Laboratory Course Material No. 3

ITP111– System Administration and Maintenance (Laboratory Manual)

Joseph D. Cartagenas
Course Instructor

Windows Performance Monitor

3

LEARNING OUTCOMES

At the end of this module the student be able to:

1. Understand the fundamental concepts of system performance and monitoring.
2. Proficiently navigate the Windows Performance Monitor interface.
3. Effectively collect performance data from Windows-based system using Performance Monitor.

MODULE CONTENTS

WHAT IS WINDOWS PERFORMANCE MONITOR

The Windows Performance Monitor (also known as PerfMon) is a powerful tool for monitoring and analyzing system performance on Windows operating systems. It allows you to collect and view performance data about various aspects of your computer such as CPU usage, memory usage, disk activity, and more.

Performance Monitor is a versatile tool for diagnosing performance issues, monitoring system health, and optimizing your Windows computer's performance.

Here's how to use Windows Performance Monitor:

1. **Open Performance Monitor**:
    - Press `Win + R` to open the Run dialog.
    - Type `perfmon` and press Enter, or you can also search for "Performance Monitor" in the Start menu and open it from there.
2. **Performance Monitor Interface**:
    - When you open Performance Monitor, you'll see a blank graph with a tree view on the left. The tree view is where you select the performance counters you want to monitor, and the graph displays the data.
3. **Adding Performance Counters**:
    - In the left panel, under "Performance Monitoring Tools," expand "Performance Monitor."
    - Right-click on the graph area and choose "Add Counters."
    - In the "Add Counters" window, you can select counters from various categories like Processor, Memory, Disk, Network, and more. Select the counters you want to monitor and click "Add" for each one.
    - You can add multiple counters at once or add them one by one.
4. **Adjusting Graph Properties**:
    - You can customize the graph by right-clicking on it and selecting "Properties." Here, you can change the appearance and settings of the graph.
5. **Starting Data Collection**:
    - After adding counters, click the "Add" button in the "Add Counters" window.

- Performance Monitor will start collecting and displaying data on the graph.

6. **Viewing and Analyzing Data**:
   - You can view real-time data in the graph, and you can also specify a time range for historical data.
   - The data can be viewed in various formats like line graphs, histograms, or reports.
   - You can also save the collected data for future analysis or export it to a file.
7. **Stopping Data Collection**:
   - To stop collecting data, click the red square "Stop" button in the toolbar.
8. **Saving or Exporting Data**:
   - You can save the performance monitor settings as a Data Collector Set for future use.
   - To export collected data, right-click on the graph, select "Save Data As," and choose a file format (e.g., CSV or HTML).
9. **Creating Alerts (Optional)**:
   - You can set up alerts to notify you when certain performance counters exceed specified thresholds. Right-click on the graph and select "Alerts."
10. **Additional Features**:
    - Performance Monitor has many advanced features, including Data Collector Sets, which allow you to schedule and automate performance monitoring tasks.

USING WINDOWS PERFORMANCE MONITORING TOOLS

Performance monitoring tools are essential for keeping an eye on the health and performance of your computer or server. They help you identify bottlenecks, troubleshoot issues, and optimize resource utilization. Windows Performance Monitor (PerfMon) is just one of the many performance monitoring tools available.

1. **Selecting the Right Tool**:

- Windows Performance Monitor is native to Windows and provides a wide range of performance counters. However, other tools like Resource Monitor, Task Manager, and

third-party applications such as Sysinternals Suite or third-party monitoring software can offer additional features and ease of use.

2. **Understanding Performance Counters**:

- Performance counters are key metrics that monitor various aspects of system performance, such as CPU usage, memory utilization, disk I/O, network traffic, and more.
- It's crucial to understand what each performance counter represents and how it relates to your system's behavior. Microsoft's documentation can help you decipher these counters.

3. **Setting Baselines**:

- Before troubleshooting performance issues, establish performance baselines during normal operation. This way, you can compare current performance data to a known-good state.
- Regularly monitor and update your baselines to account for changes in system usage or hardware upgrades.

4. **Identifying Bottlenecks**:

- Performance monitoring tools help pinpoint bottlenecks or resource constraints. For example, high CPU usage might indicate a CPU bottleneck, while high disk queue lengths could suggest a storage bottleneck.
- Bottlenecks can occur at the CPU, memory, disk, network, or even software levels. Understanding the nature of the bottleneck is crucial for effective troubleshooting.

5. **Analyzing Data**:

- Performance monitoring tools provide data in real-time graphs or reports. Analyze this data to look for trends, anomalies, and correlations.
- Pay attention to patterns that coincide with performance issues, such as high CPU usage during specific tasks or memory leaks over time.

6. **Customizing Alerts**:

- Many performance monitoring tools allow you to set up alerts. Alerts can notify you when a performance counter exceeds a defined threshold. This proactive approach helps you respond to issues before they impact users.
- Be cautious not to set thresholds too low, as it may trigger false alarms.

7. **Logs and Data Storage**:

- Performance monitoring tools often allow you to save collected data to logs or export it to files for future analysis. Storing historical data is valuable for long-term performance analysis and trend identification.

8. **Automation and Scripting**:

- Some tools, including PerfMon and PowerShell, offer scripting capabilities. You can automate data collection, analysis, and alerting tasks to streamline monitoring efforts.

9. **Third-Party Solutions**:

- Consider third-party performance monitoring solutions for more advanced features, scalability, and centralized management in enterprise environments.

10. **Documentation and Knowledge**:

- Regularly document your monitoring practices, configurations, and changes made based on monitoring results. This documentation is invaluable for future reference and troubleshooting.

Performance monitoring tools are essential for maintaining and optimizing system performance. While Windows Performance Monitor is a robust native tool, exploring other options and understanding the principles of performance monitoring can be beneficial, especially in complex or large-scale environments. Effective performance monitoring is an ongoing process that helps ensure your systems run efficiently and reliably.

ASSESSMENT TASK

Assessment Task: Performance Monitoring Tools

Objective: Demonstrate your understanding of performance monitoring tools, their usage, and the ability to analyze and troubleshoot performance issues.

Task Description:

Imagine you are an IT administrator responsible for managing a small network of computers in a business environment. You have been asked to assess and monitor the performance of these computers to ensure they operate optimally. You will need to perform the following steps:

1. **Select a Performance Monitoring Tool:** Choose a performance monitoring (PerfMon) and provide a brief rationale explaining why you think PerfMon is the most suitable for this task.
2. **Define Key Metrics:** Identify at least three critical performance metrics (e.g., CPU usage, memory utilization, disk I/O) that you believe are essential to monitor in your network environment. Explain why these metrics are important.
3. **Configuration and Data Collection:** Using your chosen tool, set up and configure monitoring for the selected metrics. Capture performance data for a specific duration (e.g., one hour) during normal network operation.
4. **Analysis and Troubleshooting:** Analyze the collected performance data. Identify any performance issues, anomalies, or bottlenecks that you observe. Suggest possible reasons for these issues based on your analysis.
5. **Recommendations:** Provide recommendations for addressing the identified performance issues. Explain how the recommended actions could improve system performance.

Grade Rubrics

Criteria	Excellent (20)	Proficient (16)	Adequate (12)	Needs Improvement (8)
Key Metrics Identification and Justification	Identified and justified at least three relevant performance metrics with a clear understanding of their importance.	Identified at least three metrics with basic justification.	Identified metrics but lacked a clear rationale.	Identified incorrect or irrelevant metrics.
Configuration and Data Collection	Successfully set up and configured the monitoring tool, captured data accurately, and presented it effectively.	Set up and configured the tool, but with minor issues in data collection or presentation.	Configuration and data collection were attempted but had significant issues.	Configuration and data collection were attempted but were largely unsuccessful.
Analysis and Troubleshooting	Demonstrated a comprehensive analysis of performance data, identified issues accurately, and provided insightful reasons for the observed problems.	Conducted a reasonable analysis, identified issues, and provided explanations for most of the observed problems.	Performed a basic analysis, identified issues with limited explanations.	Analysis lacked depth, and issues were identified without clear explanations.
Recommendations	Offered well-thought-out recommendations for addressing the identified issues,	Provided recommendations, but they lacked depth or clarity.	Offered basic recommendations without detailed explanations.	Recommendations were unclear or irrelevant to the identified issues.

	demonstrating a deep understanding of solutions.			