VIRTUAL INSTRUMENTS

INFO SHEET
WORKLOAD ANALYZER

Workload Analyzer

Unprecedented Visibility into Application Workload Profiles

Introduction

The Workload Analyzer software module of WorkloadWisdom offers powerful visualization & analytics of storage workloads, creation of individual or composite workloads for lab validation, and configurable workload characterization and analysis policies.

Challenges

Applications, networking, and storage teams often don't know their own workload profiles, and their vendors really aren't in a position to help. Consequently, performance planning is guesswork, sometimes resulting in under provisioning, but more often, over provisioning. If application workload performance optimization, or storage cost optimization get done at all, it's nearly always done by trial and error.

The typical infrastructure scenario is to deploy, listen for user complaints, and adjust. Even if the deployment goes well initially, any number of changes can affect performance of the production storage infrastructure. Changes might be characterized as:

- **Business driven**
  - More users – sometimes from mergers and acquisitions
  - Fewer users – often from downsizing or consolidation
  - New customers – a typical Service Provider scenario
- **Application driven**
  - Software/DBMS upgrades
  - New features
- **Infrastructure driven**
  - Configuration – such as HBA settings
  - Firmware/OS updates

Current performance monitoring solutions are too siloed to provide comprehensive workload visibility. Changes may affect latency, throughput or IOPS, but Application Performance Monitors (APMs) or Infrastructure Performance Monitors (IPMs) can't correlate changes to their effects because they only see a part of the data path and because they often can't associate a workload with an infrastructure resource.

WorkloadWisdom Workload Analysis Approach

The Workload Analyzer is a new module of WorkloadWisdom providing, powerful visualization and analytics of storage workloads and creation of individual or composite workloads for lab validation. The Workload Analyzer is an application workload and pattern centric approach to characterizing performance. The approach is focused on clustering or grouping of the I/O patterns generated by larger application workloads. It's universal and vendor agnostic, working with any block, file, or object storage system. The Workload Analyzer obtains its workload data from:

- The VirtualWisdom Performance Probes for Fibre Channel or Ethernet, providing real-time workload data. This is primarily useful for troubleshooting intermittent performance problems or workloads where superior realism is required.
- The WorkloadWisdom Workload Data Importer for any storage systems and any protocols, for historical workload data. This source of data is primarily useful for storage performance planning.

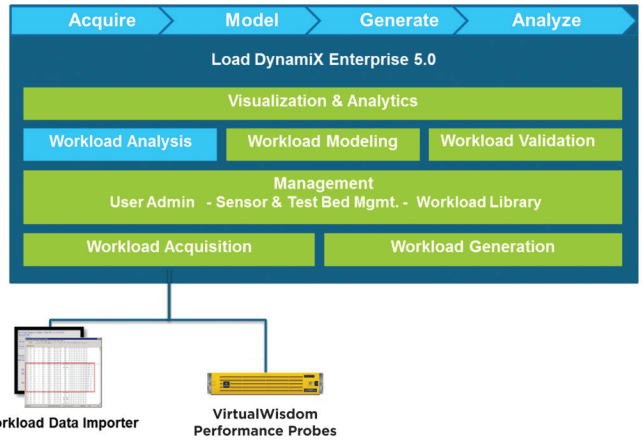

Figure 1: Image depicts the conceptual relationships between workload acquisition (Workload Data Importer and VirtualWisdom Performance Probes) and workload analysis with WorkloadWisdom.

WorkloadWisdom Workload Analyzer Details

The Workload Analyzer module of WorkloadWisdom helps visualize KPIs like latency, throughput, or as in the illustration shows, IOPS,
over time.

This visualization can be real-time or historical, covering any time-period.

The Workload Analyzer includes easy to use analysis policies to see: IOPS, throughput, latency, R/W mix, random / sequential mix, block size distributions, temporality, and more.

Finally, the automated analysis aids in the creation of individual and composite storage workloads, useful for load generation and realistic simulation of workloads in the lab.

Figure 2: Screen shot of Workload Analyzer within WorkloadWisdom.

Workload Analyzer Use Cases

Storage (Right) Sizing

Storage professionals are often asked to recommend and deploy new capacity with little or no idea of the performance requirements of the application workload(s). They often rely on rules of thumb and make best guesses, even when the cost differences between storage tiers can mean millions of dollars. Over-provisioning may provide a safe choice, but it clearly unnecessarily wastes valuable financial resources.

Storage Migration

Before migrating workloads to new infrastructure, it's important to be able to describe the profile of the applications (e.g. read/write mix, block/file size distributions, IOPS, throughput, latency, random/sequential mix, temporality, LUN activity, etc) in order to match the workload to the right tier of storage.

Storage consolidation

As with migration, understanding the workload profile is important, to avoid surprises when consolidating workloads onto fewer target devices, as often happens in virtual server and private cloud environments.

Problem Avoidance or Resolution

Understanding how workload changes affect key performance indicators is often the first step in either avoiding performance bottlenecks or identifying potential hotspots and adhering to Service Level Agreements. Troubleshooting and resolving performance problems can be greatly accelerated with a better understanding of workload behavior.

Workload Analyzer Benefits

Simple to deploy and configure, the Workload Analyzer module of WorkloadWisdom presents a dynamic analysis & clustering of workload I/O behavior across time and locality, offering a powerful real-time or offline visualization & analytics solution that helps storage professionals:

- Make better purchase and deployment decisions via simplified storage performance planning
- Avoid many performance related issues
- Resolve problems faster

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