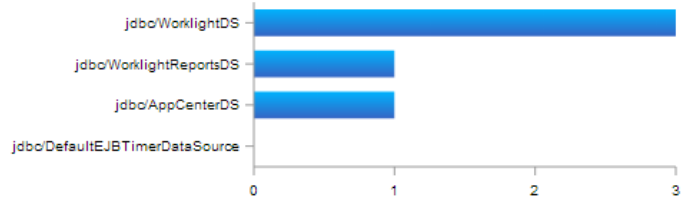
Average update proc time (ms)



## Top 5 Average Thread Pool Size ?



## Top 5 Average DB Connection Pool Size ?



[Back](#)DB2 Instances ?

Instance	Status
DB2INST3.v525400f7aa14:UD	
DB2INST3.v5254006a706f:UD	

Top 5 Table Space Utilization ?

Database name	Table space name	Table space used (%)
FLIGHTTICKET	SYSCATSPACE	98.70%
FLIGHTTICKET	USERSPACE1	27.84%
FLIGHTTICKET	SYSTOOLSPACE	1.81%
FLIGHTTICKET	TEMPSPACE1	0.00%
FLIGHTTICKET	SYSTOOLSTMPSPACE	0.00%

Top 5 Lock List In Use Percent ?

DB name	Lock list in use (%)
FLIGHTTICKET	0.00%

Bottom 5 Buffer Pool Hit Ratio ?

DB name	Buffer pool hit ratio (%)
FLIGHTTICKET	99.07%

Top 5 Sort Overflows Percent ?

DB name	Sort overflows (%)
FLIGHTTICKET	0.00%

Log Utilization ?

DB name	Log utilization (%)
FLIGHTTICKET	0.00%

Reorg Required Table ?

DB name	Reorg required tables number
<i>No items to display</i>	

Book Flights.recession (Active) Started on 4 June 2013 at 1:04:28 PM

258 packets (1.28 MB), 138 attachments (1.28 MB)

**Unmanaged Application :: Running**

*i* If it is not already started, start the application. Click Stop when yo

**HTTP Proxy Recorder :: Recording**

*i* HTTP Proxy Recorder starting to accept connections on port 1080

Open connections: 2

**Annotation Recorder :: Recording**

*i* Current state: Recording

**Statistics**

Type	Packets	Size
Proxy Recorder Message	258	1.28 MB

Encryption level: None Change...

**Annotations**

Category	Label	Time

**Timeline**

Proxy Recorder Message

Overview
Content