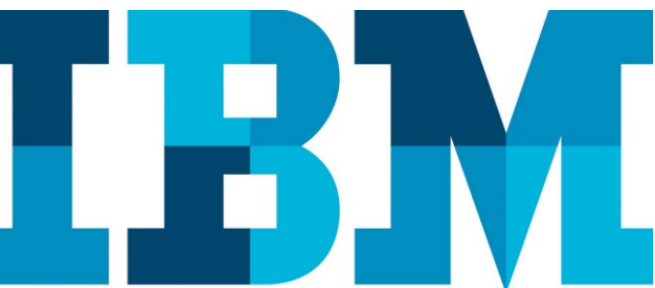


Configuring, monitoring, and deleting application and application dependencies for IBM VM Recovery Manager HA

Setting up a communication channel between VM and KSYSNODE to monitor applications from KSYS

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Overview

Challenge

Configuring, monitoring, and deleting applications and application dependency inside VM and KSYS node is a complex task for administrators on a high availability (HA) environment.

Solution

This paper provides detailed steps to configure applications and dependency between applications. This helps administrators to monitor applications from a KSYS node and VMs to achieve high availability using the IBM VM Recovery Manger solution.

Introduction

High availability (HA) of applications and virtual machines (VMs) is the key requirement to provide continued business services for IBM® VM Recovery manager HA for Power Systems. VM Recovery Manager has capability to monitor such applications at two levels, VM level and KSYS level. This paper helps in configuring applications and application dependencies in VMs and monitor the applications at the VM and KSYS levels.

Architecture overview

This section provides the architecture overview of the VM Recovery Manager solution for application monitoring.

The VM Recovery Manager HA solution is a set of software components that provides high availability for the virtual machines and applications running on different servers. HA management is a critical feature of business continuity plans. The VM Recovery Manager HA solution implements recovery of the virtual machines and applications based on the VM restart technology. The VM restart technology relies on an out-of-band monitoring and management component.

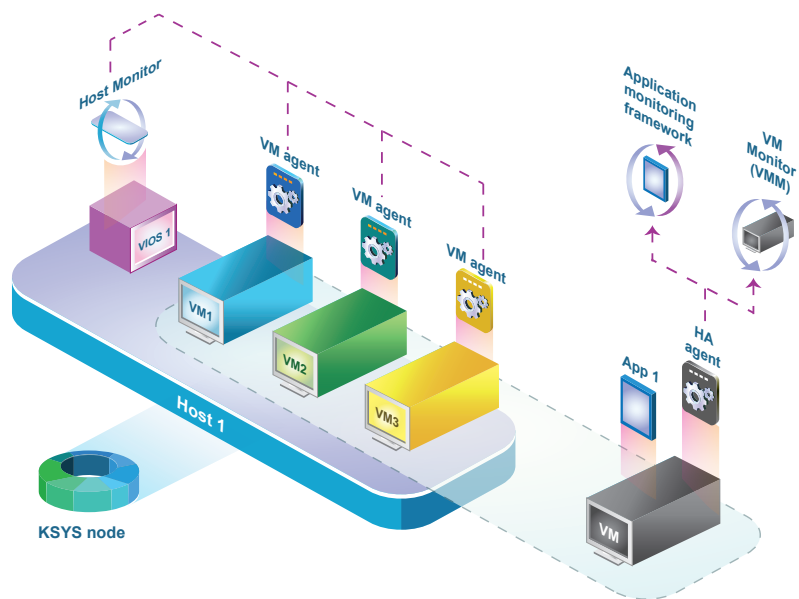


Figure 1: Application monitoring in VM Recovery Manager

Configuring an application inside the VM

This section describes how to configure an application with VM monitor inside a VM.

VM monitor allows to monitor any application using three simple scripts, namely, `start_script`, `stop_script` and `monitor_script`.

To add an application to VM monitor, use the `ksysvmmgr` utility inside the VM.

Prerequisites

The following prerequisites need to be fulfilled in VM and KSYS for monitoring an application:

- VM monitor file sets should be installed in the VM.
- HA monitor should be enabled from KSYS for the VM to monitor from KSYS. This can be performed using the `ksysmgr` command

```
# ksysmgr modify vm <vm_name> ha_monitor=enable
```

- Discovery should be performed after modifying the HA monitor for any VM from KSYS.

Configuration

Following steps explain application configuration inside a VM:

1. Configure the VM with the required OS level and install the VM monitor file set on the VM.
2. Add the application (in this example, `app1`) inside the VM using the `ksysvmmgr` command.

Syntax:

```
# ksysvmmgr -s add application  
<app_name>start_script=</path/of/start_script.sh>  
stop_script=</path/of/stop_script.sh>  
monitor_script=</path/of/monitor_script.h
```

Example:

```
# ksysvmmgr -s add app app1
  monitor_script=/apps/monitor_1
  start_script=/apps/start_1
  stop_script=/apps/stop_1
Adding application "app1" into configuration
successfully performed.
```

3. At this point, the application configuration is stored in the configuration.xml file. To enable the daemon to consider new changes, run the `ksysvmmgr sync` command as mentioned in above step
4. Run the `ksysvmmgr query` command to display the configured applications along with their health status inside the VM.

```
# ksysvmmgr query app [app_name]
```

Refer to the following example output for detailed information about the query application.

```
# ksysvmmgr query app app1
Application name=app1
version=
uuid=1607943194649982000
desc=
monitored=1
monitor_script=/apps/monitor_1
monitor_period=30
monitor_timeout=15
monitor_failure_threshold=5
stop_script=/apps/stop_1
stop_stabilization_time=25
stop_max_failures=3
start_script=/apps/start_1
start_stabilization_time=25
start_max_failures=3
max_restart=3
nooftimes_restarted=1
critical=no
type=CUSTOM
```

```
instancename=  
database=  
vendor_id=  
appstarttype=VMM  
groupname=  
groupid=  
configfile=  
status=NORMAL (GREEN)
```

Note: In the `ksysvmmgr` command, `app_name` is optional.

Configuring application dependencies inside a VM

This section describes how to configure application dependencies inside a VM.

Prerequisites

As a prerequisite, make sure that the following requirements are met

- VM monitor filesets should be installed in the VM
- A minimum of two applications must be configured inside the VM .
- HA monitor should be enabled from KSYS for the VM to monitor from KSYS. This can be performed with the `ksysmgr` utility.

```
# ksysmgr modify vm <vm_name> ha_monitor=enable
```

- Discovery should be performed after modifying HA monitor for any VM from KSYS.

Configuration

Perform the following steps to configure application dependency inside the VM:

1. Run the following command to add `parent_child` application dependencies between `app1` and `app2`:

```
#ksysvmmgr add dependency  
dependency_type=parent_child  
dependency_list=app1,app2
```

Note: `app1` is parent app and `app2` is child app

2. If required, list all the dependencies using the `ksysvmmgr query` command.

```
# ksysvmmgr query dependency Dependency
depuuid=1608006469210628000
dependency_type=parent_child
dependency_list=app1,app2 strict=YES
```

Monitoring applications from KSYS

Applications configured inside a VM can be monitored from the KSYS node (using the `ksysmgr query app` command) after successful discovery.

The following example shows the application details from the KSYS node.

```
#ksysmgr query app
```

```
Name          : app2
Status         : GREEN
AppID          : 1608006179946371000
VM             : rtbeer002
Critical       : no
MaxRestart     : 3
Monitoring     : 1
App_State      : NO_OPERATION_IN_PROGRESS
```

```
Name          : app1
Status         : GREEN
AppID          : 1607943194649982000
VM             : rtbeer002
Critical       : no
MaxRestart     : 3
Monitoring     : 1
App_State      : NO_OPERATION_IN_PROGRESS
```

Configuring application dependencies in KSYS

VM Recovery Manager allows to configure application dependencies across VMs from KSYS node.

The KSYS node allows you to configure two types of dependencies (parent_child and primary_secondary) between apps that are across VMs.

Example:

```
# ksysmgr add app_dependency test_dep
app_list=rtbeer002:app1, rtbeer003:app4
type=parent_child
App_dependency group test_dep was created.
Please run discovery to apply changes.
```

It is mandatory to run discovery for application dependency to take effect.

Note:

Upon configuring app dependency in KSYS node, KSYS will take control of the application during discovery process. Application attribute `appstarttype` at VM monitor changes from VM monitor to KSYS, indicating that VM monitor cannot make changes to the application, such as stopping application, starting application or deleting the application.

Delete application dependency from a KSYS

It describes steps to delete application dependency from KSYS node

To delete application dependencies configured in KSYS, use the following command:

Syntax:

```
# ksysmgr delete app_dependency <NAME>
```

Example:

In the following example, app_dependency is deleted from ksysmgr.

```
# ksysmgr delete app_dependency test_dep
App_dependency group test_dep was removed
Please run discovery to apply changes.
```

Note:

Discovery is mandatory after removing application dependencies from KSYS. During discovery only appstarttype will change from KSYS to VM monitor. VM monitor will not allow to delete applications if appstarttype is set to KSYS.

Delete application dependency from a VM

Run the following command to delete application dependency inside a VM.

```
#ksysvmmgr [-s] delete dependency <DEPUUID>
```

```
ksysvmmgr -s delete dependency 1631777676160232000
```

```
Deleting dependency "1631777676160232000" from configuration  
successfully performed.
```

Delete applications from a VM

The ksysvmmgr utility allows to delete application/s that are being monitored by VM monitor.

Run the following command to delete application from a VM monitor:

Syntax:

```
# ksysvmmgr -s delete app <NAME>
```

Example:

The following example explains how to delete ksysvmmgr from the VM monitor.

```
# ksysvmmgr -s del app app1  
Deleting application "app1" from configuration successfully performed.
```

Summary

This white paper described the procedure to configure, monitor, and delete applications and application dependency inside VM and configure, monitor, and delete application dependency inside a KSYS node. Then, the paper explained how a VM monitor provides a generic way to monitor most of the applications.

The paper also provided samples of VM agent scripts that allow customers to configure SAP HANA, IBM Db2®, Oracle, and Postgres.

References

Check the following references to find more information:

- [Installing VM Recovery Manager HA](#)
- [Configuring VM Recovery Manager HA](#)
- [IBM VM Recovery Manager HA for Power Systems](#)

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