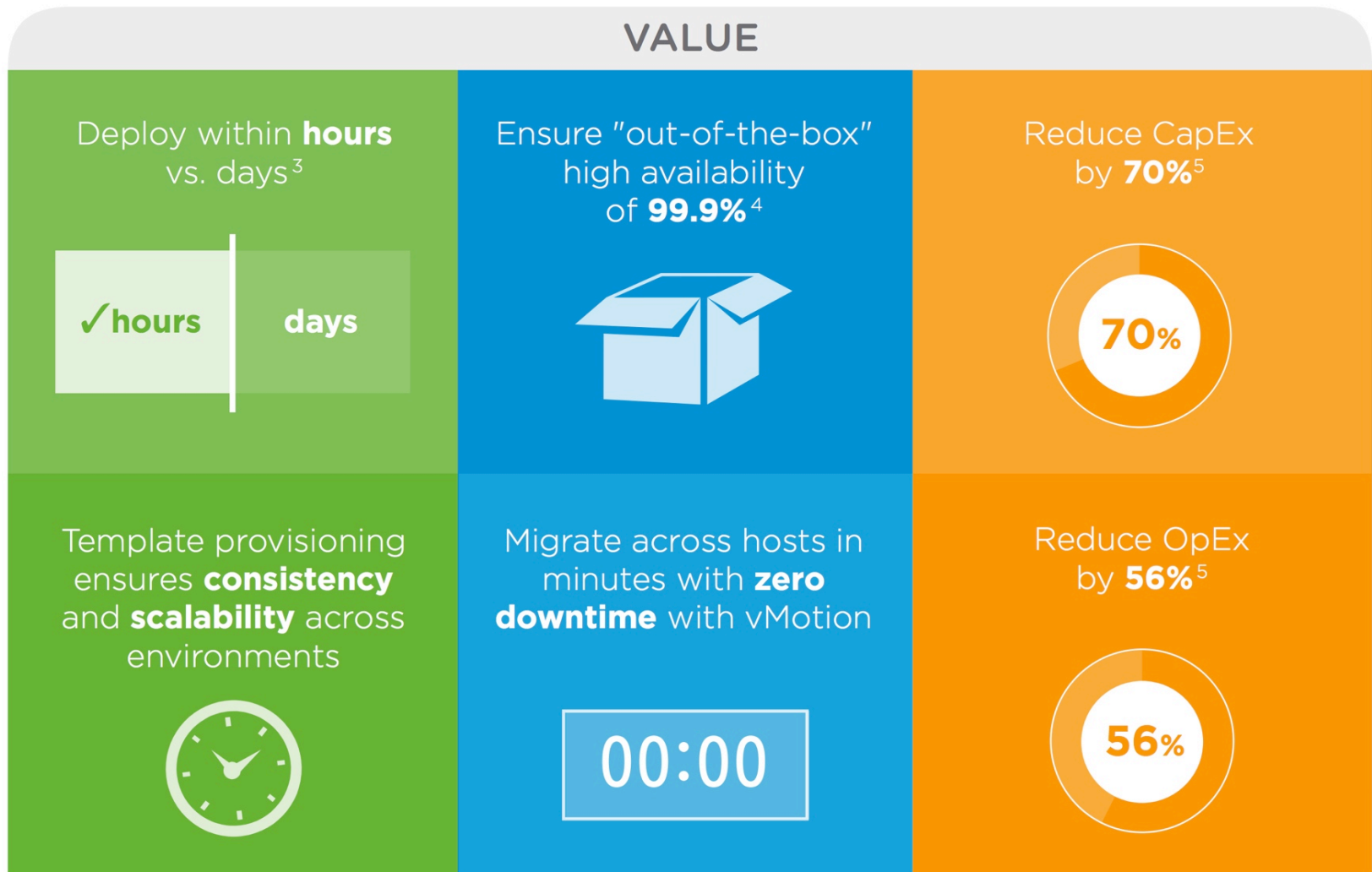


Blue Medora VMware vCenter Operations Manager Management Pack for SAP HANA

Solution Overview

Production SAP HANA workloads are moving onto VMware

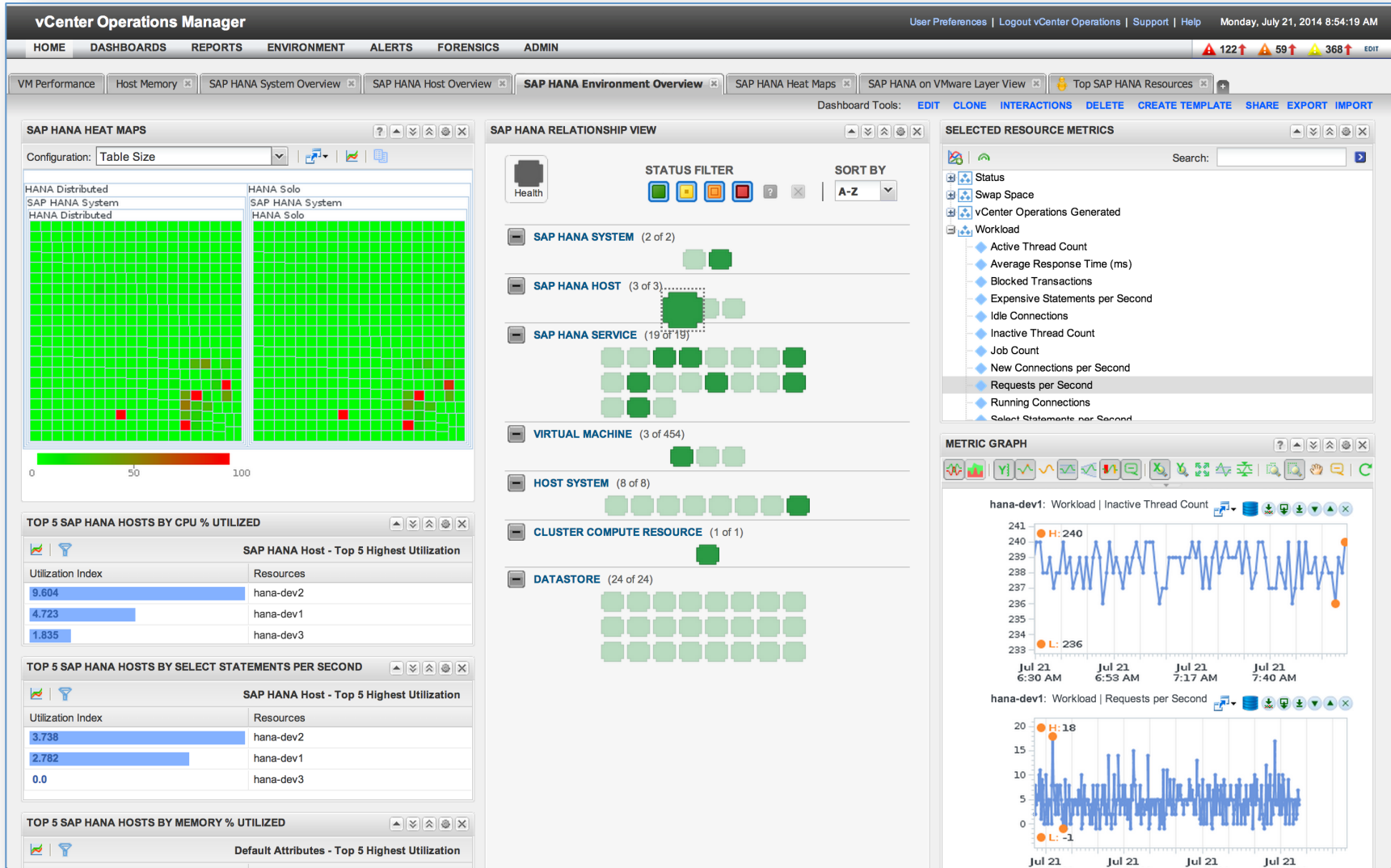


The value of running SAP HANA on VMware

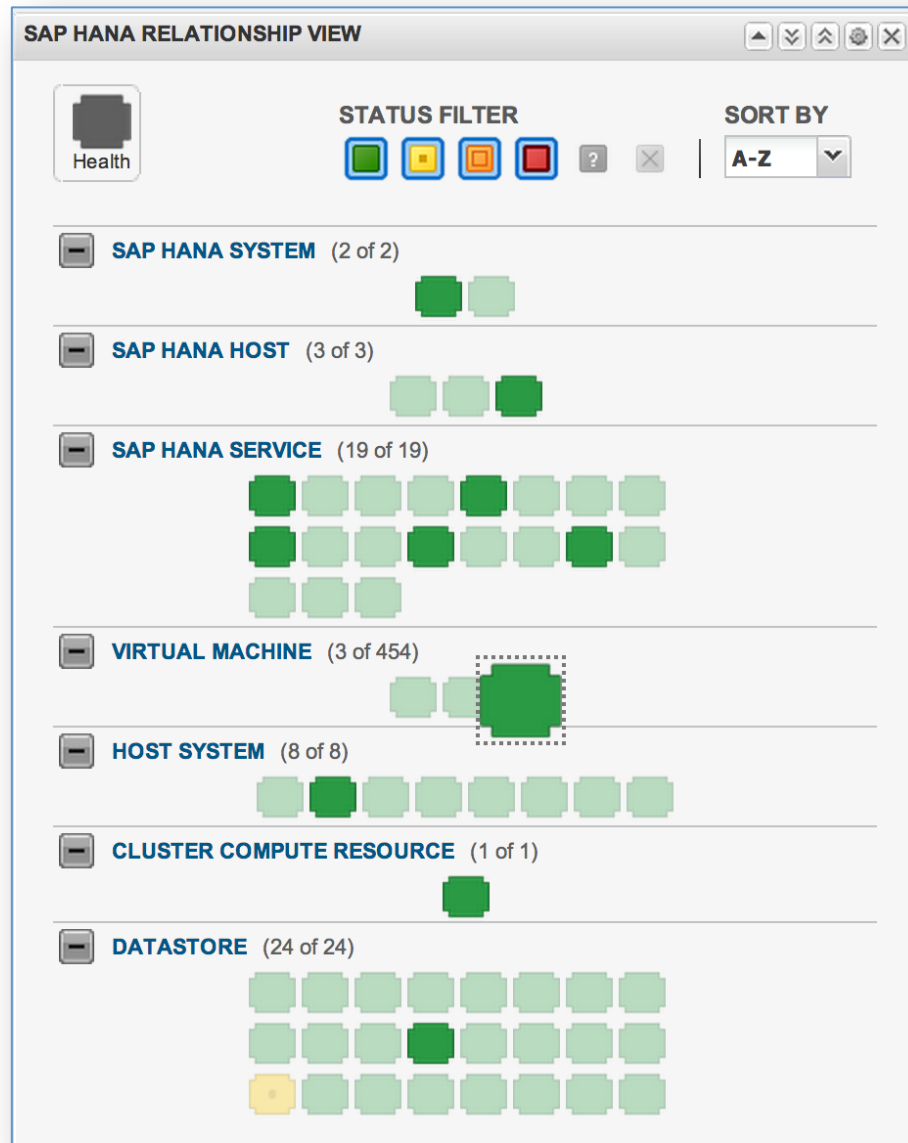
How the MP for SAP HANA extends VMware vC Ops

- Introduces **4 new SAP HANA-focused vC Ops Resource Kinds**
 - SAP HANA System, SAP HANA Host, SAP HANA Service, and SAP HANA Disk
- **Extends vC Ops by adding 300 – 400 SAP HANA specific metrics** including numerous synthetic metrics not available within SAP HANA Studio
- Provides **comprehensive relationship mapping functionality**
 - Between SAP HANA resource kinds themselves
 - Between SAP HANA Hosts and VMware virtual machine
 - With the VMware Virtual Machine mapping, all the other VMware relationships to the ESX Host, Datastores, Cluster, etc are provided
- **Adds 6 SAP HANA Out-of-the-Box Dashboards** designed for troubleshooting, diagnostics, and analysis

Insights into SAP HANA on Physical, Virtual, or the Cloud



Visualize SAP HANA on VMware component relationships



Understand SAP HANA System (Cluster) Status

vCenter Operations Manager User Preferences | Logout vCenter Operations | Support | Help Friday, July 18, 2014 4:07:39 PM

HOME DASHBOARDS REPORTS ENVIRONMENT ALERTS FORENSICS ADMIN 115 60 375 EDIT

VM Performance Host Memory **SAP HANA System Overview** SAP HANA Host Overview SAP HANA Environment Overview SAP HANA Heat Maps SAP HANA on VMware Layer View Top SAP HANA Resources

Dashboard Tools: EDIT CLONE INTERACTIONS DELETE CREATE TEMPLATE SHARE EXPORT IMPORT

SELECT SAP HANA SYSTEM

Search:

Name	Last 24 Hours	Health	Children Health	Alerts
HANA Distributed		74		0
HANA Solo		98		0

Page 1 of 1

SAP HANA SYSTEM ALERTS

Sub-Type	Resource Name	Resource Kind
	hana-dev3	SAP HANA Host

Page 1 of 1

HANA REPORTED STATUS

ALERTS WARNING	CPU OK
DATA DISK OK	LOG DISK OK
MEMORY OK	SERVICES ALL STARTED OK
TRACE DISK OK	

SAP HANA SYSTEM DETAILS

SID SH2	PLATFORM SUSE Linux Enterprise Server 11.1	VERSION 73
LAST UPDATE 2014-06-04 13:29:00.0	INACTIVE HOSTS 0	RUNNING HOSTS 2
TOTAL HOSTS 2	LICENSE DAYS REMAINING 46	

SAP HANA SYSTEM ALERTS SUMMARY

MEDIUM ALERTS (#) 0	HIGH ALERTS (#) 1
-------------------------------	-----------------------------

SAP HANA SYSTEM PERFORMANCE KPIS

PHYSICAL MEMORY UTILIZATION (%) 20.7 %	USED MEMORY GB 18.4	AVG. PROCESSOR CPU UTIL 10.2 %
TOTAL CORES 4	BLOCKED TRANSACTIONS 0	EXPENSIVE STATEMENTS 0
IDLE CONNECTIONS 1,003	RUNNING CONNECTIONS 1	JOB COUNT 0
REQUESTS 243 PER SECOND	AVERAGE RESPONSE TIME 0 MS	

Visualize SAP HANA Topology and VMware Relationships

vCenter Operations Manager User Preferences | Logout vCenter Operations | Support | Help Tuesday, July 22, 2014 6:54:25 AM

HOME DASHBOARDS REPORTS ENVIRONMENT ALERTS FORENSICS ADMIN 120↑ 69↑ 376↑ EDIT

ENVIRONMENT OVERVIEW :: RESOURCE DETAIL

HEALTH STATUS

HANA Distributed
Last 6 Hours NOW 97

Self Children: 6 Total Metrics: 4096 more

ROOT CAUSE RANKING (HANA Distributed)

HANA-DEV2 (14 OUT OF 18 SYMPTOMS)
VIRTUAL MACHINE - NETWORK (1 OF 1)
VIRTUAL MACHINE - DISK (1 OF 1)

METRIC SELECTOR (HANA Distributed)

Search:

- CPU
- Disk
- General
- HANA Reported Status
 - Alerts
 - CPU
 - Data Disk
 - Log Disk
 - Memory
 - Services All Started
 - Trace Disk
- Hosts
- Instance Generated
- License
- Memory
- Table
- vCenter Operations Generated
- Workload
 - Average Response Time (ms)
 - Job Count
 - Requests per Second

HEALTH TREE

```
graph TD; HANA[HANA Distributed] --- hana3[hana-dev3]; HANA --- hana2[hana-dev2]; HANA --- Disk763206[Disk 763206]; HANA --- Disk890324[Disk 890324]; HANA --- hana2_dev2[hana-dev2]; HANA --- hana3_dev3[hana-dev3];
```

METRIC GRAPH

HANA Distributed: Workload | Average Response Time (ms)

Time	Average Response Time (ms)
Jul 22 2:00 AM	0
Jul 22 2:06 AM	200
Jul 22 2:12 AM	~100
Jul 22 2:17 AM	~100
Jul 22 2:23 AM	~100
Jul 22 2:29 AM	~100

HANA Distributed: Workload | Requests per Second

Time	Requests per Second
Jul 22 2:00 AM	~12
Jul 22 2:06 AM	~10
Jul 22 2:12 AM	~10
Jul 22 2:17 AM	~10
Jul 22 2:23 AM	~10
Jul 22 2:29 AM	~10

Drill into individual SAP HANA Hosts and Services

vCenter Operations Manager User Preferences | Logout vCenter Operations | Support | Help Saturday, July 19, 2014 8:13:03 AM

HOME DASHBOARDS REPORTS ENVIRONMENT ALERTS FORENSICS ADMIN 119↑ 56↑ 377↑ EDIT

VM Performance Host Memory SAP HANA System Overview **SAP HANA Host Overview** SAP HANA Environment Overview SAP HANA Heat Maps SAP HANA on VMware Layer View Top SAP HANA Resources

Dashboard Tools: EDIT CLONE INTERACTIONS DELETE CREATE TEMPLATE SHARE EXPORT IMPORT

SELECT SAP HANA SYSTEM

Name Health ID

Page 1 of 1 No resources to display

SAP HANA SYSTEM ALERTS SUMMARY

MEDIUM ALERTS (#) **0** HIGH ALERTS (#) **1**

SELECT SAP HANA SERVICE

Name	Health	ID
compileserver	100	787
daemon	100	788
indexserver	100	789
nameserver	100	790
preprocessor	100	791
statisticsserver	100	792
xsengine	100	793

Page 1 of 1 1 - 7 of 7

SELECT SAP HANA HOST

Name	Health	ID
hana-dev2	100	785
hana-dev3	100	786

Page 1 of 1 1 - 2 of 2

SAP HANA HOST PERFORMANCE KPIS

HOST NAME hana-dev2	SYSTEM NAME HANA Distributed
CPU UTILIZATION (%) 7.5 %	DATABASE MEMORY USAGE GB 20
PHYSICAL MEMORY UTILIZATION 38.1 %	NETWORK DATA RECEIVED 0 MBIT/S
NETWORK DATA SENT 0 MBIT/S	SWAP SPACE UTILIZATION 96.6 %
ACTIVE THREAD COUNT 10	JOB COUNT 0
NEW CONNECTIONS 0 PER SECOND	RUNNING CONNECTIONS 1
SELECT STATEMENTS 1.8 PER SECOND	UPDATE STATEMENTS 0 PER SECOND
BLOCKED TRANSACTIONS 0	EXPENSIVE STATEMENTS 0 PER SECOND
REQUESTS 0 PER SECOND	AVERAGE RESPONSE TIME 0 MS

SERVICE DETAILS

NAME compileserver	HOST NAME hana-dev2
PORT 30,210	ACTIVE YES
UPTIME 515.158 HRS	USED MEMORY GB 5.405
CPU 0 %	ACTIVE THREADS 1
REQUESTS 0 PER SECOND	AVG RESPONSE TIME 0 MS
RUNNING CONNECTIONS 0	IDLE CONNECTIONS 0
BLOCKED TRANSACTIONS 0	CACHE HITS 0 PER SECOND
CACHE MISSES 0 PER SECOND	CACHE INVALIDATES 0 PER SECOND

SELECT VIRTUAL MACHINE

Name

hana-dev2

Page 1 of 1 1 - 1 of 1

HOST VM METRICS

MEMORY USAGE 2.994 %	GUEST ACTIVE MEMORY 1,258,290.4 KB
CPU READY 0.305 %	CPU USAGE 10.377 %
DISK USAGE RATE 259.2 KBPS	READ AVERAGE 3.733 KBPS
WRITE AVERAGE 255.067 KBPS	

Identify top SAP HANA bottlenecks via “Top N” lists

vCenter Operations Manager User Preferences | Logout vCenter Operations | Support | Help Monday, July 21, 2014 8:57:19 AM

HOME DASHBOARDS REPORTS ENVIRONMENT ALERTS FORENSICS ADMIN 122 ↑ 59 ↑ 369 ↑ EDIT

← AP HANA System Overview | SAP HANA Host Overview | SAP HANA Environment Overview | SAP HANA Heat Maps | SAP HANA on VMware Layer View | **Top SAP HANA Resources** →

Dashboard Tools: [EDIT](#) [CLONE](#) [INTERACTIONS](#) [DELETE](#) [CREATE TEMPLATE](#) [SHARE](#) [EXPORT](#) [IMPORT](#)

TOP SAP HANA HOSTS BY CPU % UTILIZATION

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
9.596	hana-dev2
4.15	hana-dev1
1.633	hana-dev3

TOP SAP HANA SERVICES BY ACTIVE THREAD #

SAP HANA Service - Top 5 Highest Utilization

Utilization Index	Resources
4.0	indexserver
4.0	indexserver
1.0	preprocessor
1.0	nameserver
1.0	compileserver

TOP SAP HANA HOSTS BY REQUESTS/S

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
9.0	hana-dev1
2.0	hana-dev2
1.0	hana-dev3

TOP SAP HANA HOSTS BY DATABASE CPU % UTILIZATION

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
11.746	hana-dev2
4.026	hana-dev1
1.467	hana-dev3

TOP SAP HANA HOSTS BY BLOCK TRANSACTION #

SAP HANA System - Top 5 Highest Utilization

Utilization Index	Resources
0.0	hana-dev1
0.0	hana-dev3
0.0	hana-dev2

TOP SAP HANA HOSTS BY AVG RESPONSE TIME

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
2.0	hana-dev3
0.0	hana-dev1
0.0	hana-dev2

TOP SAP HANA HOSTS BY PHYSICAL MEMORY % UTILIZATION

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
42.438	hana-dev1
38.451	hana-dev2
11.313	hana-dev3

TOP SAP HANA HOSTS BY SELECT STATEMENTS PER SECOND

SAP HANA System - Top 5 Highest Utilization

Utilization Index	Resources
2.754	hana-dev2
1.8	hana-dev1
0.0	hana-dev3

TOP SAP HANA HOSTS BY EXPENSIVE STATEMENTS

SAP HANA Host - Top 5 Highest Utilization

Utilization Index	Resources
0.0	preprocessor
0.0	nameserver
0.0	indexserver
0.0	daemon
0.0	compileserver

TOP 5 SAP HANA HOST BY SWAP % UTILIZATION

Top 5 Highest Utilization

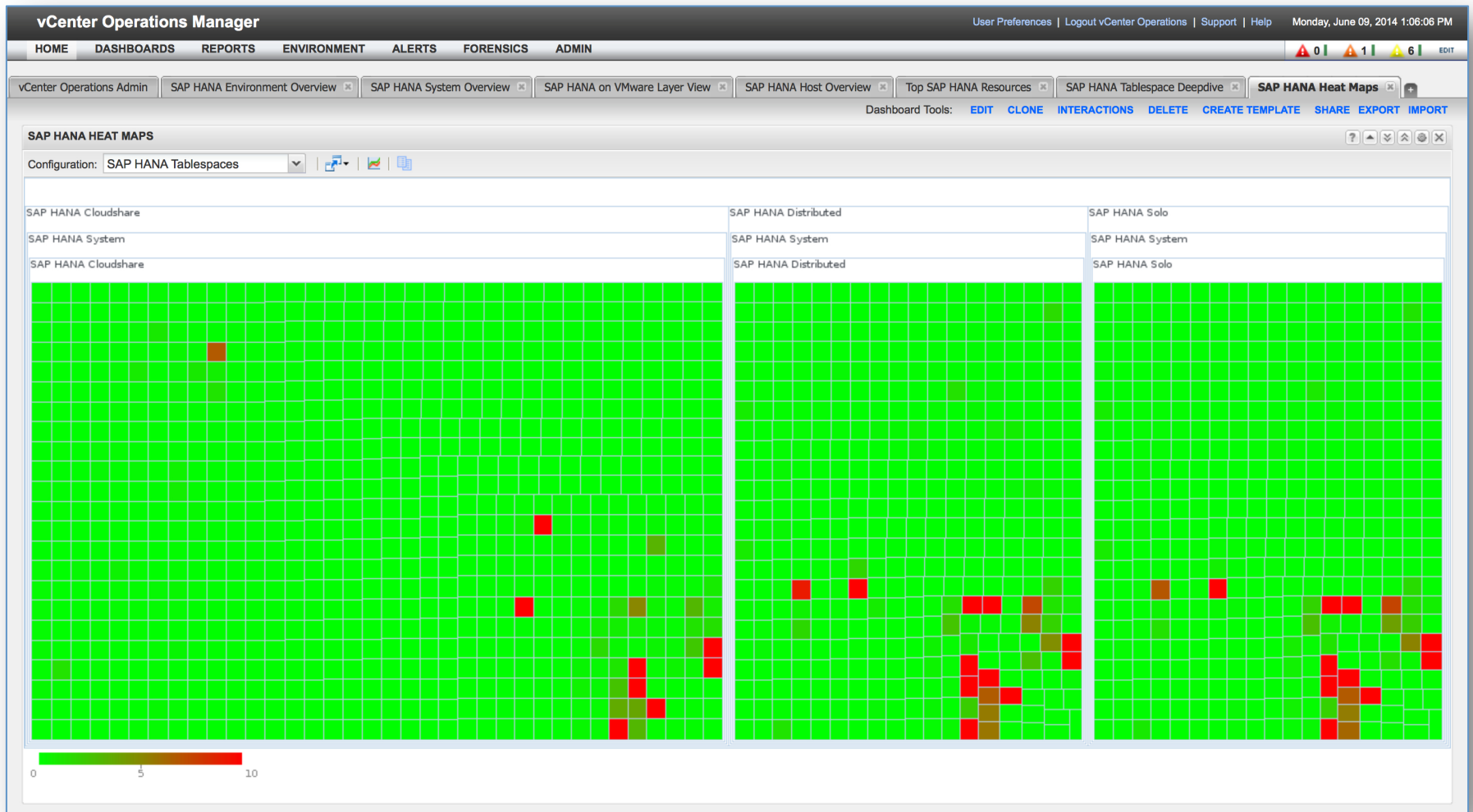
TOP 5 SAP HANA SYSTEM BY HIGH ALERT COUNT

SAP HANA System - Top 5 Highest Utilization

TOP SAP HANA HOSTS BY CONNECTIONS

SAP HANA Host - Top 5 Highest Utilization

Use Heat maps to look across the entire SAP HANA estate



Correlate performance across all of the HANA on VMware layers

The screenshot displays the vCenter Operations Manager interface, showing a dashboard for SAP HANA performance across multiple layers. The dashboard is titled "SAP HANA on VMware Layer View" and includes several panels for monitoring different components.

SELECT SAP HANA SYSTEM

Name	Health
HANA Distributed	99
HANA Solo	99

SAP HANA SYSTEM KPIS (HANA Distributed)

Metric	Value
Physical Memory Utilization (%)	20.9 %
Avg. Processor CPU Util	1.4 %
Running Connections	1
Expensive Statements	0
Job Count	0

SELECT SAP HANA HOST

Name	Health
hana-dev2	100
hana-dev3	100

SAP HANA HOST KPIS (hana-dev3)

Metric	Value
Network Data Sent	0 MBIT/S
Active Thread Count	6
Job C	hana-dev3: Workload Active Thread Count
Running Connections	0

SELECT RELATED VIRTUAL MACHINE

Name	Health
hana-dev3	100

VIRTUAL MACHINE METRICS (hana-dev3)

Metric	Value
Memory Usage	0.528 %
Disk Usage Rate	1.3 KBps
Read Average	0 KBps
Write Average	1.3 KBps

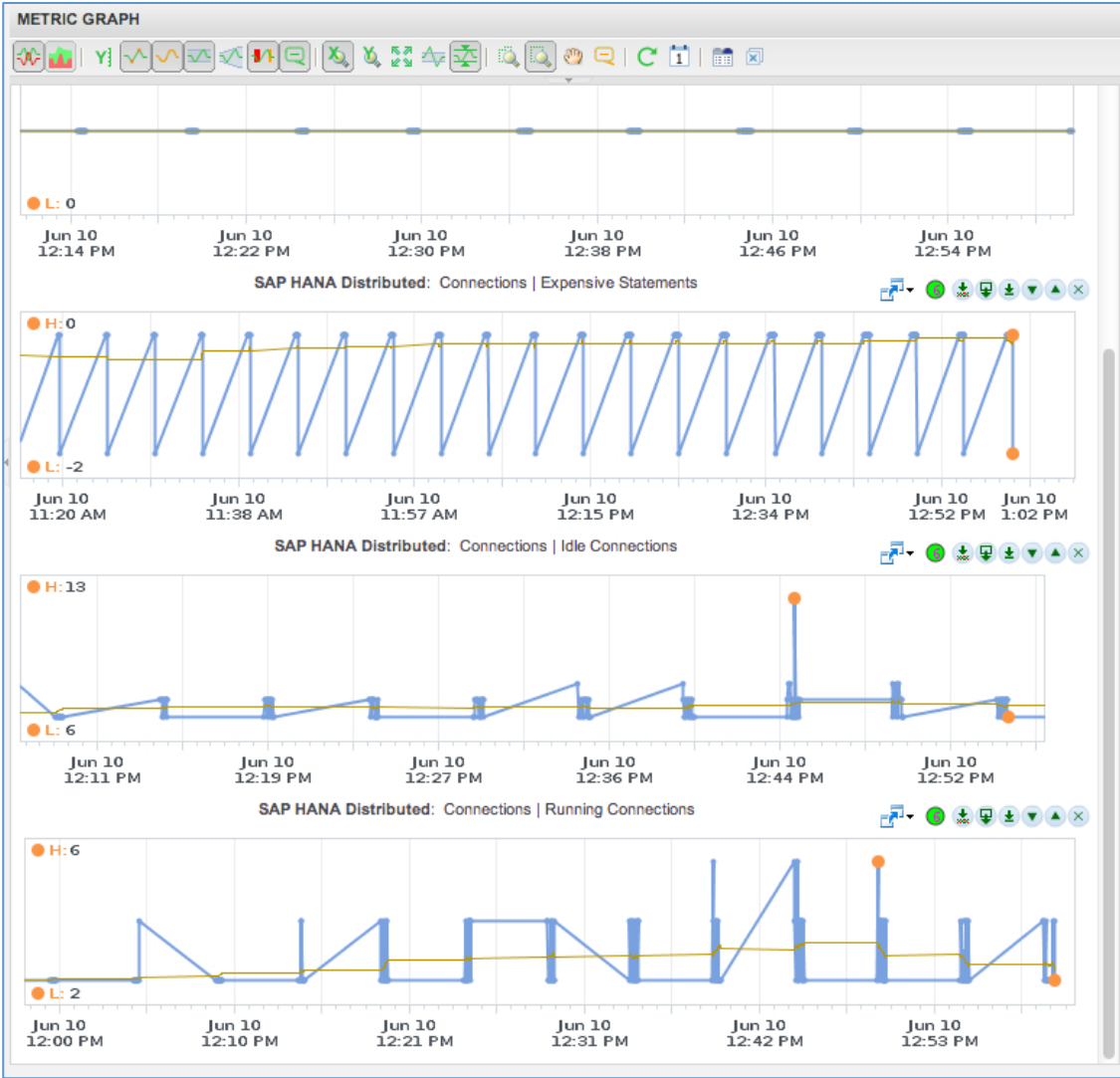
SELECT RELATED VMWARE ESX HOST

Name	Health
janus.bluededora.localnet	100

ESX HOST METRICS (janus.bluededora.localnet)

Metric	Value
Memory Usage	95.5 %
Disk Usage Rate	1.6137 KBps

Monitor Critical SAP HANA Performance Metrics



Sampling of metrics collected by vC Ops MP for SAP HANA

Example SAP HANA System (Cluster) Metrics

Avg CPU %	Avg Memory %	Blocked Transactions	Expensive Statements
Idle Connections	Running Connections	Inactive Hosts	Running Hosts
License Days Remaining	Used Memory	Table Record Count	Table Size (MB)
Table Size Change (MB/s)	Average Response Time (ms)	Job Count	Requests per Second

Example SAP HANA Host Metrics

Cache Entry Count	Cache Hits per Second	Total Cache Size (MB)	CPU Util %
Database CPU %	DB Memory Usage (MB)	Network Data Received (Mbit/s)	Network Data Sent (Mbit/s)
Uptime (Hrs)	Swap Space % Util	Total Swap Space Used	DB Average Response Time (ms)
DB Blocked Transactions	DB Expensive Statements (per sec)	DB Idle Connections	DB Inactive Thread Count
DB New Connections per sec.	DB Requests per sec.	DB Running Connections	DB Select Statements per sec
DB Update Statements per sec.	DB Record Lock Count	DB Active Thread Count	DB Job Count

Example SAP HANA Service Metrics

Cache Entry Count	Cache Hits per Second	Total Cache Size (MB)	Used Memory (MB)
Memory Allocation (MB)	Memory Utilization (of Allocation)	Garbage Collection - Waiters per sec.	Garbage Collection - Savepoint per sec.
Blocked Transactions	Expensive Statements (per sec)	Idle Connections	Inactive Thread Count
New Connections per sec.	Requests per sec.	Running Connections	Select Statements per sec
Update Statements per sec.	Record Lock Count	Active Thread Count	Job Count

Example SAP HANA Disk Metrics

Read Size (MB/s)	Reads per Second	Total Size (GB)	Used Size (GB)
Utilization %	Write Size (KB/s)	Writes Per Second	Host

vCOPs MP for SAP HANA Technical Details

- Remote agentless data collection
- Collects data from SAP HANA via JDBC connection
- Management Pack requires a Role with read-only permissions to the SAP HANA statistics server
 - Refer to [SAP HANA Doc](#) for more details on creating the role

vCOPs MP for SAPA HANA Pre-requisites

- VMware vC Ops Enterprise Edition
 - v5.8+

- SAP HANA
 - SP6+

Licensing and Support details

- Licensing computed via 128GB increments of memory within monitored SAP HANA hosts that the Management Pack is configured to collect data for
- Contact sales@bluemedora.com for pricing details
- Support Options
 - Standard Support -> 8:00am – 5:00pm (US EDT) Phone / Email / Web
 - Premium Support -> 24x7x365 Phone / Email / Web

How to evaluate the vC Ops MP for SAP HANA

- ⊕ Download the 45 Day Trial at <http://bluemedora.com>
- ⊕ Contact us for more info:



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