

Oracle® Communications

Network Analytics Data Director

Benchmarking Guide



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ORACLE®

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Acronyms

The following table provides information about the acronyms used in the document.

Table Acronyms

Acronym	Description
OCNADD	Oracle Communications Network Analytics Data Director
SCP	Oracle Communications Cloud Native Core, Service Communication Proxy
SEPP	Oracle Communications Cloud Native Core, Security Edge Protection Proxy
NRF	Oracle Communications Cloud Native Core, Network Repository Function
CNE	Oracle Communications Cloud Native Core, Cloud Native Environment
MPS	Messages Per Second

What's New in This Guide

This section lists the documentation updates for Release 23.3.x in *Oracle Communications Network Analytics Data Director Benchmarking Guide*.

Release 23.3.0.0.1 - F86178-02, December 2023

There are no updates to this document in this release.

Release 23.3.0 - F86178-01, October 2023

Updated the following sections:

- [Resource Requirement](#)
- [Profile Resource Requirements](#)
- [Deployment Profiles](#)
- [OCNADD Benchmarking Testing](#)

1

Introduction

Oracle Communications Network Analytics Data Director (OCNADD) is a specialized Network Data Broker (NDB) in 5G Network Architecture.

OCNADD receives network traffic data from various sources, 5G network functions (NFs), Non-5G NFs, and third-party producers, performs filtering, replication, and aggregation on the received data according to the rules implemented by the subscribed third-party consumers. OCNADD then sends the filtered, replicated, or aggregated data to the subscribed third-party consumers (third-party consumer applications or platforms) securely.

1.1 Purpose and Scope

This document is designed to measure the performance and capacity of OCNADD deployment and resource requirements.

1.2 References

For more information about OCNADD, see the following documents:

- *Oracle Communications Network Analytics Data Director Installation, Upgrade, and Fault Recovery Guide*
- *Oracle Communications Network Analytics Data Director User Guide*

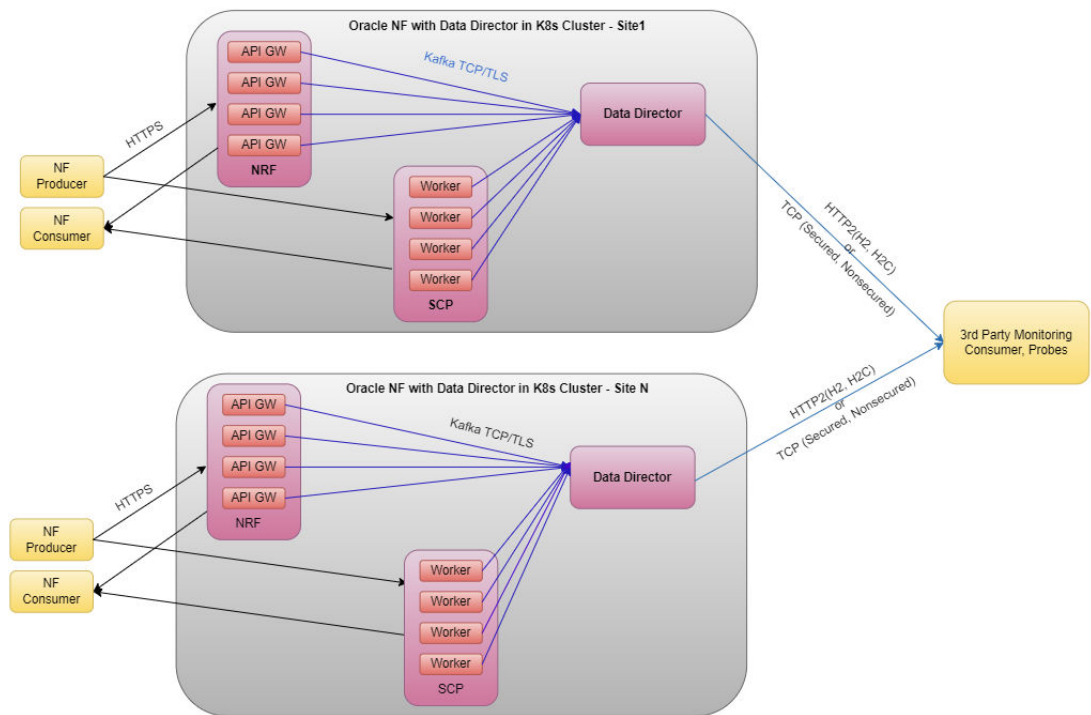
2

Deployment

OCNADD supports CNE and TANZU platforms. There are a few variations in the deployment process for both the platforms. For more information about OCNADD installation, see *Oracle Communications Network Analytics Data Director Installation, Upgrade, and Fault Recovery Guide*.

The following diagram depicts the OCNADD deployment in the 5G architecture:

Figure 2-1 OCNADD Deployment



Note

From release 23.1.0 onwards OCNADD supports Synthetic Feeds along with HTTP2 Feeds.

OCNADD uses the following common services of CNE:

- Kubernetes
- Prometheus
- Metallb (Load balancer)

- cnDBTier

3

Resource Requirement

This chapter provides information about the resource requirements to install and run Oracle Communications Network Analytics Data Director (OCNADD) with the desired Message Per Second (MPS) profiles.

The resource requirement for the profiles is captured using Baremetal CNE with the following CNE and K8 cluster configuration:

Table 3-1 CNE Configuration for HTTP2 Traffic

Type of Server	Baremetal CNE
Master node	3
Worker node	21
Storage Class	Standard
Top of Rack Switch	1

Table 3-2 CNE Configuration for Kafka Traffic

Type of Server	Baremetal CNE
Master node	3
Worker node	21
Storage Class	Standard
Top of Rack Switch	1

Table 3-3 CNE Configuration for Synthetic Traffic

Type of Server	Baremetal CNE
Master node	3
Worker node	21
Storage Class	Standard
Top of Rack Switch	1

3.1 Deployment Profiles

Default Deployment Profile

This profile can stream NFs (SCP, NRF, SEPP) data up to 15K MPS and can be scaled to handle up to 100K MPS for HTTP2 feed (and 64K for synthetic feed) when *weighted_lb* and Filter (Ingress and Egress) are "OFF".

Replication Factor should be "1" and the incoming message size on OCNADD should be less than or equal to 3500K.

Table 3-4 Default Deployment Profile

OCNADD Service Replication Factor = 1 Message Size = 3500K FEED Type = HTTP2, Synthetic	vCPU Req	vCPU Limit	Memory Req (Gi)	Memory Limit (Gi)	Min Replica	Max Replica	Partitio ns	Topic Name
ocnaddconfiguration	1	1	1	1	1	1		
ocnaddalarm	1	1	1	1	1	1		
ocnaddadmin	1	1	1	1	1	1		
ocnaddhealthmonit oring	1	1	1	1	1	1		
ocnaddscppaggrega tion (55K)	1	2	1	2	1	2	12	SCP
ocnaddnrfaggregati on (15K)	1	2	1	2	1	1	6	NRF
ocnaddseppaggreg ation (30K)	1	2	1	2	1	2	12	SEPP
ocnaddadapter	2	3	3	4	HTTP:2 SYNTH ETIC:1	HTTP:13 SYNTH ETIC:5	117	MAIN
ocnaddkafka	2	5	4	48	4	4		
zookeeper	1	1	1	2	3	3		
ocnaddgui	1	2	1	1	1	2		
ocnadduirouter	1	2	1	1	1	2		
ocnadd-cache	1	1	22	24	3	3		

Note

- Four instances of Kafka brokers might be required when running RF=2, based on the setup performance. The end-to-end latency might increase when DISK I/O is slow.
- For DISK I/O, see [Disk Throughput Requirements](#).
- For Kafka PVC-Storage, see [Kafka PVC Storage Requirements](#).

Deployment Profile Kafka and Aggregation

Table 3-5 Deployment Profile Kafka and Aggregation

OCNADD Service Replication Factor = 1 Message Size = 3500K FEED Type = HTTP2	vCPU Req	vCPU Limit	Memory Req (Gi)	Memory Limit (Gi)	Min Replica	Max Replica	Partitio ns	Topic Name
ocnaddscppaggregation (41K)	1	2	1	2	1	2	12	SCP
ocnaddnrffaggregation (9K)	1	2	1	2	1	1	6	NRF
ocnaddseppaggregation (15k)	1	2	1	2	1	1	6	SEPP
ocnaddkafka	2	5	4	24	3	3		
zookeeper	1	1	1	2	3	3		

Note

- Four instances of Kafka brokers might be required when running RF=2, based on the setup performance. The end-to-end latency might increase when DISK I/O is slow.
- For DISK I/O, see [Disk Throughput Requirements](#).
- For Kafka PVC-Storage, see [Kafka PVC Storage Requirements](#).

Deployment Profile Kafka and Egress Adapter

Table 3-6 Deployment Profile Kafka and Egress Adapter

OCNADD Service Replication Factor = 1 Message Size = 3500K FEED Type = HTTP2	vCPU Req	vCPU Limit	Memory Req (Gi)	Memory Limit (Gi)	Min Replica	Max Replica	Partitio ns	Topic Name
ocnaddconfiguration	1	1	1	1	1	1		
ocnaddalarm	1	1	1	1	1	1		
ocnaddadmin	1	1	1	1	1	1		
ocnaddhealthmonitoring	1	1	1	1	1	1		
ocnaddadapter	2	3	3	4	HTTP:2 SYNTH ETIC:1	8	72	MAIN
ocnaddkafka	2	5	4	24	3	3		
zookeeper	1	1	1	2	3	3		
ocnaddgui	1	2	1	1	1	2		

Table 3-6 (Cont.) Deployment Profile Kafka and Egress Adapter

OCNADD Service Replication Factor = 1 Message Size = 3500K FEED Type = HTTP2	vCPU Req	vCPU Limit	Memory Req (Gi)	Memory Limit (Gi)	Min Replica	Max Replica	Partitio ns	Topic Name
ocnadduirouter	2	2	1	1	1	2		
ocnaddcache	1	1	22	24	2	3		

Note

- Four instances of Kafka brokers might be required when running RF=2, based on the setup performance. The end-to-end latency might increase when DISK I/O is slow.
- For DISK I/O, see [Disk Throughput Requirements](#).
- For Kafka PVC-Storage, see [Kafka PVC Storage Requirements](#).

3.2 Profile Resource Requirements

This section provides information about the profile resource requirements to install and run Oracle Communications Network Analytics Data Director (OCNADD) with the desired Message Per Second (MPS) profiles.

Note

For information on increasing partitions in Kafka topics see, "Adding Partitions to an Existing Topic" section in *Oracle Communications Network Analytics Data Director User Guide*.

- [Profile Resource Requirements for HTTP2 Feed](#)
- [Profile Resource Requirements for Synthetic Feed](#)
- [Profile Resource Requirements for Direct Kafka Feed](#)

3.2.1 Profile Resource Requirements for HTTP2 Feed

The following table displays the profile resource requirements when **HTTP2 FEED** is "100K" MPS.

Table 3-7 Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
Replication Factor = 1 Message Size = 3500 FEED Type = HTTP2	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions
OCNADD microservices resource requirements:																				
ocnadd configuration	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd alarm	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd admin	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd healthmonitoring	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd gui	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
ocnadd uirouter	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
zookeeper	1	3	1		1	3	1		1	3	1		1	3	2		1	3	2	
OCNADD Kafka microservice requirement for Kafka Non-secured (9092) , WLB is ON/OFF and Filter is OFF :																				
ocnadd kafka	2	3	24		4	3	48		3	3	24		5	4	48		5	4	48	
OCNADD SCP, NRF, SEPP, Adapter, and Cache microservice requirements when WLB is ON/OFF and Filter in OFF :																				
ocnadd scpaggregation					2	2	2	SCP=12					2	2	2	SCP=12 (Each instance 6 partitions)	2	3	2	SCP=18 (Each instance 6 partitions)

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnaddnrfaggregation	2	1	2	NRF=6									2	1	2	NRF=6 (Each instance 6 partitions)				
ocnaddseppaggregation									2	2	2	SEPP=6	2	2	2	SEPP=12 (Each instance 6 partitions)				
ocnaddadapter	3	2	3	MAIN=18	3	7	3	MAIN=63	3	4	3	MAIN=36	3	13	4	MAIN=117 (Each instance 9 partitions)	3	13	4	MAIN=117 (Each instance 9 partitions)
ocnaddcache	1	2	24		1	2	24		1	2	24		1	2	24		1	2	24	
Kafka Non-secured (9092), WLB is ON/OFF and Filter is ON																				
OCNADD SCP, NRF, and SEPP microservice requirements when Ingress Filter is ON :																				

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnadd scpagggregation					2	3	2	SCP=18					2	3	2	SCP=18 (Each instance 6 partitions)	2	4	2	SCP=24 (Each instance 6 partitions)
ocnadd nrfagggregation	2	2	2	NRF=12									2	2	2	NRF=12 (Each instance 6 partitions)				
ocnadd seppagggregation									2	3	2	SEPP=18	2	3	2	SEPP=18 (Each instance 6 partitions)				
OCNADD Adapter and Cache microservice resource requirements when Egress Filter is ON :																				

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnadd adapter	3	3	3	MAN=27	3	8	3	MAN=72	3	5	3	MAN=45	3	14	4	MAN=126 (Each instance 9 partitions)	3	14	4	MAN=126 (Each instance 9 partitions)
ocnadd cache	2	4	24		2	6	24		2	4	24		2	8	24		2	8	24	
OCNADD Kafka microservice requirement for Kafka Non-secured (9094) , WLB is ON/OFF and Filter is OFF																				
ocnadd kafka	2	3	24		4	3	48		3	3	48		5	4	64		5	4	64	
OCNADD SCP, NRF, SEPP, Adapter, and Cache microservice resource requirements WLB is ON/OFF , FILTER is OFF :																				
ocnadd scpaggregation					2	2	2	SCP=12					2	2	2	SCP=12 (Each instance 6 partitions)	2	4	2	SCP=24 (Each instance 6 partitions)

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnaddnrfaggregation	2	1	2	NRF=6									2	1	2	NRF=6 (Each instance 6 partitions)				
ocnaddseppaggregation									2	2	2	SEPP=12	2	2	2	SEPP=12 (Each instance 6 partitions)				
ocnaddadapter	3	3	3	MAIN=27	3	8	3	MAIN=72	3	5	3	MAIN=45	3	14	4	MAIN=126 (Each instance 9 partitions)	3	14	4	MAIN=126 (Each instance 9 partitions)
ocnaddcache	1	2	24		1	2	24		1	2	24		1	2	24		1	2	24	
Kafka Non-secured (9094), WLB is ON/OFF and Filter is ON																				
OCNADD SCP,NRF, and SEPP microservice resource requirements when Ingress Filter is ON:																				

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnadd scpagggregation					2	3	2	SCP=18					2	3	2	SCP=18 (Each instance 6 partitions)	2	5	2	SCP=30 (Each instance 6 partitions)
ocnadd nrfagggregation	2	2	2	NRF=12									2	2	2	NRF=12 (Each instance 6 partitions)				
ocnadd seppagggregation									2	3	2	SEPP=18 (Each instance 6 partitions)								
OCNADD Adapter and Cache microservice requirements when Egress Filter is ON :																				

Table 3-7 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnadd adapter	3	4	3	M AI N= 36	3	8	3	M AI N= 72	3	5	3	M AI N= 45	3	15	4	M AI N= 135 (Each instance 9 partitions)	3	15	4	M AI N= 135 (Each instance 9 partitions)
ocnadd cache	2	4	24		2	6	24		2	4	24		2	8	24		2	8	24	

Note

- When advanced features such as Ingress filtering, Egress filtering, and Weighted load balancing are enabled simultaneously, the resource requirement for "ocnaddadapter" service may vary at higher throughput.
- Filter is not tested with replicated feed enabled due to disk I/O limitation and coherence performance issue.
- Resource requirement may vary when Filter is ON based on % data allowed after filtering and number of filter conditions with configured values.
- Four instances of Kafka brokers might be required when running RF=2, based on the setup performance. The end-to-end latency might increase when DISK I/O is slow.
- For DISK I/O, see [Disk Throughput Requirements](#).
- For Kafka PVC-Storage, see [Kafka PVC Storage Requirements](#).

3.2.2 Profile Resource Requirements for Synthetic Feed

The following table displays the profile resource requirements when **Synthetic FEED** is "64K" MPS.

Table 3-8 Resource Requirements

OCNADD Service	9K NRF Profile				40K SCP Profile				15K SEPP Profile				64K Profile (SCP:40K NRF:9K SEPP:15K)				64K SCP Profile			
Replication Factor = 1 Message Size = 3500 FEED Type = SYNTHETIC	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions
OCNADD microservices resource requirements:																				
ocnadd configuration	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd alarm	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd admin	1	1			1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd healthmonitoring	1	1	1			1	1		1	1	1		1	1	1		1	1	1	
ocnadd gui	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
ocnadd ui/router	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
zookeeper	1	3	1		1	3	1		1	3	1		1	3	2		1	3	1	
ocnadd kafka	2	3	24		3	3	24		3	3	24		5	3	48		5	3	48	
OCNADD SCP, NRF, SEPP, OCNADD Adapter, and OCNADD Cache microservice requirements when WEIGHTED-LB is ON/OFF, L3L4 Mapping is ON/OFF and FILTER is OFF:																				
ocnadd scpaggregation					2	2	2	SC P= 12					2	2	2	SC P= 12 (Each instance 6 partitions)	2	2	2	SC P= 12 (Each instance 6 partitions)

Table 3-8 (Cont.) Resource Requirements

OCNADD Service	9K NRF Profile				40K SCP Profile				15K SEPP Profile				64K Profile (SCP:40K NRF:9K SEPP:15K)				64K SCP Profile			
ocnaddnrfaggregation	2	1	2	NRF=6									2	1	2	NRF=6 (Each instance 6 partitions)				
ocnaddseppaggregation									2	2	2	SEPP=12	2	2	2	SEPP=12 (Each instance 6 partitions)				
ocnaddadapter	3	1	3	MAIN=6	3	3	3	MAIN=18	3	2	3	MAIN=12	3	5	4	MAIN=30 (Each instance 6 partitions)	3	5	4	MAIN=30 (Each instance 6 partitions)
ocnaddcache	1	2	24		1	2	24		1	2	24		1	2	24		1	2	24	
WEIGHTED-LB is ON/OFF, L3L4 Mapping is ON/OFF and FILTER is ON																				
OCNADD SCP, NRF, and SEPP microservice requirements when Ingress Filter is ON :																				

Table 3-8 (Cont.) Resource Requirements

OCNADD Service	9K NRF Profile				40K SCP Profile				15K SEPP Profile				64K Profile (SCP:40K NRF:9K SEPP:15K)				64K SCP Profile			
ocnadd scpaggregation					2	3	2	SCP=18					2	3	2	SCP=18 (Each instance 6 partitions)	2	3	2	SCP=18 (Each instance 6 partitions)
ocnadd nrfaggregation	2	1	2	NRF=6									2	1	2	NRF=6 (Each instance 6 partitions)				
ocnadd seppaggregation									2	2	2	SEPP=12	2	2	2	SEPP=12 (Each instance 6 partitions)				
OCNADD Adapter and OCNADD Cache microservice requirements when Egress Filter is ON :																				

Table 3-8 (Cont.) Resource Requirements

OCNADD Service	9K NRF Profile				40K SCP Profile				15K SEPP Profile				64K Profile (SCP:40K NRF:9K SEPP:15K)				64K SCP Profile			
ocnadd adapter	3	1	3	M AI N=6	3	4	3	M AI N=24	3	3	3	M AI N=18	3	6	4	M AI N=36 (Each instance 6 partitions)	3	6	4	M AI N=36 (Each instance 6 partitions)
ocnadd cache	2	4	24		2	4	24		2	4	24		2	4	24		2	4	24	

Note

- When advanced features such as Ingress filtering, Egress filtering, L3-L4 and Weighted load balancing are enabled simultaneously, the resource requirement for "ocnaddadapter" service may vary at higher throughput.
- Resource requirement may vary when Filter is ON based on % data allowed after filtering and number of filter condition with values configured.
- Resource requirement may vary when L3L4 is ON and size of global I3I4 configuration is big.
- Four instances of Kafka brokers might be required when running RF=2, based on the setup performance. The end-to-end latency might increase when DISK I/O is slow.
- For DISK I/O, see [Disk Throughput Requirements](#).
- For Kafka PVC-Storage, see [Kafka PVC Storage Requirements](#).

3.2.3 Profile Resource Requirements for Direct Kafka Feed

The following table displays the profile resource requirements when **Direct Kafka Feed** is "100K" MPS:

Table 3-9 Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
Replication Factor = 1 Message Size = 3500 FEED Type = HTTP2	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions	vCPU	Total Replicas	Memory Required (Gi)	Topic Partitions
ocnadd configuration	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd alarm	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd admin	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd healthmonitoring	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	
ocnadd gui	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
ocnadd uirouter	2	1	1		2	1	1		2	1	1		2	1	1		2	1	1	
zookeeper	1	3	1		1	3	1		1	3	1		1	3	2		1	3	2	
SCP, NRF, and SEPP microservice resource requirements when Ingress FILTER is OFF :																				
ocnadd scpaggregation																				
ocnadd nrfaggregation																				
ocnadd seppaggregation																				
SCP, NRF, and SEPP microservice resource requirements when Ingress Filter is ON :																				

Table 3-9 (Cont.) Resource Requirements

OCNADD Service	15K NRF Profile				55K SCP Profile				30K SEPP Profile				100K Profile (SCP:55K NRF:15K SEPP:30K)				100K SCP Profile			
ocnadd scpagggregation					2	3	2	SCP=18					2	3	2	SCP=18 (Each instance 6 partitions)	2	5	2	SCP=30 (Each instance 6 partitions)
ocnadd nrfagggregation	2	2	2	NRF=12									2	2	2	NRF=12 (Each instance 6 partitions)				
ocnadd seppagggregation									2	3	2	SEPP=18	2	3	2	SEPP=18 (Each instance 6 partitions)				

3.3 Ephemeral Storage Requirements

The following table describes the Ephemeral Storage requirements for OCNADD:

Table 3-10 Ephemeral Storage Requirements

Service Name	Ephemeral Storage (min) in Mi	Ephemeral Storage (max) in Mi
<app-name>-adapter	200	800
<app-name>-gw	400	800
		<i>Note</i> Supported only in release 22.0.0
ocnaddadminservice	100	200
ocnaddalarm	100	500
ocnaddhealthmonitoring	100	500
ocnaddscpaggregation	100	500
ocnaddseppaggregation	100	500
		<i>Note</i> Supported from release 23.1.0 onwards
ocnaddnrfaggregation	100	500
ocnaddconfiguration	100	500

3.4 Disk Throughput Requirements

The following table describes the disk throughput requirements in OCNADD:

Table 3-11 Disk Throughput Requirements

Avg Size (in Bytes)	Rate	RF (Kafka Replication Factor)	Topic (NF+MAIN)	Consumer Feed	Total Write Throughput (MB/s)	Total Read Throughput (MB/s)	No. of Broker	Per Broker Write Throughput (MB/s)	Per Broker Read Throughput (MB/s)	Total per Broker Throughput (MB/s) with 10% buffer	Total Disk Throughput (MB/s) for the Cluster with 10% Buffer
1941	39000	1	2	1	145	145	3	54	54	108	324
1941	39000	2	2	1	289	289	3	106	106	212	636
3769	39000	1	2	1	281	281	3	104	104	208	624
3769	39000	2	2	1	561	561	3	206	206	412	1236

Note

- The average size of OCNADD Ingress message captured in the table includes the size of metadata list + header list of original 5G HTTP2 header frame + 5G-SBI-Message.
- Currently, it is recommended to set the Replication Factor (RF) value to **1** with the assumption that the underlying storage provides data redundancy.

The disk throughput calculations are as follows:

Writes: $W * RF * T$

Reads: $((RF * T) + C - 1) * W$

Disk Throughput (Write + Read): $(W * RF * T) + (L * W)$

W -> MB/sec of data that will be written

RF -> Replication factor

T -> No of topics to which data copied. As of now, each message will be copied into two topics.

C -> Number of consumer groups, that is the number of readers for each write

L -> $(RF * T) + C - 1$

Average Message in Table:

Average Message Size = $(a1b1 + a2b2 + \dots + a(n)b(n)) / (a1 + a2 + \dots + a(n))$

a1 -> SCP MPS

b1 -> SCP message size

a2 -> NRF MPS

b2 -> NRF message size

a(n) -> NF(n) MPS

b(n) -> NF(n) message size

Example:

Average message size for row 1 = $((1624 \times 30000) + (3000 \times 9000)) / (30000 + 9000) = 1941$ Bytes (approx)

Average message size for row 4 = $((4000 \times 30000) + (3000 \times 9000)) / (30000 + 9000) = 3769$ Bytes (approx)

The following table describes the disk throughput for SCP and NRF:

Table 3-12 SCP and NRF Disk Throughput

SCP Message		NRF Message	RF (Kafka Replication Factor)	Topic (NF+MAIN)	Consumer Feed	Total Write Throughput (MB/s)	Total Read Throughput (MB/s)	No. of Broker	Per Broker Write Throughput (MB/s)	Per Broker Read Throughput (MB/s)	Total per Broker Throughput (MB/s) with 10% buffer	Total Disk Throughput (MB/s) for Cluster with 10% Buffer	Rate
Avg Size (in Bytes)	Rate	Avg Size (in Bytes)											
1624	30000	3000	9000	1	2	1	145	145	3	54	54	108	324
1624	30000	3000	9000	2	2	1	289	289	3	106	106	212	636
4000	30000	3000	9000	1	2	1	281	281	3	104	104	208	624
4000	30000	3000	9000	2	2	1	561	561	3	206	206	412	1236

Note

- The average size of OCNADD Ingress message captured in the table includes the size of metadata list + header list of original 5G HTTP2 header frame + 5G-SBI-Message.
- Currently, it is recommended to set the Replication Factor (RF) value to **1** with the assumption that the underlying storage provides data redundancy.

3.5 Kafka PVC Storage Requirements

The following table describes the retention period per topic for different NFs:

Table 3-13 Retention Period Per Topic

Topic Name	Retention Period
SCP	5 Minutes
NRF	5 Minutes
SEPP	5 Minutes

Table 3-13 (Cont.) Retention Period Per Topic

Topic Name	Retention Period
MAIN	6 Hours (Max)

The following calculation is for storage requirements for a topic:

! Important

For the 6 hrs storage in the MAIN topic, the storage requirement must be calculated using the following information:

Storage Requirement for a topic = MPS * Retention Period * RF * Average Message Size

Where,

MPS is "Message Per Second"

RF is "Replication Factor"

Examples:

1. Average Message Size = 1941 Bytes

The following example uses the values from the first row of the [Table 3-12](#) table. For more information about the table, see [Disk Throughput Requirements](#):

Storage Requirement for SCP and NRF Topics = MPS * Retention Period * RF * Message Size = 39000 * 5 Minutes * 3 * 1941

= 39000 * 5 * 60 * 3 * 1941

= ~ 63.45 GB

Storage Requirement for MAIN = MPS * Retention Period * RF * Message Size
= 39000 * 6 Hours * 3 * 1941

= 39000 * 6 * 60 * 60 * 3 * 1941

= ~ 4.46 TB

Total Storage Requirement for the Broker Cluster = Storage for SCP + Storage for NRF + Storage for MAIN

= 63.45 GB + 4.46 TB

= ~ 4.53 TB

Total Storage for each broker = (4.53/Number of Brokers) TB = (4.53/3) TB
= ~ 1.51 TB [Assuming 3 Broker cluster]

2. Average Message Size = 3769 Bytes

The following example uses the values from the fourth row of the [Table 3-12](#) table. For more information about the table, see [Disk Throughput Requirements](#):

Storage Requirement for SCP and NRF Topics = MPS * Retention Period * RF * Message Size
= 39000 * 5 Minutes * 3 * 3769

$$= 39000 * 5 * 60 * 3 * 3769$$

$$= \sim 123.20 \text{ GB}$$

Storage Requirement for MAIN = MPS * Retention Period * RF * Message Size
= 39000 * 6 Hours * 3 * 3769

$$= 39000 * 6 * 60 * 60 * 3 * 3769$$

$$= \sim 8.66 \text{ TB}$$

Total Storage Requirement for the Broker Cluster = Storage for SCP + Storage for NRF + Storage for MAIN

$$= 123.20 \text{ GB} + 8.66 \text{ TB}$$

$$= \sim 8.79 \text{ TB}$$

Total Storage for each broker = (8.79/Number of Brokers) TB = (8.79/3) TB
= ~ 2.93 TB [Assuming 3 Broker cluster]

OCNADD Benchmarking Testing

This section describes the performance testing scenarios and results for the Message Feed functionality provided by Oracle Communications Network Analytics Data Director. The message feed feature is tested with SCP, NRF, and SEPP as the source of the message feed.

- [Performance Benchmarking with HTTP2 Feed](#)
- [Performance Benchmarking with Kafka Feed](#)
- [Performance Benchmarking with SCP Traffic with HTTP2 Feed](#)
- [Performance Benchmarking with SCP Traffic with TCP Feed](#)

4.1 Performance Benchmarking with HTTP2 Feed

The performance benchmarking test is performed on OCNADD with 100K MPS HTTP2 egress feed which includes 55K MPS SCP traffic (27.5K TPS with 2 traffic copy trigger points on SCP), 15K MPS NRF traffic (7.5K TPS with 2 traffic copy trigger points on NRF) and 30K MPS SEPP traffic (15K TPS with 2 traffic copy trigger points on SEPP). The benchmarking results are provided below:

Note

One Ingress message from a NF is "1" MPS for OCNADD.

Benchmark Test Environment

The test environment specifications are listed below:

- Ingress Traffic Rate: 100K MPS
- The latency, resource utilization, and MPS is observed for the period of 3 hrs or more.
- OCNADD single site deployment with ASM disabled
- OCNADD Release 23.3.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD Data Feed: HTTP2/TLS
- OCNADD Kafka PVC: 400GB
For more information about PVC requirements, see [Kafka PVC Storage Requirements](#).
- 3rd Party Application: 1 Perfgo Server with 2 End-points
- cnDBTier Release 23.3.0
- NRF Release 23.3.0
- SCP Release 23.3.0
- SEPP Release 23.3.0
- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD

- CNCC Release 23.3.0
- Message Size: 3580 Bytes
- Environment: CNE (Bare metal)
- Execution time: 60 Hours

Benchmark Testcase Specifications

The testcase parameters are as follows:

- **OCNADD**
 - A feed is configured using the OCNADD Console with aggregation rules set for SCP, NRF and SEPP.
 - Message Ingestion Rate: 100K MPS

Resource Specifications:

Table 4-1 OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddconfiguration	1	1	1	1	1	1	
ocnaddalarm	1	1	1	1	1	1	
ocnaddadmin	1	1	1	1	1	1	
ocnaddhealthmonitoring	1	1	1	1	1	1	
ocnaddrouter	2	2	1	1	1	1	
ocnaddscppaggregation	2	3	2	2	2	2	18 (SCP)/ retention. ms = 300000
ocnaddnrffaggregation	2	3	2	2	1	1	6 (NRF)/ retention. ms = 300000
ocnaddseppaggregation	2	3	2	2	2	2	18 (SEPP)/ retention. ms = 300000
ocnaddadapter	3	3	4	4	16	16	144 (MAIN)/ retention. ms = 300000

Table 4-1 (Cont.) OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddkafka	5	8	64	64	4	4	
zookeeper	1	1	2	2	3	3	
ocnaddgui	2	2	1	1	1	1	
ocnaddcache	1	1	24	24	2	2	

- **SCP**
SCP Traffic: 55K TPS using two trigger points.
- **NRF**
NRF Traffic: 15K TPS using two trigger points.
- **SEPP**
SEPP Traffic: 30K TPS using two trigger points.

Benchmark Test Results**Traffic Feed Details****Table 4-2 Traffic Feed Details**

NF	NF Traffic Copy Trigger Points	Traffic Rate	Duration in hours	E2E Traffic Feed Average Latency	E2E Traffic Feed Success Rate
OCNADD	NA	100K MPS	60	Feed-1: 3.7 msec Feed-2: 3.5 sec	Feed-1: 99.76% Feed-2: 99.84%
NRF	2 - IGW/EGW (Request and Response)	15K MPS	60		99.82%
SCP	2 (Request Ingress/ Request Egress)	55K MPS	60		99.78%
SEPP	2 (PLMN IGW)	15K MPS	12		99.98%

CPU and Memory Utilization

The following table describes the OCNADD CPU and memory utilization:

Table 4-3 OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.10%	26.60%
ocnaddalarm	1	0.11%	16.90%
ocnaddcache	1	0.18%	84.90%

Table 4-3 (Cont.) OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddconfiguration	1	0.10%	32.20%
ocnaddgui	1	0.03%	5.08%
ocnaddhealthmonitoring	1	0.17%	31.50%
ocnaddnrfaggregation	1	73.70%	59.00%
ocnaddscpaggregation	2	79.50%	65.30%
ocnaddseppaggregation	2	64.80%	46.40%
ocnadduirouter	1	0.01%	27.90%
feed-dd1-adapter	16	65.40%	29.00%
kafka-broker	4	73.20%	74.90%
zookeeper	3	0.14%	20.60%
feed-dd2-adapter	16	64.90%	26.30%

4.2 Performance Benchmarking with Kafka Feed

The performance benchmarking test is performed on OCNADD with 100K MPS Kafka feed which includes 55K MPS SCP traffic (27.5K TPS with 2 traffic copy trigger points on SCP), 15K MPS NRF traffic (7.5K TPS with 2 traffic copy trigger points on NRF) and 30K MPS SEPP traffic (15K TPS with 2 traffic copy trigger points on SEPP). The benchmarking results are provided below:

Note

One Ingress message from a NF is "1" MPS for OCNADD.

Benchmark Test Environment

The test environment specifications are listed below:

- Ingress Traffic Rate: 100K MPS
- The latency, resource utilization, and MPS is observed for the period of 3 hrs or more.
- OCNADD single site deployment with ASM disabled
- OCNADD Release 23.3.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD Data Feed: HTTP2/TLS
- OCNADD Kafka PVC: 400GB
For more information about PVC requirements, see [Kafka PVC Storage Requirements](#).
- 3rd Party Application: 1 Perfgo Server with 2 End-points
- cnDBTier Release 23.3.0
- NRF Release 23.3.0
- SCP Release 23.3.0
- SEPP Release 23.3.0

- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD
- CNCC Release 23.3.0
- Message Size: 3580 Bytes
- Environment: CNE (Bare metal)
- Execution time: 20 Hours

Benchmark Testcase Specifications

The testcase parameters are as follows:

- **OCNADD**
 - A feed is configured using the OCNADD Console with aggregation rules set for SCP, NRF and SEPP.
 - Message Ingestion Rate: 100K MPS

Resource Specifications:

Table 4-4 OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddconfiguration	1	1	1	1	1	1	
ocnaddalarm	1	1	1	1	1	1	
ocnaddadmin	1	1	1	1	1	1	
ocnaddhealthmonitoring	1	1	1	1	1	1	
ocnaddrouter	2	2	1	1	1	1	
ocnaddsc aggregation	2	3	2	2	2	2	12(SCP)/retention.ms = 300000
ocnaddnrf aggregation	2	3	2	2	1	1	6 (NRF)/retention.ms = 300000
ocnaddsepp aggregation	2	3	2	2	2	2	12 (SEPP)/retention.ms = 300000

Table 4-4 (Cont.) OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
							144 (MAIN)/ retention. ms = 300000
ocnaddkafka	5	8	64	64	4	4	
zookeeper	1	1	2	2	3	3	
ocnaddgui	2	2	1	1	1	1	
ocnaddcache	1	1	24	24	2	2	

- **SCP**
SCP Traffic: 55K TPS using two trigger points.
- **NRF**
NRF Traffic: 15K TPS using two trigger points.
- **SEPP**
SEPP Traffic: 30K TPS using two trigger points.

Benchmark Test Results

Traffic Feed Details

Table 4-5 Traffic Feed Details

NF	NF Traffic Copy Trigger Points	Traffic Rate	Duration in hours	E2E Traffic Feed Average Latency	E2E Traffic Feed Success Rate
OCNADD	NA	100K MPS	20	NA	Feed-1: 99.93% Feed-2: 99.91%
NRF	2 - IGW/EGW (Request and Response)	15K MPS	20		99.94%
SCP	2 (Request Ingress/ Request Egress)	55K MPS	20		99.89%
SEPP	2 (PLMN IGW)	30K MPS	20		99.90%

CPU and Memory Utilization

The following table describes the OCNADD CPU and memory utilization:

Table 4-6 OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.16%	28.50%
ocnaddalarm	1	0.33%	19.60%
ocnaddcache	1	0.17%	84.90%
ocnaddconfiguration	1	0.10%	32.50%
ocnaddgui	1	0.04%	6.43%
ocnaddhealthmonitoring	1	0.17%	31.10%
ocnaddnrfaggregation	1	91.70%	54.00%
ocnaddscpaggregation	2	97.30%	79.00%
ocnaddseppaggregation	2	88.40%	61.90%
ocnaddthirdpartyconsumer	16	22.30%	80.70%
ocnadduirouter	1	0.07%	27.30%
kafka-broker	4	95.00%	57.20%
zookeeper	3	0.15%	18.50%

4.3 Performance Benchmarking with SCP Traffic with TCP Feed

The performance benchmarking test is performed on OCNADD with 64K MPS SCP traffic (32K TPS with 2 trigger points). The benchmarking results are provided below:

Note

One Ingress message from a NF is "1" MPS for OCNADD.

Benchmark Test Environment

The test environment specifications are listed below:

- Ingress Traffic Rate: 64K MPS
- The latency, resource utilization, and MPS is observed for the period of 4 hrs or more.
- OCNADD single site deployment with ASM disabled
- OCNADD Release 23.3.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD Data Feed: Secure TCP feed (TCP with TLS enabled)
- OCNADD Kafka PVC: 400GB
For more information about PVC requirements, see [Kafka PVC Storage Requirements](#).
- 3rd Party Application: 1 Perfgo Server with 2 End-points
- cnDBTier Release 23.3.0
- SCP Release 23.3.0
- SCP Configuration: Default
- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD

- CNCC Release 23.3.0
- Message Size: 3800 Bytes
- Environment: CNE (Bare metal)
- Execution time: 20 Hours

Benchmark Testcase Specifications

The testcase parameters are as follows:

- **OCNADD**
 - A feed is configured using the OCNADD Console with aggregation rules set for SCP.
 - Message Ingestion Rate: 64K MPS

Resource Specifications:

Table 4-7 OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddconfiguration	1	1	1	1	1	1	
ocnaddalarm	1	1	1	1	1	1	
ocnaddadmin	1	1	1	1	1	1	
ocnaddhealthmonitoring	1	1	1	1	1	1	
ocnaddrouter	2	2	1	1	1	1	
ocnaddscppaggregation	2	3	2	2	2	2	12(SCP)/retention.ms=300000
ocnaddnrffaggregation	2	3	2	2	1	1	
ocnaddseppaggregation	2	3	2	2	1	1	
ocnaddadapter	3	3	4	4	5	5	30 (MAIN)/retention.ms=300000
ocnaddkafka	5	5	48	48	3	3	
zookeeper	1	1	2	2	3	3	
ocnaddgui	2	2	1	1	1	1	
ocnaddcache	1	1	24	24	2	2	

- **SCP**
SCP Traffic: 32K TPS using two trigger points.

Benchmark Test Results

Traffic Feed Details

Table 4-8 Traffic Feed Details

NF	NF Traffic Copy Trigger Points	Traffic Rate	Duration in hours	E2E Traffic Feed Average Latency	E2E Traffic Feed Success Rate
OCNADD	NA	64K MPS	20	Feed-1: 2.46 msec Feed-2: 2.37 msec	Feed-1: 99.99% Feed-2: 99.98%
SCP	2 (Request Ingress/ Request Egress)	64K MPS	20		99.99%

CPU and Memory Utilization

The following table describes the OCNADD CPU and memory utilization:

Table 4-9 OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.08%	26.10%
ocnaddalarm	1	0.10%	17.10%
ocnaddcache	1	0.14%	84.90%
ocnaddconfiguration	1	0.11%	31.60%
ocnaddgui	1	0.03%	4.64%
ocnaddhealthmonitoring	1	0.23%	28.80%
ocnaddnrffaggregation	1	0.04%	17.60%
ocnaddscppaggregation	2	82.70%	66.10%
ocnaddseppaggregation	2	0.04%	15.20%
ocnadduirouter	1	0.01%	26.90%
feed-dd1-adapter	6	73.30%	53.40%
kafka-broker	3	59.50%	55.60%
zookeeper	3	0.12%	14.80%
feed-dd2-adapter	6	72.60%	48.20%

4.4 Performance Benchmarking with SCP Traffic with HTTP2 Feed

The performance benchmarking test is performed on OCNADD with 100K MPS SCP traffic (50K TPS with 2 trigger points). The benchmarking results are provided below:

Note

One Ingress message from a NF is "1" MPS for OCNADD.

Benchmark Test Environment

The test environment specifications are listed below:

- Ingress Traffic Rate: 100K MPS
- The latency, resource utilization, and MPS is observed for the period of 4 hrs or more.
- OCNADD single site deployment with ASM disabled
- OCNADD Release 23.3.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD Data Feed: Secure TCP feed (TCP with TLS enabled)
- OCNADD Kafka PVC: 400GB
For more information about PVC requirements, see [Kafka PVC Storage Requirements](#).
- 3rd Party Application: 1 Perfgo Server with 2 End-points
- cnDBTier Release 23.3.0
- SCP Release 23.3.0
- SCP Configuration: Default
- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD
- CNCC Release 23.3.0
- Message Size: 3800 Bytes
- Environment: CNE (Bare metal)
- Execution time: 20 Hours

Benchmark Testcase Specifications

The testcase parameters are as follows:

- **OCNADD**
 - A feed is configured using the OCNADD Console with aggregation rules set for SCP.
 - Message Ingestion Rate: 100K MPS

Resource Specifications:

Table 4-10 OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddconfiguration	1	1	1	1	1	1	
ocnaddalarm	1	1	1	1	1	1	

Table 4-10 (Cont.) OCNADD Resource Specifications

Services	CPU Request Per Pod	CPU Limit Per Pod	Memory Request Per Pod (Gi)	Memory Limit Per Pod (Gi)	min Replicas	max Replicas	Kafka Topic Partitions and Retention
ocnaddad min	1	1	1	1	1	1	
ocnaddhealthmonitoring	1	1	1	1	1	1	
ocnaddrouter	2	2	1	1	1	1	
ocnaddscppaggregation	2	3	2	2	4	4	24(SCP)/retention.ms=300000
ocnaddadapter	3	3	4	4	16	16	144 (MAIN)/retention.ms=300000
ocnaddkafka	5	7	64	64	4	4	
zookeeper	1	1	2	2	3	3	
ocnaddgui	2	2	1	1	1	1	
ocnaddcache	1	1	10	10	2	2	

- **SCP**
SCP Traffic: 50K TPS using two trigger points.

Benchmark Test Results**Traffic Feed Details****Table 4-11 Traffic Feed Details**

NF	NF Traffic Copy Trigger Points	Traffic Rate	Duration in hours	E2E Traffic Feed Average Latency	E2E Traffic Feed Success Rate
OCNADD	NA	100K MPS	20	Feed-1: 6.37 msec Feed-2: 5.54 msec	99.98%
SCP	2 (Request Ingress/ Request Egress)	100K MPS	20		99.98%

CPU and Memory Utilization

The following table describes the OCNADD CPU and memory utilization:

Table 4-12 OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.08%	27.70%
ocnaddalarm	1	1.51%	18.30%
ocnaddcache	1	0.17%	84.90%
ocnaddconfiguration	1	0.16%	32.10%
ocnaddgui	1	0.03%	5.22%
ocnaddhealthmonitoring	1	0.14%	30.00%
ocnaddnrffaggregation	1	0.04%	15.20%
ocnaddscppaggregation	2	70.30%	65.80%
ocnaddseppaggregation	2	0.04%	15.40%
ocnadduirouter	1	0.09%	26.50%
feed-dd1-adapter	6	59.90%	34.40%
kafka-broker	4	73.80%	75.60%
zookeeper	3	0.14%	15.60%
feed-dd2-adapter	6	61.20%	34.20%