Deep Dive – Monitoring Servers using BI 4.1

Alan Mayer
Solid Ground Technologies

SESSION CODE: 0305

AGENDA

- **Introduction**
- Definitions and Architecture
- Configuration
- Metrics
- Watches and Alerts
- Probes
- Reporting
- Conclusion

INTRODUCTION

Alan Mayer

- Co-founded Integra Solutions in 1993
  - Used BusinessObjects since 1992
  - Wrote the first BusinessObjects training manuals
  - Over 75 Fortune 1000 customers before company was sold in 2007
- Presented at every national conference
- Founded Solid Ground Technologies in 2009
  - Different company – same principles
  - Specializing in BusinessObjects consulting and training

INTRODUCTION

- We'll look at monitoring from an Administrator's perspective:
  - Configuring the service
  - Understanding the key elements
  - Working through use cases
    - Learning by doing
    - "Day in the life of …"

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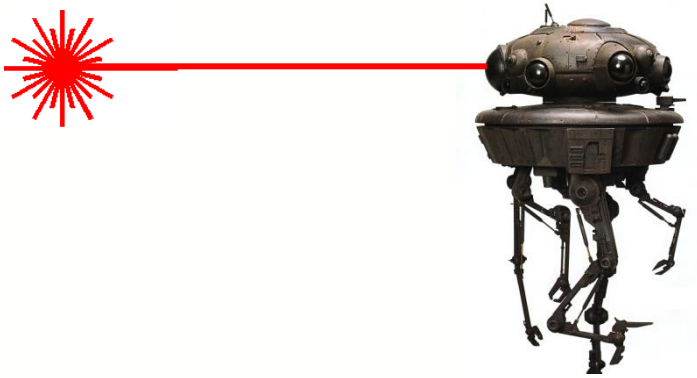
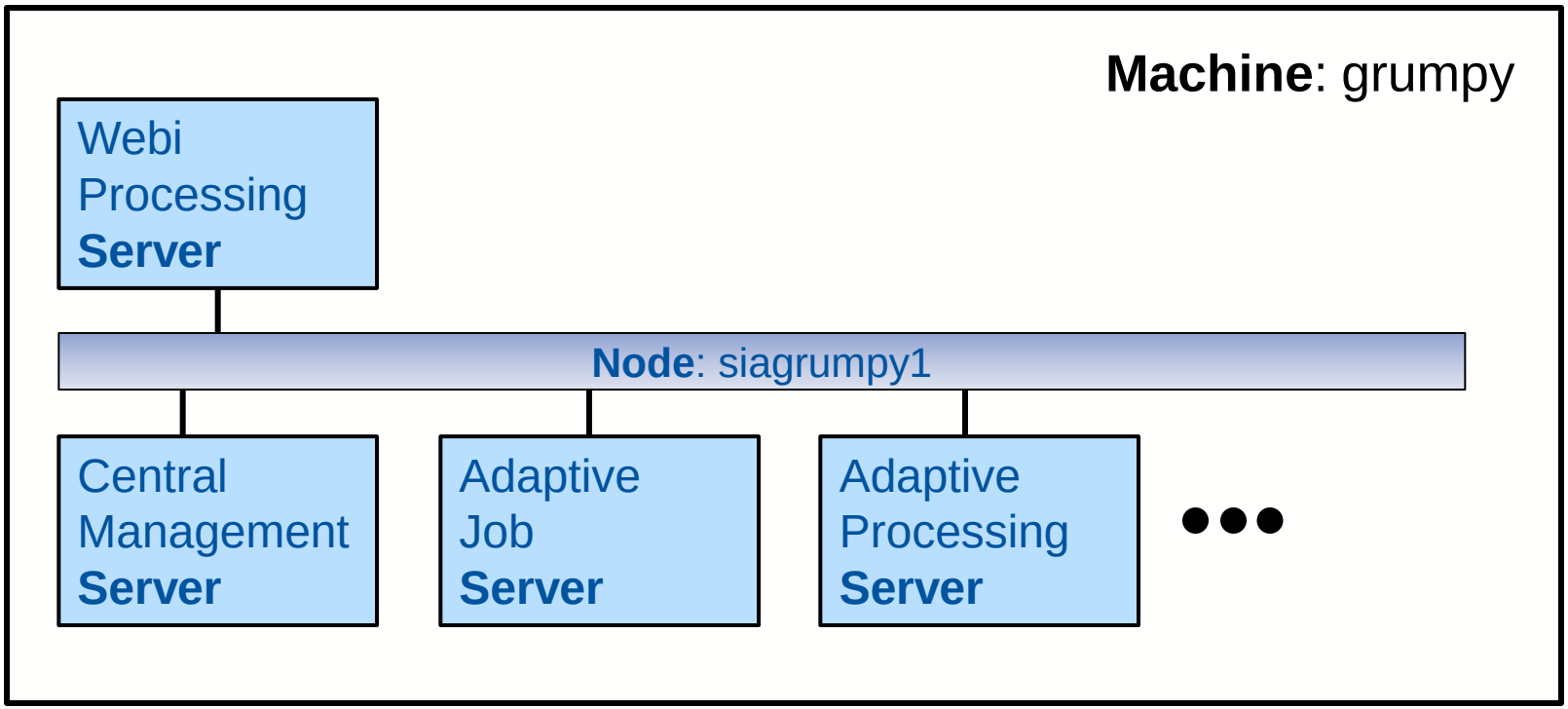


DEFINITIONS

- What is Monitoring ??
  - Keeps tabs on the health of your BI 4.1 system
  - Provides evidence of what's happened in the past
  - Issues alerts before the system fails
  - Displays real-time statistics for all BI servers
  - Summarizes those statistics in dashboards

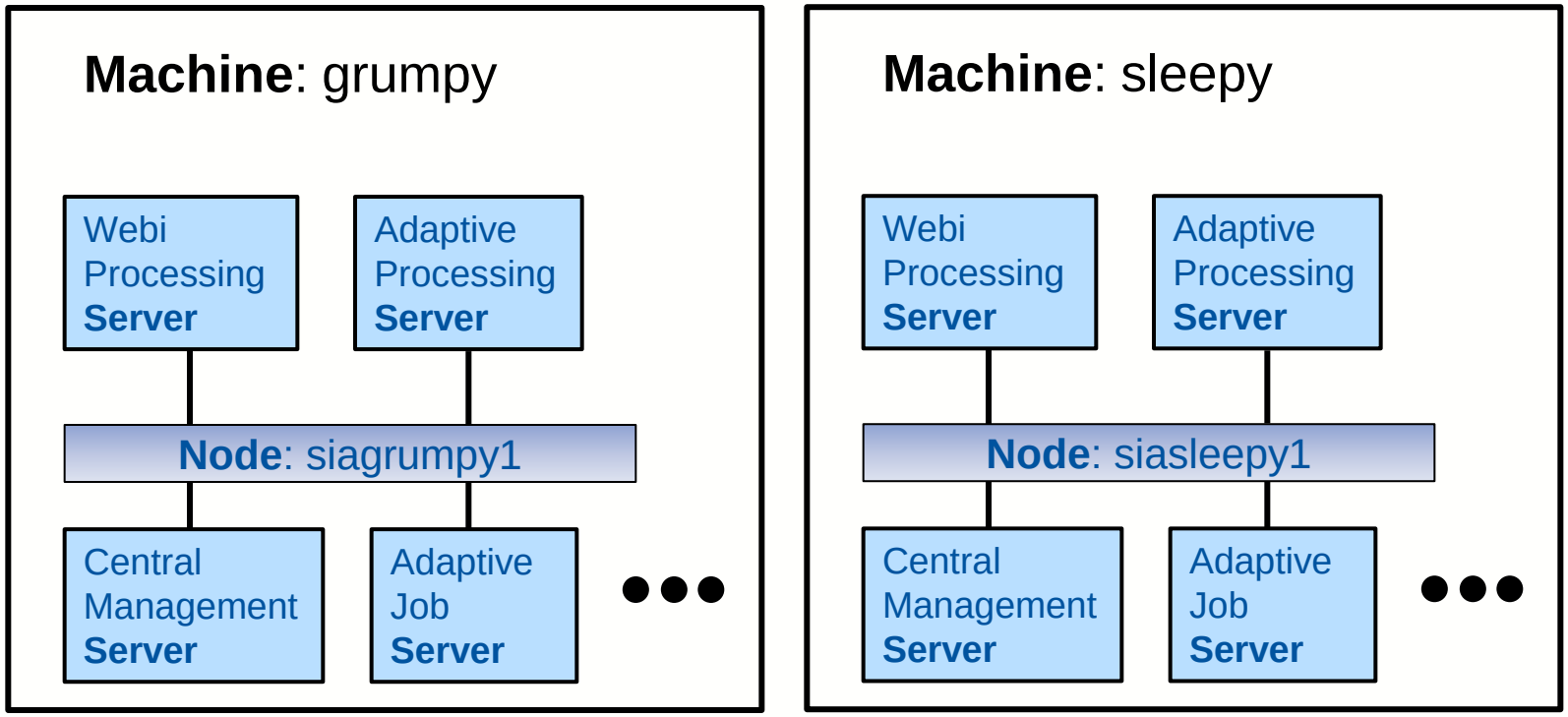
DEFINITIONS

- Machines, Nodes, and Servers
  - A physical machine can host one of more BI environments (nodes)
  - Each environment consists of a set of servers



DEFINITIONS

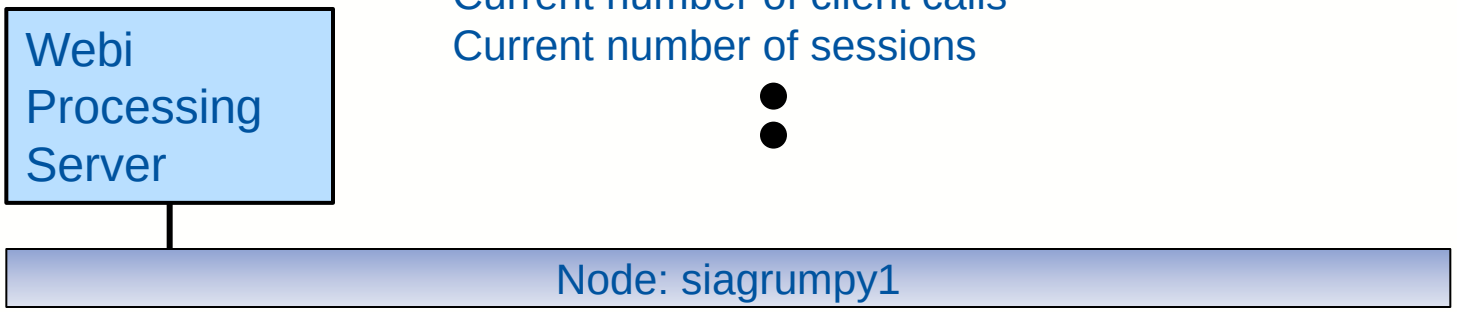
- Cluster
  - Two or more nodes



DEFINITIONS

- Metric
  - Every server has attributes that can be measured

Busy Server Threads
CPU usage_%_
CPUs
Cache high mark count
Cache size_Kb_
Current Number of Auditing Events in the Queue
Current number of active sessions
Current number of client calls
Current number of sessions
:

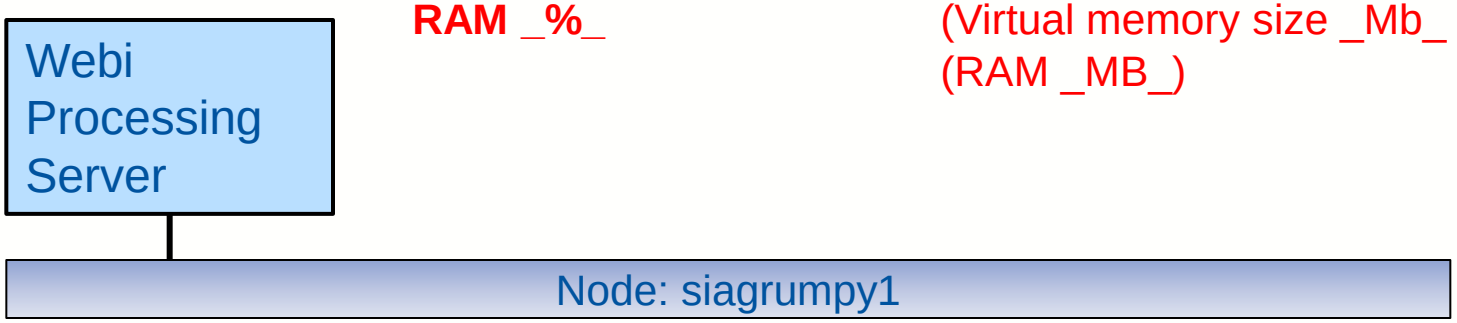


DEFINITIONS

- Derived Metric
  - Calculated attribute made up of other existing attributes

RAM _MB_ - *Total RAM memory of server*
Virtual memory size _Mb_ - *RAM memory used*

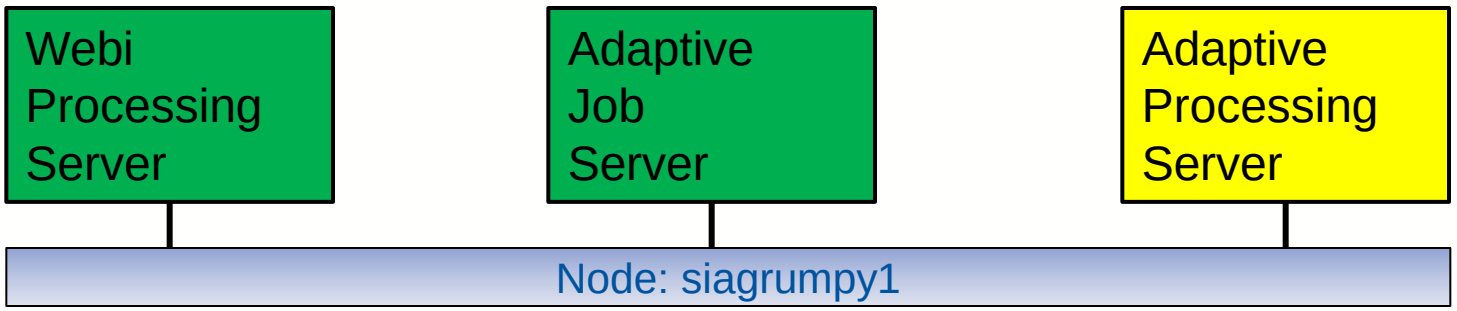
RAM _%_ (Virtual memory size _Mb_) / (RAM _MB_)



DEFINITIONS

- Topological Metric
  - Attribute that represents the overall health or state of a service
    - 0 – Danger
    - 1 – Amber
    - 2 – Green

WebIntelligenceServices$Health State = 1 (+ + =)



DEFINITIONS

- Watch
  - A set of conditions that indicate the health of a metric or service
  - Provides real time and historical trends

Watch: Webi Memory

Metric: Virtual memory size _Mb_
Caution: 3500 Mb
Danger: 4500 Mb

Webi Processing Server

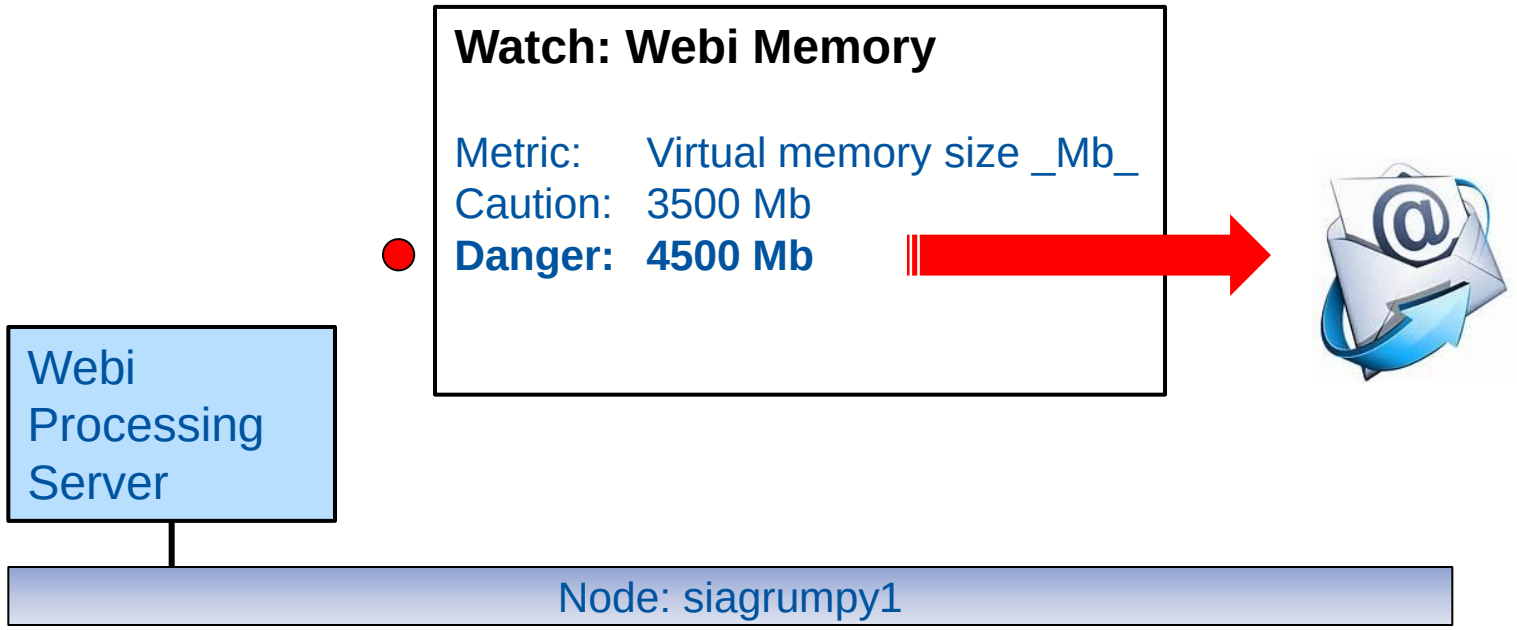
Node: siagrumpy1

DEFINITIONS

- KPI
  - **Key** Performance Indicator
  - Usually reflects good or bad performance
  - Any watch can be chosen as a KPI

DEFINITIONS

- Alert
  - Notification triggered when a threshold has been exceeded
  - Comes as a dashboard notification or email

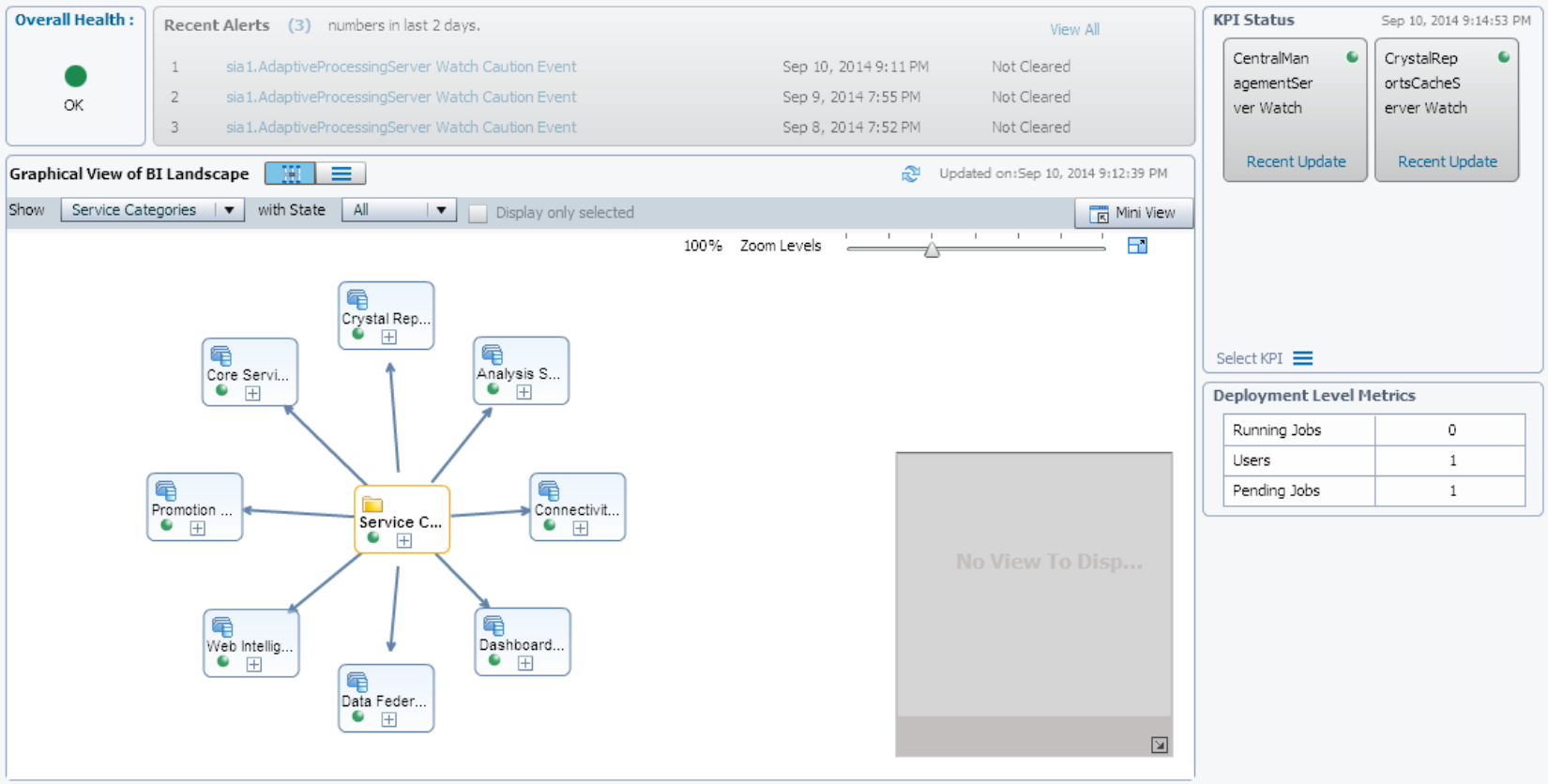


DEFINITIONS

- Probe
  - A use case (workflow) scheduled to run at defined intervals
    - CMS Logon Logoff
      - Log onto system,verifies session, then logs off
    - Crystal Reports Service
      - Runs a report using Crystal Reports Page and Cache servers
    - BI launch pad
      - Logs into BI launch pad
    - Interactive Analysis
      - Runs a Webi report and times how long the refresh takes

DEFINITIONS

- Dashboard
  - Visual representation of your BI Landscape



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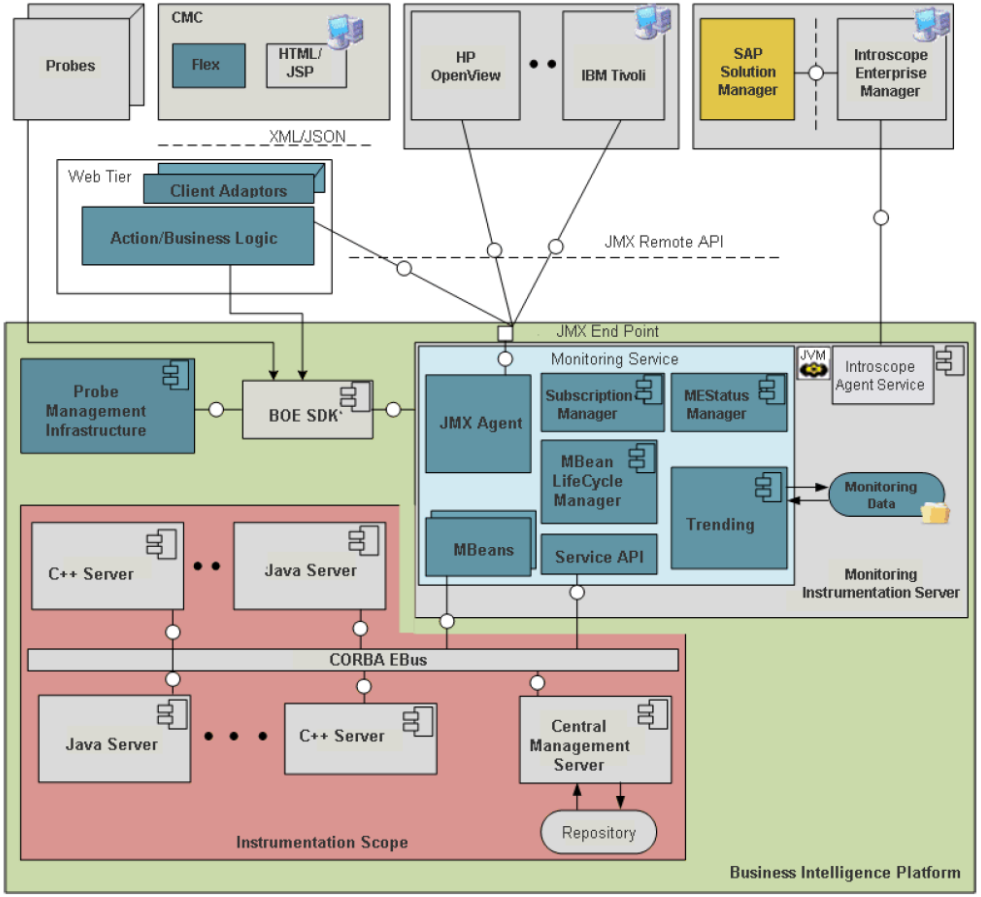
ARCHITECTURE

- Formal diagram from the BI 4.1 Admin Reference:



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ARCHITECTURE

- Architecture from an Administrator's standpoint:

Metrics: sia1.WebIntelligenceProcessingServer

Hide Navigation

- Properties
- Translations
- User Security
- Metrics
- Placeholders
- Existing Server Groups

Web Intelligence Processing Service Metrics

Cache size (Kb)	8128
Number of out-of-date documents in cache	0
Cache high mark count	0
CPU usage (%)	0
Total CPU time (seconds)	7
Memory high threshold count	0
Memory max threshold count	0
Virtual memory size (Mb)	31
Current number of client calls	0
Number of remote extension errors	0
Current number of tasks	0
Total number of client calls	6
Total number of tasks	6
Idle time (seconds)	6027
Current number of active sessions	0
Number of documents opened from cache	0
Number of documents	0
Current number of sessions	0
Number of document swap	0
Number of swapped documents	0
Number of sessions timeout	0
Total number of sessions	3
Number of users	0
Number of active threads	0
Total number of threads	5

Which metrics matter?

Which servers should be traced?

Do I have a problem?

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CONFIGURATION

- Writing monitoring results to a trending database
  - Default database is Apache Derby
    - NOT a great option
      - No failover or backup options provided
      - Must be manually refreshed to return current information
  - Alternative would use the Auditing datastore
    - Could be Oracle, SQL Server, …
    - Allows users to combine auditing and monitoring info

CONFIGURATION

- Using Audit as the trending database
- New installs
  - Create the monitoring tables in the Audit database
  - Configure .SBO files if needed
  - Switch to the Audit database
  - Restart the correct Adaptive Processing Server
    - Find the one dedicated to Monitoring

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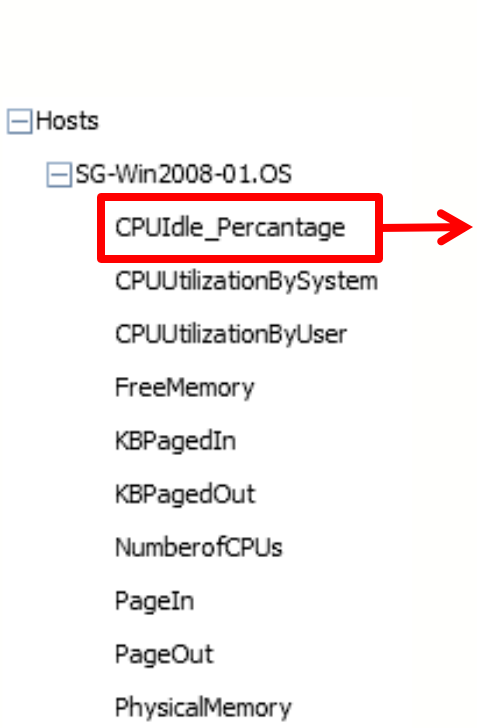
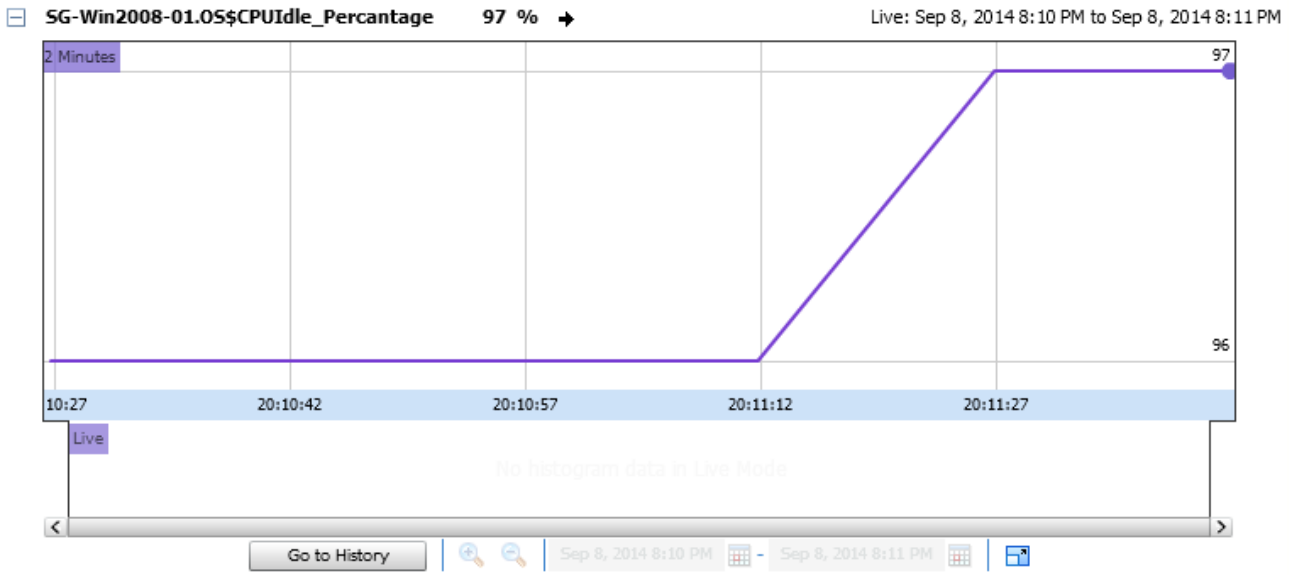
METRICS – Overall

- Metrics display real-time measurements
  - Not recorded
  - Not historical
- Create a watch to record historical values
  - Can contain one or more metrics
  - More on watches in a minute

METRICS – O/S Level





OS-Level metrics require an agent to be installed on your server - **SAPOSCAL**

METRICS – CMS

- Metrics
  - Metrics.CMSQueryMetrics
    - Number Of defined Xcelcius models
    - Number of Infospaces
    - Number of Programs
    - Number of Publications
    - Number of Universes
    - Number of defined Crystal Reports
    - Number of defined Web Intelligence Reports
    - Number of executed Programs instances
    - Number of generated Xcelcius Shockwave files
    - Number of scheduled Crystal Reports
    - Number of scheduled Web Intelligence Reports
  - Metrics.DerivedMetrics

Metrics.CMSQueryMetrics$Number of Univ...	8	→	Live: Sep 8, 2014 8:29 PM to Sep 8, 2014 8:30 PM
Metrics.CMSQueryMetrics$Number of defi...	22	→	Live: Sep 8, 2014 8:28 PM to Sep 8, 2014 8:30 PM
Metrics.CMSQueryMetrics$Number of defi...	52	→	Live: Sep 8, 2014 8:28 PM to Sep 8, 2014 8:30 PM
Metrics.CMSQueryMetrics$Number of sche...	0	→	Live: Sep 8, 2014 8:28 PM to Sep 8, 2014 8:30 PM
Metrics.CMSQueryMetrics$Number of sche...	0	→	Live: Sep 8, 2014 8:28 PM to Sep 8, 2014 8:30 PM

The metrics can also be retrieved using QueryBuilder if you knew the proper syntax (not hard)

Derived metrics (formula using existing metrics) stored here

METRICS – Probes

- Probes
  - sia1.BIlaunchpad
    - executiontime
    - passed
  - sia1.CMSCache
  - sia1.CMSDBConnection
  - sia1.CMSLogonLogoff
    - executiontime
    - passed
  - sia1.CMSPing
  - sia1.CrystalReportsService(ProcessingServer)
  - sia1.CrystalReportsService(ReportApplicationServer)
  - sia1.InteractiveAnalysis

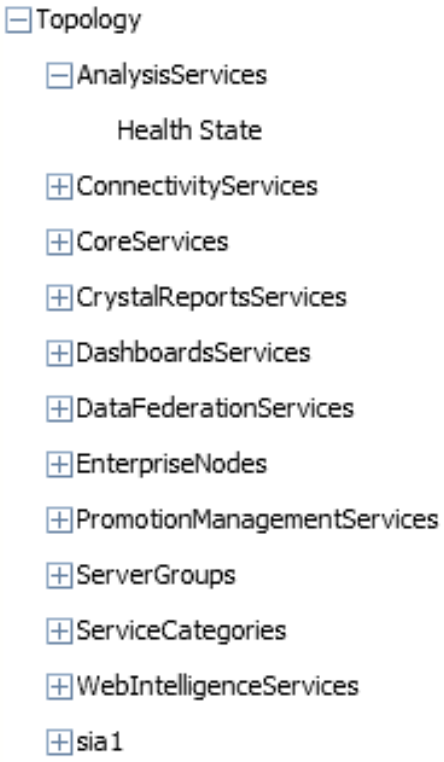
sia1.CMSLogonLogoff$executiontime	78 millisecond(s) →	Live: Sep 8, 2014 8:43 PM to Sep 8, 2014 8:45 PM
sia1.CMSLogonLogoff$passed	1 →	Live: Sep 8, 2014 8:44 PM to Sep 8, 2014 8:45 PM

Probe metrics will only show values when scheduled

METRICS – Servers

This represents the bulk of your available metrics (and some of the most valuable).

METRICS – Topology



Health State values

0 - Danger

1 - Warning

2 - OK

Health states represent the general state of the server

METRICS – Strategy

- Use the Monitoring Metrics tab to explore
  - Discover which metrics are really important
  - Note those metrics for later uses in watch lists
- ***Be careful!*** Not all metrics are created equal
  - Virtual memory metrics on Linux platforms
    - Linux can allocate 10x the virtual memory needed (or more)
    - Resident memory is much better to track but not available

METRICS – Demonstration

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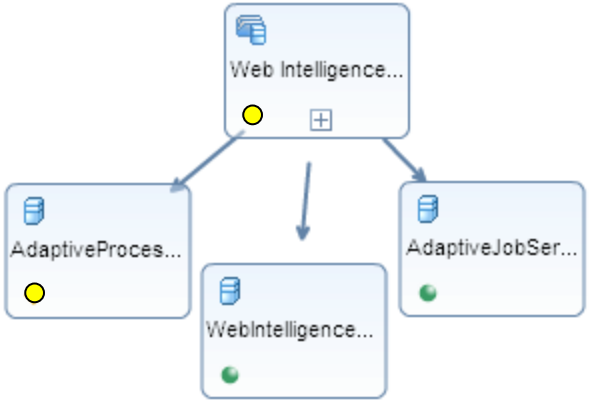
WATCHES

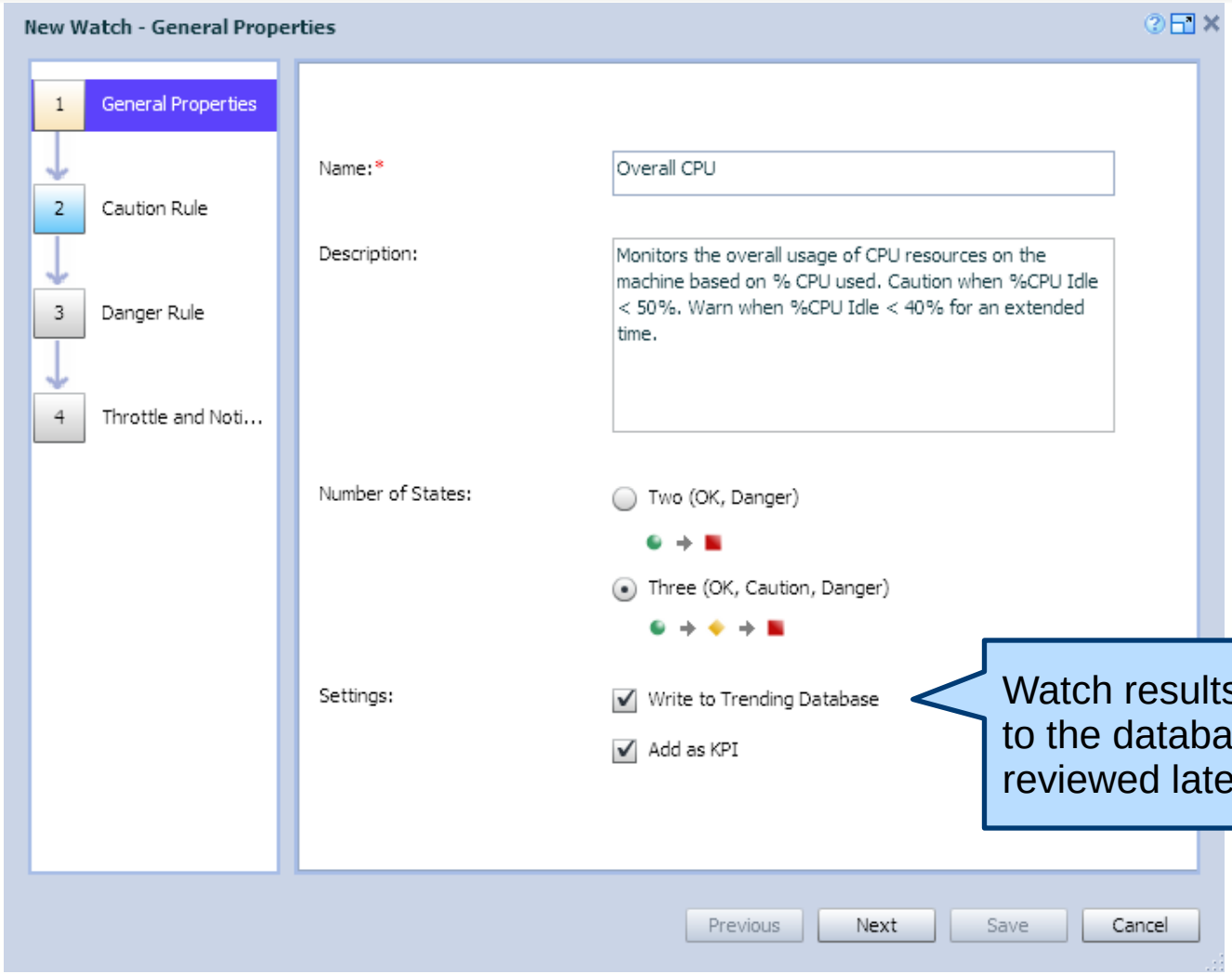
- Metrics by themselves can't record their values over time
- A Watch can, however
- It contains one or more rules that evaluate to a final state

WATCHES and Services

- The state of a service = worst state of any watch associated with it
  - Web Intelligence Services =
    - Adaptive Job Server **Watch** ● +
    - Web Intelligence Processing Server **Watch** ● +
    - Adaptive Processing Server **Watch** ●

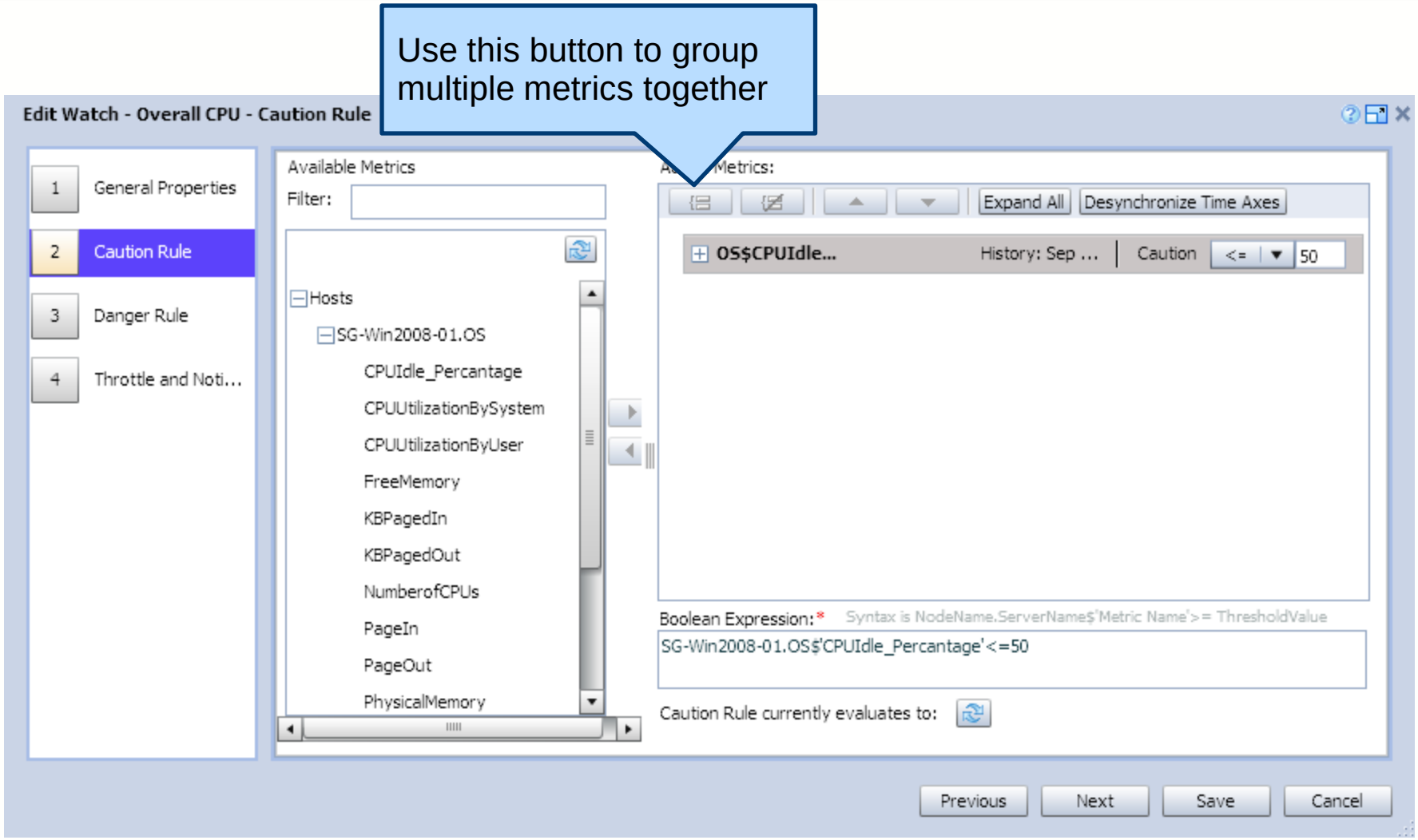


WATCHES – Creating a Watch

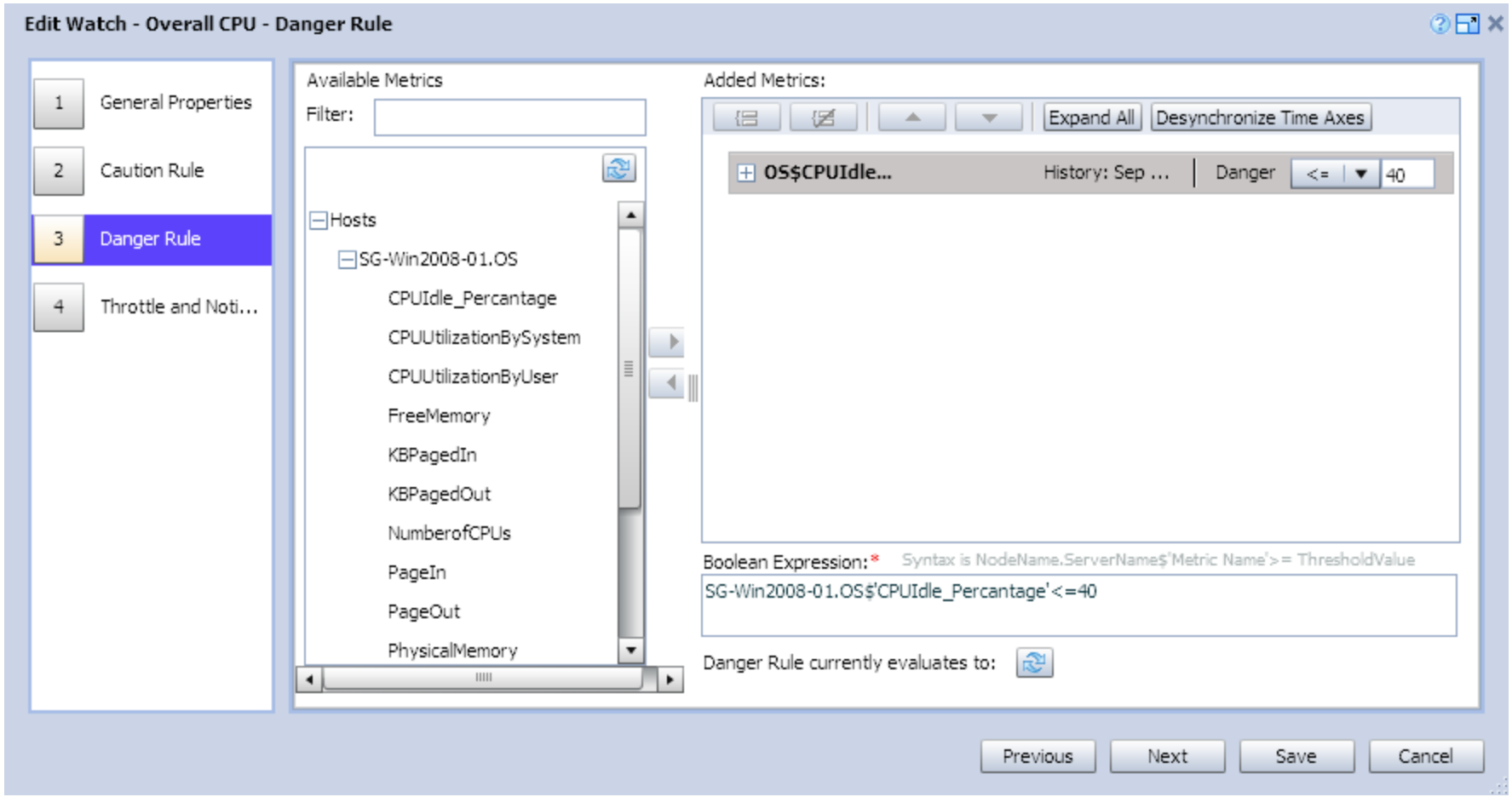


Watch results must be written to the database to be reviewed later!

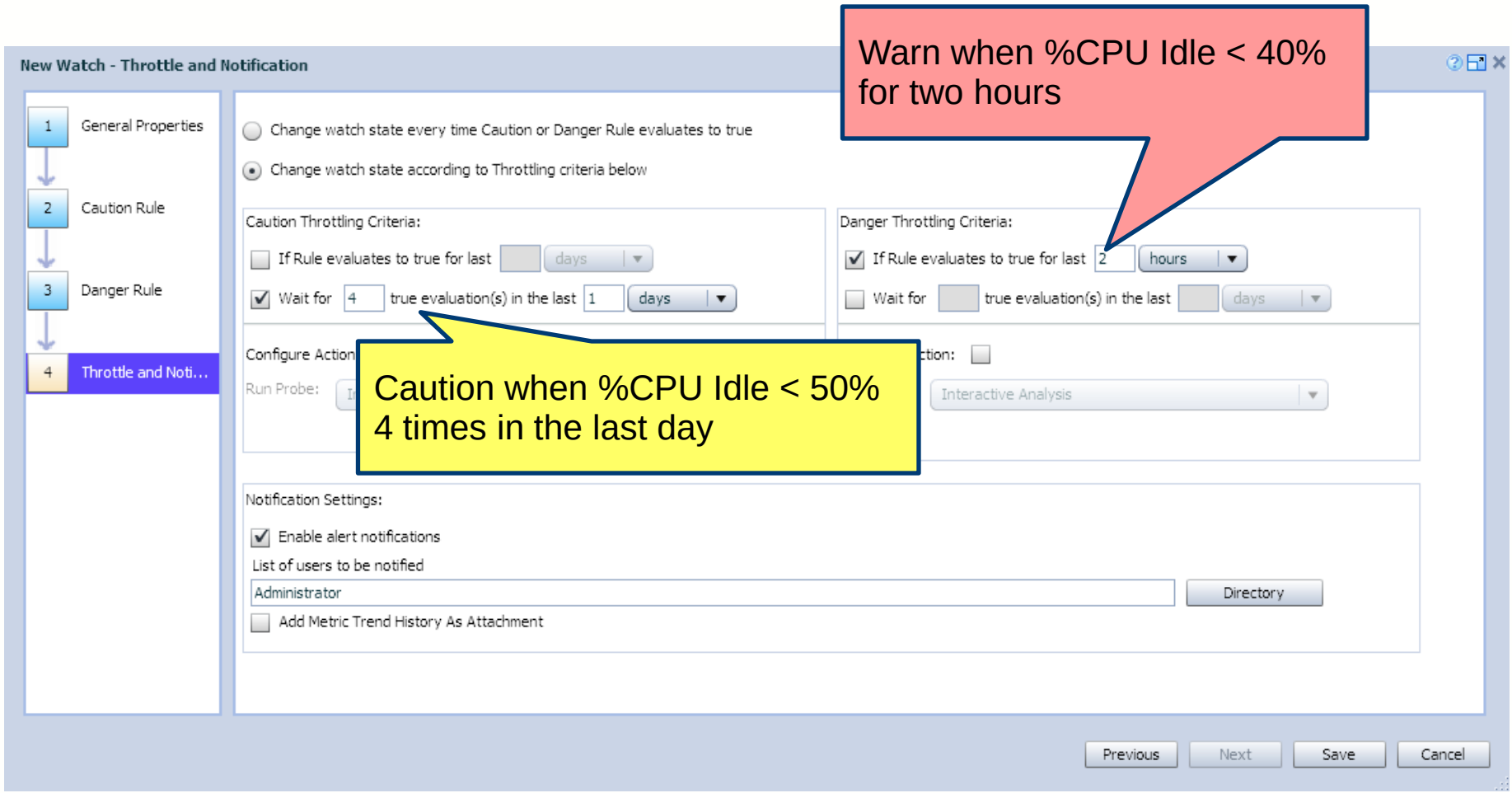
WATCHES – Adding Caution Rule(s)



WATCHES – Adding Danger Rule(s)



WATCHES – Throttle and Act



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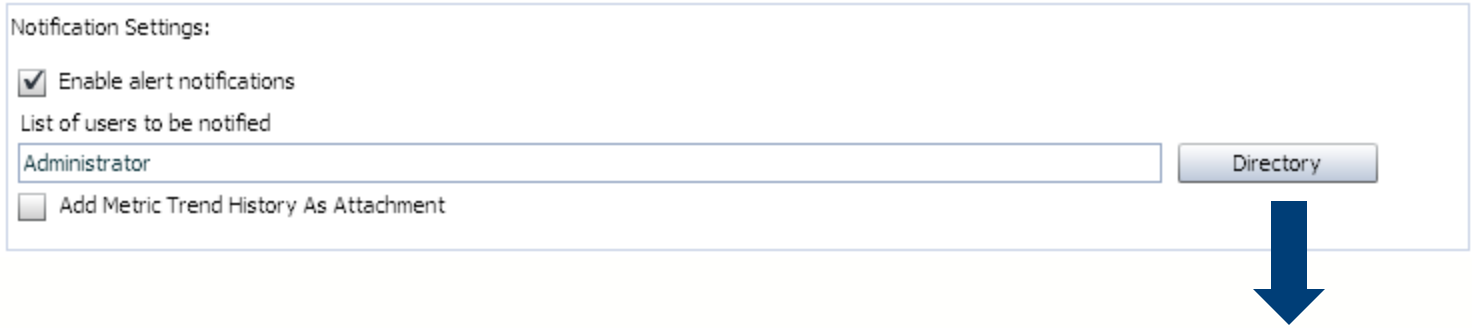
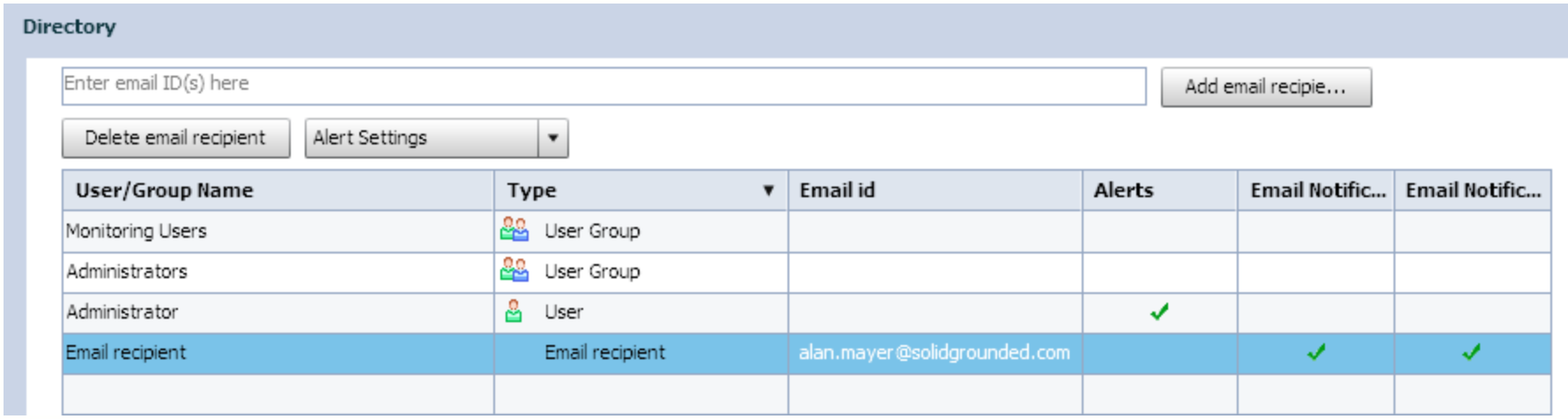
ALERTS

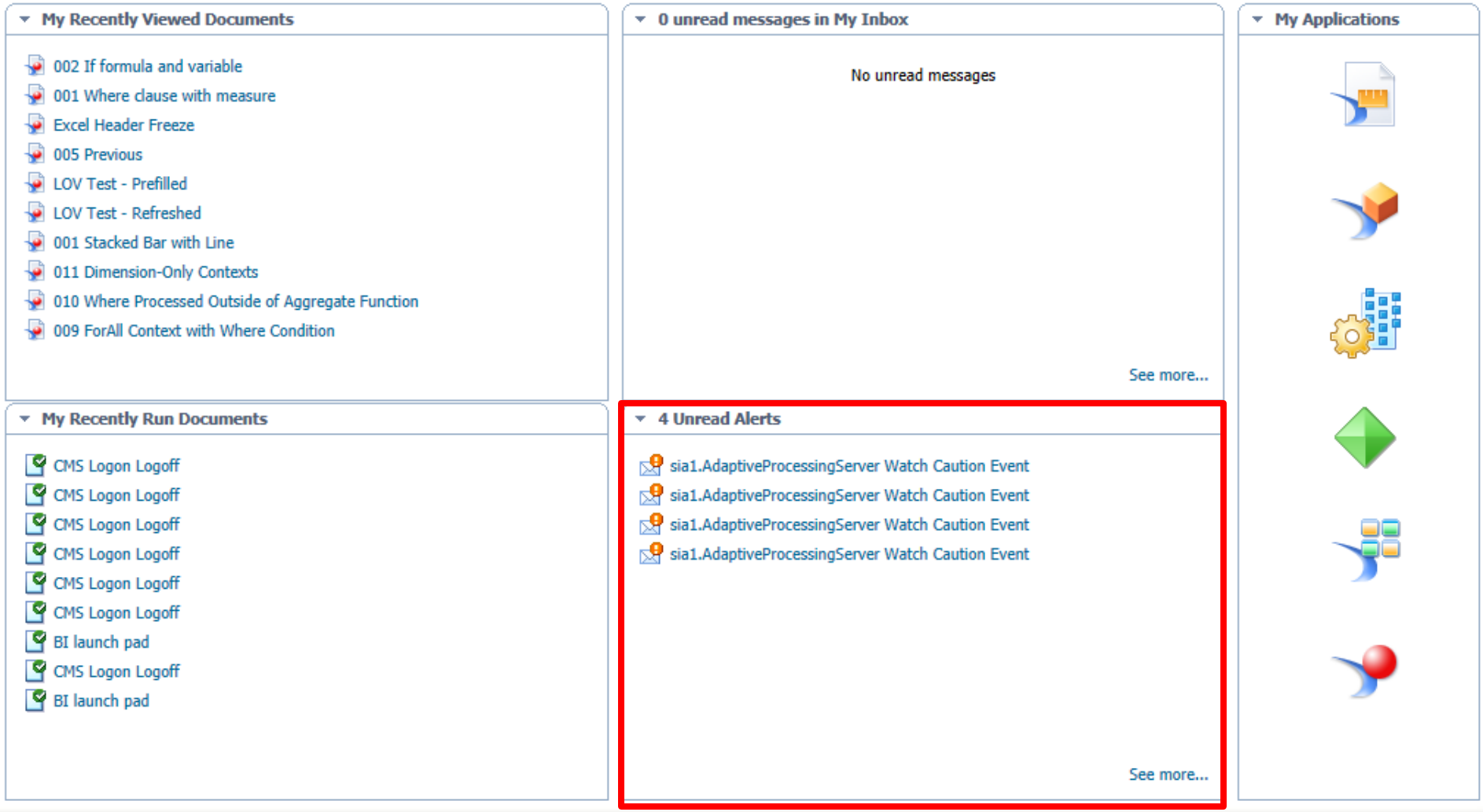
- Alerts work hand in hand with watches
  - How should a watch caution or warn you?
    - Email
    - Dashboard
    - US Postal Service
    - System meltdown

ALERTS – Adding the alert





ALERTS – Viewing an alert



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WATCHES – Strategy

- Create watches for any metrics you'd like to trend
  - Records the history of these metrics over time
- Include more than one metric per watch
  - Great way to track multiple metrics at one
  - Especially useful if those metrics are related

WATCHES – Demonstration

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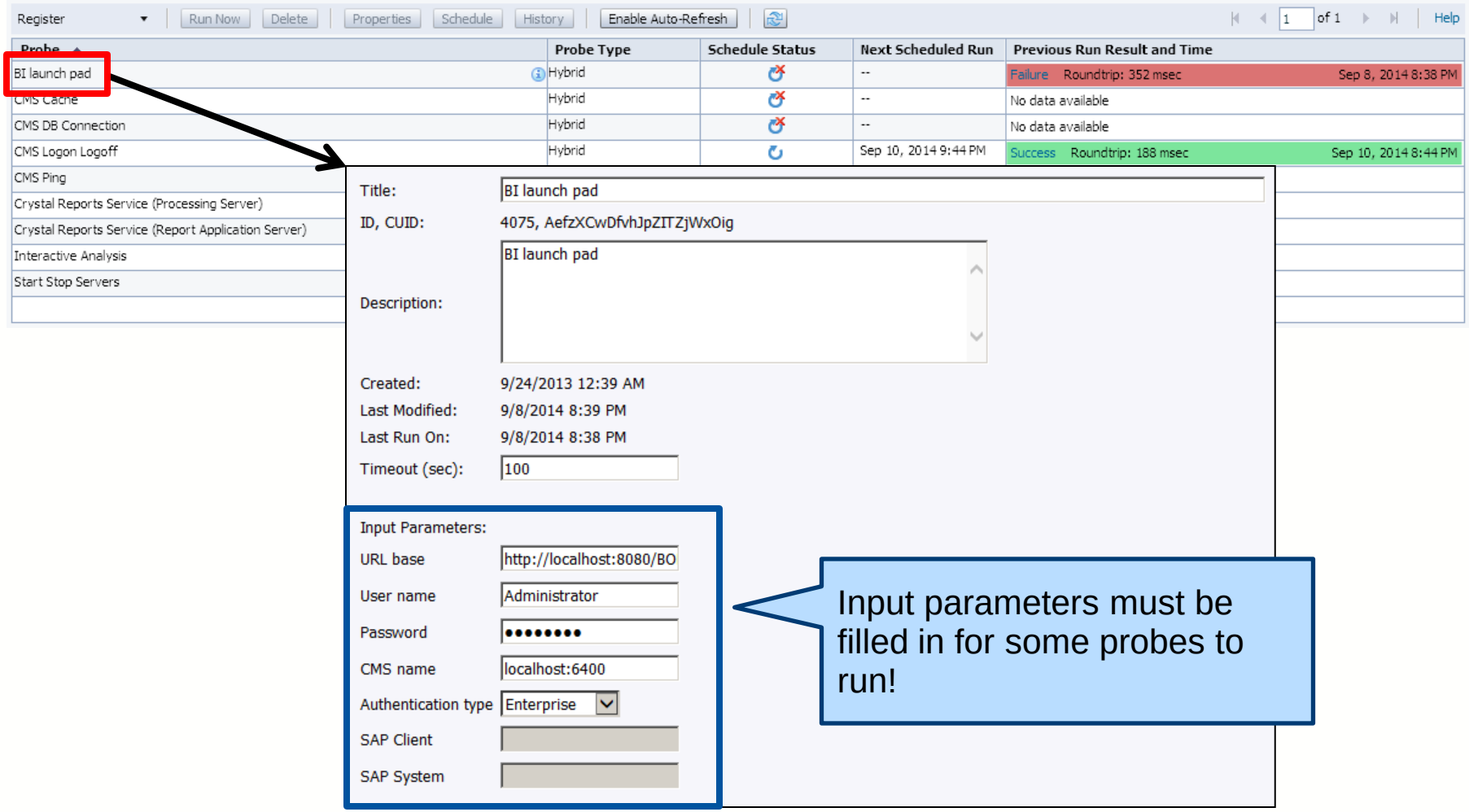
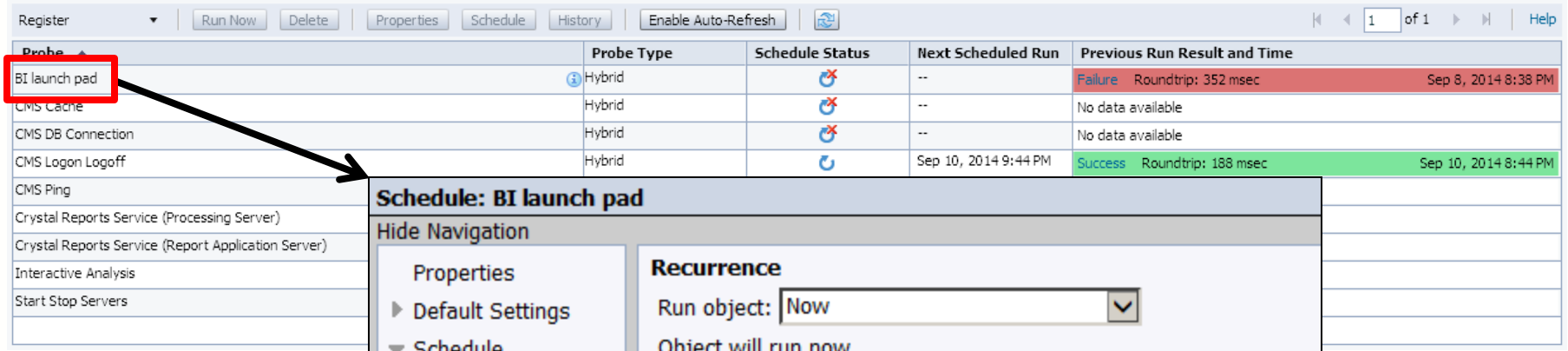
PROBES

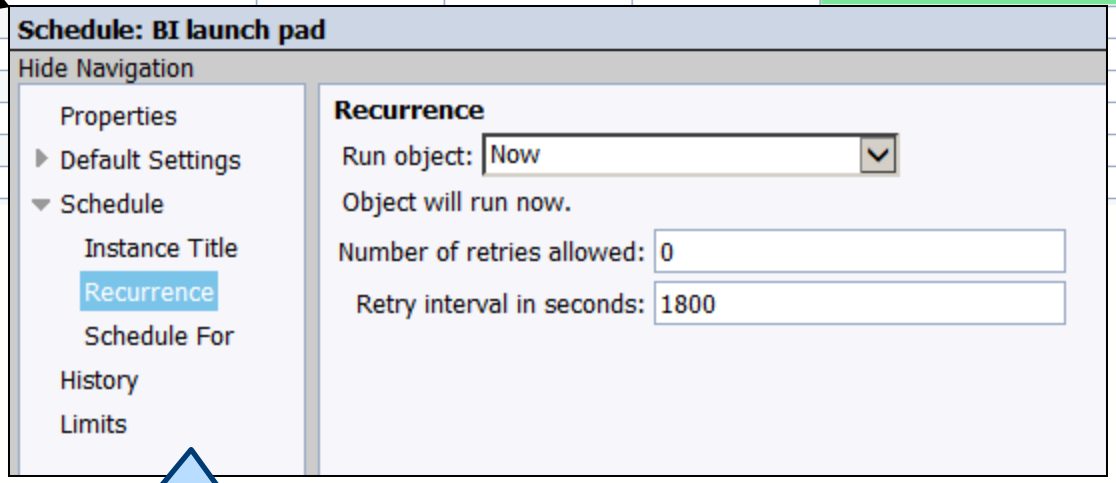
- Probes are programs that are run by the Monitoring program on a schedule
- Many actions can be performed:
  - Log in / out of BI launch pad
  - Run a report (Webi / Crystal)
  - Shut down / start up servers (careful!!)
- Why?
  - Mimics users as they use your system
  - Benchmarking common tasks
  - Assessing the overall health of a system

PROBES – Properties



PROBES – Using a probe





Use a probe by scheduling it (just like a document).

They can also be triggered by a watch.

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PROBES - Failures

- Why do certain probes fail?
  - Some take parameters
    - URL
    - Report CUID
    - User/pass
  - Check the properties for these probes
- And others …
  - Check out the BI launch pad probe
    - Then read SAP Note 2029034
      BI launch pad Probe is not working in BIP4.1

PROBES – Strategy

- Test simple key workflows
  - Users logging into your system
  - Key reports running
- Be careful how far you extend this concept …
  - Not an ideal replacement for volume testing
  - Also, there are better ways of benchmarking

PROBES – Demonstration

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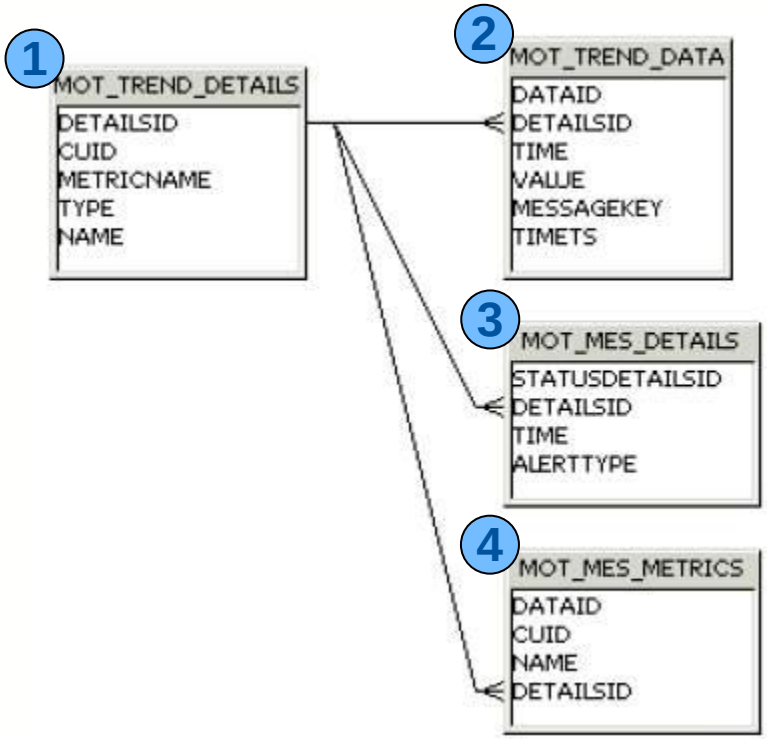
REPORTING – Tables Involved



1. **MOT_TREND_DETAILS**
   Metric definitions used by watches and probes

2. **MOT_TREND_DATA**
   Data collected for metrics used by watches and probes

3. **MOT_MES_DETAILS**
   Data collected when watch thresholds are exceeded, alerts issued

4. **MOT_MES_METRICS**
   Watch definitions

SAP KB Note **1805495** describes the columns for each table

REPORTING – Demonstration

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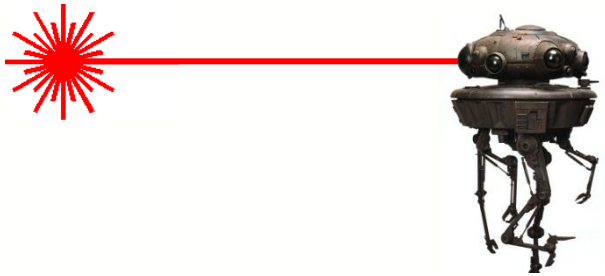

KEY LEARNING

- BI 4.x is the first BusinessObjects solution to include built-in monitoring
- This capability greatly enhances your ability to visualize, track and troubleshoot
- It is not perfect
  - Key features still missing (no appserver monitoring/metrics)
- Monitoring results can be stored and read using BusinessObjects universes
- Combine it with other tools like Wiley Interscope for a well-rounded view of your system

For More Information

- Read the BI 4.1 Administration Guide for setup and configuration
- Check out Michael Welter's blogs on monitoring:
  - http://michaelwelter.wordpress.com/2012/06/14/sap-businessobjects-monitoring-part-1/
  - http://michaelwelter.wordpress.com/2012/09/27/sap-businessobjects-monitoring-part-2/
  - http://michaelwelter.wordpress.com/2013/01/10/sap-businessobjects-monitoring-part-3/
- Look at this SAP Note for metric explanations:
  - 1772632 - Explanation of Server Monitoring Metrics for SAP BusinessObjects Business Intelligence 4.0

Follow Me

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