



OPENWORKS

BE UNSTOPPABLE



OPENWORKS

ZEP'S XPAND JOURNEY TO REDUCE HIDDEN COSTS

BYUNGKEE HONG, PLATFORM TEAM LEADER, SUPERCAT

MISSION

Connecting Through Games

SUPERCAT values making connections through games. We believe that games connect people to each other, connect the past to the present, and connect individual experiences to the experiences of others.

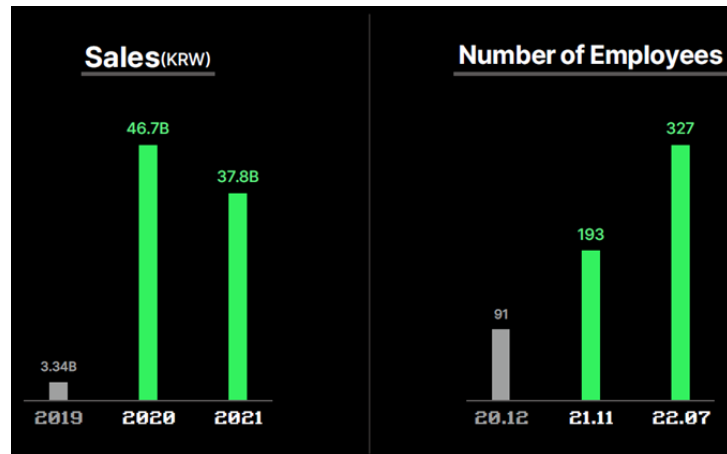
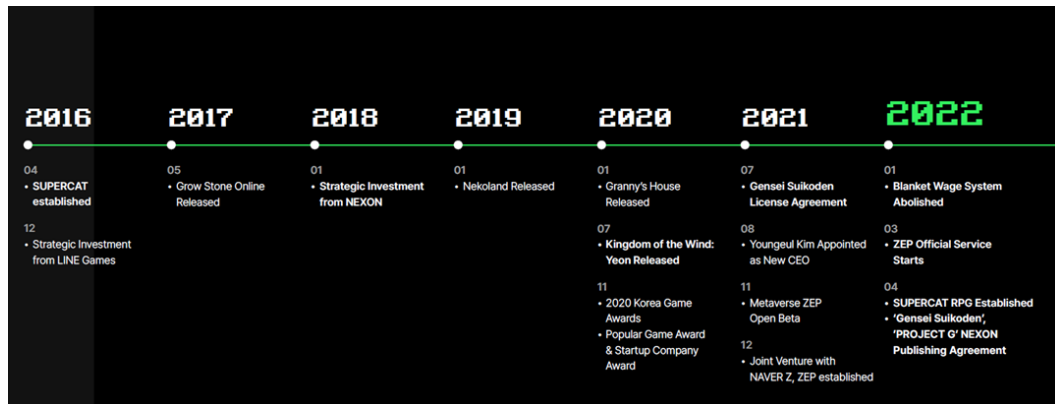
Each member of SUPERCAT considers the value of these connections as they create games. We reimagine the games we loved in the past for mobile platforms, bringing their fun into the present to create new experiences.

This is what SUPERCAT does best.

SUPERCAT



HISTORY

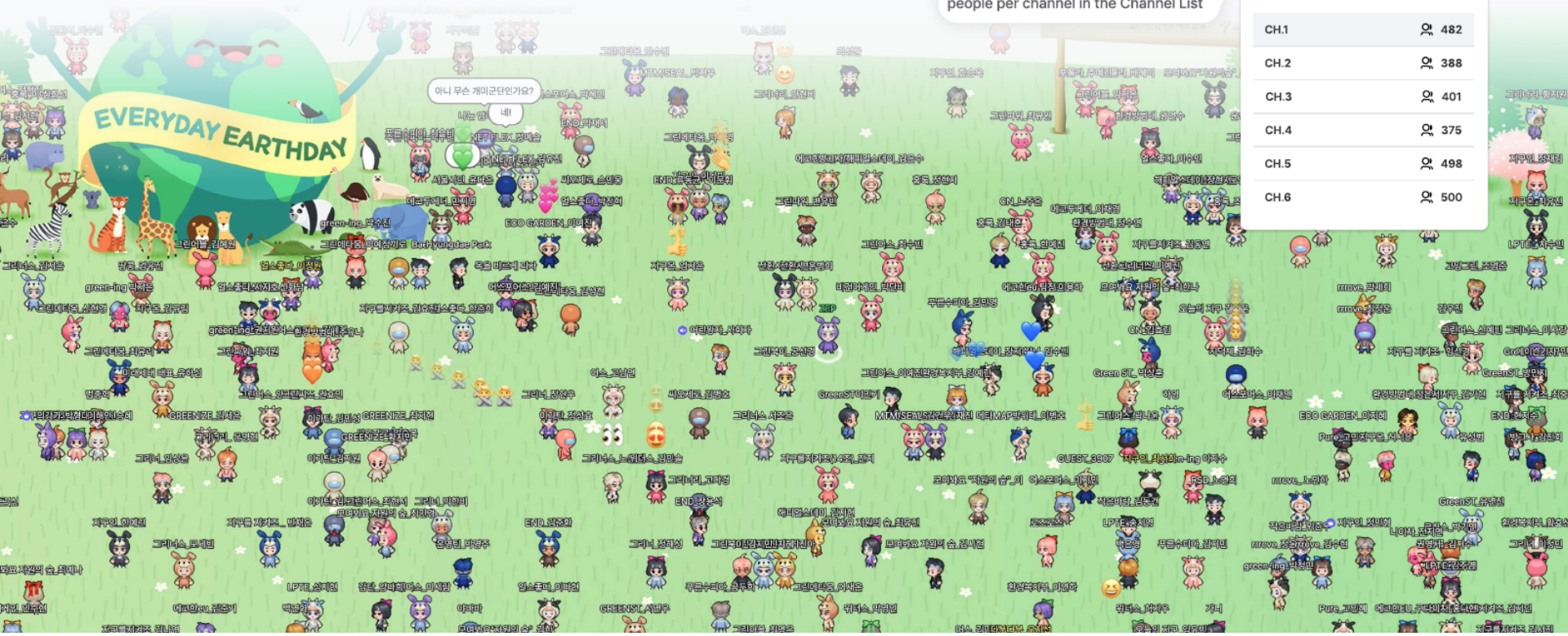


A Light, but Not Light Metaverse

Maximum Web-Based Simultaneous Access

We already have use cases in which thousands of users have stably conducted events at the same time. Stable simultaneous access is possible thanks to our 500-person channeling structure.

*2022.04.22 Seoul Earth Day Event



You can check and set the number of people per channel in the Channel List

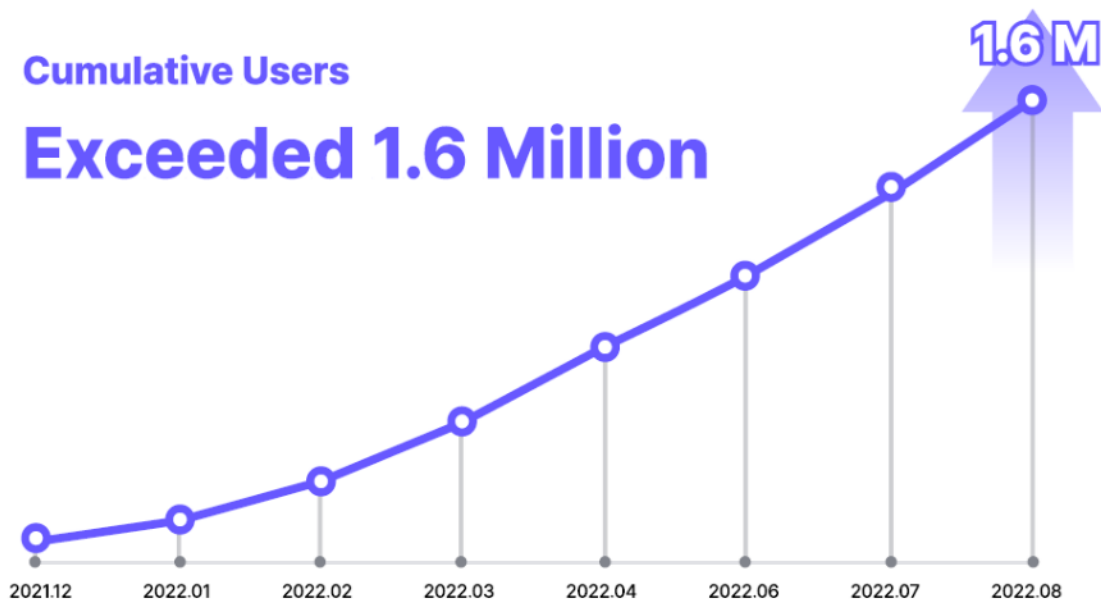
Channel List		✕
CH.1	482	
CH.2	388	
CH.3	401	
CH.4	375	
CH.5	498	
CH.6	500	

Here Is Our Performance Over the Past 8 Months

After the beta release in December 2021, the official release was carried out in March and the index rose rapidly.
Various use cases have been positively introduced in the press and have attracted a lot of attention.

Cumulative Users

Exceeded 1.6 Million



The Media Took Notice of ZEP

메타버스 ZEP, 6개월 만에 사용자 100만 · 공간 장어 1100만회 돌파
ZEP(대표: 김관태)이 내놓은 메타버스 플랫폼이 6개월 만에 사용자 100만명, 스페이스 총매수 1100만회, 스페이스 11만개를 돌파하는 쾌거를 달성했다. ZEP은 MMORPG '바람의나라'는...

메타버스 플랫폼 ZEP, 누적 사용자 100만 명 돌파 기념행사 2022.06.10.
ZEP, 누적 사용자 100만명 돌파... 웹 스토... 혁신포츠뉴스 2022.06.10. 네이버뉴스
제대로 몰고 나가... 'ZEP' 누적 사용자... 한국경제TV 2022.06.10. 네이버뉴스
메타버스 플랫폼 ZEP, 6개월 간 누적 이용... 마이뉴스24 2022.06.10. 네이버뉴스
관련뉴스 14건 전체보기 >



[카드뉴스] 네이버 신우기, 메타버스 'ZEP' 연내세 100만명 모은 비결은?
메타버스 플랫폼 ZEP(웹)이 크립과 제네트릭이 이끈 차세대 글로벌 유니콘(21집)까지 1.5 이상의 배당장기)으로 도약을 꿈꾸고 있다. ZEP은 네이퍼제트와 '바람의나라' 연을 개발한 게임...



크립·제네트릭 잇는다...네이버 최수연의 신우기 'ZEP'
리안은 메타버스 플랫폼 ZEP을 활용해 사내 AI 교육 과정 '시 부스트'도 만들었다. (사건-리 안 처음 메타버스 플랫폼 ZEP(웹)이 크립과 제네트릭이 이끈 차세대 글로벌 유니콘(21집)까지 1...



네이버, 조인트벤처 '웹' 주목...메타버스 사업 본격화-하나금융투
조인트벤처 '웹'(ZEP)에 관심을 가질 필요가 있다며 투자이전 '매수'와 목표주가 650만원을 유 지했다. 용이지... 온 연구원은 또 '네이퍼제트'는 게임 개발 업체인 슈퍼넷과 '웹'을 설립했다...



네이버, 신규 메타버스 '웹' 연내 사업 시작... 마이뉴스24 2021.12.03. 네이버뉴스

Here Is Our **Performance** Over the **Past 8 Months**

High performance was achieved in these key service indicators, which proves ZEP's high level of accessibility and low barrier to entry.

Cumulative Participation in Spaces*

23 Million Times

*Space : a metaverse area created in ZEP

Created Metaverse Spaces

230,000+



Recent MAU (Monthly Active Users)

500,000

Users



Average User Access Time

19 Minutes



Open Chatting

44,000,000 +



Video Chatting

1,700,000+



BYUNGKEE HONG

- Presently serving as the Platform Team Leader at Supercat, I also work as the DBA for ZEP (zep.us), managing a variety of data-related tasks. I am also actively involved as the representative administrator of the "MariaDB Korean User Group" community.
Current : Supercat Platform Team Leader
Former : Awesomepiece Platform Team Leader & DBA

MariaDB Korea user community
<https://www.facebook.com/groups/mariadbkorea/>



BYUNGKEE HONG

- With extensive experience in MariaDB & MySQL database administration, I have successfully managed high-capacity services and optimized live game databases serving tens of millions of users in recent years.

Skill :

Game DBA (MySQL & MariaDB Xpand)

- Core DBA skillset includes
- 10+ years of experience in Python programming
- LinkedIn <https://www.linkedin.com/in/byungkeehong/>



WE'RE USING XPAND

1. Hard to predict how many concurrent users
2. Sharding is expensive to develop and difficult to maintain



XPAND

DB PERFORMANCE TUNING

1. Configuration Tuning
2. Index & Query Tuning
3. Server Scale-up
4. Sharding

DB PERFORMANCE TUNING

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SHARDING

GamePlayer		

GameLog	

GamePlayer		

GamePlayer		

GamePlayer		

SHARDING



Amazon Aurora

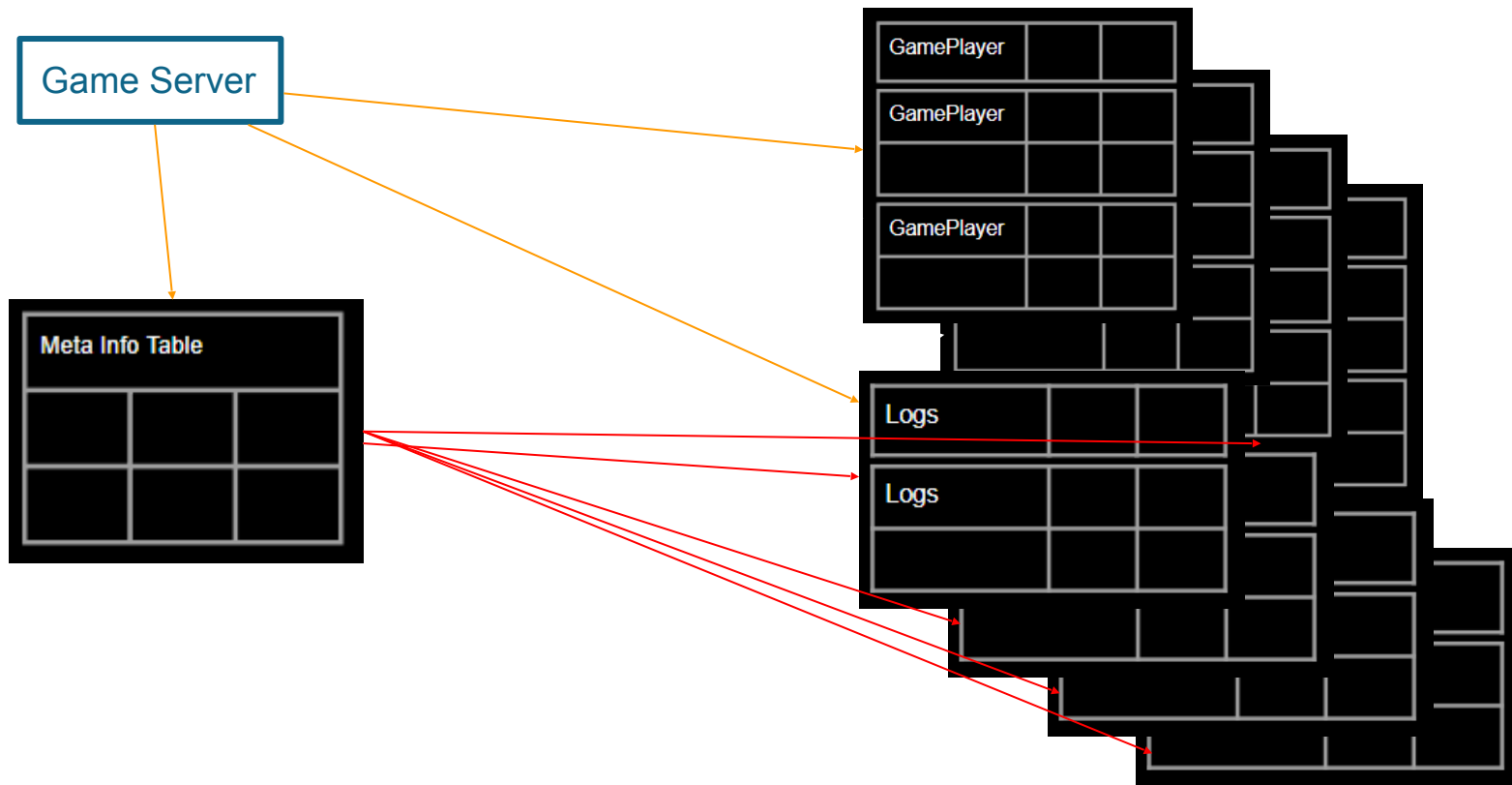


MariaDB



MySQL®

SHARDING



SHARDING HIDDEN COST WITH PROGRAMMER

1. Programming Complexity
2. Manage a large number of shard
3. Important consider access pattern

+ 10%~15%



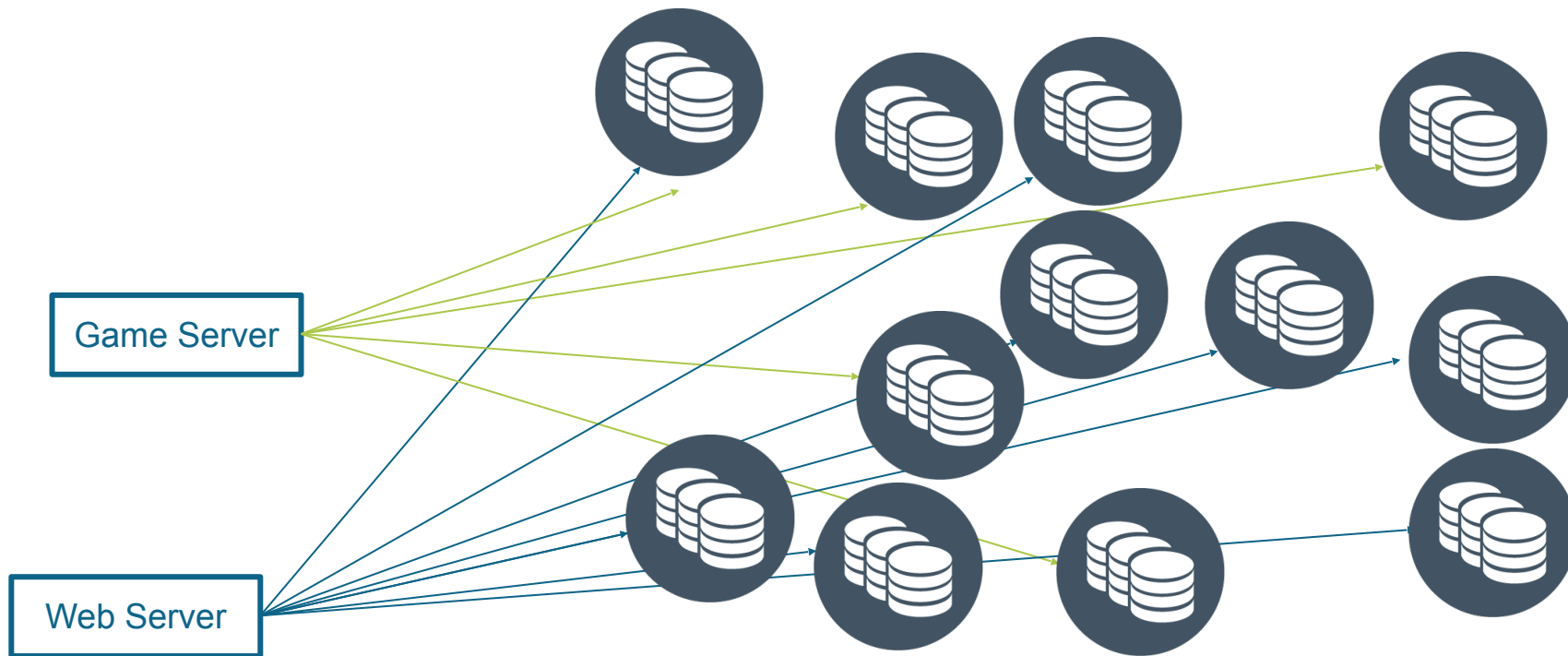
Average annual salary for server developers in US ?



The average annual salary for server developers in the United States is approximately \$91,000 to \$129,000, depending on various factors such as location, experience, and company size. However, individual circumstances and job requirements can affect the actual salary.



PROBLEMS WITH SHARDING - ENDPOINT



SHARDING HIDDEN COST WITH DBA

1. DBA must understand sharding strategy
2. Hard to find skilled DBAs
3. More difficult to recover data and reporting

+ 20%~25%



SHARDING HIDDEN COST WITH INFRA ENGINEER

More servers more management points



+ 15%~20%

RECAP HIDDEN COST

1. Increase Programming Cost = **Over 10~15%**
2. Increase DBA Cost = **Over 20~25%**
3. Increase Infra Cost = **Over 15~20%**

About 40%

XPAND

So I decided to use Xpand DB to reduce this hidden cost by **about 40%**.

AURORADB VS XPAND COST SIMULATION

	A	B	C	D	E	F	G	H	I	K	M
1		Seoul Region									
2	no.	title	instance	count	GB	peaktime/ month	avg IO	max IO	IO(avg/ max)	cost	saving ratio
3		XPAND - i4i.2xlarge(8CPU/ 64GB)	\$564.18	3	1875(internal)		5000	100000		\$4,191.54	
4		XPAND - i4i.2xlarge(8CPU/ 64GB)	\$564.18	4	1875(internal)		5000	120000		\$5,588.72	
5		XPAND - i4i.2xlarge(8CPU/ 64GB)	\$564.18	5	1875(internal)		5000	140000		\$6,985.90	
6		XPAND - i4i.2xlarge(8CPU/ 64GB)	\$564.18	6	1875(internal)		5000	160000		\$8,383.08	
7	no.	title	instance	count	GB	peaktime/ month	avg IO	max IO	IO(avg/ max)	cost	saving ratio
8	1	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	3	1000	240 hours(daily 8 hours)	1250	5000	1) 1250/ 5000	\$4,745.43	11.67%
9	2	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	3	1000	240 hours(daily 8 hours)	2500	10000	2) 2500/ 10000	\$6,311.43	33.59%
10	3	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	3	1000	240 hours(daily 8 hours)	5000	20000	3) 5000/ 20000	\$9,443.43	55.61%
11	4	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	3	1000	240 hours(daily 8 hours)	7500	30000	4) 7500/ 30000	\$12,575.43	66.67%
12	5	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	3	1000	240 hours(daily 8 hours)	10000	40000	5) 10000/ 40000	\$15,707.43	73.31%
13	6	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	4	1000	240 hours(daily 8 hours)	12500	50000	6) 12500/ 50000	\$19,859.24	71.86%
14	7	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	4	1000	240 hours(daily 8 hours)	15000	60000	7) 15000/ 60000	\$22,991.24	75.69%
15	8	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	4	1000	240 hours(daily 8 hours)	17500	70000	8) 17500/ 70000	\$26,123.24	78.61%
16	9	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	5	1000	240 hours(daily 8 hours)	20000	80000	9) 20000/ 80000	\$30,275.05	76.93%
17	10	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	5	1000	240 hours(daily 8 hours)	22500	90000	10) 22500/ 90000	\$33,407.05	79.09%
18	11	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	5	1000	240 hours(daily 8 hours)	25000	100000	11) 25000/ 100000	\$36,539.05	80.88%
19	12	db.r6g.2xlarge(8CPU/ 64GB)	\$ -	6	1000	240 hours(daily 8 hours)	27500	110000	12) 27500/ 110000	\$40,690.56	79.40%
20											
21											



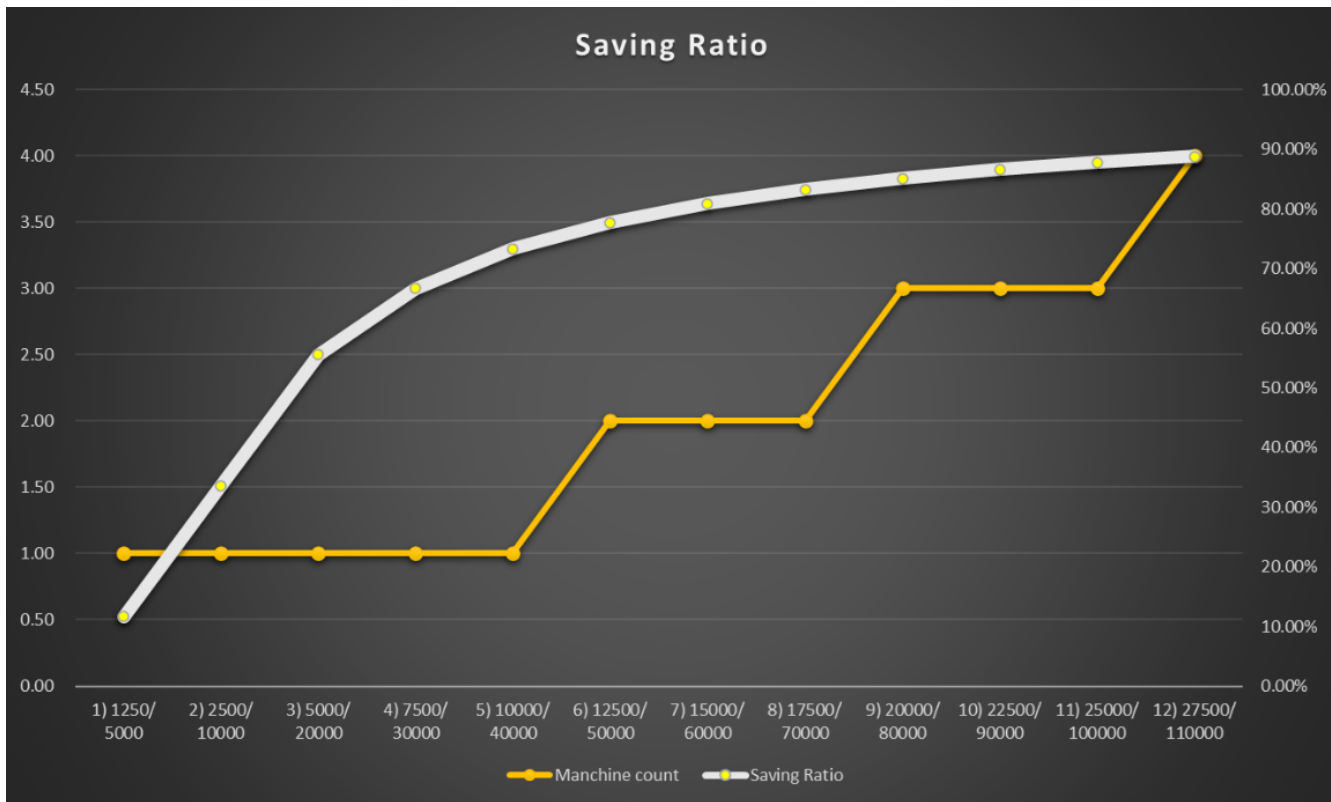
AURORADB VS XPAND COST SIMULATION

IO(avg/ max)	Saving Ratio	Manchine count
1) 1250/ 5000	11.67%	1
2) 2500/ 10000	33.59%	1
3) 5000/ 20000	55.61%	1
4) 7500/ 30000	66.67%	1
5) 10000/ 40000	73.31%	1
6) 12500/ 50000	77.75%	2
7) 15000/ 60000	80.92%	2
8) 17500/ 70000	83.30%	2
9) 20000/ 80000	85.16%	3
10) 22500/ 90000	86.64%	3
11) 25000/ 100000	87.85%	3
12) 27500/ 110000	88.86%	4

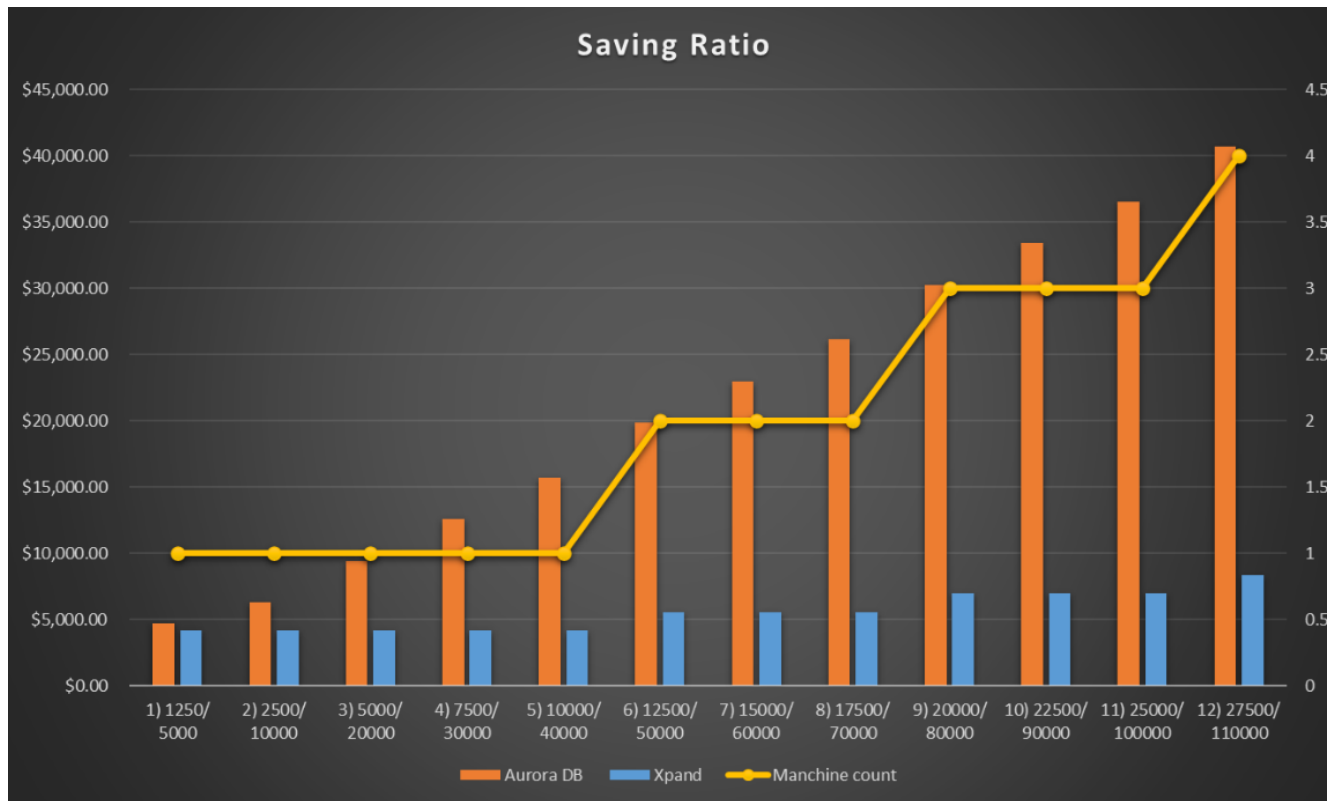
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AURORADB VS XPAND COST SIMULATION



AURORADB VS XPAND COST SIMULATION



WISE INVESTMENT

A wise investment may save you much, in cost and trouble.

XPAND EXPERIENCE - I3EN.2XLARGE -> I4I.2XLARGE

i3en.2xlarge (2019)

	Instance name ▾	vCPUs ▾
<input type="radio"/>	i3en.large	2
<input type="radio"/>	i3en.xlarge	4
<input checked="" type="radio"/>	i3en.2xlarge	8
<input type="radio"/>	i3en.3xlarge	12
<input type="radio"/>	i3en.6xlarge	24
<input type="radio"/>	i3en.12xlarge	48
<input type="radio"/>	i3en.metal	96
<input type="radio"/>	i3en.24xlarge	96

Total Upfront cost: 0.00 USD
Total Monthly cost: 776.72 USD

[Show Details ▾](#)

I4I.2xlarge (2022)

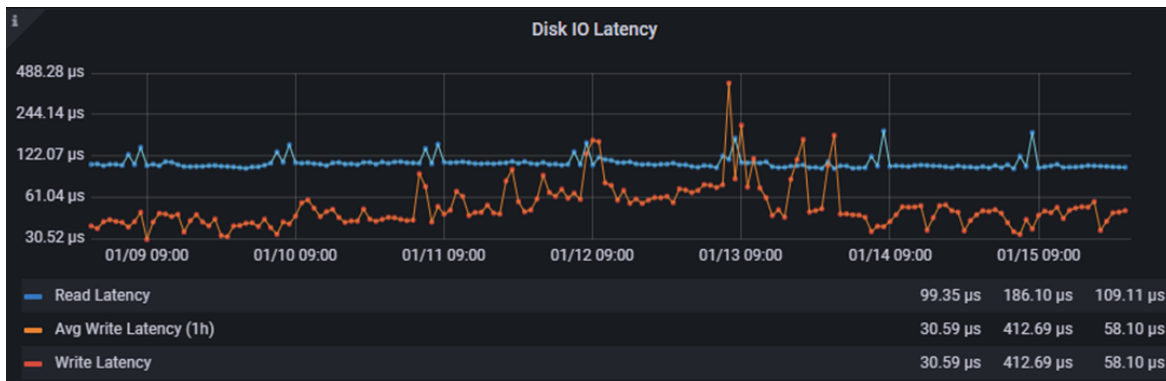
	Instance name ▾	vCPUs ▾
<input type="radio"/>	i4i.large	2
<input type="radio"/>	i4i.xlarge	4
<input checked="" type="radio"/>	i4i.2xlarge	8
<input type="radio"/>	i4i.4xlarge	16
<input type="radio"/>	i4i.8xlarge	32
<input type="radio"/>	i4i.16xlarge	64
<input type="radio"/>	i4i.metal	128
<input type="radio"/>	i4i.32xlarge	128

Total Upfront cost: 0.00 USD
Total Monthly cost: 587.65 USD

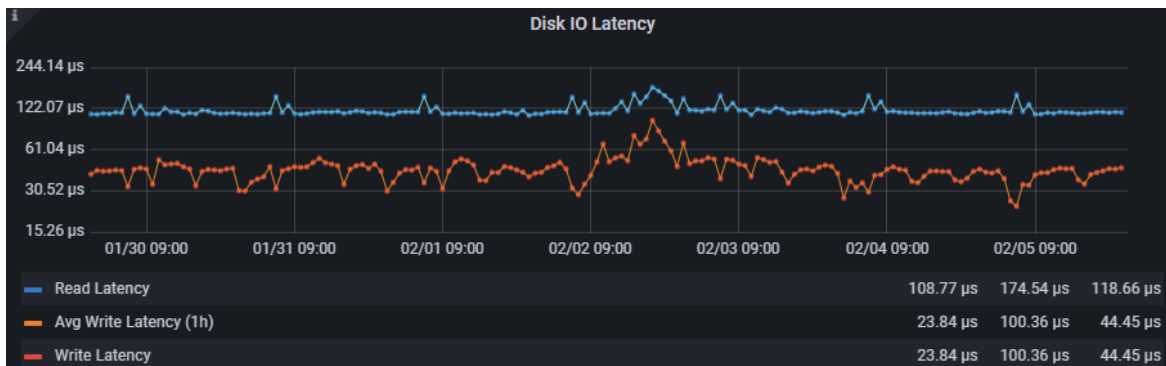
[Show Details ▾](#)



XPAND EXPERIENCE - I3EN.2XLARGE -> I4I.2XLARGE

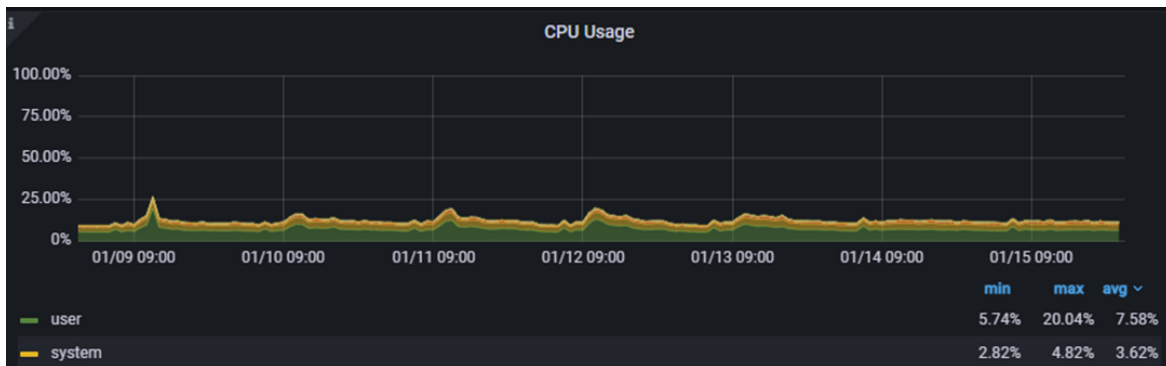


i3en.2xlarge

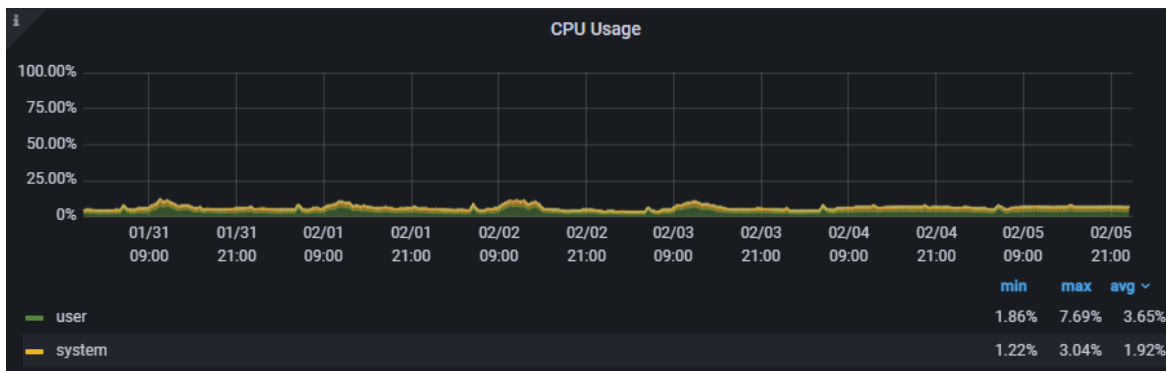


i4i.2xlarge

XPAND EXPERIENCE - I3EN.2XLARGE -> I4I.2XLARGE



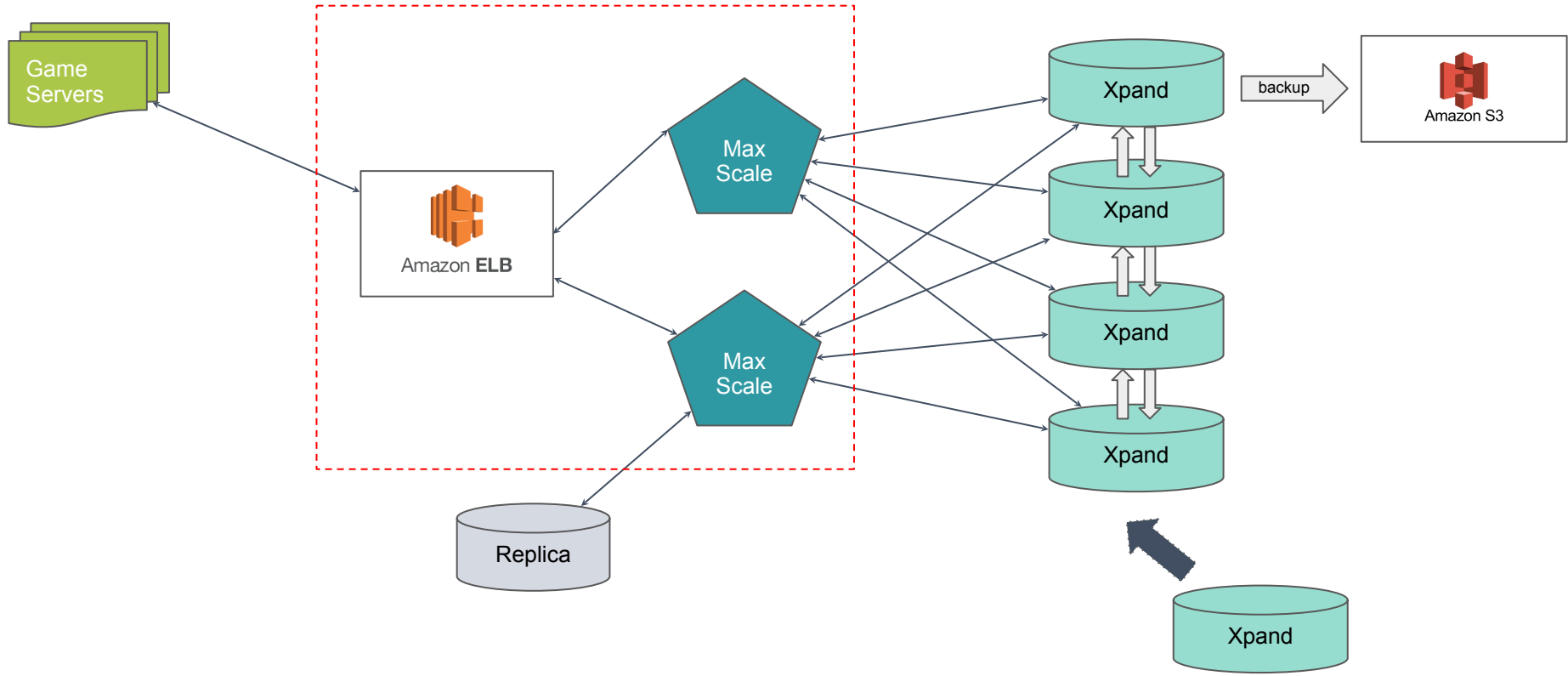
i3en.2xlarge



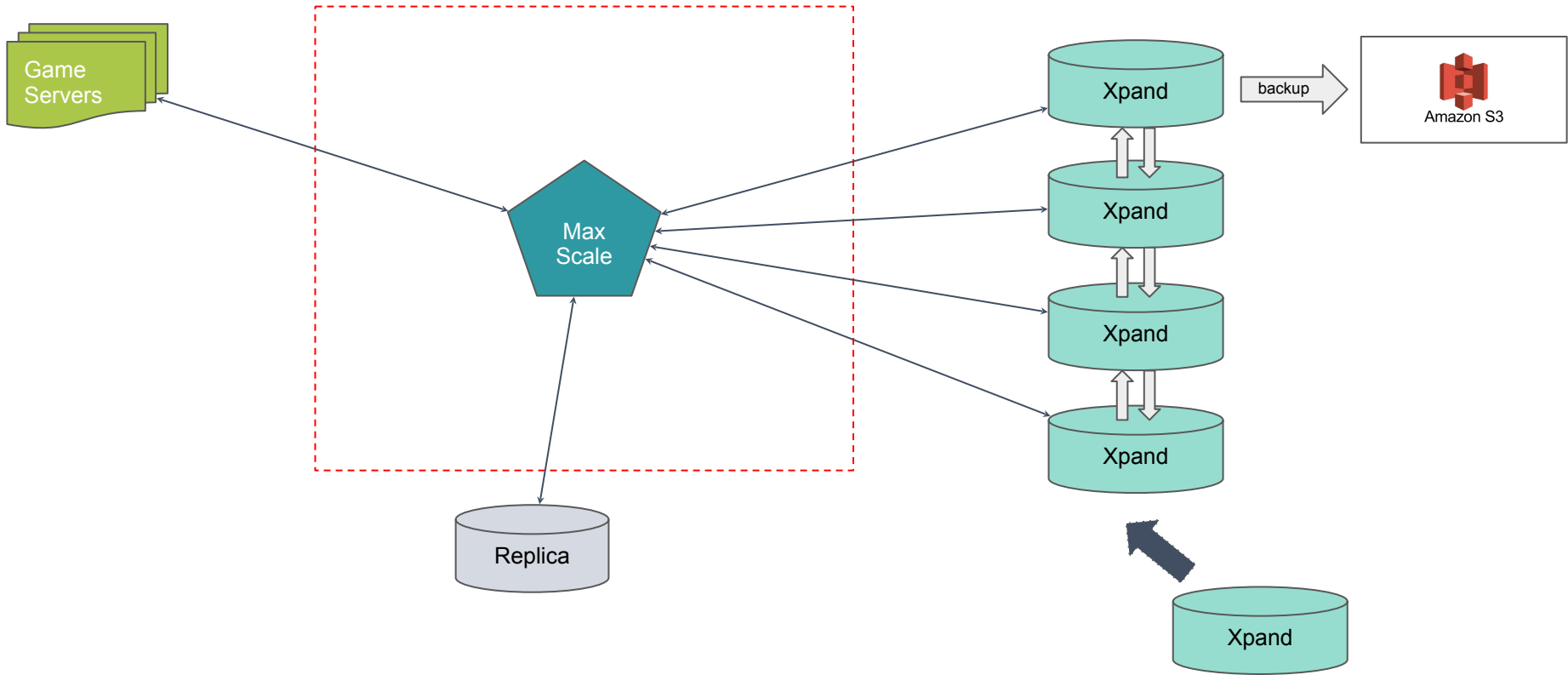
i4i.2xlarge



XPAND EXPERIENCE - TOPOLOGY



XPAND EXPERIENCE - TOPOLOGY



XPAND PERFORMANCE

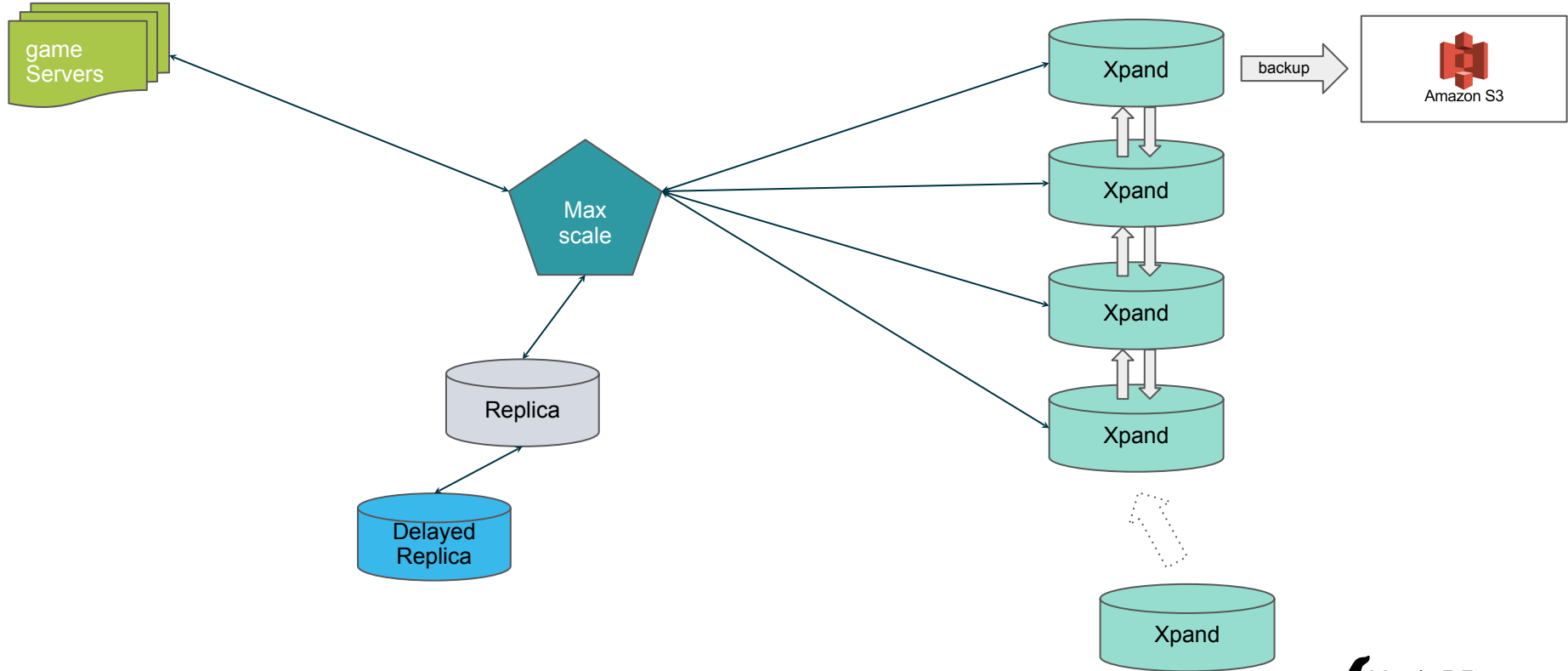
d	Hostname	Status	IP Address	TPS	Used	Total
1	stage2-zep-db-xpand01	OK	10.200.0.111	36964	282.6G (21.7%)	1.3T
2	stage2-zep-db-xpand03	OK	10.200.0.113	24567	282.6G (21.7%)	1.3T
3	stage2-zep-db-xpand02	OK	10.200.0.112	32930	282.6G (21.7%)	1.3T
				94461	847.8G (21.7%)	3.8T

14i.2xlarge x 3ea

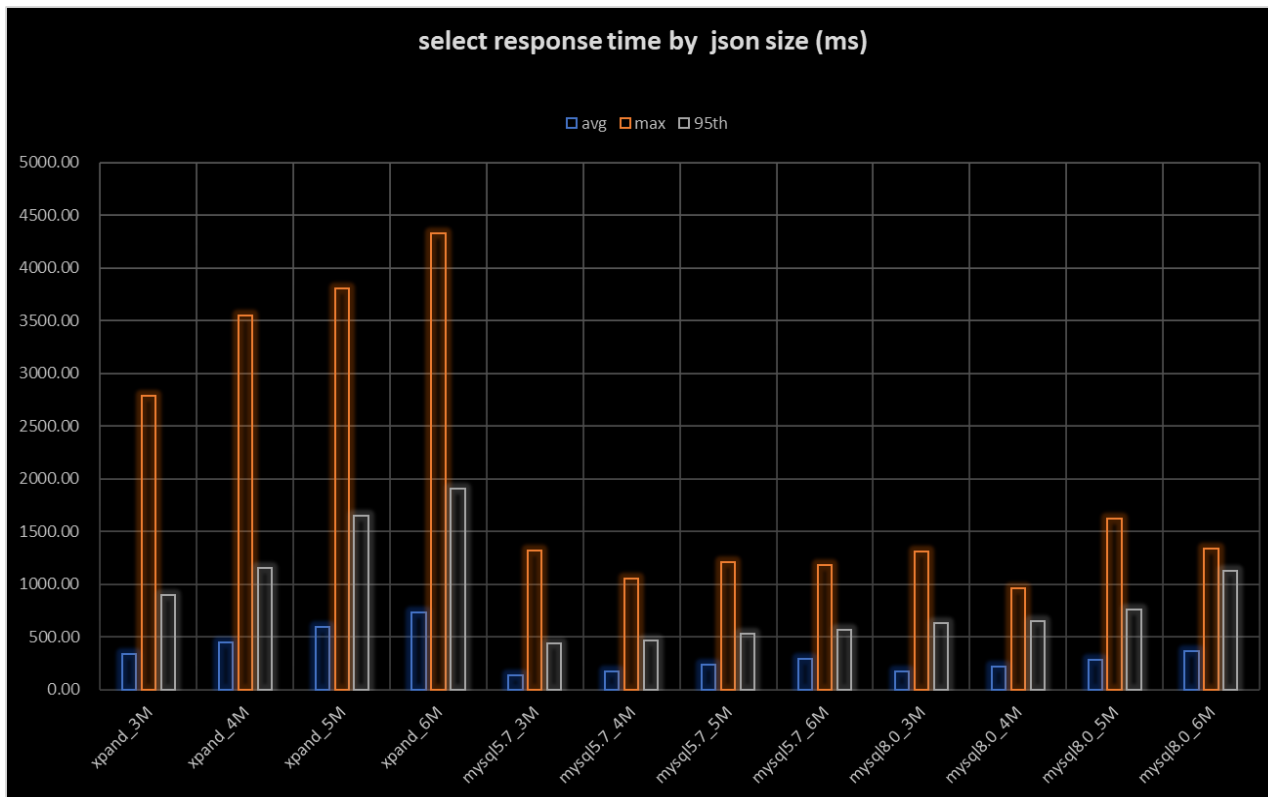
Concurrent bot : about 206,015



AURORADB HAS FAST POINT-IN-TIME RECOVERY, HOW DID XPAND OVERCOME IT ?




XPAND EXPERIENCE - JSON COLUMN SLOW



XPAND EXPERIENCE – MARIADB SUPPORT

Join us for OpenWorks NYC, May 9-10, 2023



Home > My Lists

Search Q

My Lists

- All Cases
- Action Needed
- My Cases

All Cases

🔍 All

Number	Short description	Product	Account	Requestor	Priority	State	Reason	U
CS0547495	query.log	MariaDB Xpand	supercat	병기홍	4 - Low	Waiting	Waiting on Customer	2 1
CS0521937	i3en.2xlarge to i4i.2xlarge	MariaDB Xpand	supercat	병기홍	3 - Moderate	Closed		2 2
CS0523479	Group change during GTM operation: group change in progress, try restarting transaction	MariaDB Xpand	supercat	병기홍	3 - Moderate	Waiting	Waiting on Bug Fix	2 2
CS0522020	log-slave-updates option?	MariaDB Xpand	supercat	병기홍	3 - Moderate	Closed		2 0
CS0483610	It's simple, but the query is slow.	MariaDB Xpand	supercat	병기홍	3 - Moderate	Closed		2 1
CS0441856	Memory	MariaDB Xpand	supercat	병기홍	3 - Moderate	Closed		2 1
CS0431161	Large table add column	MariaDB Xpand	supercat	병기홍	3 - Moderate	Closed		2 1
CS0409046	Xpand connection problem	MariaDB Xpand	supercat	병기홍	2 - High	Resolved		2 1



THANK YOU



OPENWORKS

BE UNSTOPPABLE