CHƯƠNG 9:

Giám sát hoạt động hệ thống

Tham khảo: Chapter 10: **Monitoring SQL Server**

Mục tiêu chương 9:

Học viên phải biết, hiểu và thực hiện được các nội dung sau:

- Giám sát hoạt động hệ thống
- Tìm ra nguyên nhân hư hỏng
- Tối ưu hóa hoạt động

Mục đích giám sát hệ thống (Monitoring and Optimization)

Giám sát SQL Server 2008 để nhằm 5 mục đích giám sát:

- Tài nguyên hệ thống (System resources)
- Bản thân chương trình SQL Server (SQL Server itself)
- CSDL (The database)
- Các ứng dụng CSDL (The database application)
- Mạng (The network)

Chiến lược tối ưu hoá hệ thống (Optimization Strategy):

1. Tạo một ngưỡng cho là tốt để đánh giá (Create a performance baseline)
2. Cân chỉnh để không bị rớt xa khỏi ngưỡng vừa tạo (Complete periodic performance audits)
3. Thay đổi và đánh giá kết quả đạt được (Make changes and evaluate their impact)
4. Tạo lại ngưỡng đánh giá mới (Reset the baseline)

Mad clicker

Tạo một ngưỡng cho là tốt để đánh giá (Create a performance baseline)

ĐỌC THÊM:

Dùng phép định lượng (Performance Counters):

1. Processor Counters
    - *Processor: % Processor Time*

As a general rule, if total % Processor Time is consistently greater than 70 percent, you probably have a CPU bottleneck, and you should look at either optimizing current application processes, upgrading the CPU, or both.

- *Process: % Processor Time (sqlservr)*

- *System: Processor Queue Length*

If the average queue length is consistently greater than two times the number of processors, then you may have a CPU bottleneck, because the processors can't keep up with the number of requests.

2. Disk Counters
    - *PhysicalDisk: Avg. Disk Queue Length*

This counter should remain below the number of physical disks multiplied by two. For example, if your database is located on a 10-disk array, the counter should remain below 20.

- *PhysicalDisk: % Disk Time*

The % Disk Time counter shouldn't consistently run at more than 60 percent. If it does, check out the % Disk Read and % Disk Write counters to determine what type of activity the disk is primarily performing.

3. Memory Counters
    - *Memory: Pages/Sec*

The Pages/Sec counter measures the number of pages per second that are paged out of memory to disk, or paged into memory from disk. The official recommendation for this counter is that it should never be consistently greater than zero.

- *Memory: Available Bytes*

The official recommendation is that there should always be at least 5MB of available memory, but this is a particularly low number, and it should probably be at least 10 times as much.

- *Process:Working Set (sqlservr)*

The SQL Server instance of the Working Set counter shows how much memory is in use by SQL Server.

- *SQL Server: Buffer Manager: Buffer Cache Hit Ratio*

The Buffer Cache Hit Ratio counter measures the percentage of time that data was found in the buffer without having to be read from disk. This counter should be very high, optimally 90 percent or better. When it is less than 90 percent, disk I/O will be too high, putting added burden on the disk subsystem.

- *SQL Server: Buffer Manager: Page Life Expectancy*

The Page Life Expectancy counter returns the number of seconds a data page will stay in the buffer without being referenced by a data operation. The minimum value for this counter is approximately 300 seconds.

4. Network Counters
   - *Network Interface: Bytes Total/Sec*

The Bytes Total/Sec counter measures the total number of bytes that are being sent back and forth between the server and the network.

5. SQL Server Counters
   - *SQL Server: General Statistics: User Connections*

The User Connections counter displays the number of user connections that are currently connected to SQL Server.

- *SQL Server: Locks: Average Wait Time*

The Average Wait Time counter is an excellent counter to monitor and track the average amount of time that user requests for data resources have to wait because of concurrent blocks to the data.

- *SQL Server: Locks: Deadlocks/Sec*

Deadlocks occur when two or more transactions hold a lock on different resources and the transactions require access to the resources held by the opposing transaction

- *SQL Server Access Methods: Page Splits/sec*

page splits occur when SQL Server attempts to insert a row in a clustered or non-clustered index page, but there is not sufficient space available to accommodate the new row.

Dynamic Management Views

- **sys.dm_os_performance_counters**
- **sys.dm_db_index_physical_stats**
- **sys.dm_db_index_usage_stats**

Công cụ và kỹ thuật giám sát (Tools and Techniques for Monitoring Performance)

- Log File Viewer: xem thông tin log file
- Activity Monitor: công cụ xem thông tin các process
- System Stored Procedures: xem thông tin các process
  - sp_who (9 cột)
  - sp_who2 (13 cột, cột spid lặp 2 lần)
- SQL Server Locking
  - sp_lock: xem thông tin lock của từng process (sp_lock *spid*)
- KILL: hủy process (lệnh: kill *spid*)
- Using Profiler: giám sát theo trace
- Detect and Analyze Long Running Queries with Profiler
- Using the Database Tuning Advisor (DTA)
- Using the DTA with Profiler
- Monitoring Files
- Disk Usage Report
- Monitoring Files with Performance Monitor

Giám sát việc chỉnh sửa CSDL (Monitoring Database Modifications)

- Data Definition Language (DDL) Triggers