REVISION 045 - 5/13/20

DataMiner system requirements

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dataminer
by skyline communications

Revisions

Revision	Date	Name	Comments
REV011	22 Feb 2016	MGO	• Note added on usage Cassandra database. • Web browser updated in client requirements.
REV012	24 Feb 2016	MGO	• Windows Server 2003 removed from supported operating systems.
REV013	01 Apr 2016	MGO	• Note added on use “fast startup” setting.
REV014	10 May 2016	MGO	• Note added on use antivirus software.
REV015	08 Aug 2016	MGO	• Note added on domains and DataMiner clusters.
REV016	11 Oct 2016	JSP	• Supported Cassandra architectures added.
REV017	08 Nov 2016	MGO	• Revisions table added.
REV018	14 Nov 2016	MGO	• Note added on TLS and Cube installation. • Memory requirements updated in minimum hardware requirements server.
REV019	18 Nov 2016	MGO	• Minimum hardware requirements server updated: Cassandra DB should be located on different drive.
REV020	19 Dec 2016	MGO	• Windows Server 2016 added to the server software requirements.
REV021	01 Feb 2017	MGO	• Note added on supported Cassandra architectures in a Failover setup.
REV022	26 May 2017	MGO	• Notes added on supported Cassandra architectures.
REV023	5 Jan 2018	MGO	• Required .NET Framework version updated
REV024	6 Feb 2018	MGO	• DataMiner metrics added
REV025	15 Feb 2018	MGO	• System requirements virtual servers updated
REV026	26 Feb 2018	MGO	• Server hardware requirements updated
REV027	06 Mar 2018	MGO	• Mobile Gateway: Erco&Gener GenPro 20e modem discontinued
REV028	09 Mar 2018	MGO	• Metrics updated with max elements/DMS
REV029	14 Mar 2018	MGO	• Metrics updated with switch frequency
REV030	03 Jul 2018	MGO	• Other Microsoft software requirements updated
REV031	03 Sep 2018	MGO	• Note on antivirus software updated • DMA health assessment guidelines updated
REV032	24 Sep 2018	MGO	• Note added to health assessment guidelines
REV033	10 Oct 2018	MGO	• Server software requirements updated • Antivirus warning layout adjusted
REV034	26 Oct 2018	MGO	• Health assessment guidelines updated

Revision	Date	Name	Comments
REV035	27 Feb 2019	MGO	• Hardware order numbers updated • Mobile Gateway approved modems updated • Server software requirements updated
REV036	05 Jun 2019	MGO	• Hardware requirements updated
REV037	13 Sep 2019	MGO	• Maximum number of active tickets added to metrics
REV038	30 Sep 2019	MGO	• MSXML 4.0 removed from required Microsoft software
REV039	10 Dec 2019	MGO	• Client software requirements updated: Vista removed + .Net Framework requirements updated
REV040	19 Dec 2019	MGO	• Indexing requirements + Hardware requirements for Cassandra nodes added
REV041	4 Feb 2020	MGO	• CPE now renamed to EPM
REV042	12 Feb 2020	MGO	• Layout updated to new template • Network connection added to Indexing requirements
REV043	6 Apr 2020	MGO	• Indexing Engine requirements clarified
REV044	5 May 2020	MGO	• Microsoft .NET Framework requirements for DataMiner 10.0.6 added
REV045	13 May 2020	MGO	• Indexing system requirements updated with note on hard disk

Contents

1. System requirements for DataMiner servers

1.1 Hardware

The DataMiner multi-vendor network management platform is a powerful software solution that runs on industry standard hardware, readily available from different vendors. By avoiding specialized hardware, operators are able to:

- Reduce the cost of ownership. There is a lower cost per unit because of the wide availability, a lower cost for spare or replacement parts, etc.
- Remain vendor-independent in terms of hardware components, today and in the future.

DataMiner server hardware can be purchased either from Skyline Communications, as part of a turnkey solution, or from any other third-party hardware supplier. Although small standalone and/or trial installations can run on a desktop server, DataMiner server software will typically be deployed on 1U 19" rack-mounted or blade servers.

Hardware requirements

Depending on the edition of the DataMiner software, server hardware has to comply with the following requirements.

Hardware	DataMiner Professional Edition	DataMiner Enterprise Edition	DataMiner EPM (formerly CPE) Edition
Processor	One CPU Intel Core i5/i7, Xeon or similar Passmark CPU mark: >5000	One CPU Intel Xeon or similar PassMark CPU mark: >10000	Dual CPU Intel Xeon or similar PassMark CPU mark: >20000
Memory	16 GB (min. 8 GB)	32 GB (min. 16 GB)	64 GB (min. 32 GB)
Hard disk	500 GB SATA (min. 250 GB)* We recommend to locate an intensively used Cassandra database on a separate disk. * Optional: RAID 1, hot-pluggable	Disk for OS and DataMiner: • 300 GB SAS (10k RPM)* Disk for Cassandra database: • 600 GB SAS (10k RPM)* * RAID 1, hot-pluggable	Disk for OS and DataMiner: • 300 GB SAS (10k RPM)* Disk for Cassandra database: • 600 GB SAS (10k RPM)* * RAID1, hot-pluggable
Network	Dual Ethernet interfaces recommended	Dual Ethernet interfaces recommended	Dual Ethernet interfaces recommended
Power supply	Single, or Redundant (hot-pluggable)	Redundant (hot-pluggable) recommended	Redundant (hot-pluggable)

NOTE:	Although DataMiner is fully flexible in terms of which Ethernet ports should be used for different types of traffic (including data acquisition, client interfacing and synchronization traffic in case of redundant setups), for some architectures it may be desirable to have up to three Ethernet ports available. Consult your DataMiner Technical Account Manager for more details.

Hardware requirements for Cassandra nodes

NOTE:	This functionality will become available in a future DataMiner release.

In Cassandra clusters, the following requirements apply for servers hosting a Cassandra node:

- **Data Layer operating system**: Windows/Linux

NOTE:	Maintenance of Cassandra clusters in a Linux environment is not covered by the support contract.

- **Processor**: 4-core CPU. 8 cores are recommended.
- **Memory**: 32 GB – ECC RAM.

  Cassandra heap: Minimum 2 GB and no more than 50% of total RAM. Recommended heap size no bigger than 12 GB.
- **OS disk**: SSD/mechanical.
- **Cassandra disk**: SSD recommended.

  Minimum 500 GB. Maximum Cassandra node size 200 GB (allowing sufficient room for compaction).
- **Disk configuration**: RAID recommended.
- **Network connection**: Gigabit-capable.

  Installation may be blocked by the software on highly dispersed systems with high latency.

Ordering hardware

If you intend to acquire hardware from Skyline Communications, use the following order numbers:

DataMiner Edition	Order no.
DataMiner Professional/Enterprise Edition	DMS-AGT-HDW-HPC
DataMiner EPM (formerly CPE) Edition	DMS-AGT-HDW-UPC

If you intend to acquire hardware from third-party vendors, it is recommended to seek approval of Skyline Communications prior to purchasing the hardware.

Approved modems for use with DMS Mobile Gateway

- Falcom A2D (discontinued)
- Falcom Tango55 (discontinued)
- Erco&Gener GenPro 18e (discontinued)
- Erco&Gener GenPro 20e (discontinued)
- SMSEagle
- Turnpike

Regarding virtual servers

The DataMiner software can be run on a virtual server as long as it has sufficient resources available (CPU, memory, hard disk space and throughput, etc.), as indicated in the above minimum requirements.

Please note the following:

- For the CPU, it is mainly the PassMark that determines whether the CPU has sufficient power, rather than the number of cores. Make sure you assign enough CPU power to keep the CPU usage under 50% and the PassMark above the minimum limit indicated above, e.g. 10000. Also, we recommend to avoid oversubscribing.
- As far as memory is concerned, we recommend the same minimum as indicated in the above requirements.
- For the disk, the disk throughput is of vital importance. As there will be a very active database on the disk, you need to ensure there is not only sufficient size on the disk, but also sufficient IO. We recommend the same throughput as for the recommended disks above, e.g. about 140 IOPS for 10k RPM SAS disks.

1.2 Software

Operating system

See below for an overview of the supported operating systems per DataMiner edition.

DataMiner Edition	Supported operating systems
DataMiner Professional Edition	Windows 7/8/10 Professional, or Windows Server 2008/2012/2016/2019 Standard Edition
DataMiner Enterprise Edition	Windows Server 2008/2012/2016/2019 Standard Edition
DataMiner EPM (formerly CPE) Edition	Windows Server 2008/2012/2016/2019 Standard Edition

NOTE:

- All servers (DMAs) in a DataMiner cluster (DMS) need to be either in the same domain or in no domain at all. Also, it is not advisable to install DataMiner on a server that is also Domain Controller since this is not supported in a DataMiner cluster. If any exceptions need be made to these general rules, please contact your Technical Account Manager.
- The Windows setting "fast startup" should not be used on a system running a DataMiner Agent.

Microsoft .NET Framework

Minimum

- Up to DataMiner 9.6.1: Microsoft .NET Framework 4.5
- From DataMiner 9.6.2 onwards: Microsoft .NET Framework 4.6
- From DataMiner 10.0.6 onwards: Microsoft .NET Framework 4.6.2

Recommended

- Microsoft .NET Framework 4.6.2

NOTE:	We recommend to always upgrade to the latest .NET Framework version.

Other Microsoft software

- Microsoft Visual C++ Redistributable Packages 2005 SP1, 2010 SP1 (x86 or x64) and 2015.
- Microsoft Web Services Enhancements (WSE) 2.0 SP3 for Microsoft .NET

Database software

- MySQL Server (incl. MySQL Workbench),
- Microsoft SQL Server, or
- Apache Cassandra.

Other software

- WinPcap

WARNING:	It is possible to install antivirus software on a DMA. However, you need to keep in mind that this is going to consume resources of the server. As such, we recommend not to install such software if the server is in a well-protected environment. If you do install antivirus software, you must: • Exclude the directory *C:\Skyline DataMiner* and the data directory of the database. • Exclude all DataMiner processes (process names starting with SL) and your chosen database application (Cassandra, MySQL, MSSQL). • Avoid scheduled virus scans affecting the available resources for the DataMiner software at certain moments in time. Failing to make these adjustments when using antivirus software may cause undesired operational problems with your DataMiner system, which are not covered under warranty or maintenance and support.

1.3 Indexing system requirements

The DataMiner Indexing Engine (which includes an Elasticsearch database) can only be installed on DataMiner Agents with the following characteristics:

- Operating system: Windows Server 2012 or higher (64-bit)
- Free RAM: Up to DataMiner 9.6.13: At least 4 GB

  From DataMiner 10.0.1 onwards: At least 10 GB

NOTE:	This requirement refers to the amount of free RAM in the system, not the total amount of RAM. DataMiner Indexing will always reserve 8 GB of RAM when it is in use, and an additional 2 GB of free RAM must be available to ensure that the system can run correctly.

- Average CPU usage: Lower than 70%
- Local database type: Cassandra

- Free hard disk space: Same amount as used by Cassandra
- Separate hard disk from the one containing the Cassandra database

NOTE:	• At least 20% of the disk must remain free at all times. • For small databases of no more than 5 GB, using the same disk for Cassandra and Elasticsearch is supported. However, in that case we recommend that the disk is an SSD.

- Microsoft .Net version: 4.6 or higher
- Network connection: Gigabit-capable.

  Installation may be blocked by the software on highly dispersed systems with high latency.

NOTE:	• If multiple indexing databases will be used, the latency between those databases must be less than 50 ms. • The minimum number of nodes required in order to install DataMiner Indexing Engine depends on the number of alarms that occurred in the 24 hours prior to the installation. One node is required for every 30,000 alarms per day in the DMS.

2. System requirements for DataMiner clients

2.1 Hardware

Recommended DataMiner client configuration:

- **Processor**: Multi-core processor
- **Memory**: 4 GB
- **Graphics memory**: 256 MB

2.2 Software

Operating system

- Microsoft Windows 7
- Microsoft Windows 8
- Microsoft Windows 10

Microsoft .NET Framework

- Up to DataMiner 9.5.5: Microsoft .NET Framework 3.5 SP1 / Microsoft .NET Framework 4.0 (incl. fixes)
- From DataMiner 9.5.6 onwards: Microsoft .NET Framework 4.5.2
- From DataMiner 9.6.0 onwards: Microsoft .NET Framework 4.6.2

Recommended:

- We recommend to always upgrade to the latest .NET Framework version.

NOTE:	When you connect to DataMiner using HTTPS, TLS 1.0 is required to install Cube. It is also possible to use TLS 1.1 or TLS 1.2, but in that case Microsoft .NET Framework 4.6.2 is required.

Skyline certificates

To install the Skyline certificates:

1. Depending on your setup, go to either of the following URLs, replacing [DMA] with the IP address or name of the DataMiner Agent:

```
http://[DMA]/tools
https://[DMA]/tools
```

2. Under "DataMiner Tools," Click *Register Skyline Certificates*, and then click *Run*.

NOTE:	• The tool will try to install the certificates for all users of the computer. If this is not possible because of insufficient rights, it will try to install the certificates for the current user only. • When the installation is complete, a message "Certificates have been installed (current user)" or "Certificates have been installed (all users)" will be displayed. • This tool (SLRegCerts.exe) also supports a "/silent" option which suppresses any message box output, so that it can be used in automatic installations.

Web browser

If DataMiner Cube will be run as a web application instead of a desktop application, then the following web browser has to be installed:

- Microsoft Internet Explorer (v9.0 or above)

Optional software

Web Services Enhancements (WSE) 2.0 SP3 for Microsoft .NET

- Optional package, only to be installed if the client will connect to DataMiner servers using web services instead of .NET Remoting.

Microsoft Visio (Standard or Professional, version 2003 or later)

- Optional software, only to be installed for users who will be creating or adapting Microsoft Visio drawings.

3. DataMiner metrics

The specifications provided below are provided as a guide to help dimension DataMiner platforms. They are in no way guaranteed. Also, take care when combining specifications. For example, it is impossible to run 1000 regular elements next to 100,000 EPM (formerly CPE) devices on a single DMA.

All specifications are provided based on the assumption that DMAs are running on physical servers that comply with the DataMiner hardware requirements.

#	Specification	Scope	Maximum	Remarks
1	Number of elements	DMA	5 - 1,000	Depending on the license (highest license is 1,000).
2	Number of elements	DMS	25,000	
3	Number of standard services	DMS	10,000	This specification only applies to standard services. To enhanced services and SLAs, the element specification applies.
4	Number of concurrent active alarms	DMS DataMiner Cube	10,000	DataMiner Cube will enter protection mode when the number of alarms increases above this limit. In protection mode, the system will remain fully functional. However, not all active alarms will be pushed to the client. Note: This setting is configurable. 10,000 is the recommended default value.
5	Number of concurrent active alarms	DMA	25,000	
6	Number of SNMP traps per second received on a DMA continuously	DMA	400	
7	Number of SNMP traps per second received on a DMA in burst mode	DMA	1,000	
8	Number of DVEs	DMA	2,000 - 10,000	Depending on the type of device.
9	Number of EPM (formerly CPE) devices	DMA	100,000	Based on a 15-minute update cycle.
10	Number of views	DMS	8,000	
11	Number of parameters	DMA	10,000,000	
12	Number of configured users	DMS	1,000	
13	Number of online users	DMS	100	Assuming common user behavior.
14	Switch frequency	DataMiner Failover	1 switch every 15 minutes	
15	Number of concurrent active tickets	DMS	10,000	

4. Supported Cassandra architectures

At present, Skyline only supports DataMiner setups in which each DataMiner Agent uses a dedicated Cassandra cluster. This Cassandra cluster can consist of one or more Cassandra nodes.

Architectures in which several DataMiner Agents are simultaneously sharing the same Cassandra cluster are currently not supported.

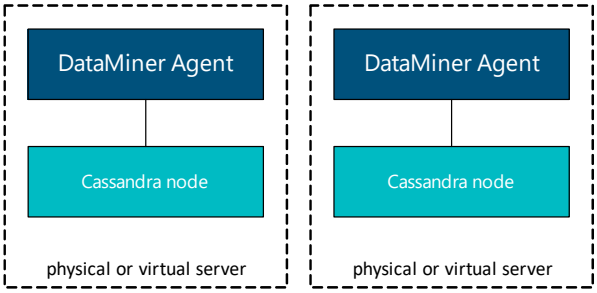
NOTE:

- A DataMiner Failover system can be considered a special case. In such a system, two redundant DataMiner Agents share the same two-node Cassandra cluster. For more information, see *"DataMiner Failover" on page 14* and "Failover" in DataMiner Help.
- When a DataMiner Agent and its Cassandra node(s) are hosted on different servers, network quality is of the utmost importance.
- Even if the Cassandra database is hosted on a separate machine, it is still the DMA's "local database". If you want an external program to do queries on the database, this is not possible with a local database. In that case, you should instead retrieve the data from a central database. Refer to the "Central database" section in the DataMiner Help for more information.
- Cassandra nodes can be hosted on servers running an OS other than Microsoft Windows. Note, however, that Skyline does not offer support for non-Windows systems.
- Do not place the Cassandra database on a network attached storage (NAS) device or in a shared network file system (NFS). Such a setup is not supported by Cassandra.

For more information on the different supported setups, see the sections below.

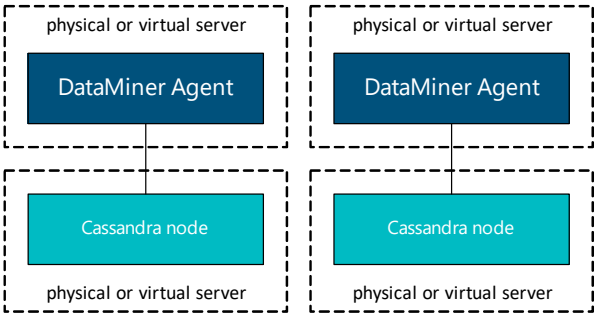
4.1 DataMiner Agent and Cassandra node on the same server

By default, a DataMiner Agent uses a single Cassandra node that is hosted on the same physical or virtual server.



4.2 DataMiner Agent and Cassandra node on separate servers

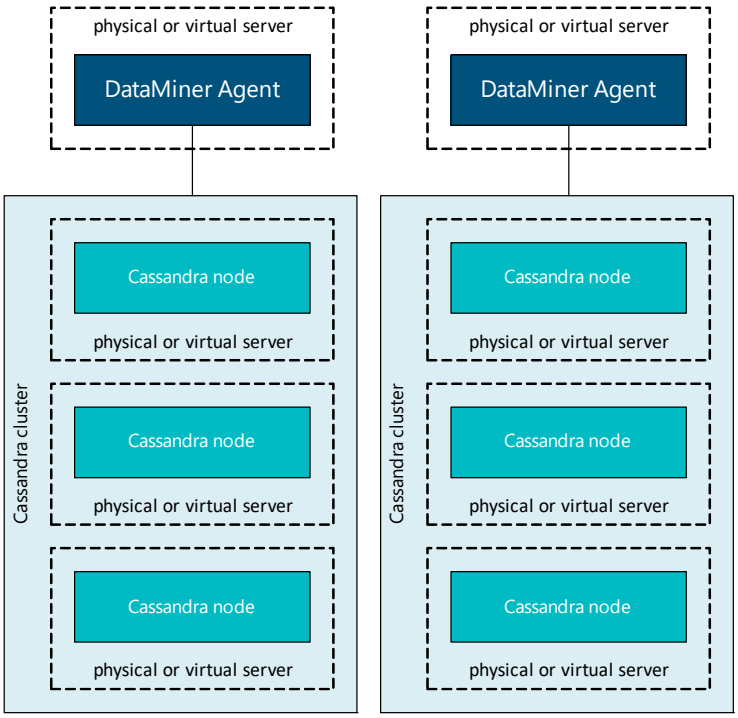
In order to increase overall performance, a DataMiner Agent can use a single Cassandra node that is hosted on a separate server.



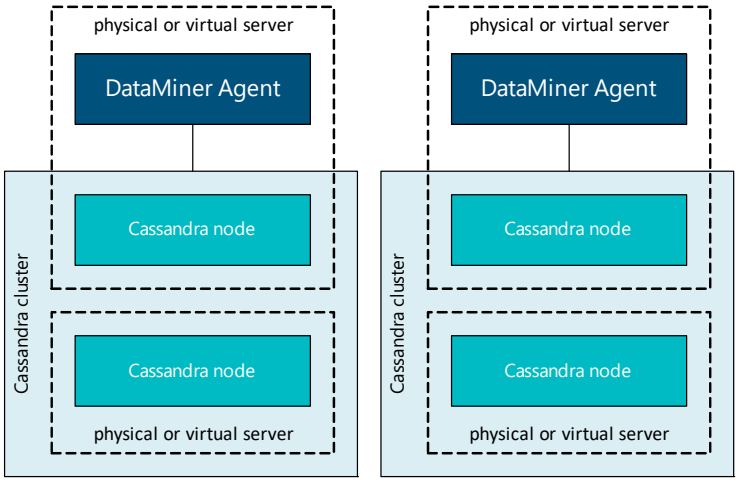
4.3 DataMiner Agent and Cassandra cluster

In case of high requirements as to storage and redundancy, a DataMiner Agent can use a multi-node Cassandra cluster spread over a number of separate servers.

Compared to setups as described in *"DataMiner Agent and Cassandra node on separate servers" on page 13*, this type of setup offers an even greater increase in performance and storage capacity, as well as various options as to data redundancy (in which case the data backup can be omitted from the DataMiner automatic backup, making the latter faster and more efficient).

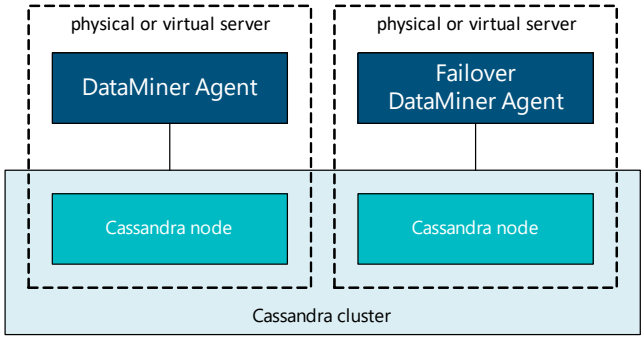


Note that it is also possible to cluster additional Cassandra nodes on separate servers with a Cassandra node on a DataMiner Agent. See below. At any time, additional Cassandra nodes can be added to a cluster to further increase the overall storage capacity.



4.4 DataMiner Failover

In a DataMiner Failover system, two redundant DataMiner Agents share the same two-node Cassandra cluster. Note, however, that at any given moment, only one of the two DataMiner Agents is accessing the Cassandra cluster.



For more information on DataMiner Failover systems, see "Failover" in DataMiner Help.

NOTE:	Only DataMiner Agents with a single Cassandra node are currently supported for use in a DataMiner Failover configuration. If DataMiner Agents with two or more Cassandra nodes are joined in a Failover configuration, this could result in unexpected behavior.

5. Health assessment guidelines for DataMiner Agents

Monitoring the health of a DataMiner Agent requires attention for several key metrics, including but not necessarily limited to processor load, physical memory and commit charge, disk space, disk busy time, network throughput, threads, virtual bytes, handles, database queue, etc. While it is not possible to provide an exact definition for when a DMA reaches its limits, the following guidelines should be considered for individual metrics.

5.1 Guidelines

- **Processor Load**:

  The average CPU level should not exceed 60%.

  If it does exceed 60%, the DMA will indicate a warning. If the average CPU level exceeds 80%, the alarm state of the DMA will be set to critical.

- **Physical Memory & Commit Charge**:

  A minimum of 25% of physical memory should be available on average.

  If less than 25% is available, the DMA will indicate a warning. If less than 12.5% of physical memory is available, the alarm state of the DMA will be set to critical.

- **Disk Space**:

  A minimum of 10 GB of space should be available for a system in full operation.

  If less than 10 GB is available, the DMA will indicate a warning. If less than 5 GB of space is available, the alarm state of the DMA will be set to critical.

- **Disk Busy Time**:

  The disk busy time should be less than 40% on average.

  If it does exceed 40%, the DMA will indicate a warning. If the disk busy time exceeds 70%, the alarm state of the DMA will be set to critical.

- **Avg. Disk sec/Transfer:**

  The Avg. Disk sec/Transfer rate should be lower than 10 ms.

  If it becomes more than 10 ms, the DMA will indicate a warning. If the Avg. Disk sec/Transfer rate exceeds 20 ms, the alarm state of the DMA will be set to critical.

NOTE:	Failing to operate within the above guidelines may cause operational problems with your DataMiner system, which are not covered under warranty or maintenance and support.

5.2 Remarks

- It is recommended to consult Skyline Communications for a system health assessment whenever any of the above-mentioned metrics reaches the specified threshold.
- Note that breaches of individual metrics do not necessarily translate to an overall system overload, and that sometimes certain configuration changes or architecture changes can effectively return the system to normal.
- Typically, Skyline also recommends configuring DataMiner to monitor its own servers, and to dispatch a comprehensive email report every 24 hours with trend information about some of the key metrics such as CPU, memory, etc.

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