IntelliMagic Technical Note
Storage Performance Management
Understanding HyperPAV with IntelliMagic Vision

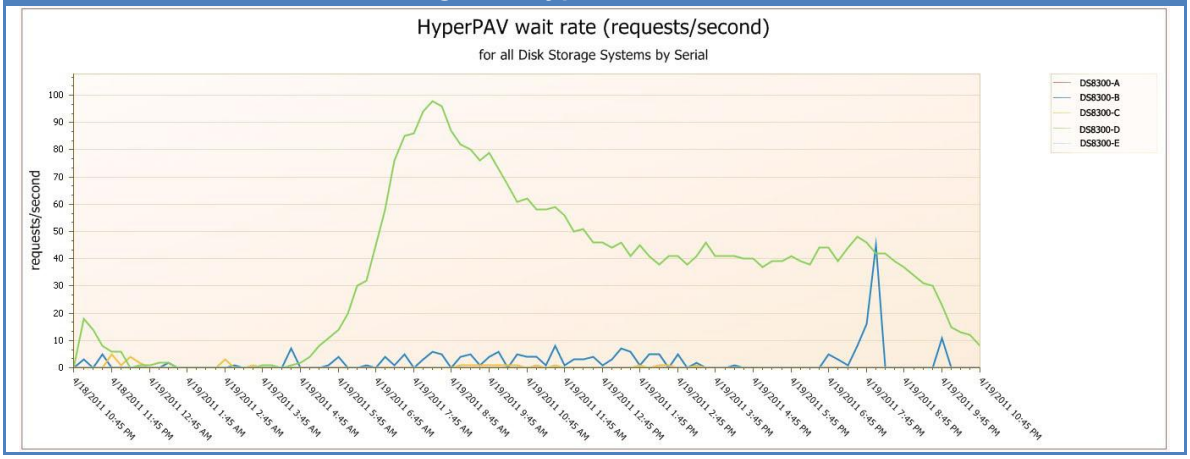
The most important metric for HyperPAV monitoring is the HyperPAV Wait Rate. It shows how many I/O requests could not be served immediately because all available aliases were in use.

Figure 1: HyperPAV Wait Rate illustrates the HyperPAV for five disk storage systems (DSS). In general, there are very few waits, but one of the DSS shows a wait rate close to 100 for a many hours of the day.

Useful Links:

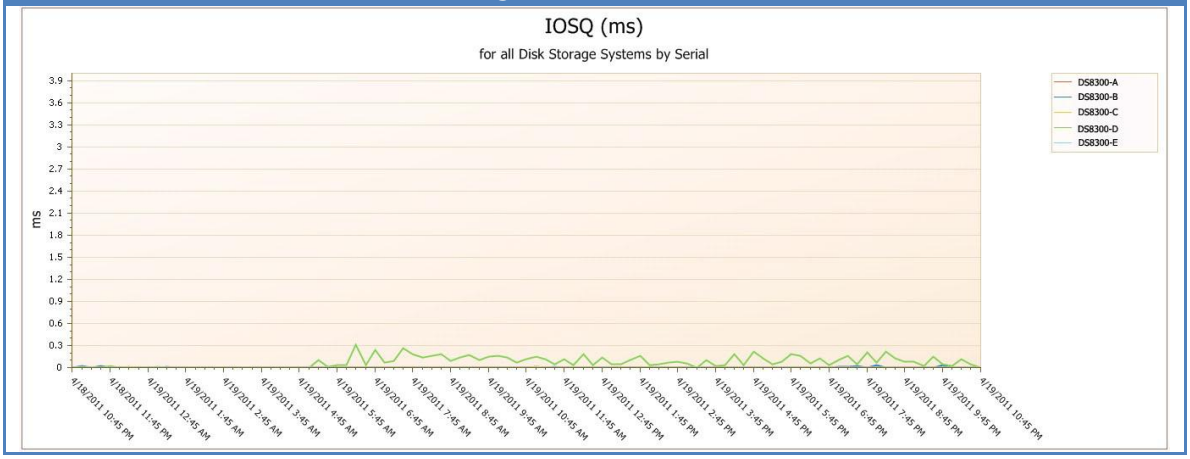
- Whitepapers
- Product Literature
- Published Article
- Linked In Discussions

Figure 1: HyperPAV Wait Rate



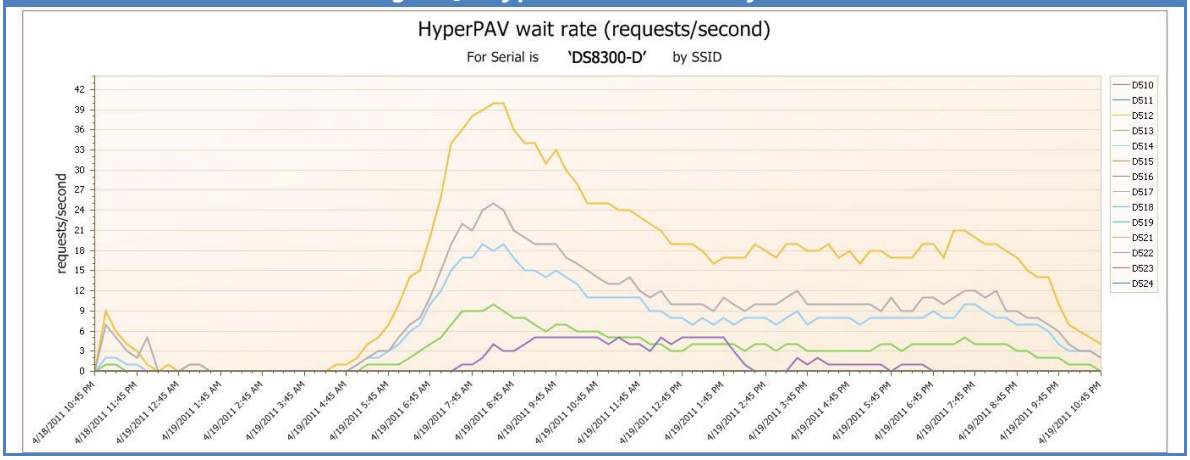
A HyperPAV Wait rate is not a problem in itself. It is to be expected that I/O requests do arrive in bursts. If the wait rate does result in queuing, you would see IOSQ time develop. As illustrated in ***Figure 2: IOSQ Time***, the IOSQ time for the same set of DSSs does not show any real problems, however, there is some queuing for the DSS that shows increased HyperPAV waits.

Figure 2: IOSQ Time



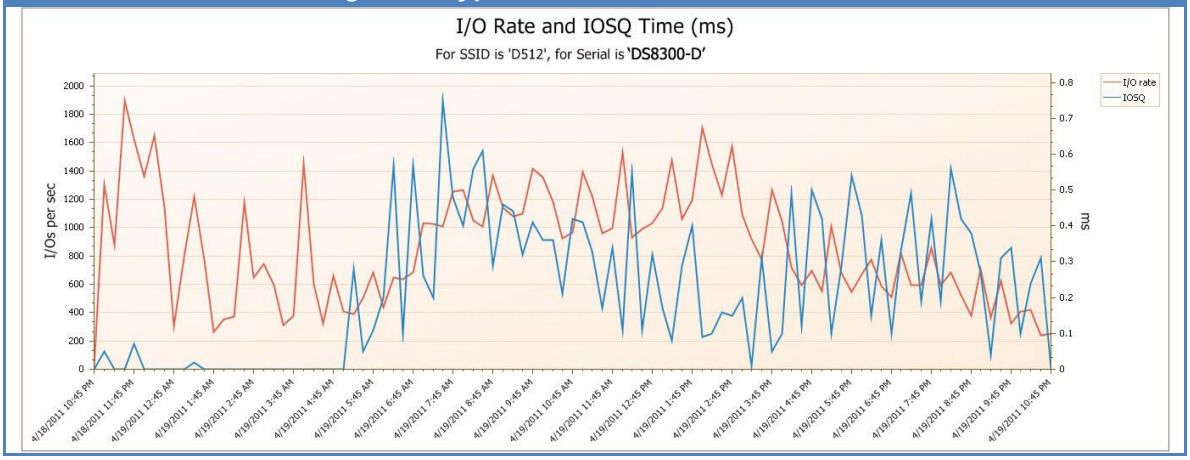
The HyperPAV mechanism works at the LCU (Logical Control Unit) level, so the first thing to investigate is which LCUs contribute to the problem. IntelliMagic Vision enables you to drill down on any of the DSSs in the DSS level chart to the HyperPAV Wait Rate for each SSID in the selected DSS. ***Figure 3: HyperPAV Wait Rate by SSID*** illustrates this drilldown. It shows that multiple LCUs have significant wait rates.

Figure 3: HyperPAV Wait Rate by SSID



Drilling down further reveals that the HyperPAV Wait Rate causes significant IOSQ time for the LCU with the highest wait rate as illustrated in ***Figure 4: HyperPAV Wait Rate and IOSQ Time***. This particular LCU does need more alias addresses for HyperPAV if the IOSQ time needs to be reduced.

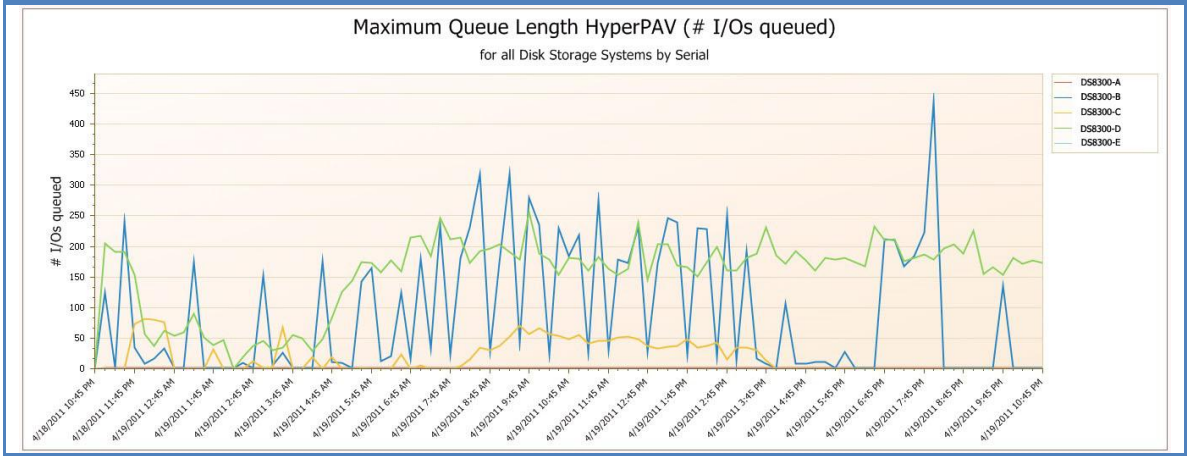
Figure 4: HyperPAV Wait Rate and IOSQ Time



There are other metrics for HyperPAV, but they are not as useful as the wait rate. For example, the Maximum Queue length measures that highest number of I/O requests waiting at any point in time. For most installations, this report would show relatively high numbers that may give the impression that there are issues with IOSQ time.

The spikes shown in ***Figure 5: Maximum Queue Length HyperPAV*** represent very short increases in queuing that may only last seconds. It is very likely they did not last long enough to generate IOSQ time for this example. Another difficulty with this metric is that it is only recorded at the LCU level, so even if you wanted to, you cannot find out from the measurement data which device is causing the peaks. As we have seen before, only the green line represents a DSS with any measureable IOSQ time.

Figure 5: Maximum Queue Length HyperPAV



For more information about the IntelliMagic Vision product, please visit www.intellimagic.net or contact sales@intellimagic.net.