Oracle® Communications Network Analytics Data Director Benchmarking Guide





Oracle Communications Network Analytics Data Director Benchmarking Guide, Release 24.1.0

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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
OCI	Oracle Cloud Infrastructure
SCP	Oracle Communications Cloud Native Core, Service Communication Proxy
SEPP	Oracle Communications Cloud Native Core, Security Edge Protection Proxy
NDB	Network Data Broker
NRF	Oracle Communications Cloud Native Core, Network Repository Function
NVME	Non Volatile Memory Express
OCPU	Oracle Compute Unit
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 24.1.x in *Oracle Communications Network Analytics Data Director Benchmarking Guide*.

Release 24.1.0 - F94770-01, April 2024

Updated the following sections:

- Updated the <u>Resource Requirement</u> section to include resource requirements for OCI environment.
- Updated the following sections in the <u>Profile Resource Requirements</u> 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 following profile resource requirements section for OCI environment:
 - Profile Resource Requirements for HTTP2 Feed in OCI Environment
 - Profile Resource Requirements for Synthetic Feed in OCI Environment
 - Profile Resource Requirements for Aggregated Kafka Feed in OCI Environment
 - Profile Resource Requirements for Correlated Kafka Feed in OCI Environment
- Added the <u>Profile Resource Requirements for 110K MPS SCP Profile Message Sequencing</u> section.
- Added the following sections in the <u>OCNADD Benchmarking Testing</u> chapter:
 - Performance Benchmarking with Synthetic Feed with Replication in OCI Environment
- Updated the <u>Performance Benchmarking with Synthetic Feed with Replication</u> section for 110K MPS traffic.

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
- Oracle Communications Cloud Native Core OCI Adaptor, NF Deployment on OCI Guide

Deployment

OCNADD supports CNE and OCI 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:

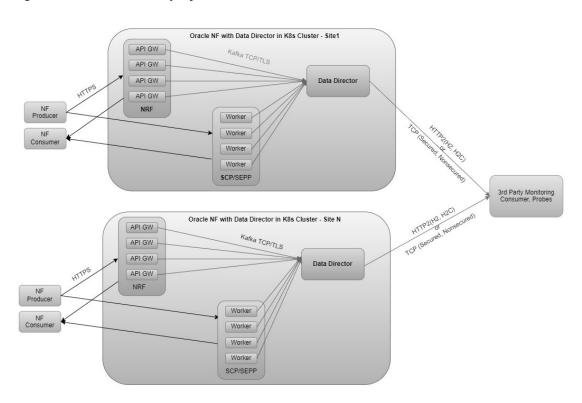


Figure 2-1 OCNADD Deployment

(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.

Resource Requirements for CNE Environment

Resource requirements for vCNE (with SSD and NVM):

Table 3-1 CNE Configuration for vCNE

Type of Server	vCNE with X9 server and NVME
Master node	3
Worker node	44
Storage Class	Standard

Table 3-2 Bare Metal Environment

Type of Server	X9 Server and NVME
Master node	3
Worker node	19
Storage Class	Standard

Resource Requirements for OCI Environment

- OCI block volume is attached to the PVC with auto-tune based performance from balanced to high performance. To change block volume to auto-tune based performance (Balance to High Performance), see Changing the Performance of a Volume.
- All tests are performed with the default round-robin based ordering.
- Resource requirements may vary after enabling key or custom based ordering and running traffic with actual NFs.

Table 3-3 OKE Worker Nodes

Type of Server	X9 Server and NVME
Worker nodes	6
Instance Shape	VM.Standard.E4.Flex
OCPUs in worker node	50 (CPU: 100)
Memory in worker node	194 GB

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 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	Default D	eploymer	t Profile					
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
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	4	4	1	4	24	SCP
ocnaddnrfaggregati on (15K)	2	2	2	2	1	1	6	NRF
ocnaddseppaggreg ation (30K)	2	2	4	4	1	2	12	SEPP
ocnaddadapter	3	3	6	6	HTTP:2 SYNTH ETIC:1	HTTP:14 SYNTH ETIC:9	126	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	-	-

(i) Note

- Four instances of Kafka brokers might be required when running Replication Factor (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 <u>Kafka PVC Storage Requirements</u>.

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:
    appl : 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 110K MPS SCP Profile Message Sequencing
- 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



- Profile Resource Requirements for HTTP2 Feed in OCI Environment
- Profile Resource Requirements for Synthetic Feed in OCI Environment
- Profile Resource Requirements for Aggregated Kafka Feed in OCI Environment
- Profile Resource Requirements for Correlated Kafka Feed in OCI Environment

3.3.1 Profile Resource Requirements for 110K MPS SCP Profile Message Sequencing

The following table displays the profile resource requirements for 110K MPS SCP Profile.



For a vCNE setup update the value of the parameter *numloThreads* to "3024" in the *custom-values.yaml* file.

Table 3-5 Resource Requirements

OCNADD Service	110K MPS SCP	Profile		
Replication Factor = 2 (vCNE) Message Size = 3500 FEED Type = HTTP2/TCP/ KAFKA	vCPU	Total Replica	Memory Required (Gi)	Topic Partitions
Kafka with RF=2				
ocnaddkafka	6	4	164	-
MESSAGE_SEQUENCING_TYPE TRANSACTION_MSG_SEQUENCE				
ocnaddscpaggregation	2	5	24	SCP=30
MESSAGE_SEQUENCING_TYPE WINDOW_MSG_SEQUENCING_				
ocnaddscpaggregation	2	5	24	SCP=30
MESSAGE_SEQUENCING_TYPE REQUEST_RESPONSE_MSG_S			ms	
ocnaddscpaggregation	2	5	16	SCP=30
INGRESS FILTER is ON				
MESSAGE_SEQUENCING_TYPE TRANSACTION_MSG_SEQUENCE				
ocnaddscpaggregation	2	6	36	SCP=36
MESSAGE_SEQUENCING_TYPE WINDOW_MSG_SEQUENCING_				
ocnaddscpaggregation	2	6	36	SCP=36
MESSAGE_SEQUENCING_TYPE REQUEST_RESPONSE_MSG_S			ms	
ocnaddscpaggregation	2	6	24	SCP=36
HTTP2 FEED (FILTER = OFF)				
ocnaddadapter	3	14	4	MAIN=126
SYNTHETIC FEED (TCP CONNE (FILTER=OFF)	CTION MESSAG	E and/or MESSAC	GE SEGEMENTAT	TON = ON)
ocnaddadapter	3	10	12	MAIN=60



- The performance run is completed with a 90% success rate of transactions. (Success Transaction = All four transaction messages (RxRequest, TxRequest, RxResponse, and TxResponse) received from SCP).
- The number of instances for SCP aggregation may increase from the defined number in the resource profile based on the message sequencing timer expiry configuration (using the Max timer expiry value) and the Transaction success rate.
- The end-to-end latency may increase based on "Timer Expiry Value + Processing Time + RF2 Processing Time + 3rd party response time (For HTTP2 Feed)".

3.3.2 Profile Resource Requirements for HTTP2 Feed

The following table displays the profile resource requirements when HTTP2 FEED is "110K" MPS.

Table 3-6 Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	file	65K	SCF	P Pro	file	30K Pro	SEF file	PΡ		(SC NRI	K Pro P:65 =:15k PP:30	K (110K SCP Profile			
Replica tion Factor = 1 Messa ge Size = 3500 FEED Type = HTTP2	V PU	To tal Re pli ca	Me m or y Re que d (Gi)	To pic Pa rtit io ns	V PU	To tal Re pli ca	Me m or y Re que d (G)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re que d ⊙)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re que 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	3:											
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	-
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	1	3	2	-
ocnadd kafka	2	3	24	-	4	3	48	-	3	3	48	-	6	6	48	-	6	6	48	-



Table 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	ofile	65K SCP Profile				30K Pro	SEF file	PP		(SC	K Pr P:65 F:15I PP:30	K (110K SCP Profile			
Replicate																				
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	48	-	7	6	96	-	7	6	96	-
WLB is 0	O/NC	FF a	nd F	ilter i	s OF	F														
ocnadd scpaggr egation	-	-	-	-	2	3	4	SC P= 18	-	-	-	-	2	3	4	SC P= 18 (E ac h ins tan ce 6 par titi on s)	2	6	4	SC P= 36 (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	4	SE PP =1 2	2	2	4	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)	-	-	-	1



Table 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	= Pro	ofile	65K	SCF	P Pro	file	30K Pro	SEF file	PP		(SC NRI	K Pr P:65 =:15 PP:30	<		110 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	6	M AI N= 12 6 (E ac h ins tan ce 9 par titi on s)	3	14	6	M AI = 12 6 (E ac h ins tan ce 9 par titi on s)
WLB is 0				ilter i	s ON															
Ingress Founded	-ilter -	is Oi	ν: Γ_	Ι-	2	4	4	SC	l	l	Ι_	Ι_	2	4	4	sc	2	7	4	sc
scpaggr egation							•	P= 24								P= 24 (E ac h ins tan ce 6 par titi on s)			•	P= 42 (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 3-6 (Cont.) Resource Requirements

OCNA DD Servic e	15K NRF Profile								30K Pro	SEF file	PP		(SC NRI	K Pro P:65 =:15h PP:30	K (110K SCP Profile			
ocnadd seppag gregati on		-	-	1	-	-	-	-	2	3	2	SE PP =1 8	2	3	4	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
Egress F	ilter	is ON	1 :											<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	6	M AI N= 13 5 (E ac h ins tan ce 9 par titi on s)	3	15	6	M AI = 13 5 (E ac h ins tan ce 9 par titi on s)



- 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.

3.3.3 Profile Resource Requirements for Synthetic Feed

The following table displays the profile resource requirements when Synthetic FEED is "110K" MPS.

Table 3-7 Resource Requirements

OCNA DD Servic e	15K NRF Profile				65K SCP Profile				30K Pro	SEF file	PP		(SC	K Pro P:65 F:15h PP:30	K (110K SCP Profile			
Replica tion Factor = 1 Messa ge Size = 3500 FEED Type = SYNTH ETIC	vC PU	To tal Re pli ca	Me m or y Re qu ire d (G)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re qu ire d (G)	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 que d (G)	To pic Pa rtit io ns	vC PU	To tal Re pli ca	Me m or y Re que d ⊙)	To pic Pa rtit io ns
OCNADI) mic	rose	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	-
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	-
ocnadd gui	2	1	1	-	2	1	1	-	2	1	1	-	2	1	1	-	2	1	1	-



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	- Pro	ofile	65K	SCF	P Pro	file	30K Pro	SEF file	PР		(SC NRI	K Pr P:65 =:15I PP:30	<		110 Pro	K SC file	P	
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	1	3	1	-	1	3	2	-	1	3	1	-
ocnadd kafka	2	3	24	-	3	3	24	ı	3	3	24	-	6	6	48	-	6	6	48	ı
Replicate	ed Fe	ed																		
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	24	-	7	6	96	-	7	6	96	-
WEIGHT	ED-I	B is	ON/	OFF,	L3L4	Map	ping	is O	N/OF	F ar	d FIL	TER	is O	FF						
ocnadd scpaggr egation	-	-	-	-	2	3	4	SC P= 18	-	-	-	-	2	3	4	SC P= 18 (E ac h ins tan ce 6 par titi on s)	2	6	4	SC P= 36 (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)	-	-	-	



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic e	15K	NRI	F Pro	ofile	65K	SCF	Pro	ofile	30K Pro	SEF file	P		(SC	K Pr P:65 F:15 PP:30	<		110 Pro	K SC file	P	
ocnadd seppag gregati on	-	-	-	-	-	-	-	-	2	2	4	SE PP =1 2	2	2	4	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
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	6	M AI N= 54 (E ac h ins tan ce 6 par titi on s)	3	9	6	M AI N= 54 (E ac h ins tan ce 6 par titi on s)
WEIGHT				OFF,	L3L4	l Map	ping	is O	N/OF	F ar	d FIL	TER	is O	N						
Ingress I	1	ıs Ol	ν Γ	1	۱,		,	۵۵	l	l		1	١,			۱۵۵	<u>_</u>	-		
ocnadd scpaggr egation	-	-	-	-	2	4	4	SC P= 24	-	-	-	-	2	4	4	SC P= 24 (E ac h ins tan ce 6 par titi on s)	2	7	4	SC P= 42 (E ac h ins tan ce 6 par titi on s)



Table 3-7 (Cont.) Resource Requirements

OCNA DD Servic	15K	NRI	- Pro	file	65K	SCF	Pro	file	30K Pro	SEF file	PP		(SC	K Pro P:65 =:15h	K (110 Pro	K SC file	P	
e ocnadd nrfaggr egation	2	2	2	NR F= 6	-	-	-	-	-	-	-	-	2	2 2	2	NR F= 12 (E ac h ins tan ce 6 par titi on s)	-	-	-	-
ocnadd seppag gregati on	-	-	-	1	1	1	1	1	2	3	4	SE PP =1 8	2	3	4	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	1	1	-	-
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	6	M AI = 54 (E ac h ins tan ce 6 par titi on s)	3	9	6	M AI N= 54 (E ac h ins tan ce 6 par titi on s)



- 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.

3.3.4 Profile Resource Requirements for Aggregated Kafka Feed

The following table displays the profile resource requirements when Aggregated Kafka Feed is "110K" MPS:

Table 3-8 Resource Requirements

OCNA DD Servic e	15K	NRF	- Pro	file	65K	SCF	Pro	file	30K Pro	SEF file	PP		(SC	K Pro P:64 F:15h PP:30	K		1101 Pro	K SC	P	
Replica tion Factor = 1 Messa ge Size = 3500 FEED Type = KAFKA	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 (Gi)	To pic Pa rtit io ns
ocnadd configur ation	1	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	1	1	-
ocnadd gui	2	1	1	-	2	1	1	-	2	1	1	-	2	1	1	-	2	1	1	-
ocnadd uirouter	2	1	1	ı	2	1	1	1	2	1	1	-	2	1	1	ı	2	1	1	-



Table 3-8 (Cont.) Resource Requirements

OCNA DD Servic e	15k	NRI	F Pro	ofile	65K	SCI	Pro	ofile	30k Pro	(SEI	PP		(SC	K Pr :P:64 F:15 PP:3	IK K		110 Pro	K SC	P	
zookee per	1	3	1	-	1	3	1	-	1	3	1	-	1	3	1	-	1	3	2	-
ocnadd kafka	2	3	24	-	4	3	48	-	3	3	24	-	5	6	48	-	5	6	48	-
Replicate	ed Fe	eed																		
ocnadd kafka	2	3	24	-	4	3	48	-	4	3	48	-	7	6	96	-	7	6	96	-
Ingress f	filter i	is "Ol	FF"																	
ocnadd scpaggr egation	-	-	-	-	2	3	4	SC P= 18	-	-	-	-	2	3	4	SC P= 18 (E ac h ins tan ce 6 par titi on s)	2	6	4	SC P= 36 (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	4	SE PP =1 2	2	2	4	SE PP =1 2 (E ac h ins tan ce 6 par titi on s)	-	-	-	-

Table 3-8 (Cont.) Resource Requirements

OCNA DD Servic e			F Pro	ofile	65K	SCI	Pro	ofile	30K Pro	SEI file	PΡ		(SC	K Pr :P:64 F:15 PP:3	K		110 Pro	K SC file	P	
Ingress f	ilter i	s "Ol	N"																	
ocnadd scpaggr egation	-	-	-	-	2	4	4	SC P= 24	-	-	-	-	2	4	4	SC P= 24 (E ac h ins tan ce 6 par titi on s)	2	7	4	SC P= 42 (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)	-	-	-	1
ocnadd seppag gregati on	-	-	-	-	-	-	-	1	2	3	4	SE PP =1 8	2	3	4	SE PP =1 8 (E ac h ins tan ce 6 par titi on s)	-	-	-	-

3.3.5 Profile Resource Requirements for Correlated Kafka Feed

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



- 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 3-9 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 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)	Top ic Par titio ns	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	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	-
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															



Table 3-9 (Cont.) Resource Requirements

OCNADD Service	15K	NRF I	Profile	9	30K	SCP I	Profile)	30K	SEPP	Profi	le	(SCF NRF	Profil P:15K :5K P:10K		
ocnaddka fka	4	4	48	-	8	4	72	-	8	4	72	-	8	4	72	-
ocnaddsc paggregat ion	-	-	-	-	2	2	2	SC P=1 2	-	-	-	-	2	1	2	SC P=6 Eac h Inst anc e 6 part ition)
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	= CO	RREL	ATED		-	•		-			-	-	•	-	-	-



Table 3-9 (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		
ocnaddco rrelation	3	3	64	MAI N=1 8 <fe ed-<br="">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- na me >- 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 	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
FEED TYP	E = C	ORRI	ELATE	D_FII	TERE	D (Mi	nimur	n 20%	data	filter is	s conf	igured)			
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



OCNADD 15K NRF Profile 30K SCP Profile 30K SEPP Profile 30K Profile Service (SCP:15K NRF:5K SEPP:10K) 3 ocnaddco 3 48 <fe 64 <fe 4 64 <fe <fe rrelation ededededna na na na me me me me FIL FIL FIL FIL ΤE ΤE TE TE RE RE RE RE D-D-D-D-CO CO CO CO RR RR RR RR ELA ELA ELA ELA ΤE ΤE ΤE TE D=1 D=2 D=2 D=2 8 or 4 or 4 or 4 or as as as as per per per per con con con con

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Table 3-9 (Cont.) Resource Requirements

3.3.6 Profile Resource Requirements for HTTP2 Feed in OCI Environment

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er

The following table displays the profile resource requirements for HTTP2 feed in OCI environment.

(i) Note

- This test is performed without enabling the Ingress or Egress features.
- The replicated HTTP2 feed's end-to-end latency is between 2ms to 8ms.
- The single HTTP2 feed's end-to-end latency is between 1ms to 3ms.

Table 3-10 Resource Requirements

OCNADD Service	5K Profile (SCP:3K	e NRF:1K S	EPP:1K)		5K SCP F	Profile		
Replication Factor = 1	vCPU	Total Replica	Memory Require	Topic Partitio	vCPU	Total Replica	Memory Require	Topic Partitio
Message Size =			d (C:)	ns			d (C:)	ns
3500			(Gi)				(Gi)	
FEED Type = HTTP2								
OCNADD microserv	rices resou	rce require	ments:	-	-			-
ocnaddconfiguratio n	1	1	1	-	1	1	1	-



Table 3-10 (Cont.) Resource Requirements

OCNADD Service	5K Profil (SCP:3K	e NRF:1K S	EPP:1K)		5K SCP F	Profile		
ocnaddalarm	1	1	1	-	1	1	1	-
ocnaddadmin	1	1	1	-	1	1	1	-
ocnaddhealthmonit oring	1	1	1	-	1	1	1	-
ocnaddgui	2	1	1	-	2	1	1	-
ocnadduirouter	2	1	1	-	2	1	1	-
zookeeper	1	3	1	-	1	3	1	-
ocnaddkafka	2	4	24	-	2	4	24	-
Replicated Feed (Av	g. Latency	: 1ms)	•		•		•	•
ocnaddkafka	3	4	32	-	3	4	32	-
Single Feed (Avg. La	atency: 1m	s)	•		•	•	•	•
ocnaddscpaggrega tion	2	1	2	SCP=6 (Each instance 6 partition s)	2	2	2	SCP=12 (Each instance 6 partition s)
ocnaddnrfaggregati on	2	1	2	NRF=6 (Each instance 6 partition s)	-	-	-	-
ocnaddseppaggreg ation	2	1	2	SEPP=1 2 (Each instance 6 partition s)	-	-	-	-
ocnaddadapter	3	2	3	MAIN=1 8 (Each instance 9 partition s)	3	2	3	MAIN=1 8 (Each instance 9 partition s)

3.3.7 Profile Resource Requirements for Aggregated Kafka Feed in OCI Environment

The following table displays the profile resource requirements for Aggregated feed in OCI environment.



• This test is performed without enabling the Ingress or Egress features.



Table 3-11 Resource Requirements

OCNADD Service	5K Profil (SCP:3K	e NRF:1K S	EPP:1K)		5K SCP I	Profile		
Replication Factor = 1 Message Size = 3500 FEED Type = Aggregated Kafka	vCPU	Total Replica	Memory Require d (Gi)	Topic Partitio ns	vCPU	Total Replica	Memory Require d (Gi)	Topic Partitio ns
OCNADD microserv	ices resou	rce require	ments:					
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	-
ocnaddgui	2	1	1	-	2	1	1	-
ocnadduirouter	2	1	1	-	2	1	1	-
zookeeper	1	3	1	-	1	3	1	-
ocnaddkafka	2	4	24	-	2	4	24	-
Replicated Feed							_	
ocnaddkafka	3	4	32	-	3	4	32	-
Single Feed			_				•	
ocnaddscpaggrega tion	2	1	2	SCP=6 (Each instance 6 partition s)	2	2	2	SCP=12 (Each instance 6 partition s)
ocnaddnrfaggregati on		1	2	NRF=6 (Each instance 6 partition s)	-	-	-	-
ocnaddseppaggreg ation	2	1	2	SEPP=1 2 (Each instance 6 partition s)	-	-	-	-

3.3.8 Profile Resource Requirements for Synthetic Feed in OCI Environment

The following table displays the profile resource requirements for Synthetic feed in OCI environment.



- This test is performed without enabling the Ingress or Egress features.
- The replicated TCP feed's end-to-end average latency is 3ms. The Block Volume Performance is 50% Balanced and 50% High Performance.
- The single TCP feed's end-to-end average latency is 3ms. The Block Volume Performance is "Balanced".

Table 3-12 Resource Requirements

	1									
OCNADD Service	5K Profil (SCP:3K	e NRF:1K S	EPP:1K)		5K SCP Profile					
Replication Factor = 1 Message Size = 3500 FEED Type = TCP	vCPU	vCPU Total Replica Require d (Gi) Topic Partitio ns		vCPU	Total Replica	Memory Require d (Gi)	Topic Partitio ns			
OCNADD microserv	ices resou	rce require	ments:		•	•	•			
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	-		
ocnaddgui	2	1	1	-	2	1	1	-		
ocnadduirouter	2	1	1	-	2	1	1	-		
zookeeper	1	3	1	-	1	3	1	-		
ocnaddkafka	2	4	24	-	2	4	24	-		
Replicated Feed (Av	g. Latency	: 0.3ms)								
ocnaddkafka	4	4	32	-	4	4	32	-		
Single Feed (Avg. La	atency: 0.3	ms)								
ocnaddscpaggrega tion	2	1	2	SCP=6 (Each instance 6 partition s)	2	2	2	SCP=12 (Each instance 6 partition s)		
ocnaddnrfaggregati on			2	NRF=6 (Each instance 6 partition s)	-	-	-	-		
ocnaddseppaggreg ation	2	1	2	SEPP=1 2 (Each instance 6 partition s)	-	-	-	-		



Table 3-12 (Cont.) Resource Requirements

OCNADD Service	5K Profile (SCP:3K NRF:1K SEPP:1K)				5K SCP Profile				
ocnaddadapter	3	2	3	MAIN=1 2 (Each instance 6 partition s)	3	2	3	MAIN=1 2 (Each instance 6 partition s)	

3.3.9 Profile Resource Requirements for Correlated Kafka Feed in OCI Environment

The following table displays the profile resource requirements for Correlated Kafka feed in OCI environment.

Table 3-13 Resource Requirements

OCNADD Service	5K SCP I	Profile			5K Profile (SCP:3K NRF:1K SEPP:1K)				
Replication Factor = 1 Message Size =	vCPU	Total Replica	Memory Require d	Topic Partitio ns	vCPU	Total Replica	Memory Require d	Topic Partitio ns	
3500			(Gi)				(Gi)		
ACL FEED Type = Correlated									
OCNADD microserv	ices resou	rce require	ments:						
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	-	
ocnaddgui	2	1	1	-	2	1	1	-	
ocnadduirouter	2	1	1	-	2	1	1	-	
zookeeper	1	3	1	-	1	3	2	-	
ocnaddkafka	3	4	32	-	3	4	32	-	
FEED TYPE = COR	RELATED								
ocnaddscpaggrega tion	2	1	2	SCP=6 (Each instance 6 partition s)	2	2	2	SCP=12 (Each instance 6 partition s)	
ocnaddnrfaggregati on	2	1	2	NRF=6 (Each instance 6 partition s)	-	-	-	-	



Table 3-13 (Cont.) Resource Requirements

OCNADD Service	5K SCP F	Profile			5K Profile (SCP:3K NRF:1K SEPP:1K)				
ocnaddseppaggreg ation	2	1	2	SEPP=1 2 (Each instance 6 partition s)	-	-	-	-	
ocnaddcorrelation	3	3	24	MAIN=1 8, <feed-name> - CORRE LATED= 18 or as per consum er.</feed-name>	3	3	24	MAIN=1 8, <feed- name> - CORRE LATED= 18 or as per consum er.</feed- 	
FEED TYPE = COR ocnaddfilter	2	3	3	MAIN=1 8, <feed- name> - FILTERE D=18</feed- 	2	3	3	MAIN=1 8, <feed- name> - FILTERE D=18</feed- 	
ocnaddcorrelation	2	3	16	<feed- name> - FILTERE D - CORRE LATED= 18 or as per consum er.</feed- 	2	3	16	<feed- name> - FILTERE D - CORRE LATED= 18 or as per consum er.</feed- 	



- The filter service's resource requirements may vary based on the percentage of data allowed post-filtering and the number of filter conditions with configured values.
- The correlation service's resource requirements may vary when all transaction messages are not received and the value of "maxTransactionWaitTime" is set to a higher value (Use a lower value for such scenarios).
- The Kafka broker's resource requirement increases if the Replication Factor is "2" and (or) the Replicated Feed is running, and the end-to-end latency increases when DISK I/O is slow.
- The resource requirement in the above table is for a single feed. Additional Kafka resources are required for replicated feeds.
- Depending on the number of CORRLATION_FILTERED feeds configured, you
 might have to increase the filter service memory and CPU requirements. The
 requirements mentioned in the above table are for a single configuration.

3.4 Ephemeral Storage Requirements

The following table describes the Ephemeral Storage requirements for OCNADD:

Table 3-14 Ephemeral Storage Requirements

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



Table 3-14 (Cont.) Ephemeral Storage Requirements

Service Name	Ephemeral Storage (min) in Mi	Ephemeral Storage (max) in Mi
ocnaddseppaggregation	100	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 3-15 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
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
  -> No of topics to which data copied. As of now, each message will be
copied into two topics.
   -> Number of consumer groups, that is the number of readers for each
write
  -> (RF*T) + C -1
```

Average Message in Table:

```
Average Message Size= (a1b1+a2b2+..+a(n)b(n))/(a1+a2+..+a(n))
al -> SCP MPS
b1
    -> SCP message size
a2
     -> NRF MPS
b2 -> NRF message size
a(n) \rightarrow NF(n) MPS
b(n) \rightarrow NF(n) message size
```

Example:

ORACLE

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 3-16 SCP, NRF, and SEPP Disk Throughput

SCP Mess	age	Mes Message (Kaf c sum I I of I sag e Rep +MA Fee e d ker Message Ka Ka Ka Ka Ka Ka Ka K				Mes Message (Kaf c sum I I o o ka (NF er Writ Rea B Rep +MA Fee e d k				Mes Message (Kaf c sum I I of ka (NF er Writ Rea Bro Rep +MA Fee e d ker	Mes Message (Kaf c sum l l of writ Rea Bro e Rep +MA Fee e d ker			(Kaf c (NF Rep +MA licat IN)	c sum I I ord (NF er Writ Rea B +MA Fee e d ke			l I Writ Rea e d	I of Rea Bro	um I I of Bro Writ Rea Bro ker ee e d ker Writ		of Bro Bro ker	Per Bro ker Rea	Tota I per Bro ker	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	Fee d	Thr oug hpu t (MB /s)		d Thr oug hpu t (MB /s)	Thr oug hpu t (MB /s) with 10% buff er	oug 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											



SCP SEPP Tota NRF RF Topi Con **Tota** Tota No. Per Per Tota Message Mes Message (Kaf sum of Bro Bro I per С (NF Rea Bro Writ Bro Disk sag ka er ker ker +MA е Rep Fee d ker Writ Rea ker Thr IN) Thr licat Thr d Thr oug Avq Avg Rat Avq Rat ion oug oug Thr Thr oug hpu Size Size Size **Fact** hpu hpu oug oug hpu (in (in (in (MB or) hpu hpu Byt Byt Byt (MB (MB (MB ls) es) es) es) (MB (MB ls) ls) ls) for ls) ls) with Clu 10% ster buff with 10% er **Buff** er 4000 3000 3000 9000 3000 1500 281 281 104 104 208 624 4000 3000 3000 9000 3000 1500 2 2 561 561 3 206 206 412 1236

Table 3-16 (Cont.) SCP, NRF, and SEPP Disk Throughput

(i) Note

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- 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 3-17 Retention Period Per Topic

Topic Name	Retention Period
SCP	5 Minutes
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 <u>Table 3-16</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 * 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 <u>Table 3-16</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

 $= \sim 8.79$ 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
- Performance Benchmarking with Synthetic Feed with Replication in OCI Environment

4.1 Performance Benchmarking with Synthetic Feed with Replication

The performance benchmarking test is performed on OCNADD with 110K MPS traffic (feed replication enabled) which includes 65K MPS SCP traffic (32.5K 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

- Ingress Traffic Rate: 110K 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 24.1.0 deployed over CNE (Bare metal) 23.3.4 version
- Kafka Replication Factor (RF): 1
- OCNADD TCP Feed: TCP/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 24.1.0
- NRF Release 24.1.0
- SCP Release 24.1.0
- SEPP Release 24.1.0



- SASL/SSL, enabled between NRF/SCP/SEPP and OCNADD
- CNCC Release 24.1.0
- Message Size: 3450 Bytes
- Environment: CNE (Bare metal), "3" Master Nodes (X9 Server and NVME), "3" Worker Nodes (X9 Server and NVME).
- 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: 110K 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	4	4	2	2	24 (SCP)/ retention. ms = 300000
ocnaddnrf aggregatio n	2	2	2	2	1	1	6 (NRF)/ 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
ocnaddsep paggregati on	2	2	4	4	2	2	12 (SEPP)/ retention. ms = 300000
ocnaddad apter	3	3	6	6	9	9	54 (MAIN)/ retention. ms = 300000
ocnaddkaf ka	7	7	96	96	6	6	-
zookeeper	1	1	2	2	3	3	-
ocnaddgui	2	2	1	1	1	1	-

SCP

SCP Traffic: 65K 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	110K MPS	12	Feed-1: 15.5 msec Feed-2: 14.4 msec	Feed-1: 99.94% Feed-2: 99.96%
NRF	2 - IGW/EGW (Request and Response)	15K MPS	12	NA	99.94%
SCP	2 (Request Ingress/ Request Egress)	65K MPS	12	NA	99.97%
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 Memory Utilization

Microservice/ Container	Pod Count	CPU Utilization (%)	Memory Utilization (%)
ocnaddadminservice	1	0.09%	28.80%
ocnaddalarm	1	0.08%	18.10%
ocnaddconfiguration	1	0.09%	36.60%
ocnaddgui	1	0.00%	1.79%
ocnaddhealthmonitoring	1	0.17%	33.90%
ocnadduirouter	1	0.01%	29.10%
ocnaddfilter	1	48.70%	12.70%
ocnaddnrfaggregation	1	82.80%	34.00%
ocnaddscpaggregation	4	74.50%	23.10%
ocnaddseppaggregation	2	72.40%	21.00%
feed-dd11-adapter	9	84.80%	24.30%
kafka-broker	6	72.20%	18.40%
zookeeper	3	0.13%	21.80%
feed-dd22-adapter	9	83.30%	23.70%

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

- 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

11:	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

- 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%

4.4 Performance Benchmarking with Synthetic Feed with Replication in OCI Environment

The performance benchmarking test is performed on OCNADD with 5K MPS traffic, which includes 3K MPS SCP traffic, 1K MPS NRF traffic, and 1K MPS SEPP traffic, in a centralized deployment with one worker group. The benchmarking results are provided below:



(i) Note

An ingress message from a NF is '1' MPS for OCNADD.

Benchmark Test Environment

- Ingress Traffic Rate: 5K 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 24.1.0 deployed over OCI.
- Kafka Replication Factor (RF): 1
- OCNADD TCP Feed: TCP/TLS
- OCNADD Kafka PVC: 50GB
- 3rd Party Application: OCNADD Simulator with one endpoint
- cnDBTier Release 24.1.0
- NRF Release: NA
- SCP Release: NA
- SEPP Release: NA
- SASL/SSL, enabled between OCNADD Simulator and OCNADD
- CNCC Release 24.1.0
- Message Size: 3330 Bytes



- Environment: OCI environment, "6" Worker Nodes, "VM.Standard.E4.Flex" Instance Shape, "194 GB" memory in Worker Node, "50 (CPU: 100)" OCPUs in the Worker Nodes
- Execution time: 16 Hours

Benchmark Testcase Specifications

The testcase parameters are as follows:

- OCNADD
 - Message Ingestion Rate: 5K MPS

Resource Specifications:

Table 4-10 OCNADD Worker Group 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	2	2	1	1	-
ocnaddala rm	1	1	2	2	1	1	-
ocnaddad min	1	1	2	2	1	1	-
ocnaddhe althmonito ring	1	1	2	2	1	1	-
ocnadduir outer	0	0	0	0	0	0	-
ocnaddscp aggregatio n	2	2	4	4	1	1	6 (SCP)/ retention. ms = 300000
ocnaddnrf aggregatio n	2	2	4	4	1	1	6 (NRF)/ retention. ms = 300000
ocnaddsep paggregati on	2	2	4	4	1	1	12 (SEPP)/ retention. ms = 300000
ocnaddad apter	3	3	5	5	2	2	12 (MAIN)/ retention. ms = 300000
ocnaddkaf ka	4	4	32	32	4	4	-
zookeeper	1	1	3	3	3	3	-
ocnaddgui	0	0	0	0	0	0	-

SCP



SCP Traffic: 3K TPS in a centralized deployment having one worker group.

NRF

NRF Traffic: 1K TPS in a centralized deployment having one worker group.

SEPP

SEPP Traffic: 1K TPS in a centralized deployment having one worker group.

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 Worker Group	NA	5K MPS	16	Feed-1: 5 msec Feed-2: 4 msec	99.99%
NRF	2 - IGW/EGW (Request and Response)	1K MPS	16	NA	NA
SCP	2 (Request Ingress/ Request Egress)	3K MPS	16	NA	NA
SEPP	2 (PLMN IGW) (Request and Response)	1K MPS	16	NA	NA

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	54.764%	53.423%
ocnaddalarm	1	0.205%	60.424%
ocnaddconfiguration	1	0.214%	64.145%
ocnaddhealthmonitoring	1	0.275%	54.615%
kafka-broker	4	74.323%	59.958%
zookeeper	3	0.430052465%	53.955%
ocnaddnrfaggregation	1	40.833%	78.980%
ocnaddscpaggregation	1	60.754%	82.635%
ocnaddseppaggregation	1	44.205%	84.717%