Hewlett Packard Enterprise

Managing thousands of nodes using OMi Monitoring Automation

Contents

Purpose

This white paper describes how to manage more than 15 000 nodes – the amount of nodes a single OMi deployment can handle – using multiple OMi deployments and a central OMi Manager-of-Manager (MoM) system that acts as central configuration manager. It lists the hardware requirements and necessary configuration steps.

Overview

Currently, a single OMi deployment can monitor up to 15 000 nodes using OMi Monitoring Automation (according to the OMi v10 Product Performance and Sizing Guide Technical White Paper). To manage more nodes with Monitoring Automation, additional OMi deployments can be used.
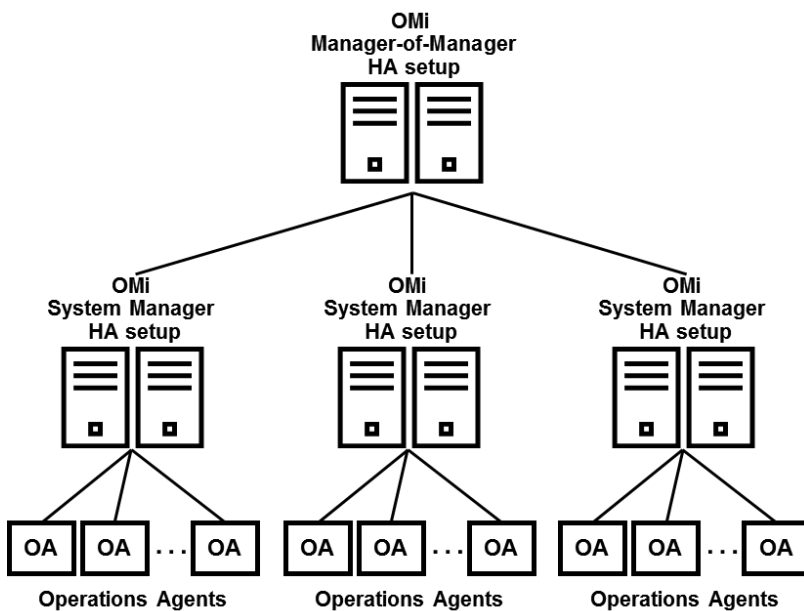
In such a setup, the MoM system is used as the central configuration manager, where all policies, aspects, and managements templates are stored and where the overall RTSM model is maintained. The MoM system provides the single pane of glass for the complete environment.The majority of solution users connect to the MoM system only.

Each System Manager contains a subset of the nodes and CIs that exist on the MoM server.

To avoid that policy, aspect or management templates that are used on the various OMi systems get out of sync, new policies, aspects or managements templates are developed on the MoM system (or on a test system and then uploaded to the MoM system) and are distributed automatically to the OMi System Managers.

On the OMi System Managers these artifacts can then be used in auto-assignment rules or manual assignments.

If new artifact versions are distributed after the initial assignment, a manual task on each System Manager is required to update existing assignments so that the new artifact versions are used.

In this setup, OMi System Managers also take over the following functions for the nodes they are responsible for:

• Executing agent health checks

• Acting as target manager for events – System Managers will process events using duplicate suppression, event storm detection, event suppression etc. and then forward remaining events to the MoM system.

Architecture & Hardware recommendations

General recommendations for all OMi systems
• Low network latency (between OMi and Database)

Database
• 300GB-1TB (depends on the number of CIs)

• IO: High Transfer Rate, Fast transaction rate

Disk space:
Local file storage needs:

• Logfiles: 2GB-10GB

• Resolver cache: ~25GB

• Overall: 50GB

Memory
• WDE: 4GB

• JBoss: 4GB

• opr-backend: 4GB

OMi MoM System
Architecture recommendation
• Use 2x OMi single server (HA) deployment or distributed deployment,
  #GWs depends on user/event load, follow recommendations of <u>OMi Performance & Sizing Guide</u>

• Integrate MoM with Incident Management Systems (Service Anywhere, Service Manager, Remedy, Xmatters, etc.),
  Operations Orchestration, Knowledge Base Systems, Operations Bridge Reporter etc. as needed

• Integrate with CMS (UCMDB, etc.) if required

Hardware recommendation
CPU
• More than 8 CPUs >2.4 GHz

Memory
• RTSM: 15 GB + 3GB/5.000 agents on top of 15.000 agents
  e.g. use 24 GB for 30.000 agents

OMi System Managers
Architecture recommendation
• Use 2x OMi single server + 1 additional GW deployment (3xGW, 2xDPS for HA)

  – Use 2 Gateways as each GW can handle up to 7500 nodes

  – A third Gateway is recommended to avoid delays in event and distribution job processing if one of the Gateways is
    stopped.

• Integrate with Global ID Generator (OMi MoM or UCMDB)

• Integrate with 3rd party domain managers as needed (APM, SiteScope, NNMi, OpcCx)

Hardware recommendation
CPU
• 4-8 CPUs > 2.4GHz

Memory
• RTSM: 15 GB

Required Software

OMi 10.12 or later

Setup and Configuration

General

- Time must be in sync (between database and OMi instances).

- All events will be consolidated on the MoM.

- No more than 3,000,000 events should be in each OMi database. Event retention time should be adapted accordingly on OMi MoM.

- Operators work on the MoM; there is no need to synchronize MyWorkspace pages to System Managers. Only a subset of users/user groups needs to be set up with appropriate tuning permissions on the System Managers.

- Assignments are done on System Managers only;
  For initial assignment or tuning, users have to log into the corresponding System Manager UI (LW-SSO between MoM and System Managers can be used to avoid a second login).

  - Recommendation: Use automatic assignment rules on the System Managers and tune resulting assignments as necessary, as manual assignments cannot be automatically updated to use the latest aspect & management template versions. If manual assignments are used, then they can be updated manually to use the latest artifact versions.

- MoM system needs to be able to access all agents (for remote tool execution and for performance graphing);
  this requires a flexible management policy on each agent (OMi MoM must be at least ActionAllowManager) and appropriate routing/firewall rules.

- Global ID Generator should the UCMDB (if available) or the OMi MoM.

- Heartbeat interval on System Managers should be set taking the event load on that server into account.

- When installing new Management Packs or new MP versions, these should be installed on the System Manager systems first (MP artifacts should not be distributed using the MoM >System Manager distribution).

- Load Balancer for System Manager system needs to be able to process up to 15 000 connections (as after network outages all 15 000 nodes will try to send data to the System Manager)

CI Synchronization

To synchronize CIs between all systems, HPE recommends to use a Data Flow Probe on each System Manager and a Date Flow Probe on the MoM System.

Each System Manager should push its (discovered) CIs to the MoM server at regular intervals, otherwise the MoM server cannot map received events and display the correct health status. See the OMi RTSM Best Practices Manual for details. This document also explains why a push integration is recommended instead of using a population job.

HPE recommends to use an interval of 5 mins for push jobs from System Managers to the MoM server.

In case modeled CIs such as business application CIs or business service CI should be used in assignments on the System Managers, these need to be pushed from the MoM server to the corresponding System Managers. The relationship between the System Manager CI and operations agent CIs can be used in Sync TQLs to make sure that only those CIs are synced to the System Manager that are using CIs/nodes for which the System Manager is responsible for.

Note: When setting up the MoM Connected Server on each System Manager, do not select the "forward topology" option, as this could create CIs on the MoM server without synchronizing back the global ID.

Recommended Configuration Settings

Create a nodeinfo policy with the following content and deploy it to all operations agent nodes.

```
[bbc.cp]
REQUEST_TIMEOUT=600
SSL_HANDSHAKE_TIMEOUTSOCKETS_PER_SOCKETSET=300000

[eaagt]
OPC_MSGA_PING_SERVER_INTERVAL=600
```

On all OMi servers (Gateway and processing servers) set these configuration settings:

```
ovconfchg -ns bbc.http -set AUTO_CONNECTION_CLOSE_INTERVAL 60

ovconfchg -ns bbc.http -set CONNECTION_TIMEOUT 30

ovconfchg -ns bbc.http -set MAX_CONNECTIONS 0

ovconfchg -ns bbc.http -set MAX_SOCKETSET_THREADS 3

ovconfchg -ns bbc.http -set SSL_HANDSHAKE_TIMEOUTSOCKETS_PER_SOCKETSET  300000

ovconfchg -ns xpl.net -set SOCKETS_PER_SOCKETSET 10

ovconfchg -ns xpl.net -set SocketPoll  TRUE


ovconfchg -ovrg server -ns bbc.http -set AUTO_CONNECTION_CLOSE_INTERVAL 60

ovconfchg -ovrg server -ns bbc.http -set CONNECTION_TIMEOUT 30

ovconfchg -ovrg server -ns bbc.http -set MAX_CONNECTIONS 0

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ovconfchg -ovrg server -ns xpl.net -set SOCKETS_PER_SOCKETSET 10

ovconfchg -ovrg server -ns xpl.net -set SocketPoll  TRUE
```

Monitoring Automation Configuration Synchronization

To avoid that policy, aspect, or management templates that are used on the various OMi systems get out of sync, we recommend that such artifacts are developed on a test system and then uploaded to the MoM system, from where the artifacts are then distributed automatically to the OMi System Managers.

Configuration/deployment sequence

1. Choose the configuration folders that should be distributed to System Managers
   Note: all referenced policy templates and instrumentation files will be distributed as well

2. Create a Content Pack referencing these configuration folders.
   The following figure shows an example content pack that references various Infrastructure Management and Database Management configuration folders:

Figure 1: Content pack summary page

Note
Only Configuration Folders are included in this content pack definition. All other artifacts are referenced.

3. Create a script that exports this content pack from the OMi MoM, imports it on all System Managers and updates the automatic assignment rules.

   – Export the distribution content pack using the ContentManager CLI:
   ```
   ContentManager -server <OMi MoM LB/Virtual server> -ssl
   -username <user with content manager permissions on OMi MoM> -password <password>
   -export <your CP name as shown in CP details> -output <filename e.g. CPForDistrib>
   ```


Content pack for automatic distribution to System Managers – Details

   General

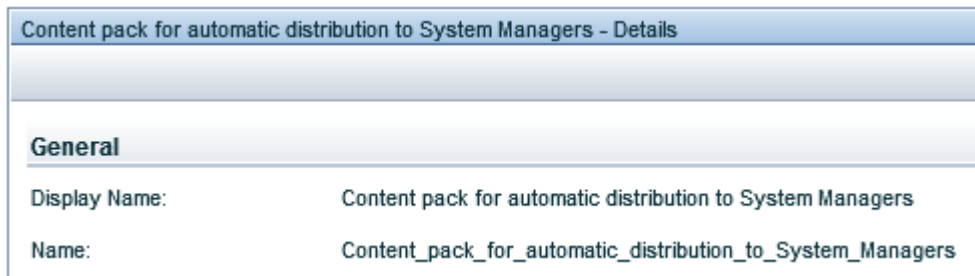 | Display Name: | Content pack for automatic distribution to System Managers |
   | --- | --- |
   | Name: | Content_pack_for_automatic_distribution_to_System_Managers |

   Figure 2: Name of content pack in Content Pack Details

   – Upload CP on each System Manager using ContentManager:

   ```
   ContentManager -server <OMi system manager LB/Virtual server> -ssl
   -username <user with content manager permissions on OMi System Manager> -password <password>
   -import <e.g. CPForDistrib>
   ```

   – Update the automatic assignments on each System Manager using ConfigWsTool:

   ```
   ConfigWstool -server <OMi system manager LB/Virtual server> -ssl -username <user with
   automatic assignment rules permissions on OMi System Manager> -password <password>
   -update_latest_auto_assignment -use_existing
   ```

   Note: option `-use_existing` assures that parameter values used in existing automatic assignment rules are not overwritten. For example, you might create an assignment rule A using management template B for a view C, and another automatic assignment rule A2, using the same management template B and view D, but overwriting some default parameter values as you want to use different thresholds for CIs in view D. Using option -use_existing keeps these customizations in the automatic assignment rule A2. Default values that have not been overwritten in an automatic assignment rule will be replaced by new default values.

   Using option `-update_latest_auto_assignment` **without the -use_existing option** updates all automatic assignment rules **resetting** all parameter values that were overwritten in the auto-assignment rules (like in A2), so use this option only if this is exactly what you want to do.

   Another option is to store the parameter customizations done in assignment rule A2 in a management template B2. The advantage of this option is that B2 can be used on other system managers as well and you avoid having to maintain parameter values in various automatic assignment rules on multiple system managers.

4. Use auto-assignment rules on each OMi System Manager to assign aspects or management templates to corresponding views.

Figure 3: Example auto-assignment rules

5. Overwrite/tune assigned parameter values for certain CIs on the System Managers when necessary.

6. Maintain your configuration on your test system (policies, aspects, management templates):
   Create new aspects or aspect versions.

7. Upload new artifacts to the MoM system when tested successfully (using Content Manager UI or CLI).

8. Start the script created in step 3 whenever new artifacts were uploaded from your test system to the MoM OMi system. This distributes the new configuration to all System Managers and updates all **automatic** assignment rules, which triggers corresponding deployment jobs to the managed nodes.

   Note: Tuned parameter values - manually configured for a specific CI - are never overwritten by such an update! This is intended behavior as it is assumed that there was a specific reason for the overwrite.

   It might happen that the tuned parameter value and the new default parameter value are the same and that you want to return to using the default instead of a manually tuned value. In this case tune the value again for that corresponding CI – in the UI choose "Revert to the initial assignment value" to return to using the default value.

9. To update the manual assignments on each System Manager so that the latest artifact versions are used, use the UI.

   You can check which assignments require an update in the Assignment & Tuning UI:

   Select suitable views and click **Show Assignments That Require an Update**. Then click **Update Assigned Item** and use the resulting wizard to update the assignments. If parameter values have been tuned, decide if the new or old

values should be used.

D	Assigned Item	Version	Target CI	Assigned By
✓	Essential System Management	1.100	bsm-gw2	admin
✓	Essential System Management	1.100	iwfvm07997	admin
✓	Essential System Management	1.100	oo	admin
✓	Essential System Management	1.100	trdpsrv4	admin
✓	AWS Discovery	1.200	bsm-gw2	admin
✓	Docker Availability	2.0	iwfvm07997	admin
✓	Docker Collector	2.0	iwfvm07997	admin
✓	Docker Discovery	2.0	iwfvm07997	admin
✓	Docker Performance	2.0	iwfvm07997	admin
✓	EC2 Instance Health	1.200	ec2-52-192-79-78	AutoAssignment
✓	EC2 Instance Health	1.200	ec2-52-196-229-183	AutoAssignment
✓	EC2 Instance Health	1.200	ec2-52-221-255-47	AutoAssignment
✓	EC2 Instance Health	1.200	ec2-52-62-240-44	AutoAssignment

Title: Systems_Infrastructure - Direct Assignments for Included CIs. Tooltip shown: Show Assignments That Require an Update

Figure 4: Use **Show Assignments That Require an Update** Icon in Assignments & Tuning UI

Or if you know which artifacts have been updated, use the Management Templates & Aspects UI, select a corresponding aspect or management template and click **List Assignments for Selected Item…**. Then use **Update Assigned Item** to update the assignment.
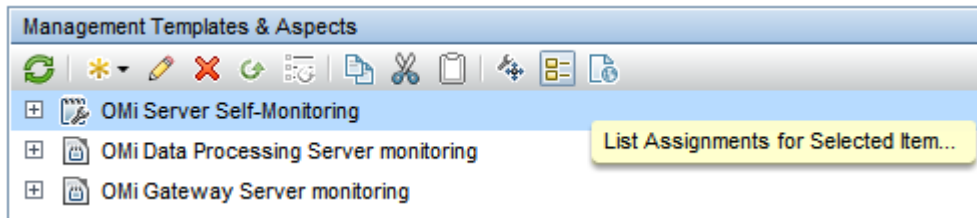
Management Templates & Aspects panel:
- OMi Server Self-Monitoring
- OMi Data Processing Server monitoring   *(tooltip: List Assignments for Selected Item...)*
- OMi Gateway Server monitoring

Figure 5: Use **List Assignments for Selected Item…** Icon in Management Templates & Aspects UI

Learn more at
https://hpln.hpe.com/group/operations-manager-i

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