

SOLARWINDS TECHNICAL REFERENCE

APM Exchange Template Pack

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Document Revised: 03/18/2011

Overview

These templates allow you to monitor all necessary counters and services for Exchange 2007 and Exchange 2010.

Basic versus Advanced Templates

These templates are divided into two categories:

- Basic
- Advanced

The templates in the *Basic* category contain templates with basic counters and services for monitoring both versions of Exchange: Exchange 2007 and Exchange 2010. These templates should work out of the box. Counters in this category have well documented thresholds and do not require any additional configuration. Each of the templates in the basic category has `(Basic)` at the end of its name.

The templates in the *Advanced* category contain other performance and statistics counters. You can use these templates in addition to the basic templates if the information from the basic templates is not sufficient to monitor the server. The advanced templates are provided for a specific Exchange version, as indicated by the template name. For example, the Exchange 2007 Mailbox Role Counters (Advanced) template applies to Exchange 2007 only. Some of the counters will require manual configuration, such as specific instances, correcting thresholds for your environment, and so forth. Each of the templates in the advanced category has `(Advanced)` at the end of its name.

There is also the Exchange 2007-2010 Common Performance Counters template. This template contains general counters (CPU usage, available memory, LDAP times, and so forth) that can be used in all server roles. This template will require manual configuration similar to that required by the advanced templates.

Typical Usage Scenario

Assume that you need to monitor an Exchange 2010 installation with Mailbox Role.

First you should apply the Exchange 2007-2010 Mailbox Role Services and Counters (Basic) template. As a result, you will have the statuses for critical Exchange services (up or down) and information from general performance counters for this role. If you need system level general performance counters (CPU usage, available memory, and so forth) you can also apply the Exchange 2007-2010 Common Performance Counters template, but you will need to correct some counters manually according to your environment (see the documentation for the Exchange 2007-2010 Common Performance Counters template).

If the information provided by the basic template is not enough, you need to additionally apply the Exchange 2010 Mailbox Role Counters (Advanced) template. After applying this template, you may need to modify some thresholds and instances according to your environment. Then you should receive full performance and statistics information for this Exchange role.

Exchange 2007-2010 Client Access Role Services and Counters (Basic)

This template contains basic performance counters and services for monitoring the Exchange 2007 and 2010 Client Access Role. This template is designed to work out of the box and does not require any additional configuration. If you need more detailed monitoring, you should use it in combination with the Exchange 2007 (or 2010) Client Access Role Counters (Advanced) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters and services are based on the following information:

- *Monitoring Client Access Server: Exchange 2007 Help:* "Microsoft TechNet": [http://technet.microsoft.com/en-us/library/bb201674\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201674(EXCHG.80).aspx)
- *Client Access Server Counters: Exchange 2010 Help:* "Microsoft TechNet": <http://technet.microsoft.com/en-us/library/ff367877.aspx>.

Service: Exchange Active Directory Topology

Provides Active Directory topology information to Exchange services. If this service is stopped, most Exchange services are unable to start. This service has no dependencies.

Service: Exchange File Distribution Service

Distributes offline address book (OAB) and custom Unified Messaging prompts. This service is dependent on the Microsoft Exchange Active Directory Topology and Workstation services.

Service: Exchange IMAP4

Provides IMAP4 service to clients. If this service is stopped, clients will not be able to connect to this computer using the IMAP4 protocol. This service is dependent upon the Microsoft Exchange Active Directory Topology service.

Service: Exchange Monitoring

Allows applications to call the Exchange diagnostic cmdlets. This service has no dependencies.

Service: Exchange POP3

Provides POP3 service to clients. If this service is stopped, clients cannot connect to this computer using the POP3 protocol. This service is dependent on the Microsoft Exchange Active Directory Topology service.

Service: Exchange Service Host

Provides a host for several Exchange services. On internal server roles, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent upon the Microsoft Exchange ADAM service.

Average Search Time

Shows the average time that elapsed while waiting for a search to complete.

Should be less than 5,000 milliseconds (ms) at all times.

Average Time to Process a Free Busy Request

Shows the average time to process a free/busy request in seconds. One request may contain multiple mailboxes. Free/busy responses do not have meeting suggestions.

Should always be less than 5.

Requests Queued

Shows the number of HTTP requests waiting to be assigned to a thread.

Average of 50–100.

Download Task Queued

Shows the number of OAB download tasks queued since the File Distribution service started.

Should be 0 at all times.

Values greater than 0 indicate a failure to copy OAB data files from Mailbox servers.

Exchange 2007-2010 Mailbox Role Services and Counters (Basic)

This template contains basic performance counters and services for monitoring Exchange 2007 and 2010 Mailbox Role. This template is designed to work out of the box and does not require any additional configuration. If you need more detailed monitoring you should use it in combination with the Exchange 2007 (2010) Mailbox Role Counters (Advanced) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters and services are based on the following information:

- Monitoring Mailbox Servers: Exchange 2007 Help, "Microsoft TechNet": [http://technet.microsoft.com/en-us/library/bb201689\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201689(EXCHG.80).aspx)
- Mailbox Server Counters: Exchange 2010 Help, "Microsoft TechNet": <http://technet.microsoft.com/en-us/library/ff367871.aspx>

Service: Exchange Active Directory Topology

Provides Active Directory topology information to Exchange services. If this service is stopped, most Exchange services are unable to start. This service has no dependencies.

Service: Exchange Information Store

Manages the Exchange Information Store. This includes mailbox databases and public folder databases. If this service is stopped, mailbox databases and public folder databases on this computer are unavailable. If this service is disabled, any services that explicitly depend on it will fail to start. This service is dependent on the RPC, Server, Windows Event Log, and Workstation services.

Service: Exchange Mail Submission Service

Submits messages from the Mailbox server to Exchange Hub Transport servers. This service is dependent on the Microsoft Exchange Active Directory Topology service.

Service: Exchange Mailbox Assistants

Performs background processing of mailboxes in the Exchange store. This service is dependent on the Microsoft Exchange Active Directory Topology service.

By default this service is stopped.

Service: Exchange Monitoring

Allows applications to call the Exchange diagnostic cmdlets. This service has no dependencies.

By default this service is stopped.

Service: Exchange Service Host

Provides a host for several Exchange services. On internal server roles, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Service: Exchange System Attendant

Forwards directory lookups to a global catalog server for legacy Outlook clients, generates e-mail addresses and OABs, updates free/busy information for legacy clients, and maintains permissions and group memberships for the server. If this service is disabled, any services that explicitly depend on it will fail to start. This service is dependent on the RPC, Server, Windows Event Log, and Workstation services.

Service: Exchange Replication Service

Provides replication functionality for mailbox databases on Mailbox servers in a database availability group (DAG). This service is dependent on the Microsoft Exchange Active Directory Topology service.

RPC Averaged Latency

Indicates the RPC latency, in ms, averaged for all operations in the last 1,024 packets. For information about how clients are affected when overall server RPC averaged latencies increase, see "Understanding Client Throttling Policies" at <http://technet.microsoft.com/en-us/library/dd297964.aspx>.

Should not be higher than 10 ms on average.

To determine if certain protocols are causing overall RPC latencies, monitor MExchangeIS Client (*)\RPC Average Latency to separate latencies based on client protocol.

Messages Queued for Submission

Shows the current number of submitted messages not yet processed by the transport layer.

Should be below 50 at all times. Should not be sustained for more than 15 minutes.

This may indicate connectivity issues to the transport server.

Database: Log Threads Waiting

Shows the number of threads waiting for their data to be written to the log to complete an update of the database. If this number is too high, the log may be a bottleneck.

Should be less than 10 on average.

Regular spikes concurrent with log record stall spikes indicate that the transaction log disks are a bottleneck. If the value for log threads waiting is more than the spindles available for the logs, there is a bottleneck on the log disks.

Slow Findrow Rate

Shows the rate at which the slower FindRow needs to be used in the mailbox store.

Should be no more than 10 for any specific mailbox store.

Higher values indicate applications are crawling or searching mailboxes, which is affecting server performance. These include desktop search engines, customer relationship management (CRM), or other third-party applications.

RPC Latency average (msec)

Shows the average latency, in ms, of RPC requests. The average is calculated over all RPCs since exrpc32 was loaded.

Should be less than 100 ms at all times.

Replication Receive Queue Size

Shows the number of replication messages waiting to be processed.

Should be less than 100 at all times.

This value should return to a minimum value between replication intervals.

Client: RPCs Failed:Server Too Busy

The client reported a number of failed RPCs (since the store was started) due to the server too busy ROC error.

Should be 0 at all times.

RPC Requests

Indicates the overall RPC requests currently executing within the information store process.

Should be below 70 at all times.

Database: I/O Database Reads Average Latency

Shows the average length of time, in milliseconds, per database read operation.

Should be 20 ms on average. Should show 50 ms spikes.

Database: I/O Database Writes Average Latency

Shows the average length of time, in milliseconds, per database write operation.

Should be 50 ms on average. Spikes of up to 100 ms are acceptable if not accompanied by database page fault stalls.

Exchange 2007-2010 Hub Transport Role Services and Counters (Basic)

This template contains basic performance counters and services for monitoring Exchange 2007 and 2010 Hub Transport Role. This template is designed to work out of the box and does not require any additional configuration. If you need more detailed monitoring, you should use it in combination with the Exchange 2007 (2010) Hub Transport Role Counters (Advanced) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters and services are based on the following information:

- *Monitoring Hub Transport Server: Exchange 2007 Help, "Microsoft TechNet":*
[http://technet.microsoft.com/en-us/library/bb201704\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201704(EXCHG.80).aspx)
- *Transport Server Counters: Exchange 2010 Help, "Microsoft TechNet":*
<http://technet.microsoft.com/en-us/library/ff367923.aspx>

Service: Exchange Active Directory Topology

Provides Active Directory topology information to Exchange services. If this service is stopped, most Exchange services are unable to start. This service has no dependencies.

Service: Exchange EdgeSync

Connects to an AD LDS instance on subscribed Edge Transport servers over a secure LDAP channel to synchronize data between a Hub Transport server and an Edge Transport server. This service is dependent on the Microsoft Exchange Active Directory Topology service. If Edge Subscription is not configured, this service can be disabled.

Service: Exchange Anti-spam Update

Provides the Microsoft Forefront Protection 2010 for Exchange Server anti-spam update service. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Service: Exchange Monitoring

Allows applications to call the Exchange diagnostic cmdlets. This service has no dependencies.

Service: Exchange Transport

Provides SMTP server and transport stack. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Service: Exchange Transport Log Search

Provides remote search capability for Microsoft Exchange Transport log files. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Aggregate Delivery Queue Length (All Queues)

Shows the number of messages queued for delivery in all queues.

Should be less than 3,000 and not more than 5,000.

Active Remote Delivery Queue Length

Shows the number of messages in the active remote delivery queues.

Should be less than 250 at all times.

Active Mailbox Delivery Queue Length

Shows the number of messages in the active mailbox queues.

Should be less than 250 at all times.

Submission Queue Length

Shows the number of messages in the submission queue.

Should not exceed 100.

If sustained high values are occurring, investigate Active Directory and Mailbox servers for bottlenecks or performance-related issues.

Active Non-Smtp Delivery Queue Length

Shows the number of messages in the drop directory used by a Foreign connector.

Should be less than 250 at all times.

Retry Mailbox Delivery Queue Length

Shows the number of messages in a retry state attempting to deliver a message to a remote mailbox.

Should be less than 100 at all times.

Retry Remote Delivery Queue Length

Shows the number of messages in a retry state in the remote delivery queues.

Should not exceed 100.

We recommend that you check the next hop to determine the causes for queuing.

Unreachable Queue Length

Shows the number of messages in the Unreachable queue.

Should not exceed 100.

Poison Queue Length

Shows the number of messages in the poison message queue.

Should be 0 at all times.

Exchange 2007-2010 Edge Transport Role Services and Counters (Basic)

This template contains basic performance counters and services for monitoring Exchange 2007 and 2010 Edge Transport Role. This template is designed to work out of the box and does not require any additional configuration. If you need more detailed monitoring, you should use it in combination with the Exchange 2007 (2010) Edge Transport Role Counters (Advanced) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters and services are based on the following information:

- *Monitoring Edge Transport Server: Exchange 2007 Help, "Microsoft TechNet":*
[http://technet.microsoft.com/en-us/library/ee532088\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/ee532088(EXCHG.80).aspx)
- *Transport Server Counters: Exchange 2010 Help, "Microsoft TechNet":*
<http://technet.microsoft.com/en-us/library/ff367923.aspx>

Service: Exchange ADAM

Stores configuration data and recipient data on the Edge Transport server. This service represents the named instance of Active Directory Lightweight Directory Service (AD LDS) that is automatically created by Setup during Edge Transport server installation. This service is dependent on the COM+ Event System service.

Service: Exchange Anti-spam Update

Provides the Microsoft Forefront Protection 2010 for Exchange Server anti-spam update service. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Service: Exchange Monitoring

Allows applications to call the Exchange diagnostic cmdlets. This service has no dependencies.

Service: Exchange Transport

Provides SMTP server and transport stack. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Service: Exchange Transport Log Search

Provides remote search capability for Microsoft Exchange Transport log files. On Hub Transport servers, this service is dependent on the Microsoft Exchange Active Directory Topology service. On Edge Transport servers, this service is dependent on the Microsoft Exchange ADAM service.

Aggregate Delivery Queue Length (All Queues)

Shows the number of messages queued for delivery in all queues.

Should be less than 3,000 and not more than 5,000.

Active Remote Delivery Queue Length

Shows the number of messages in the active remote delivery queues.

Should be less than 250 at all times.

Active Mailbox Delivery Queue Length

Shows the number of messages in the active mailbox queues.

Should be less than 250 at all times.

Submission Queue Length

Shows the number of messages in the submission queue.

Should not exceed 100.

If sustained high values are occurring, investigate Active Directory and Mailbox servers for bottlenecks or performance-related issues.

Active Non-Smtp Delivery Queue Length

Shows the number of messages in the drop directory used by a Foreign connector.

Should be less than 250 at all times.

Retry Mailbox Delivery Queue Length

Shows the number of messages in a retry state attempting to deliver a message to a remote mailbox.

Should be less than 100 at all times.

Retry Remote Delivery Queue Length

Shows the number of messages in a retry state in the remote delivery queues.

Should not exceed 100.

We recommend that you check the next hop to determine the causes for queuing.

Unreachable Queue Length

Shows the number of messages in the Unreachable queue.

Should not exceed 100.

Poison Queue Length

Shows the number of messages in the poison message queue.

Should be 0 at all times.

Exchange 2007-2010 Unified Messaging Role Services and Counters (Basic)

This template contains basic performance counters and services for monitoring Exchange 2007 and 2010 Unified Messaging Role. This template is designed to work out of the box and does not require any additional configuration. If you need more detailed monitoring, you should use it in combination with the Exchange 2007 (2010) Unified Messaging Role Counters (Advanced) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters and services are based on the following information:

- *Monitoring Unified Messaging Server: Exchange 2007 Help*, "Microsoft TechNet": [http://technet.microsoft.com/en-us/library/bb201671\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201671(EXCHG.80).aspx)
- *Unified Messaging Server Counters: Exchange 2010 Help*, "Microsoft TechNet": <http://technet.microsoft.com/en-us/library/ff367900.aspx>

Service: Exchange Active Directory Topology

Provides Active Directory topology information to Exchange services. If this service is stopped, most Exchange services are unable to start. This service has no dependencies.

Service: Exchange File Distribution Service

Distributes offline address book (OAB) and custom Unified Messaging prompts. This service is dependent on the Microsoft Exchange Active Directory Topology and Workstation services.

Service: Exchange Monitoring

Allows applications to call the Exchange diagnostic cmdlets. This service has no dependencies.

Service: Exchange Speech Engine

Provides speech processing services for Unified Messaging (UM). This service is dependent on the Windows Management Instrumentation (WMI) service.

Service: Exchange Unified Messaging

Enables Microsoft Exchange Unified Messaging features. This allows voice and fax messages to be stored in Exchange and gives users telephone access to e-mail, voice mail, calendar, contacts, or an auto attendant. If this service is stopped, Unified Messaging is not available. This service is dependent on the Microsoft Exchange Active Directory Topology and the Microsoft Exchange Speech Engine service.

Directory Access Failures

Shows the number of times that attempts to access Active Directory failed.

Should be 0 at all times.

Operations over Six Seconds

Shows the number of all UM operations that took more than six seconds to complete. This is the time during which a caller was waiting for UM to respond.

Should be 0 at all times.

Calls Disconnected by Callers During UM Audio Hourglass

Shows the number of calls during which the caller disconnected while Unified Messaging was playing the audio hourglass tones.

Should be 0 at all times.

A nonzero value suggests excessive latency between a Unified Messaging server and targeted domain controller.

Exchange 2007-2010 Common Performance Counters

This template contains common Exchange and OS performance counters (CPU usage, available memory, LDAP times, and so forth) that can be monitored for all Exchange 2007 and 2010 roles. This template requires additional configuration. You can use this template together with other Exchange 2007 and 2010 templates.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Common Counters: Exchange 2007 Help, "Microsoft TechNet":*
[http://technet.microsoft.com/en-us/library/cc671175\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/cc671175(EXCHG.80).aspx)
- *Common Counters: Exchange 2010 Help, "Microsoft TechNet":*
<http://technet.microsoft.com/en-us/library/ff367896.aspx>

% Processor Time

Shows the percentage of time that the processor is executing application or operating system processes. This is when the processor is not idle.

Should be less than 75% on average.

Available Mbytes (memory)

Shows the amount of physical memory, in megabytes (MB), immediately available for allocation to a process or for system use. It is equal to the sum of memory assigned to the standby (cached), free, and zero page lists. For a full explanation of the memory manager, refer to Microsoft Developer Network (MSDN) or "System Performance and Troubleshooting Guide" in the Windows Server 2003 Resource Kit.

Should remain above 100 MB at all times.

.NET CLR Memory: % Time in GC

Shows when garbage collection has occurred. When the counter exceeds the threshold, it indicates that the CPU is cleaning up and is not being used efficiently for load. Adding memory to the server would improve this situation.

Should be below 10% on average.

If this counter increases to a high value, there might be some objects that are surviving Gen 1 garbage collections and being promoted to Gen 2. Gen 2 collections require a full global catalog for clean up. Add other .NET Framework memory counters to determine if this is the case.

.NET CLR Exceptions: # of Excepts Thrown / sec

Displays the number of exceptions thrown per second. These include both .NET Framework exceptions and unmanaged exceptions that get converted into .NET Framework exceptions. For example, the null pointer reference exception in unmanaged code would get thrown again in managed code as a .NET Framework System.NullReferenceException. This counter includes both handled and unhandled exceptions.

Should be less than 5% of total requests per second

Exceptions should only occur in rare situations and not in the normal control flow of the program. This counter was designed as an indicator of potential performance problems due to a large (greater than 100 sec) rate of exceptions thrown. This counter is not an average over time. It displays the difference between the values observed in the last two samples divided by the duration of the sample interval.

LDAP Search Time

Shows the time (in ms) to send an LDAP search request and receive a response.

Should be below 50 ms on average. Spikes (maximum values) should not be higher than 100 ms.

Note: The instance field is *installation-specific*. You need to specify the full DNS name of the Domain Controller (for example: `dc.example.com`).

LDAP Read Time

Shows the time in milliseconds (ms) to send an LDAP read request to the specified domain controller and receive a response.

Should be below 50 ms on average. Spikes (maximum values) should not be higher than 100 ms.

Note: The instance field is *installation-specific*. You need to specify the full DNS name of the Domain Controller (for example: `dc.example.com`).

LDAP Searches timed out per minute

Shows the number of LDAP searches that returned LDAP_Timeout during the last minute.

Should be below 10 at all times for all roles.

Higher values may indicate issues with Active Directory resources.

Note: The instance field is *installation-specific*. You need to specify the full DNS name of the Domain Controller (for example: `dc.example.com`).

Long running LDAP operations/Min

Shows the number of LDAP operations on this domain controller that took longer than the specified threshold per minute. (Default threshold is 15 seconds.)

Should be less than 50 at all times.

Higher values may indicate issues with Active Directory resources.

Note: The instance field is *installation-specific*. You need to specify the full DNS name of the Domain Controller (for example: `dc.example.com`).

Page Reads/sec (memory)

Indicates data must be read from the disk instead of memory. Indicates there is not enough memory and paging is beginning. A value of more than 30 per second means the server is no longer keeping up with the load.

Should be less than 100 on average.

Exchange 2010 Client Access Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2010 Client Access Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Client Access Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters are based on the following information:

- *Client Access Server Counters: Exchange 2010 Help*, "Microsoft TechNet":
<http://technet.microsoft.com/en-us/library/ff367877.aspx>

RPC Operations/sec

Shows the rate at which RPC operations occur, per second.

Referral RPC Requests Average Latency

This is Exchange 2010 address book service counter. Shows the average time, in ms, that referral requests took to complete during the sampling period.

Should be below 1,000 ms.

Requests - Average Response Time

Shows the average time (in ms) the Exchange Control Panel took to respond to a request during the sampling period.

The average should be under 6,000 ms.

ActiveSync: Requests/sec

Shows the number of HTTP requests received from the client via ASP.NET per second.

Determines the current Exchange ActiveSync request rate.

OWA: Current Unique Users

Shows the number of unique users currently logged on to Outlook Web App. This value monitors the number of unique active user sessions, so that users are only removed from this counter after they log off or their session times out.

Determines current user load.

OWA: Requests/sec

Shows the number of requests handled by Outlook Web App per second.

Determines current user load.

Web Service: Current Connections

Shows the current number of connections established with the Web service.

Determines current user load.

Requests - Activations/sec

Shows the number of requests activated per second in the Exchange Control Panel.

Connection Count

This is RPC Client Access load counter. Shows the total number of client connections maintained.

NSPI Connections Current

This is Exchange Address Book load counter. Shows the number of NSPI clients currently connected to the server.

NSPI RPC Requests/sec

This is Exchange Address Book load counter. Shows the rate at which NSPI requests occur each second.

Exchange 2010 Mailbox Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2010 Mailbox Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Mailbox Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Mailbox Server Counters: Exchange 2010 Help*, "Microsoft TechNet":
<http://technet.microsoft.com/en-us/library/ff367871.aspx>

% Processor Time (Exchange Search)

Shows the amount of processor time currently being consumed by the Exchange Search service.

Should be less than 1% of overall CPU typically and not sustained above 5%. Should be less than 10% of what the store process is during steady state.

% Processor Time (Mailbox Assistant)

Shows the amount of processor time being consumed by mailbox assistants.

Should be less than 5% of overall CPU capacity.

Note: If service Exchange Mailbox Assistant is down, this counter should be ignored.

Requests Failed (Resource Booking Attendant)

Shows the total number of failures that occurred while the Resource Booking Attendant was processing events.

Should be 0 at all times.

Requests Failed (Calendar Attendant)

Shows the total number of failures that occurred while the Calendar Attendant was processing events.

Should be 0 at all times.

RPC Requests outstanding

Shows the current number of outstanding RPC requests.

Should be 0 at all times.

RPC Requests failed (%)

Shows the percentage of failed requests in the total number of RPC requests. Failed means the sum of failed with error code plus failed with exception.

Should be 0 at all times.

Hub Servers In Retry

Shows the number of Hub Transport servers in retry mode.

Should be 0 at all times.

RPC Client Backoff/sec

Indicates the rate at which client backoffs are occurring. Higher values may indicate that the server may be incurring a higher load resulting in an increase in overall averaged RPC latencies, causing client throttling to occur. This can also occur when certain client user actions are being performed. Depending on what the client is doing and the rate at which RPC operations are occurring, it may be normal to see backoffs occurring.

Messages Delivered/sec

Shows the rate that messages are delivered to all recipients. Indicates current message delivery rate to the store.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=_Total.

Messages Sent/sec

Shows the rate that messages are sent to transport. Used to determine current messages sent to transport.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=_Total.

User Count

Shows the number of users connected to the information store.

Used to determine current user load.

Mailboxes Processed/sec

Shows the rate of mailboxes processed by time-based assistants per second.

Determines current load statistics for this counter.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of instance. Default value: instance=msexchangemailboxassistants-total.

Events Polled/sec

Shows the number of events polled per second.

Determines current load statistics for this counter.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of instance. Default value: instance=`msexchangemailboxassistants-total`.

Database: Database Page Fault Stalls/sec

Shows the rate that database file page requests require of the database cache manager to allocate a new page from the database cache.

Should be 0 at all times.

If this value is nonzero, this indicates that the database is not able to flush dirty pages to the database file fast enough to make pages free for new page allocations.

Database: Log Record Stalls/sec

Shows the number of log records that cannot be added to the log buffers per second because the log buffers are full. If this counter is nonzero for a long period of time, the log buffer size may be a bottleneck.

The average value should be below 10 per second. Spikes (maximum values) should not be higher than 100 per second.

If I/O log write latencies are high, check for RAID5 or synchronize replication on log devices.

Database: Version buckets allocated

Shows the total number of version buckets allocated.

Should be less than 12,000 at all times.

The maximum default version is 16,384. If version buckets reach 70% of maximum, the server is at risk of running out of the version store.

Database Cache Size (MB)

Shows the amount of system memory, in megabytes (MB), used by the database cache manager to hold commonly used information from the database files to prevent file operations.

Maximum value is RAM-2GB (RAM-3GB for servers with sync replication enabled).

This and Database Cache Hit % are useful counters for gauging whether a server's performance problems might be resolved by adding more physical memory. Use this counter along with store private bytes to determine if there are store memory leaks. If the database cache size seems too small for optimal performance and there is little available memory on the system (check the value of Memory/Available Bytes), adding more memory to the system may increase performance. If there is ample memory on the system and the database cache size is not growing beyond a certain point, the database cache size may be capped at an artificially low limit. Increasing this limit may increase performance.

Note: Set the thresholds as appropriate for your environment.

Average Document Indexing Time

Shows the average, in milliseconds, of how long it takes to index documents.

Should be less than 30 seconds at all times.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=_Total.

Events in queue

Shows the number of events in the in-memory queue waiting to be processed by the assistants.

Should be a low value at all times.

High values may indicate a performance bottleneck.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=msexchangemailboxassistants-total.

Average Event Processing Time in Seconds

Shows the average processing time of the events chosen.

Should be less than 2 at all times.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=msexchangemailboxassistants-total.

Average Resource Booking Processing Time

Shows the average time to process an event in the Resource Booking Attendant.

Should be a low value at all times.

High values may indicate a performance bottleneck.

Average Calendar Attendant Processing time

Shows the average time to process an event in the Calendar Attendant.

Should be a low value at all times.

High values may indicate a performance bottleneck.

Client: RPCs Failed:Server Too Busy/sec

Shows the client-reported rate of failed RPCs (since the store was started) due to the server too busy ROC error.

Should be 0 at all times.

Higher values may indicate RPC threads are exhausted or client throttling is occurring for clients running versions of Outlook earlier than Office Outlook 2007.

Exchange 2010 Hub Transport Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2010 Hub Transport Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Hub Transport Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters are based on the following information:

- *Transport Server Counters: Exchange 2010 Help*, "Microsoft TechNet":
<http://technet.microsoft.com/en-us/library/ff367923.aspx>

Dumpster Size

Shows the total size (in bytes) of mail items currently in the transport dumpster on this server.

Dumpster Inserts/sec

Shows the rate at which items are inserted into the transport dumpster on this server. Determines the current rate of transport dumpster inserts.

Dumpster Item Count

Shows the total number of mail items currently in the transport dumpster on this server. Shows the current number of items being held in the transport dumpster.

Dumpster Deletes/sec

Shows the rate at which items are deleted from the transport dumpster on this server. Determines the current rate of transport dumpster deletions.

I/O Log Writes/sec (database)

Shows the rate of log file write operations completed. Determines the current load. Compare values to historical baselines.

I/O Log Reads/sec (database)

Shows the rate of log file read operations completed. Determines the current load. Compare values to historical baselines.

Log Generation Checkpoint Depth (database)

Represents the amount of work (in count of log files) that needs to be redone or undone to the database files if the process fails.

Should be less than 1,000 at all times.

I/O Database Reads/sec (database)

Shows the rate of database read operations completed. Determines the current load. Compare values to historical baselines.

I/O Database Writes/sec

Shows the rate of database write operations completed. Determines the current load. Compare values to historical baselines.

Messages Submitted Per Second

Shows the number of messages queued in the Submission queue per second. Determines current load. Compare values to historical baselines.

Messages Received/sec

Shows the number of messages received by the SMTP server each second. Determines current load. Compare values to historical baselines.

Messages Sent/sec

Shows the number of messages sent by the SMTP send connector each second. Determines current load. Compare values to historical baselines.

Messages Queued for Delivery Per Second

Shows the number of messages queued for delivery per second. Determines current load. Compare values to historical baselines.

Messages Completed Delivery Per Second

Shows the number of messages delivered per second. Determines current load. Compare values to historical baselines.

Avg. Disk sec/Read (Physical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Physical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Read (Logical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Logical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) shouldn't be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Retry Non-Smtp Delivery Queue Length

Shows the number of messages in a retry state in the non-SMTP gateway delivery queues.

Should not exceed 100.

Largest Delivery Queue Length

Shows the number of messages in the largest delivery queues.

Should be less than 200 for the Edge Transport and Hub Transport server roles.

Version buckets allocated (database)

Total number of version buckets allocated. Shows the default backpressure values as listed in the `edgetransport.exe.config` file.

Should be less than 200 at all times.

Log Record Stalls/sec (database)

Shows the number of log records that cannot be added to the log buffers per second because they are full. If this counter is nonzero most of the time, the log buffer size may be a bottleneck.

Should be less than 10 per second on average. Spikes (maximum values) should not be greater than 100 per second.

Log Threads Waiting (database)

Shows the number of threads waiting for their data to be written to the log to complete an update of the database. If this number is too high, the log may be a bottleneck.

Should be less than 10 threads waiting on average.

Exchange 2010 Edge Transport Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2010 Edge Transport Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Edge Transport Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Transport Server Counters: Exchange 2010 Help*, "Microsoft TechNet":
<http://technet.microsoft.com/en-us/library/ff367923.aspx>

Dumpster Size

Shows the total size (in bytes) of mail items currently in the transport dumpster on this server.

Dumpster Inserts/sec

Shows the rate at which items are inserted into the transport dumpster on this server. Determines the current rate of transport dumpster inserts.

Dumpster Item Count

Shows the total number of mail items currently in the transport dumpster on this server. Shows the current number of items being held in the transport dumpster.

Dumpster Deletes/sec

Shows the rate at which items are deleted from the transport dumpster on this server. Determines the current rate of transport dumpster deletions.

I/O Log Writes/sec (database)

Shows the rate of log file write operations completed. Determines the current load. Compare values to historical baselines.

I/O Log Reads/sec (database)

Shows the rate of log file read operations completed. Determines the current load. Compare values to historical baselines.

Log Generation Checkpoint Depth (database)

Represents the amount of work (in count of log files) that needs to be redone or undone to the database files if the process fails.

Should be less than 1,000 at all times.

I/O Database Reads/sec (database)

Shows the rate of database read operations completed. Determines the current load. Compare values to historical baselines.

I/O Database Writes/sec

Shows the rate of database write operations completed. Determines the current load. Compare values to historical baselines.

Messages Submitted Per Second

Shows the number of messages queued in the Submission queue per second. Determines current load. Compare values to historical baselines.

Messages Received/sec

Shows the number of messages received by the SMTP server each second. Determines current load. Compare values to historical baselines.

Messages Queued for Delivery Per Second

Shows the number of messages queued for delivery per second. Determines current load. Compare values to historical baselines.

Messages Completed Delivery Per Second

Shows the number of messages delivered per second. Determines current load. Compare values to historical baselines.

Avg. Disk sec/Read (Physical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Physical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Read (Logical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) shouldn't be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Logical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) shouldn't be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Retry Non-Smtp Delivery Queue Length

Shows the number of messages in a retry state in the non-SMTP gateway delivery queues.

Should not exceed 100.

Largest Delivery Queue Length

Shows the number of messages in the largest delivery queues.

Should be less than 200 for the Edge Transport and Hub Transport server roles.

Version buckets allocated (database)

Total number of version buckets allocated. Shows the default backpressure values as listed in the `edgetransport.exe.config` file.

Should be less than 200 at all times.

Log Record Stalls/sec (database)

Shows the number of log records that cannot be added to the log buffers per second because they are full. If this counter is nonzero most of the time, the log buffer size may be a bottleneck.

Should be less than 10 per second on average. Spikes (maximum values) should not be greater than 100 per second.

Log Threads Waiting (database)

Shows the number of threads waiting for their data to be written to the log to complete an update of the database. If this number is too high, the log may be a bottleneck.

Should be less than 10 threads waiting on average.

Exchange 2010 Unified Messaging Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2010 Unified Messaging Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Unified Messaging Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Unified Messaging Server Counters: Exchange 2010 Help*, "Microsoft TechNet":
<http://technet.microsoft.com/en-us/library/ff367900.aspx>

Average Call Duration

Average Call Duration is the average duration, in seconds, of calls since the service was started.

Total Calls

Total Calls is the number of calls answered or placed since the service was started. Transfers are not included.

User Response Latency

User Response Latency is the average response time, in milliseconds, for the system to respond to a user request. This average is calculated over the last 25 calls. This counter is limited to calls that require significant processing.

Call Answering Calls

Call Answering Calls is the number of diverted calls that were answered on behalf of subscribers.

Percentage of Successful Valid Fax Calls

Percentage of Successful Valid Fax Calls is the percentage of successful valid fax call requests.

% of Failed Mailbox Connection Attempts Over the Last Hour

Shows the percentage of mailbox connection attempts that failed in the last hour.

Should be less than 5%.

% of Inbound Calls Rejected by the UM Service Over the Last Hour

Shows the percentage of inbound calls that were rejected by the Microsoft Exchange Unified Messaging (UM) service over the last hour.

Should be less than 5%.

% of Inbound Calls Rejected by the UM Worker Process Over the Last Hour

Shows the percentage of inbound calls that were rejected by the UM worker process over the last hour.

Should be less than 5%.

% of Messages Successfully Processed Over the Last Hour

Shows the percentage of messages that were successfully processed by the Microsoft Exchange Unified Messaging service over the last hour.

Should be greater than or equal to 95%.

% of Partner Voice Message Transcription Failures Over the Last Hour

Shows the percentage of voice messages for which transcription failed in the last hour.

Should be less than 5%.

Calls Disconnected on Irrecoverable Internal Error

Shows the number of calls disconnected after an internal system error occurred.

Should be 0 at all times.

Total Inbound Calls Rejected by the UM Service

Shows the total number of inbound calls that were rejected by the Microsoft Exchange Unified Messaging Service since the service was started.

Should be 0 at all times.

Exchange 2007 Client Access Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2007 Client Access Role. Some of counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the 2007-2010 Client Access Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Client Access Server: Exchange 2007 Help*, "Microsoft TechNet": [http://technet.microsoft.com/en-us/library/bb201674\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201674(EXCHG.80).aspx)

Availability Requests (sec)

Shows the number of requests serviced per second. The request can be only for free/busy or include suggestions. One request may contain multiple mailboxes.

Determines the rate at which Availability service requests are occurring.

Average Request Time (Active Sync)

Shows the average time that elapsed while waiting for a request to complete. Includes Ping Request Time, which can increase the general response time of this counter. Adding ping counters helps clarify where performance is being impacted.

Determines the rate at which Availability service requests are occurring.

Requests/sec (Active Sync)

Shows the number of HTTP requests that are received from the client via ASP.NET per second.

Determines the current Exchange ActiveSync request rate.

OWA: Requests/sec

Shows the number of requests handled by Outlook Web Access per second.

Determines current user load.

Current Connections

Shows the current number of connections established with the Web service.

Determines current user load.

ASP.NET: Requests Current

Shows the current number of requests, including those that are queued, currently executing, or waiting to be written to the client. Under the ASP.NET process model, when this counter exceeds the requestQueueLimit defined in the processModel configuration section, ASP.NET will begin rejecting requests.

Should be less than 5,000 at all times.

The maximum value is 5,000. The server will return a 503 error if this value is exceeded. This value can be increased in the `machine.config` file to allow for Client Access server scalability.

ASP.NET: Request Wait Time

Shows the number of milliseconds the most recent request was waiting in the queue.

Should be less than 1,000 milliseconds (ms) at all times.

Disk Reads/sec

Indicates that a paging situation may exist because data was read from disk instead of memory.

Should be less than 50 at all times.

Disk Writes/sec

Indicates that a paging situation may exist because data was written to disk instead of being stored in memory.

Should be less than 50 at all times.

Average Response Time

Shows the average time (in milliseconds) that elapsed between the beginning and end of an OEH or ASPX request.

Should be less than 100 ms at all times.

Used to determine the latency that a client is experiencing. Higher values may indicate high user load or higher than normal CPU time.

Exchange 2007 Mailbox Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2007 Mailbox Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Mailbox Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Mailbox Servers: Exchange 2007 Help*, "Microsoft TechNet":
[http://technet.microsoft.com/en-us/library/bb201689\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201689(EXCHG.80).aspx)

Messages Sent/sec

Shows the rate that messages are sent to transport.

Used to determine current messages sent to transport.

Directory Access: LDAP Reads/sec

Shows the current rate that the Lightweight Directory Access Protocol (LDAP) reads occur while processing requests for the client.

Used to determine the current LDAP read rate per protocol.

Directory Access: LDAP Searches/sec

Shows the current rate that the LDAP searches occur while processing requests for the client.

Used to determine the current LDAP search rate per protocol.

User Count (Information Store)

Shows the number of users connected to the information store.

Used to determine current user load.

% Processor time (Exchange Search)

Shows the amount of processor time that is currently being consumed by the Exchange Search service.

Should be less than 1% of overall CPU typically and not sustained above 5%.

% Processor Time (msftefd)

Shows the amount of processor time that is being consumed to update content indexing within the store process.

Should be less than 10% of what the store process is during steady state.

Full crawls will increase overall processing time, but should never exceed overall store CPU capacity. Check throttling counters to determine if throttling is occurring due to server performance bottlenecks.

Throttling Delay Value

Shows the total time, in milliseconds, a worker thread sleeps before it retrieves a document from the Microsoft Exchange Information Store service. This is set by the throttling monitor thread.

Indicates the current throttling delay value. If this value is nonzero, this indicates a potential server bottleneck causing delay values to be introduced to throttle the rate at which indexing is occurring.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=_total.

% Processor Time (Mailbox Assistants)

Shows the amount of processor time that is being consumed by mailbox assistants.

Should be less than 5% of overall CPU capacity.

Average Event Processing Time in Seconds

Shows the average processing time of the events chosen.

Should be less than 2 at all times.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=msexchangemailboxassistants-total.

Average Resource Booking Processing Time

Shows the average time to process an event in the Resource Booking Attendant.

Should be a low value at all times. High values may indicate a performance bottleneck.

Requests Failed (resource booking)

Shows the total number of failures that occurred while the Resource Booking Attendant was processing events.

Should be 0 at all times.

Average Calendar Attendant Processing time

Shows the average time to process an event in the Calendar Attendant.

Should be a low value at all times. High values may indicate a performance bottleneck.

Requests Failed (calendar attendant)

Shows the total number of failures that occurred while the Calendar Attendant was processing events.

Should be 0 at all times.

Information Store: RPC Requests

Indicates the overall RPC requests that are currently executing within the information store process.

Should be below 70 at all times.

The maximum value in Exchange 2007 is 500 RPC requests that can execute at any designated time before the information store starts rejecting any new connections from clients.

Information Store: RPC Averaged Latency

Indicates the RPC latency, in milliseconds, averaged for all operations in the last 1,024 packets. For information about how clients are affected when overall server RPC averaged latencies increase, see "Understanding Client Throttling" at: <http://go.microsoft.com/fwlink/?LinkId=116695>.

Should not be higher than 25 ms on average.

To determine if certain protocols are causing overall RPC latencies, monitor MExchangeIS Client (*)\RPC Average Latency to separate latencies based on client protocol. Cross-reference MExchangeIS\RPC Client Backoff/sec to ensure higher latencies are not causing client throttling.

Information Store: RPC Client Backoff/sec

Shows the rate that the server notifies the client to back off. Indicates the rate at which client backoffs are occurring. Higher values may indicate that the server may be incurring a higher load resulting in an increase in overall averaged RPC latencies, causing client throttling to occur. This can also occur when certain client user actions are being performed. Depending on what the client is doing and the rate at which RPC operations are occurring, it may be normal to see backoffs occurring.

Database: Database Page Fault Stalls/sec

Shows the rate that database file page requests require of the database cache manager to allocate a new page from the database cache.

This should be 0 at all times.

If this value is nonzero, this indicates that the database is not able to flush dirty pages to the database file fast enough to make pages free for new page allocations.

Database: Log Record Stalls/sec

Shows the number of log records that cannot be added to the log buffers per second because the log buffers are full. If this counter is nonzero most of the time, the log buffer size may be a bottleneck.

The average value should be below 10 per second.

Spikes (maximum values) should not be higher than 100 per second.

Database: Version buckets allocated

Shows the total number of version buckets allocated.

Should be less than 12,000 at all times.

The maximum default version is 16,384. If version buckets reach 70 percent of maximum, the server is at risk of running out of the version store.

Database Cache Size (MB)

Shows the amount of system memory, in megabytes, used by the database cache manager to hold commonly used information from the database files to prevent file operations. If the database cache size seems too small for optimal performance and there is little available memory on the system (check the value of Memory/Available Bytes), adding more memory to the system may increase performance. If there is ample memory on the system and the database cache size is not growing beyond a certain point, the database cache size may be capped at an artificially low limit. Increasing this limit may increase performance.

Maximum value is RAM-2GB (RAM-3GB for servers with sync replication enabled). This and Database Cache Hit % are extremely useful counters for gauging whether a server's performance problems might be resolved by adding more physical memory.

Use this counter along with store private bytes to determine if there are store memory leaks.

Note: Set the thresholds as appropriate for your environment.

Average Document Indexing Time

Shows the average, in milliseconds, of how long it takes to index documents.

Should be less than 30 seconds at all time.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value: instance=_total.

Events in queue

Shows the number of events in the in-memory queue waiting to be processed by the assistants.

Should be a low value at all times. High values may indicate a performance bottleneck.

Note: In the instance field, you can specify your own mailbox database or use the default value. Use **perfmon.exe** to determine the name of the instance. Default value:
instance=msexchangemailboxassistants-total.

RPC Latency average (msec)

Shows the average latency, in milliseconds, of RPC requests. The average is calculated over all RPCs since exrpc32 was loaded.

Should be less than 100 ms at all times.

Failed Submissions Per Second

Shows the number of failed submissions per second.

Should be 0 at all times.

Exchange 2007 Hub Transport Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2007 Hub Transport Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Hub Transport Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Hub Transport Server: Exchange 2007 Help*, "Microsoft TechNet": [http://technet.microsoft.com/en-us/library/bb201704\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201704(EXCHG.80).aspx)

Dumpster Size

Shows the total size (in bytes) of mail items currently in the transport dumpster on this server.

Dumpster Inserts/sec

Shows the rate at which items are inserted into the transport dumpster on this server. Determines the current rate of transport dumpster inserts.

Dumpster Item Count

Shows the total number of mail items currently in the transport dumpster on this server. Shows the current number of items being held in the transport dumpster.

Dumpster Deletes/sec

Shows the rate at which items are deleted from the transport dumpster on this server. Determines the current rate of transport dumpster deletions.

I/O Log Writes/sec (database)

Shows the rate of log file write operations completed. Determines the current load. Compare values to historical baselines.

I/O Log Reads/sec (database)

Shows the rate of log file read operations completed. Determines the current load. Compare values to historical baselines.

Log Generation Checkpoint Depth (database)

Represents the amount of work (in count of log files) that needs to be redone or undone to the database files if the process fails.

Should be less than 1,000 at all times.

I/O Database Reads/sec (database)

Shows the rate of database read operations completed. Determines the current load. Compare values to historical baselines.

I/O Database Writes/sec

Shows the rate of database write operations completed. Determines the current load. Compare values to historical baselines.

Messages Submitted Per Second

Shows the number of messages queued in the Submission queue per second. Determines the current load. Compare values to historical baselines.

Messages Received/sec

Shows the number of messages received by the SMTP server each second. Determines the current load. Compare values to historical baselines.

Messages Sent/sec

Shows the number of messages sent by the SMTP send connector each second. Determines the current load. Compare values to historical baselines.

Messages Queued for Delivery Per Second

Shows the number of messages queued for delivery per second. Determines the current load. Compare values to historical baselines.

Messages Completed Delivery Per Second

Shows the number of messages delivered per second. Determines the current load. Compare values to historical baselines.

Avg. Disk sec/Read (Physical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Physical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Read (Logical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Logical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Retry Non-Smtp Delivery Queue Length

Shows the number of messages in a retry state in the non-SMTP gateway delivery queues.

Should not exceed 100.

Largest Delivery Queue Length

Shows the number of messages in the largest delivery queues.

Should be less than 200 for the Edge Transport and Hub Transport server roles.

Version buckets allocated (database)

Total number of version buckets allocated. Shows the default backpressure values as listed in the `edgetransport.exe.config` file.

Should be less than 200 at all times.

Log Record Stalls/sec (database)

Shows the number of log records that cannot be added to the log buffers per second because they are full. If this counter is nonzero most of the time, the log buffer size may be a bottleneck.

Should be less than 10 per second on average. Spikes (maximum values) should not be greater than 100 per second.

Log Threads Waiting (database)

Shows the number of threads waiting for their data to be written to the log to complete an update of the database. If this number is too high, the log may be a bottleneck.

Should be less than 10 threads waiting on average.

Exchange 2007 Edge Transport Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2007 Edge Transport Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Edge Transport Role Services and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Edge Transport Server: Exchange 2007 Help*, "Microsoft TechNet":
[http://technet.microsoft.com/en-us/library/ee532088\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/ee532088(EXCHG.80).aspx)

Dumpster Size

Shows the total size (in bytes) of mail items currently in the transport dumpster on this server.

Dumpster Inserts/sec

Shows the rate at which items are inserted into the transport dumpster on this server. Determines the current rate of transport dumpster inserts.

Dumpster Item Count

Shows the total number of mail items currently in the transport dumpster on this server. Shows the current number of items being held in the transport dumpster.

Dumpster Deletes/sec

Shows the rate at which items are deleted from the transport dumpster on this server. Determines the current rate of transport dumpster deletions.

I/O Log Writes/sec (database)

Shows the rate of log file write operations completed. Determines the current load. Compare values to historical baselines.

I/O Log Reads/sec (database)

Shows the rate of log file read operations completed. Determines the current load. Compare values to historical baselines.

Log Generation Checkpoint Depth (database)

Represents the amount of work (in count of log files) that needs to be redone or undone to the database files if the process fails.

Should be less than 1,000 at all times.

I/O Database Reads/sec (database)

Shows the rate of database read operations completed. Determines the current load. Compare values to historical baselines.

I/O Database Writes/sec

Shows the rate of database write operations completed. Determines the current load. Compare values to historical baselines.

Messages Submitted Per Second

Shows the number of messages queued in the Submission queue per second. Determines the current load. Compare values to historical baselines.

Messages Received/sec

Shows the number of messages received by the SMTP server each second. Determines the current load. Compare values to historical baselines.

Messages Queued for Delivery Per Second

Shows the number of messages queued for delivery per second. Determines the current load. Compare values to historical baselines.

Messages Completed Delivery Per Second

Shows the number of messages delivered per second. Determines the current load. Compare values to historical baselines.

Avg. Disk sec/Read (Physical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Physical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Read (Logical Disk)

Shows the average time, in seconds, of a read of data from the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Avg. Disk sec/Write (Logical Disk)

Shows the average time, in seconds, of a write of data to the disk.

Should be less than 20 milliseconds (ms) on average. Spikes (maximum values) should not be higher than 50 ms.

Note: When looking at hard disks using **perfmon.exe**, an understanding of the underlying hard disk subsystem is required to determine which counters (physical disk or logical disk) to look at.

Retry Non-Smtp Delivery Queue Length

Shows the number of messages in a retry state in the non-SMTP gateway delivery queues.

Should not exceed 100.

Largest Delivery Queue Length

Shows the number of messages in the largest delivery queues.

Should be less than 200 for the Edge Transport and Hub Transport server roles.

Version buckets allocated (database)

Total number of version buckets allocated. Shows the default backpressure values as listed in the `edgetransport.exe.config` file.

Should be less than 200 at all times.

Log Record Stalls/sec (database)

Shows the number of log records that cannot be added to the log buffers per second because they are full. If this counter is nonzero most of the time, the log buffer size may be a bottleneck.

Should be less than 10 per second on average. Spikes (maximum values) should not be greater than 100 per second.

Log Threads Waiting (database)

Shows the number of threads waiting for their data to be written to the log to complete an update of the database. If this number is too high, the log may be a bottleneck.

Should be less than 10 threads waiting on average.

Exchange 2007 Unified Messaging Role Counters (Advanced)

This template contains advanced performance and statistics counters for monitoring Exchange 2007 Unified Messaging Role. Some of the counters may require manual configuration, such as setting up installation-specific instances, correcting thresholds for the client's environment, and so forth. Use this template in addition to the Exchange 2007-2010 Unified Messaging Role Service and Counters (Basic) template.

Prerequisites: RPC and WMI access to the Exchange server.

Credentials: Windows Administrator on the target server.

Monitored Components

These performance counters are based on the following information:

- *Monitoring Unified Messaging Server: Exchange 2007 Help*, "Microsoft TechNet":
[http://technet.microsoft.com/en-us/library/bb201671\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb201671(EXCHG.80).aspx)

Queued OCS User Event Notifications

Shows the number of notifications that have been created and not yet submitted for delivery.

Should be 0 at all times.

Represents the number of missed call notifications that have been generated in the Office Communications Server environment and have not been submitted for delivery.

Unhandled Exceptions/sec

Shows the number of calls that were disconnected after an internal system error occurred in the last second.

Should be 0 at all times.

Mailbox Server Access Failures

Shows the number of times the system did not access a Mailbox server.

Should be 0 at all times.

A non-zero value indicates that Unified Messaging is having problems with MAPI connectivity to mbx servers.

Call Answer Queued Messages

Shows the number of messages created and not yet submitted for delivery.

Should be less than 50 at all times.

Hub Transport Access Failures

Shows the number of times that attempts to access a Hub Transport server failed. This number is only incremented if all Hub Transport servers were unavailable.

Should be 0 at all times.