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# ONTAP Performance Analysis (ONTAP 9.6)

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## Zakres tematyczny

### Module 1: Performance Analysis Fundamentals

- Basic Concepts of Performance
- Performance Monitoring Methodology

### Module 2: Performance Analysis Tools

- Performance terminology
- Using Active IQ Unified Manager

### Module 3: Storage System Architecture and Data Flow

- FAS and AFF Architecture
- Data Flow
- NVRAM Functionality

### Module 4: WAFL

- WAFL Functions
- WAFL Readahead
- Resolving WAFL issues

### Module 5: CPU and Memory

- Identifying CPU Performance Bottlenecks
- Resolving CPU Performance Bottlenecks
- Identifying Memory Performance Bottlenecks
- Resolving Memory Performance Bottlenecks

### Module 6: Disk Subsystem

- Disk Subsystem Hardware
- Analyzing and Isolating Disk Subsystem Bottlenecks
- Analyzing Disk Subsystem Bottlenecks with Statit
- Resolving Disk Subsystem Bottlenecks



#### Module 7: Cache Subsystem

- Cache Subsystem Overview
- Flash Cache Feature
- Flash Pool Feature
- Flash Cache Policies and Flash Pool Policies
- Storage Pool
- Cache Sizing

#### Module 8: Storage Quality of Service

- Managing System Performance with QoS

#### Module 9: NAS Subsystem

- NAS functions
- Identifying NAS Bottlenecks
- Resolving NAS Bottlenecks

#### Module 10: SAN Subsystem

- SAN Overview
- SAN Multipathing
- SAN load balancing
- SAN I/O Misalignment
- Queue depth

#### Labs:

- Identifying cluster components
- Analyzing performance statistics
- OnCommand performance manager thresholds, events and alerts
- Identifying and resolving storage controller performance issues
- WAFL performance monitoring and analysis
- Identifying and resolving disk I/O bottlenecks
- Exploring cache performance
- Cluster interconnect performance
- Workload management with storage QoS
- NAS performance
- SAN protocol performance