Capacity Profiling – Workload Based Storage Performance Optimization

Customer Challenges

Today's IT staffs are challenged to deal with the endless demand for storage capacity to support their applications or workloads. Industry analysts state that storage demand is increasing between 30%- 50% annually while the declining costs per GB are not enough to offset soaring overall storage expenses. At the same time, data center administrators must ensure performance is improved or, at the very least, preserved. One option to contain the soaring increase in capital expense by optimizing the utilization of the capacity of the storage LUNs already deployed in the data center. This approach is difficult to accomplish without accurate visibility into the LUNs actual IO traffic patterns. That is, visibility into the IOPs, Throughput, Latency and traffic paths of the LUNs is critical to any optimization strategy. Armed with actual LUN IO traffic activity and the LUN's current capacity, storage administrators can confidently reclaim cold LUNs, re-configure hot LUNs and optimize storage paths to improve performance.

Virtual Instruments Capacity Profiling Solution

The Virtual Instruments Customer Success Capacity Profiling Service presents data center owners with actionable data to realize substantial savings by deferring future capital expenditures. Savings of <u>millions of dollars can be achieved</u>. The Capacity Profiling Service is designed to empower storage administrators with the most effective storage capacity planning approach based on the correlation of actual LUN IO traffic patterns and LUN configured capacity. Let the VI Professional Services' team provide you with a clear holistic view of the LUN utilization and optimization opportunities for each of your arrays. The Capacity Profiling Service leverages the unique set of real-time data metrics from your VirtualWisdom® installation and the array's LUN configured capacity data provided by the customer.

Benefits

- Intelligently plan purchasing decisions for future storage deployments
- Reclaim silent or underutilized LUNs saving future capital expenditures
- Expose "Hot" LUNs with associated capacity and performance
- Optimize path configuration for better performance
- Re-tier applications based on LUN utilization and performance by moving less frequently accessed items to a lower (and less costly) tier, while freeing faster (and more expensive) tiers for the critical applications
- Intelligently plan migrations or consolidations based on actual traffic utilization, expected performance and LUN capacity
- Track storage use by hosts, groups or departments

Capacity Profiling Solution Deliverables

The Capacity Profiling Service is powered by the most knowledgeable infrastructure performance analytics experts in the industry. A dedicated team of Virtual Instruments subject matter experts (SMEs) with experience providing answers to hundreds of customers globally.

The Capacity Profiling service provides three sets of deliverables:

- Lists of Hot and Cold LUNs: List of External and Internal LUN Ids with their associated capacity.

- Visualization via Utilization and Performance Graphs: IO Ranking(Skew) of active LUNs, capacity distribution vs Frequency, Storage Ports and presented LUN ids, Active ITLs per LUN, Active/Inactive LUNs presented to Hosts, Number of Hosts associated to Storage LUNs, read/write performance data, Throughput and IOPs per LUN.

- Explanation and Advice on Storage Configuration: A session with VI Services experts to explain the findings and actionable advice on capacity and configuration options.

Capacity Profiling Service

SKU	Description	Deliverables
Capacity Profiling Standard	Leverages VirtualWisdom® real time data and the array's capacity data to profile and optimize capacity and configuration.	• Lists of Hot LUNs, Cold LUNs and relevant capacity information. • Graphics and Visualization. • Explanation and advice via a remote session with the VI Services' Experts.

Table no. 1: Capacity Profiling offer

Sample Deliverables: List of LUNs

LUN_ID	Read ECT (ms)	Read (KB/s)	Write ECT (ms)	Write (KB/s)	Read IOPs	Write IOPs	Total IOPS	Throughput (KB/s)	Capacity (GB)	Read Size (KB)	Write Size (KB)	Host List
2820	0.5136	12.8972	0.3932	1.2624	1.1439	1.2624	2.4064	14.1596	394.043	11.2744	1	TRAN00,TRAN80,ORAdb365
1621	0.1846	0.0307	1.0334	9.9326	0.026	2.3284	2.3544	9.9633	24.6279	1.1821	4.2658	TRAN800,TRAN00,TRAN80, ORAdb368
0DBE	14.5404	733.557	1.619	0.0001	2.3497	0	2.3498	733.5571	394.043	312.1852	4	Resv200,Rev080,Rev900,ORA16,ORA17,ORA20, ORAdb205,ORAdb206,SAPdb333,SAPdb11, Mail12,Mail13,Mail14
1709	1.579	9.9562	1.6363	3.0902	2.0262	0.3162	2.3424	13.0464	394.043	4.9138	9.774	Online80,Online70,Online60, ORAdb368
04B3	0.2339	8.8748	0.9673	0.5285	2.2275	0.0929	2.3204	9.4032	24.6279	3.9842	5.69	Med00,Med80,ORAdb365
0E0E	39.4666	2294.738	NaN	0	2.2806	0	2.2806	2294.738	394.043	1006.192	0.0	ENG009,ENG00,8QA16, QA17,ORAdb100, ORAdb200, TRANdb10,TRANdb10, ORAdb02,ORAdb01

Table no. 2 Cold LUNs with their associated capacity, hosts and performance data.

LUN_ID	Read ECT (ms)	Read (KB/s)	Write ECT (ms)	Write (KB/s)	Read IOPs	Write IOPs	Total IOPS	Throug hput (KB/s)	Capacity (GB)	Read Size (KB)	Write Size (KB)	Host List
1731	6.83	816.94	1.59	659.05	107.45	81.2	188.65	1475.9 9	394.04	7.6	8.12	SAP001,SAP002, SAP003, SAP004
16ED	7.36	566.61	1.62	869.32	70.86	99.05	169.92	1435.9 3	394.04	8	8.78	CRM234,CRM235,CRM236,CRM237
1761	7.13	246.75	1.3	849.81	31.62	92.32	123.94	1096.5 7	394.04	7.8	9.21	S22800,S25R00,S2PD80,RAdb368
0586	2.99	390.91	1.4	272.49	71.16	33.53	104.7	663.4	394.04	5.49	8.13	S25P00,02PE80,ORAdb365
1701	3.99	315.14	1.63	411.77	52.04	48.21	100.25	726.91	394.04	6.06	8.54	S22833,S25e33,02fa80,nzapdb368
0582	3.59	357.19	1.37	369.02	60.12	38.48	98.59	726.21	394.04	5.94	9.59	S25P00,S2fb80,ORAapdb365
04C4	0.82	39.01	2.18	23263.76	1.46	95.08	96.54	23302. 77	98.51	26.75	244.66	S25f00,S2fb80,ORApdb365
057A	4.05	330.63	1.39	389.42	53.36	40.13	93.49	720.04	394.04	6.2	9.7	S25f00,S2fb80,ORAdb365
0532	4.02	327.32	1.37	369.02	52.91	38.27	91.19	696.34	394.04	6.19	9.64	S25f00,ORAdb365
0546	4.29	317.83	1.36	379.1	50.04	39.09	89.13	696.92	394.04	6.35	9.7	S25f00,S2fb80,ORAdb365
0562	4.53	296.32	1.4	384.27	45.63	39.44	85.07	680.59	394.04	6.49	9.74	S25f00,ORAdb365

Table no. 3 Hot LUNs with their associated capacity, hosts and performance data.

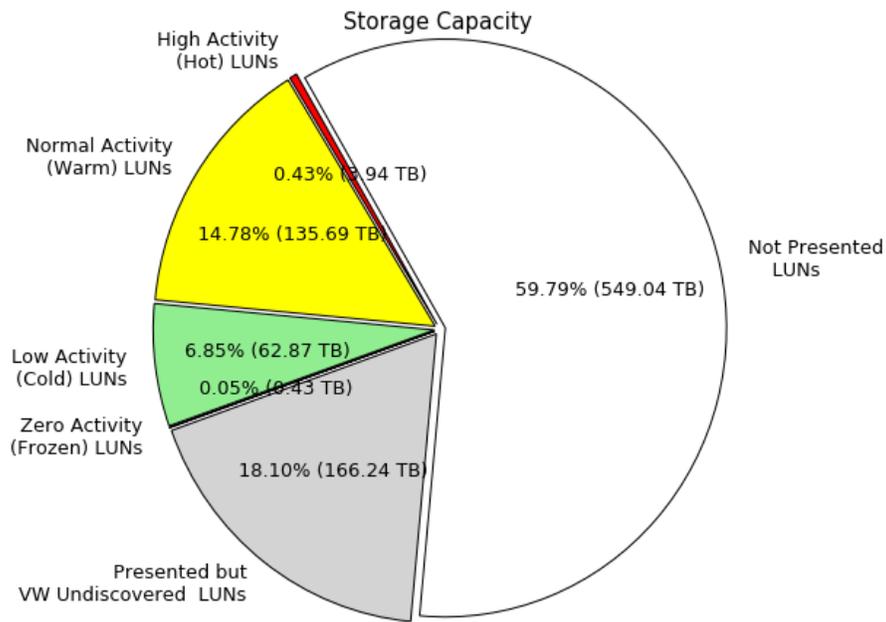## Sample Deliverables Visualization:

Figure no. 1 LUN traffic ranking distribution and associated exposed and unexposed capacity.
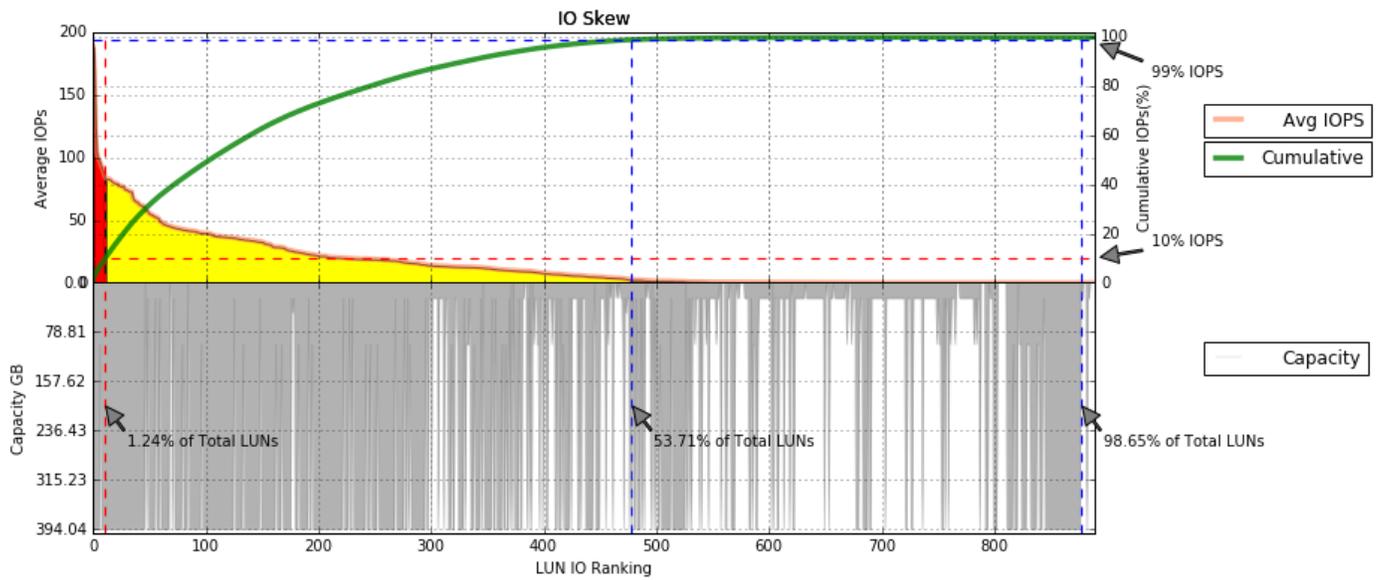
Figure no. 2 LUN traffic ranking skew and associated capacity.

Summary

The vendor-independent Capacity Profiling Service is typically conducted in a matter of days and typically pays for itself within days of delivery.

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