Oracle® Communications Network Analytics Data Director Benchmarking Guide





Oracle Communications Network Analytics Data Director Benchmarking Guide, Release 23.4.0.0.1

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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
XDR	Extended Detection and Response

What's New in This Guide

This section lists the documentation updates for Release 23.4.x in *Oracle Communications Network Analytics Data Director Benchmarking Guide*.

Release 23.4.0.0.1 - F91516-02, July 2024

There are no updates to this document in this release.

Release 23.4.0 - F91516-01, January 2024

Updated the following sections:

- Updated the following sections in the Profile Resource Requirements chapter:
 - Profile Resource Requirements for HTTP2 Feed
 - Profile Resource Requirements for Synthetic Feed
 - Profile Resource Requirements for Aggregated Kafka Feed
 - Profile Resource Requirements for Correlated Kafka Feed
- Updated the <u>Deployment Profiles</u> section.
- Added the <u>Pod Affinity</u> (or <u>Anti-affinity</u>) <u>Rules</u> section.
- Added the following sections in the <u>OCNADD Benchmarking Testing</u> chapter:
 - Performance Benchmarking with Correlated Feed for XDR Generation
 - Performance Benchmarking with Synthetic Feed with Replication
 - Performance Benchmarking with 60K MPS SEPP Traffic with HTTP2 Feed Replication

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

Deployment

OCNADD supports CNE deployment. 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:

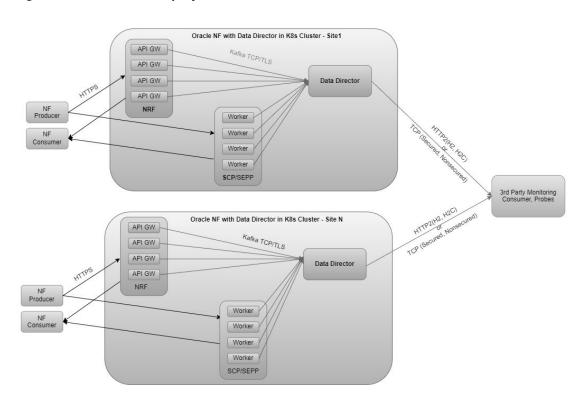


Figure 2-1 OCNADD Deployment

(i) 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



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 (up to 100K MPS for HTTP2 feed and up to 64K MPS for synthetic feed) 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	7
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	7
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	7
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 100K 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" or "2" (if SSD is supported) 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 or 2 (when SSD is enabled) 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
ocnaddconfiguratio n	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		
ocnaddscpaggrega tion (55K)	2	2	2	2	1	2	12	SCP
ocnaddnrfaggregati on (15K)	2	2	2	2	1	1	6	NRF
ocnaddseppaggreg ation (30K)	2	2	2	2	1	2	12	SEPP
ocnaddadapter	3	3	4	4	HTTP:2 SYNTH ETIC:1	HTTP:13 SYNTH ETIC:5	117	MAIN
ocnaddkafka	6	6	48	48	4	4		
zookeeper	1	1	1	2	3	3		
ocnaddgui	1	2	1	1	1	2		
ocnadduirouter	1	2	1	1	1	2		

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 <u>Disk Throughput Requirements</u>.
- For Kafka PVC-Storage, see Kafka PVC Storage Requirements.

3.2 Pod Affinity (or Anti-affinity) Rules

The ocnaddkafka and Zookeeper services use the POD anti-affinity rules. The rules are intended to support even distribution of Kafka and Zookeeper pods across the available nodes.

Zookeeper Service Anti-affinity Rules

Zookeeper service anti-affinity rules are listed below:

spec:
 affinity:



```
podAntiAffinity:
   preferredDuringSchedulingIgnoredDuringExecution:
     weight: 100
     podAffinityTerm:
     labelSelector:
        matchExpressions:
        - key: app
        operator: In
        values:
        - zookeeper
     topologyKey: topology.kubernetes.io/zone
```

ocnaddkafka Service Anti-affinity Rules

ocnaddkafka service anti-affinity rules are listed below:

```
spec:
    topologySpreadConstraints:
    - maxSkew: 1
    topologyKey: kubernetes.io/hostname
    whenUnsatisfiable: ScheduleAnyway
    labelSelector:
        matchLabels:
        app1 : nodeselection
```

The configuration ensures the scheduler keeps equal number of pods matching the constraint on every node. However, the parameter whenUnsatisfiable set to ScheduleAnyway, helps to schedule the pod, but the scheduler prioritizes honoring the skew to not make the cluster more imbalanced.

3.3 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.



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 Aggregated Kafka Feed
- Profile Resource Requirements for Correlated Kafka Feed

3.3.1 Profile Resource Requirements for HTTP2 Feed

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



Table 3-5 Resource Requirements

OCNA DD Servic e	15K	NRI	- Pro	file	55K	SCF	P Pro	file	30K Pro	SEF file	PР		(SC	K Pr P:55 =:15k PP:30	K (100 Pro	K SC file	P	
Replica tion Factor = 1 or 2 (SSD is enable d) Messa ge Size = 3500 FEED Type = HTTP2	vC PU	To tal Re pli ca	Me m or y Re qu ire d (⑤)	To pic Pa rtit io ns	VC PU	To tal Re pli ca	Me m or y Re qu ire d (⑤)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (Gi	To pic Pa rtit io ns	V PU	To tal Re pli ca	Me m or y Re qu ire d ⊖)	To pic Pa rtit io ns	V PU	To tal Re pli ca	Me m or y Re qu ire d (Gi	To pic Pa rtit io ns
OCNADI) mic	rose	rvice	s res	ourc	e req	uiren	nents	8:											
ocnadd configur ation	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 healthm onitorin g	1	1	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	-
zookee per	1	3	1	-	1	3	1	-	1	3	1	-	1	3	2	-	1	3	2	-
ocnadd kafka	2	3	24	-	4	3	48	-	3	3	48	-	6	4	48	-	6	4	48	-
Replicate	ed Fe	ed																		
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	48	-	10	4	96	-	10	4	96	-
WLB is 0	O/NC	FF a	nd Fi	lter is	s OF	F														



Table 3-5 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	ofile	55K	SCI	Pro	file	30K Pro	SEF file	PР		(SC	K Pr :P:55 F:15 PP:3	K		100 Pro	K SC file	P	
ocnadd scpaggr egation	-	-	-	-	2	2	2	SC P= 12	-	-	-	-	2	3	2	SC P= 18 (E ac h ins tan ce 6 par titi on s)	2	4	2	SC P= 24 (E ac h ins tan ce 6 par titi on s)
ocnadd nrfaggr egation	2	1	2	NR F= 6	-	-	-	-	-	-	-	-	2	1	2	NR F= 6 (E ac h ins tan ce 6 par titi on s)	-	-	-	
ocnadd seppag gregati on	-	-	-	-	-	-	-	-	2	2	2	SE PP =1 2	2	2	2	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)	-	-	-	-



Table 3-5 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	file	55K	SCF	Pro	file	30K Pro	SEF file	PP		(SC	K Pr P:55 =:15l PP:30	<		100 Pro	K SC file	P	
ocnadd adapter	3	3	3	M Al N= 27	3	8	3	M AI N= 72	3	5	3	M AI N= 45	3	14	4	M AI N= 12 6 (E ac h ins tan ce 9 par titi on s)	3	14	4	M A I = 12 6 (E ac h ins tan ce 9 partition s)
WLB is 0				ilter i	s ON															
Ingress Founded	-ilter -	is Ol	N: 	Ι.	2	3	2	sc	l -	l -		Ι_	2	4	2	sc	2	5	2	sc
scpaggr egation								P= 18								P= 24 (E ac h ins tan ce 6 par titi on s)				P= 30 (E ac h ins tan ce 6 par titi on s)
ocnadd nrfaggr egation	2	2	2	NR F= 12	-	-	-	-	-	-	-	-	2	2	2	NR F= 12 (E ac h ins tan ce 6 par titi on s)		-	-	-



Table 3-5 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	file	55K SCP Profile				30K Pro	SEF file	PP		(SC NRI	K Pr P:55 =:15k PP:30	K (100 Pro	K SC file	P	
ocnadd seppag gregati on		-	-	1	1	-	-	-	2	3	2	SE PP =1 8	2	3	2	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
Egress F	ilter	is ON	1 :						I	!		<u> </u>	<u> </u>						I	
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= 13 5 (E ac h ins tan ce 9 par titi on s)	3	15	4	M AI = 13 5 (E ac h ins tan ce 9 par titi on s)



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 <u>Disk Throughput Requirements</u>.
- For Kafka PVC-Storage, see Kafka PVC Storage Requirements.

3.3.2 Profile Resource Requirements for Synthetic Feed

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

Note

Set the value of the parameter *TCP_CONN_INSPECTOR_FIXED_DELAY_MS* to "60000" in the *custom-value.yaml* file.

Table 3-6 Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	file	55K	SCF	P Pro	file	30K Pro	SEF file	PP		(SC	K Pro P:55 =:15k PP:30	K (100 Pro	K SC	P	
Replica tion Factor = 1 or 2 (when SSD is enable d) Messa ge Size = 3500 FEED Type = SYNTH ETIC	vC PU	To tal Re pli ca	Me m or y Re qu ire d (Gi	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (Gi)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (Gi)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (Gi)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (⑤)	To pic Pa rtit io ns
OCNADI) mic	crose	rvice	s res	ourc	e req	uiren	nents	S:											
ocnadd configur ation	1	1	1	-	1	1	1	-	1	1	1	-	1	1	1	1	1	1	1	-



Table 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	ofile	55K	SCI	P Pro	ofile	30k Pro	(SEI file	PP		(SC	K Pr :P:55 F:15I PP:3	K K		100 Pro	K SC	P	
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 healthm onitorin g	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	-
zookee per	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	-	6	4	48	-	6	4	48	-
Replicate	ed Fe	ed								•										
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	24	-	10	4	96	-	10	4	96	-
WEIGHT	ED-I	LB is	ON/	OFF,	L3L4	I Mar	ping	is O	N/OF	F ar	nd FII	TER	is O	FF	•	•			•	•
ocnadd scpaggr egation	2	1	2	- NR	2	2	2	SC P= 12	-	-	-	-	2	3	2	SC P= 18 (E ac h ins tan ce 6 par titi on s)	2	-	2	SC P= 24 (E ac h ins tan ce 6 par titi on s)
nrfaggr egation				F= 6												F= 6 (E ac h ins tan ce 6 par titi on s)				



Table 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	ofile	55K	SCF	Pro	file	30K Pro	SEF file	PP		(SC	K Pr :P:55 F:15I PP:30	<		100 Pro	K SC file	P	
ocnadd seppag gregati on	-	-	-	-			-	-	2	2	2	SE PP =1 2	2	2	2	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)				1
ocnadd adapter	3	1	3	M AI N= 6	3	3	3	M AI N= 18	3	2	3	M AI N= 12	3	9	4	M AI N= 54 (E ac h ins tan ce 6 par titi on s)	3	9	4	M AI N= 54 (E ac h ins tan ce 6 par titi on s)
WEIGHT				OFF,	L3L4	Мар	ping	is O	N/OF	F ar	d FIL	TER	is O	N						
Ingress F	I	ıs Ol	N I	I	۱,		2	00	1	1		l	<u>ا</u>	<u></u>	<u>ا</u>		_	_	_	
ocnadd scpaggr egation	-	-	-		2	4	2	SC P= 18	-	-	-	-	2	4	2	SC P= 24 (E ac h ins tan ce 6 par titi on s)	2	5	2	SC P= 30 (E ac h ins tan ce 6 par titi on s)



Table 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	ofile	55K	SCF	Pro	file	30K Pro	SEF file	P		(SC	K Pr :P:55 F:15I PP:3(<		100 Pro	K SC	P.	
ocnadd nrfaggr egation	2	2	2	NR F= 6	-	-	-	-	-	-	-	-	2	2	2	NR F= 12 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
ocnadd seppag gregati on	-	-	-	-	-	-	-	-	2	3	2	SE PP =1 2	2	3	2	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
Egress F																				
ocnadd adapter	3	2	3	M AI N= 6	3	4	3	M AI N= 24	3	3	3	M AI N= 18	3	9	4	M AI N= 54 (E ac h ins tan ce 6 par titi on s)	3	9	4	M AI N= 54 (E ac h ins tan ce 6 par titi on s)



(i) 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 huge.
- Five or six 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 <u>Disk Throughput Requirements</u>.
- For Kafka PVC-Storage, see Kafka PVC Storage Requirements.

3.3.3 Profile Resource Requirements for Aggregated Kafka Feed

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

Table 3-7 Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	file	55K	SCF	P Pro	file	30K Pro	SEF file	PΡ		(SC	K Pr P:55 =:15k PP:30	K (100 Pro	K SC file	P	
Replica tion Factor = 1 or 2 (when SSD is enable d)	vC PU	To tal Re pli ca	Me m or y Re qu ire d	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d	To pic Pa rtit io ns
Messa ge Size = 3500			(Gi)				(Gi)				(Gi)				(Gi)				(Gi)	
FEED Type = HTTP2																				
ocnadd configur ation	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	ı	1	1	1	-
ocnadd healthm onitorin g	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	-



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	ofile	55K	SCF	Pro	ofile	30K Pro	SEF file	PР		(SC	K Pr P:55 =:15 PP:3(<		100 Pro	K SC file	CP	
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	-
zookee per	1	3	1	-	1	3	1	-	1	3	1	1	1	3	2	-	1	3	2	ı
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	48	-	10	4	96	-	10	4	96	1
Replicate	ed Fe	eed																		
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	48	-	10	4	96	-	10	4	96	1
Ingress f	ilter i	s "Ol	FF"																	
ocnadd scpaggr egation	-	-	-	-	2	2	2	SC P= 12	-	-	-	-	2	2	2	SC P= 12 (E ac h ins tan ce 6 par titi on s)	2	4	2	SC P= 24 (E ac h ins tan ce 6 par titi on s)
ocnadd nrfaggr egation	2	1	2	NR F= 6	-	-	-	-	-	-	-	-	2	1	2	NR F= 6 (E ac h ins tan ce 6 par titi on s)	-	-	-	1



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	- Pro	file	55K	SCF	Pro	file	30K Pro	SEF file	PP		(SC NRI	K Pr P:55 =:15h PP:30	K (100 Pro	K SC file	P	
ocnadd seppag gregati on	-	-	-	-	-	-	_	_	2	2	2	SE PP =1 2	2	2	2	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)	-	_	-	-
Ingress f	ilter i	s "Ol	\ "																	
ocnadd scpaggr egation	-	-		-	2	4	2	SC P= 24				-	2	4	2	SC P= 24 (E ac h ins tan ce 6 par titi on s)	2	5	2	SC P= 30 (E ac h ins tan ce 6 par titi on s)
ocnadd nrfaggr egation	2	2	2	NR F= 12	-	-	1	•	•	1	-	-	2	2	2	NR F= 12 (E ac h ins tan ce 6 par titi on s)	-	1	-	-



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic e	15K	(NRI	F Pro	ofile	55K			30K Pro	SEF	PP		(SC	K Pr :P:55 F:15I PP:3(K K		100 Pro	K SC	P		
ocnadd seppag gregati on	-	-	-	-	-	-	-	-	2	3	2	SE PP =1 8	2	3	2	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	-	-	-	-

3.3.4 Profile Resource Requirements for Correlated Kafka Feed

The following table displays the profile resource requirements when Correlated Kafka Feed is "30K" MPS:

Note

- Creating a CORRELATED or CORRELATED_FILTERED ACL feed is mandatory before making a correlation configuration.
- Calculate the PVC size of a Kafka broker in advance, as each new CORRELATED ACL feed type correlation configuration creates one new topic, and each new CORRELATED_FILTERED ACL feed type correlation configuration creates two new topics.
- The CPU and memory requirement in Kafka increase based on the number of CORRELATED or CORRELATED_FILTERED configurations; the resources mentioned in the below table are for a maximum of two configurations.
- Resource requirements for correlation service vary when all the transaction messages are not received and the value of maxTransactionWaitTime is set to higher value (it is recommended to have a lower value for this scenario).



Table 3-8 Resource Requirements

OCNADD Service	15K	NRF F	Profile	;	30K	SCP I	Profile	!	30K	SEPP	Profi	le	(SCF NRF	Profile P:15K :5K P:10K		
Replicati on Factor = 1 or 2 (when SSD is enabled) Message Size = 3500 ACL Feed Type: Correlate d	vC PU	Tot al Rep lica	Me mor y Req uire d (Gi)	Top ic Par titio ns	vC PU	Tot al Rep lica	Me mor y Req uire d (Gi)	Top ic Par titio ns	vC PU	Tot al Rep lica	Me mor y Req uire d (Gi)	Par	vC PU	Tot al Rep lica	Me mor y Req uire d (Gi)	Top ic Par titio ns
ocnaddco nfiguratio n	1	1	1	-	1	1	1	-	1	1	1	-	1	1	1	-
ocnaddal arm	1	1	1	-	1	1	1	-	1	1	1	-	1	1	1	-
ocnaddad min	1	1	1	-	1	1	1	-	1	1	1	-	1	1	1	-
ocnaddhe althmonit oring	1	1	1	-	1	1	1	1	1	1	1	-	1	1	1	1
ocnaddgu i	2	1	1	-	2	1	1		2	1	1	-	2	1	1	-
ocnadduir outer	2	1	1	-	2	1	1	-	2	1	1	-	2	1	1	-
zookeepe r	1	3	1	-	1	3	1	-	1	3	1	-	1	3	2	-
ocnaddka fka	4	4	48	-	6	4	48	•	6	4	48	-	6	4	48	-
Replicated	Feed															
ocnaddka fka	4	4	48	-	8	4	72	-	8	4	72	-	8	4	72	-
ocnaddsc paggregat ion	-	-	-	-	2	2	2	SC P=1 2	-	-	1	-	2	1	2	SC P=6 Eac h Inst anc e 6 part ition



Table 3-8 (Cont.) Resource Requirements

OCNADD Service	15K	NRF I	Profile	:	30K	SCP I	Profile	•	30K	SEPP	Profi	le	(SCF NRF	Profil P:15K :5K P:10K		
ocnaddnrf aggregati on	2	1	2	NR F=6	-	-	-	-	-	-	-	-	2	1	2	NR F=6 Eac h Inst anc e 6 part ition
ocnaddse ppaggreg ation	-	-	-	-	-	-	-	-	2	2	2	SE PP= 12	2	1	2	SE PP= 6 (Ea ch Inst anc e 6 part ition)
Feed Type															ı	
ocnaddco rrelation	3	3	64	MAI N=1 8 <fe ed- na me >- CO RR ELA TE D=1 8 or as per con sum er</fe 	3	4	64	MAI N=2 4 <fe ed-="" me="" na="">- CO RR ELA TE D=2 4 or as per con sum er</fe>	3	4	64	MAI N=2 4 <fe ed-="" me="" na="">- CO RR ELA TE D=2 4 or as per con sum er</fe>	3	4	64	MAI N=2 4 <fe ed- na me >- CO RR ELA TE D=2 4 or as per con sum er</fe



Table 3-8 (Cont.) Resource Requirements

OCNADD Service	15K	NRF F	Profile	•	30K	SCP I	Profile	9	30K	SEPP	Profi	le	(SCF NRF	Profil P:15K :5K P:10K		
ocnaddfilt er	2	3	3	MAI N=1 8 <fe ed- na me >- FIL TE RE D=1 8</fe 	2	4	3	MAI N=2 4 <fe ed- na me >- FIL TE RE D=2 4</fe 	2	4	3	MAI N=2 4 <fe ed- na me >- FIL TE RE D=2 4</fe 	2	4	3	MAI N=2 4 <fe ed- na me >- FIL TE RE D=2 4</fe
ocnaddco rrelation	3	3	48	<pre><fe ed-="" me="" na="">- FIL TE RE D-CO RR ELA TE D=1 8 or as per con sum er</fe></pre>	3	4	64	<pre><fe ed-="" me="" na="">- FIL TE RE D-CO RR ELA TE D=2 4 or as per con sum er</fe></pre>	3	4	64	<fe ed-="" me="" na="">- FIL TE RE D- CO RR ELA TE D=2 4 or as per con sum er</fe>	3	4	64	<pre><fe ed-="" me="" na="">- FIL TE D- CO RR ELA TD=2 4 or as per con sum er</fe></pre>

3.4 Ephemeral Storage Requirements

The following table describes the Ephemeral Storage requirements for OCNADD:

Table 3-9 Ephemeral Storage Requirements

Service Name	Ephemeral Storage (min) in Mi	Ephemeral Storage (max) in Mi
<app-name>-adapter</app-name>	200	800



Table 3-9 (Cont.) Ephemeral Storage Requirements

Service Name	Ephemeral Storage (min) in Mi	Ephemeral Storage (max) in Mi
<app-name>-gw</app-name>	400	800
		i Note Supported only in release 22.4.0
ocnaddadminservice	100	200
ocnaddalarm	100	500
ocnaddhealthmonitoring	100	500
ocnaddscpaggregation	100	500
ocnaddseppaggregation	100	500 (i) Note Supported from release 23.1.0 onwards
ocnaddnrfaggregation	100	500
ocnaddconfiguration	100	500

3.5 Disk Throughput Requirements

The following table describes the disk throughput requirements in OCNADD:

Table 3-10 Disk Throughput Requirements

Avg Size (in Bytes)	Rate	RF (Kafk a Repli cation Facto r)	Topic (NF+ MAIN)	Cons umer Feed	Total Write Throu ghput (MB/s)	Total Read Throu ghput (MB/s)	No. of Broke r	Per Broke r Write Throu ghput (MB/s)	Per Broke r Read Throu ghput (MB/s)	Total per Broke r Throu ghput (MB/s) with 10% buffer	Total Disk Throu ghput (MB/s) for the Clust er with 10% Buffer
1941	39000	1	2	1	145	145	3	54	54	108	324



Table 3-10	(Cont.)	Disk	Throughput	Requirements
-------------------	---------	------	-------------------	--------------

Avg Size (in Bytes)	Rate	RF (Kafk a Repli cation Facto r)	Topic (NF+ MAIN)	Cons umer Feed	Total Write Throu ghput (MB/s)	Total Read Throu ghput (MB/s)	No. of Broke r	Per Broke r Write Throu ghput (MB/s)	Per Broke r Read Throu ghput (MB/s)	Total per Broke r Throu ghput (MB/s) with 10% buffer	Total Disk Throu ghput (MB/s) for the Clust er with 10% Buffer
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

(i) 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. RF value of "2"
 will be supported in a future release.

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= (alb1+a2b2+..+a(n)b(n))/(al+a2+..+a(n))
al -> SCP MPS
bl -> 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*30000)+(3000*9000))/(30000+9000) = 1941 Bytes (approx)

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

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

Table 3-11 SCP, NRF, and SEPP Disk Throughput

SCP Mess	age	NRF Mes sag e	SEPF Mess		RF (Kaf ka Rep licat	Topi c (NF +MA IN)	Con sum er Fee d	Tota I Writ e Thr	Tota I Rea d Thr	No. of Bro ker	Per Bro ker Writ	Per Bro ker Rea d	Tota I per Bro ker Thr	Tota I Disk Thr	
Avg Size (in Byt es)	Rat e	Avg Size (in Byt es)	Rat e	Avg Size (in Byt es)	ion Fact or)	,	-	oug hpu t (MB /s)	oug hpu t (MB /s)		Thr oug hpu t (MB /s)	Thr oug hpu t (MB /s)	oug hpu t (MB /s) with 10% buff er	hpu t (MB /s) for Clu ster with 10% Buff er	Rat e
1624	3000 0	3000	9000	3000	1500 0	1	2	1	145	145	3	54	54	108	324
1624	3000 0	3000	9000	3000	1500 0	2	2	1	289	289	3	106	106	212	636
4000	3000 0	3000	9000	3000	1500 0	1	2	1	281	281	3	104	104	208	624
4000	3000 0	3000	9000	3000	1500 0	2	2	1	561	561	3	206	206	412	1236

(i) 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.

3.6 Kafka PVC Storage Requirements

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

Table 3-12 Retention Period Per Topic

Topic Name	Retention Period
SCP	5 Minutes



Table 3-12 (Cont.) Retention Period Per Topic

Topic Name	Retention Period
NRF	5 Minutes
SEPP	5 Minutes
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 3-11 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
    = \sim 63.45 \text{ 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 \text{ GB} + 4.46 \text{ TB}
    = \sim 4.53 \text{ TB}
Total Storage for each broker = (4.53/\text{Number of Brokers}) TB = (4.53/3) TB
= ~ 1.51 TB [Assuming 3 Broker cluster]
```

Average Message Size = 3769 Bytes



The following example uses the values from the fourth row of the <u>Table 3-11</u> table. For more information about the table, see <u>Disk Throughput Requirements</u>:

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

= 39000 * 5 * 60 * 3 * 3769

= ~ 123.20 GB

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

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

= ~ 8.66 TB

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

= 123.20 GB + 8.66 TB

= ~ 8.79 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 Synthetic Feed with Replication
- Performance Benchmarking with 60K MPS SEPP Traffic with HTTP2 Feed Replication
- Performance Benchmarking with Correlated Feed for XDR Generation

4.1 Performance Benchmarking with Synthetic Feed with Replication

The performance benchmarking test is performed on OCNADD with 100K MPS traffic (feed replication enabled) 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:



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 23.4.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD TCP Feed: HTTP2/TLS
- OCNADD Kafka PVC: 400GB
 For more information about PVC requirements, see <u>Kafka PVC Storage Requirements</u>.
- 3rd Party Application: With 2 End-points
- cnDBTier Release 23.4.0
- NRF Release 23.4.0
- SCP Release 23.3.0
- SEPP Release 23.4.0
- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD



CNCC Release 23.4.0

Message Size: 3580 Bytes

Environment: CNE (Bare metal)

Execution time: 12 Hours

NRF: IGW and EGW messageCopy feature is enabled

SCP: Default configuration

cSEPP: PLMN IGW messageCopy feature is enabled

pSEPP: The messageCopy feature is disabled

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
ocnaddcon figuration	1	1	1	1	1	1	-
ocnaddala rm	1	1	1	1	1	1	-
ocnaddad min	1	1	1	1	1	1	-
ocnaddhe althmonito ring	1	1	1	1	1	1	-
ocnadduir outer	2	2	1	1	1	1	-
ocnaddscp aggregatio n	2	2	2	2	2	2	18 (SCP)/ retention. ms = 300000
ocnaddnrf aggregatio n	2	2	2	2	1	1	6 (NRF)/ retention. ms = 300000
ocnaddsep paggregati on	2	2	2	2	2	2	12 (SEPP)/ 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
ocnaddad apter	3	3	4	4	9	9	54 (MAIN)/ retention. ms = 300000
ocnaddkaf ka	10	6	96	48	4	4	-
zookeeper	1	1	2	2	3	3	-
ocnaddgui	2	2	1	1	1	1	-

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	12	Feed-1: 4.17 msec Feed-2: 4.07 sec	Feed-1: 99.95% Feed-2: 99.95%
NRF	2 - IGW/EGW (Request and Response)	15K MPS	12	NA	99.93%
SCP	2 (Request Ingress/ Request Egress)	55K MPS	12	NA	99.99%
SEPP	2 (PLMN IGW) (Request and Response)	30K MPS	12	NA	99.93%

CPU and Memory Utilization

The following table describes the OCNADD CPU and memory utilization:



Table 4-3	OCNADD CPU and Memo	ry Utilization
-----------	---------------------	----------------

Microservice/	Pod Count	CPU Utilization (%)	Memory Utilization (%)
Container			
ocnaddadminservice	1	0.16%	28.60%
ocnaddalarm	1	0.26%	18.60%
ocnaddconfiguration	1	0.15%	35.00%
ocnaddgui	1	0.00%	3.47%
ocnaddhealthmonitoring	1	0.40%	35.30%
ocnadduirouter	1	0.01%	27.80%
feed-dd1-adapter	9	61.00%	29.70%
feed-dd2-adapter	9	62.00%	28.92%
kafka-broker	4	87.70%	72.50%
zookeeper	4	0.16%	17.00%
ocnaddfilter	4	49.30%	13.90%
ocnaddnrfaggregation	1	62.40%	64.70%
ocnaddscpaggregation	3	71.60%	66.20%
ocnaddseppaggregation	2	54.20%	52.50%

4.2 Performance Benchmarking with Correlated Feed for XDR Generation

The performance benchmarking test is performed on OCNADD with correlated feed for XDR generation in a centralized deployment. The traffic includes 20K MPS SCP traffic (10K TPS with 2 traffic copy trigger points on SCP), 4K MPS NRF traffic (2K TPS with 2 traffic copy trigger points on NRF), and 6K MPS SEPP traffic (3K TPS with 2 traffic copy trigger points on SEPP). The benchmarking results are provided below:



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 23.4.0 deployed over CNE (Bare metal) 22.3.0 version
- Kafka Replication Factor (RF): 1
- OCNADD Correlated Feed: HTTP2/TLS
- OCNADD Kafka PVC: 400GB
 For more information about PVC requirements, see Kafka PVC Storage Requirements.
- 3rd Party Application: With 2 End-points



- cnDBTier Release 23.4.0
- NRF Release 23.4.0
- SCP Release 23.3.0
- SEPP Release 23.4.0
- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD
- CNCC Release 23.4.0
- Message Size: 3300 bytes
- Environment: CNE (Bare metal)
- Execution time: 12 Hours
- NRF: IGW and EGW messageCopy feature is enabled
- SCP: Default configuration
- cSEPP: PLMN IGW messageCopy feature is enabled
- pSEPP: The messageCopy feature is disabled

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
ocnaddcon figuration	1	1	1	1	1	1	-
ocnaddala rm	1	1	1	1	1	1	-
ocnaddad min	1	1	1	1	1	1	-
ocnaddhe althmonito ring	1	1	1	1	1	1	-
ocnadduir outer	2	2	1	1	1	1	-
ocnaddscp aggregatio n	2	2	2	2	2	2	18 (SCP)/ 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
ocnaddnrf aggregatio n	2	2	2	2	1	1	6 (NRF)/ retention. ms = 300000
ocnaddsep paggregati on	2	2	2	2	2	2	12 (SEPP)/ retention. ms = 300000
ocnaddad apter	3	3	4	4	9	9	54 (MAIN)/ retention. ms = 300000
ocnaddkaf ka	8	8	64	64	4	4	-
zookeeper	1	1	2	2	3	3	-
ocnaddgui	2	2	1	1	1	1	-

SCP

SCP Traffic: 20K TPS using two trigger points.

NRF

NRF Traffic: 4K TPS using two trigger points.

SEPP

SEPP Traffic: 6K 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	30K MPS	12	NA	99.99%
NRF	2 - IGW/EGW (Request and Response)	4K MPS	12	NA	99.99%
SCP	2 (Request Ingress/ Request Egress)	20K MPS	12	NA	99.99%
SEPP	2 (PLMN IGW) (Request and Response)	6K MPS	12	NA	99.99%

CPU and Memory Utilization



The following table describes the OCNADD CPU and memory utilization:

Table 4-6 OCNADD CPU and Memory Utilization

	D. 10	OD111111111111111111111111111111111111	M
Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.13%	29.40%
ocnaddalarm	1	0.34%	21.80%
ocnaddconfiguration	1	0.14%	34.80%
ocnaddgui	1	0.00%	5.09%
ocnaddhealthmonitoring	1	0.29%	35.30%
ocnadduirouter	1	0.06%	29.20%
kafka-broker	4	52.10%	35.90%
zookeeper	4	0.14%	18.10%
ocnaddfilter	4	49.50%	15.40%
ocnaddnrfaggregation	1	63.60%	55.50%
ocnaddscpaggregation	3	49.20%	46.60%
ocnaddseppaggregation	2	39.00%	39.10%
feed-dd1-correlation	16	23.40%	26.50%

4.3 Performance Benchmarking with 60K MPS SEPP Traffic with HTTP2 Feed Replication

The performance benchmarking test is performed on OCNADD with SEPP HTTP2 feed (replication enabled) in a centralized deployment with one worker group. The traffic includes 60K MPS SEPP traffic (15K TPS with 4 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: 60K 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 23.4.0 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: With 2 End-points
- cnDBTier Release 23.4.0



SEPP Release 23.4.0

SASL/SSL, enabled between SEPP and OCNADD

CNCC Release 23.4.0

Message Size: 3300 bytes

Environment: CNE (Bare metal)

Execution time: 12 Hours

cSEPP: PLMN IGW and N32 EGW messageCopy feature enabled

• pSEPP: The messageCopy feature is disabled

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: 60K 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
ocnaddcon figuration	1	1	1	1	1	1	-
ocnaddala rm	1	1	1	1	1	1	-
ocnaddad min	1	1	1	1	1	1	-
ocnaddhe althmonito ring	1	1	1	1	1	1	-
ocnadduir outer	2	2	1	1	1	1	-
ocnaddscp aggregatio n	2	2	2	2	4	4	6 (SCP)/ retention. ms = 300000
ocnaddnrf aggregatio n	2	2	2	2	1	1	6 (NRF)/ retention. ms = 300000
ocnaddsep paggregati on	2	2	2	2	1	1	24 (SEPP)/ retention. ms = 300000



Table 4-7 (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 apter	3	3	4	4	14	14	126 (MAIN)/ retention. ms = 300000
ocnaddkaf ka	8	8	64	64	4	4	-
zookeeper	1	1	2	2	3	3	-
ocnaddgui	2	2	1	1	1	1	-

SEPP

SEPP Traffic: 60K TPS using four 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	60K MPS	12	Feed-1: 2.39 msec Feed-2: 2.27 sec	Feed-1: 99.99% Feed-2: 99.99%
SEPP	2 (PLMN IGW) (Request and Response) 2 - N32 EGW (Request and Response)	60K MPS	12	NA	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	0.15%	29.00%
ocnaddalarm	1	1.42%	22.00%
ocnaddconfiguration	1	0.16%	35.20%
ocnaddgui	1	0.00%	3.02%
ocnaddhealthmonitoring	1	0.35%	37.70%
ocnadduirouter	1	0.23%	30.50%



Table 4-9 (Cont.) OCNADD CPU and Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
feed-dd1-adapter	14	42.50%	17.00%
kafka-broker	4	84.10%	39.70%
zookeeper	4	0.16%	16.70%
feed-dd2-adapter	14	41.00%	17.60%
ocnaddfilter	4	49.40%	15.20%
ocnaddnrfaggregation	1	0.06%	14.10%
ocnaddscpaggregation	1	0.06%	14.80%
ocnaddseppaggregation	4	75.20%	59.50%