# Load Profiling Clusters & Use-Cases

How can I know:

Does a Workload fit well into my Cluster?

## We know 4 optimization targets: Latency Throughput Durability Availability

Target	Cluster A									
Latency	High	Low								
Throughput	Low	High								
Durability	Low	High								
Availability	Low	High								

Target	Clus	Cluster B							
Latency	High	Low							
Throughput	Low	High							
Durability	Low	High							
Availability	Low	High							

Target	Use	Case 1
Latency	High	Low
Throughput	Low	High
Durability	Low	High
Availability	Low	High

## Collect values from Cluster / Use-Case description

Last Changes	21.3.2020			Reference:	This document is	based on the Confluent Performation	se//www.agowhfte	panier/white-pa	per/optir	mizing-your-ap	ache-kafka-de	oloyment						
Autor Version	Mirko Kämpf																	
Cluster Name :	2.0.1 < <name>&gt;</name>						Latency		0	Throughp	ut		Durability	)	0	Availabili	tu	0
			u	ow impo	tant is this antim	isation target? [0 5	The second second	5		Till Ougrip	3	- ·	Durability	5	ď	Availabili	1	_ ~
Cluster State :	<< DATE or VERSION >>			ow impor	tant is this optim	isation target? [U 5	J	5			3			5			1	
Apache Kafka Docs	property source	update mode	property name	valu	TOPIC- OVERWRITE- AVAILABLE	default value	relevancy	required action	DONE	relevancy	contributio	n DONE	relevancy	contribution	DONE	relevancy	contributio	n DONE
medium	David and a second	(a)	Harana and	1		0		-		×	2							
	Producer Producer/Topic/Broker	cluster-wird	linger.ms	2	<del></del>		x x	-			-							
		ciuster-wird	compression.type	_		producer				x	-							-
	Producer	•	acks batch.size	3		1 16384	x	-		X	-		x	-				-
	Producer Producer	-	buffer.memory	4 5		16384 33554432			+	X	-							+
	Broker Producer	•		6					+	x	-							-
	Producer	•	default.replication.factor	6		1 FALSE	-		+	-		-	X	-				-
			enable.idempotence max.in.flight.requests.per.connection	8		FALSE 5			+			+	x	-				+
low	Producer		max.in.nignt.requests.per.connection	0		5							X					
high	Consumer	-	fetch.min.bytes	9		1	x	-		x	-							
medium	Consumer	-	enable.auto.commit	10		TRUE							x	-				
medium	Consumer	-	isolation.level	11		read_uncommitted							x	-				
high	Consumer	-	session.timeout.ms	12		10000			-			-				x	-	
high	Streams	-:	StreamsConfig.TOPOLOGY_OPTIMIZATION	13		StreamsConfig.NO_OPTIMIZATION	×	-										
medium	Streams		StreamsConfig.REPLICATION_FACTOR_CONFIG	14		1							x	-				
medium	Streams		StreamsConfig.PROCESSING_GUARANTEE_CONFIG	15		StreamsConfig.AT_LEAST_ONCE							x	-				
high	Streams		StreamsConfig.NUM_STANDBY_REPLICAS_CONNFIG	16		0										×	-	
high	Streams	-	replication.factor	17		1							x	-		×	-	
high	Brokers	cluster-wide	num.replica.fetchers	18		1	×	-										
high	Brokers	-	default.replication.factor	19	x	1							×	-				
high	Topic	cluster-wide	min.insync.replicas	20		1							x	-		x	-	
high	Brokers	-	auto.create.topics.enable	21		TRUE							x	-				
	Brokers	-	unclean.leader.election.enable	22		FALSE							x	-		x	-	
	Brokers	-	broker.rack	23		null							x	2				
	Brokers	-	log.flush.interval.messages	24		large value=> OS-responsibility							х	-				
	Brokers	-	log.flush.interval.ms	25		large value=> OS-responsibility							х	-				
high	Brokers	cluster-wide	num.recovery.threads.per.data.dir	26	-	1										x		
	List of all Configuration Para	meters:																
	https://kafka.apache.org/doo																	
	List of proportion which con	be changed per Topic in Co	officent Cloud:									+						
		rrent/cloud/using/topics/top		-			-		+			+						
	nttps://docs.confluent.io/cu	mentycloud/using/topics/top	iics.iiuiii	-					+			+						-

# Specify importance of each aspect

Last Changes	21.3.2020			Reference:	This document is	based on the Confluent Performates	e/funing:white	enpėr/white-pap	er/optin	nizing-you <u>r-a</u>	pache-kafka <u>-de</u> r	oloyment						
Autor	Mirko Kämpf																	
Version	2.0.1																	
Cluster Name :	< <name>&gt;</name>						Latency	<b>.</b>	0	Through	out	0	Durability	7	0	Availabili	ty	0
Cluster State :	<< DATE or VERSION >>		Но	w important i	s this ontim	isation target? [0 5]		5			3			5			1	1
Cluster State :	<< DATE OF VERSION >>		TIC	w important i	s uns opum	isation target: [0 5]		3			3			,				
Apache Kafka Docs	property source	update mode	property name	value	TOPIC- OVERWRITE- AVAILABLE	default value	relevancy	required action	DONE	relevancy	contributio	n DONE	relevancy	contribution	DONE	relevancy	contributi	on DONE
	Producer		linger.ms	1	÷	0	x	-		x	-							_
	Producer/Topic/Broker	cluster-wird	compression.type	2		producer	X	-		x								_
	Producer		acks	3		1	X	-		x	-		X	-				-
	Producer	•	batch.size	4		16384			-	x								-
	Producer		buffer.memory	5		33554432			-	x	-							
	Broker		default.replication.factor	6		1			-			-	X	-				_
	Producer		enable.idempotence	7		FALSE			-			-	X	-				_
low	Producer		max.in.flight.requests.per.connection	8		5						+	X	-				
high	Consumer	-	fetch.min.bytes	9		1	x	-		x								
medium	Consumer		enable.auto.commit	10		TRUE							×	-				
medium	Consumer		isolation.level	11		read_uncommitted							×	-				
high	Consumer	-	session.timeout.ms	12		10000										×	-	
high :	Streams		StreamsConfig.TOPOLOGY_OPTIMIZATION	13		StreamsConfig.NO_OPTIMIZATION	x	-										
medium	Streams		StreamsConfig.REPLICATION_FACTOR_CONFIG	14		1							×	-				
medium	Streams		StreamsConfig.PROCESSING_GUARANTEE_CONFIG	15		StreamsConfig.AT_LEAST_ONCE							×	-				
high :	Streams		StreamsConfig.NUM_STANDBY_REPLICAS_CONNFIG	16		0										x	-	
high :	Streams		replication.factor	17		1							×	-		×		
high	Brokers	cluster-wide	num.replica.fetchers	18		1	x	-										
high	Brokers	-	default.replication.factor	19	x	1							x	-				
high	Topic	cluster-wide	min.insync.replicas	20	x	1							x	-		x	-	
high	Brokers	-	auto.create.topics.enable	21		TRUE							x	-				
hiigh	Brokers		unclean.leader.election.enable	22	x	FALSE							x	-		x	-	
medium	Brokers		broker.rack	23		null							x	-				
medium	Brokers		log.flush.interval.messages	24	x	large value=> OS-responsibility							x	-				
medium	Brokers		log.flush.interval.ms	25	x	large value=> OS-responsibility							x	-				
high	Brokers	cluster-wide	num.recovery.threads.per.data.dir	26	-	1										x	-	
												+						
	List of all Configuration Parar																	
	https://kafka.apache.org/doc	umentation/#configuration																
	List of properties which can	he changed ner Tonic in Con	fluent Cloud:									+						
	https://docs.confluent.io/cu						_		-			+						-
	nttps://docs.com/dent.lo/cu	remycloud/using/topics/topi	CSATORII						-			+						-
		V																

#### For each aspect check out recommendations ...

(1) Here is what you have configured / defined:

				L		
		Latency				
checked	property source	property name	default	configured	recommended	delta / action
	Producer	linger.ms	0	1	0	( <u>4</u> )
	Producer	compression.type	none	2	none	
	Producer	acks	1	3	1	121
	Consumer	fetch.min.bytes	1	9	1	
	Streams	StreamsConfig.TOPOLOGY_OPTIMIZATION	StreamsConfig.NO_OPTIMIZATION	13	OPTIMIZE	141
	Brokers	num.replica.fetchers	1	18	increase if followers can't keep up with leader	
-						
						7

(2) Here is what Confluent recommends:

(3) Please note, what you plan to do with each property here:

### Conflicts are visible on the main page:

	L							Throughput		Durability		0	Availability		0	
Ho		5			3			5			1					
property name	value	TOPIC- OVERWRITE- AVAILABLE	default value	relevancy	required action	DONE	relevano	required y action	DONE	relevancy	required action	DONE	relevancy	required action	DONE	
linger.ms	500		0	х	0		х	100								

In each phase of the procedure you have a clear focus on one thing at a time!

You can get a clear overview per cluster.

This procedure can be applied per cluster and per use-case.

>>> The **priorities** help you to decide where to go >>>

## **Quantitative Support for Decision Makers:**

Cluster - Workload	l - Pr	ofile Mate	hing										
			8										
		Target		Cluster A		Weight	Available	Delta	Delta^2	MSE	Unexpected	Missing Aspects	Absolut Delta
		Latency	High		Low	5	0	0	0		3	-11	-8
		Throughput	Low		High	2	6	-9	81				
		Durability	Low		High	5	5	3	9				
		Availability	Low		High	3	6	-2	4				
										23.5			
		Target		Cluster B		Weight	Available	Delta	Delta^2	MSE	Unexpected	Missing Aspects	Absolut Delta
		Latency	High		Low	1	0	0	0		3	-2	1
		Throughput	Low		High	6	18	3	9				
		Durability	Low		High	0	0	-2	4				
		Availability	Low		High	4	8	0	0				
										3.25			
		Target		Use Case 1		Contribution	Expected						
Unimportant Aspect	0	Latency	High		Low	1	0						
Dominant Aspect	3	Throughput	Low		High	5	15						
	1	Durability	Low		High	2	2						
	2	Availability	Low		High	4	8						