



# VNX Profile - MAA- VNX01

---

Project: VNX L1

Project ID: 1044576

Prepared For: Demian Geven, demian.geven@l1.nl

Created: 04/28/2020, 05:06 (UTC +02:00)



# Common Summary: Inventory, Capacity and Workload

## Inventory and Capacity Summary

Serial No.	CKM00133700906
Model No.	VNX_5400
Software Level	5.33.184
System Cache (GB)	32
Fast Cache Enabled	True
Fast Cache (GB)	275
Total No. Drives	155
No. SSD Drives	7
No. HDD Drives	148
Usable SSD Capacity (TB)	0.62
Usable HDD Capacity (TB)	257.0
Subscription %	93.67%
Subscription Capacity (TB)	192.96
Used Capacity TB	186.1
Configured Capacity (TB)	205.78
LUN Skew - Avg IO	77%

## Workload Summary Peak IOP Measurements

Configuration File Date	2020-04-20
Performance Start	2020-04-20 10:52:18
Performance End	2020-04-27 01:25:51
Performance Interval	1 mins
Peak IOPS: Date Time	2020-04-23 12:04:34
Peak IOPS: IOPS	11318
Peak IOPS: Read %	84
Peak IOPS: Avg. Read Size (KB)	16.69
Peak IOPS: Avg. Write Size (KB)	66.05
Peak IOPS: MB/s	274.09
Peak IOPS: Latency (ms)	6.6

## Workload Summary 95<sup>th</sup> Percentile Measurements

95 <sup>th</sup> IOPS: Date Time	2020-04-25 00:40:15
95 <sup>th</sup> IOPS: IOPS	6,002
95 <sup>th</sup> IOPS: Read %	78
95 <sup>th</sup> IOPS: Avg. Read Size (KB)	33.61

## Workload Summary Peak MB/s Measurements

Peak MB/s: Date Time	2020-04-24 18:21:34
Peak MB/s: IOPS	7472
Peak MB/s: Read %	65
Peak MB/s: Avg. Read Size (KB)	59.74
Peak MB/s: Avg. Write Size (KB)	93.86
Peak MB/s: MB/s	524.07
Peak MB/s: Latency (ms)	18.8

# Summary - MAA-VNX01

## Hardware Overview

Serial No.	CKM00133700906
Model No.	VNX_5400
Software Level	5.33.184
System Cache (GB)	32
No. DAEs	9
Active Drives	144
Inactive Drives	11
Empty Slots	10

## Input Data

Configuration File Date	2020-04-20
Performance Start	2020-04-20 10:53
Performance End	2020-04-27 01:25
Performance Interval (mins)	1 mins

## Emulations

File	Yes
Block	Yes

## Software Features

Snap View	Yes
Mirror View	Yes
Recover Point	Yes
SAN Copy	Yes

## Connectivity

FC 4GB	0
FC 8GB	4
FC 16GB	0
1 GigE	0
10 GigE	0
iSCSI	4

# Capacity Summary by Drive Type - MAA-VNX01

Name	Model	Total Raw Capacity (TB)	Usable SSD (TB)	Configured Capacity (TB)	Used (TB)	Utilization (%)
MAA-VNX01	VNX_5400	257.63	0.62	205.78	186.1	90

Drive Type	Rotational Speed (K)	Number of Spare Drive	Number of Data Drive	Raw Size (GB)	Number of Drives	Raw Capacity (TB)	Raw Capacity (%)
Unknown	Flash	10	0	0	10	0.0	0.0
HDD	7.2	3	80	2,751	83	222.98	86.55
HDD	10	7	58	536	65	34.02	13.21
SSD	Flash	1	6	91	7	0.62	0.24

# Array Profile Metric - MAA-VNX01

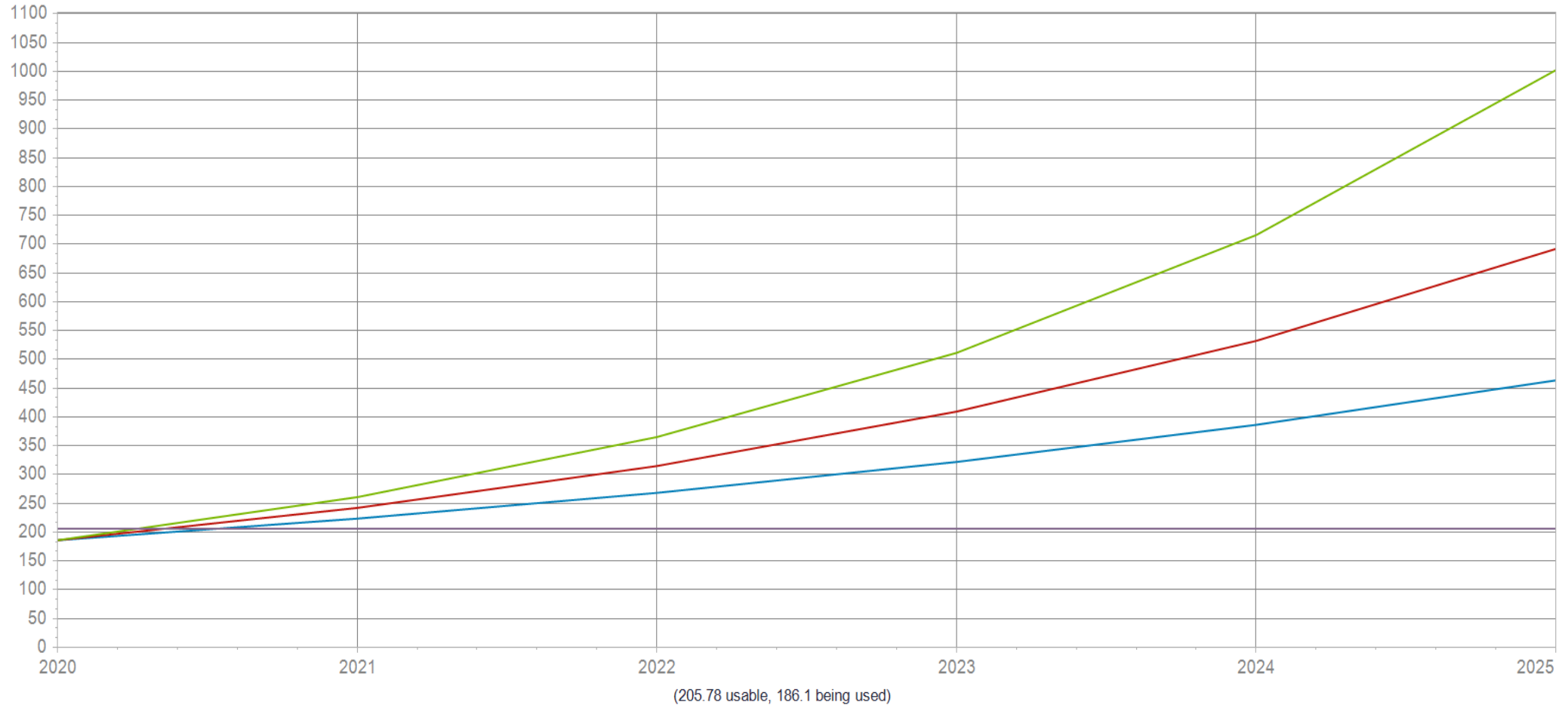
Number of Disks	155
Usable HDD (TB)	257
Usable SSD (TB)	0.62
Raw Capacity (TB)	257.63
Used Capacity(TB)	186.1
LUN Skew	77% of IOPS/23% of LUNS
Front End MB/sec - max	524
Date Time- Peak	2020-04-23 12:04:34
IOPS at Peak	11,318
Read % at Peak	84.00
Read Size (KB) at Peak	16.69
Write Size (KB) at Peak	66.05
MB/sec at Peak	274
Latency (ms) at Peak	6.6

# 5 Year Growth Projection - MAA-VNX01

At 20% growth, usable capacity will be exceeded in less than 1 year.

CONSUMED TERABYTES

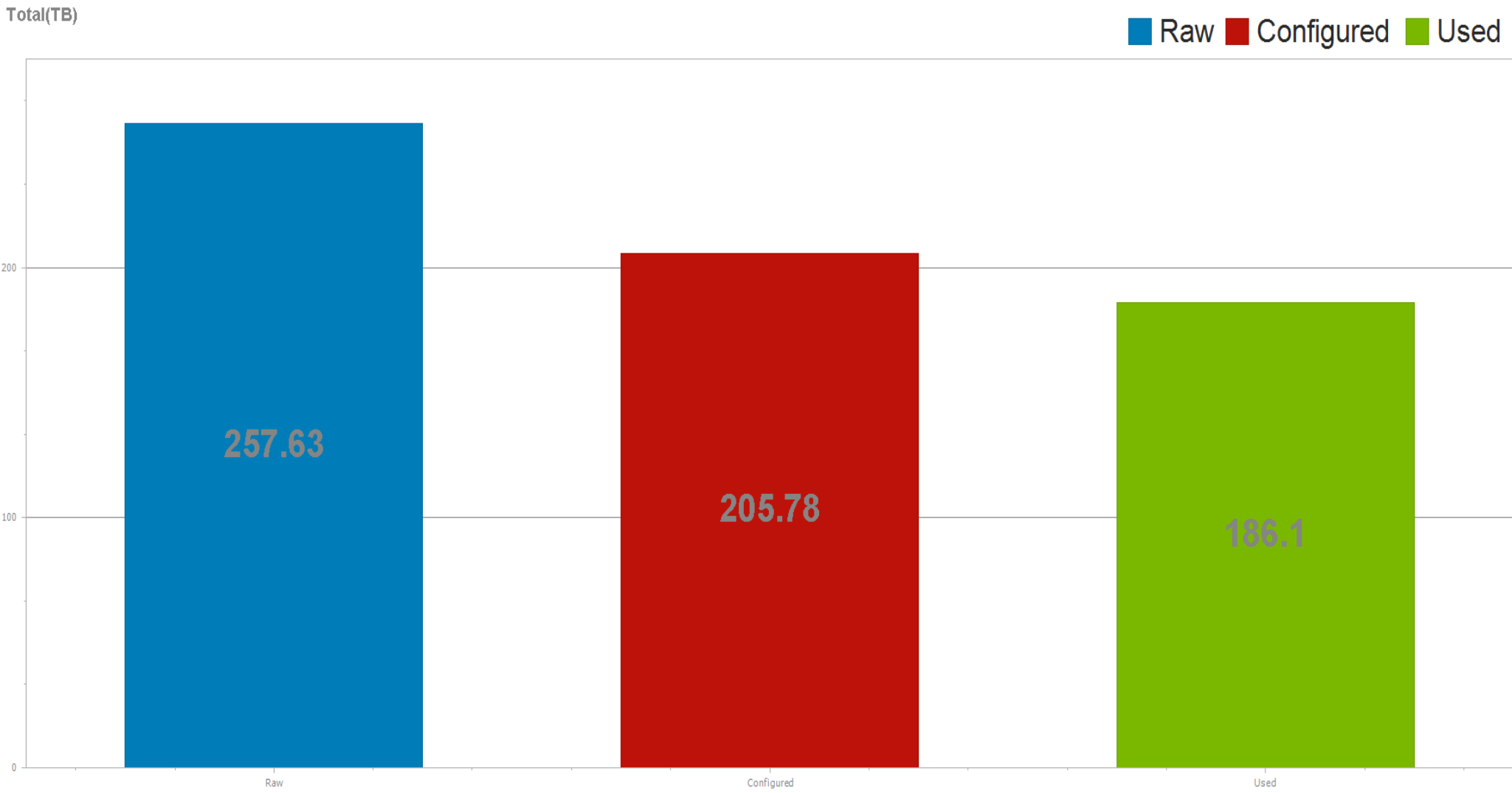
— 20% Growth (IDC Standard) — 30% Growth — 40% Growth  
— Current Configured Capacity





# Array Profile Details

# Array Capacity - MAA-VNX01



# Fibre Channel Ports - MAA-VNX01

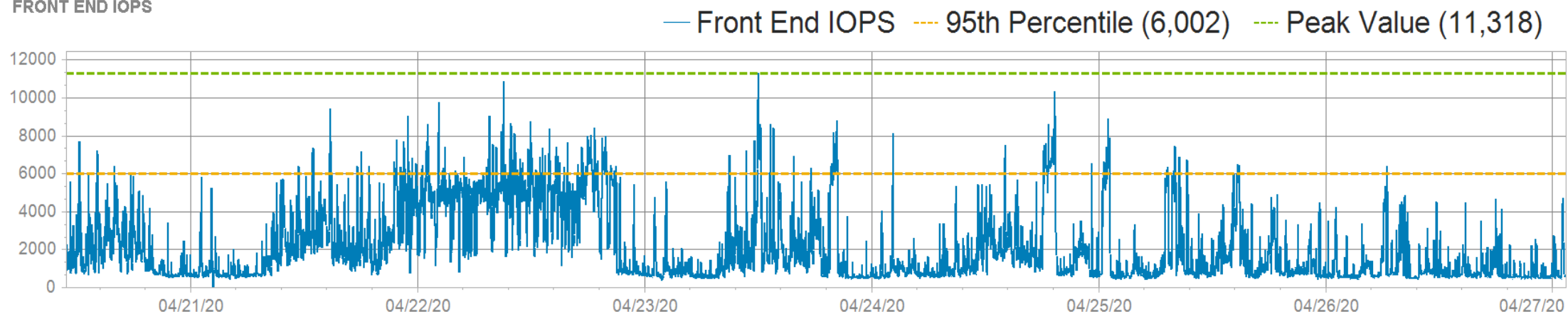
Name	Speed (Gbit/sec)	Read MB/sec 95 <sup>th</sup>	Write MB/sec 95 <sup>th</sup>
Port 0 [FC; 50:06:01:60:88:60:14:25:50:06:01:60:08:60:14:25 ]	0	0	0
Port 0 [FC; 50:06:01:60:88:60:14:25:50:06:01:68:08:60:14:25 ]	0	0	0
Port 1 [FC; 50:06:01:60:88:60:14:25:50:06:01:61:08:60:14:25 ]	0	0	0
Port 1 [FC; 50:06:01:60:88:60:14:25:50:06:01:69:08:60:14:25 ]	0	0	0
Port 2 [FC; 50:06:01:60:88:60:14:25:50:06:01:62:08:60:14:25 ]	0	0	0
Port 2 [FC; 50:06:01:60:88:60:14:25:50:06:01:6A:08:60:14:25 ]	0	0	0
Port 3 [FC; 50:06:01:60:88:60:14:25:50:06:01:63:08:60:14:25 ]	0	0	0
Port 3 [FC; 50:06:01:60:88:60:14:25:50:06:01:6B:08:60:14:25 ]	0	0	0
Port 4 [FC; 50:06:01:60:88:60:14:25:50:06:01:64:08:60:14:25 ]	8	1	28
Port 4 [FC; 50:06:01:60:88:60:14:25:50:06:01:6C:08:60:14:25 ]	8	1	30
Port 5 [FC; 50:06:01:60:88:60:14:25:50:06:01:65:08:60:14:25 ]	8	0	1
Port 5 [FC; 50:06:01:60:88:60:14:25:50:06:01:6D:08:60:14:25 ]	8	0	0

# Fibre Channel Ports - MAA-VNX01

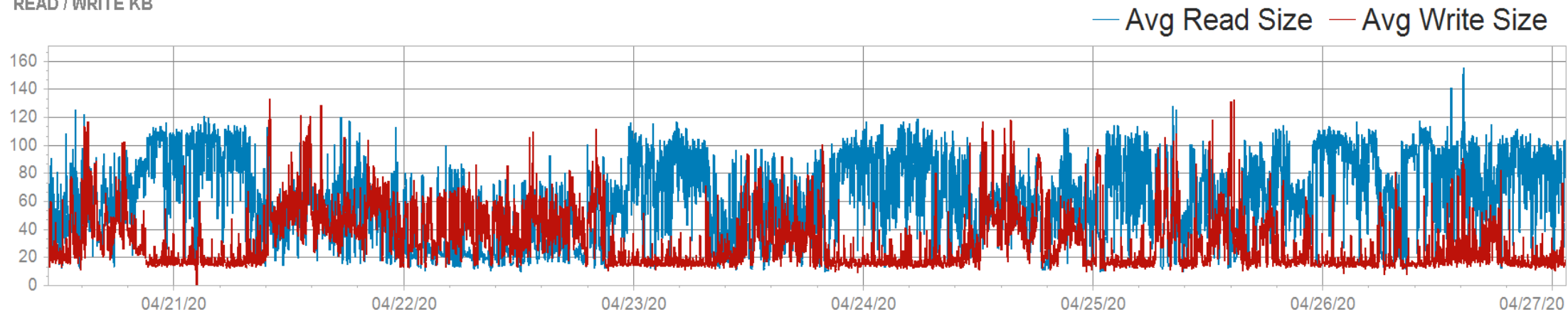
Name	Speed (Gbit/sec)	Read MB/sec 95 <sup>th</sup>	Write MB/sec 95 <sup>th</sup>
Port 6 [FC; 50:06:01:60:88:60:14:25:50:06:01:66:08:60:14:25 ]	0	0	0
Port 6 [FC; 50:06:01:60:88:60:14:25:50:06:01:6E:08:60:14:25 ]	0	0	0
Port 7 [FC; 50:06:01:60:88:60:14:25:50:06:01:67:08:60:14:25 ]	0	0	0
Port 7 [FC; 50:06:01:60:88:60:14:25:50:06:01:6F:08:60:14:25 ]	0	0	0
Port 8 [iSCSI; iqn.1992- 04.com.emc:cx.ckm00133700906.a8 ]	16	11	4
Port 8 [iSCSI; iqn.1992- 04.com.emc:cx.ckm00133700906.b8 ]	16	14	5
Port 9 [iSCSI; iqn.1992- 04.com.emc:cx.ckm00133700906.a9 ]	16	11	4
Port 9 [iSCSI; iqn.1992- 04.com.emc:cx.ckm00133700906.b9 ]	16	14	5

# Performance Profile - MAA-VNX01

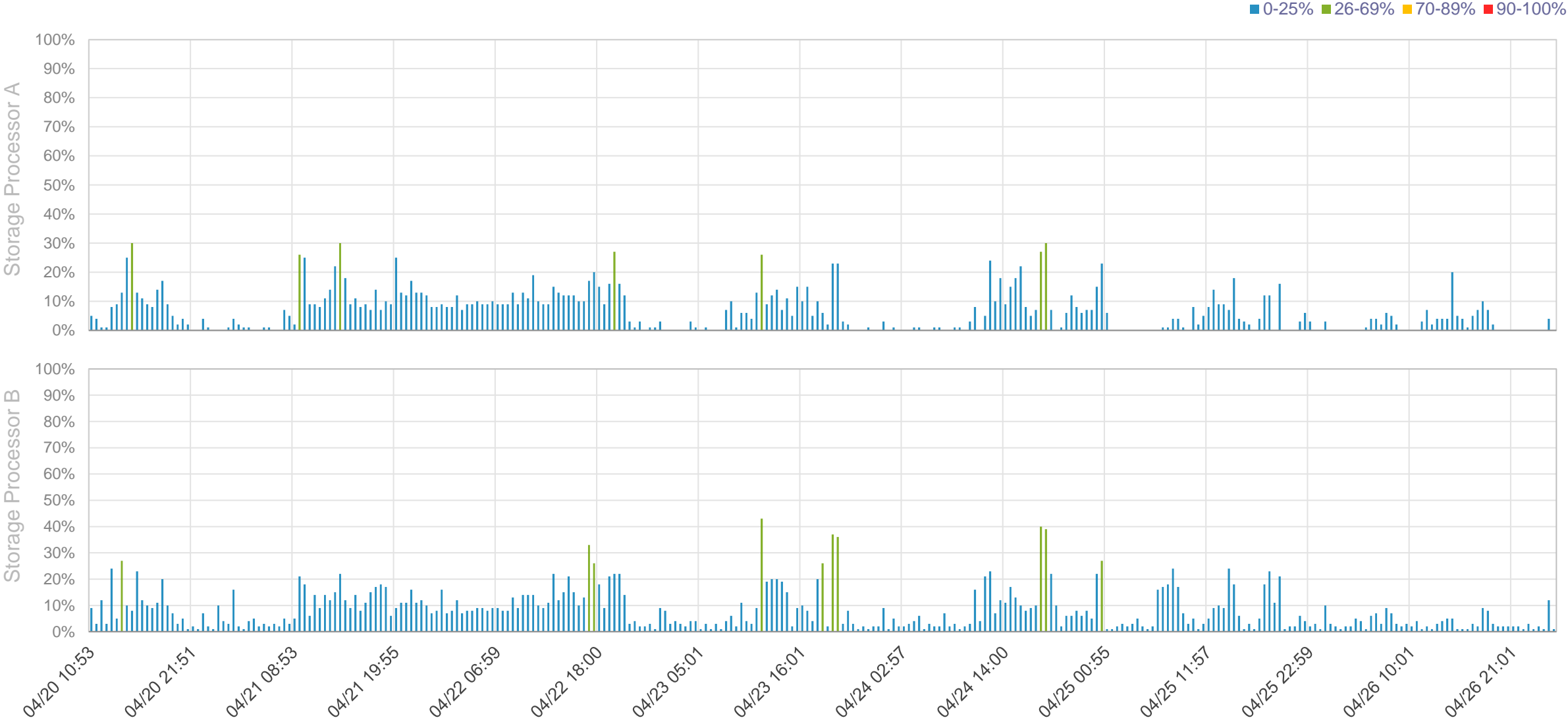
FRONT END IOPS



READ / WRITE KB

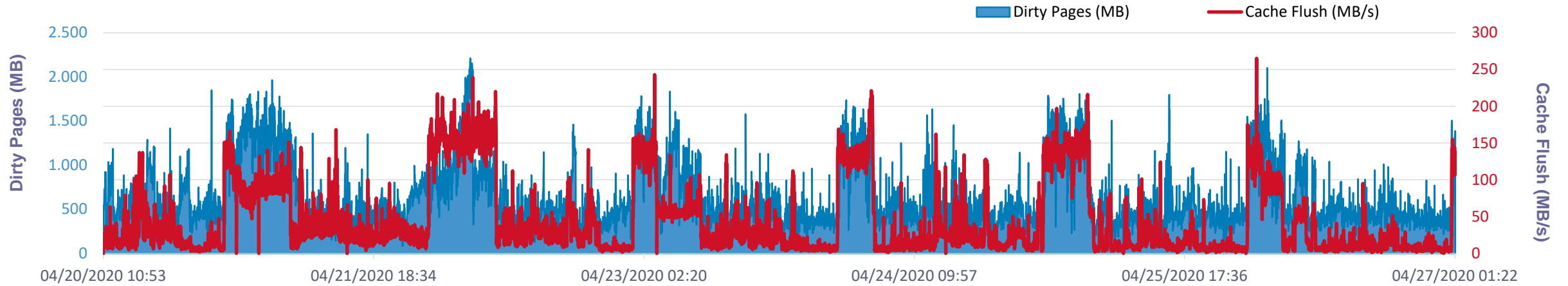


# Front End Ports: Peak Composite

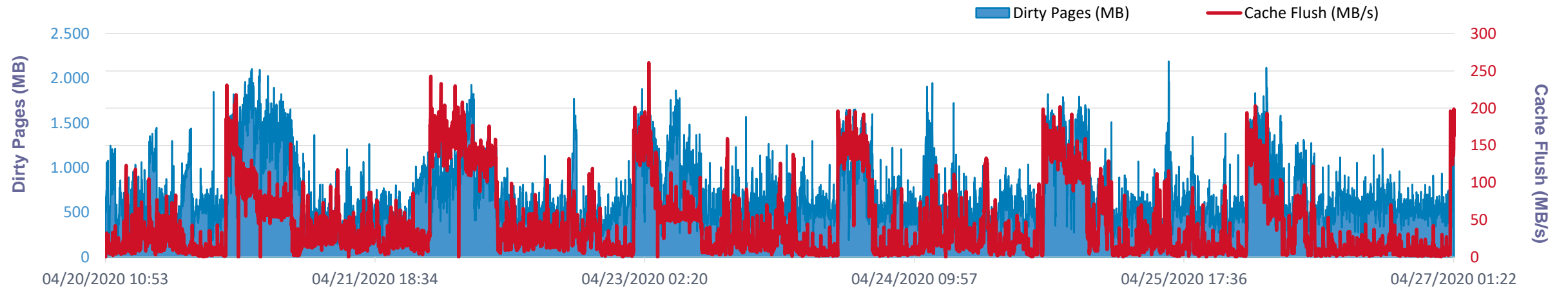


# Cache Utilization

SP-A

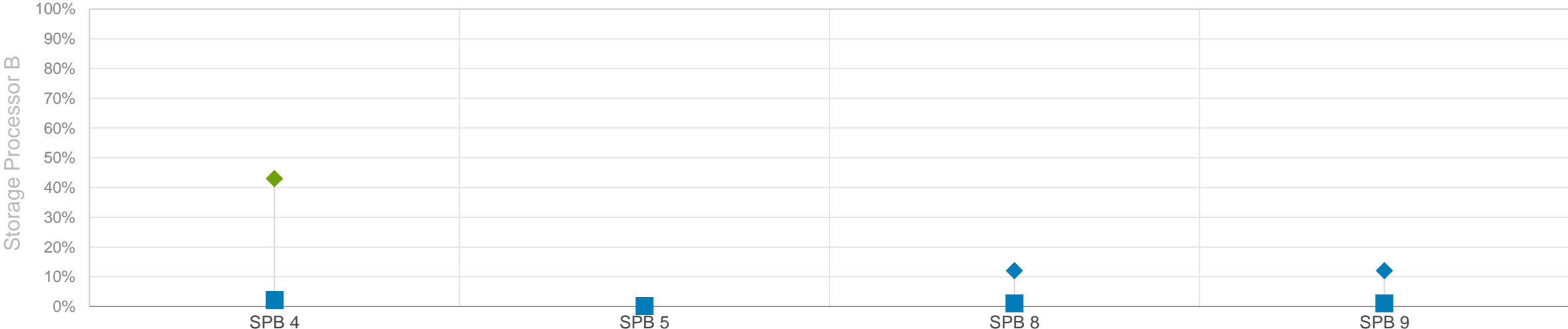
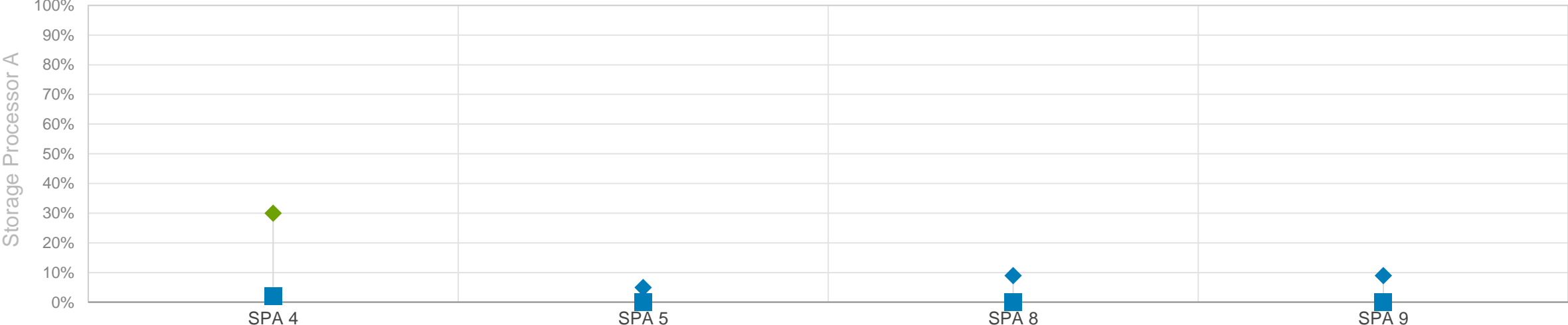


SP-B



# Peak/Average Ports Utilization

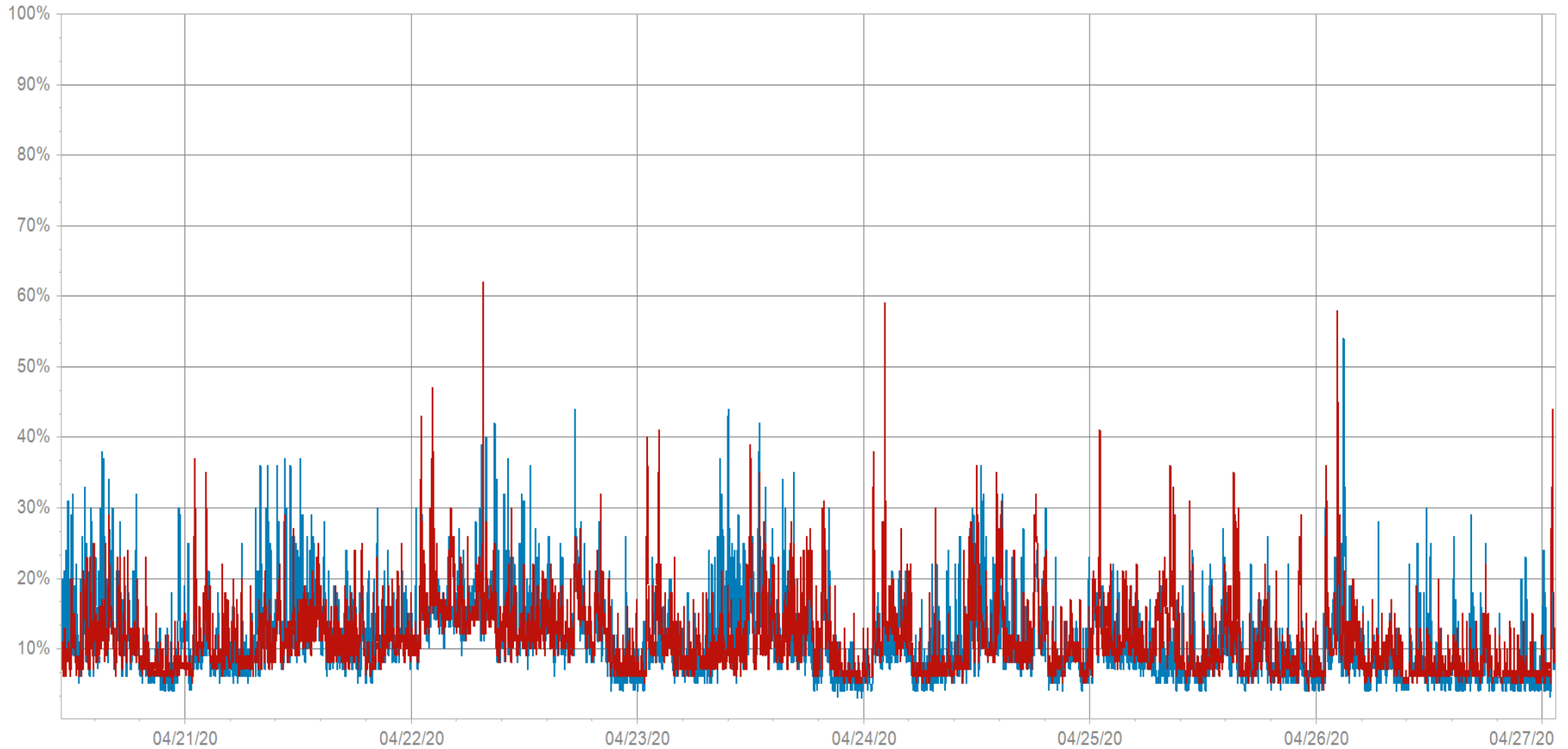
◆ Peak Utilization    ■ Average Utilization



# Storage Processor Utilization

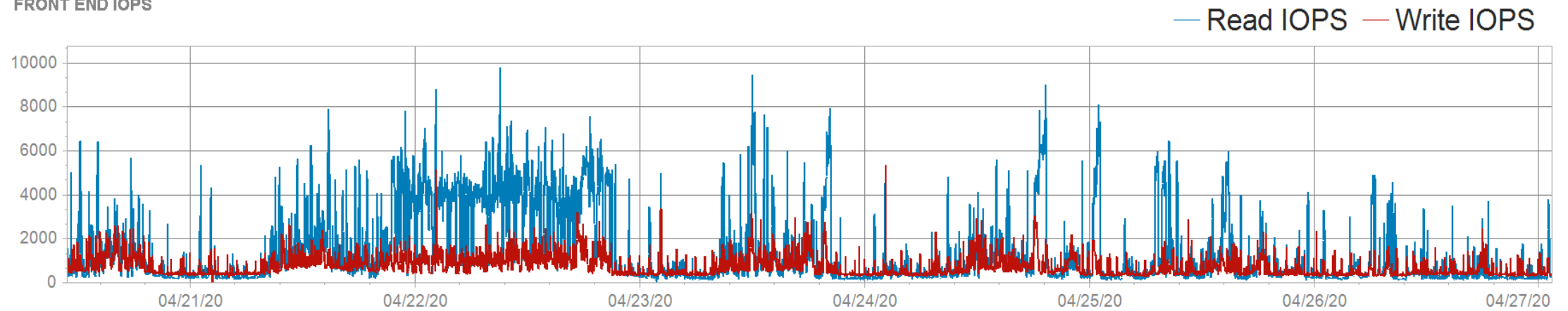
SP UTILIZATION

— SP-A — SP-B

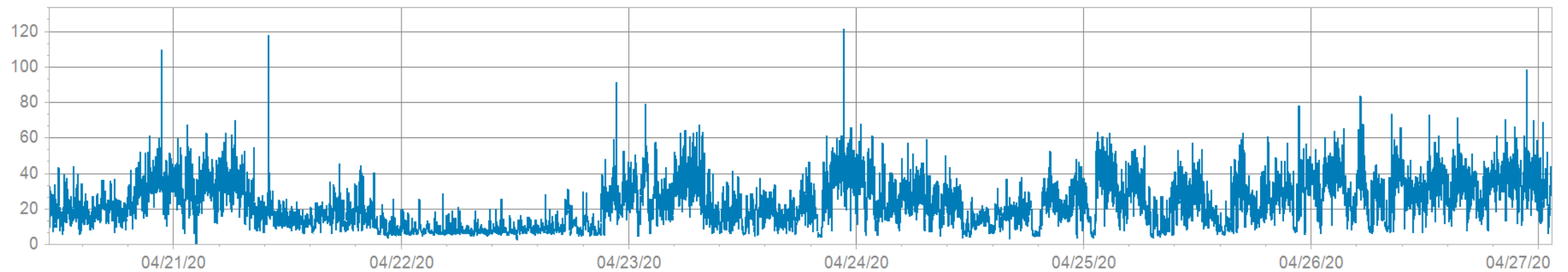


# Front End Latency - MAA-VNX01

FRONT END IOPS

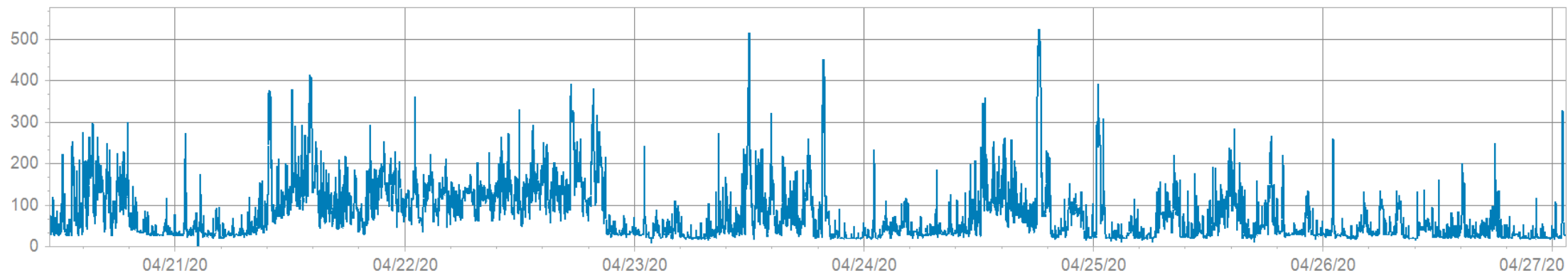


RESPONSE TIME (MS)



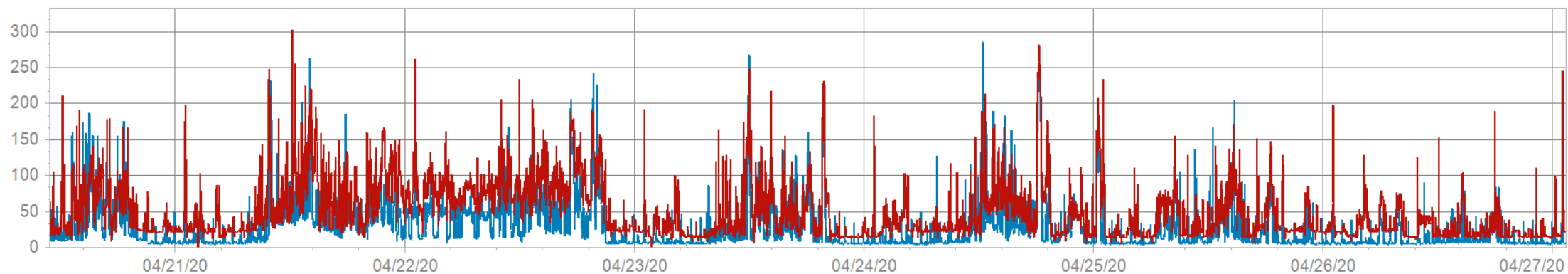
# Front End Bandwidth - MAA-VNX01

FRONT END MB/SEC



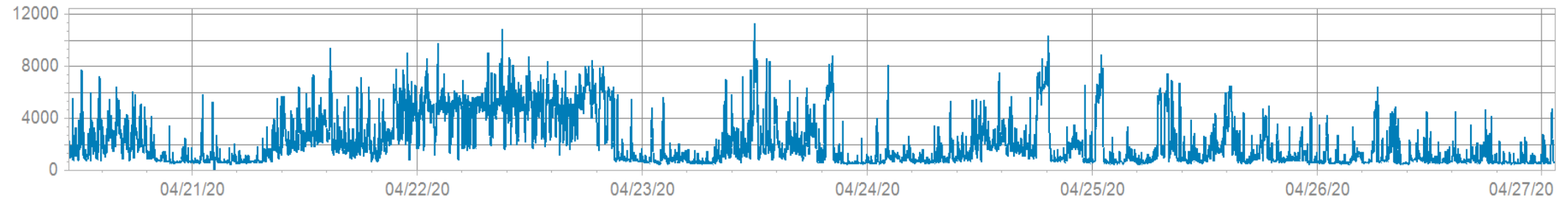
READ/WRITE MB/SEC

— Write MB/SEC — Read MB/SEC

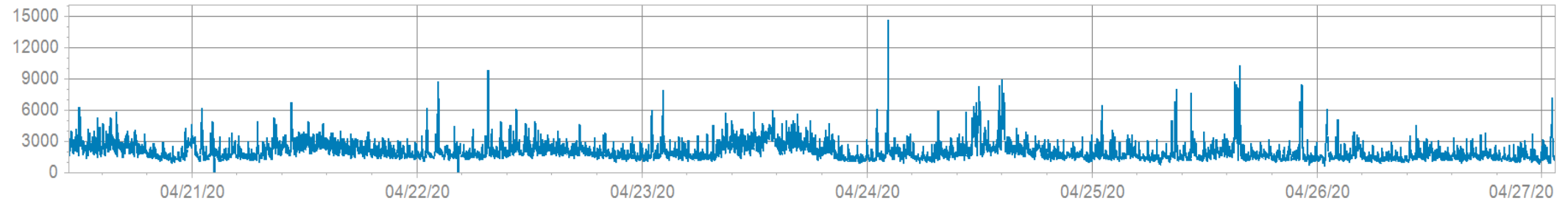


# Front End IOPS vs Back End IOPS - MAA-VNX01

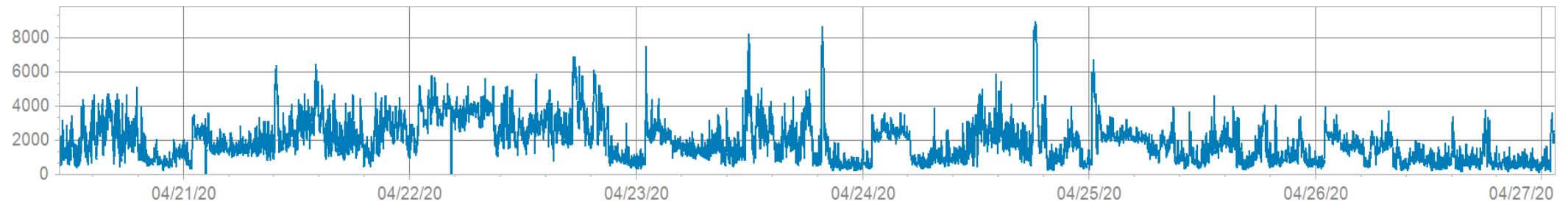
FRONT END IOPS



BACK END IOPS - SSD ONLY



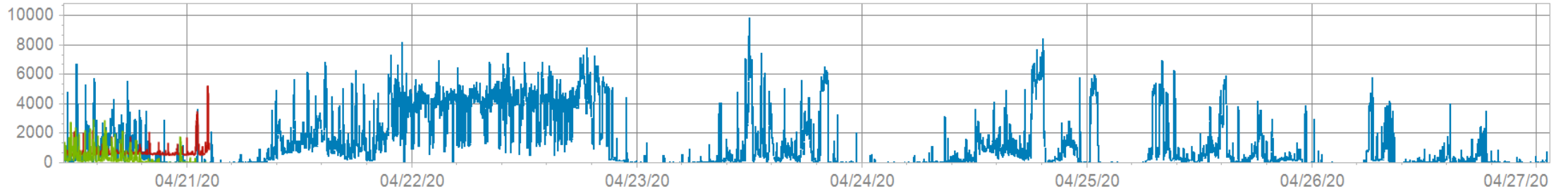
BACK END IOPS - DISK ONLY



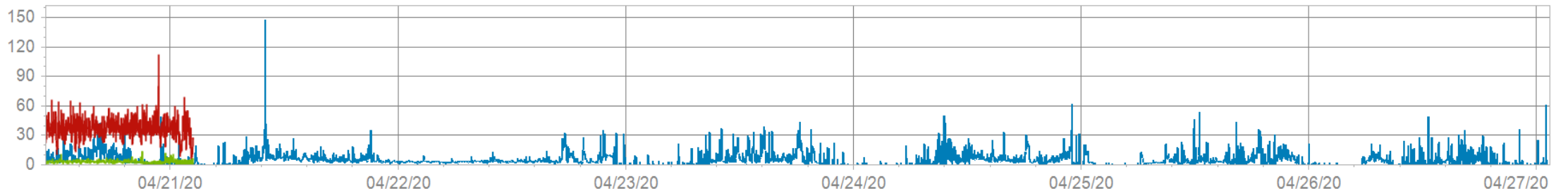
# Top 3 Clients by IOPS - MAA-VNX01

FRONT END IOPS

— Celerra\_MAA-CS0-VNX01  
— MAA-ESXi01.I1rtv.I1.nl MAA-ESXi02.I1rtv.I1.nl MAA-ESXi03.I1rtv.I1.nl MAA-ESXi06.I1rtv.I1.nl  
— MAA-ESXi04.I1rtv.I1.nl MAA-ESXi05.I1rtv.I1.nl



RESPONSE TIME (MS)



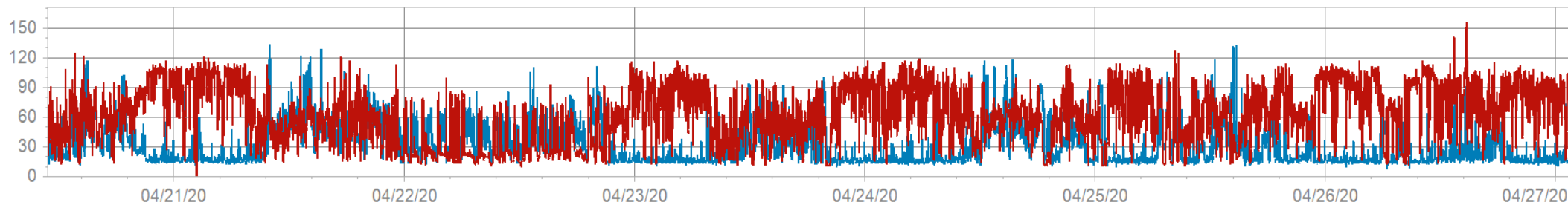
# Top 3 Clients by IOPS - MAA-VNX01

Client	#LUNs	Used (TB)	Peak IOPS	Response Time (ms)	Front End MB/sec	Read %	Avg IO Size (KB)
Celerra_MAA-CS0-VNX01	45	27	9,828	5.65	41	81.67%	36.33
MAA-ESXi01.I1rtv.I1.nl MAA-ESXi02.I1rtv.I1.nl MAA-ESXi03.I1rtv.I1.nl MAA-ESXi06.I1rtv.I1.nl MAA-ESXi07.I1rtv.I1.nl MAA-ESXi08 MAA-ESXi09 MAA-ESXi10	5	8	5,243	31.99	28	38.98%	41.29
MAA-ESXi04.I1rtv.I1.nl MAA-ESXi05.I1rtv.I1.nl	3	1	2,960	2.7	6	66.55%	24.38

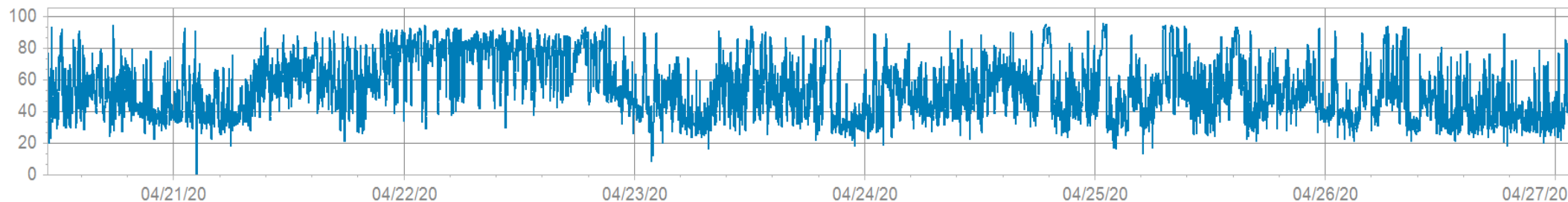
# IO Size and Read Percent - MAA-VNX01

AVG IO SIZE (KB)

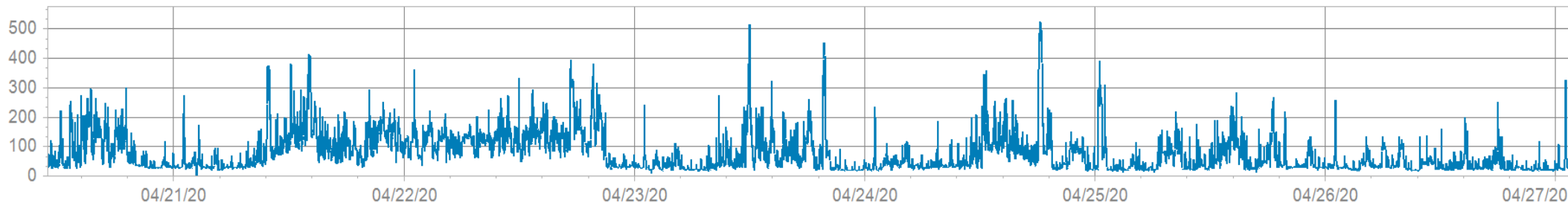
— Avg Write Size (KB) — Avg Read Size (KB)



READ %

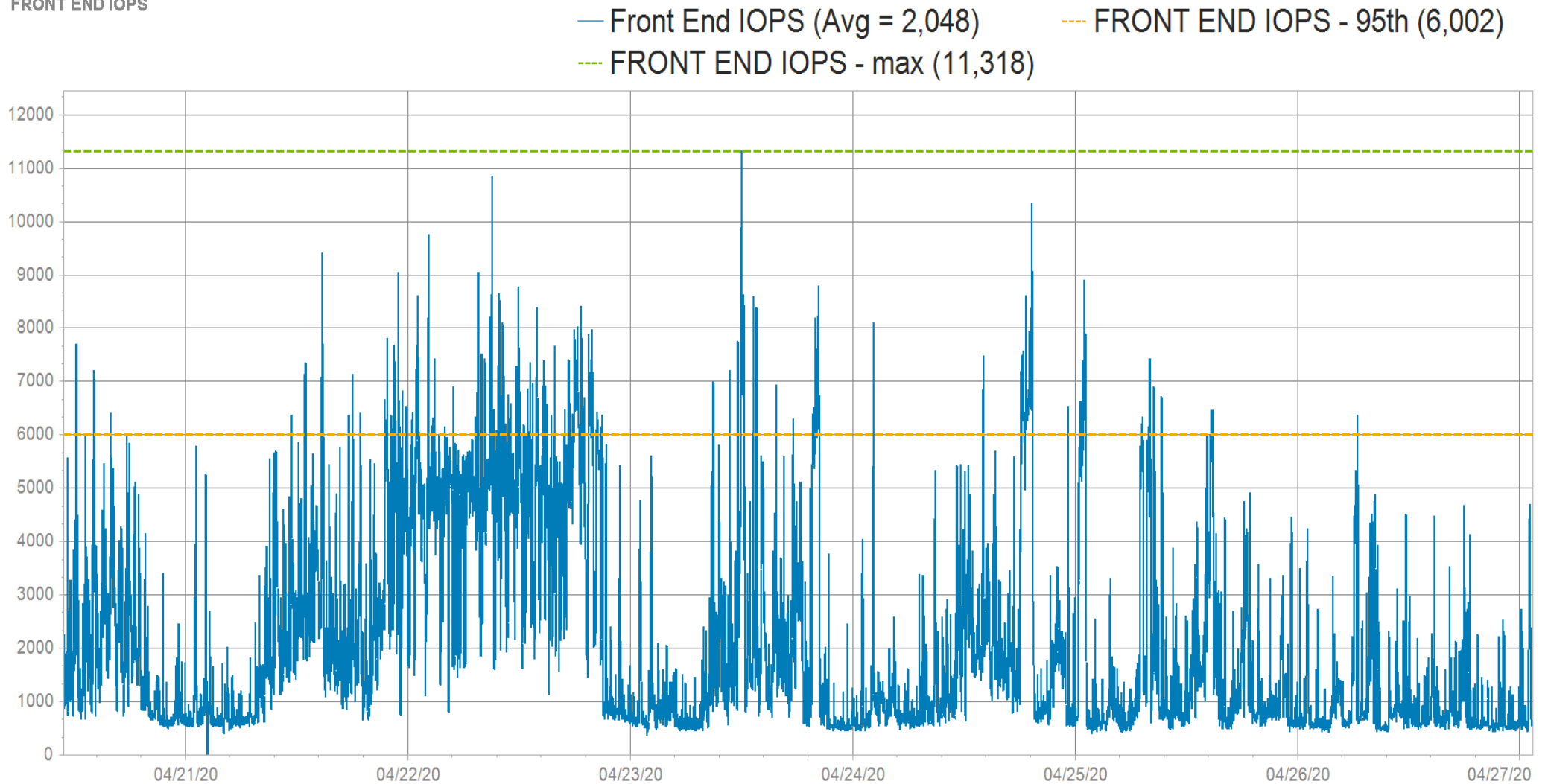


FRONT END MB/SEC

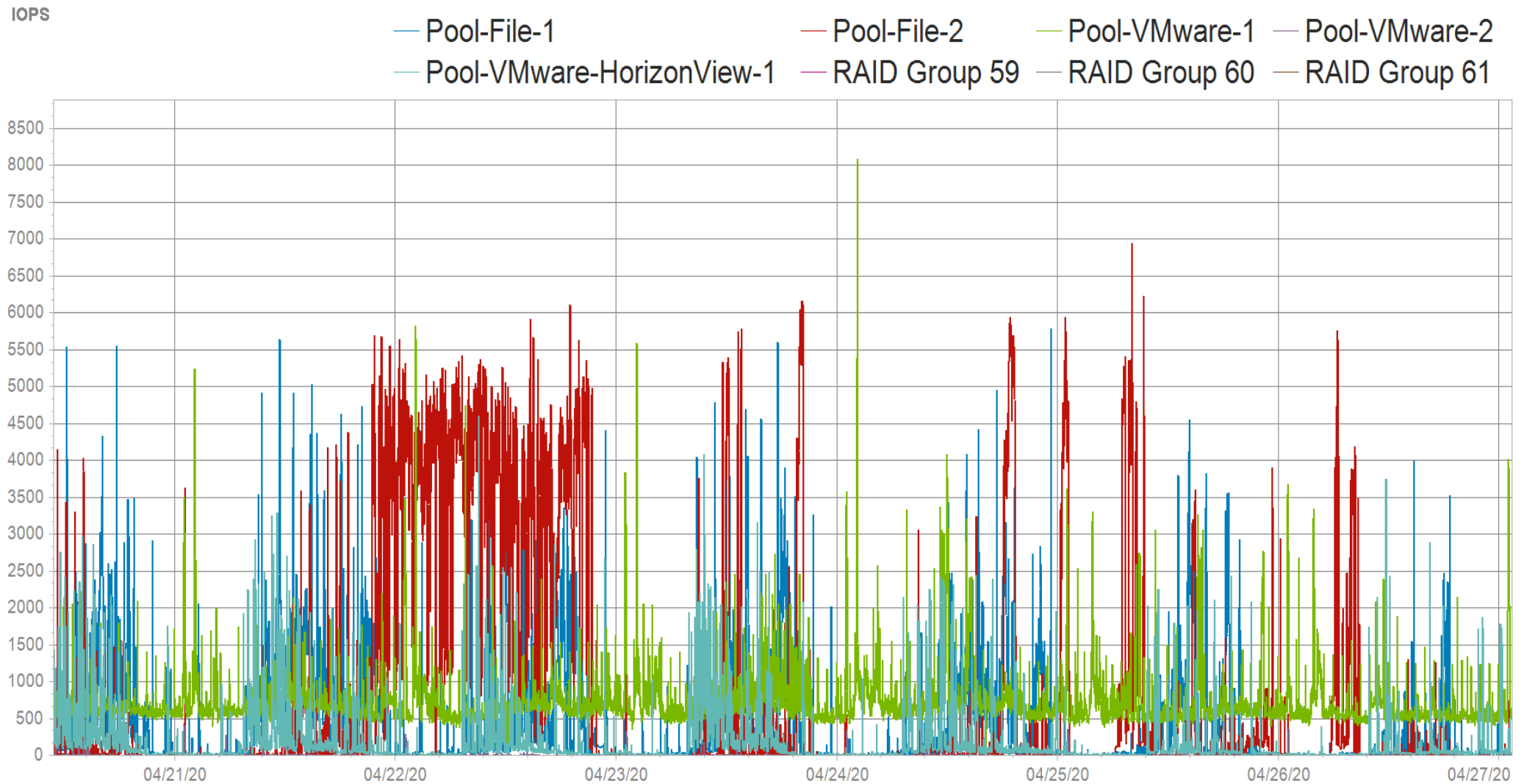


# IOPS Thresholds - MAA-VNX01

FRONT END IOPS

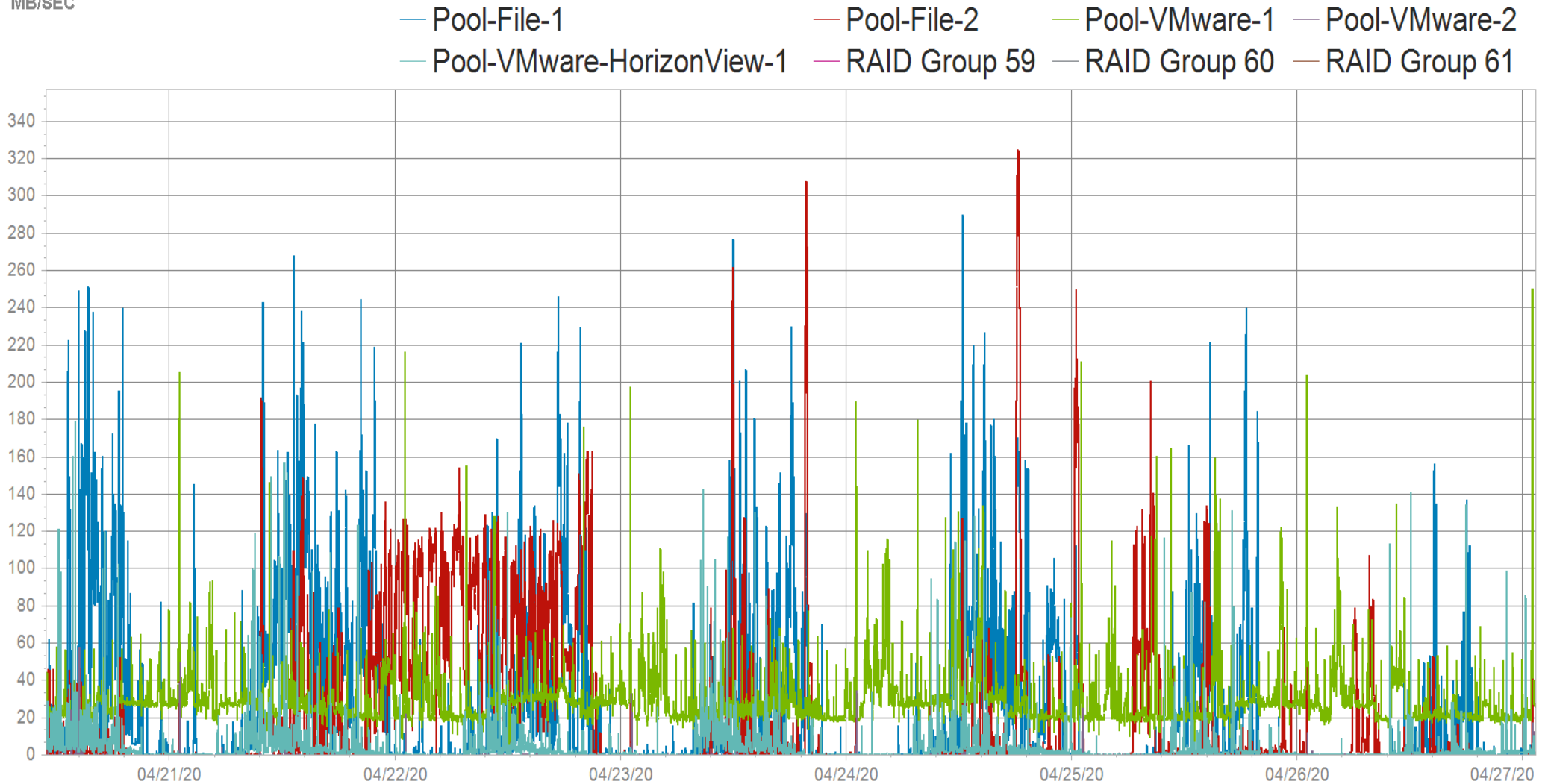


# Back End Activity By Pool - MAA-VNX01



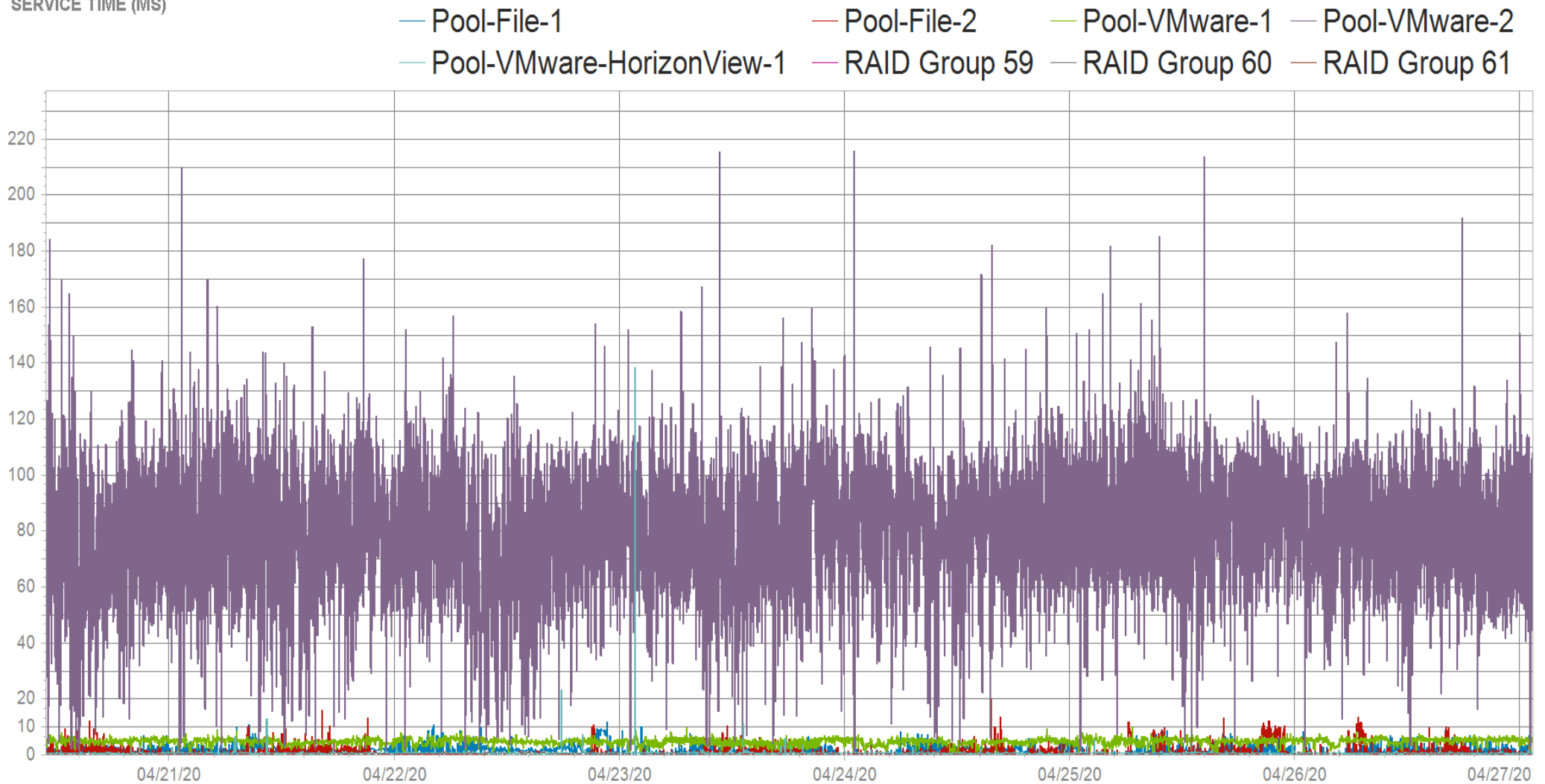
# Back End Activity By Pool - MAA-VNX01

MB/SEC



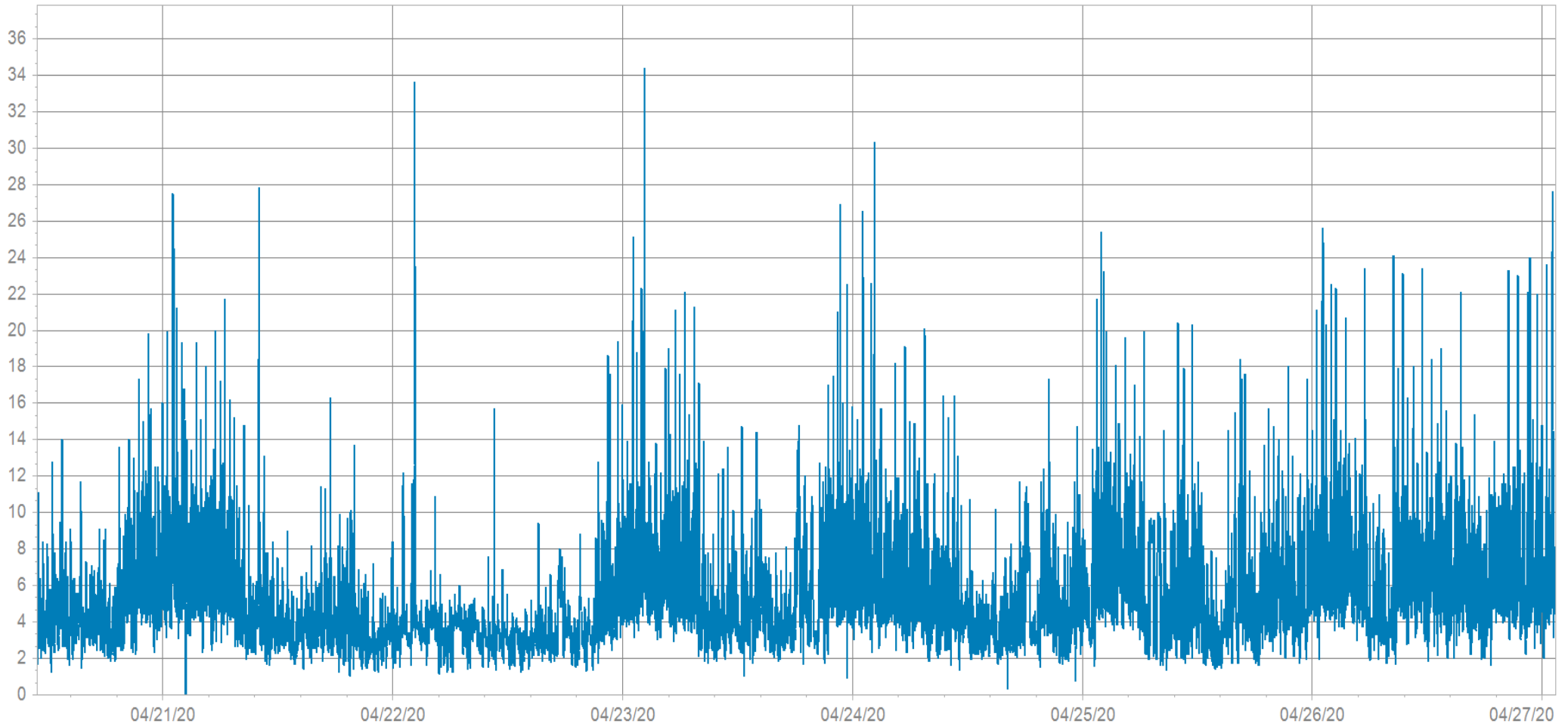
# Back End Activity By Pool - MAA-VNX01

SERVICE TIME (MS)



# Total Queue Length - MAA-VNX01

QUEUE LENGTH



Shows the total busy queue length across both SPs.



# Top Clients and LUNs

# Top 15 LUNs by IOPS - MAA-VNX01

LUN	Front End IOPS - max	Front End MB/sec-max	Avg IO Size (KB)	Latency (ms) - max	Latency (ms) - avg	Read % - avg
VMware-Productie_0	7,557	233	48.18	125.40	23.89	51.6%
LUN-File-NLSAS_16	5,365	150	29.7	27.30	2.04	97.34%
VMware-HorizonView_1	4,139	144	20.24	121.70	2.43	66.93%
LUN-File-NLSAS_15	3,619	72	42.33	24.90	2.77	85.59%
VMware-HorizonView_2	2,762	171	24.11	48.70	2.72	67.61%
VMware-Productie_2	2,399	88	20.18	176.50	30.40	17.7%
VMware-HorizonView_0	2,211	157	30.47	17.90	1.97	77.24%
VMware-Productie_1	1,973	66	31.61	528.50	49.02	30.98%
LUN-File-NLSAS_17	1,846	81	23.2	21.90	2.76	83.73%
LUN-File-NLSAS_18	1,681	82	24.18	23.50	3.12	88.23%

# Top 15 LUNs by IOPS - MAA-VNX01

LUN	Front End IOPS - max	Front End MB/sec-max	Avg IO Size (KB)	Latency (ms) - max	Latency (ms) - avg	Read % - avg
LUN-File-NLSAS_20	1,584	81	26.26	21.20	2.60	88.59%
LUN-File-NLSAS_19	1,526	80	26.66	22.90	2.59	88.29%
LUN-File-NLSAS_6	1,509	21	17.95	55.30	3.64	84.94%
Lun-File-Mixed_17	1,355	158	133.62	130.50	16.85	79.36%
LUN-File-Mixed_3	1,220	57	50.05	214.10	5.63	69%

# Top 15 LUNs by MBPS - MAA-VNX01

LUN	Front End IOPS - max	Front End MB/sec-max	Avg IO Size (KB)	Latency (ms) - max	Latency (ms) - avg	Read % - avg
VMware-Productie_0	7,557	233	48.18	125.40	23.89	51.6%
VMware-HorizonView_2	2,762	171	24.11	48.70	2.72	67.61%
Lun-File-Mixed_17	1,355	158	133.62	130.50	16.85	79.36%
VMware-HorizonView_0	2,211	157	30.47	17.90	1.97	77.24%
LUN-File-NLSAS_16	5,365	150	29.7	27.30	2.04	97.34%
VMware-HorizonView_1	4,139	144	20.24	121.70	2.43	66.93%
VMware-Productie_2	2,399	88	20.18	176.50	30.40	17.7%
LUN-File-NLSAS_18	1,681	82	24.18	23.50	3.12	88.23%
LUN-File-NLSAS_17	1,846	81	23.2	21.90	2.76	83.73%
LUN-File-NLSAS_20	1,584	81	26.26	21.20	2.60	88.59%

# Top 15 LUNs by MBPS - MAA-VNX01

LUN	Front End IOPS - max	Front End MB/sec-max	Avg IO Size (KB)	Latency (ms) - max	Latency (ms) - avg	Read % - avg
LUN-File-NLSAS_19	1,526	80	26.66	22.90	2.59	88.29%
LUN-File-Mixed_16	1,173	80	74.2	123.10	20.15	73.95%
LUN-File-Mixed_14	1,134	80	81.35	103.90	19.91	74.61%
LUN-File-NLSAS_15	3,619	72	42.33	24.90	2.77	85.59%
VMware-Productie_1	1,973	66	31.61	528.50	49.02	30.98%