OpenView Smart Plug-in für Datenbanken: Technische Einblicke

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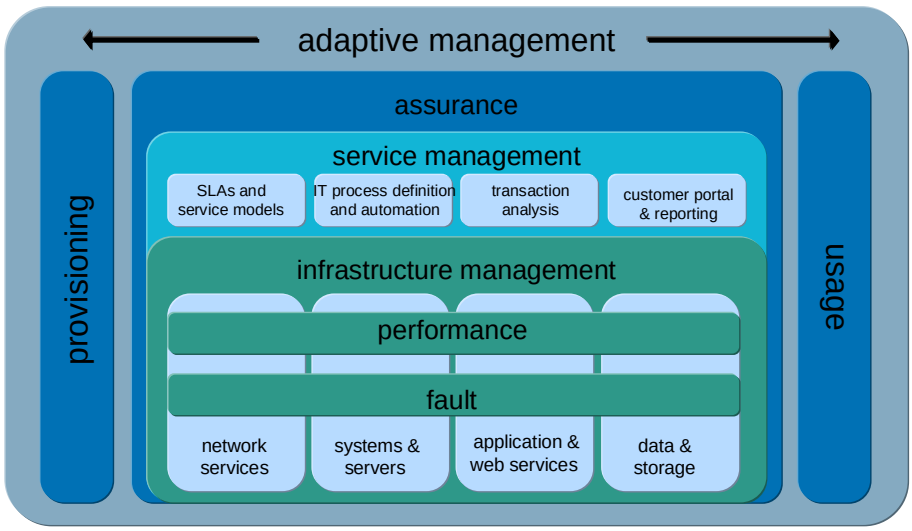
HP OpenView: building block approach



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HP OpenView Operations

centralized fault management

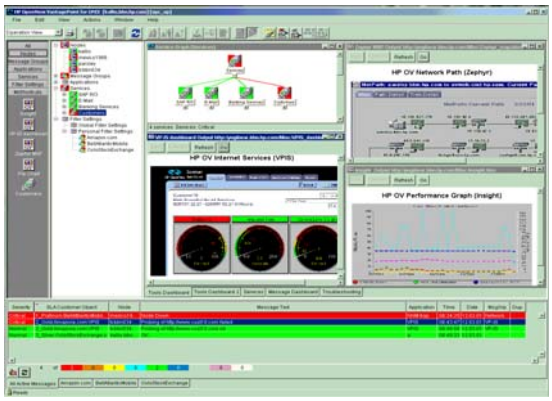
- networks, servers,applications, databases, storage
- policy driven

event monitoring

- availability, failures, warnings, thresholds, message strings

fast problem resolution

- automatic or 1-click operator-initiated actions
- extensive drill-down and problem analysis capabilities



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HP OpenView Performance

track, monitor, alarm, & report

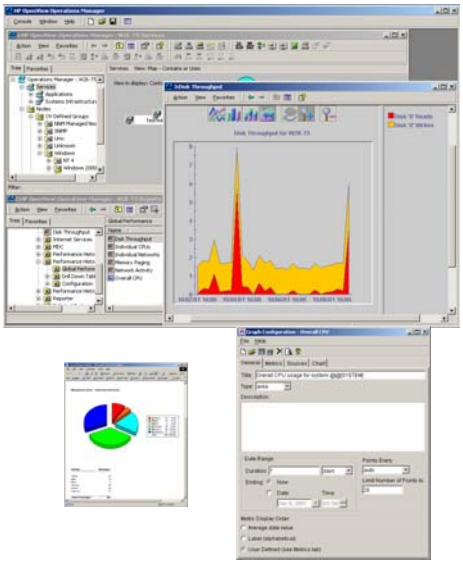
- performance of networks, servers, databases, applications, storage

intelligent alarming

- address issues as soon as performance begins to degrade
- alert on threatened service levels

performance data stored for problem analysis and resolution

- pinpoint the time and the source of the problem



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HP OpenView Service Navigator

business impact analysis

operators can instantly see

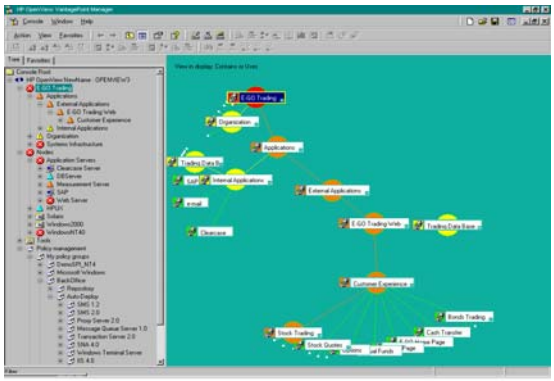
- what services are impacted by technology faults
- which problem to address first

"why is this service red?"

- show root cause maps the problem directly to it's source

"who else is affected?"

- "show impacted services" displays all services affected



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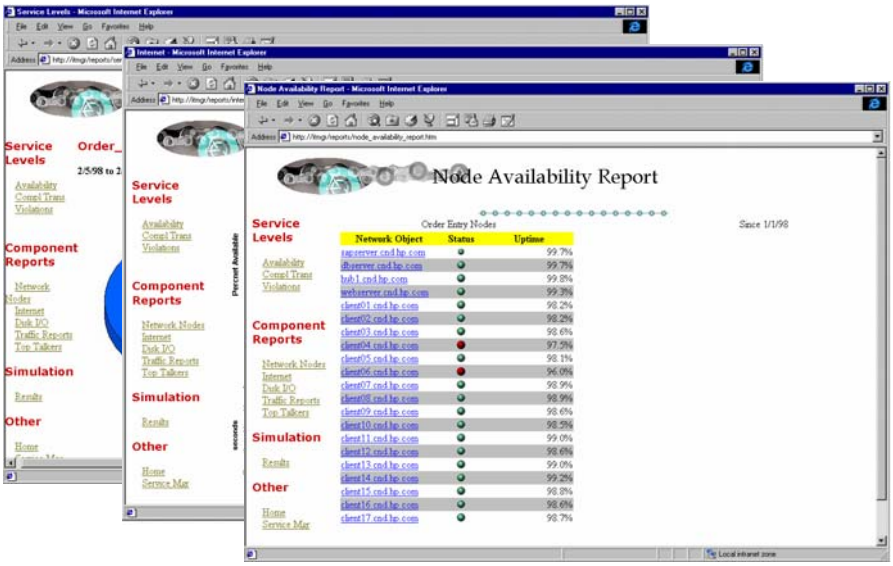
HP OpenView Reporter



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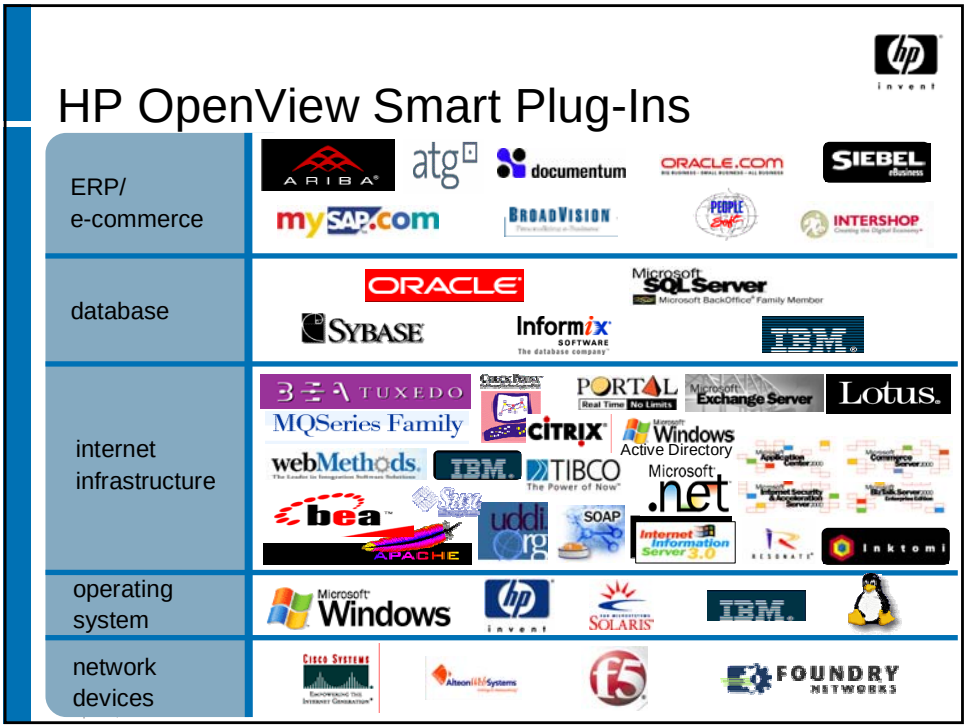
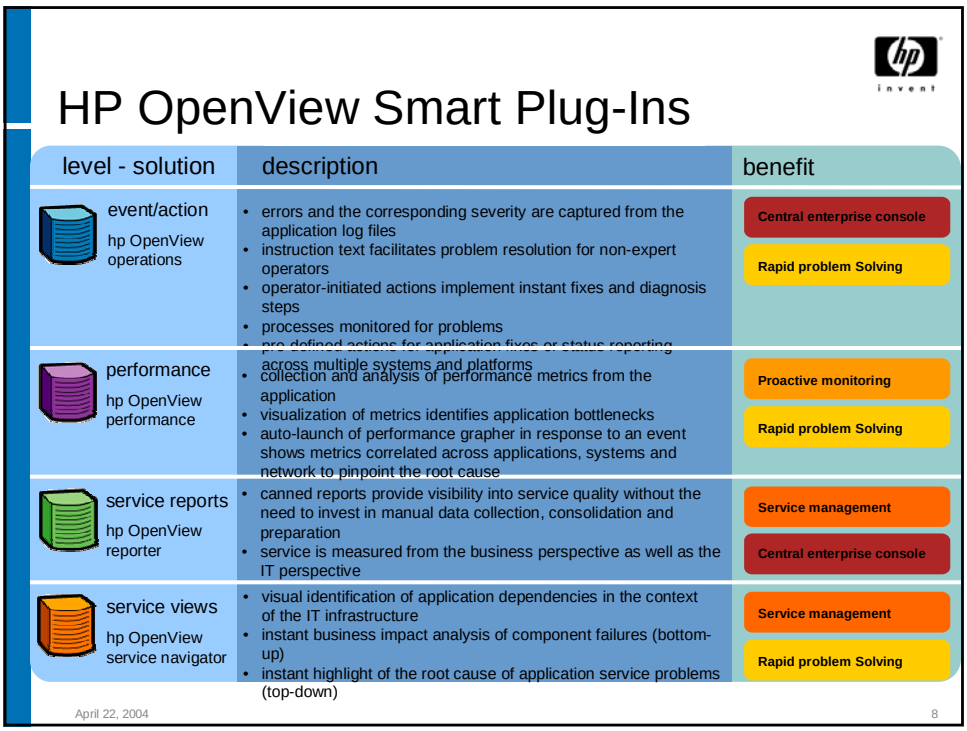

HP OpenView Smart Plug-Ins
ERP/ e-commerce
database
internet infrastructure
operating system
network devices


HP OpenView Smart Plug-Ins
level - solution
description
benefit
event/action
hp OpenView operations
errors and the corresponding severity are captured from the application log files
instruction text facilitates problem resolution for non-expert operators
operator-initiated actions implement instant fixes and diagnosis steps
processes monitored for problems
Central enterprise console
Rapid problem Solving
performance
hp OpenView performance
collection and analysis of performance metrics from the application
visualization of metrics identifies application bottlenecks
auto-launch of performance grapher in response to an event shows metrics correlated across applications, systems and network to pinpoint the root cause
Proactive monitoring
Rapid problem Solving
service reports
hp OpenView reporter
canned reports provide visibility into service quality without the need to invest in manual data collection, consolidation and preparation
service is measured from the business perspective as well as the IT perspective
Service management
Central enterprise console
service views
hp OpenView service navigator
visual identification of application dependencies in the context of the IT infrastructure
instant business impact analysis of component failures (bottom-up)
instant highlight of the root cause of application service problems (top-down)
Service management
Rapid problem Solving
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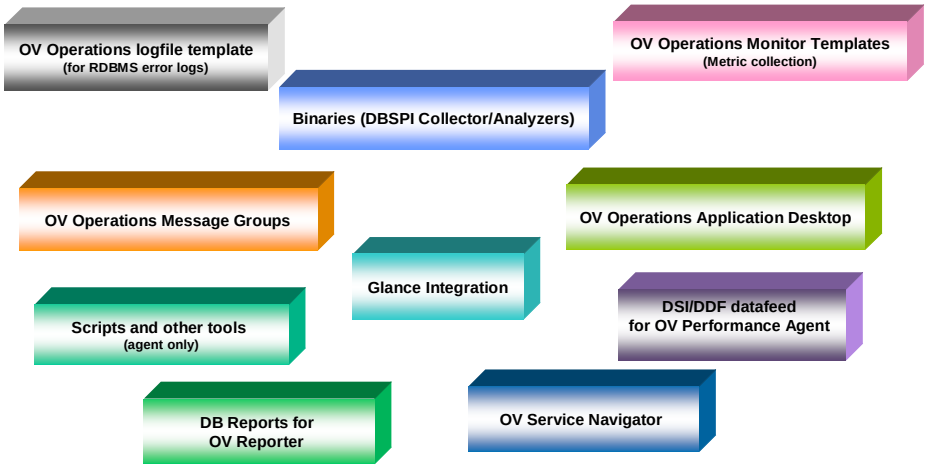
8

and now focusing on the SPI for Databases (DBSPI)

Functional Areas



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Logfile Monitoring

- Monitoring of RDBMS logfiles
- Predefined conditions

OV Operations logfile template
(for RDBMS error logs)

- Instruction text with further information on cause and potential solution
- Attach user defined OV Operations actions per condition (automatic and/or operator-initiated)

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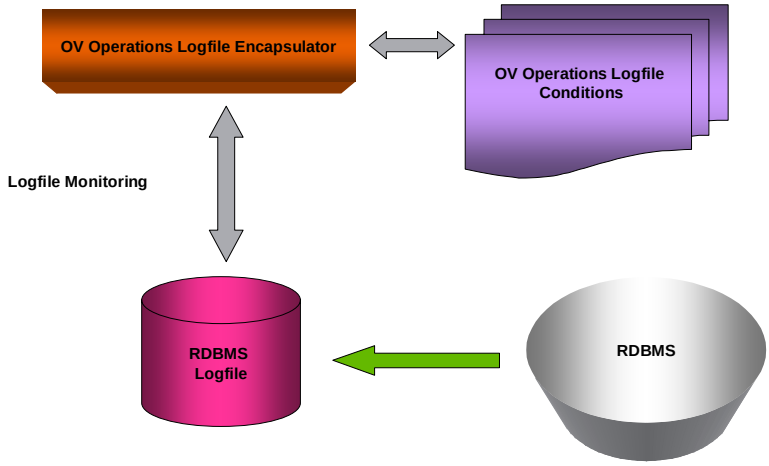
Logfile Encapsulation



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Metric Monitoring

OV Operations Monitor Templates
(Metric collection)

- Monitoring of RDBMS Metrics with OV Operations external monitors, identified by DBSPI-XXXX
- Scheduling groups for metric collection (5m, 15m, 1h, 1d) for efficient collection
- Multiple conditions per monitor template allow customization for different instances or thresholds
- Predefined actions which provide drill-down on events

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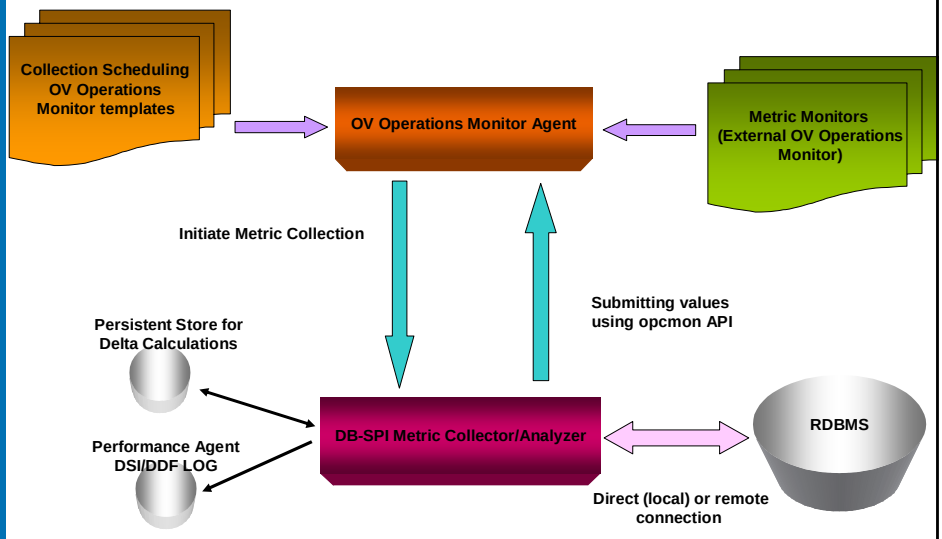
Metrics Monitoring Process



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Metric Types

Examples are for Oracle

- *Simple* - Snapshot value
  RBSegmentStatusCnt (DBSPI-0067) Number of Rollback segments not online
- *Ratio/Percentage* - Snapshot calculation
  SortInMemoryPct (DBSPI-0020) Percentage of memory sorts to total sorts (memory + disk)
- *Delta calculations* - values from previous collections
  RollbackRate (DBSPI-0054) Rate at which rollbacks are being generated (RollbackRate)
- *Rollups* - Lists entities (or # of entities) where given condition matches or threshold is matched or exceeded.
  TblSpaceFreePctCnt (DBSPI-0006) Number of table spaces where percentage of free space to total available space is inadequate
- *Complex correlation* - values calculation based on the analysis of various values and conditions (smart alarming)
  SegmentCantExtendCnt (DBSPI-0016) # of segments that cannot extend

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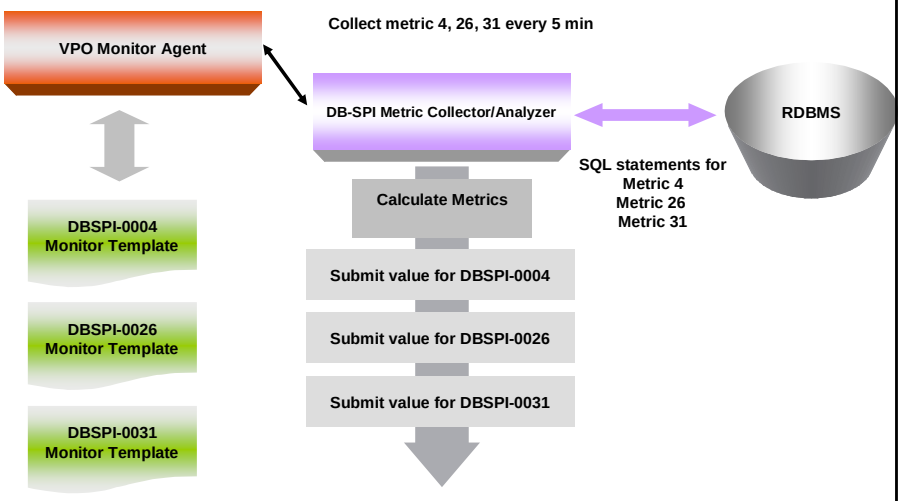
Metric Collection Overview



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Metric Collection Considerations

- Collection Scheduling Templates are grouped by the interval
- The call of the DB-SPI Collector/Analyzer is the expensive part of the collection
- Once connected to the DB the DBSPI Collector/Analyzer should collect all required metrics in one run for better performance and efficiency
- VPO Monitor agent can handle External Monitors fast and efficiently
- Collector/Analyzer submits the DB instance name for all metrics
- Thresholds are set in External Monitors, *except* for several rollup metrics
- Rollup metrics require a “command-line threshold” parameter in the collection scheduling template
- Command-line thresholds can be identified by a colon
  e.g. dbspicao -c DBSPI-Ora-05min -m **6:10** (retrieve metric DBSPI-0006 with 10% threshold)

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Integration with OV Performance

- RDBMS Metrics are forwarded into OV Performance’s Data Source Integration (DSI) Facility or (DDF)
- Collection is triggered by collection monitor template (default collection every 5min)
- Easy setup: Integrate and enable/disable via OV Operations application in desktop

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Integration with GlancePlus

Glance application reporting group for Oracle, Informix, Sybase and DBSPI processes

Adds entries to `/var/opt/perf/parm` file for Oracle,Informix and Sybase processes and the DBSPI collector process to report on

Message Groups

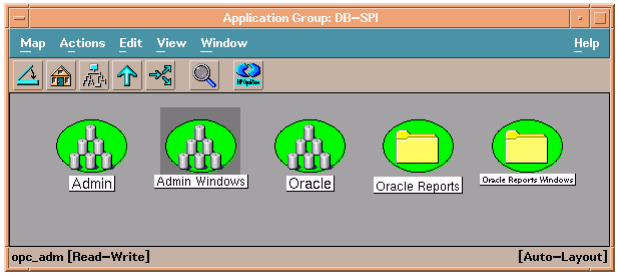
Additional OV Operations message Groups for DB-SPI events
DB-SPI Plug-In Internal Message Group: Informational and error messages
Database Message Groups
Events grouped in

	Oracle	Informix	Sybase	SOL Server
Configuration	Ora_Conf	Inf_Conf	Syb_Conf	MSS_Conf
Administration	Ora_Admin	Inf_Admin	Syb_Admin	MSS_Admin
Performance	Ora_Perf	Inf_Perf	Syb_Perf	MSS_Perf
Fault	Ora_Fault	Inf_Fault	Syb_Fault	MSS_Fault

Application Desktop

OV Operations Application Desktop

- Frequently used RDBMS applications, with DB instance selection
- DB Status/Metric Reports easily accessible from the OV Operations Application Desktop
- DB-SPI Admin Application Group for configuration tasks



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Admin Group

Overview Applications

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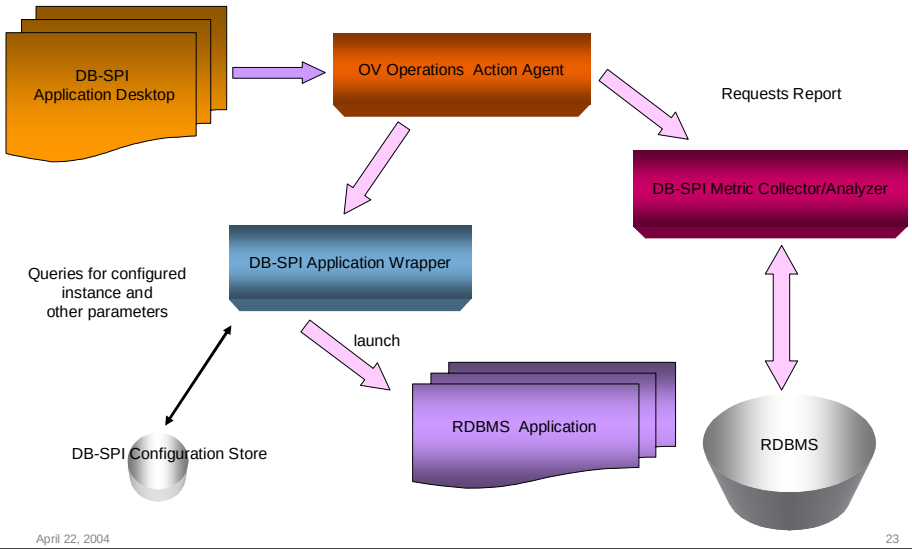
Application Desktop - overview



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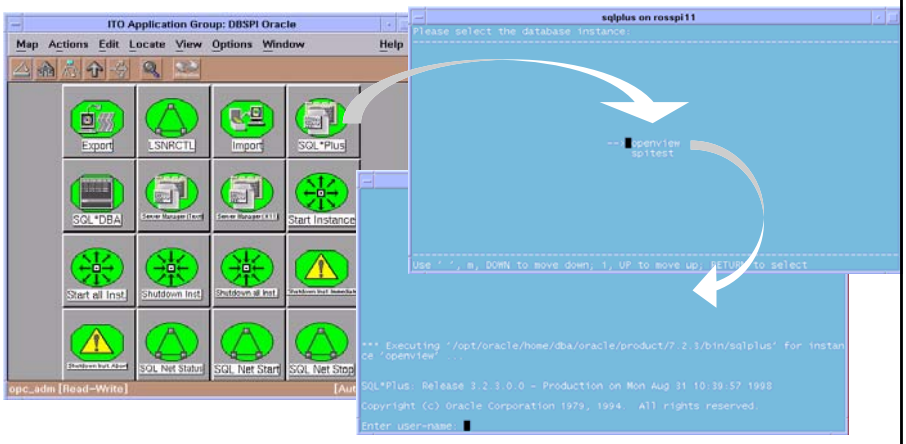
Invoking Applications

Example: Oracle's SQL*Plus



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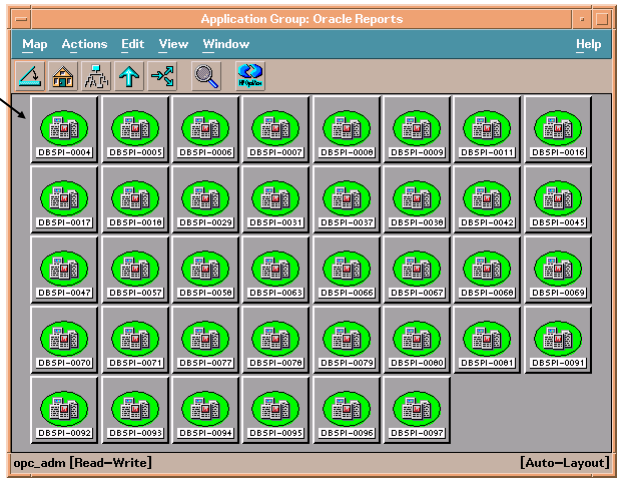
Invoking Reports
(Oracle Reports)

Identified by metric number



Binaries and Scripts

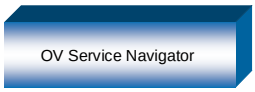
Binaries (DBSPI Collector/Analyzer)

Scripts and other tools
(agent only)

- DBSPI Collector/Analyzer pulls metrics from the database using Embedded SQL and performs calculations
  - Located in the OV Operations monitor directory on the managed node
  - Statically linked with RDBMS libraries
  - Connection to remote RDBMS instance possible*
- Scripts and tools for configuration and DB-SPI application desktop
  - Located in OV Operations `monitor`, `actions` and `cmds` directories

*Oracle, Informix, Sybase, SQL Server some restrictions apply

OV Service Navigator



- Discovers RDBMS on managed node
- Illustrates managed node and discovered RDBMS in Service Map
- Allows for ease of deployment and management of services
- Updates map nightly

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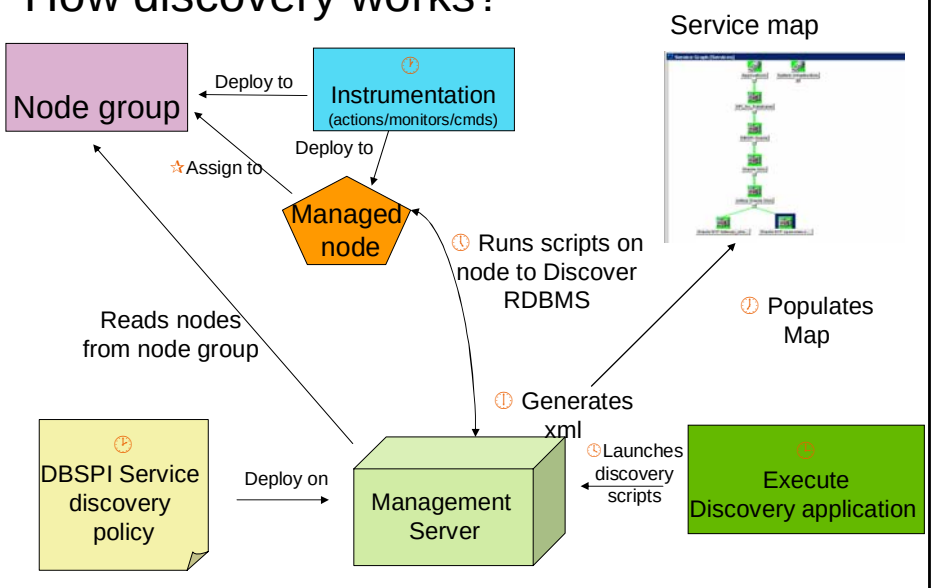
How discovery works?



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Steps for Discovery

- Assign nodes to the DBSPI node group
- Deploy instrumentations (actions/monitors/cmds) to RDBMS managed node
- Deploy Discovery Schedule Template to the management Server
- Execute Discovery tool
- Configure DBSPI connections – passwords and enabling
- Optional (if it does not discover database): Manually config RDBMS connection
  - Rerun tool to discover new connections
- Deploy Templates

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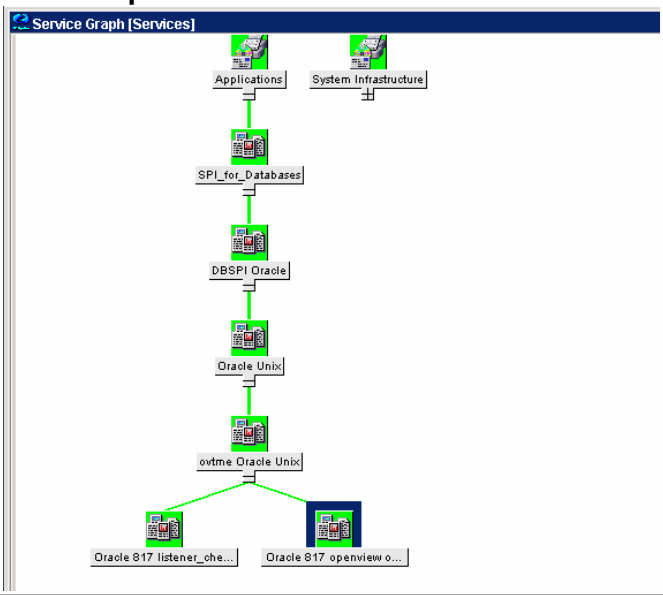
Service Map



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OpenView Reporter

DB Reports for OV Reporter

- Predefined database Reports for Oracle, Informix, Sybase and SQL Server
- Installed on the OV Reporter Windows workstation
- OV Reporter reports are accessible via a URL in a web browser
- Reports are based on the Crystal Reporter engine

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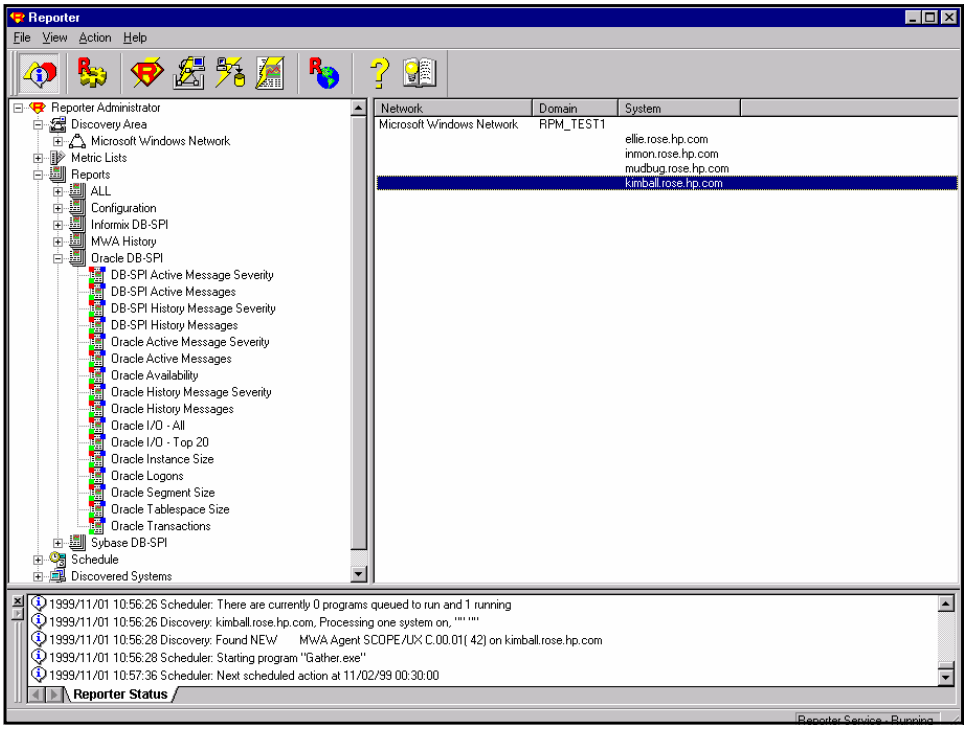

Reporter Metrics & Reports

Oracle Reports
Availability, Instance Size, Tablespace, Segment Size, Workload I/O, Logons, Transactions

Informix Reports
Availability, Instance Size, DBSpace Size, Table Size,Workload I/O, Sessions, Transactions

Sybase Reports
Availability, Database Size, Table Size, Virtual Size, Workload I/O, Sessions, Transactions

SQL Server Reports
Availability, Database Size, Table Size, Virtual Device Size, Workload I/O, Sessions, Transactions

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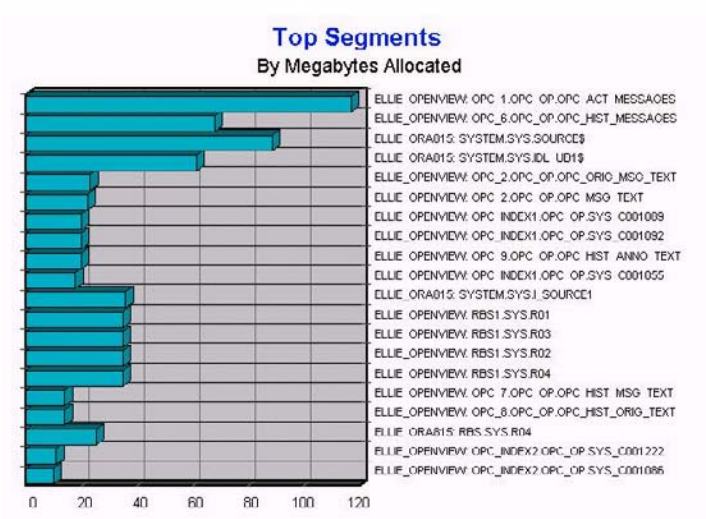
Sample Report
Oracle - Top Segments



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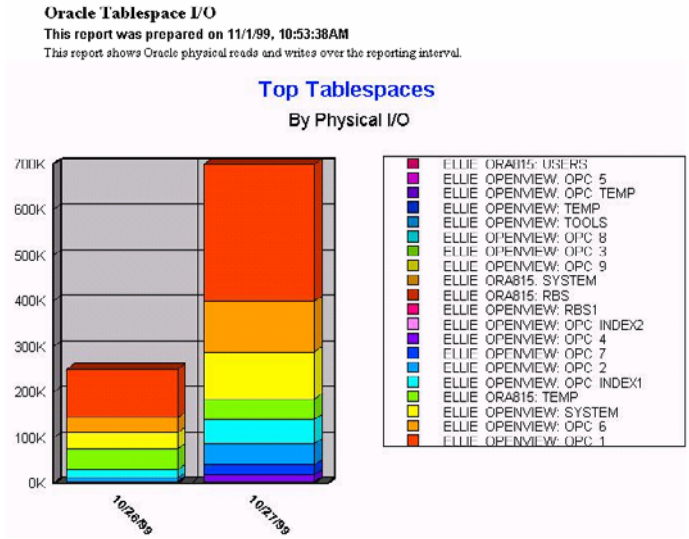
Sample Report
Oracle - Physical I/O



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customization options of the DBSPI

Levels of Customization

- Out-of-the box with e.g. "*DBSPI-Oracle: Quick Start*"
- Change collection interval
- Change thresholds (globally for all instances)
- Change thresholds (per instance)
- Enable/Disable metrics
- Move metrics to different collection intervals
- Create new collection groups and intervals
- Create and implement filters
- Create custom copies of the Metric Monitors (TAG)
- Local Thresholds to override OVO templates
- User Defined Metrics (UDM)

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Out-of-the-box Customization

- Assign the group "*DBSPI-<RDBMS>: Quick Start*"
  - Contains a factory selected set of metrics
  - Predefined thresholds for a typical installation
- Distribute to node(s)

Jumpstart for DB management

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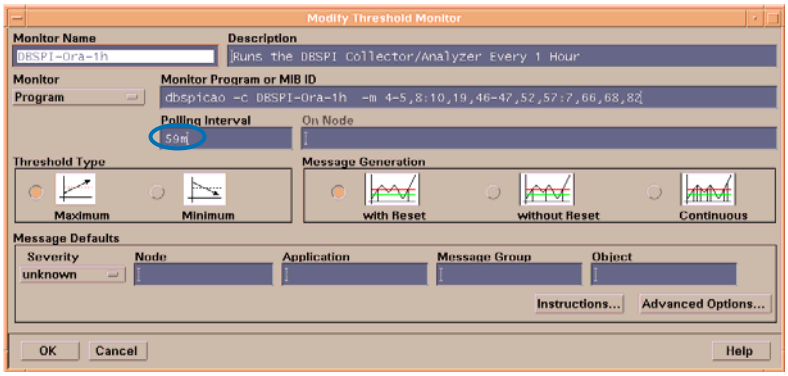
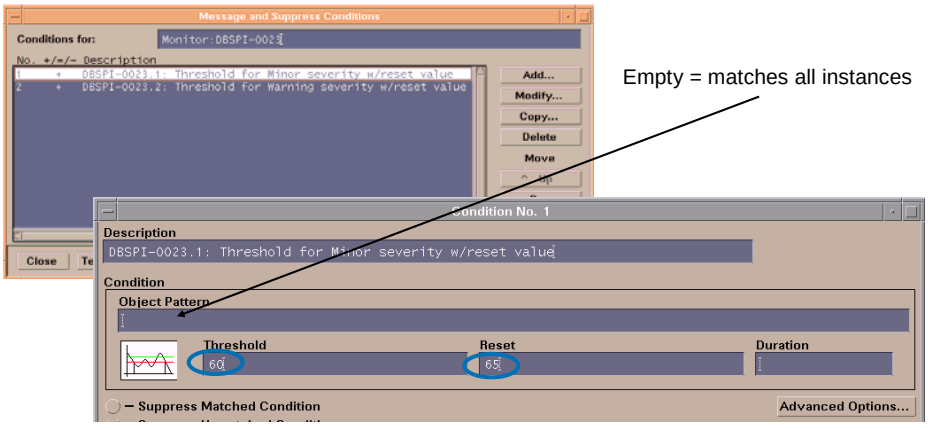
Change Collection Interval

Change collection interval in one interval group (globally)



Change Threshold Globally

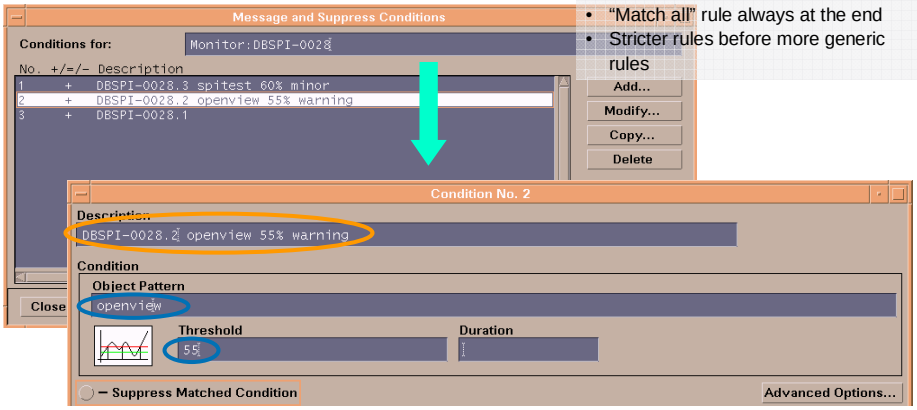
Globally changes the threshold for all instances



Change Threshold - Specific Instance

Change threshold for specific instances

- Processing order: Top down
- "Match all" rule always at the end
- Stricter rules before more generic rules



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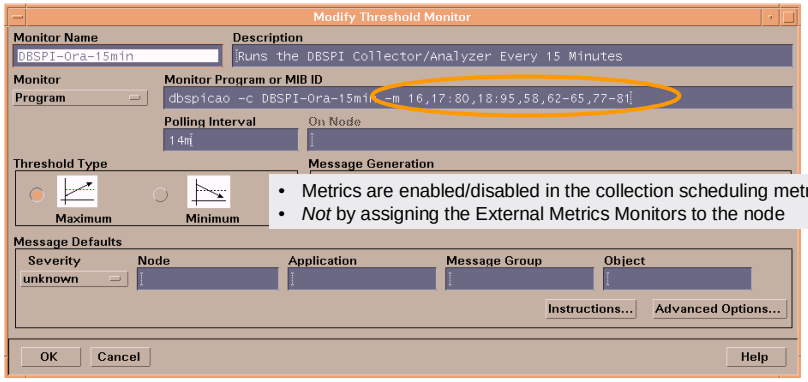
Enabling/Disabling Metrics

- Move Metrics to different collection intervals



- Metrics are enabled/disabled in the collection scheduling metric
- *Not* by assigning the External Metrics Monitors to the node

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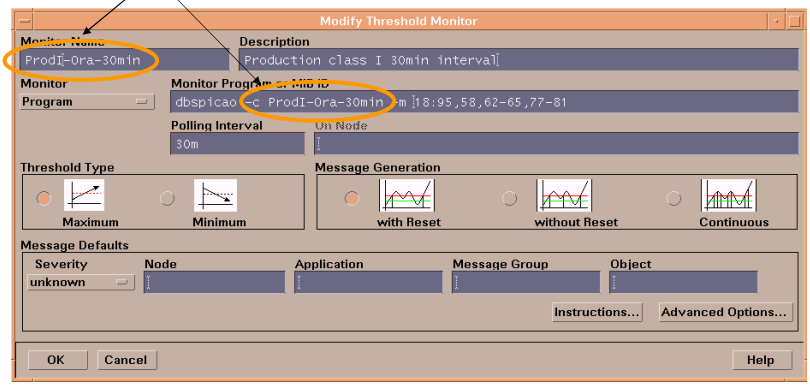
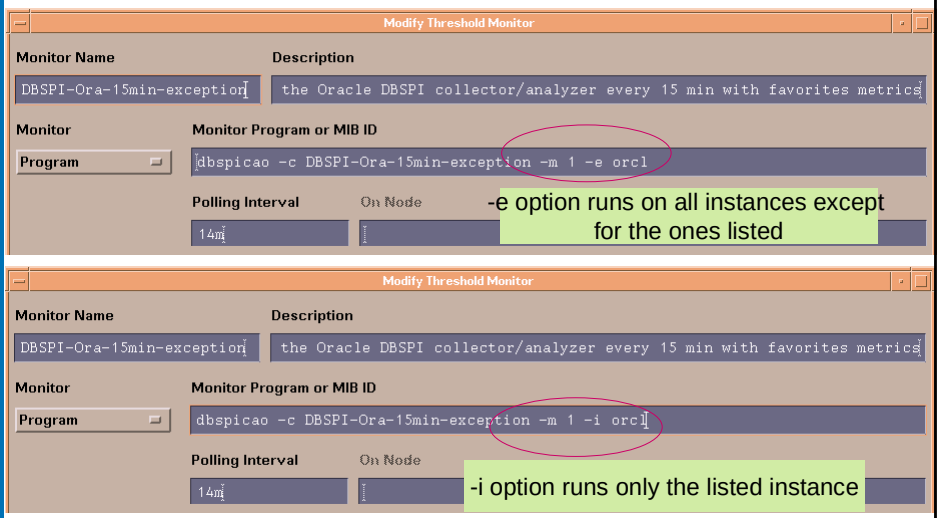
Custom Grouping

Create new, additional and custom collection groups

Template identifier has to match the "-c" Collector/Analyzer command line parameter



Instance Specific Metric Collection



Implementing Filters

Oracle and Informix only

- Filters are used to prevent unnecessary alarms or messages
  - e.g. a Read-Only tablespace that is always near 100% full
- Filters are simply appending a “where clause” to the SQL that the Collector/Analyzer uses
- Filter specification is located in the configuration file
- Must specify appropriate column and SQL syntax
- Allows =, LIKE, IN, BETWEEN, NOT, < >
- Filter syntax is checked when the configuration file is saved via DBSPI Config

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Example Configuration File with Filters

```
#
# Example
#
SYNTAX_VERSION 2
ORACLE
   HOME "/opt/oracle/7.3.2"
     DATABASE sapr3 CONNECT "dbspi/password"
     FILTER 4 "username NOT IN ('Mark', 'Angie')"
     FILTER 6 "tablespace_name NOT LIKE 'SAP1001%' and tablespace_name NOT BETWEEN 'TS001' and 'TS010'"
     FILTER 67 "segment_name < > 'R0'"

INFORMIX
   HOME "/opt/informix/7.23"
     SERVER "sales"
       ONCONFIG "onconfig.723"
       CONNECT "informix/password"
       SQLHOSTS "/opt/informix/7.23/etc/sqlhosts"
       FILTER 7 "username NOT IN ('Mark', 'Angie')'
```

Additional details on filters like what column may be used with each metric can be found in the SMART Plug-In User’s Guide

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TAG Feature
Advanced Customization

- Metrics Monitor Templates have to have a unique identifier
  e.g. DBSPI-0020 - Filtering is done on condition level
- Enterprise customers and large installations require custom copies of the VPO templates
  - Scalability
  - Ownership (VP Operation Template ownership)
  - Naming convention

TAG Feature allows custom copies of the Metric Monitor templates

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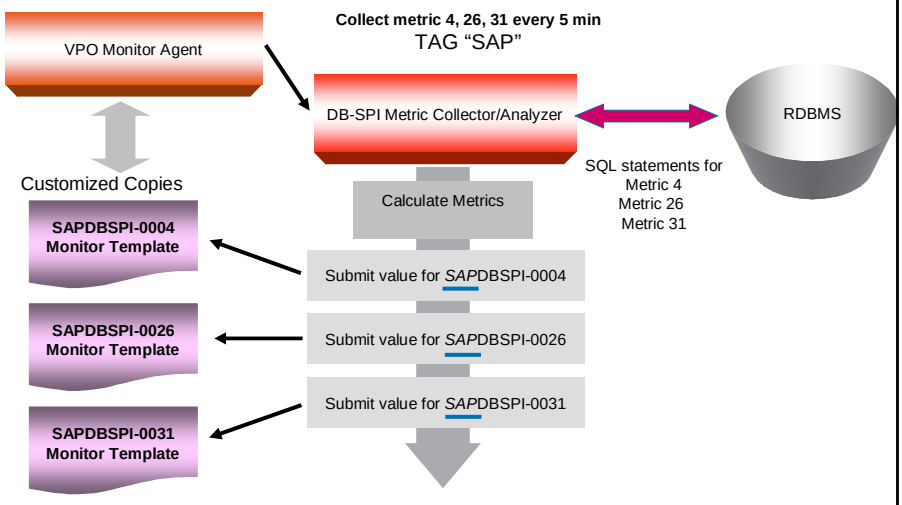
TAG Feature Overview



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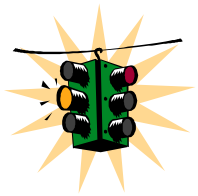
Local Thresholds to Override OVO Templates

- Local Thresholds used to override OVO thresholds
- Used to generate fewer alarms
- Prevent unwanted messages from a specific system/database



Local Thresholds - Steps

- Create a ASCII text configuration file (override.cfg)
- Define specific threshold for any metric collected on the local system
- Save it on the managed node

Overriding Specific Thresholds

override.cfg

```
MONITOR "DBSPI-0217"
     MAXTHRESHOLD
     MSGCONDITION
          CONDITION
               OBJECT
  "ora217:segmentA"
               THRESHOLD 85
          CONDITION
               OBJECT
  "ora217:segmentB"
               THRESHOLD 90


MONITOR "DBSPI-0022"
```

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Overriding All Thresholds

1. Open each OVO monitor template and reset the threshold to an opposite extreme value
2. Using your text editor, open an empty file and create an entry for every metric collected on the system
3. Save the file as override.cfg in the appropriate directory on the managed node

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User Defined Metrics

- User Defined Metrics (UDM) allow the creation of custom queries to retrieve specific values or perform custom calculations
- UDMs are configured centrally on the VP Operations Management Server
- UDM Metric Numbering starts at x700
- UDM Config Application is available in the Application Desktop
- Each new custom UDM is required to be
  - Created with the UDM Config Application
  - Optionally: use the UDM <RDBMS> SP Create application to create
    stored procedures used by User Defined Metrics
  - Collected by directing Collector/Analyzer to retrieve it
  - Retrieved by creating a Metric Monitor template for each new UDM

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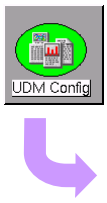
User Defined Metrics: Required Steps (1)

Oracle Example



UDM Config

```
# Format of the file:
# ORACLE
#   METRIC 07XX
#     COLLECT <OPTIONS> "<sqlcode>"
#     REPORT 1 "<sqlcode>"
#     REPORT 2 "<sqlcode>"
#   METRIC 07YY
#     ...
#
# where <OPTIONS> are MW ITO RATE, e.g. COLLECT ITO MW RATE "<sqlcode>"
#
# Example:
#
# ORACLE
#   METRIC 0700
#     COLLECT ITO MW "
#       declare
#         tmp number;
#       begin
#         :dbspi_error := '<no error>';
#         tmp := :dbspi_threshold;
#         :dbspi_value := 2*tmp;
#       end;
#     "
#
```

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User Defined Metrics: Required Steps (2)

Oracle Example

UDM Example code for Metric 713

```
declare
        block_gets number;
        consistent_gets number;
        physical_reads number;
      begin
        :dbspi_error := '<no error>';
        select value into block_gets from v$sysstat
               where name = 'db block gets';
        select value into consistent_gets from v$sysstat
               where name = 'consistent gets';
        select value into physical_reads from v$sysstat
               where name = 'physical reads';
        :dbspi_value := (((block_gets + consistent_gets) - physical_reads )/
                         (block_gets + consistent_gets)) * 100;

       exception
         when OTHERS then :dbspi_value := -1;
       end;
```

Other UDM keyword: dbsspi_threshold for the Command line threshold (not used in above example)

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User Defined Metrics: Required Steps (3)

Oracle Example

- Add/Create a new Collector Monitor Template or UDM 713 to any existing interval group (e.g. dbspicao -c DBSPI-Ora-UDM-15min -m 713)
- Create a new Metric Monitor Template DBSPI-0713 and include the appropriate conditions
- Examples for both templates can be found in the Template Group DBSPI-Oracle: UDM Templates
- Be sure that “Monitors” are re-distributed to the agent nodes (UDM Config file)
- Be sure that both new Monitor Templates are assigned and distributed
- UDM metrics are available in VP Performance with an additional data source, identified by ORAUDM_<Instancename>
- DSIDDF-UDM datafeed has to be enabled in the DBSPI Admin Application group

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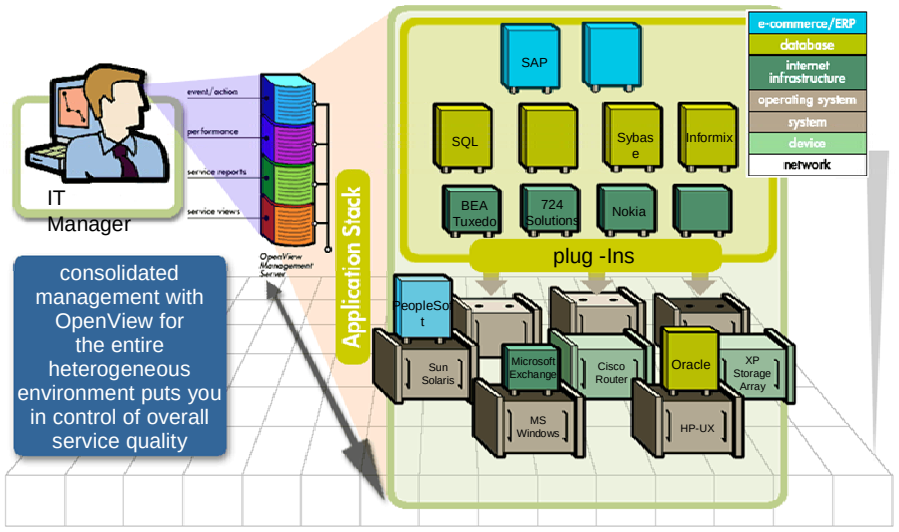
Management of applications in a consistent way with HP OpenView



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Looking for more information?

Please check the OpenView website at:

http://openview.hp.com

… or just visit me at the booth!

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