Correlated Monitoring of an Enterprise ALM Environment at Bosch

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Who We Are

What we do

About us

- Raffael Eiler (raffael.eiler@de.bosch.com)
  - Robert Bosch GmbH Stuttgart, Germany
  - ClearCase and Rational Team Concert Deployment Expert

- Juergen Magiera (jmagiera@splunk.com)
  - Splunk Munich, Germany
  - ITSI Architect and Lead EMEA

Overview about Bosch Group

Bosch Group

- 70.6 billion euros in sales
- 374,778 associates

Mobility Solutions
- One of the world's largest suppliers of automotive technology

59% share of sales

Industrial Technology
- Leading in drive and control technology, packaging, and process technology

Energy and Building Technology
- Leading manufacturer of security technology
- Global market leader of energie-efficent heating products and hot-water solutions

41% share of sales

Consumer Goods
- Leading supplier of power tools and accessories
- Leading supplier of household appliances

* As of 12.15

Bosch – technology to enhance quality of life

- Some 56,000[1] researchers and developers work at Bosch: at 118[2] locations worldwide, in a single network.
- Bosch is one of the world's leading international providers of technology and services.
- Over the past five years, Bosch has invested more than 24 billion euros in research and development.
- Our objective: to develop innovative, useful, and exciting products and solutions to enhance quality of life – technology that is "Invented for life."

Electronics & Software Development Platforms

Products & Services

Bosch CLM infrastructure

Facts and figures

- IBM CLM is the preferred tool for ALM[*1] within the Bosch Group
- IBM CLM is a set of web-apps hosted in WebSphere 8.5 running on virtual Windows servers. As database is used ORACLE 11 (RAC)
- CLM is in a ramp-up phase in most product lines
- We have many SW-developers using that system (about 3000 concurrent sessions)
- CLM system is essential for steps in SW development process
- Unplanned system outages have to be minimized

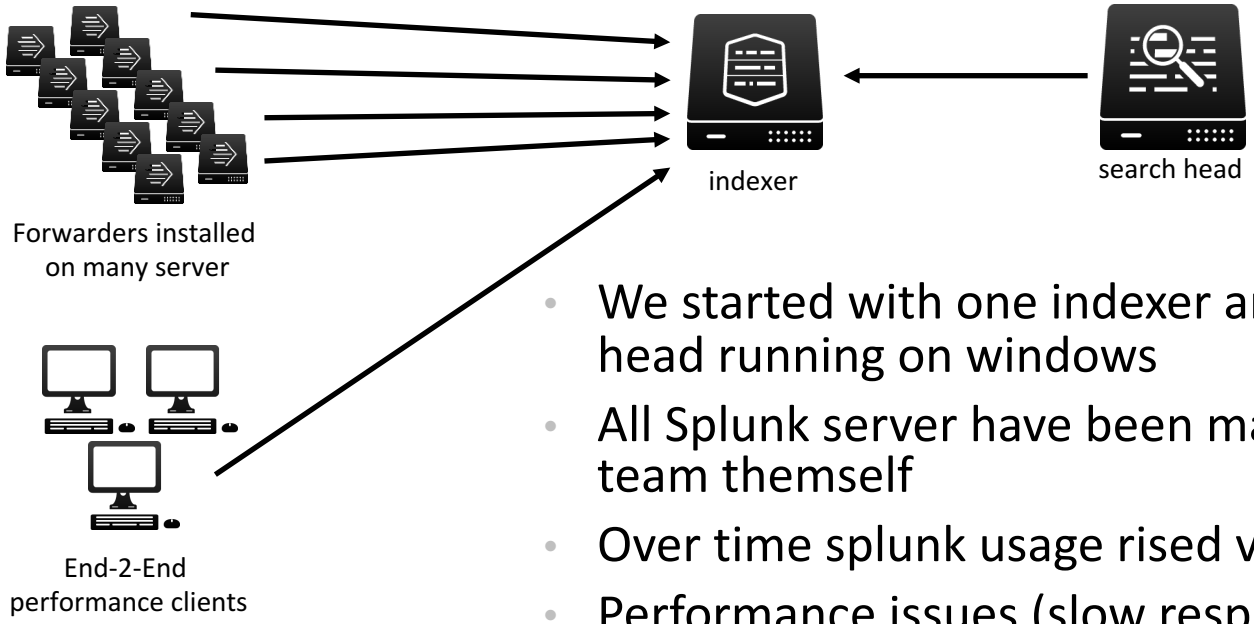
*1 : ALM = Application Lifecycle Management

CLM System Types at Bosch

Type	DB	Count	Availability	Version	Purpose
P-System	Ora	18	Highest	5.0.2	
Q-Systems	Ora	9	High	5.0	ers, for acceptance testing.
Test-Servers	DB2	~ 10	Low		d by PL tools teams for process developments, playgrounds.
Development-Servers	DB2, Ora	6		and 0.1	For PL plugin development. Customers have JazzAdmin-Role.
Beta-Servers	DB2			6.0.1 Mx	To host and show the upcoming pre-release versions (Mx/RCx).
Demo-Servers			Low	5.0.2 and 6.0.1	General playground and product show-case for anyone interested. Stable version.
Training-Ser		1	Low	5.0.2	For user training.
Proxy-Server	quid	13	Highest	3.1.10	For remote access at each location, based on customer request.

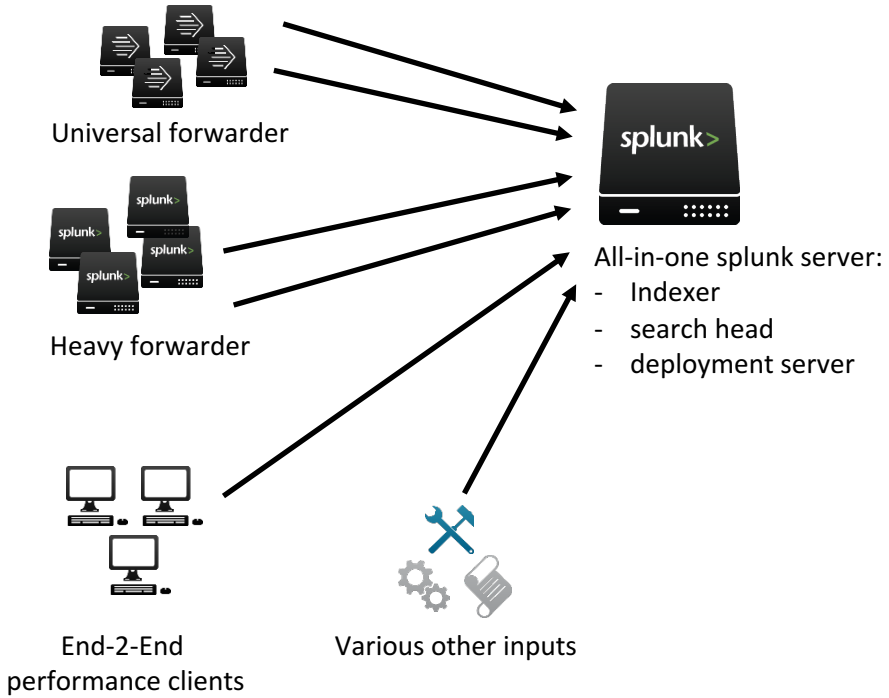
~ 400 servers in summary

Splunk Topology in 2015



- We started with one indexer and one search head running on windows
- All Splunk server have been managed by the team themself
- Over time splunk usage rised very fast
- Performance issues (slow response, concurrent searches, …) during daily usage came up

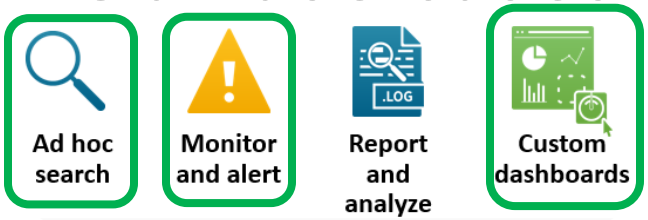
Splunk Topology today



- Every product (e.g. Subversion or ALM) has it's own splunk server
- All Splunk server (basic operation) are managed by a Bosch internal service provider
- Splunk configuration (inputs.conf, scripts, alters, dashboards, …) is under our control
- Splunk server are running on Linux
- If we recognize performance issues we will split indexer and searchhead

Our use cases

implemented



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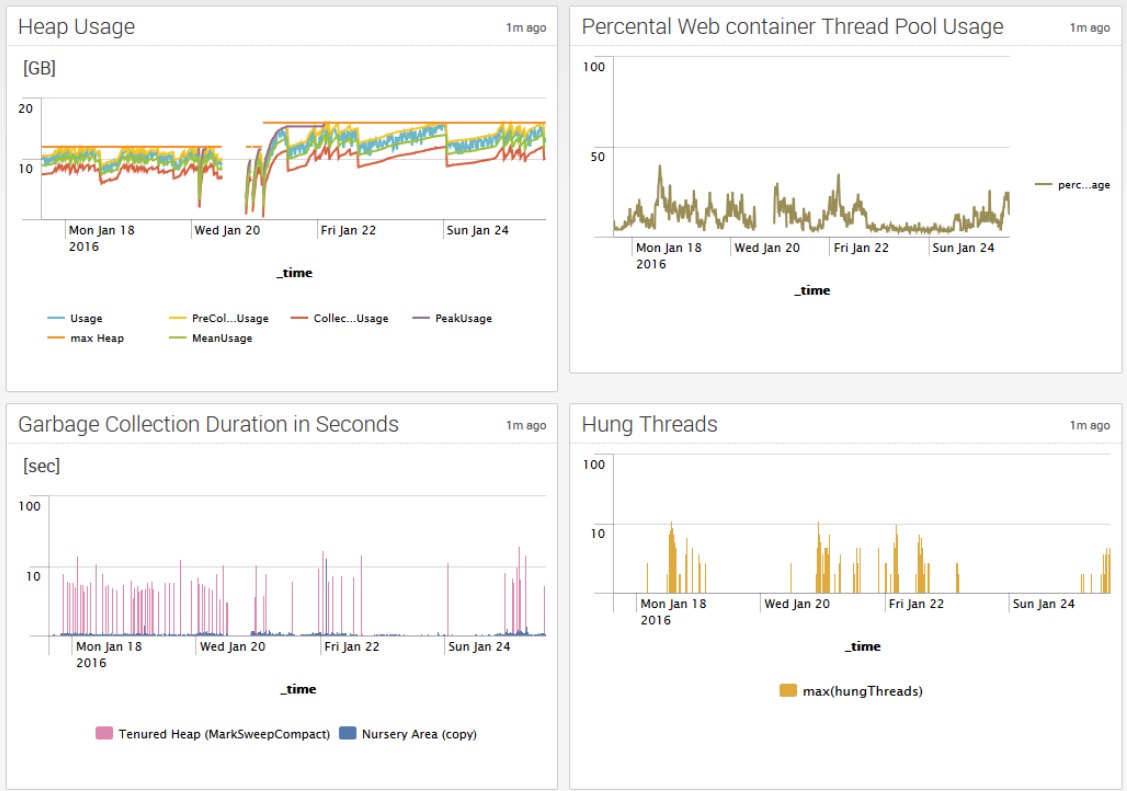
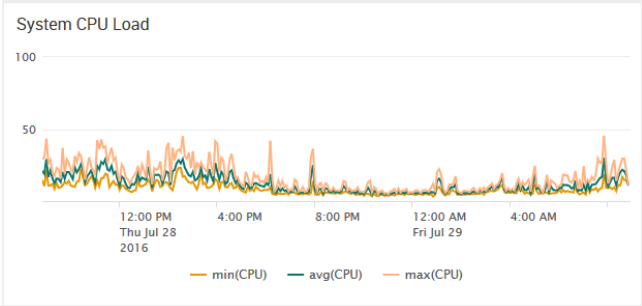
Windows	Linux / Unix	Virtualization & Cloud	Applications	Databases	Networking
• Registry • Event logs • File system • WMI • PerfMon • Logfiles • ….	• Configurations • Syslogs • File system • ps, ostat, netstat, top, … • Logfiles • ….	• Hypervisor • Guest OS • Apps • Cloud • …	• Web logs • Log4J • JMX • Scripts • …	• Configurations • Audit/query logs • Tables • Size • …	• Network Interface • Configurations • SNMP • ….

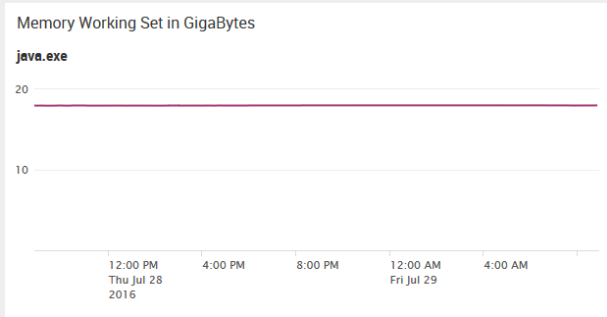
Example: Heap Increase

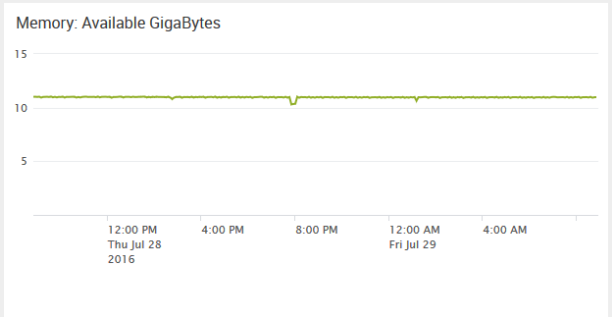


- Before heap increase
  - Heap usage constantly above 80%
  - Very frequent Garbage Collection Cycles
  - Lots of Hung threads
- After heap increase
  - GC less stressed
  - Less hung threads
  - -> Less impact for the user

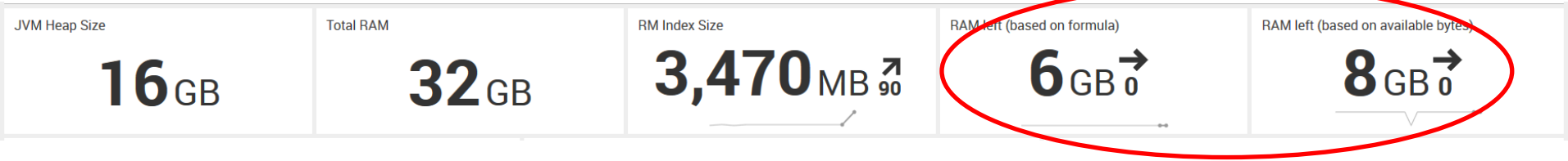
Example: System Details - RAM







- Optimise usage of RM index in RAM
- Calculate real „RAM left“



Highlights From End-users Perspective

„All-in-one“ solution

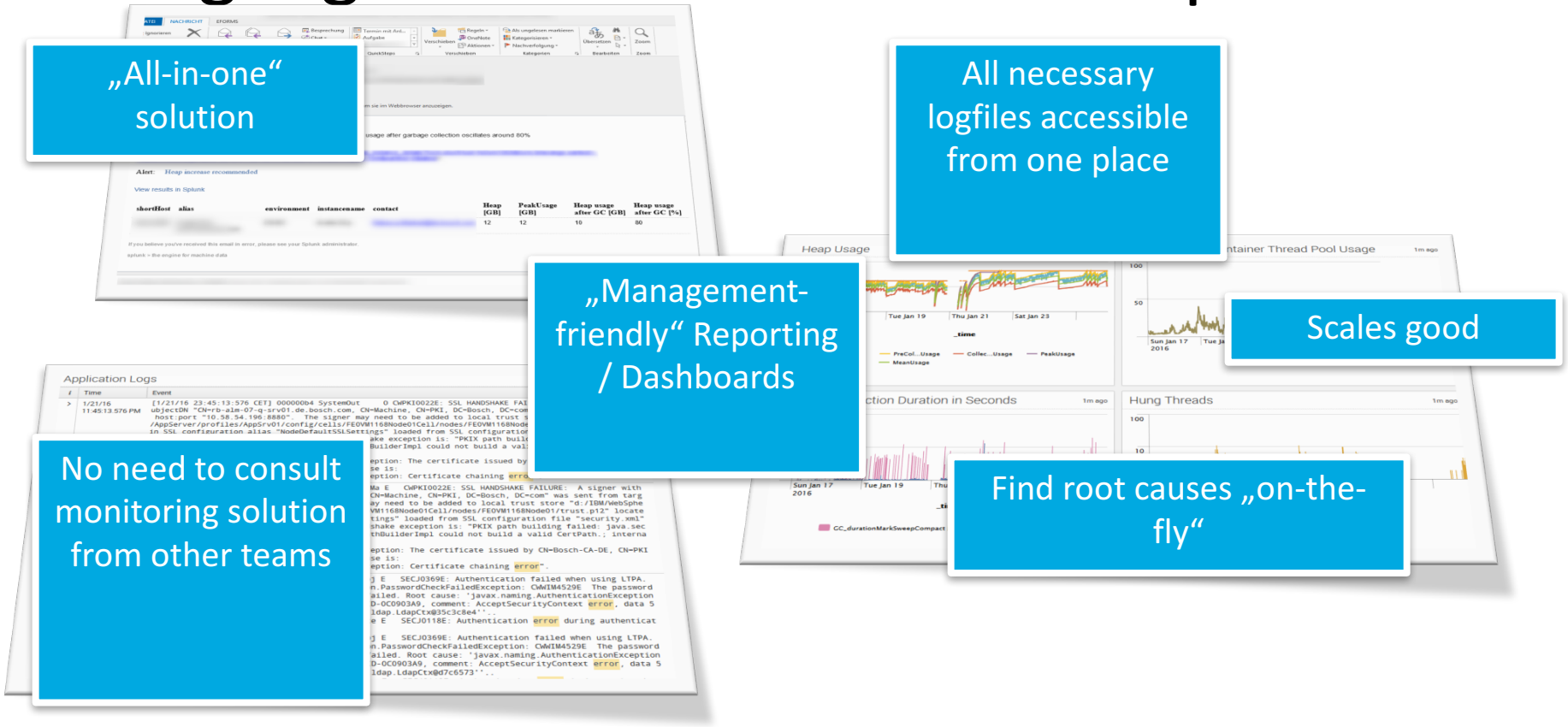
All necessary logfiles accessible from one place

„Management-friendly“ Reporting / Dashboards

Scales good

No need to consult monitoring solution from other teams

Find root causes „on-the-fly“



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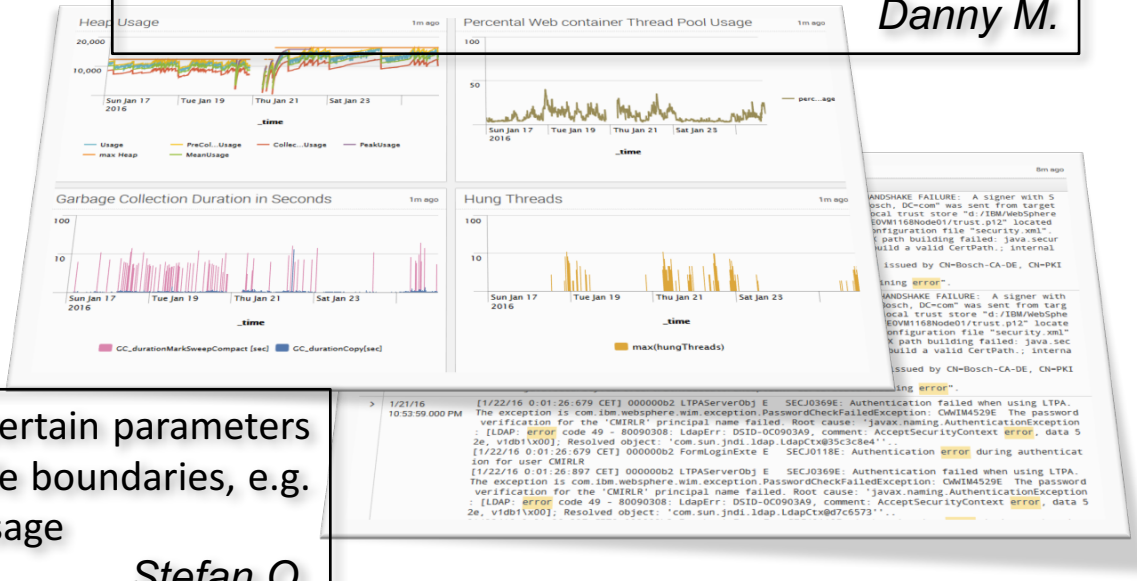
Feedback From My Colleagues

Splunk is my first stop in case of problems. I can quickly check what errors have been logged, and where. It is also really useful to track the system load and resource consumption. We have graphs with matching timelines that allow you to easily detect patterns across different data sources, or even different servers.

Volker G

Splunk informs me when heap usage is high so I can consider increasing the heap long before users complain about performance issues.

Danny M.



Splunk provides early warnings if certain parameters of the system start to leave the safe boundaries, e.g. free disk space, heap usage, CPU usage

Stefan O.

Current splunk activities (NetIQ phase-out)

- In the past we used NetIQ as monitoring system provided by another department within Bosch

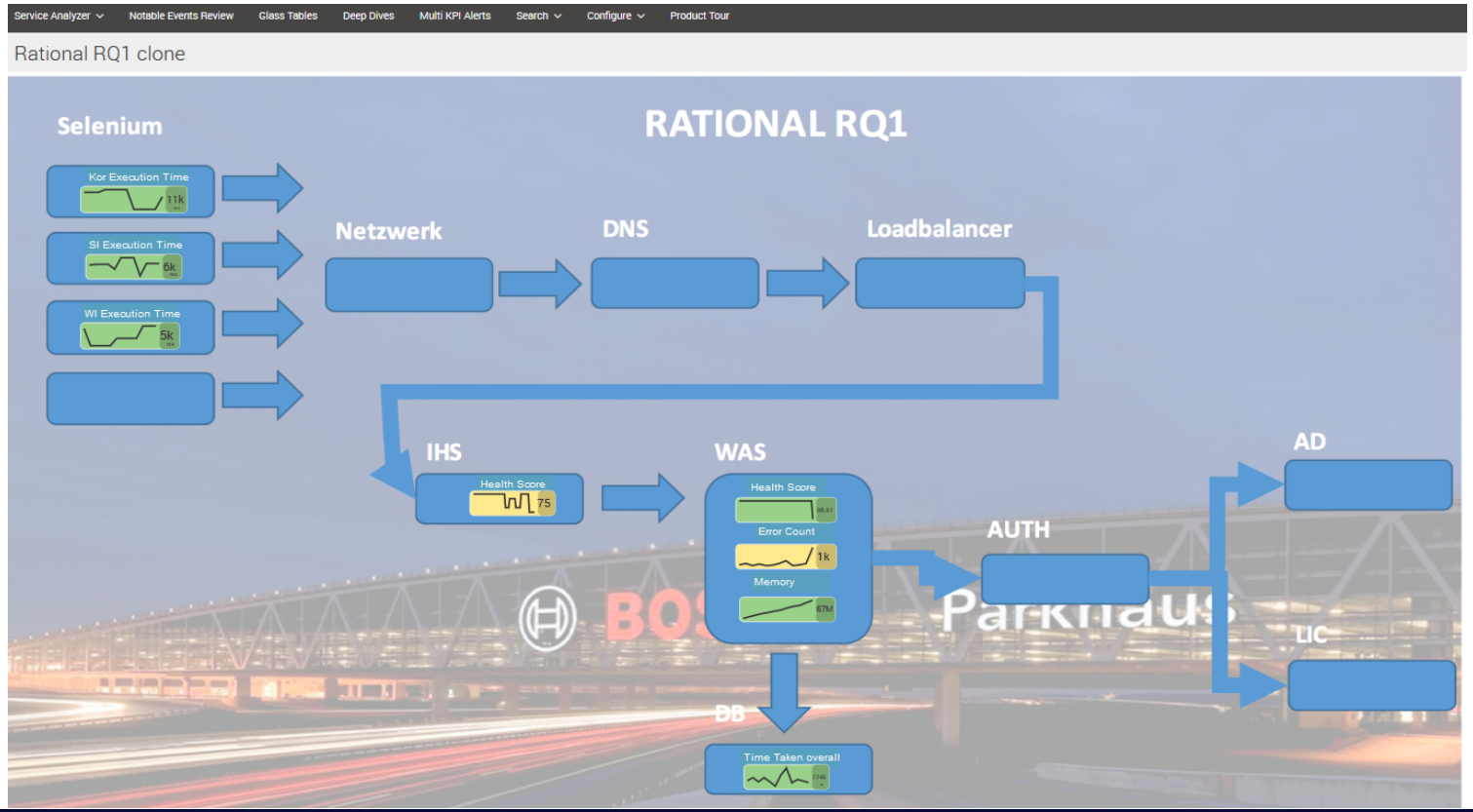
- With splunk we have now a system that is/has …

  … possibility of implementing any kind of changes in a very fast way

  … stable and well performing solution

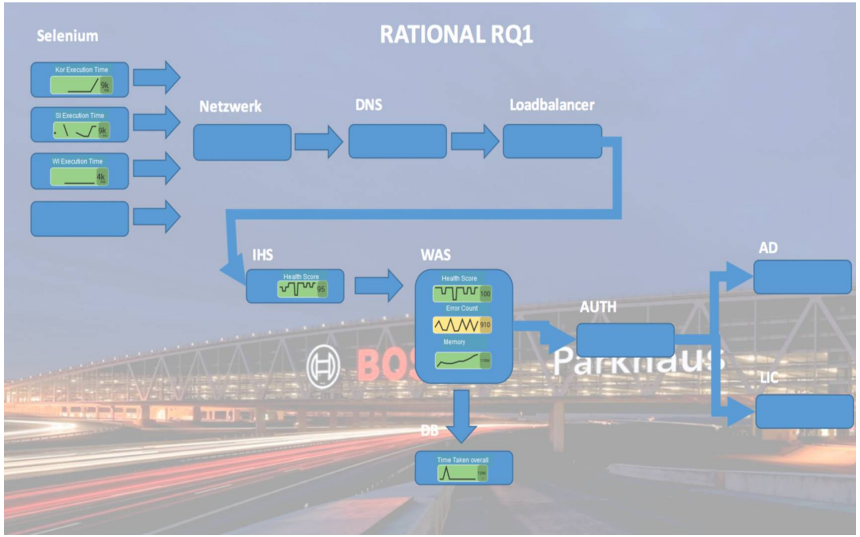
  … easy to learn and very useful in daily work as a sysadmin

Current splunk activities (ITSI)



Clearquest Glass Table Details

Rational ClearQuest (RQ1)



ITSI Glass table for Rational ClearQuest (RQ1) service:

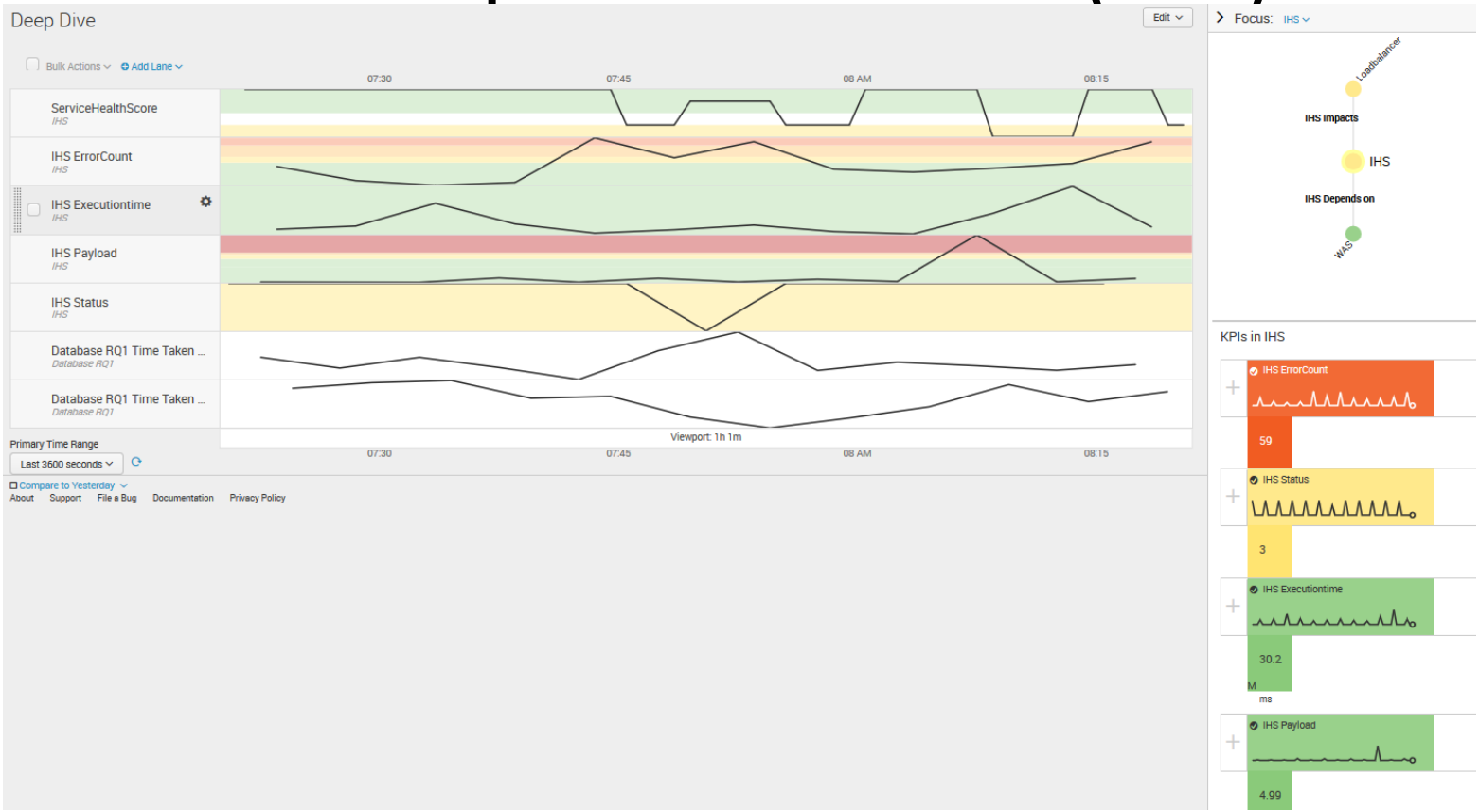
KPIs:

- Selenium End-to-End transaction time.
- Overall health of IHS application
- Detailed performance metrics on WAS
- Response time for DB

Value:

- Get notified about about poor response times for customers early.
- At a glance view of current and historic performance metrics along the whole service chain.

Current Splunk Activities (ITSI)



Planned Implementation (additional Info)

Implemented:

- License statistics
- Logfiles
- Monitoring WAS with JMX
- Most system ressources (perfmon)

Planned:

- Reporting
- Management view (e.g. dashboard with traffic lights)
- Long-term monitoring (trend analysis)
- Historical, cumulated data
- Different Dashboards for different interests (Managers, Technicals, Problem Analysis, Quick overview, …)
- E2E test results (selenium)
- Amount of HTTP requests

Conclusion – next steps

To be evaluated:

- SSL (certificates expiration)
- Monitoring caching proxies, for example:
  - How much data is provided through cache?
- CSM (CLM Server Monitoring) integration
  - Get Application data to correlate this with system resources, e. g. heap size:
    - How much users are working?
    - How much work items are created today?
- ESX monitoring
- Network monitoring (Whole route, not just the network interface)

THANK YOU

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