

Basic monitoring of MS SQL servers' performance on Windows OS is realized by performance counters. There's a large number of them, we've selected a few of the most important ones and we also add configuration procedure for monitoring of any custom performance counter.

1. SQL Memory, Page splits, users v1.1 (template)

SQL Total Memory - currently used memory by the SQL server (from dedicated RAM)

SQL Target memory - **dedicated** max. RAM for the SQL server, this value can be found in the Task Manager

SQL Memory Usage % - percentage of the currently used RAM from a target value (if it's near 100%, it means you need to add RAM to the server)

SQL Page splits / sec - it's a specific amount of operations per second at memory management by the SQL server. If the values in cells exceed a certain size, the SQL server must split them among several memory pages - hence the name "Page split". If it happens too often, it slows down the SQL server's operation. (*indicatively, even a few dozens for a few GB database is a bad number*). This can be removed by maintenance of the SQL server by an SQL specialist

SQL User connections - number of connections to the SQL server, for you to be able to tell if the performance parameters are adequate to number of users

[Setup can be found be below in the article](#)

2. SQL Transactions and Deadlocks v1.1. (template)

SQL Active Transactions - one or more changes actively executed in the database at the time of value reading. It's a field, for which you should choose limit values empirically, since it depends on the application.

SQL Deadlocks - deadlock occurs, when two processes try to update the same record or a record file

[Setup can be found be below in the article](#)

3. Custom performance counter

It's possible to monitor any other performance counter using the Watch condition Performance counter.

[An example of setup is given below in the article](#)

Monitoring setup through templates

Both Watches from the above stated templates are configured directly on the WIN server with SQL server. You must enter its name or instance into the wizard. It's the only parameter that you will enter. Reading of the very performance counters happens directly on OS with the SQL server.

The following images capture the most important setup steps. The others are very similar to other Watches.

1. Setup of Watch through template SQL Memory, Page splits, users

The template is described in [introduction of the article](#), and we only further describe important points of setup .

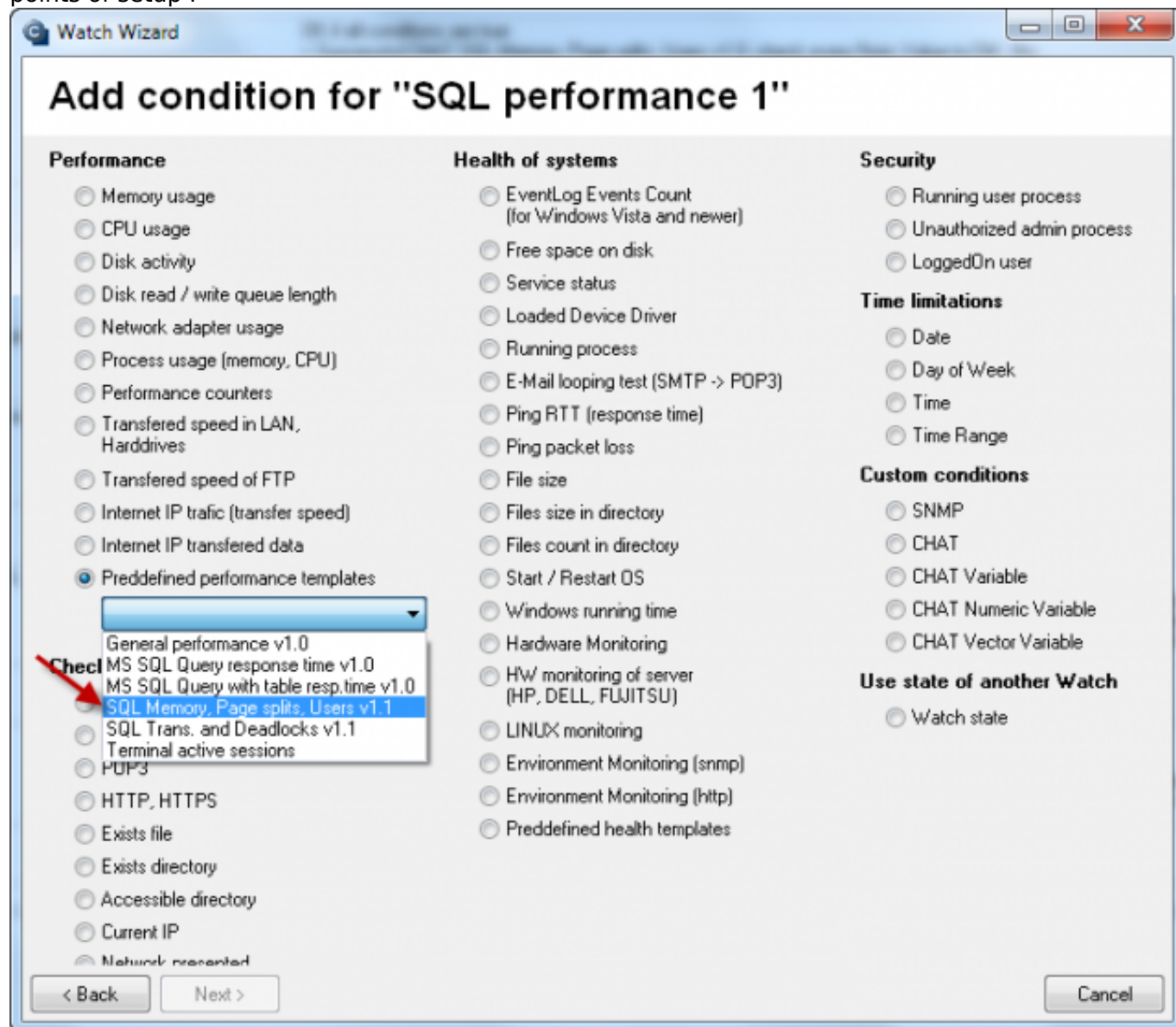


Image: Výber šablóny k meraniu obsadenia RAM, počet operácií Page splits /sec, počet aktívnych SQL spojení.

Watch Wizard

SQL Memory, Page splits, Users v1.1

Script Name
SQL Memory, Page splits, Users v1.1

Script

| Parameter | Value |
|--------------|--------------------------|
| Sql instance | SQLSERVER or MSSQL\$NAME |

Help Test, Edit Script

Operation: Successful Test Period: 5 Unit: min

Value from this condition send to CM server

☐ Always
☒ Never

☐ Assess the state of watch

< Back Next > Cancel

Image: Políčko pre zadanie názvu SQL servera alebo inštancie v rámci sprievodcu (pre znovu otvorenie tohto dialógu urobte dvojité kliknutie na prvú podmienku v CHATe)

Name selection for the SQL instance, it's usually SQLSERVER for the first one, and for the other it's usually MSSQL\$instance_name.

Watch Wizard

Conditions for "SQL performance 1"

| | |
|---|---|
| 1 | Successful CHAT SQL Memory, Page splits, Users v1.1 Check every 5min None value will be sent to CM Server |
| 2 | CHAT Var. "TotalMem" (SQL Total Memory kB) > 0 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 50000 |
| 3 | CHAT Var. "TargetMem" (SQL Target Memory kB) > 0 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 50000 |
| 4 | CHAT Var. "MemUsage" (SQL Memory Usage %) < 102 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 5 |
| 5 | CHAT Var. "PageSplits" (SQL Page splits / sec) < 250 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 20 |
| 6 | CHAT Var. "UserCon" (SQL User connections) < 300 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 3 |

State of watch is **OK** if all conditions are true **FAIL** - if at least one condition is false

☒ Delay for FAIL state. Conditions for FAIL state must be met at least

Note: Watches are active from 5 min after the operating system start

Image: Dokončenie nastavenia Watchu môžete spraviť s definovaním akcií alebo ich preskočiť.

Admin zóna | Prehliadanie a Vyhodnotenie | Customer Desk

Watches (Online monitoring)

Spoločnosť: Počítač & miestnosť: Zoradiť podľa: CM ID
 Meno Watchu: Current status: Zoradiť ako: Vzhľadne
 Operátor: Zobrazíť: ☒ True ☒ False ☒ Unknown ☐ Vypnúť watche ☐ Len online PC

| SQL MEM Page S Users | 10. Mar 2013 08:44:19 | OK - because all conditions are true |
|--|-----------------------|---|
| SQL Total Memory KB 9930848150000 | | TRUE - successful CHAT "SQL Memory, Page splits, Users v1.1" (10.3.2013 8:44) |
| SQL Target Memory KB 99798888150000 | | TRUE - CHAT Var. "TotalMem" (SQL Total Memory KB (9930848150000)) > 0 |
| SQL Memory Usage % 9055 | | TRUE - CHAT Var. "TargetMem" (SQL Target Memory KB (99798888150000)) > 0 |
| SQL Page splits / sec 3020 | | TRUE - CHAT Var. "MemUsage" (SQL Memory Usage % (9055)) < 102 |
| SQL User connections 4913 | | TRUE - CHAT Var. "PageSplits" (SQL Page splits / sec (3020)) < 250 |
| | | TRUE - CHAT Var. "UserCon" (SQL User connections (4913)) < 300 |
| | | Delay for FAILED state is 2m |

Image: Ukážka z Watchu zo šablóny SQL Memory, Page splits, users

2. Setup of Watch through template SQL Transactions and Deadlocks

The template is described in [introduction of the article](#), and we only further describe important points of setup .

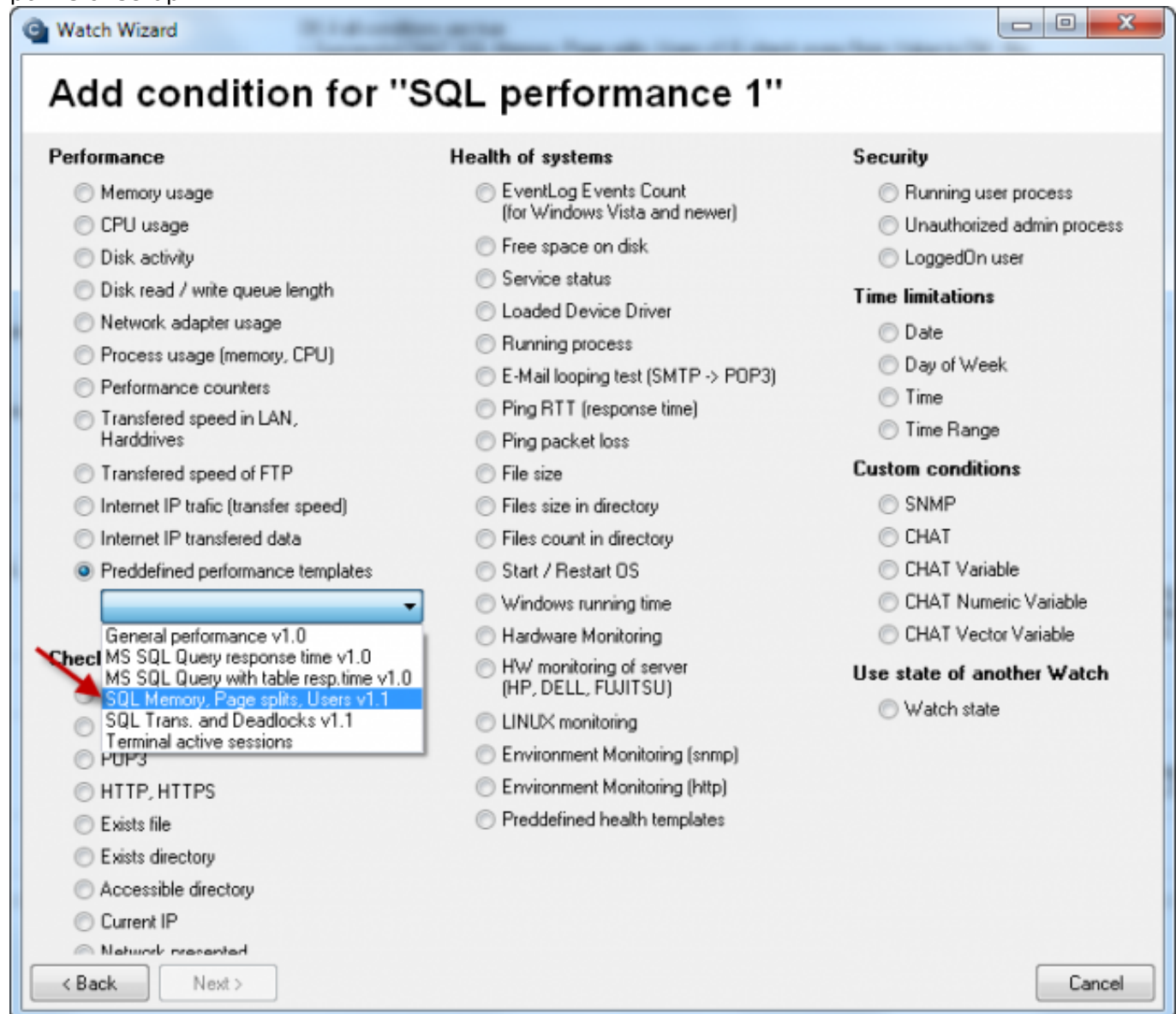


Image: Výber šablóny k meraniu počtu SQL transakcií, deadlockov a kontrola služieb

Watch Wizard

SQL Trans. and Deadlocks v1.1

Script Name
SQL Trans. and Deadlocks v1.1

Script

| Parameter | Value |
|--------------|--------------------------|
| Sql instance | SQLSERVER or MSSQL\$NAME |

Test, Edit Script

Operation: Successful Test Period: 1 Unit: min

Value from this condition send to CM server
☒ Always
☐ Never

☐ Assess the state of watch

< Back Next > Cancel

Image: Políčko pre zadanie názvu SQL servera alebo inštancie v rámci sprievodcu (pre znovu otvorenie tohto dialógu urobte dvojité kliknutie na prvú podmienku v CHATe)

Name selection for the SQL instance, it's usually SQLSERVER for the first one, and for the other it's usually MSSQL\$instance_name.

Watch Wizard

Conditions for "SQL Performance Counters 02"

| | |
|---|---|
| 1 | Successful CHAT SQL Trans. and Deadlocks v1.1 Check every 1min Each value will be sent to CM Server |
| 2 | CHAT Var. "ActivTrans" (SQL Active Transactions) < 1000 Check on each watch state evaluation Value will be sent to CM Server only if change to last sent value is more than 5 |
| 3 | CHAT Var. "DeadLocks" (SQL deadlocks / sec) < 10 Check on each watch state evaluation Each value will be sent to CM Server |
| 4 | Service Status "MSSQLSERVER" is "Running" Check on each watch state evaluation Each value will be sent to CM Server |
| 5 | Service Status "SQLBrowser" is "Running" Check on each watch state evaluation Each value will be sent to CM Server |

State of watch is **OK** if all conditions are true **FAIL** - if at least one condition is false

☐ Delay for FAIL state. (Useful for suppressing short term FAIL state)

Note: Watches are active from 5 min after the operating system start

Image: Dokončenie nastavenia Watchu môžete spraviť s definovaním akcií alebo ich preskočiť.

Watches (Online monitoring)

| Spoločnosť | Počítač & Inštalovanie | Zoradiť podľa | Zoradiť Watches podľa | Rozvidu |
|-------------|------------------------|---------------|--|---|
| Meno Watchu | Current status | Zoradiť ako | Vzostupne | Zoradiť Watches ako |
| Operátor | Zobrazíť | Pod sieťou | <input checked="" type="checkbox"/> True <input checked="" type="checkbox"/> False <input checked="" type="checkbox"/> Unknown | <input type="checkbox"/> Vypnúť watche <input type="checkbox"/> Len online PC |

SQL transactions deadlocks

OK - because all conditions are true

- TRUE - successful CHAT "SQL Trans. and Deadlocks v1.1" (10. 3. 2013 9:43:50)
- TRUE - CHAT Var. "ActivTrans" : SQL Active Transactions (0) < 1000
- TRUE - CHAT Var. "DeadLocks" : SQL deadlocks / sec (0) < 10

Image: Ukážka z Watchu zo šablóny SQL transactions and Deadlocks

3. Setup of performance counters for monitoring of SQL of custom choice

Setup is realized by direct configuration of a Watch without the wizard. After opening the Watch and dialog for adding condition, choose the condition **Performance counter**. Then find the required Watch. To help you find it, we give you a hint that counters for SQL are among other counters, in alphabetical order, starting with name of the SQL instance. For a single or the first instance, it's SQLSERVER, for other instances it's MSSQL\$instance_name.

After selection of the counter, you must choose a unit of the expected value. Unfortunately, you must choose it manually, because it cannot be read from the system, it's usually just a part of the counter's description in different forms. On the other hand, you get an option to convert the value from the counter to a more acceptable number (e.g. from high, difficultly read numbers in Bytes, to smaller, easily read MB or GB). Then enter a Friendly name, which will appear on CM Portal, and which you should choose to know what you're monitoring.

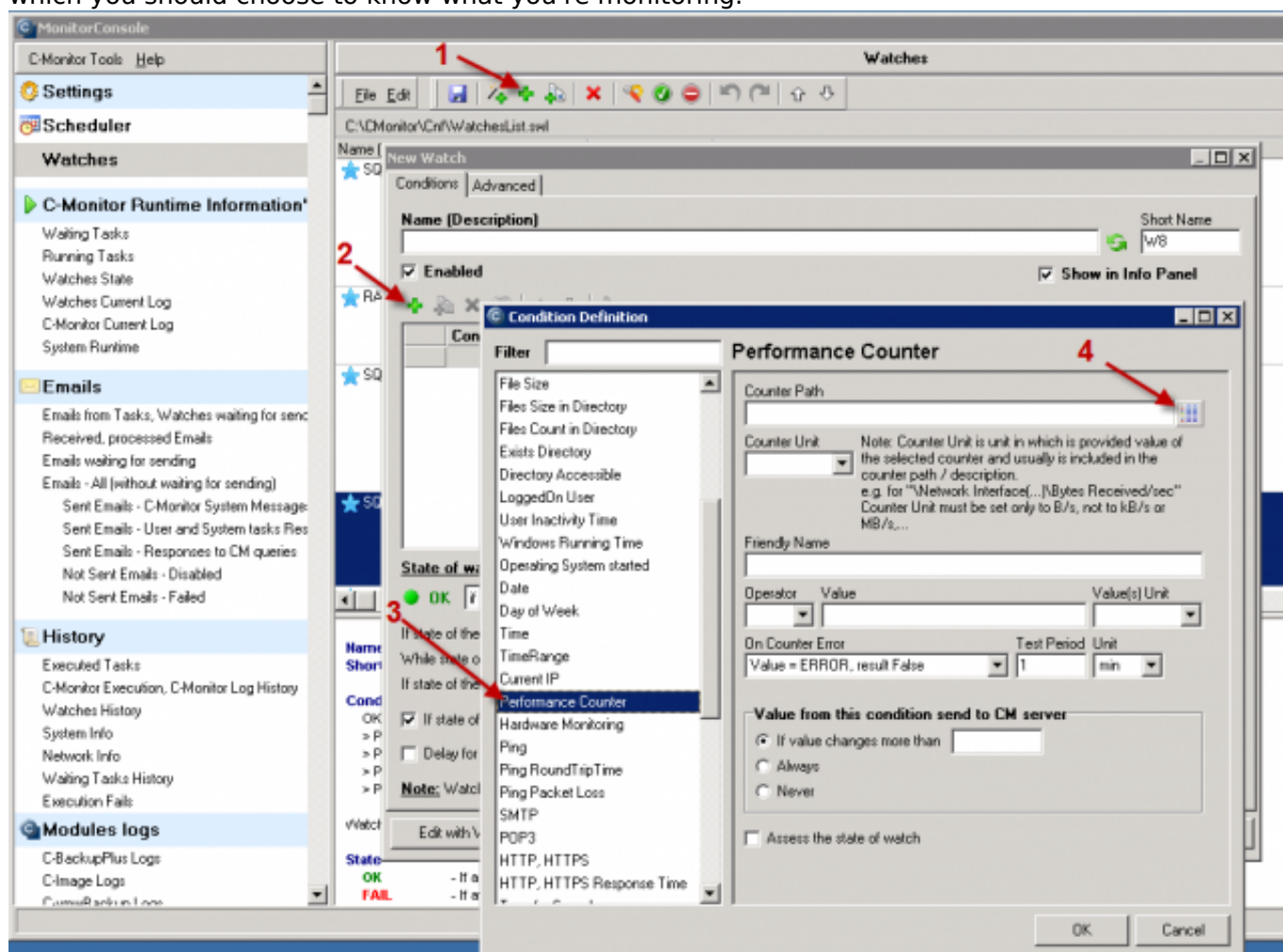


Image: Postup k vytvoreniu Watchu na sledovanie zvoleného countra bez sprievodcu

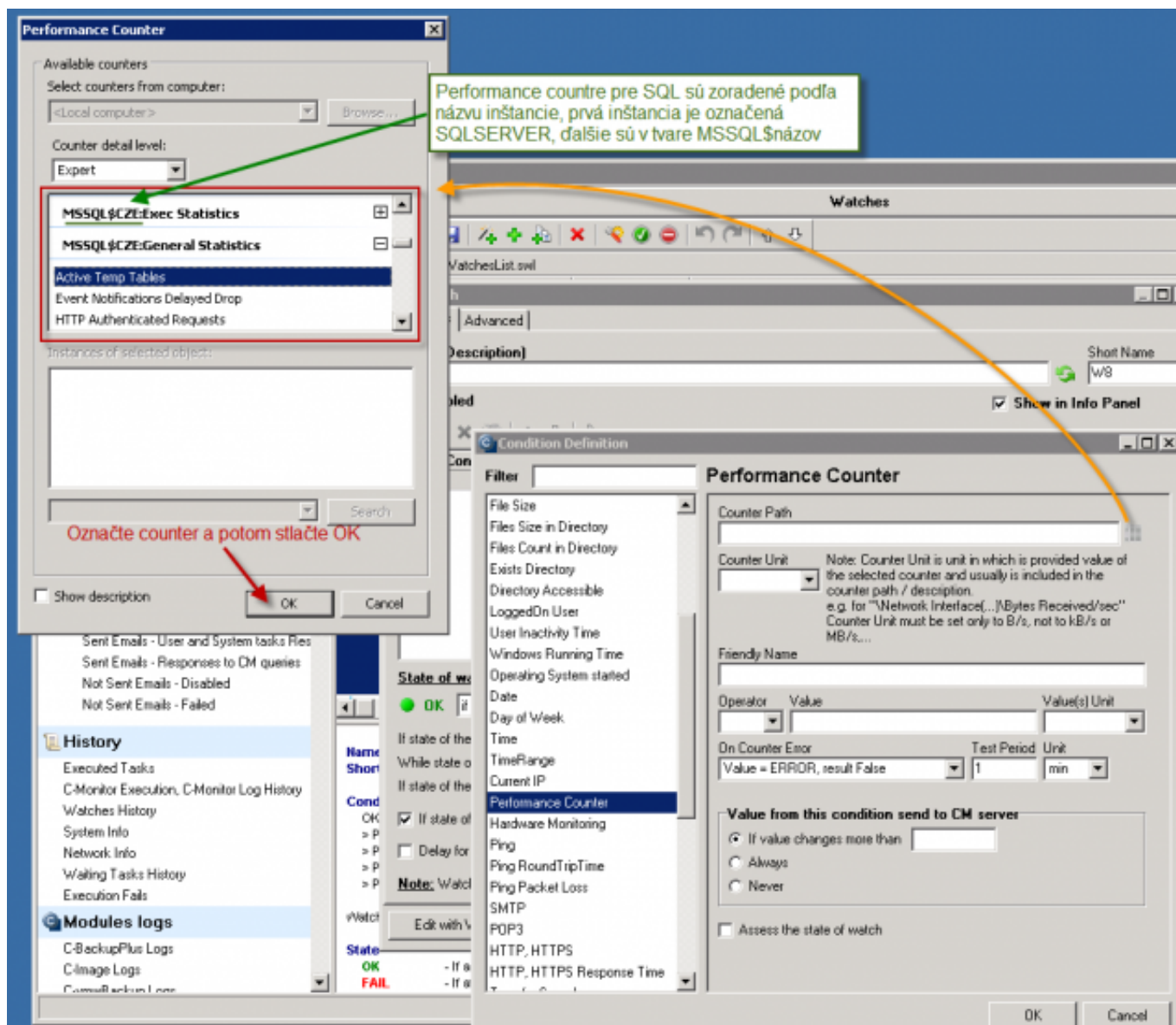


Image: Výber performance countra v systémovom dialógu

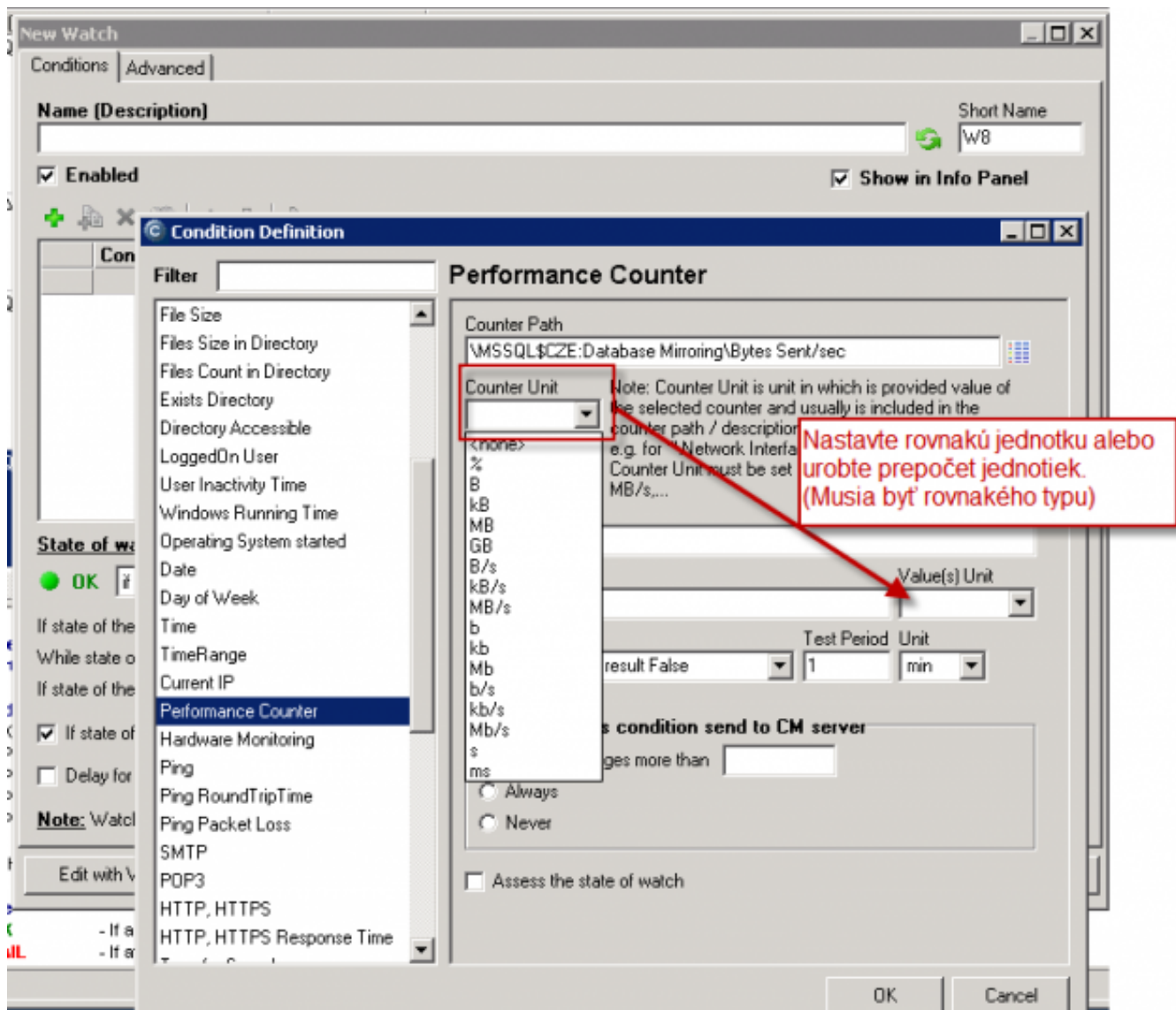


Image: Voľba jednotky performance countra a jednotky na zobrazenie v CM (s automatickým prepočtom jednotiek)

Condition Definition

Filter

- CPU Usage
- Disk Activity
- Disk Queue Length
- Network Adapter Usage
- Internet IP Traffic
- Internet IP Transferred Data
- Free Space On Disk
- Exists File
- File Size
- Files Size in Directory
- Files Count in Directory
- Exists Directory
- Directory Accessible
- LoggedOn User
- User Inactivity Time
- Windows Running Time
- Operating System started
- Date
- Day of Week
- Time
- TimeRange
- Current IP
- Performance Counter**

Performance Counter

Counter Path: \\MSSQL\$CZE:Database Mirroring\Bytes Sent/sec

Counter Unit: B/s

Note: Counter Unit is unit in which is provided value of the selected counter and usually is included in the counter path / description.
e.g. for '\\Network Interface\Bytes Total/sec' Counter Unit must be MB/s....

Friendly Name: DB Mirroring Sent data

Operator: < Value: 5 Value(s) Unit: MB/s

On Counter Error: Value = ERROR, result False Test Period: 1 Unit: min

Value from this condition send to CM server

☒ If value changes more than 0.01 MB/s

☐ Always

☐ Never

☐ Assess the state of watch

OK Cancel

Image: Príklad : Nastavený counter, ktorý má jednotku B/s, ale zobrazenie v CM Portáli bude v MB/sec pod zrozumiteľnejším Friendly názvom a do CM Servera bude posiadaná hodnota len, keď sa zmení aspoň o 10kB/sec a malé zmeny zbytočne neplnia databázu v CM Server



Image: Ukážka v CM Portáli vlastného výberu performance countrov pre sledovanie SQL výkonu

Date:
03/06/2013



[1]



[2]



[3]



[4]



[5]



[6]



[7]



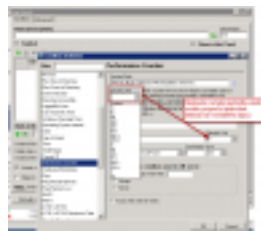
[8]



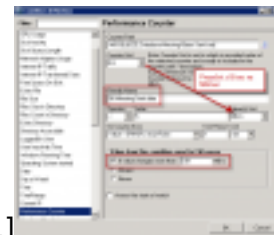
[9]



[10]



[11]



[12]

Links

[1] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre_Wizard01_select_templates.png

[2] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre_Wizard02_insert_data.png

[3] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre_Wizard03_skip_action.png

[4] https://customermonitor.eu/sites/default/files/SQL_performance_counters_podla_sablony_Memory_Pagesplit_Users_Ukazka.png

[5] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre_Wizard01_select_templates_0.png

[6] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre02_Wizard02_insert_data.png

[7] https://customermonitor.eu/sites/default/files/SQL_Performance_Countre02_Wizard02_skip_actions.png

[8] https://customermonitor.eu/sites/default/files/SQL_performance_counters_podla_sablony_Transactions_Deadlocks_Ukazka.png

[9] https://customermonitor.eu/sites/default/files/SQL_counters_vlastny_vyber_zaciatok_nastavenia.png

[10] https://customermonitor.eu/sites/default/files/SQL_counters_vlastny_vyber_selekcia_countru.png

[11] https://customermonitor.eu/sites/default/files/SQL_counters_vlastny_vyber_selekcia_jednotky_z_countra_a_na_zobrazenie.png

[12] https://customermonitor.eu/sites/default/files/SQL_counters_vlastny_vyber_komentovany_priklad.png

[13] https://customermonitor.eu/sites/default/files/SQL_counters_vlastny_vyber_Ukazka_v_CMportali.png