Introduction: With the introduction of the Monitoring and Alerting Infrastructure in SAP Solution Manager the criticality of SAP Solution Manager in regards to planned and unplanned downtimes has increased. The main requirement is to avoid, that during downtimes, the 1st and 2nd level are completely blind or systems have to be checked manually. As the productive Solution Manager is not available, the solution described provides additionally to the centralized Monitoring and Alerting Infrastructure a partially centralized Monitoring Infrastructure based on already existing infrastructure – CA Introscope and Diagnostics Agents.

Contents

Emergency Monitoring for SAP Solution Manager ................................................................. 2
Prerequisites ......................................................................................................................... 2
Restrictions .......................................................................................................................... 3
Configuration Guide ........................................................................................................... 3
Activation main switch for emergency monitoring ................................................................. 3
Distribute configuration for database monitoring ................................................................. 4
Activate the dashboard in Introscope Enterprise Manager ................................................... 5
Usage .................................................................................................................................... 5
EMERGENCY MONITORING FOR SAP SOLUTION MANAGER

During maintenance of the productive SAP Solution Manager it is necessary to provide monitoring for the managed system landscape as emergency monitoring scenario. This needs to be provided to ensure that during a planned or unplanned maintenance of the SAP Solution Manager system the 1st and 2nd level support has tools to monitor the managed system landscape manually. To achieve this solution the SAP Diagnostics Agents and the CA Introscope are used to provide monitoring during downtimes of the central SAP Solution Manager system.

The monitoring of the system landscape is provided via a specific dashboard deployed on CA Introscope as part of the SAP Management Modules for CA Introscope.

To provide the necessary content for the dashboard, the following data collection infrastructure is used:

1. **Channel 1**: is the data collection of performance metrics from ABAP based system via specific ST-PI data collection modules. This data is read by the wily host agelet in the SAP Solution Manager Diagnostics Agent. The collected data is mapped to Introscope metric paths and transferred to Introscope Enterprise Manager.

2. **Channel 2**: the wily host agelet subscribes as additional receiver to some predefined metrics collected by the MAI agelet in the diagnostics agent (as configured by system monitoring). The metrics are mapped to specific Introscope metric paths and transferred to the Introscope Enterprise Manager.

3. **Channel 3**: the wily host agelet is enhanced by a JDBC collector, which connects locally to the database system running on the same host with the monitoring user provided in the Managed System Configuration and reads a defined set of metrics from the database monitoring views. The metrics are mapped to specific Introscope metric paths and transferred to the Introscope Enterprise Manager.

4. **Channel 4**: the Introscope byte code injection agent is deployed in the J2EE engine. Data is mapped to Introscope metric paths and sent by the byte code agent to the Introscope Enterprise Manager. There are no changes to this existing channel required for emergency monitoring.

**Prerequisites**

The functionality described in this guide is available starting with the following support package levels of the involved Software Components:
Introscope Enterprise Manager: 9.7 or higher
SAP Management Modules for Introscope: 9.7 or higher
SAP Solution Manager: 7.1 SP14 or 7.20 SP1

Also all systems, which should be displayed in the Emergency Monitoring Dashboard must be configured in the productive Solution Manager with Managed System Configuration and System Monitoring must be activated.

Restrictions

The metrics available in CA Introscope are focused on categories availability and performance. For exception only statistical metrics e.g. number of exception type per time unit will be considered. Configurations metrics are not available at all.

The scope is currently limited to system types ABAP, SAP J2EE, SAP Sybase ASE, SAP HANA. Operations systems are all considered.

The monitoring content shown in the dashboard is not fully configurable, this means only a fixed set of metrics per system/database type is defined and thresholds could not be adjusted per system individually.

CONFIGURATION GUIDE

The configuration and activation of emergency monitoring contains of 3 different steps.

1. You have to activate the additional data collection and forwarding of selected metrics to Introscope Enterprise Manager. Therefore a central switch has been created.

2. For database monitoring of SAP Sybase ASE and/or SAP HANA the connection credentials needs to be deployed from Solution Manager to the individual Diagnostics Agents responsible for the databases. An Automatic migration report for this is available.

3. The dashboard to display the additional metrics in Introscope EM in an easy to consume way needs to be activated in the Introscope Webview Jetty server.

Activation main switch for emergency monitoring

To activate the emergency monitoring go to https://<solman_fqdn_hostname>:<port>/sap/url/go/diag_agent_admin to access the Diagnostics Agent Administration. Switch there to the tab “Application Configuration” and select the application com.sap.smd.agent.application.wilyhost. There you have to change the value for emergency.monitoring.enable to true in scope “Global”.

SAP
Restart the Wilyhost application for all Agents by switching on/off the maintenance mode centrally in the Agent Administration.

**Distribute configuration for database monitoring**

To allow collection of database metrics via Introscope Host adapter, the following prerequisites must be fulfilled:

- DB monitoring user with appropriate authorization is available (e.g. DBACockpit user)
- DB monitoring enabled (schema objects generated etc.), this is usually done during managed system configuration in SAP Solution Manager
- Introscope host adapter configured completely and connected to Introscope EM (also done by Managed System Configuration)
- JDBC client library must be installed on the DB host. The Diagnostics Agent needs authorization to access the JDBC driver. Typical locations:
  - HANA: /usr/sap/<SID>/hdbclient/ngdbc.jar
  - ASE: /sybase/<SID>/DBISQL/lib/jconn4.jar

To centrally distribute the user and passwords, which has been used to setup the DBACockpit connection in SAP Solution Manager, the ABAP report E2E_EMERGMON_CONFIGURE is available as of SP14, which allows the automatic and selective transfer of the credential information. You have to specify the SIDs of the
databases you want to configure and the technical system type (DATABASE for SAP ASE or HANADB for SAP HANA).
Alternatively the information can be stored manually by setting the parameters
- `emerg.dbmon.monuser` - database monitoring user
- `emerg.dbmon.monpwd` - database monitoring user's password (secure)
- `emerg.dbmon.host` - database host
- `emerg.dbmon.port` - connection port
- `emerg.dbmon.jdbcpath` - path to the JDBC client .JAR
- `emerg.dbmon.dbtype` - database type (HDB, SYB)

in the Agent Administration for the Wilyhost application on the specific database host scope. All parameters have to be specified with the database name (SID) like `<parameter>_<SID>`, for example

```
emerg.dbmon.port_H10 = 31015
```

**Activate the dashboard in Introscope Enterprise Manager**

To enable emergency monitoring the following files are needed (provided as part of the Introscope Management Modules package):

- `product/enterprisemanager/plugins/com.sap.introscope.em.emon.jar`
- `product/enterprisemanager/plugins/com.sap.introscope.em.emon.local.jar`
- `sap/emon/emon.xml` (definition of all relevant metrics)
- `sap/emon/emon.properties`
- `sap/extra_modules/EMon.*.jar` (management modules, move to config/modules)
- `webapps/emergmon.war` (actual UI5 application)
- `webapps/uocshell.war` (Solution Manager libraries for UI5)
- `webapps/sapui5.war` (UI5 runtime)

After extraction of the MM package the only manual steps for activation of emergency monitoring should be

- move `sap/extra_modules/EMon.*.jar` to `config/modules`
- rename `sap/emon/emon.properties.sample` to `sap/emon/emon.properties` Without presence of this file the emon service will not launch, thus no data provided
- restart EM

**USAGE**

You can launch the emergency monitoring application by launching the URL `http://<emhost>:<webviewport>/emergmon`. Both `<emhost>` and `<webviewport>` are the same that you also use e.g. to access Introscope Webview. You will be prompted to enter credentials. The same users as for Webview and Workstation apply here.

The launch screen contains four different tabs: Overview, Systems, Hosts, Databases.

The initially displayed “Overview” tab gives an overview on how many hosts, systems, databases were discovered and displays how many of each are rated red, yellow, or green. The landscape information for this display is directly read from the metric paths in Introscope Enterprise Manager. No additional data sources (e.g. LMDB) are necessary to create Overview Dashboard.
In the System, Database and Host screen on the left side an overview of all known systems, databases, hosts are shown with the overall rating of the Managed Object. After clicking an entry on the left side, on the right side a metric tree with all metrics collected for this managed object is displayed.

Clicking on any of the rectangles will display the list of systems/hosts/databases represented by the number by switching to the appropriate tab and applying a status filter on the table.

The following additional functions are available in the dashboard:

- right click on table cell will bring a context menu for targeted jump-in to Webview or Workstation, Investigator or Console Depending on Introscope release some jump-ins may fail due to Introscope limitations

- mouse over for a table row will show metric details, eg thresholds, last update, etc
status / rating is coded as follows: 0=gray (missing data), 1=green, 2=yellow, 3=red, 4=no rating (info only) You can use this for table filtering

<table>
<thead>
<tr>
<th>SID</th>
<th>Type</th>
<th>Host</th>
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<tbody>
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The INFO pane on the right displays Introscope EM version and launch time

Enterprise Manager Information

EM Version: 9.1.5.0
EMon Version: 97.1.0.201510261043

The LINKS pane on the right provides generic links to launch Webview or Workstation

Related Links

- Workstation
- Webview