Capacity Planning with Stress Testing

Zhao Cheng, MOGU Inc.

forrest.zhaoc@gmail.com
@forrest_zhao

About Me

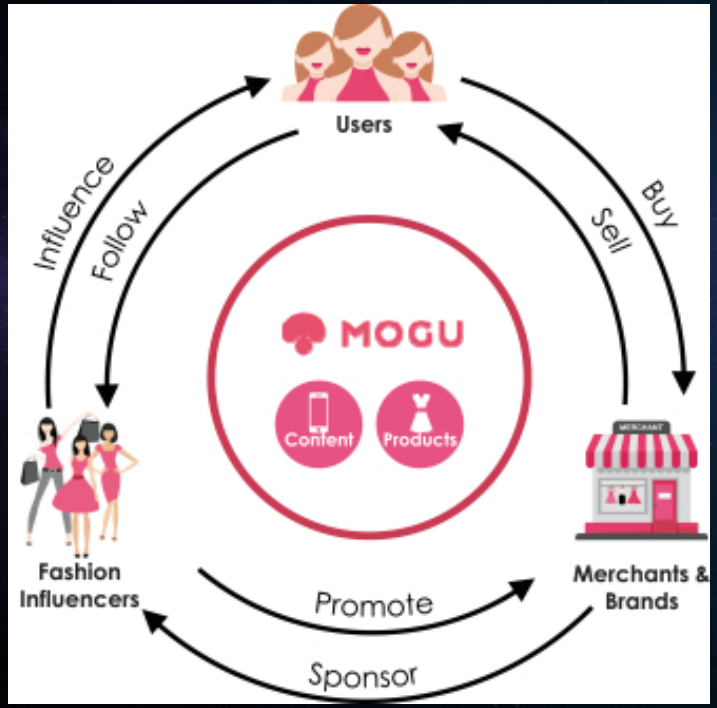


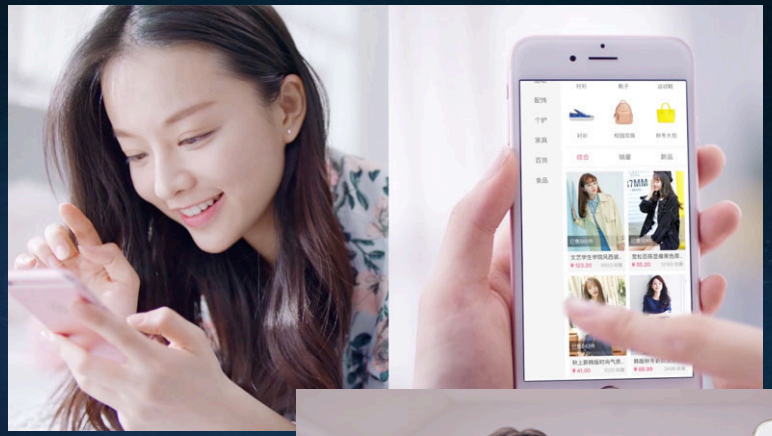
Zhao Cheng

Tech Lead, SRE

- Joined MOGU in January 2015
- Senior SWE in HUAWEI 7 Years
- Columnist & Speaker of InfoQ China
- Tencent Cloud Valuable Professional

About MOGU Inc.







Shopping Carnivals

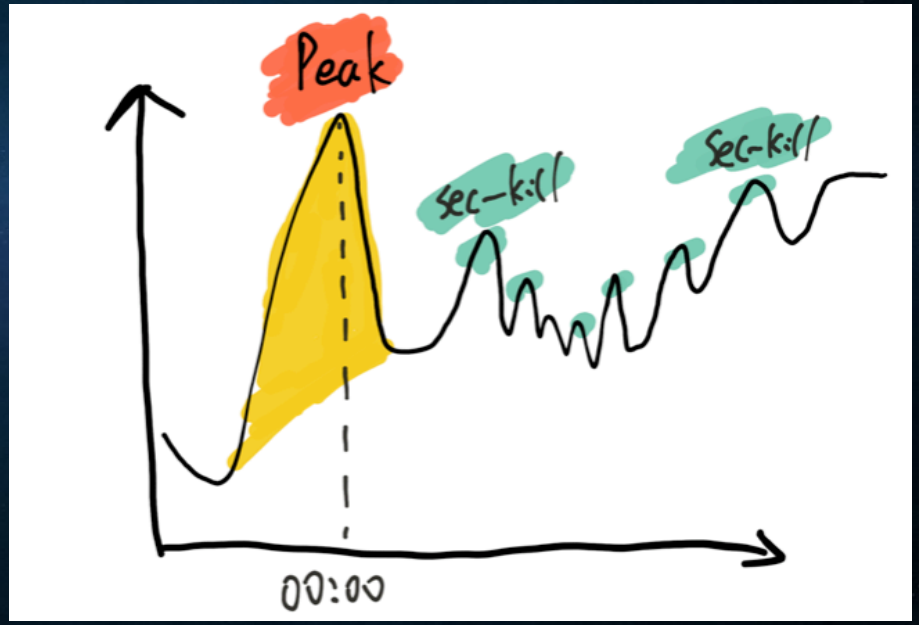
Single's Day 11.11

12.12

6.18

Valentine's Day 2.14

.....



The Key Steps of Capacity Planning

- Estimation of Business Model
- Analyzation of Critical Path
- Simulation of Traffic Load

User and System Behaviors

Users

Snaping Up Products

System

Creating Orders

The Most Key Process of Estimation

Estimation of Peak TPS of Order Creation at 0.

Derivation of Peak Order Creation Amount

Known

- GMV
- UV
- Conversion Rates
- Per Cust Trans
- Historical Data
- ……

Derive

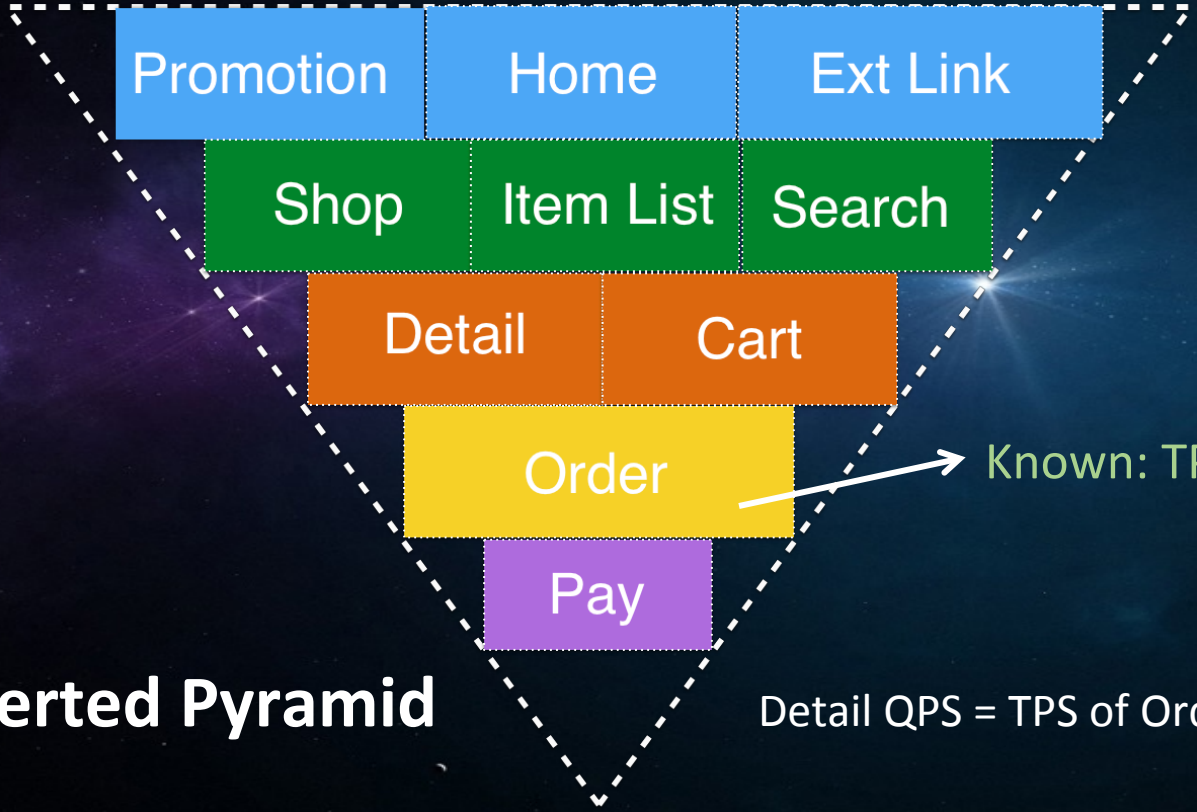
Unknown

- QPS
- TPS
- Sessions
- ……

$$POCA = \frac{\text{Objective GMV}}{\text{Historical GMV}} \times \frac{\text{Per Cust Trans}}{\text{Historical Per Cust Trans}} \times \text{Historical POCA}$$

Peak TPS = POCA × Called Times of Order APIs

Estimation of Business Model

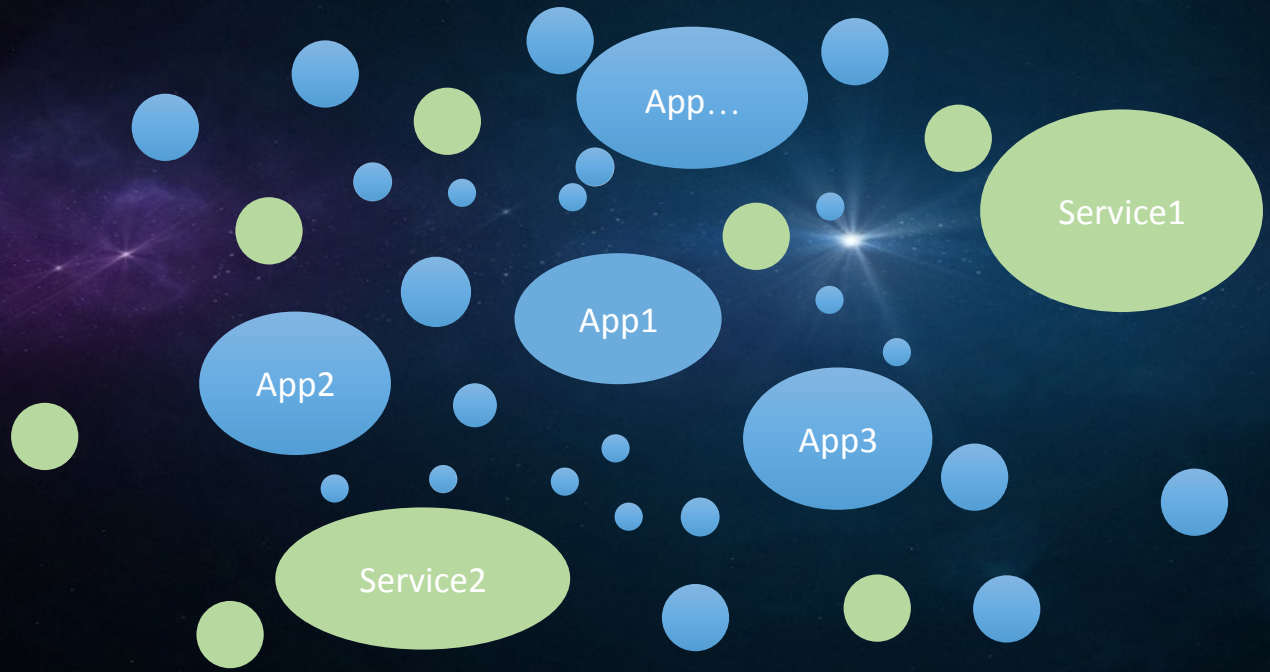


Known: TPS of Order Creation

Inverted Pyramid

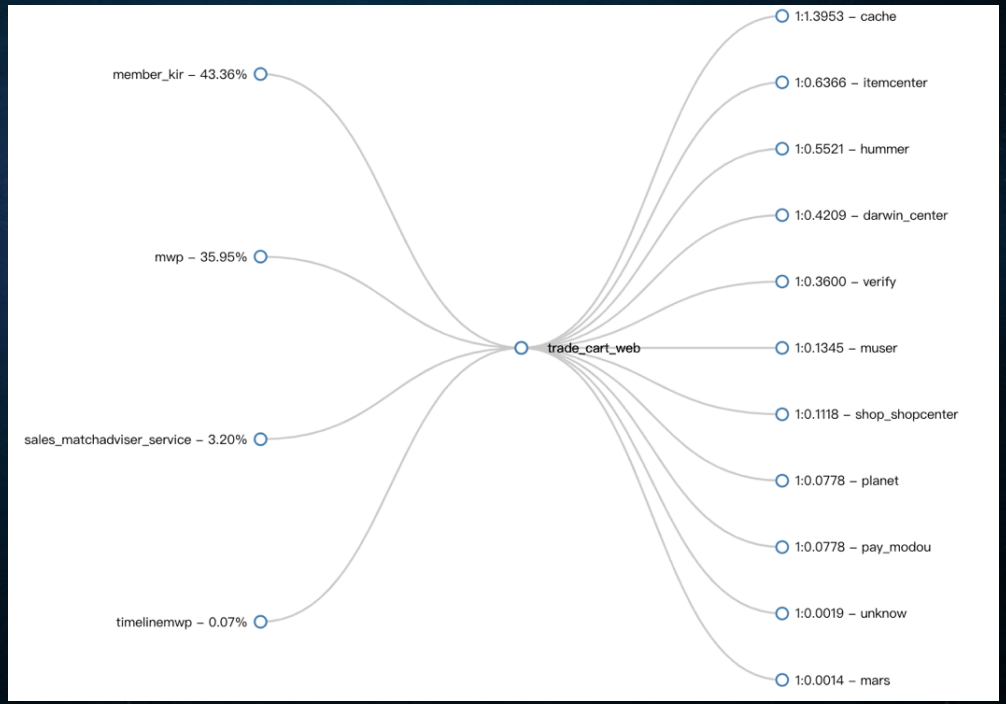
Detail QPS = TPS of Order × (1+conversion rate)

1K+ Distributed Java Apps and Services

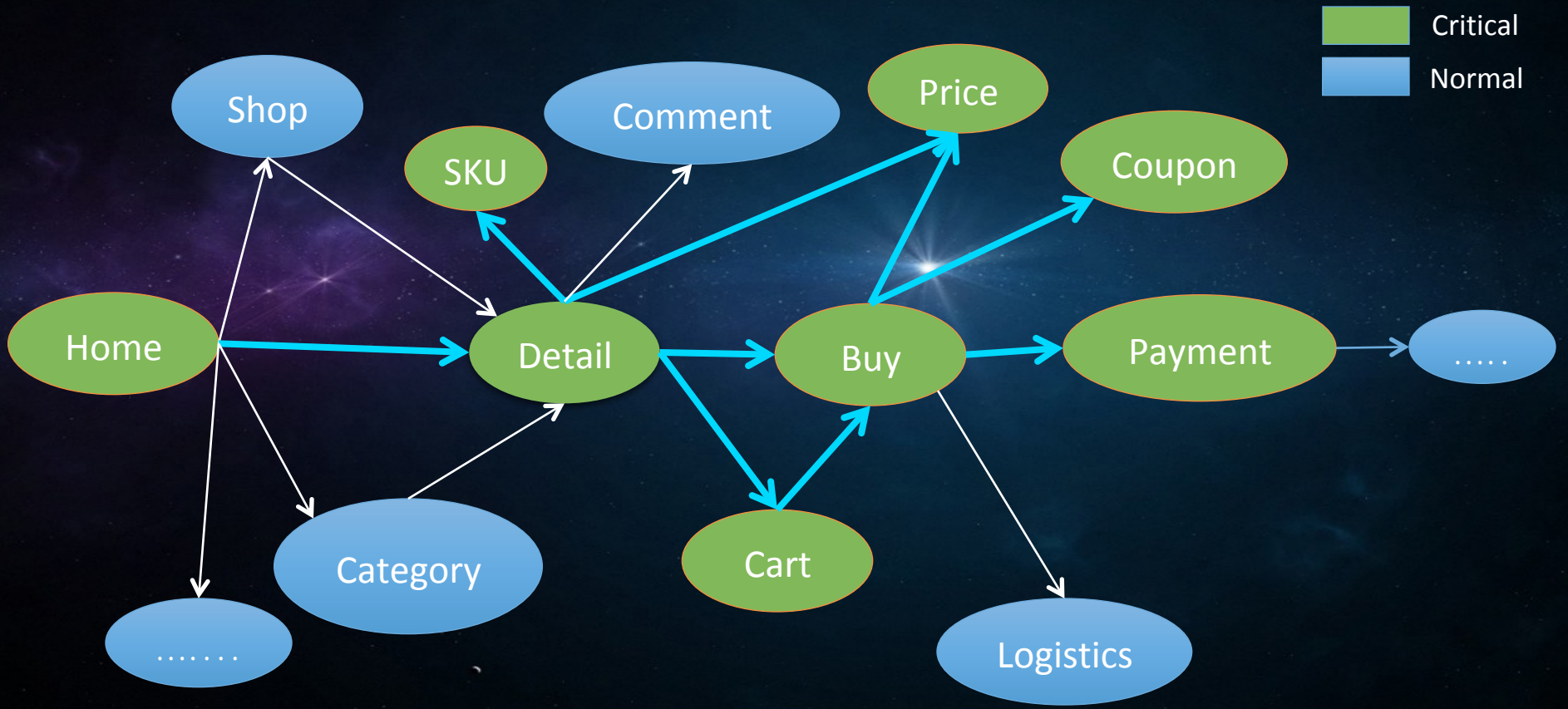


Strong and Weak Dependencies

- Application Level
- Service Level
- API Level



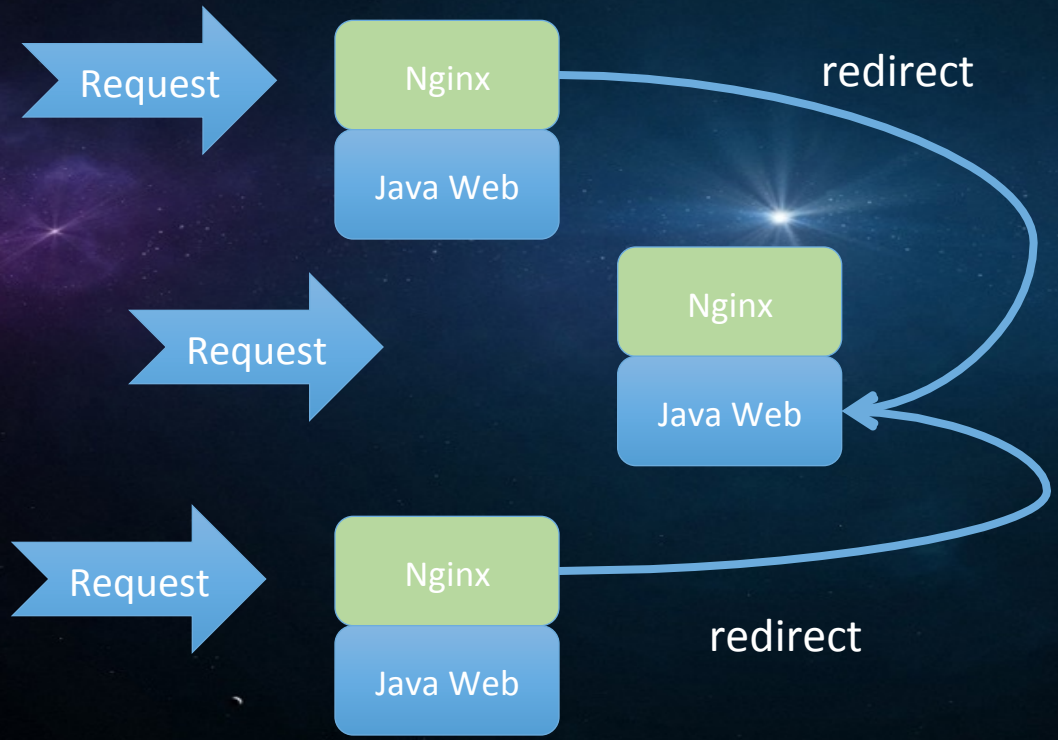
Critical Transaction Path



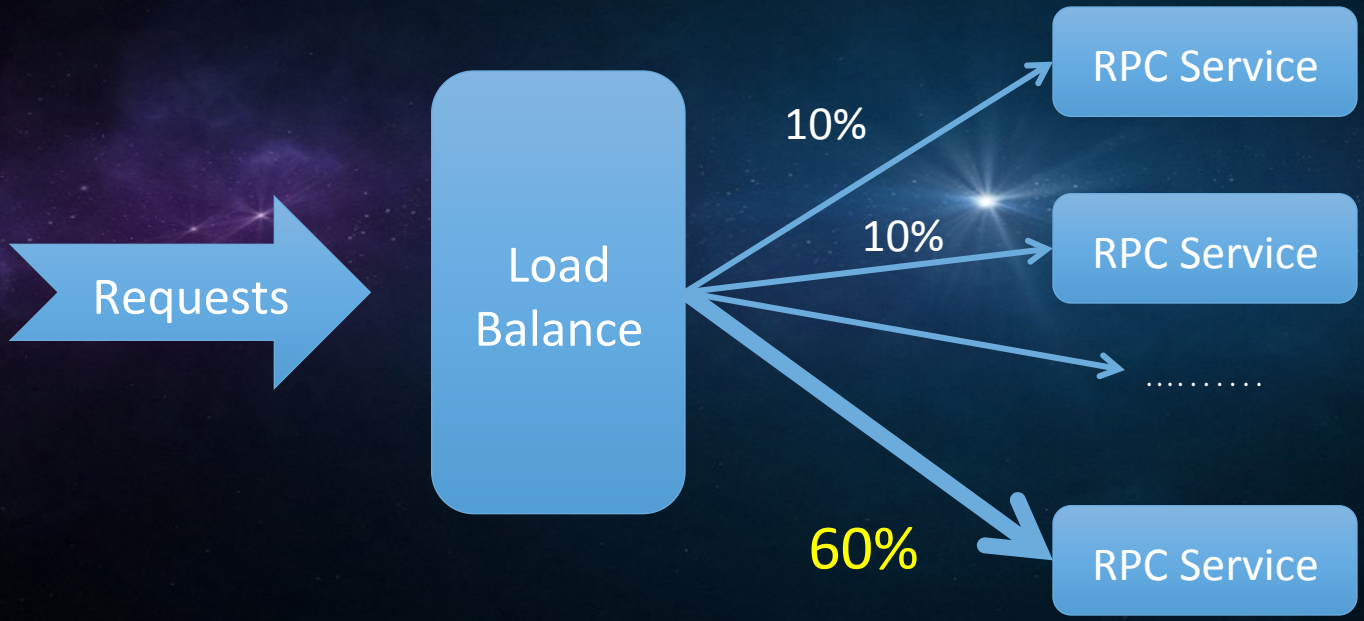
Stress Testing Process

- Single Machine in Each App Cluster
- Single Critical Path
- Full Critical Path

Single Machine in Each App Cluster



Single Machine in Each App Cluster

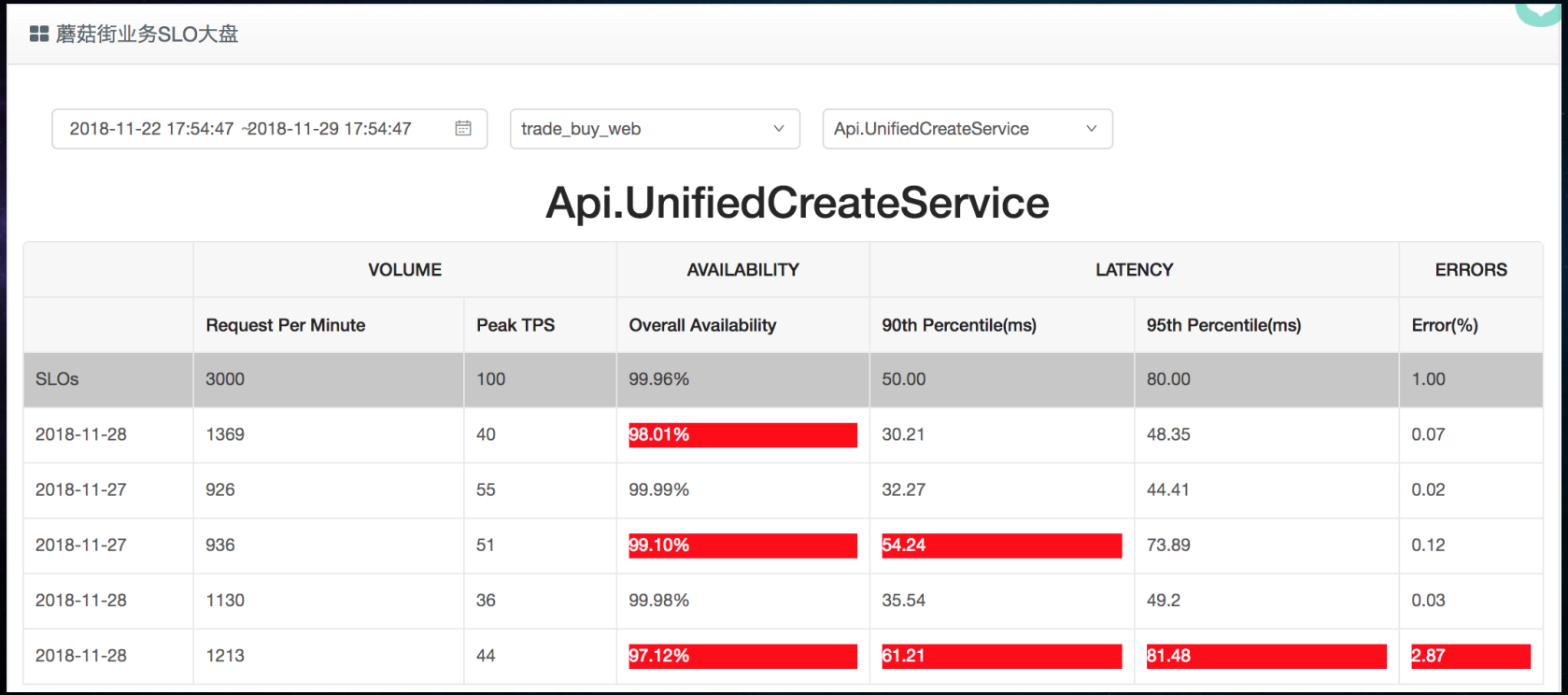


Machines of Each Cluster

=

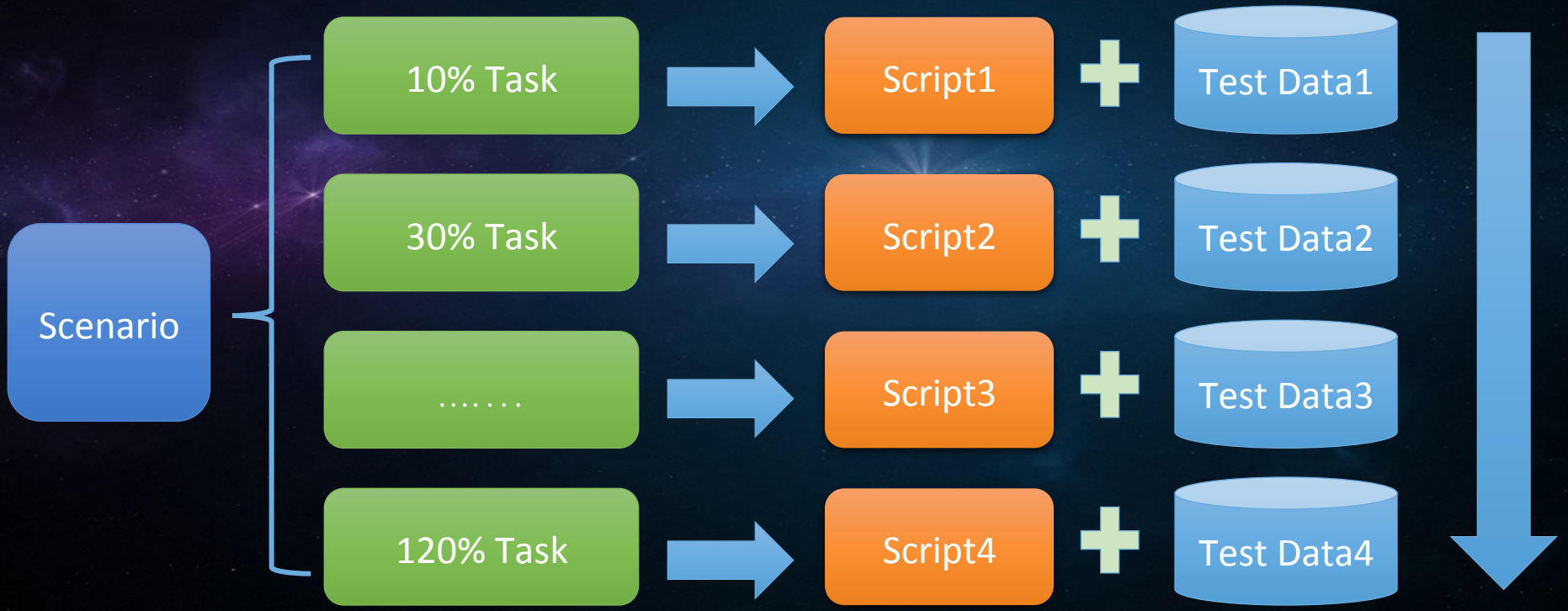
Estimation of QPS / Single Machine QPS Capacity

SLO Management of Capacity



	VOLUME		AVAILABILITY	LATENCY		ERRORS
	Request Per Minute	Peak TPS	Overall Availability	90th Percentile(ms)	95th Percentile(ms)	Error(%)
SLOs	3000	100	99.96%	50.00	80.00	1.00
2018-11-28	1369	40	98.01%	30.21	48.35	0.07
2018-11-27	926	55	99.99%	32.27	44.41	0.02
2018-11-27	936	51	99.10%	54.24	73.89	0.12
2018-11-28	1130	36	99.98%	35.54	49.2	0.03
2018-11-28	1213	44	97.12%	61.21	81.48	2.87

Single and Full Critical Path



Automatic Generation of Script and Data

```
/************** http request definition **************/

val teslaVal_1_2_1 = tesla("详情页getUserStatusDtoNew")
.setGroup("trade-GROUP")
.setService("com.mogujie.pay.mailo.api.MaiLoUserBasicInfoApi")
.setMethod("getUserStatusDtoNew")
.setInclass("com.mogujie.pay.mailo.dto.request.parameters.BaseUserQueryDTO")
.setInvalue("{\"onlineTest\":true,\"userId\":${uid}}")
.setSerializationMode("JSON")
.setLurker("true")
.setPrintResult("false")
.setBigResult("false")


/************** scenario definition **************/

val scn_1_2_1 = scenario("SCN: 详情页getUserStatusDtoNew_1.2.1")
.feed(csv("users.csv").circular)
.exec(teslaVal_1_2_1).exitHereIfFailed
```

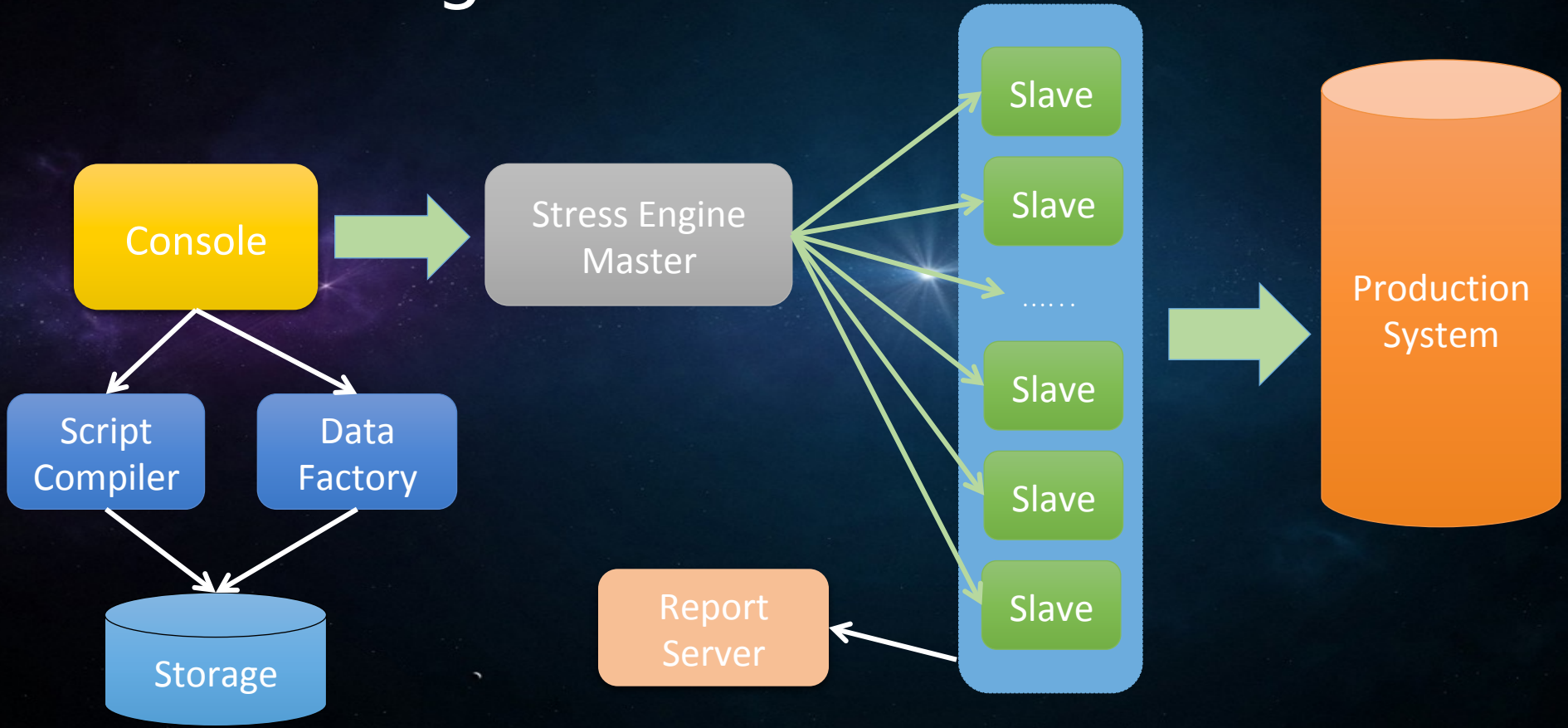
Stress Testing Script



Stress Testing Data

```
uid,uid2,address,address2,sign,signUrl
117381818,13vrsto,44080982,11ghm90,5y6vr09jUCdSzuqat7M8dP1xAR8hX1qh2IyMPQumOMVX
117381819,13vrstq,44080983,11ghm92,WfxwBcRZkuWc8R4javP++4UeChHB+dCVg4dF1cr535+A
117381820,13vrsts,44080984,11ghm94,O3XttHNgs88CeP36pAaQqhmzGe3XjvTZqALuk+xr9iQl
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117381831,13vrsue,44080992,11ghm9k,L+kgb+/E/6e7a5syQzivieMod55jlDUO0SkFDiALeHJc
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117382160,13vrtco,44081233,11ghmmy,VUd7RqwSTVyKl595jhynsHjvoMn6ULZhgQ1dGJdi5h4M
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117381835,13vrsum,44080996,11ghm9s,0sUGvLnwWpVeFqk50aZp1aTKuqBPBr76scQUPg9HOJRa
```

Stress Testing Architecture



Stress Testing Report

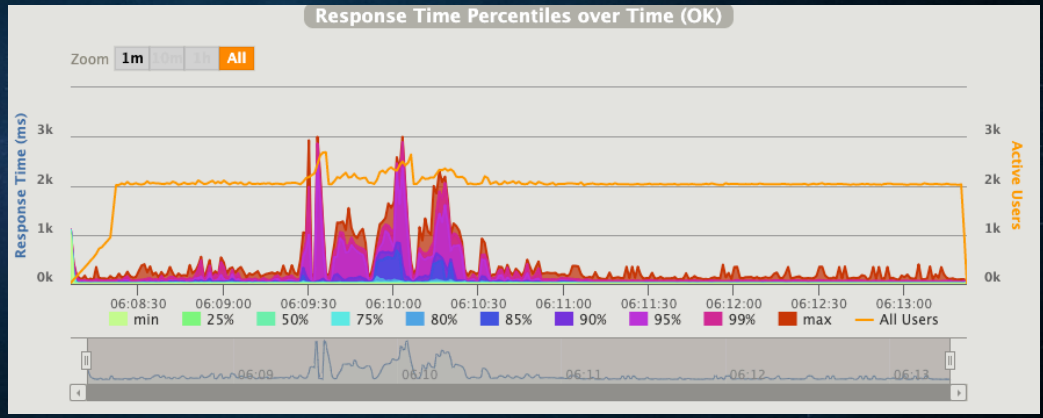
STATISTICS

Executions

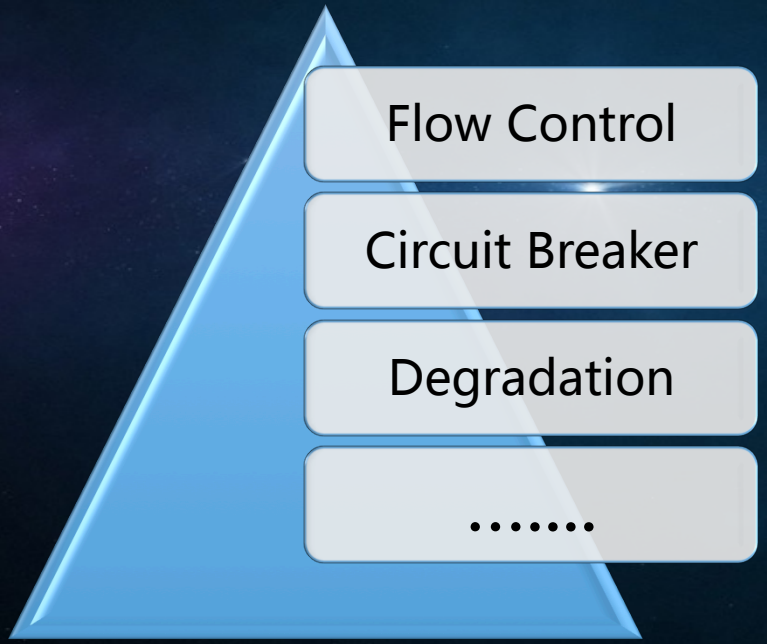
	Total	OK	KO
	33420	33310	110
Mean req/s	106.022	105.673	0.349

Response Time (ms)

	Total	OK	KO
Min	5	28	5
50th percentile	50	50	10
75th percentile	59	60	16
95th percentile	93	94	37
99th percentile	131	131	64
Max	659	659	92
Mean	55	55	14
Std Deviation	20	19	12



System Emergency Protection



Summary

- Estimation of Business Model
- Analyzation of Critical Path
- Simulation of Traffic Load

Thanks