

Course Syllabus

Duration: 2 days **Cost: 16 credits**

Prerequisites: NA-301 – NetApp Clustered Data ONTAP Administration
(or equivalent practical experience)

This course focuses on analyzing and optimizing the performance of a FAS (or All-Flash FAS) NetApp storage system.

It covers concepts related to performance analysis, elements specific to NetApp FAS, related tools, specific case studies and optimization recommendations.

Module 1

INTRODUCTION

- What is performance analysis?
- Reasons for performance analysis
- Terminology (workload, working set, bottleneck, baseline, IOPS, latency...)

Module 2

RELATED COMPONENTS

- Material (disks, memory, NVRAM, flashcache...)
- Disk performance (IOPS, latency)
- Flash technology (Flash, SSD, Flash Pool)
- End-to-end Data Path

Module 3

FUNCTIONING OF ONTAP

- Notion of direct / indirect path
- Functioning of WAFL
- Functioning of FlashCache card
- Functioning of FlashPool
- All-Flash FAS optimization

Module 4

PERFORMANCE ANALYSIS

- Workload characteristics
- Element of analysis
- Integrated tools (statistics, QoS statistics, sysstat, statit)
- External NetApp tools (perfstat, OPM, Harvest / Grafana...)
- Analysis process

Module 5

CASE STUDIES

- Controller overload
- Disk saturation
- Network environment

Module 6

OPTIMIZATION

- Performance optimization
- Remediation
- Best practices