

MasterScope MISSION CRITICAL OPERATIONS  
Ver4.3  
Release Memo  
-Invariant Analyzer Edition-

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NEC Corporation

Thank you for choosing our products. This document describes features and usage of the Invariant Analyzer you are going to use.

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# 1. Product Description

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## 1.1. Product Details

MasterScope Invariant Analyzer automatically models and analyzes performance information obtained from monitoring a system and detects a failure (or a silent failure) that has occurred within the system without anyone noticing it. It can contribute to reducing the many hours and much labor consumed in the past to identify the causes of such failures and take measures against them.

This product have a capability to analyze, in real-time, server performance data collected from MasterScope SystemManager.

And by integrating with MasterScope Application Navigator and MasterScope Network Manager, system-wide performance data will be analyzed including applications or network performance data.

The versions to which MasterScope Network Manager applies are as follows:

- Windows: Ver3.0 or higher

Hereinafter MasterScope MISSION CRITICAL OPERATIONS will be described as MISSION CRITICAL OPERATIONS and Invariant Analyzer capability is described as IA capability.

## 1.2. System Architecture

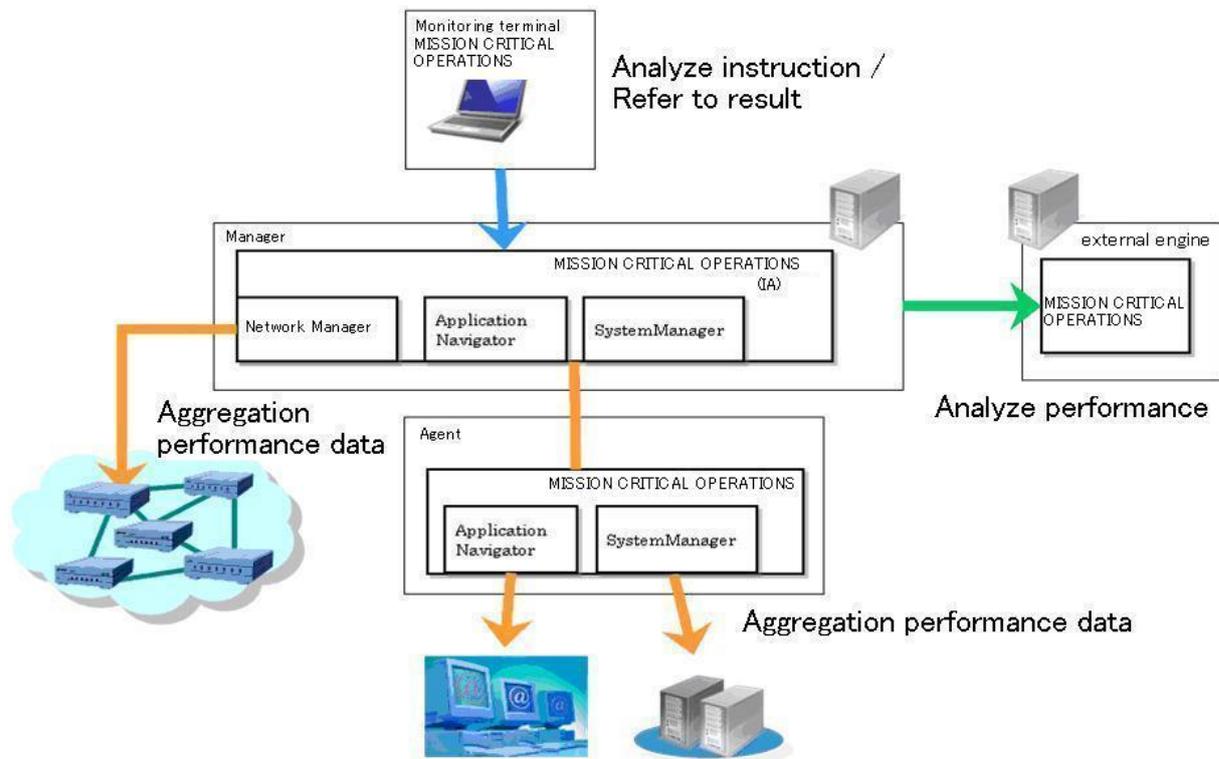


figure 1-1 MISSION CRITICAL OPERATIONS(IA) System Architecture

- **Monitoring terminal**  
Direct performing analysis to Manager and view the result.
- **Manager**  
Accumulating performance data collected from MasterScope SystemManager, generate a model by extracting invariant relationship from normal system performance data. Based on the model generated, analyze performance data and detect failures.
- **External engine**  
To offload manager's workload, you can put external engine capability on the other machine . External engine performs high cost modeling and analysis process.  
If external engine is not used, Manager will do the same process.

## 2. Installing in Windows x64 Edition

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To install the manager and external engine in the Windows x64 Edition environment, the runtime components of the Visual C++ 2010 library need to be installed in advance.

Obtain and install the “Microsoft Visual C++ 2010 Redistributable Package (x64)” from the Microsoft website or the following path on the WebSAM Media.

(When the DVD-ROM drive is E drive)

E:\tools\Microsoft\2010\vcredist\_x64\vcredist\_x64.exe

## 3. Configuring external engine environment

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In this section, it is described how to setup external engine.

Both MISSION CRITICAL OPERATIONS Manager and monitoring console should be installed prior to this step, and the IA capability is already activated by registering its license.

### 3.1. Installing external engine

Install MasterScope MISSION CRITICAL OPERATIONS RelayManager with MasterScope Media(DVD-ROM media).

For more detail of installation and uninstallation of this product, please refer to “MasterScope Media releasememo”(relmemo.pdf)

Please refer the following for setup after installation.

To install the manager and external engine in the Windows x64 Edition environment, the runtime components of the Visual C++ 2010 library need to be installed in advance.

Obtain and install the “Microsoft Visual C++ 2010 Redistributable Package (x64)” from the Microsoft website or the following path on the WebSAM Media.

(When the DVD-ROM drive is E drive)

E:\tools\Microsoft\2010\vcredist\_x64\vcredist\_x64.exe

#### 3.1.1. Install configuration(Windows)

At the installer window, when MasterScope MISSION CRITICAL OPERATIONS RelayManager is chosen to install, the following window is displayed.

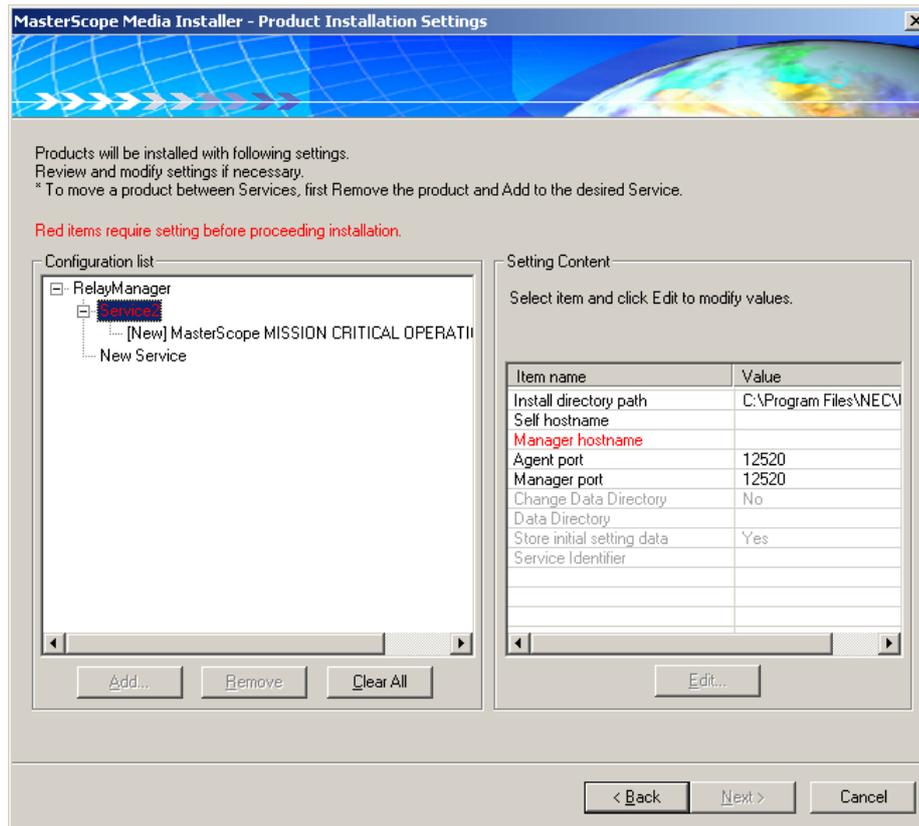


figure 3-1 RelayManager installation window(Windows)

When RelayManager related services at the configuration list tree, configurable items are displayed at the Setting content frame. Referring the following, please setup it.

- Self hostname (optional)  
Configure the name of external engine.  
Please do not duplicate the name of MISSION CRITICAL OPERATIONS agent host names. If the agent and external engine are installed in the same machine, please do not leave it blank. Otherwise the initial name will be the same of the agent's name.  
If the host name is configured as the same of one of the agents host names, the agent or external engine will not work.  
When installing on the machine on which the manager is installed, be sure not to use the same name as the host name of the manager
- Manager hostname  
Configure the host name or IP address of manager to connect.
- Agent port  
This is not used in this product.  
However external engine will use this port number.  
Please specify one of the available port number on the external engine machine.

When installing the external engine into the manager machine, please change the port number from the default configuration.

If the port number is duplicated with manager's port, agents may not be able to connect to manager.

- **Manager port**

Specify the port number to connect to the Manager.

The port number should be the same of the "Agent port" of the manager configured.

After installation, external engine will startup automatically. When external engine has connected to the manager, the message like "Connected external engine (ENGINE="host name of external engine")" is generated. Refer to the monitoring console.

### 3.1.2. Install configuration(Unix)

When the installation process has been started, the window similar to the following is displayed.

```
-----  
Installation settings  
-----  
  
RelayManager  
  1 Service1  
    1.1 MasterScope MISSION CRITICAL OPERATIONS X.X.X.X  
  2 New Service  
  
-----  
(* marked products or services require specific settings before installation.  
-----  
Please select operation to perform from following commands.  
[Example: 's1' configures settings for first service listed above.]  
(r[n.n]:remove v[n]:view c:clear b:back e:execute q:quit program):
```

figure 3-2 RelayManager installation window(Unix)

When the 's' and number of the service of RelayManager is input in a configuration list, configurable items are displayed. Referring the following, please setup it.

- **Self hostname (optional)**

Configure the name of external engine.

Be sure not to use the same host names as other agents connected to the MasterScope. If there is another agent installed on the same machine, be sure to specify the host name because the initial value of the host name will be the same name as the agent when the host name is not specified.

If the same host name is specified, the agent or external engine functions will not operate normally.

Also, when installing the external engine on the machine on which the manager is installed, be sure not to use the same name as the host name of the manager.

■Manager hostname

Configure the host name of manager to connect.

■Agent port

This is not used in this product.

However external engine will use this port number.

Please specify one of the available port number on the external engine machine.

When installing the external engine functions on the machine on which the manager is installed, be sure to change the communication port because the initial value of the communication port is the same as the manager.

If the port specified as a waiting port is the same as that of the manager, the agent may not be able to connect to the manager.

■Manager port

Specify the port number to connect to the Manager.

The port number should be the same of the “Agent port” of the manager configured.

After installation, external engine will startup automatically. When external engine has connected to the manager, the message like 「Connected external engine.(ENGINE=<hostname of external engine>)」 is generated. Refer to the monitoring console.

## 3.2. Configuration from monitoring console

At the option, open invariant analysis tab and then go to analysis engine setting.

Check on the “Use external analysis engine server” at the Analysis engine settings window.

Select the check box for [Use external analysis engine server.] in the [Analysis engine setting] dialog box, and then press the [Add] button.

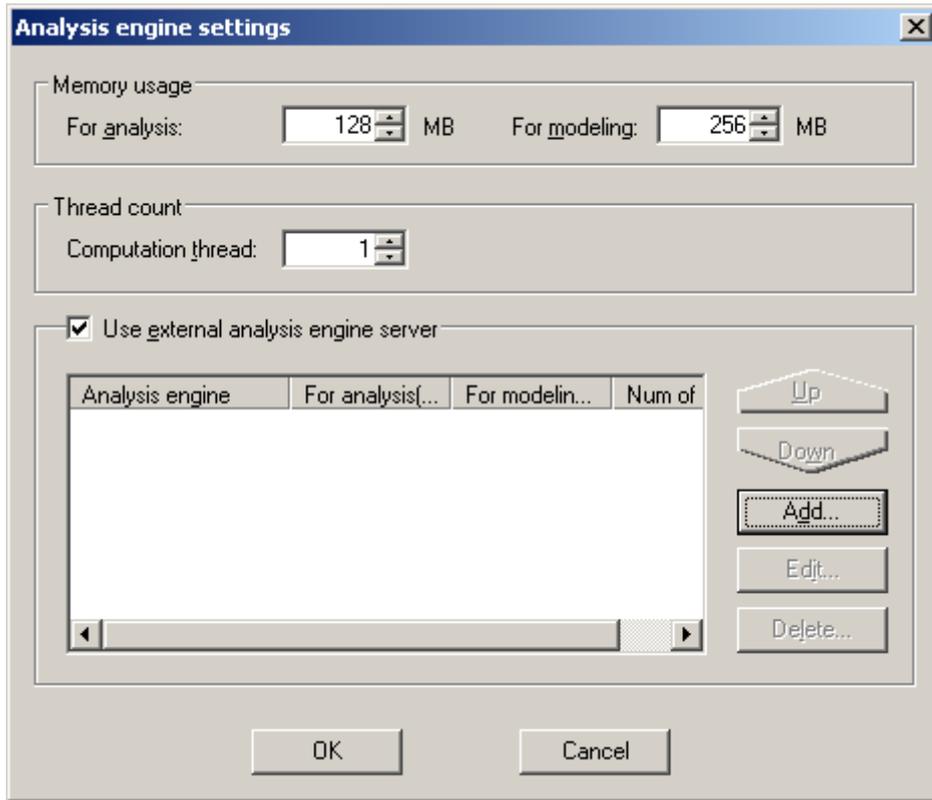


figure 3-3 Analysis engine settings window

When you click the [Add] button, the [Analysis engine setting] dialog box is displayed.

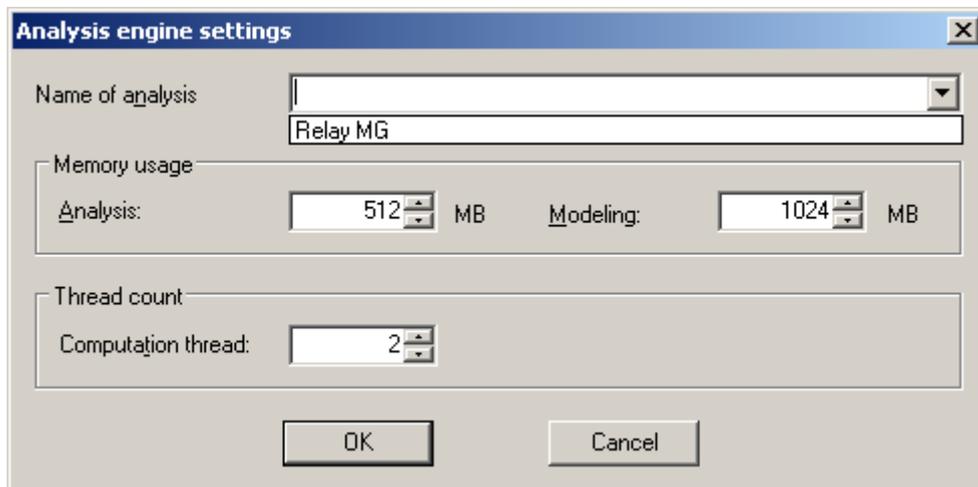


figure 3-4 Analysis engine add/edit window

In the host name list, the list of the external engines available are displayed. If you will not see new external engine, please make sure the external engine is configured exactly and started up already.

For more detail of this window, please refer to the manual.

## 4. Procedure for Creating an INTROSCOPE Linker Environment

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The MasterScope Application Navigator functionality enables you to analyze on a real time basis with the IA function the metric data for JAVA and .NET Web applications collected and monitored with Wily Introscope.

If you need to confirm the analysis results from the IA function with Introscope Workstation, create an environment by referring to the following procedure.

### 4.1. Configuring analysis result reporting

Configure settings for reporting analysis results to Introscope.

#### 4.1.1. Installing EPAgent

Install Environmental Performance Agent (EPAgent) in a host on which an Invariant Analyzer manager is running by referring to the manual for Introscope per se. At the same time, configure other settings such as the location and ports of Enterprise Manager.

#### 4.1.2. Setting EPAgent

Add the following three lines to <Introscope\_Home>\IntroscopeEPAgent.properties:

```
introscope.epagent.plugins.stateless.names=IA
introscope.epagent.stateless.IA.command=<Install_Path>\Manager\bin\SIATPin_IS-SL.exe
<Install_Path>\Manager\sg\SIAT\Analysis\Introscope\AnalysisResult.dat -C
introscope.epagent.stateless.IA.delayInSeconds=60
```

\*"\" is represented by "\\".

\*If <Install\_Path> includes a space(s), enclose <Install\_Path> up to the end of a file name with a double quotation mark, and denote "\" with "\\\" as follows:

```
introscope.epagent.stateless.IA.command="C:\\Program
Files\\NEC\\UMF\\Operations\\Manager\\bin\\SIATPin_IS-SL.exe" "C:\\Program
Files\\NEC\\UMF\\Operations\\Manager\\sg\\SIAT\\Analysis\\Introscope\\AnalysisResult.dat
" -C
```

\* For UNIX, "/" is used as a directory description delimiter.

\*If there is a stateless plug-in(s) in addition to Invariant Analyzer, specify it with a comma as its delimiter as follows:

```
introscope.epagent.plugins.stateless.names=plugin1,plugin2,IA
```

### 4.1.3. Running EPAgent

Run EPAgent.

For information on how to run EPAgent, refer to the manual for Introscope per se.

## 4.2. Analysis result metric and event

Invariant Analyzer reports the following metric data to Introscope on a-per-analysis basis:

Metric name	Description
AnomalyScore	Correlation anomaly score (abnormal correlation/model's effective correlation)
BrokenInvariants	Abnormal correlation
NormalInvariants	Normal correlation
EffectivelInvariants	Model's effective correlation
IncidentOccurrence	Occurrence presence of anomaly alert
TopCounterPath	Top counter path
InvariantAnalysisID	Invariant analysis ID
AnalysisID	Analysis ID

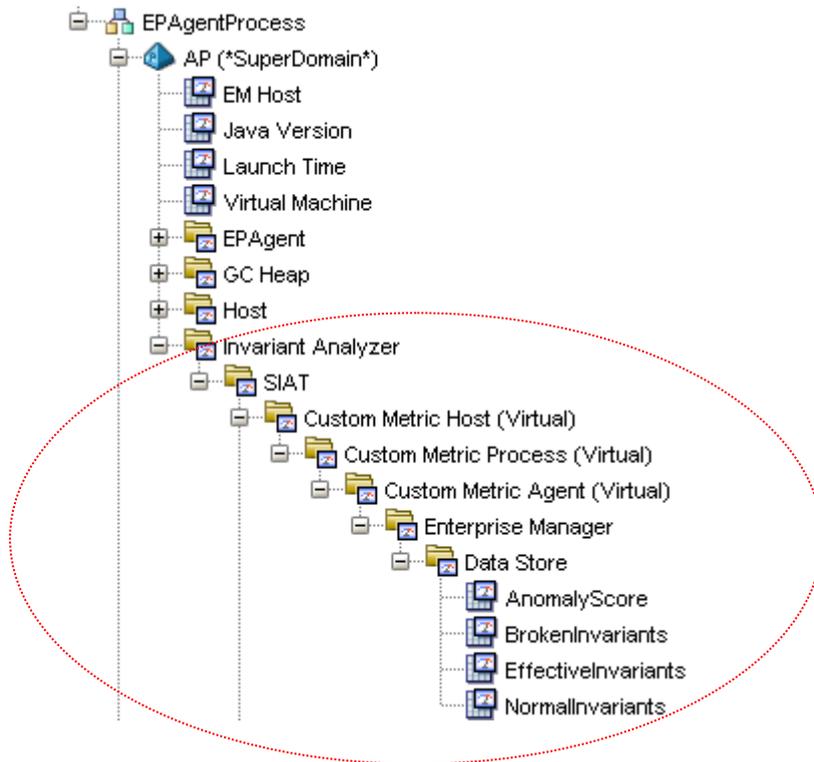
These pieces of the metrics data are displayed as follows in the Workstation Investigator tree.

The tree's layer in which the metric data listed above is the same as the one in which the Invariant Analyzer's invariant analysis node resides.

### 4.3. Viewing analysis results in dashboard

Create monitor configuration information on the analysis result metric data listed above by using the Management Module editor provided with Introscope Workstation.

Edit the created monitor configuration information by using Dashboard Editor provided with Introscope Workstation so that it can be monitored with the dashboard.



## 5. Notes

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### 5.1. About connection between different versions

Versions of Manager, external engine and monitoring console should be the same exactly. When you upgrade the products, please keep each version at the same time.

### 5.2. About logical items name in the integrated topology

In you put the characters“\” or “|” in logical items names in the integrated topology, the performance data in those logical items are not analyzed. Please do not put “\” or “|” in logical items names.

### 5.3. When using Web Monitoring View

If a runtime error occurs when using the IA function in an environment where Web Monitoring View is used, upgrade gdiplus.dll in that environment to the latest version. You can upgrade gdiplus.dll by downloading “Platform SDK Redistributable: GDI+” from the Microsoft Web site.

### 5.4. Upper limit for the number of counters

If model generation or analysis is performed on a lot of counters, the memory usage of the process exceeds the limitation, causing the process to fail. The estimated maximum number of target counters is 200,000.

The upper limit depends on parameters (a time period for the target performance data and its sampling interval) at the time of model generation and analysis, model’s effective correlation, and the number of abnormal correlations detected. It should absolutely be treated as an approximate number.

If your environment has more than 10,000 counters, please take the following precautions:

- Use an external engine.  
You can install an external engine in the same machine on which the manager is running.
- Use a machine with ample physical memory (4 GB or more) installed.
- When using Windows as the platform for the manager and an external engine, use a 64-bit OS and perform the following steps:

1. Stop the manager and the external engine.
2. Rename respective SysMonMgr.exe files to SysMonMgr32.exe in the following directories:

Manager: <Install\_Path>/Manager/bin

External engine: <Install\_Path>/RelayManager/bin

3. Rename respective SysMonMgr64.exe files to SysMonMgr.exe in the same directories.
4. Start the manager and the external engine.

- To use Linux for the manager and external engine, use a 64-bit operating system.

## **5.5. When creating a model from performance data from many counters in an HP-UX (IPF) environment**

When creating a model from performance data from many counters (\*) in an HP-UX (IPF) environment, it may fail because processes may use more memory than an upper limit for the memory usage. When creating a model from performance data for many counters, use an external engine and perform the following steps:

(\*) The approximate limit for the number of counters is about 20,000.

The number may increase or decrease, depending on the number of correlations included in the data.

1. Stop the external engine.
2. Change the address space model.

```
# chattr +as mpas <Install_Path>/RelayManager/bin/SysMonMgr ↵
```

3. Edit the following rc script file.

/sbin/init.d/UMFOperationsRelayManager\_1

```
:
:
UMF_COREID=1
UMF_FUNCNAME=RelayManager
UMF_CORENAME=SysMonMgr

export _M_ARENA_OPTS=1:8           ←ADD
export UMF_BASE_PATH
umask 022

cd $UMF_BASE_PATH
:
:
```

4. Start the external engine.

\*If you install it in an environment where other WebSAM products are using their services and rc script files with the same names as those for it, the rc script files will be renamed so that their last numeric characters are 2 or higher

(e.g. : UMFOperationsRelayManager\_2, UMFOperationsRelayManager\_3,...).

You need to reread the explanation above according to your actual environment.

## **5.6. External Engines**

To install and use MasterScope MISSION CRITICAL OPERATIONS and MasterScope Application Navigator individually, use an external engine compatible with each product respectively.

To install and use MasterScope MISSION CRITICAL OPERATIONS and MasterScope Application Navigator in the same core, use an external engine compatible with either product. It is not necessary to install external engines for both products.

When additionally installing MasterScope Application Navigator after MasterScope MISSION CRITICAL OPERATIONS has been installed, or additionally installing MasterScope MISSION CRITICAL OPERATIONS after MasterScope Application Navigator has been installed, the external engine used until then can be used as is for the newly installed product. Thus, is not necessary to install an external engine compatible with the additionally installed product.

## **6. Restrictions**

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### **6.1. Restriction when manager is not running**

Because when manager is not running the performance data is not collected, the analysis is not available in such time.

### **6.2. Installing a product on Linux**

When using the Linux manager, specify 50,000 or less for the total number of counters to be analyzed. The maximum number of counters that can be used varies depending on the configuration and performance of the computer on which the manager is installed. Use this number as a guideline.