VirtualWisdom NAS Performance Probe (ProbeNAS)

Q: What is the NAS Performance Probe?

A: VirtualWisdom with ProbeNAS monitors both NFS/SMB protocols, as well as IP level statistics. The VirtualWisdom NAS Performance Probe (aka ProbeNAS) is the industry's most complete real - time, full line rate monitoring solution for NFSv3, SMBv2 and SMBv3 NAS. ProbeNAS monitors NFS level constructs (NFSFlow, NLMFlow, RPCFlow, MNTFlow, etc), and it monitors Ethernet level constructs (CRC, Dup Packets, Out of Order Packets, LOS, LOSig, Link Up, etc). SMB Flow metrics are now available as well. This means if you are running strictly SMB, you can take advantage of the same Link level (Ethernet) metrics that you would if you were running strictly NFS.   ProbeNAS metrics are correlated with those from other VirtualWisdom Probes, including Ethernet traffic via NetFlow, sFlow, Jflow, and IPFIX, persistently stored, and presented by the VirtualWisdom Platform Appliance— providing holistic and timely insight into the health, utilization, and performance of large-scale, heterogeneous, open-systems based infrastructures.

Q: Who can use the NAS Performance Probe?

A: Companies who are deploying mission critical applications on NFSv3 or SMB are in a perfect position to benefit from the ProbeNAS. Typical industries include Financial, Insurance, Healthcare, Service Providers, Manufacturing), Media & Entertainment, Oil & Gas, and Electronic Design Automation (EDA). Individuals within IT include NAS or Storage Engineers, NAS or Storage Architects, or Enterprise Storage Managers.

Q: Why did Virtual Instruments develop the NAS Performance Probe?

A: The #1 reason is: our customers asked for it. Most large enterprises deploy some mission critical applications on NAS, using NFS and SMB. The ProbeNAS fills a customer need in the same was as our Fibre Channel performance probes, and solidifies VI's pre-eminent position as a premier supplier of storage Infrastructure Performance Analytics solutions.

Q: What about other NAS and IP protocols?

A: The release of VirtualWisdom 5.4 provides SMBv2 and SMBv3 support. iSCSI support will follow in 2018.

Q: Do the NAS Performance Probes work with all NAS devices?

A: The Probe works with any device that communicates via NFSv3, SMBv2 and SMBv3. This includes industry leading products like EMC Isilon, HDS Blue Arc, NetApp FAS, and many others.

Q: How is the ProbeNAS different than other monitoring solutions?

A: Our advantages are very similar to the advantages we have in the Fibre Channel (FC) space. For instance, we are vendor agnostic, just as we are with the Fibre Channel probes as we work at the protocol level. Software probes have to stay current with all changes in the vendor storage systems very time they update their devices. Many software solutions require the use of agents; we do not. Compared to SRM products, such as NetApp's OnCommand, we focus on performance. Others focus on discovery and capacity reporting, with weaker performance metrics. Compared to many hardware vendor's proprietary solutions, our VirtualWisdom platform supports both Fibre Channel and IP networks, including environments where the protocols are mixed on the same device. And we're delivering full functionality today, not "sometime in the future".

Q: How does performance of NFS and SMB compare to Fibre Channel?

A: The answer to this question could be very long, but for many applications, the performance can be nearly identical. Performance doesn't have to be the reason to select Fibre Channel SAN over IP networked NAS or vice versa, especially with block-like workloads, that is, workloads without a lot of metadata.

Q: What TAPs do we use for the NAS Performance Probe?

A: We use optical TAPs as we do for our traditional Fibre Channel deployments. An additional benefit with our NAS Performance Probe is the ability to use TAP aggregation products from companies like Gigamon as well as correlation metrics from Ethernet-based flow records via Netflow.

Q: Which Advanced Analytics are supported by ProbeNAS?

A: ProbeNAS is supported by all Analytics which are not probe-specific, including Event Advisor, Trend Matcher and Seasonal Trends. Analytics that are not applicable to NAS include: Balance Finder is ProbeSW-specific (MPIO is not a NAS concept), VM Coordinator is ProbeVM-specific (VM CPU and Memory optimization is not a NAS concept), Queue Solver is ProbeFC-specific (HBA Queue Depth is not a NAS concept).

Q: What do we monitor / track?

A: We monitor all end-to-end, Source-Destination-Filesystem conversations. Discovered entities on the host are at the source IP address, a VLAN switch, and for storage, the destination IP address, monitored link / LAG, and the NAS filesystem. It's important to note that the host can have both IP NICs and Fibre Channel HBAs. Conversations belonging to all source IP addresses are recorded and reported upon, including those associated with Virtual Machines.

Q: What NFS command metrics are collected?

A: NFS Metrics (373 metrics), accumulated

- Per monitored probe port
- Per bi-directional TCP flow identified by 4 or 5 of keys shown below depending on the container:
  - Probe Port
  - Source & Destination IP Addresses
  - Source & Destination MAC Address
  - VLAN ID
  - Mount (NFS File System ID / SMB Share Name)

Metric Containers (Layered Container Organization)

- DPL Health
- Link Metrics
- TCP Flow
- NFS v3 Flow Procedure Metrics

Procedures Groups:

- Read
- Write
- Lookup
- Access
- Read Directory (readdir, readdirplus & readlink)
- Create (create, remove, mkdir, rmdir, rename, link, symlink, mknod)
- Attribute (getattr, setattr, fsinfo, fsstat, pathconf)
- Other

Per Procedure Metric Categories

- Procedure Occurrence (IO), success & Error Count
- Exchange Completion Time Min, Max & Mean
- Procedure Pending Min, Max & Mean
- Total Bytes (formerly named Payload Bytes)
- Read & Write Histograms
- Read & Write Payload Histograms

RPC Flow Program metrics

- Procedure occurrence, success, error and Payload Byte counts.

NLM Flow Metrics

- Procedure occurrence, success and error counts

Q: What SMB command metrics are collected?

A: NFS Metrics (210 metrics), accumulated

Command groups (unique to SMB)
- Read
- Write
- GetInfo
- Find
- SetInfo
- Create
- Flush
- Other (Tree Connect/Disconnect, Negotiate etc.)
- Ioctl
- ServerStatus
- Issued command counter for all commands; this is specific to SMB

Categories: SMB
- Procedure Occurrence (IO), success & Error Count
- Exchange Completion Time Min, Max & Mean
- Procedure Pending Min, Max & Mean
- Payload Bytes
- Write Host Delay
- Write Filer Delay
- Write Host Delay Histogram
- Write Filer Delay Histogram
- Read ECT Histogram
- Write ECT Histogram
- Write Payload Histogram
- Read Payload Histogram

SMB v2/v3 Error Metrics
- Command Code
- Error Code
- Instance Counter

Q: How does the NAS Performance Probe compare to the ProbeNTAP?

A: We don't get controller metrics with the NAS Performance Probe, but the ProbeNTAP doesn't get the level of data to the granularity we get with the ProbeNAS and of course, it's only for NetApp FAS systems. For NetApp FAS sites, both probes provide a comprehensive and compelling view of performance and utilization.

Q: How can I see a demonstration of the new NAS Performance Probe?

A: Go to http://www.virtualinstruments.com/request-demo/ and request a live demo. Or watch for our announcements to be at a local IT event and stop by and see us

Q: Where can I learn more?

A: Call your Virtual Instruments reseller or sales person, or for more information on VirtualWisdom, the platform that drives the ProbeNAS, see this FAQ.

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