Windows Vista: the Diagnostics and Problem Resolution Framework

A Windows Vista Webinar by William R. Stanek

This is the first webinar in a three-part series of webinars on the Windows Vista support architecture from bestselling author and training instructor William Stanek.

William is a leading technology expert, award-winning author, and instructional trainer with over 20 years of experience in server technologies, encryption, Internet solutions, and advanced programming and development. He has written over 65 books and numerous whitepapers and training courses on a wide variety of topics. His most recent books include Microsoft Exchange Server 2007 Administrator's Pocket Consultant 2nd Edition, Microsoft Windows Server 2008 Administrator's Pocket Consultant, and Windows Server 2008 Inside Out. For more information on William's consulting and training courses, you can visit www.WilliamStanek.com.

The books featured here, Windows Vista Administrator's Pocket Consultant and Windows Server 2008 Administrator's Pocket Consultant, are William's highly acclaimed books on Windows Vista and Windows Server 2008 respectively. Most recent customer reviews have called them A Must Have manual, a great reference tool, technically accurate and best of the bunch, and the best manual for administrators.

William's highly popular books and training courses for technical professionals cover Windows Vista, Windows Server 2008, Exchange Server 2007, SQL Server 2005, and Active Directory. In this presentation, William explores one of the least understood areas of the new support architecture in Windows Vista: the diagnostics and problem resolution framework. The presentation examines:

- Built-in diagnostics and troubleshooting
- System recovery and startup repair
- Problem reporting and solutions.
- Related administration tools
- Related Group Policy management settings

This presentation is suitable for IT managers, CIOs, executives, and administrators who are looking for a better understanding of Windows Vista. As many of these same features are in Windows Server 2008, this presentation has a twofold value in that it can also help you prepare for what's in Microsoft's next generation server operating system.

The next 2 webinars in this series covering critical Windows Vista topics: The Windows Boot and Pre-Boot Architecture, and the Windows Vista User Account Control Architecture.

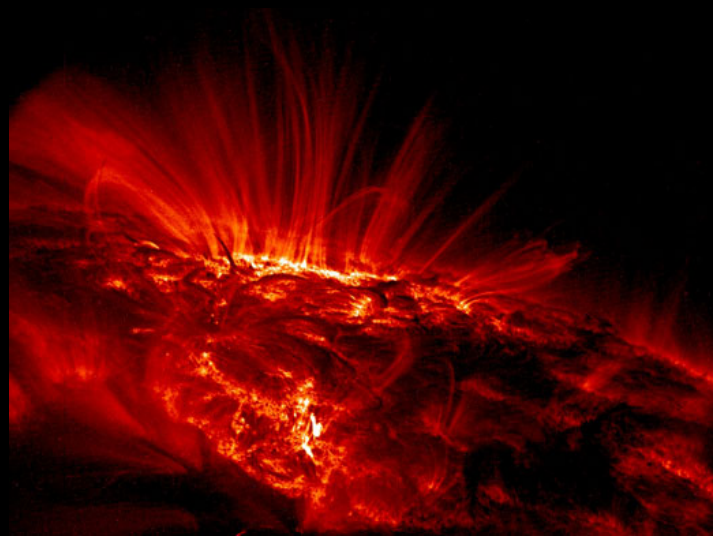
William Stanek's Training Seminars –
www.WilliamStanek.com

Windows Vista Support Architecture:

Diagnostics & Problem Resolution

What we're going to discuss:

- Built-in diagnostics and troubleshooting
- System recovery and startup repair
- Problem reporting and solutions
- Related administration tools
- Related Group Policy settings



Session Objectives

You're in the right place if you are an IT pro who is looking for a better understanding of Windows Vista.

After completing this session, you'll have a better understanding of:

- Built-in diagnostics
- Startup repair
- System recovery
- Troubleshooting

Bottom Line:

- Support framework almost identical in Windows Vista and Windows Server 2008
- IT pros must understand this support architecture to succeed.

Understanding Diagnostics

- What's Broke
- What Works

What's Broke in Windows Vista

- User Account Control
- Network Performance
  - File Transfers
  - Remote Copy
- Printer Drivers
  - Slow performance
  - Poor driver support
- Audio Playback
  - Can affect performance
  - Poor driver support

Built-in Diagnostics

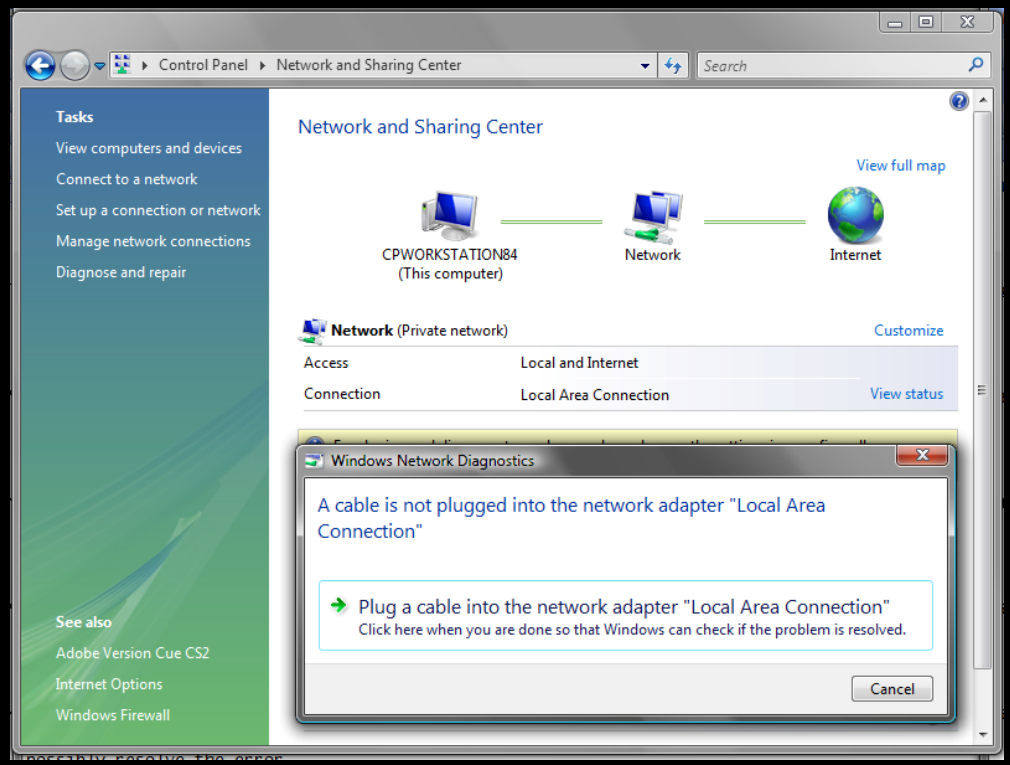
- Next generation Automated Help System.
- Can be self-correcting and self-diagnosing
- Resolves automatically or helps users to diagnose
- Primarily implemented through:
  - Windows Diagnostics Infrastructure (WDI)
  - Network Diagnostics Framework (NDF)
- NDF is complimentary to WDI
- NDF diagnoses connectivity and networking issues
- WDI diagnoses device, memory, and performance issues

Network Diagnostics

- How NDF Works
- How NDF is Changing

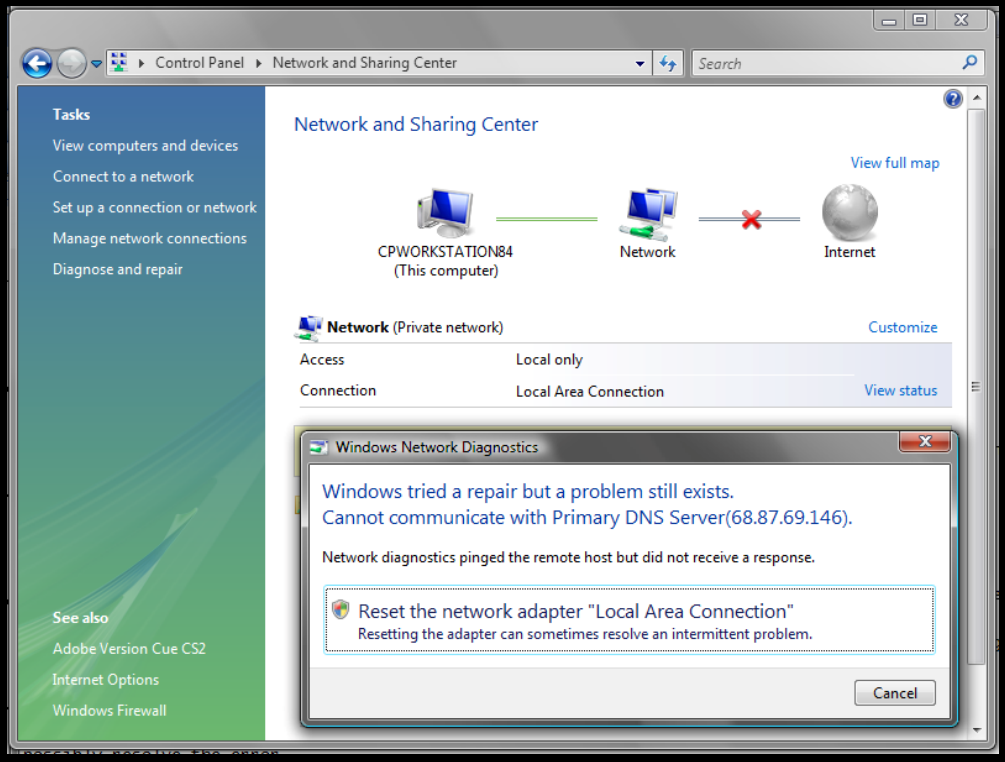
Network Diagnostics

- Diagnoses connectivity and networking issues



Network Diagnostics

- Diagnoses connectivity and networking issues



Networking Changes

- Windows Vista SP1 adds:
  - DHCPv6 Domain Suffixes
    - Multiple name suffixes possible
    - Use Option 24 in DCHPv6 config
  - 802.11x networks will display their information
  - Server Message Block (SMB) Helper Class
  - Diagnoses these file sharing issues:
    - Not existing server
    - Existing server but not existing share
    - Incorrect name, but similar name available

Networking Changes

- Windows Vista SP1 includes:
  - Network share thumbnail cache
    - Thumbs.db shared with all users
    - Displays thumbnails faster, improves performance
  - Improved file transfer algorithms
    - Better file copy performance disk to disk
    - Better remote copy performance
  - Implements SMB v2 improvements
    - Significant file transfer enhancement
    - Windows Vista to Windows Server 2008

Windows Diagnostics

- How WDI Works
- How WDI is Changing

Windows Diagnostics Infrastructure

- Windows Vista features:
  - Improved diagnostics guidance
  - Additional error reporting details
  - Expanded event logs
  - Extensive recovery policies
- Tracked through
  - Problem Reports and Solutions
  - Group Policy

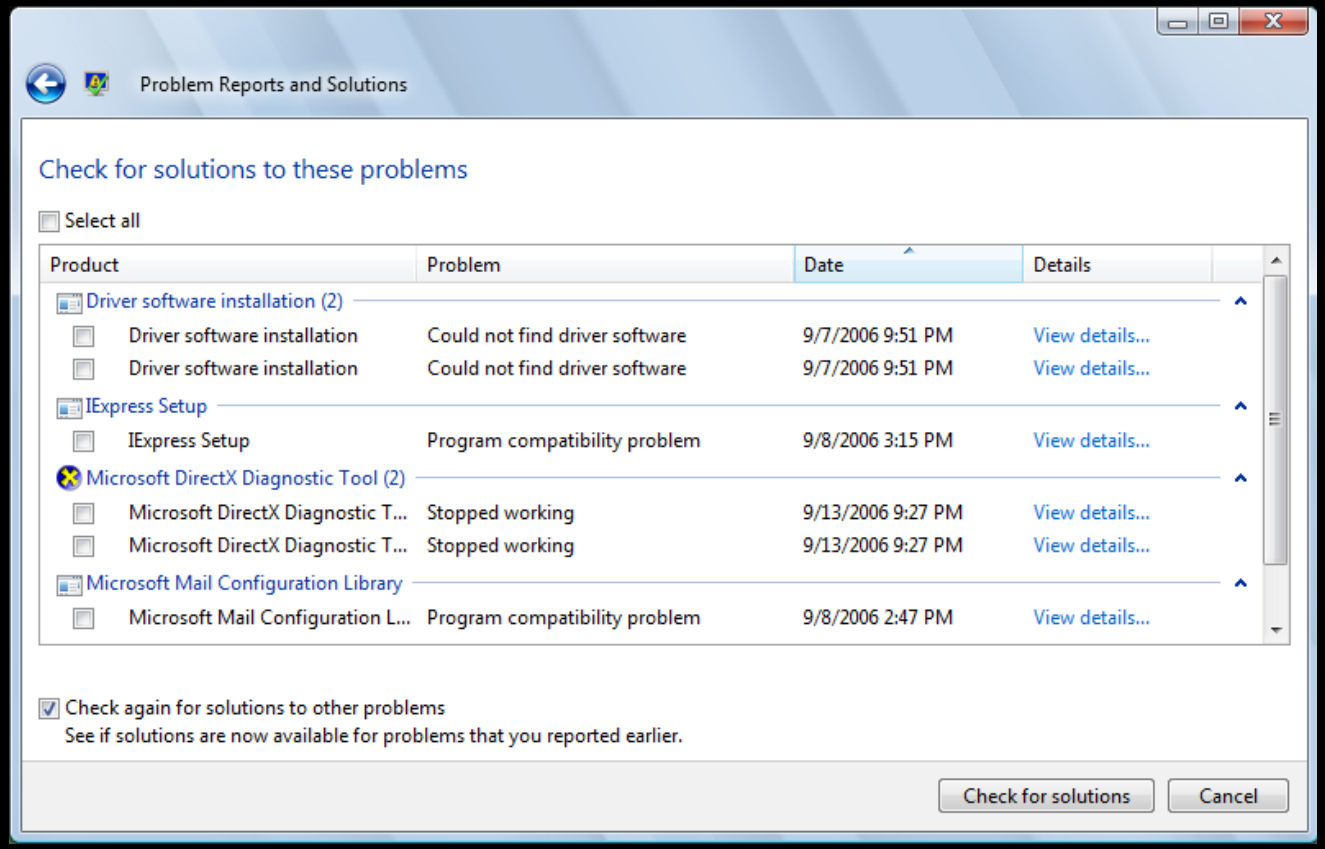
Windows Diagnostics Infrastructure

- For Devices
  - More reliable and better performing
  - Prevents many common causes of hangs and crashes.
  - Improves input/output (I/O) cancellation
    - Graceful recovery from blocking calls
    - Fewer blocking disk I/O operations.
- For Services
  - Automatic recovery improved
  - Handles dependent services and components

Windows Diagnostics Infrastructure

- For Applications
  - Uses update process to mark in-use files
    - Reduces downtime and required restarts
  - Uses memory more efficiently
    - Orders execution of thread groups
    - Includes better process scheduling
    - Background processes have less impact on performance
  - Failed installation is tracked and diagnosed
  - Unresponsive conditions can be auto-resolved

Problem Reports and Diagnostics

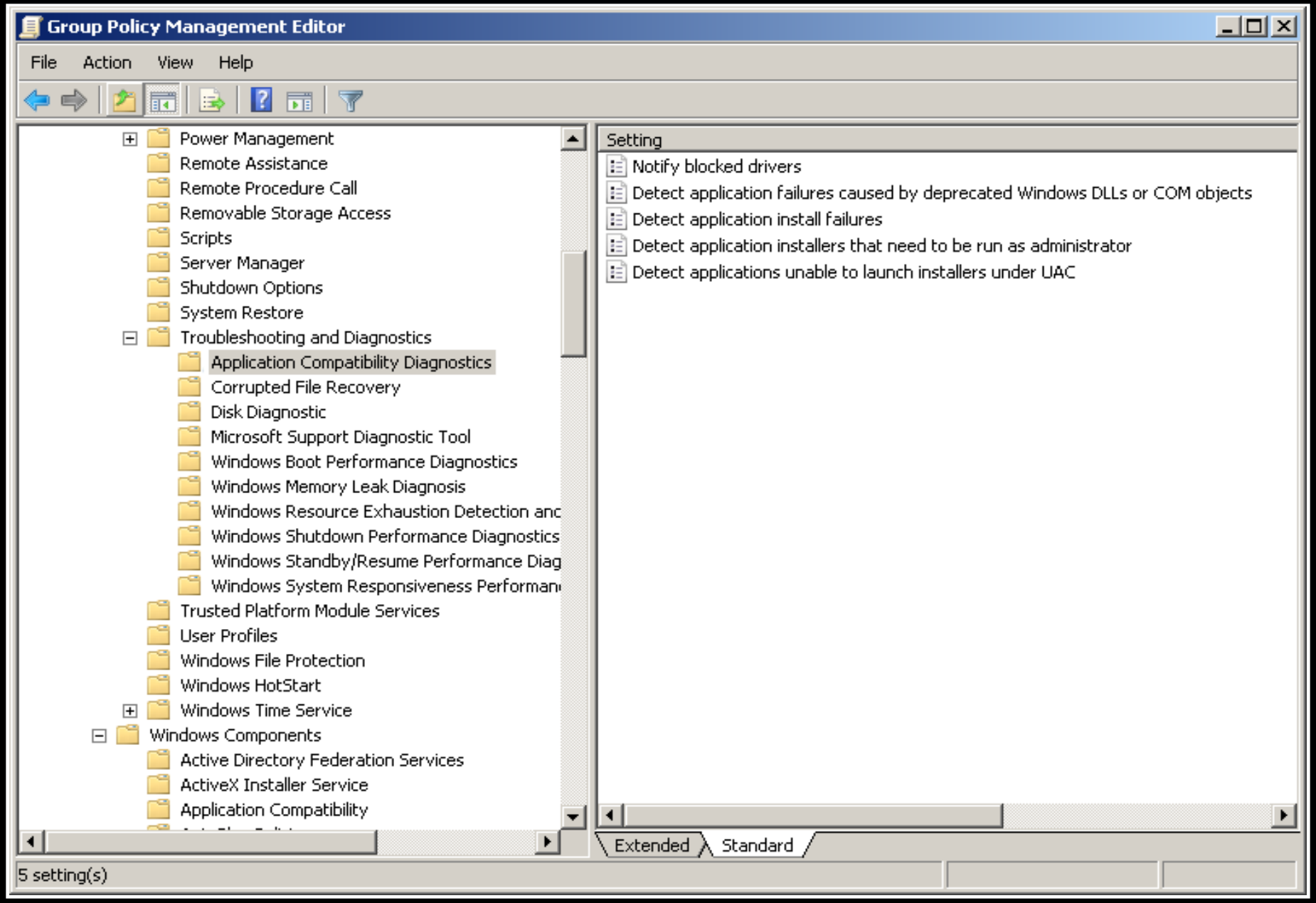


Group Policy

- 10 diagnostic areas
  - Application compatibility
  - Corrupted file recovery
  - Disk diagnostics
  - External support diagnostics
  - Boot performance
  - Memory leak
  - Resource exhaustion
  - Shutdown performance
  - Standby/resume performance
  - System responsiveness

Group Policy

- Computer Configuration
  \Administrative Templates
  \System
  \Troubleshooting and Diagnostics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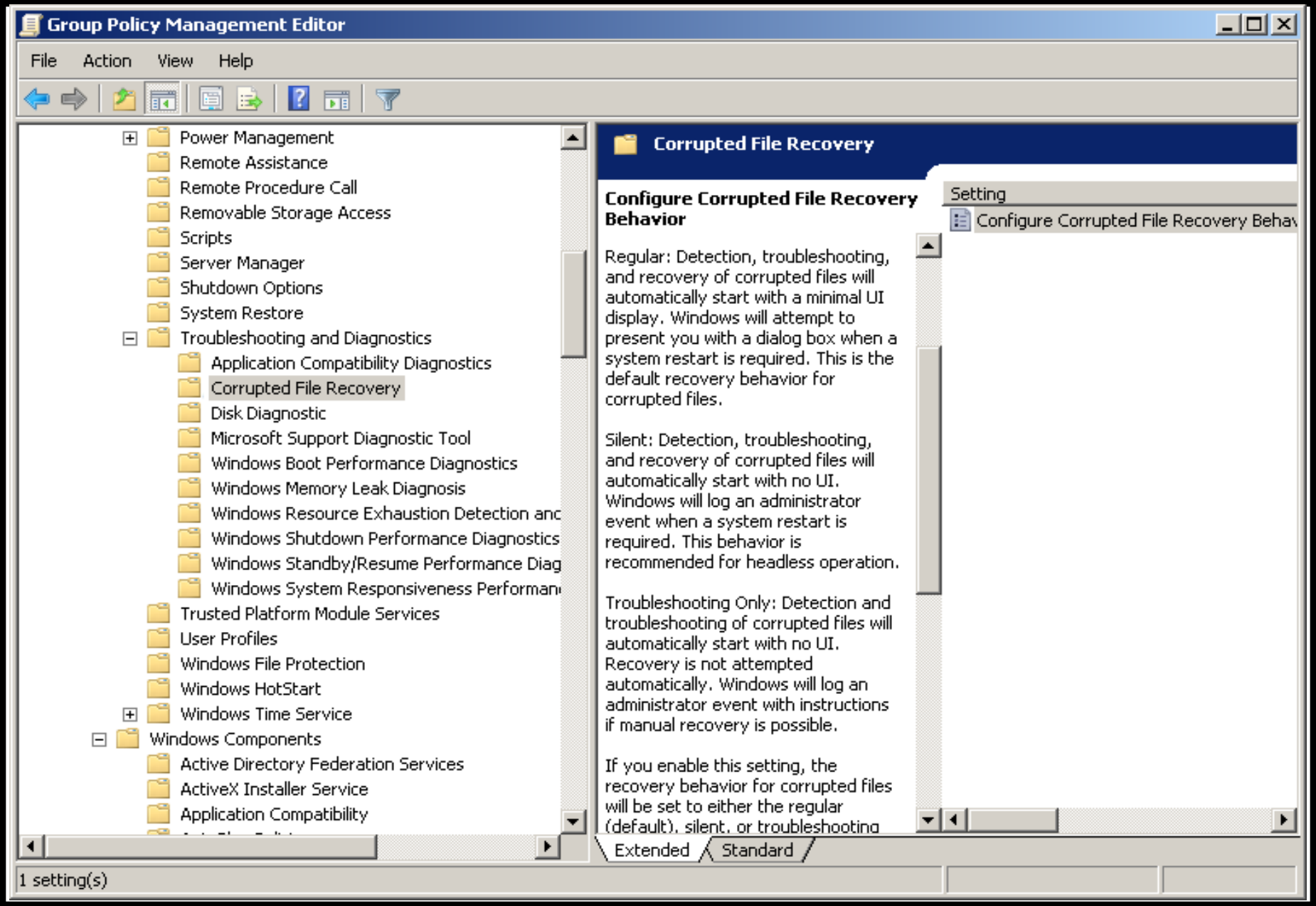
ActiveX Installer Service
Application Compatibility
Setting
Notify blocked drivers
Detect application failures caused by deprecated Windows DLLs or COM objects
Detect application install failures
Detect application installers that need to be run as administrator
Detect applications unable to launch installers under UAC
Extended
Standard
5 setting(s)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Corrupted File Recovery
Configure Corrupted File Recovery Behavior
Regular: Detection, troubleshooting, and recovery of corrupted files will automatically start with a minimal UI display. Windows will attempt to present you with a dialog box when a system restart is required. This is the default recovery behavior for corrupted files.
Silent: Detection, troubleshooting, and recovery of corrupted files will automatically start with no UI. Windows will log an administrator event when a system restart is required. This behavior is recommended for headless operation.
Troubleshooting Only: Detection and troubleshooting of corrupted files will automatically start with no UI. Recovery is not attempted automatically. Windows will log an administrator event with instructions if manual recovery is possible.
If you enable this setting, the recovery behavior for corrupted files will be set to either the regular (default), silent, or troubleshooting
Setting
Configure Corrupted File Recovery Behav
Extended
Standard
1 setting(s)


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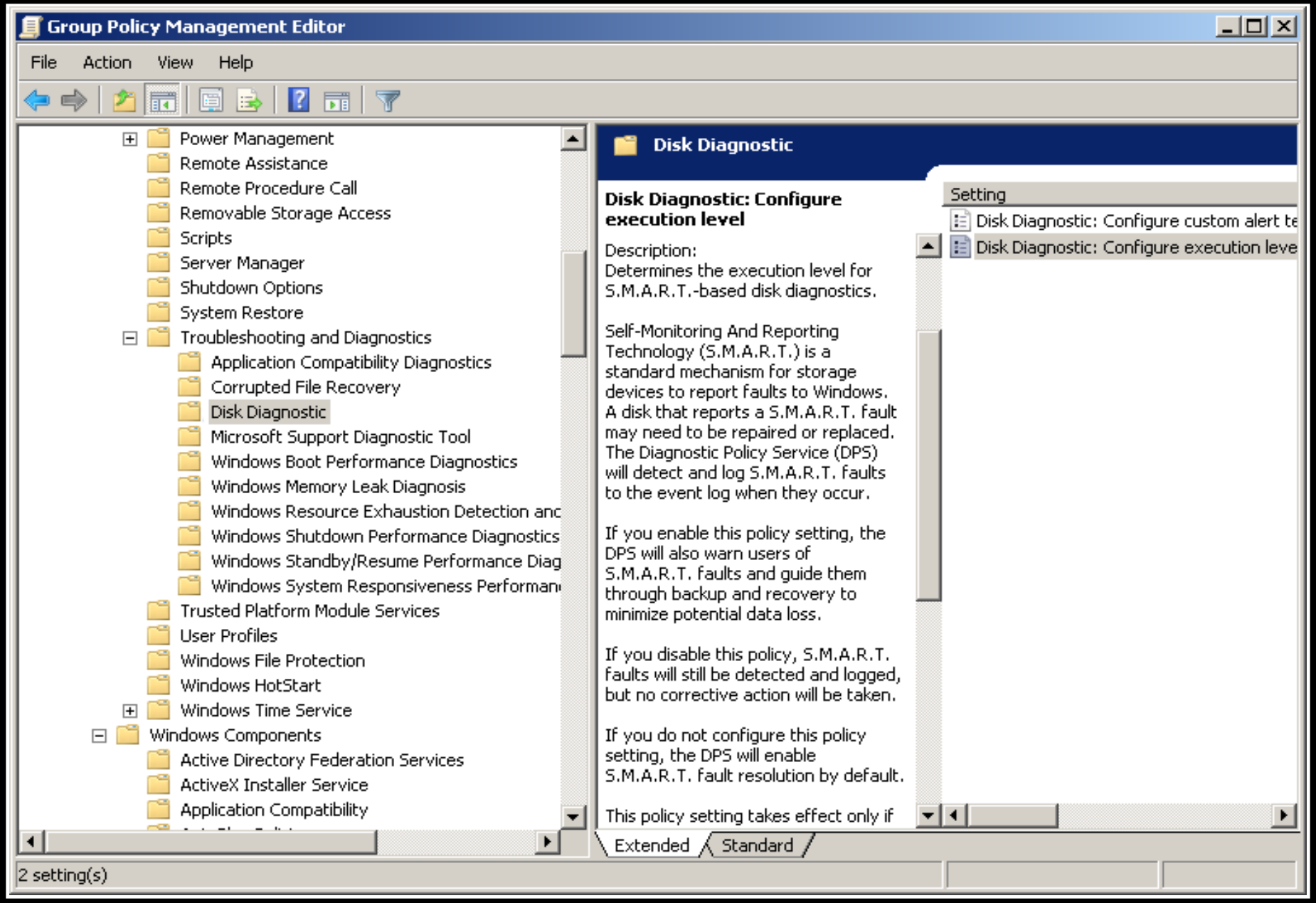
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Application Compatibility
Disk Diagnostic
Disk Diagnostic: Configure execution level
Description:
Determines the execution level for S.M.A.R.T.-based disk diagnostics.
Self-Monitoring And Reporting Technology (S.M.A.R.T.) is a standard mechanism for storage devices to report faults to Windows. A disk that reports a S.M.A.R.T. fault may need to be repaired or replaced. The Diagnostic Policy Service (DPS) will detect and log S.M.A.R.T. faults to the event log when they occur.
If you enable this policy setting, the DPS will also warn users of S.M.A.R.T. faults and guide them through backup and recovery to minimize potential data loss.
If you disable this policy, S.M.A.R.T. faults will still be detected and logged, but no corrective action will be taken.
If you do not configure this policy setting, the DPS will enable S.M.A.R.T. fault resolution by default.
This policy setting takes effect only if
Setting
Disk Diagnostic: Configure custom alert te
Disk Diagnostic: Configure execution leve
Extended Standard
2 setting(s)


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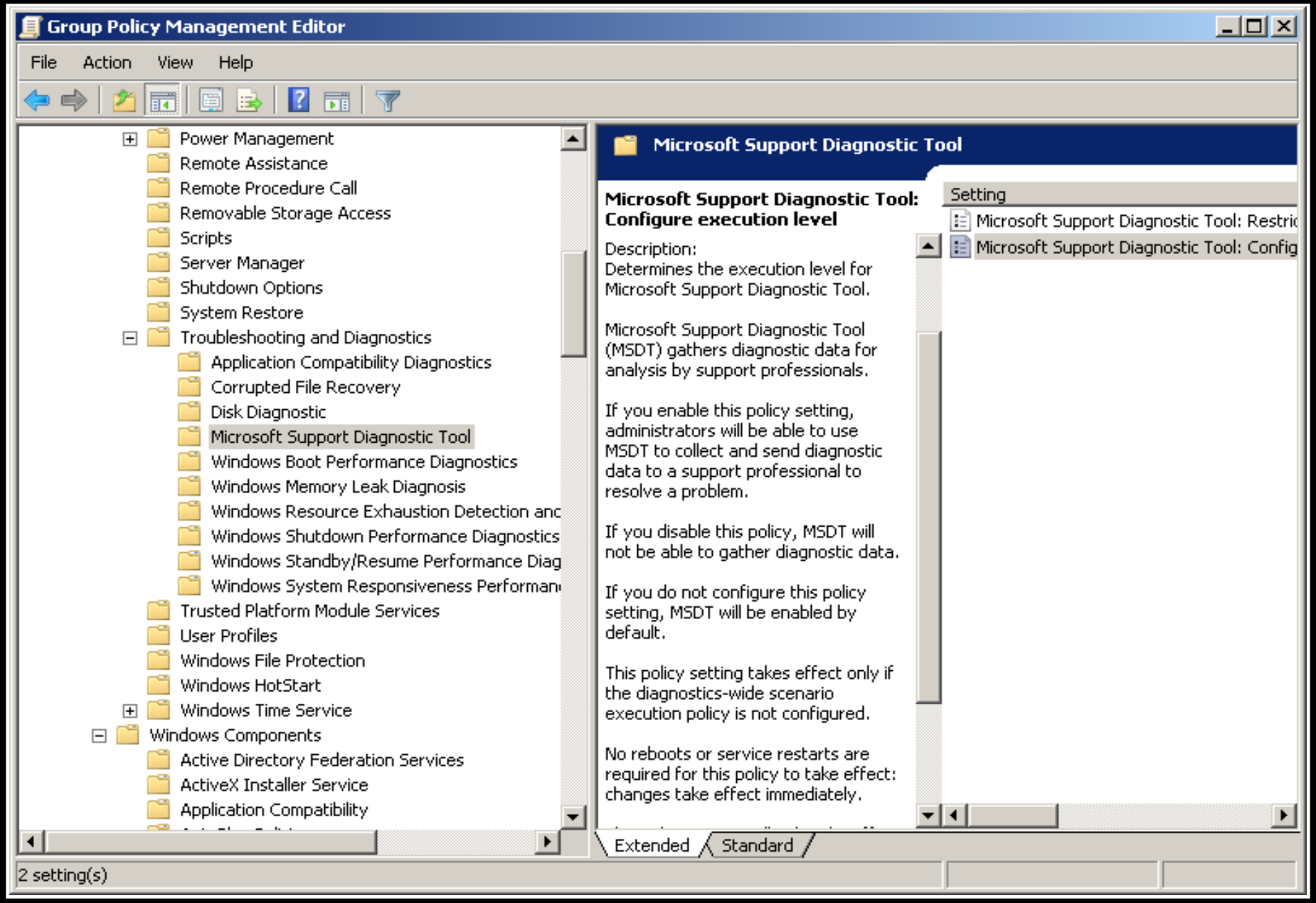
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Application Compatibility
Microsoft Support Diagnostic Tool
Microsoft Support Diagnostic Tool: Configure execution level
Description:
Determines the execution level for Microsoft Support Diagnostic Tool.
Microsoft Support Diagnostic Tool (MSDT) gathers diagnostic data for analysis by support professionals.
If you enable this policy setting, administrators will be able to use MSDT to collect and send diagnostic data to a support professional to resolve a problem.
If you disable this policy, MSDT will not be able to gather diagnostic data.
If you do not configure this policy setting, MSDT will be enabled by default.
This policy setting takes effect only if the diagnostics-wide scenario execution policy is not configured.
No reboots or service restarts are required for this policy to take effect: changes take effect immediately.
Setting
Microsoft Support Diagnostic Tool: Restric
Microsoft Support Diagnostic Tool: Config
Extended
Standard
2 setting(s)


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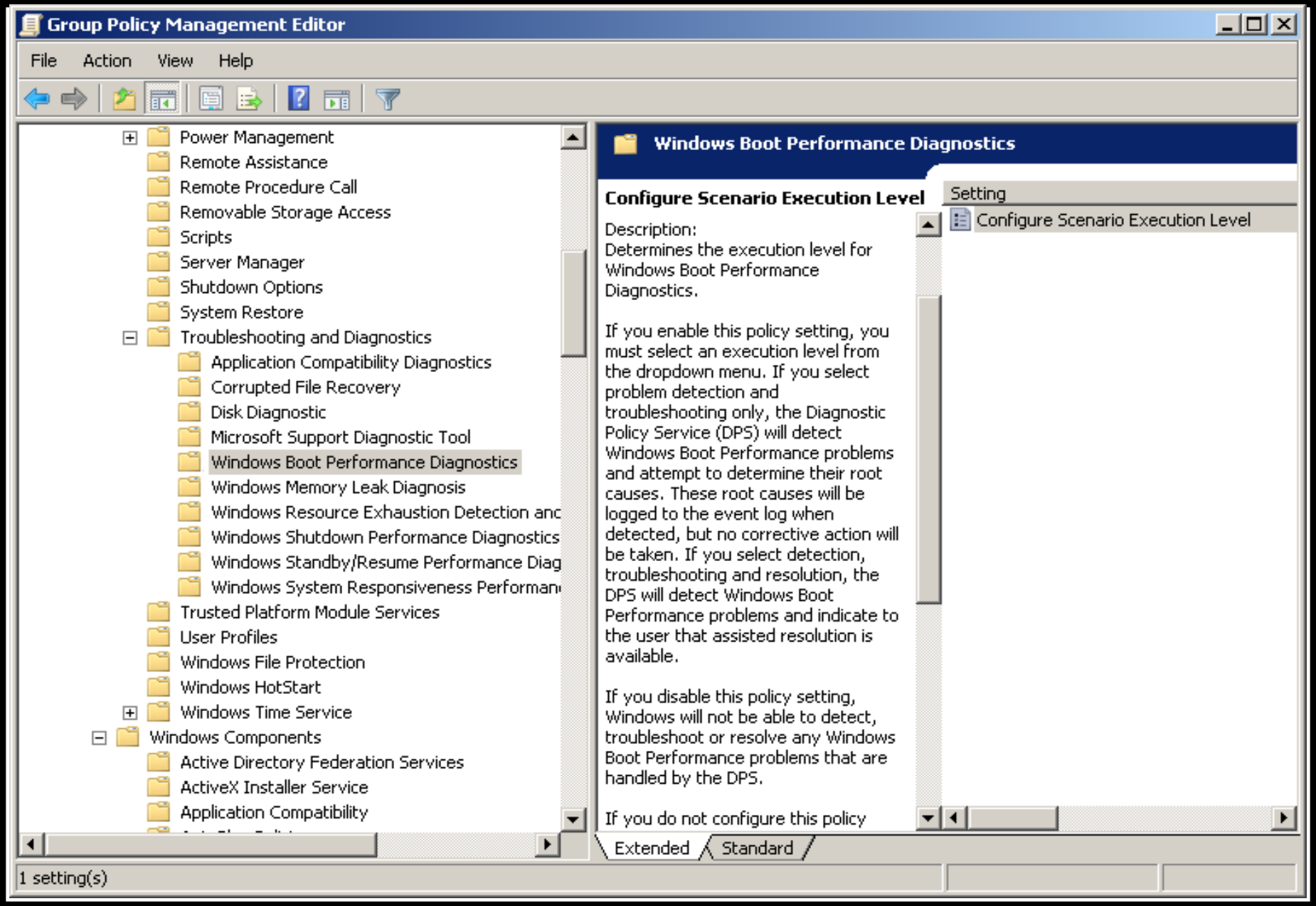
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Windows Boot Performance Diagnostics
Configure Scenario Execution Level
Description:
Determines the execution level for Windows Boot Performance Diagnostics.
If you enable this policy setting, you must select an execution level from the dropdown menu. If you select problem detection and troubleshooting only, the Diagnostic Policy Service (DPS) will detect Windows Boot Performance problems and attempt to determine their root causes. These root causes will be logged to the event log when detected, but no corrective action will be taken. If you select detection, troubleshooting and resolution, the DPS will detect Windows Boot Performance problems and indicate to the user that assisted resolution is available.
If you disable this policy setting, Windows will not be able to detect, troubleshoot or resolve any Windows Boot Performance problems that are handled by the DPS.
If you do not configure this policy
Setting
Configure Scenario Execution Level
Extended
Standard
1 setting(s)


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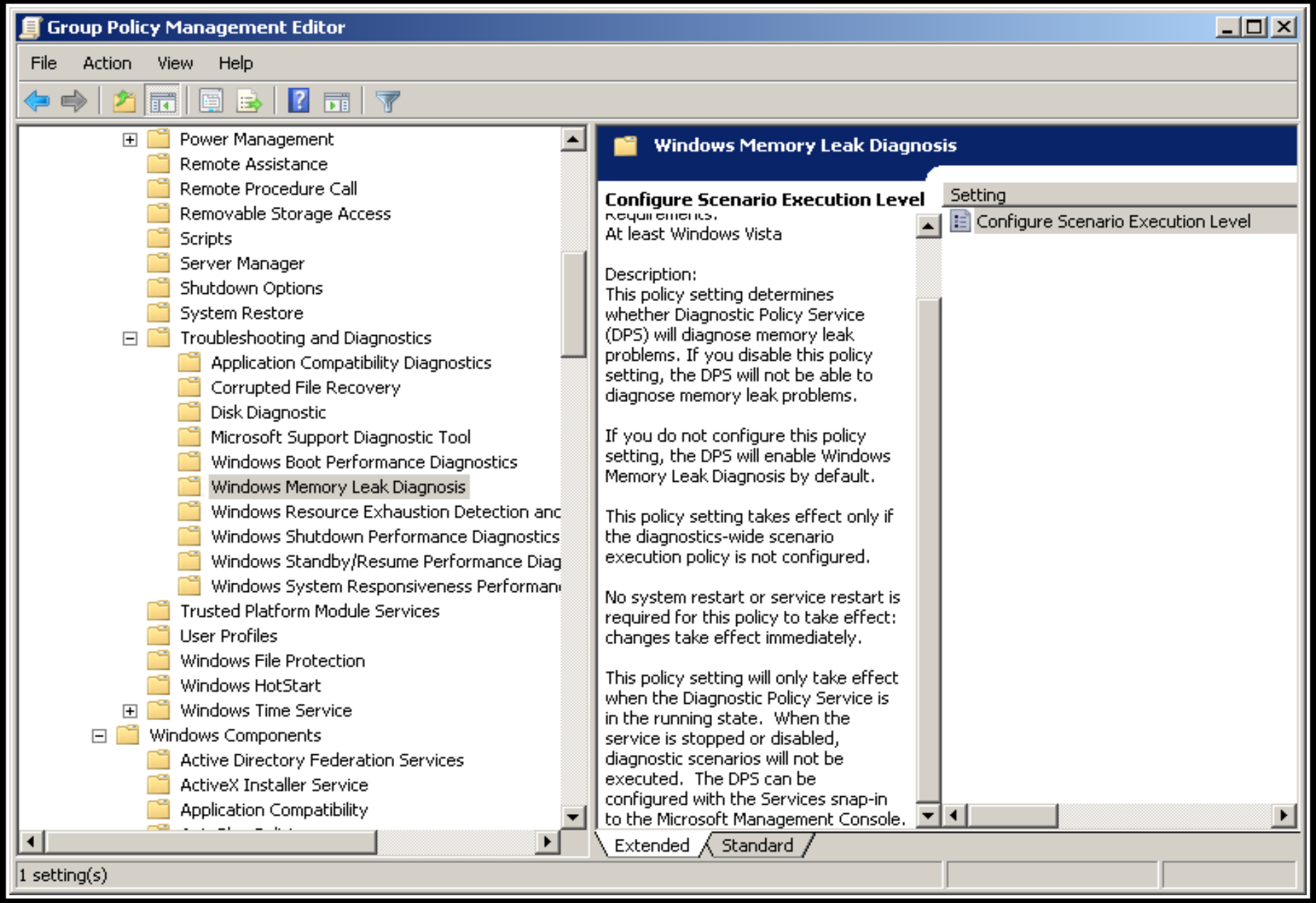
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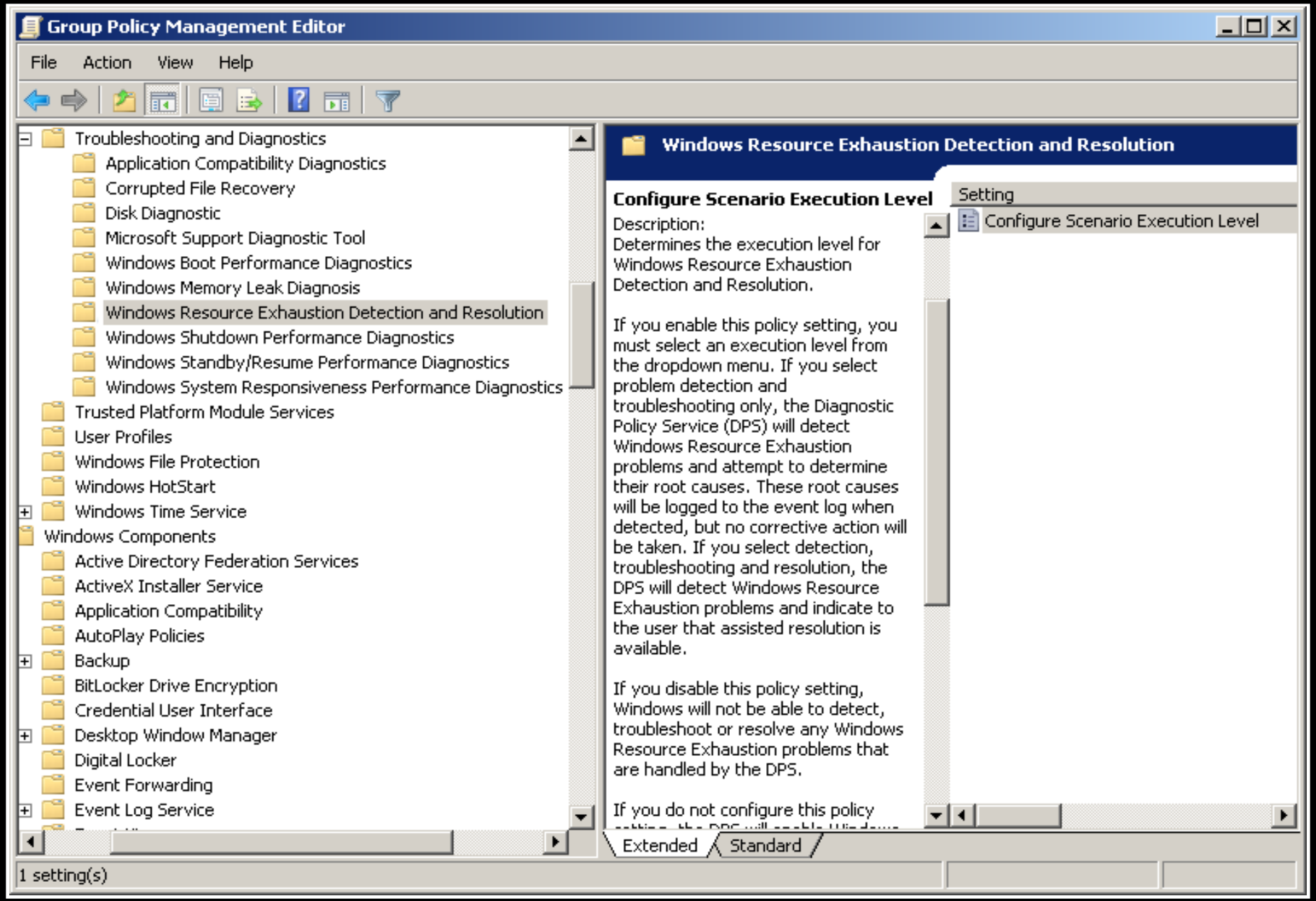
ActiveX Installer Service
Application Compatibility
Windows Memory Leak Diagnosis
Configure Scenario Execution Level
At least Windows Vista
Description:
This policy setting determines whether Diagnostic Policy Service (DPS) will diagnose memory leak problems. If you disable this policy setting, the DPS will not be able to diagnose memory leak problems.
If you do not configure this policy setting, the DPS will enable Windows Memory Leak Diagnosis by default.
This policy setting takes effect only if the diagnostics-wide scenario execution policy is not configured.
No system restart or service restart is required for this policy to take effect: changes take effect immediately.
This policy setting will only take effect when the Diagnostic Policy Service is in the running state. When the service is stopped or disabled, diagnostic scenarios will not be executed. The DPS can be configured with the Services snap-in to the Microsoft Management Console.
Setting
Configure Scenario Execution Level
Extended
Standard
1 setting(s)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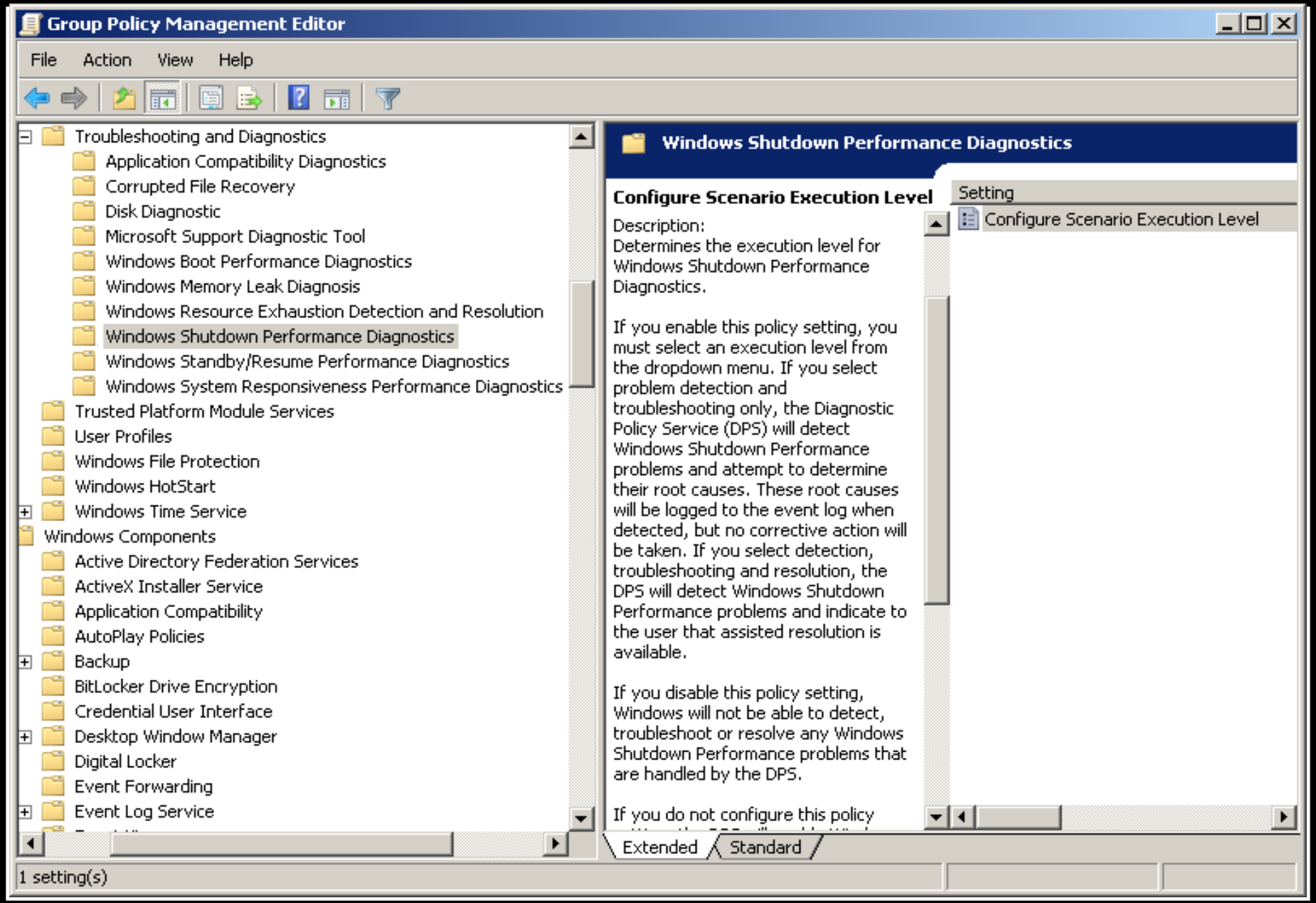
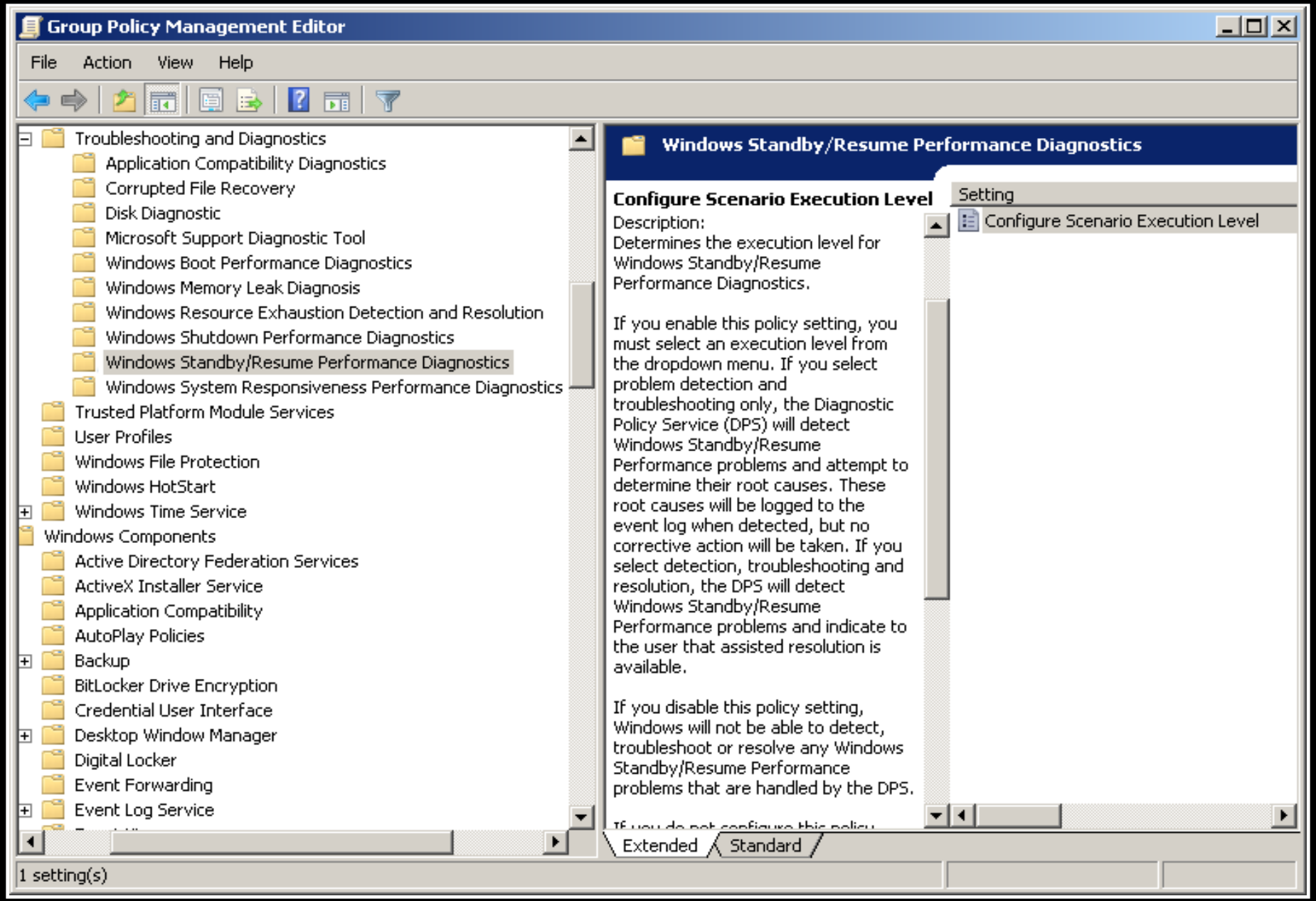
Active Directory Federation Services
ActiveX Installer Service
Application Compatibility
AutoPlay Policies
Backup
BitLocker Drive Encryption
Credential User Interface
Desktop Window Manager
Digital Locker
Event Forwarding
Event Log Service
Windows Resource Exhaustion Detection and Resolution
Configure Scenario Execution Level
Setting
Configure Scenario Execution Level
Description:
Determines the execution level for Windows Resource Exhaustion Detection and Resolution.
If you enable this policy setting, you must select an execution level from the dropdown menu. If you select problem detection and troubleshooting only, the Diagnostic Policy Service (DPS) will detect Windows Resource Exhaustion problems and attempt to determine their root causes. These root causes will be logged to the event log when detected, but no corrective action will be taken. If you select detection, troubleshooting and resolution, the DPS will detect Windows Resource Exhaustion problems and indicate to the user that assisted resolution is available.
If you disable this policy setting, Windows will not be able to detect, troubleshoot or resolve any Windows Resource Exhaustion problems that are handled by the DPS.
If you do not configure this policy
Extended
Standard
1 setting(s)

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Application Compatibility
AutoPlay Policies
Backup
BitLocker Drive Encryption
Credential User Interface
Desktop Window Manager
Digital Locker
Event Forwarding
Event Log Service
Windows Standby/Resume Performance Diagnostics
Configure Scenario Execution Level
Description:
Determines the execution level for Windows Standby/Resume Performance Diagnostics.
If you enable this policy setting, you must select an execution level from the dropdown menu. If you select problem detection and troubleshooting only, the Diagnostic Policy Service (DPS) will detect Windows Standby/Resume Performance problems and attempt to determine their root causes. These root causes will be logged to the event log when detected, but no corrective action will be taken. If you select detection, troubleshooting and resolution, the DPS will detect Windows Standby/Resume Performance problems and indicate to the user that assisted resolution is available.
If you disable this policy setting, Windows will not be able to detect, troubleshoot or resolve any Windows Standby/Resume Performance problems that are handled by the DPS.
Setting
Configure Scenario Execution Level
Extended
Standard
1 setting(s)


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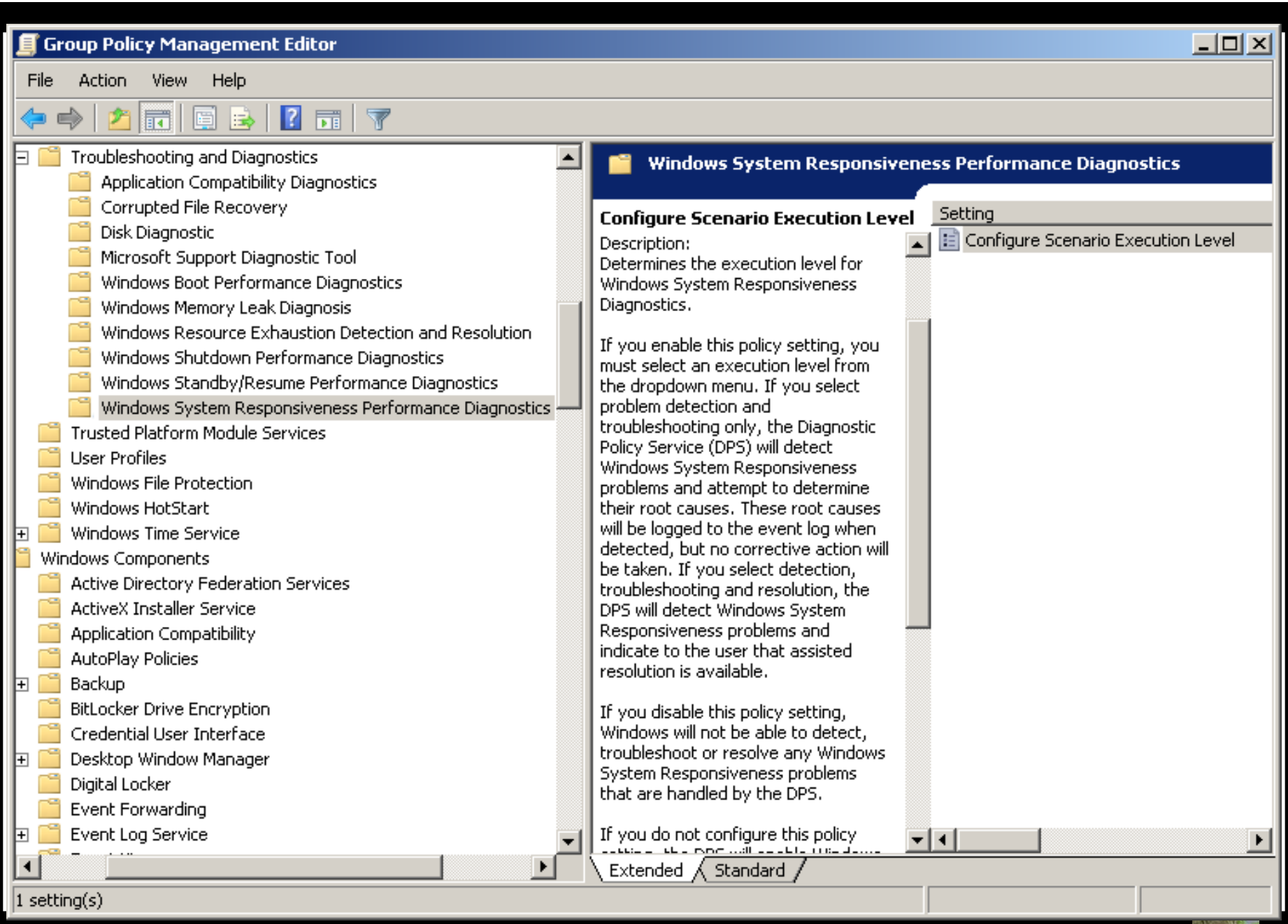
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Credential User Interface
Desktop Window Manager
Digital Locker
Event Forwarding
Event Log Service
Windows System Responsiveness Performance Diagnostics
Configure Scenario Execution Level
Setting
Configure Scenario Execution Level
Description:
Determines the execution level for Windows System Responsiveness Diagnostics.
If you enable this policy setting, you must select an execution level from the dropdown menu. If you select problem detection and troubleshooting only, the Diagnostic Policy Service (DPS) will detect Windows System Responsiveness problems and attempt to determine their root causes. These root causes will be logged to the event log when detected, but no corrective action will be taken. If you select detection, troubleshooting and resolution, the DPS will detect Windows System Responsiveness problems and indicate to the user that assisted resolution is available.
If you disable this policy setting, Windows will not be able to detect, troubleshoot or resolve any Windows System Responsiveness problems that are handled by the DPS.
If you do not configure this policy
Extended
Standard
1 setting(s)

Windows Vista SP1 Changes

- Enhanced Audio Stack
  - Improved playback/record reliability
  - Better system performance during playback
  - Support for more devices
- Windows Media Player
  - Reduces memory allocation
  - Improves performance
- Video
  - 3D benchmarks improved
  - Enhancements for DX and other graphics components
  - WDDM 2.1 and Direct 3D 10.1

Windows Vista SP1 Changes

- File improvements
  - File compression/decompression faster
  - Backup of EFS encryption allowed
  - Hot pluggable media supported with NTFS
- Prefetch/Superfetch
  - New binaries cause fetch data to be rebuilt
  - Improves performance
- Windows Desktop Manager
  - Memory leak fixed
  - Improves performance

Windows Vista Support Architecture:

Diagnostics & Problem Resolution

What we've discussed:

- Built-in diagnostics and troubleshooting
- System recovery and startup repair
- Problem reporting and solutions
- Related administration tools
- Related Group Policy settings