Monitoring SQL Server

Module Overview

Introduction to Monitoring SQL Server •

Dynamic Management Views and Functions •

Performance Monitor •

Lesson 1: Introduction to Monitoring SQL Server

SQL Server Monitoring Overview •

Monitoring Tools for SQL Server •

Activity Monitor •

Demonstration: Using Activity Monitor •

SQL Server Monitoring Overview

- Why monitor?
  - Diagnose causes of performance issues
  - Detect and resolve concurrency problems
  - Identify changing trends in resource utilization
- Guidelines for monitoring
  - Understand the workloads you need to support
  - Establish a baseline
  - Monitor regularly to track changes in key metrics

Monitoring Tools for SQL Server

- Activity Monitor
- Dynamic Management Views and Functions
- Performance Monitor
- SQL Server Profiler
- SQL Trace
- Database Engine Tuning Advisor
- Distributed Replay
- SQL Server Data Collection
- SQL Server Utility Control Point
- Microsoft System Center Operations Manager

Activity Monitor

- Shows information about:
  - SQL Server processes
  - Waits
  - I/O
  - Resource performance
  - Expensive queries

- Requires VIEW SERVER STATE permissions

Demonstration: Using Activity Monitor

In this demonstration, you will see how to:

- View server activity in Activity Monitor
- Troubleshoot a blocked process

Dynamic Management Views and Functions

Overview of Dynamic Management Views and Functions •

Viewing Activity by Using Dynamic Management Views •

Demonstration: Querying Dynamic Management Views •

Overview of Dynamic Management Views and Functions

- Virtual views and functions that provide dynamic system data at server and database level

Category	Description
sys.dm_exec_%	Execution and connection information
sys.dm_os_%	Operating system related information
sys.dm_tran_%	Transaction management information
sys.dm_io_%	I/O related information
sys.dm_db_%	Database information

Viewing Activity by Using Dynamic Management Views

- Must reference using the sys schema
- Two basic types:
  - Real-time state information
  - Historical information

```
SELECT s.original_login_name, s.program_name,
        t.wait_type, t.wait_duration_ms
FROM sys.dm_os_waiting_tasks AS t
INNER JOIN sys.dm_exec_sessions AS s
ON t.session_id = s.session_id
WHERE s.is_user_process = 1
AND t.wait_duration_ms > 3000;

SELECT * FROM sys.dm_os_wait_stats
ORDER BY wait_time_ms DESC;
```

Demonstration: Querying Dynamic Management Views

In this demonstration, you will see how to:

- View SQL Server service configuration settings
- View storage volume statistics
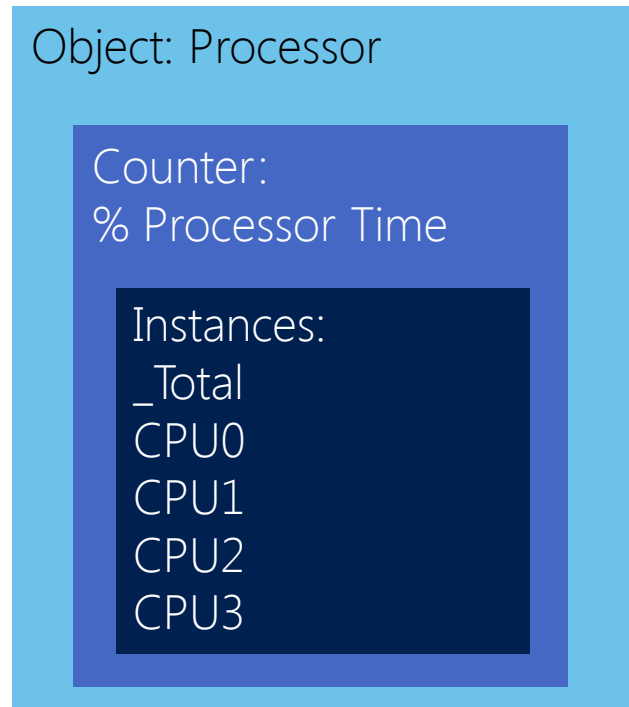- View query statistics

Lesson 3: Performance Monitor

Introduction to Performance Monitor •

SQL Server Counters •

Data Collector Sets and Logs •

Demonstration: Using Performance Monitor •

Introduction to Performance Monitor

- Collects and displays system metrics
  - Objects: system resource categories
  - Counters: Metrics that can be measured
  - Instances: Individual instances of multi-instance objects

- Charts and Reports
  - Line chart
  - Histogram bar chart
  - Text-based report

Object: Processor

Counter:
% Processor Time

Instances:
_Total
CPU0
CPU1
CPU2
CPU3

SQL Server Counters

- SQL Server exposes objects to Performance Monitor
  - **SQLServer:<object>** (default SQL Server instance)
  - **MSSQL$<instance>:<object>** (named SQL Server instance)
  - **SQLAgent$<instance>:<object>** (SQL Server Agent)

- Query performance counters using the **sys.dm_os_performance_counters** DMV

Data Collector Sets and Logs

- Group counters into reusable Data Collector Sets
- Run Data Collector Sets to log counter values
- View logs in Performance Monitor

Demonstration: Using Performance Monitor

In this demonstration, you will see how to:
- View performance counters