BSS for Everyone.

Микросервисная платформа BSS

Будущее цифровых банковских сервисов

Дмитрий Свалов
Технический директор

BSS

Цели создания

Технологический стек

Архитектура

Ключевые преимущества

- **Поставка**
- **Развертывание**
- **Мониторинг**
- **Логирование**

Дмитрий Свалов

Технический директор BSS

Отвечаю за технологическое развитие и
за архитектуру продуктов BSS

Руковожу проектом по созданию
микросервисной платформы BSS

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BSS

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Москва

Обнинск

Санкт-Петербург

Самара

Ижевск

Тольятти

Алматы

Ташкент

СБЕР БАНК

ТРИКОЛОР

открытие Банк

Alfa-Bank

ВТБ

UniCredit Group

РоссельхозБанк

МТС

GAZPROMBANK

ПСБ

Credit EuropeBank

госуслуги

ФОРАБАНК

HOME CREDIT BANK

RENT A RIDE

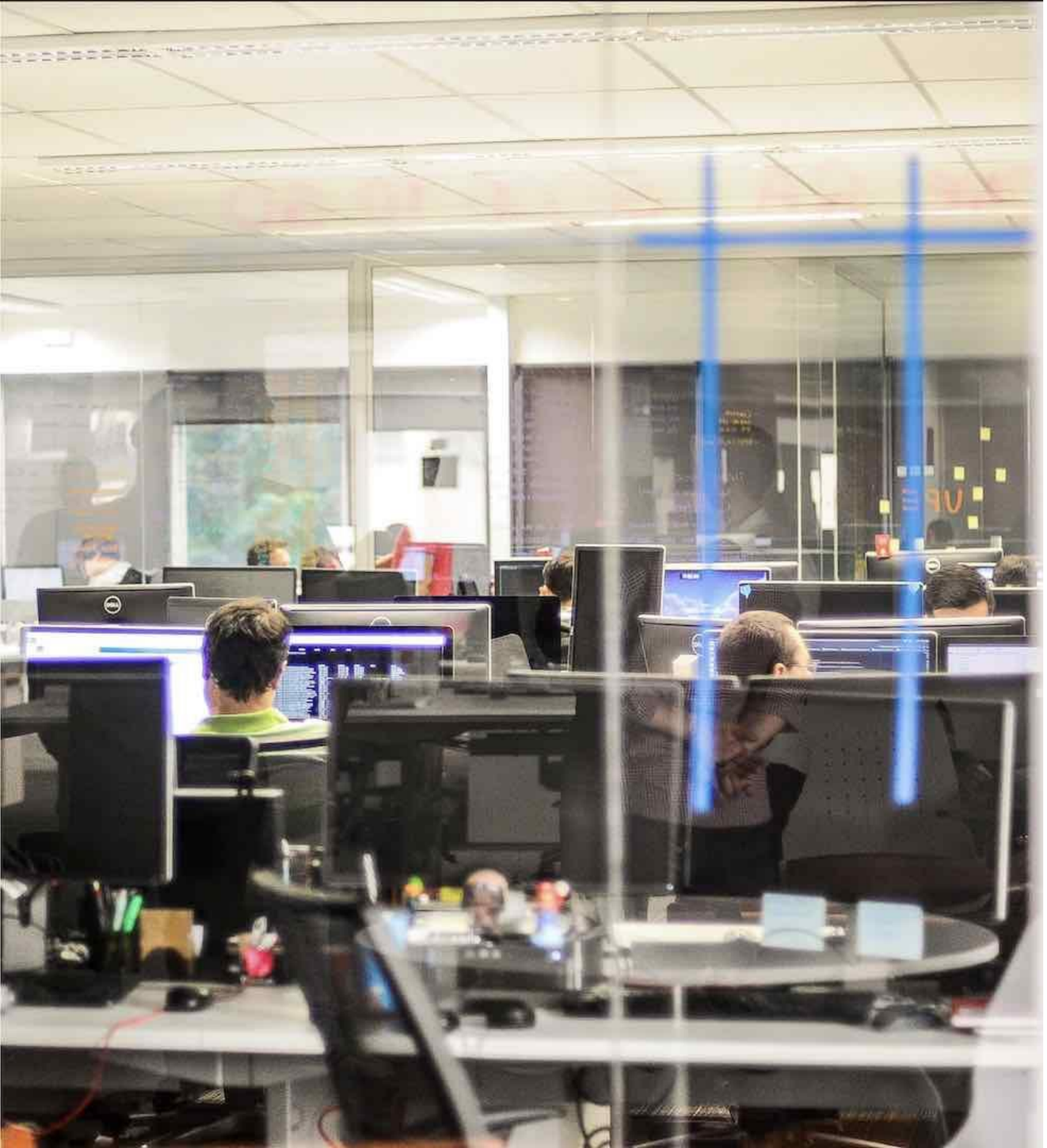
ДОМ РФ БАНК

Ак Барс Банк

Raiffeisen BANK

ВОЗРОЖДЕНИЕ БАНК

МОИ документы
государственные и муниципальные услуги



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Цели

Быстрая поставка

Упрощение совместной с банками разработки на базе SDK

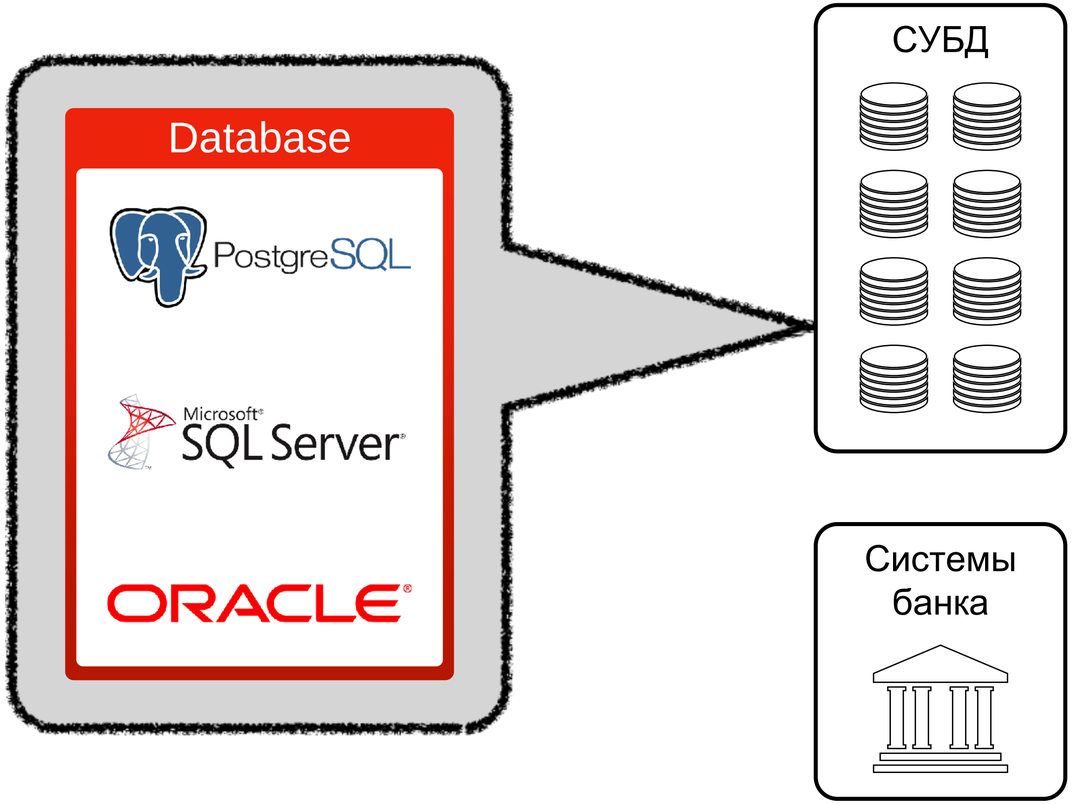
Возможность отдельного внедрения продуктов без внедрения всего ДБО

Повышение производительности и отказоустойчивости

Возможность частичной модернизации ДБО в микросервисной архитектуре

Архитектура

Архитектура



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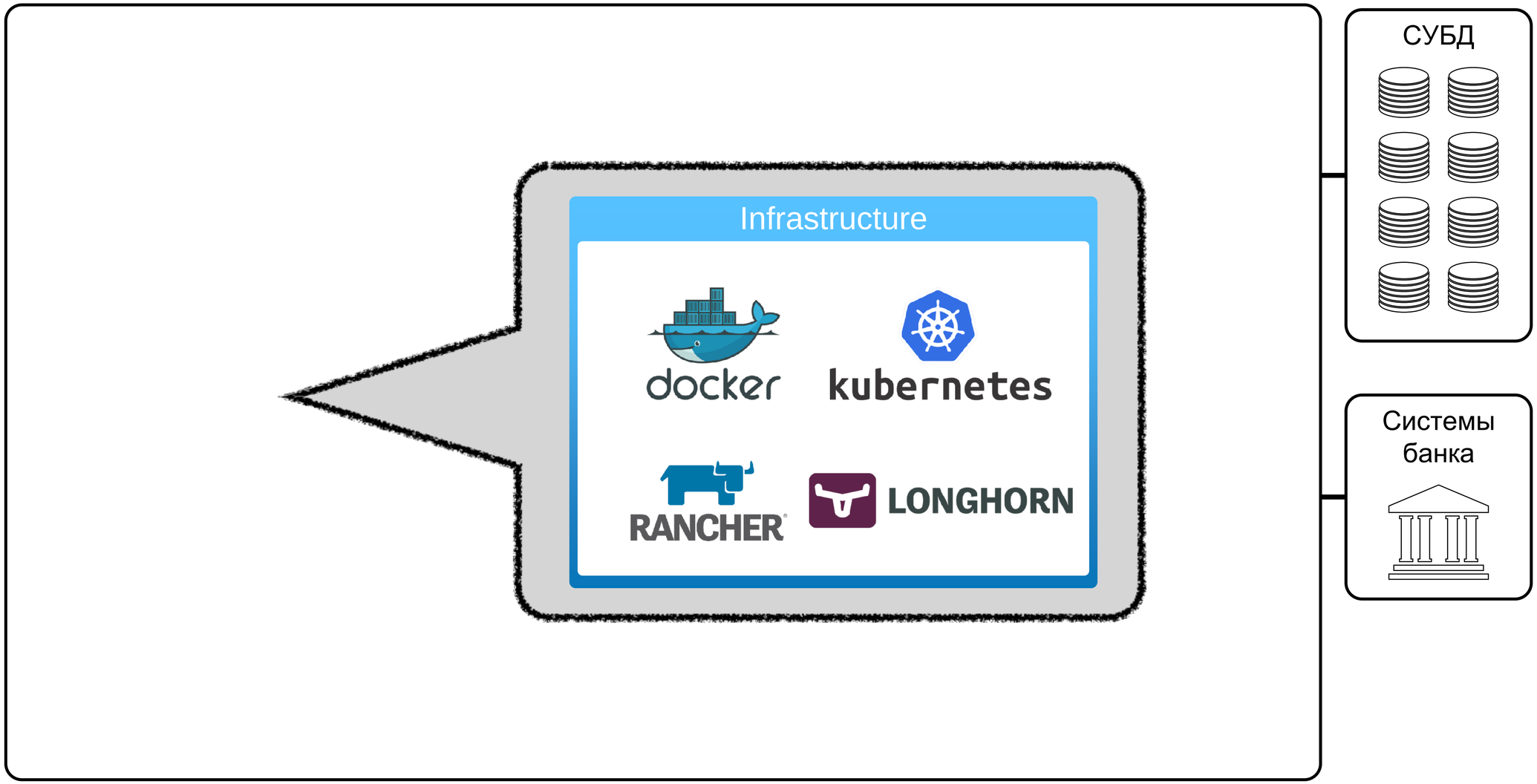

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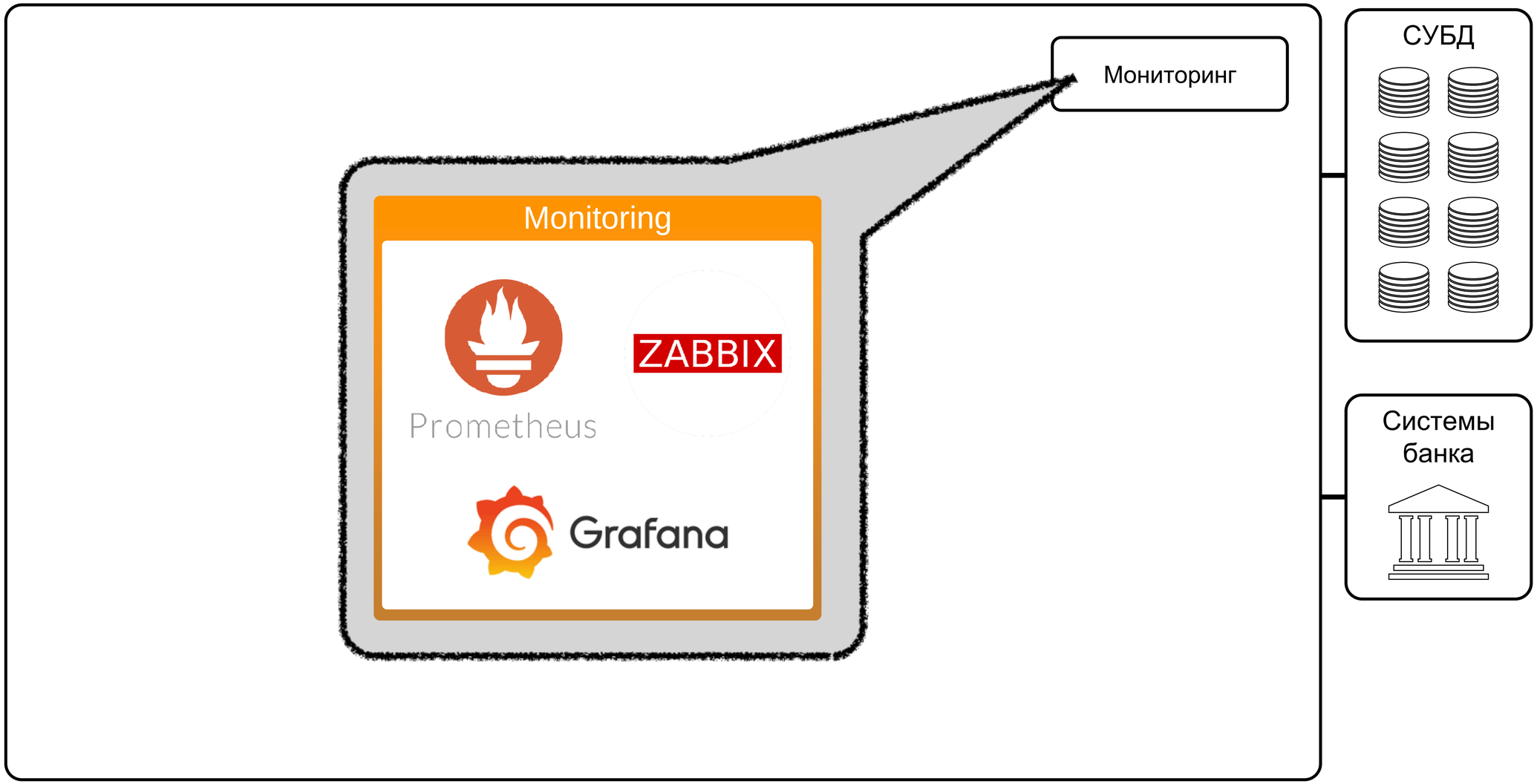

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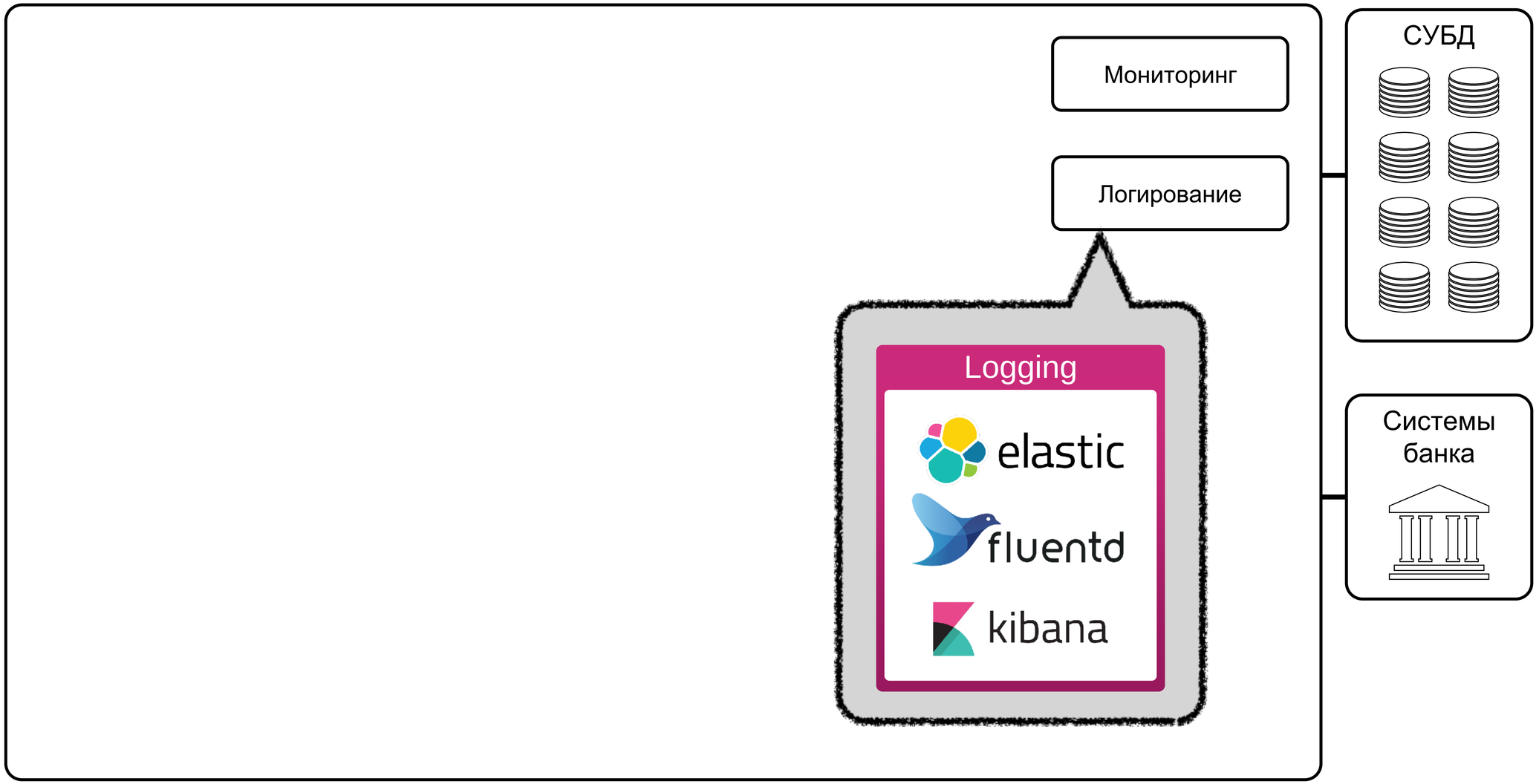

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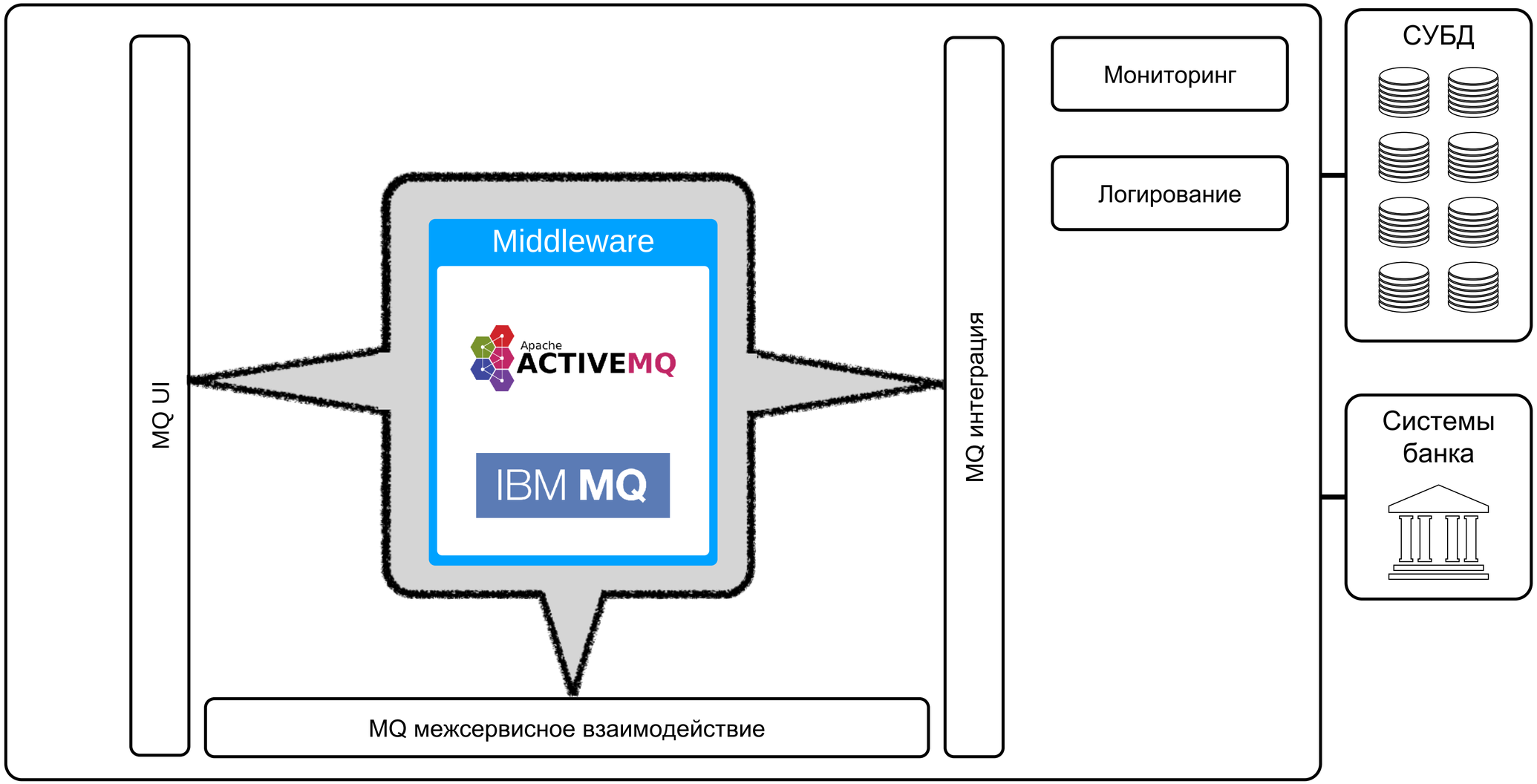

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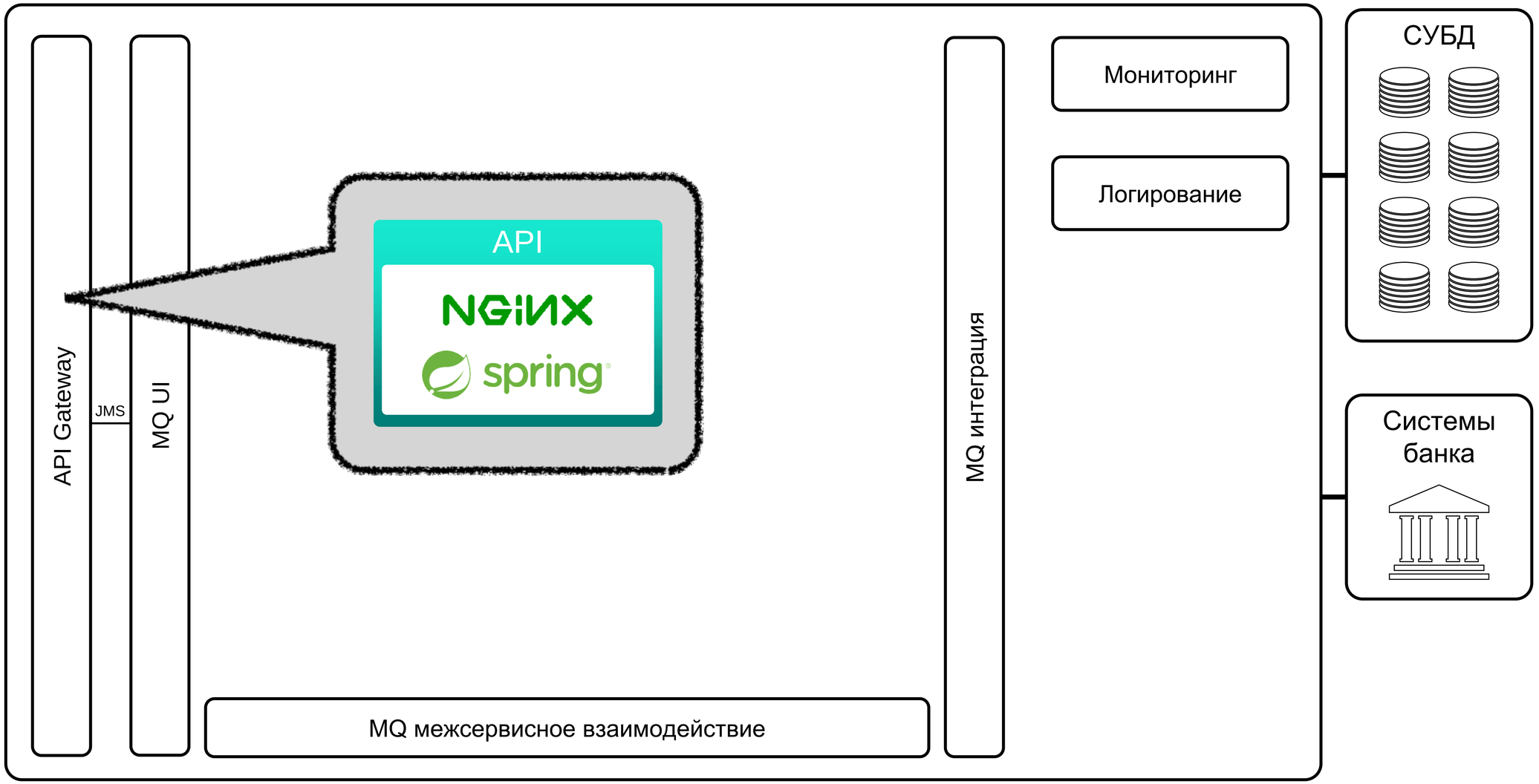

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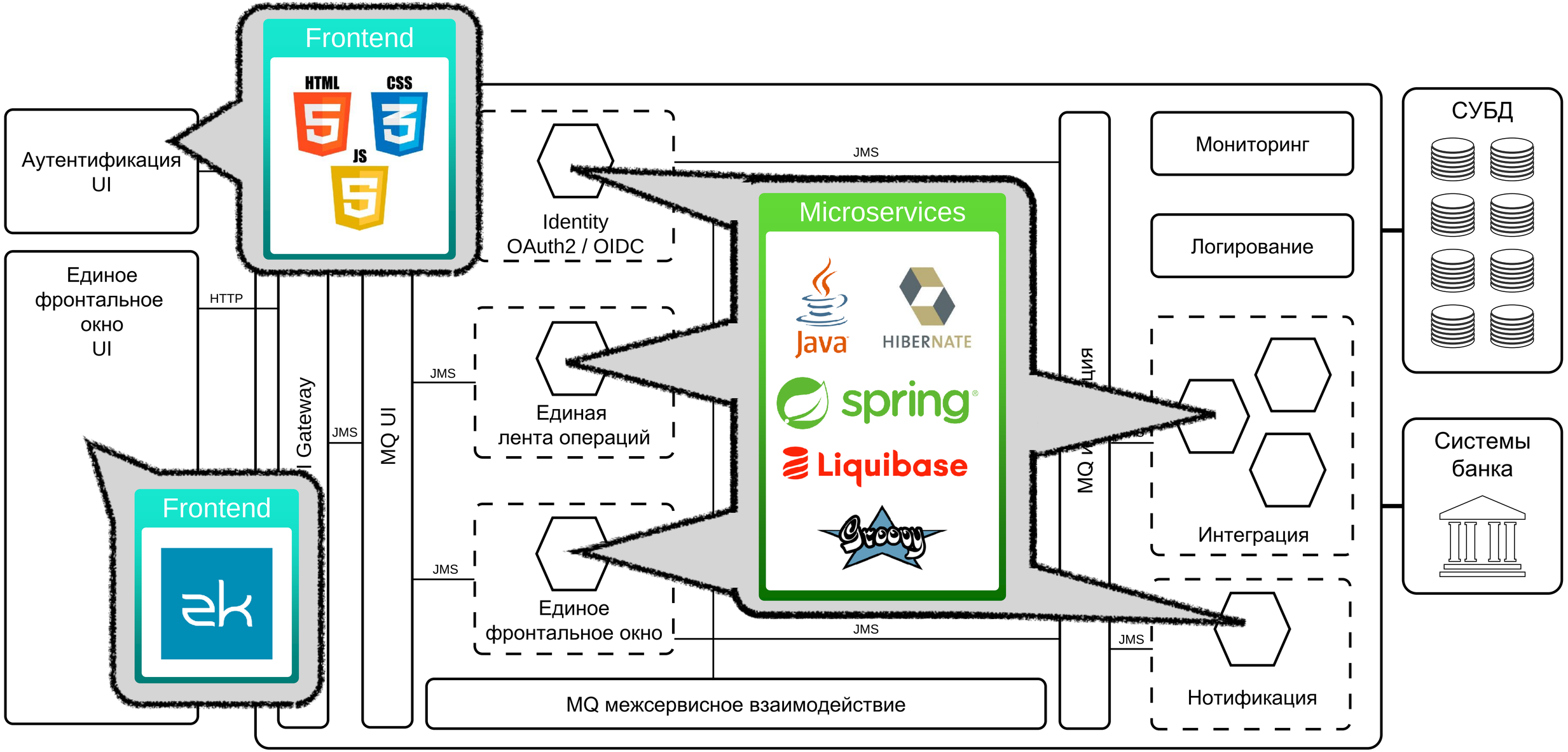

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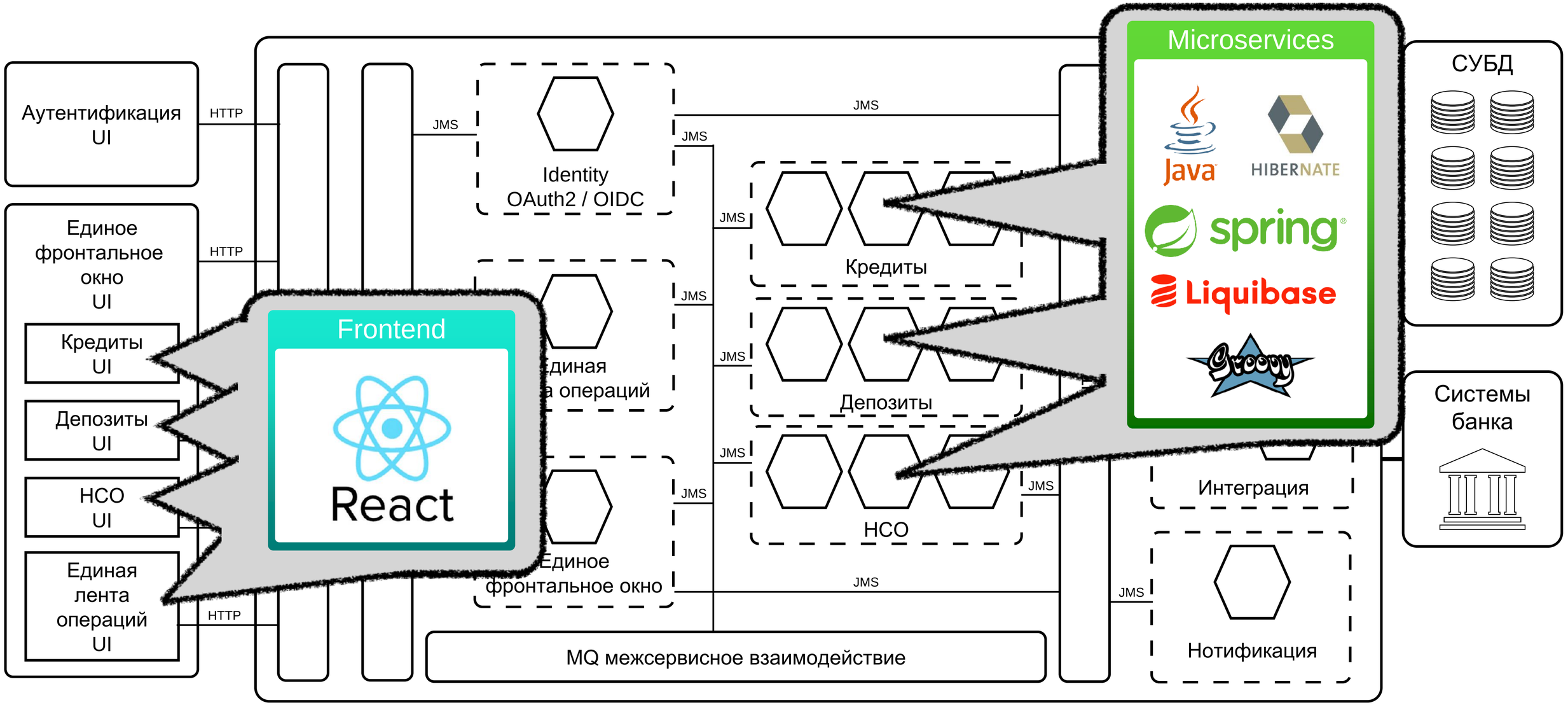

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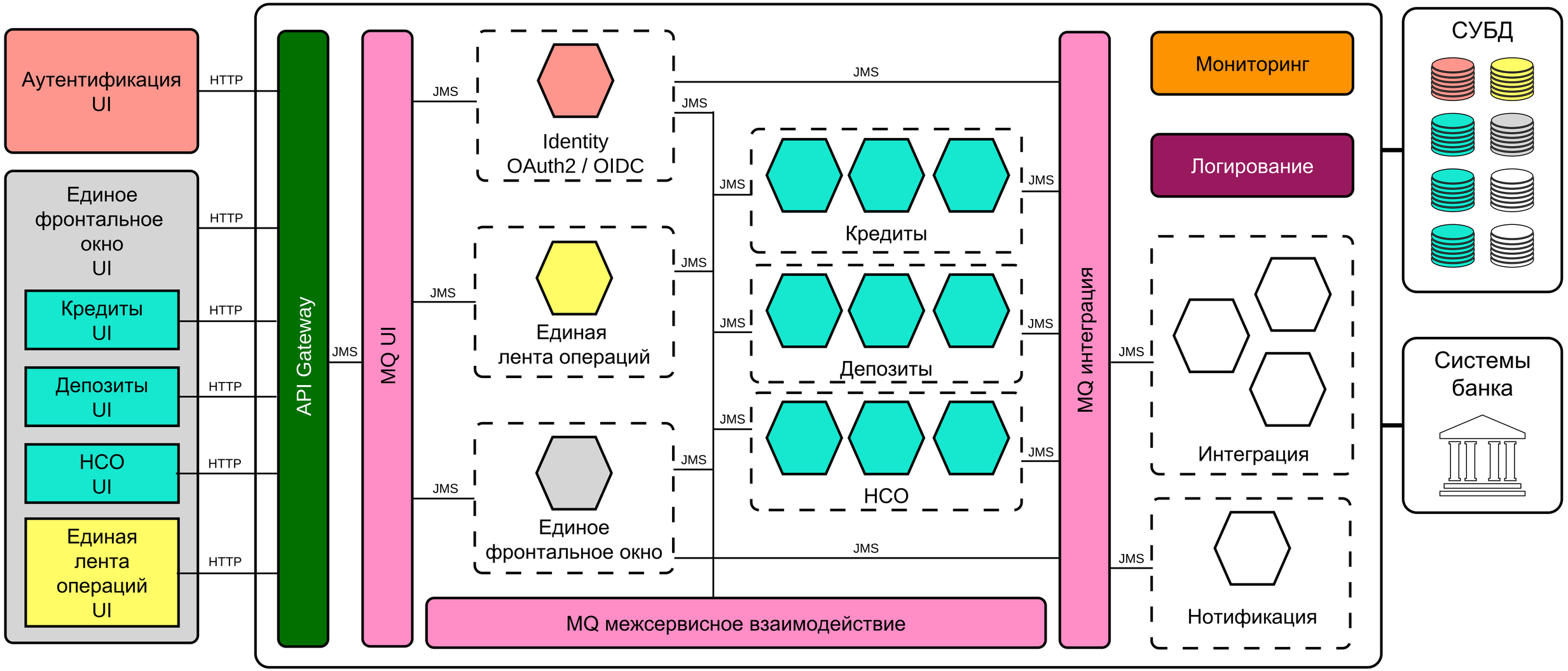
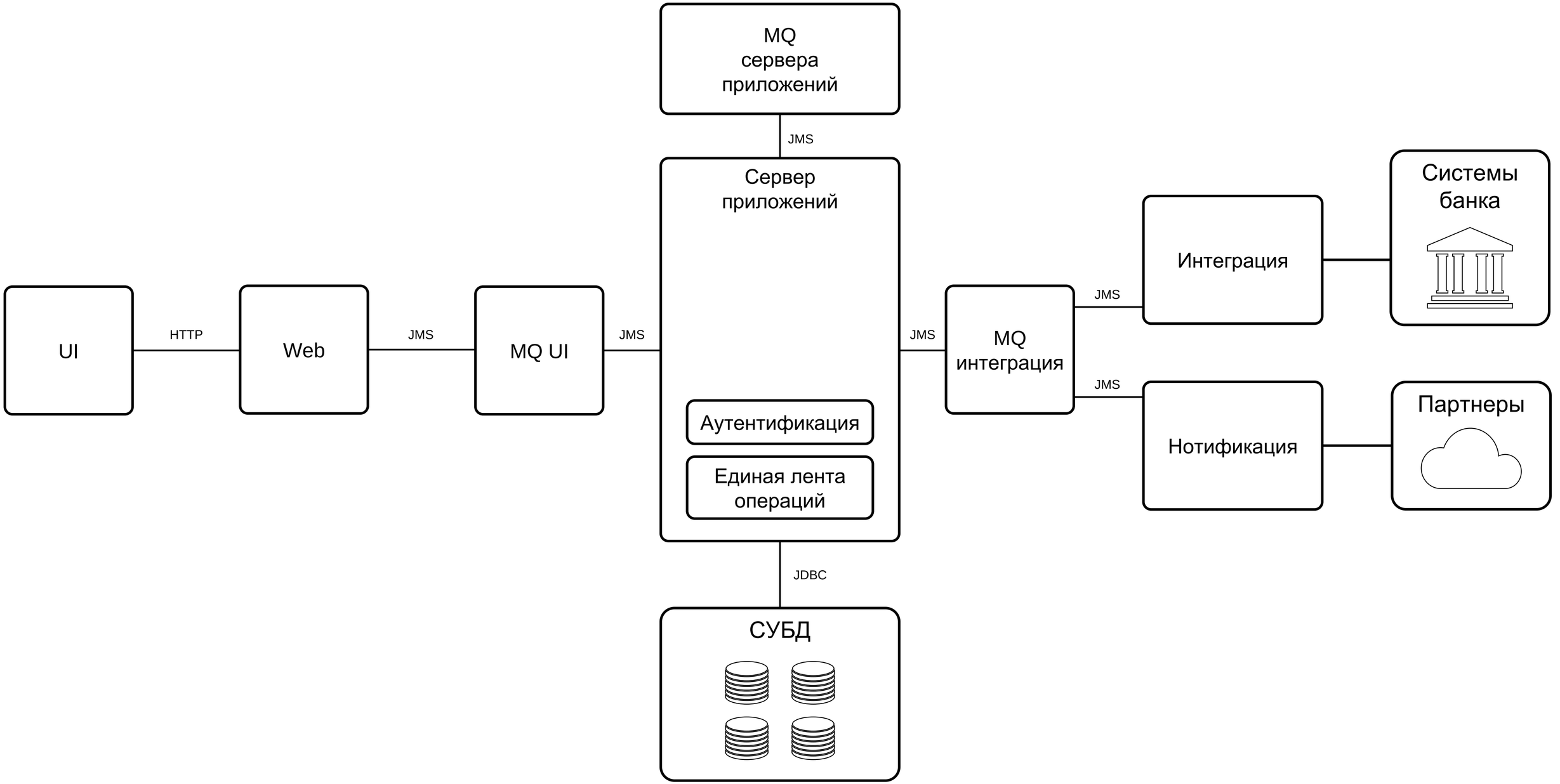


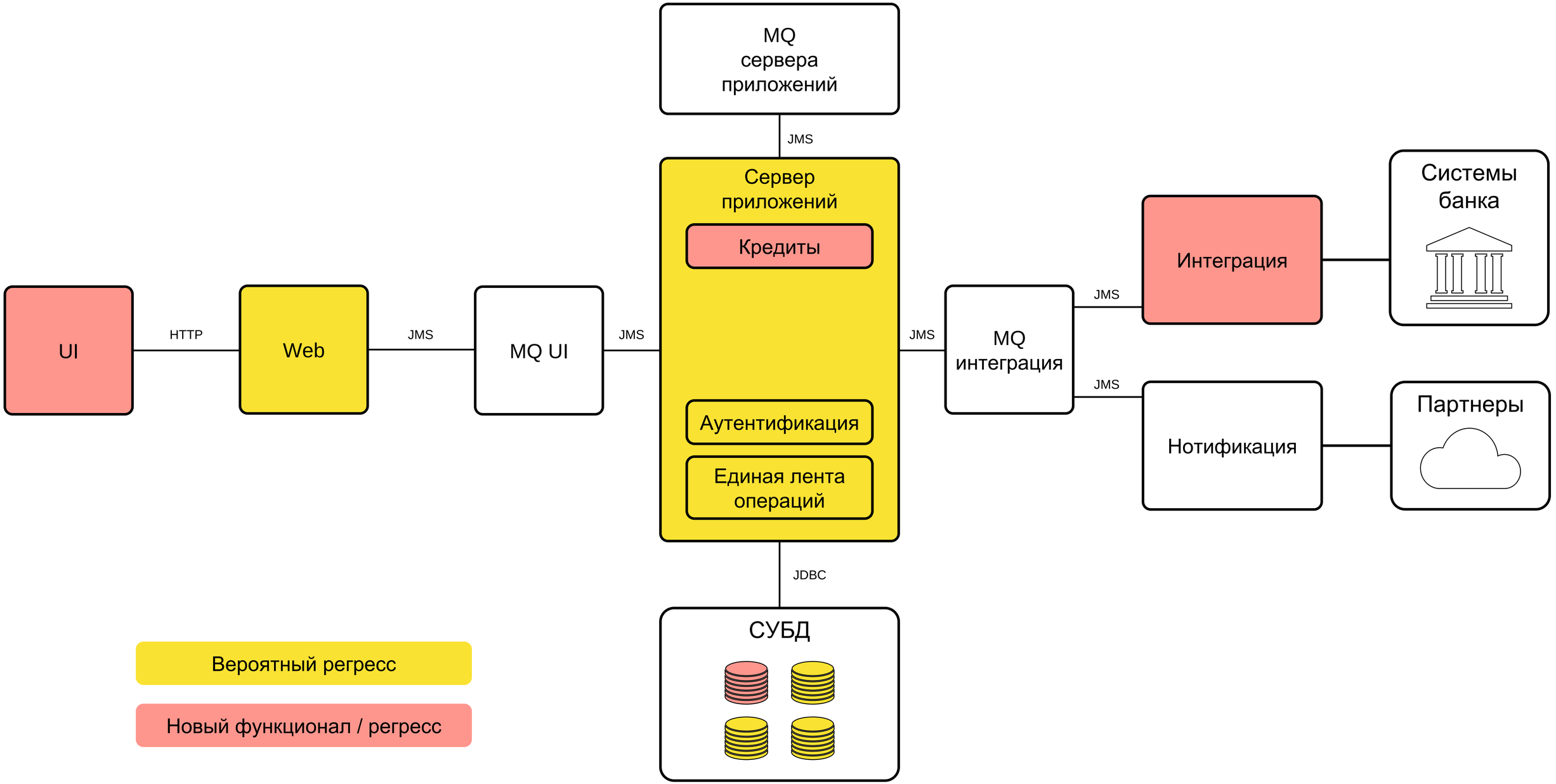
BSS

Поставка

Поставка в монолите



Поставка в монолите



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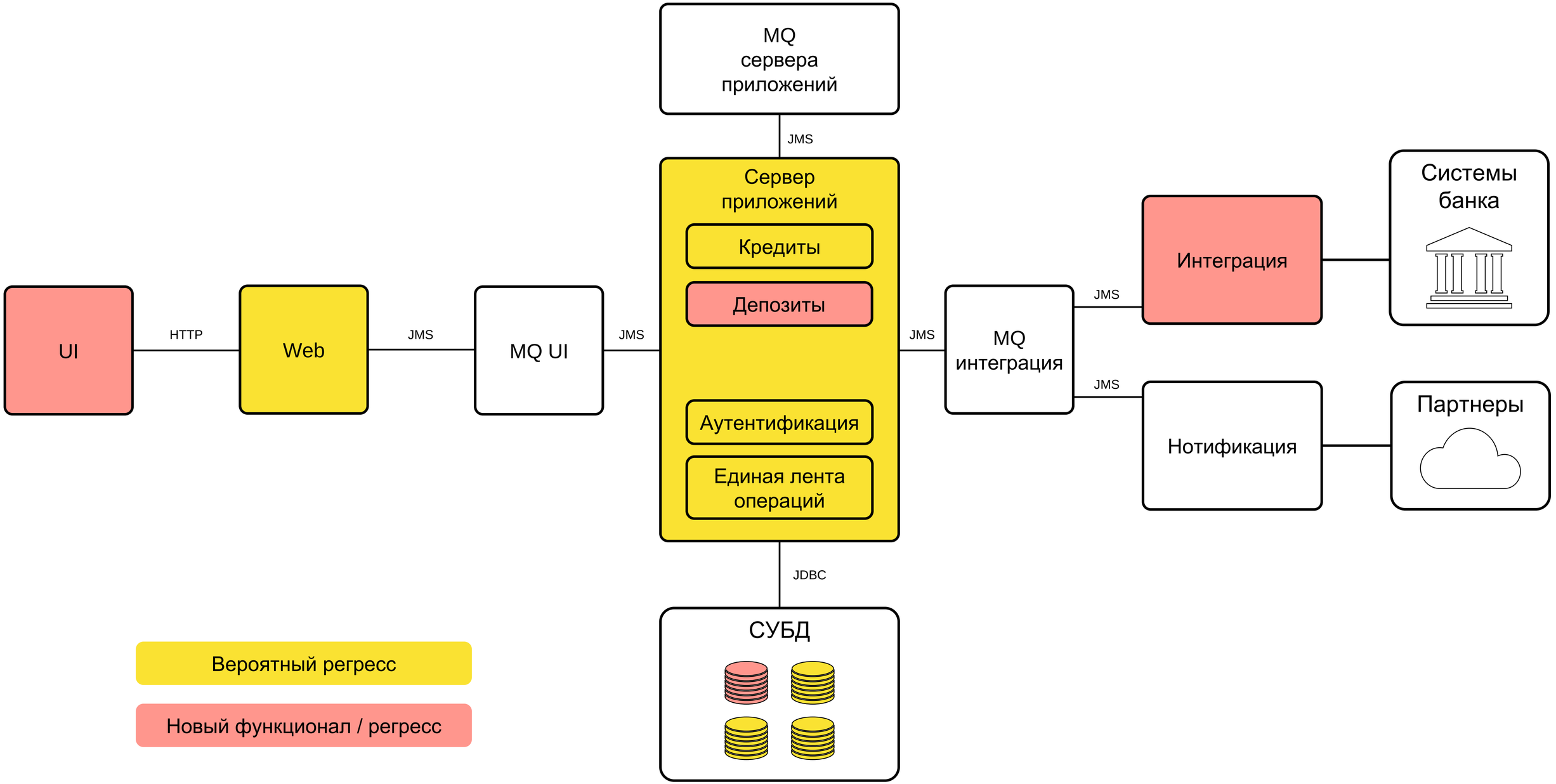

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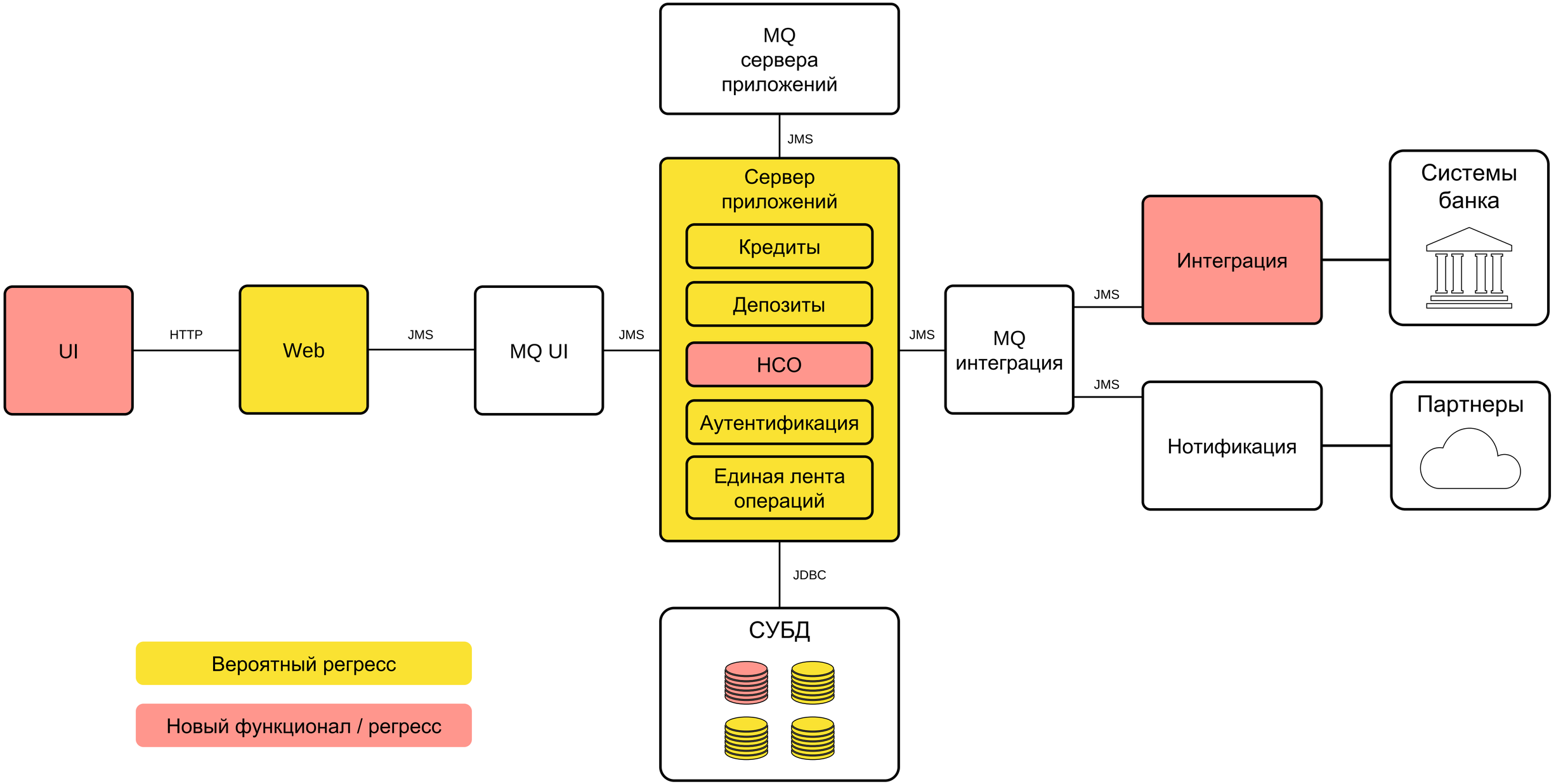

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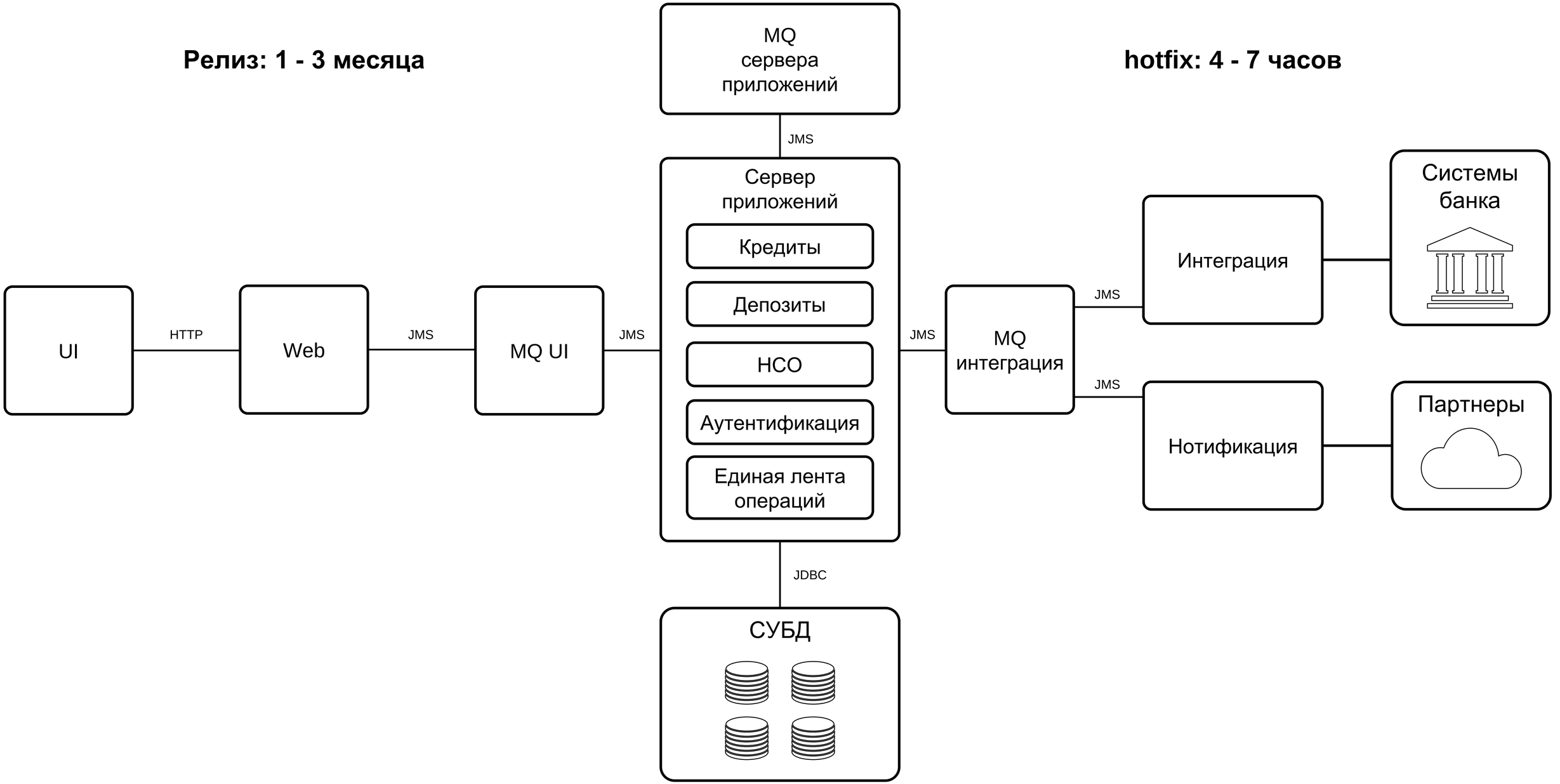
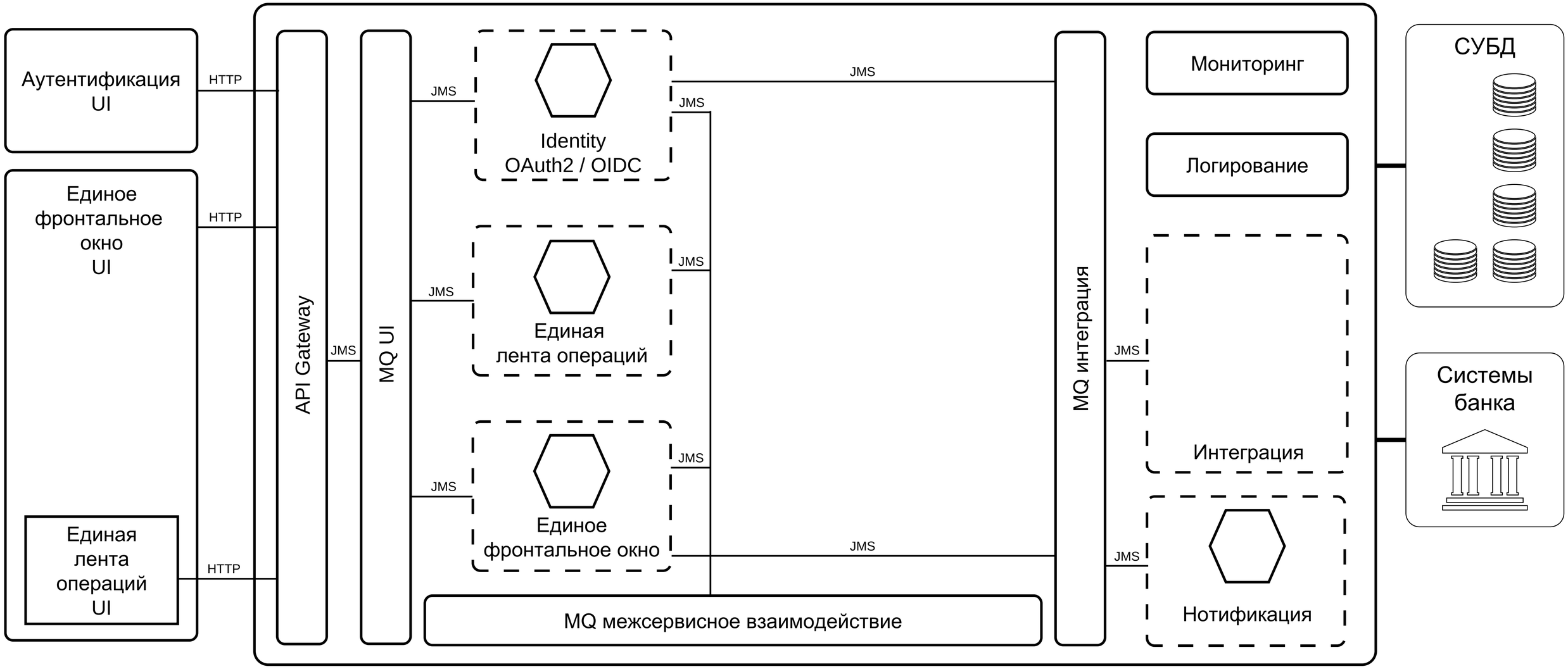


Поставка в микросервисной платформе



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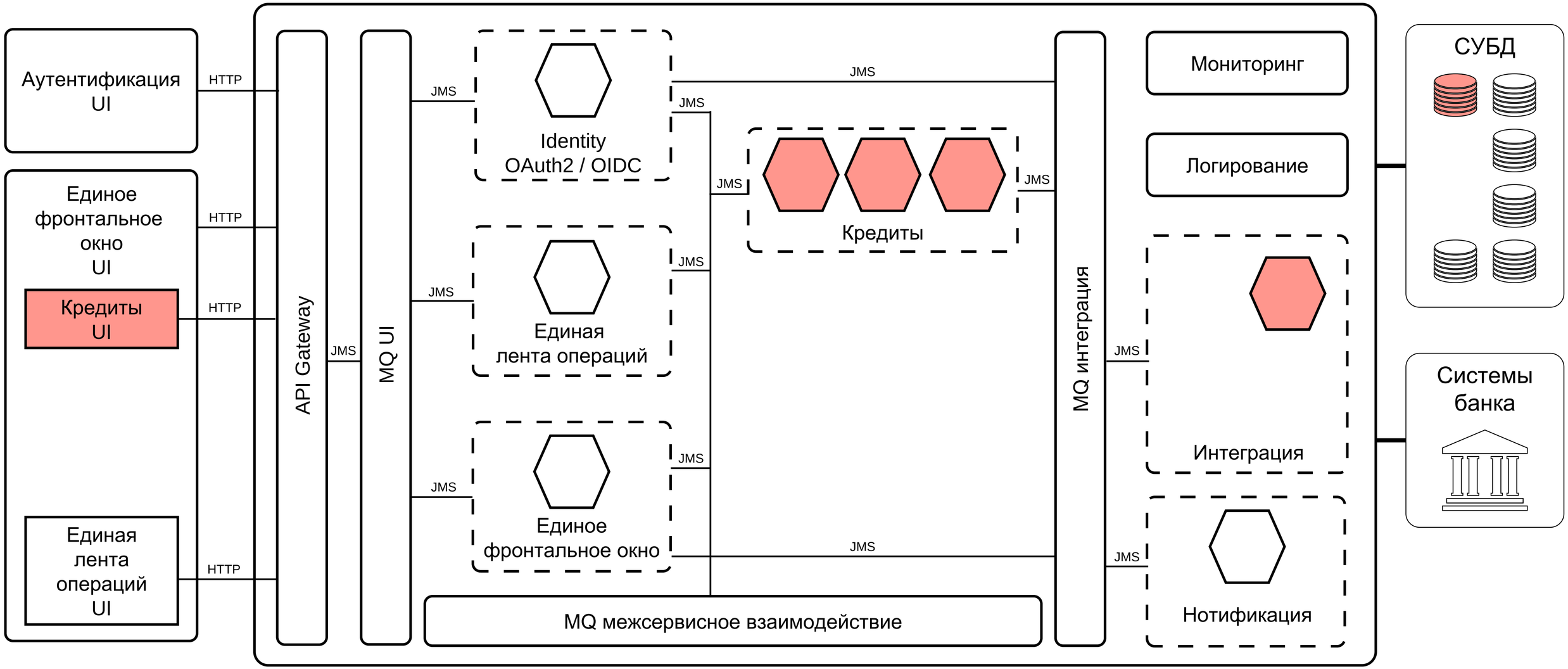

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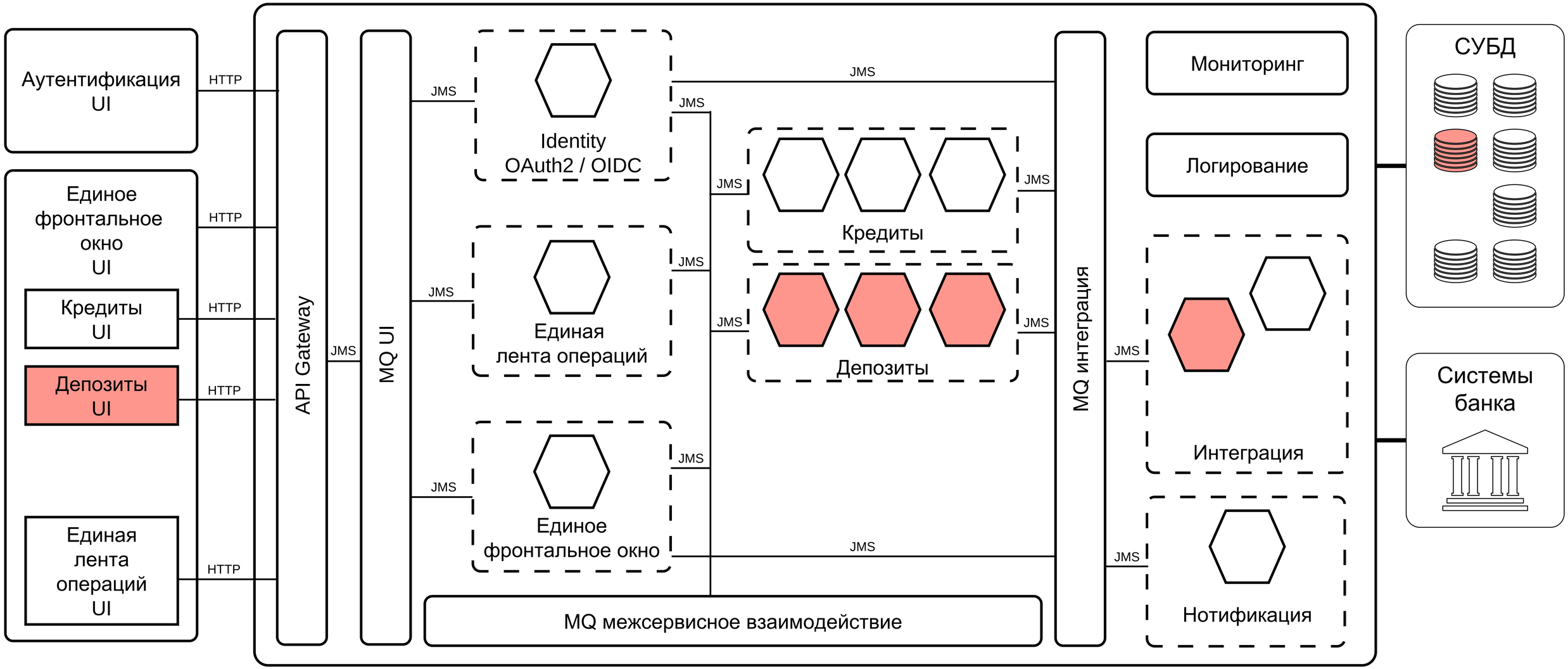
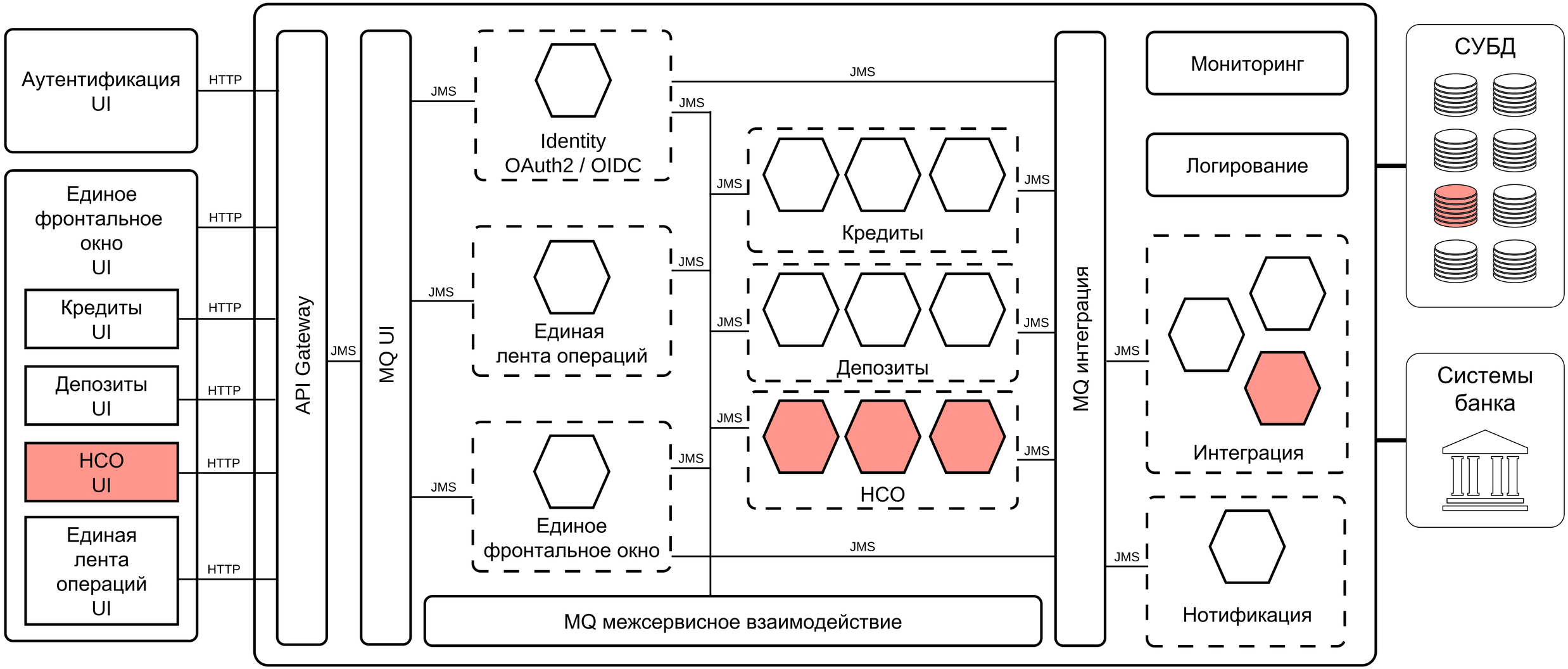
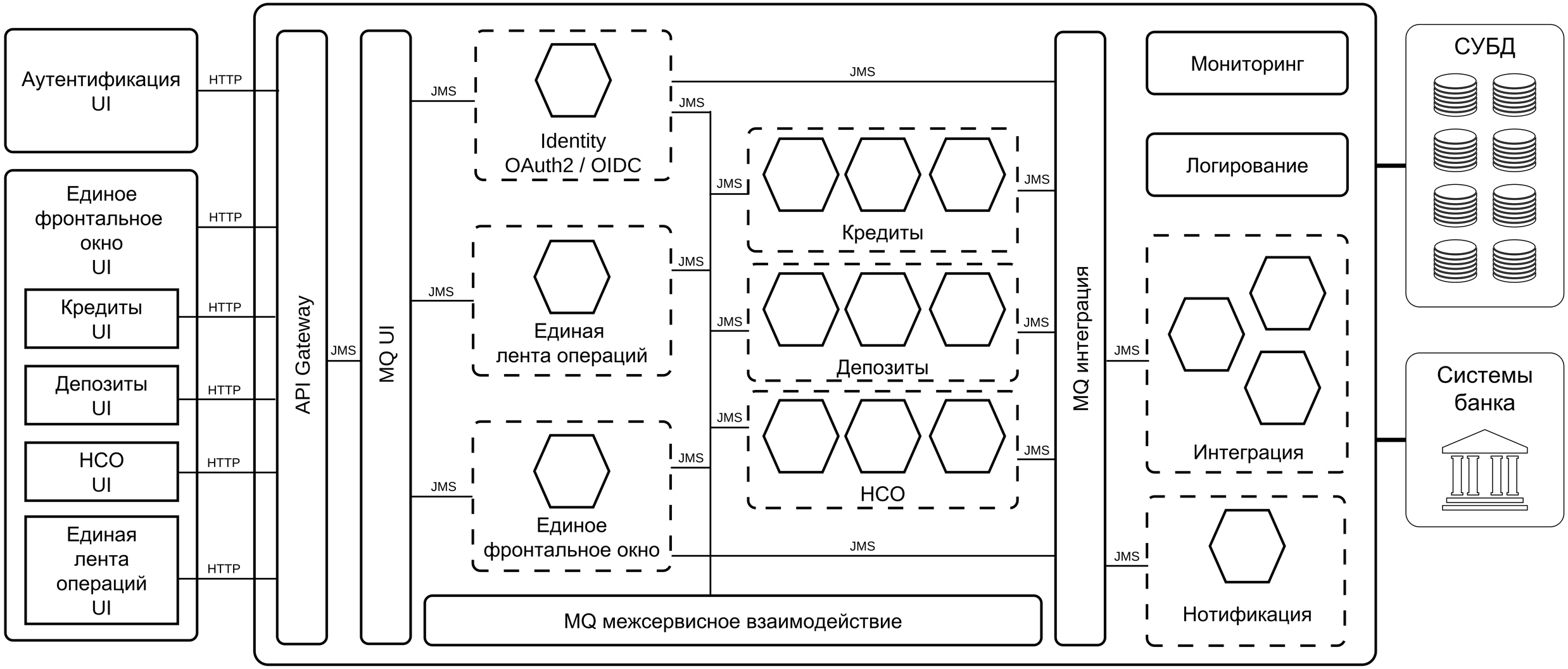


Поставка в микросервисной платформе



Поставка в микросервисной платформе

Релиз: до 1 недели, hotfix: 1 - 4 часа



Преимущество в TTM

от 4 до 12 раз быстрее

BSS

Развертывание

Развертывание монолита

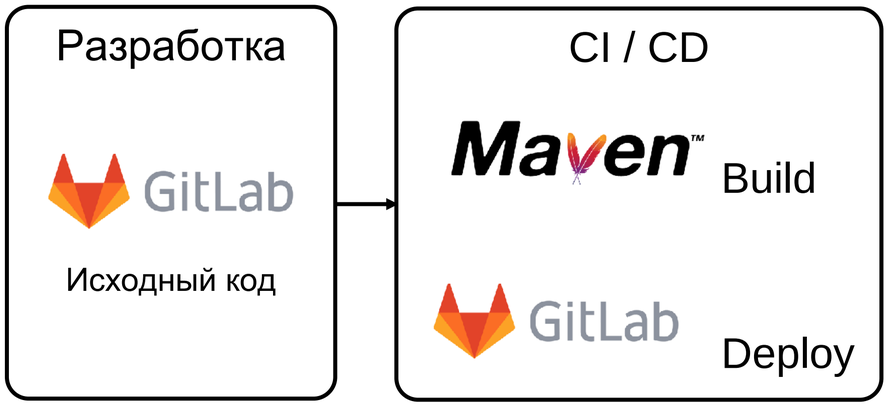
BSS

Разработка

Исходный код

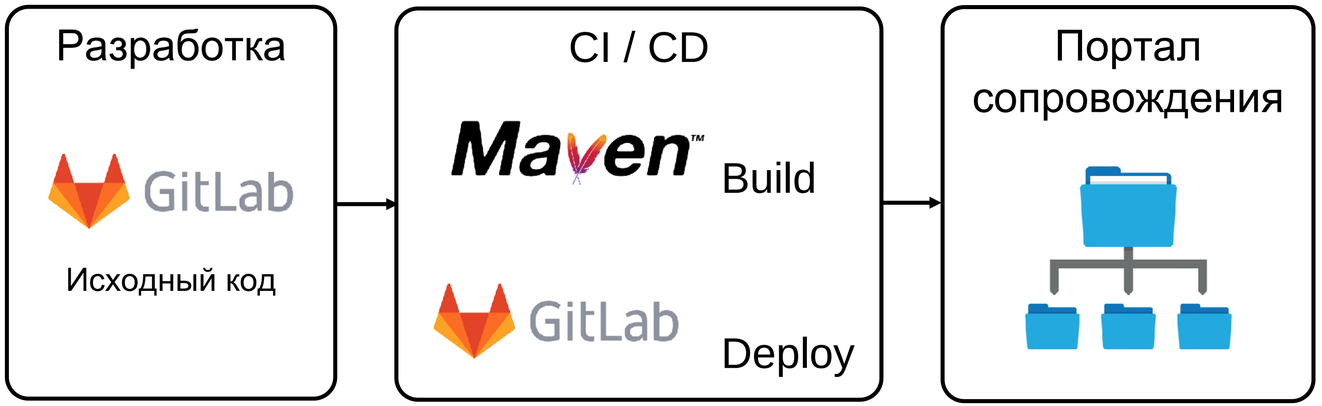
Развертывание монолита

BSS **BSS**



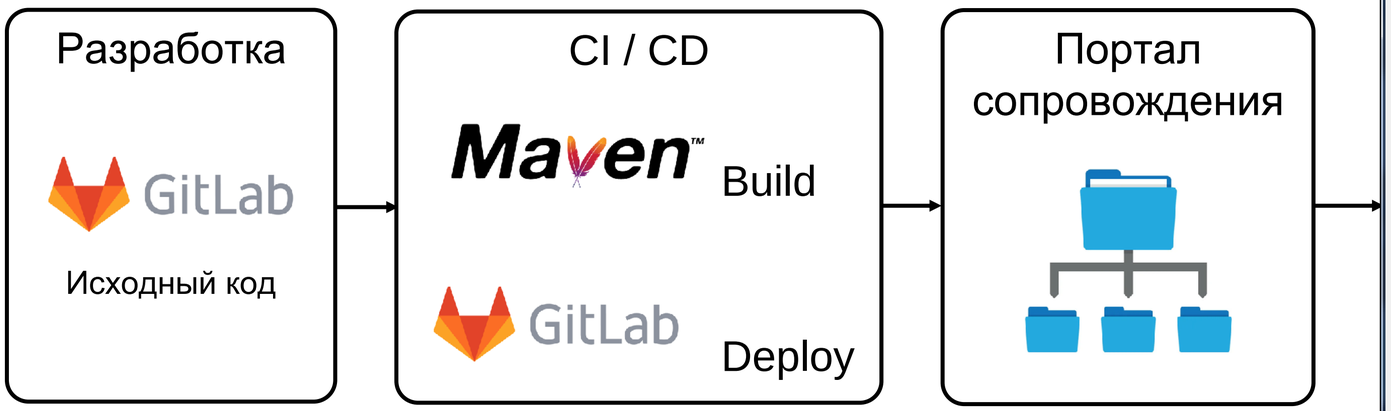
Развертывание монолита

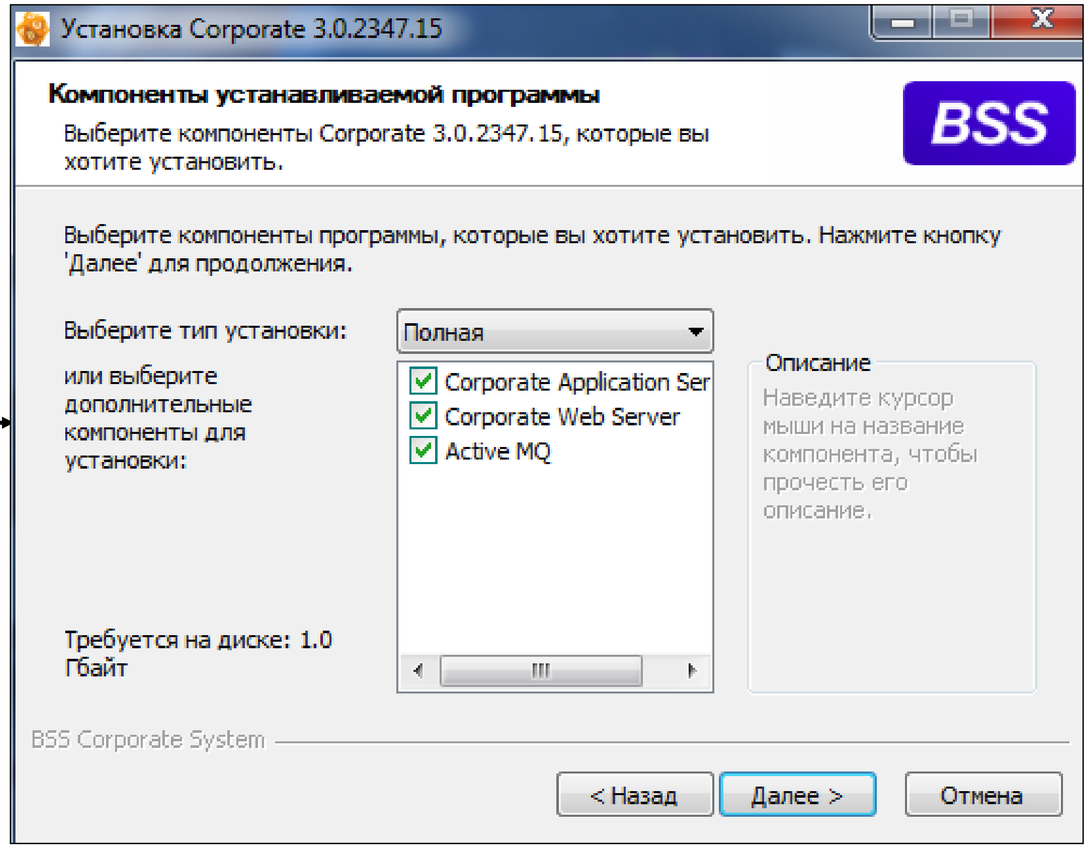
BSS **BSS** **BSS**



Развертывание монолита

BSS **BSS** **BSS** **Банк**





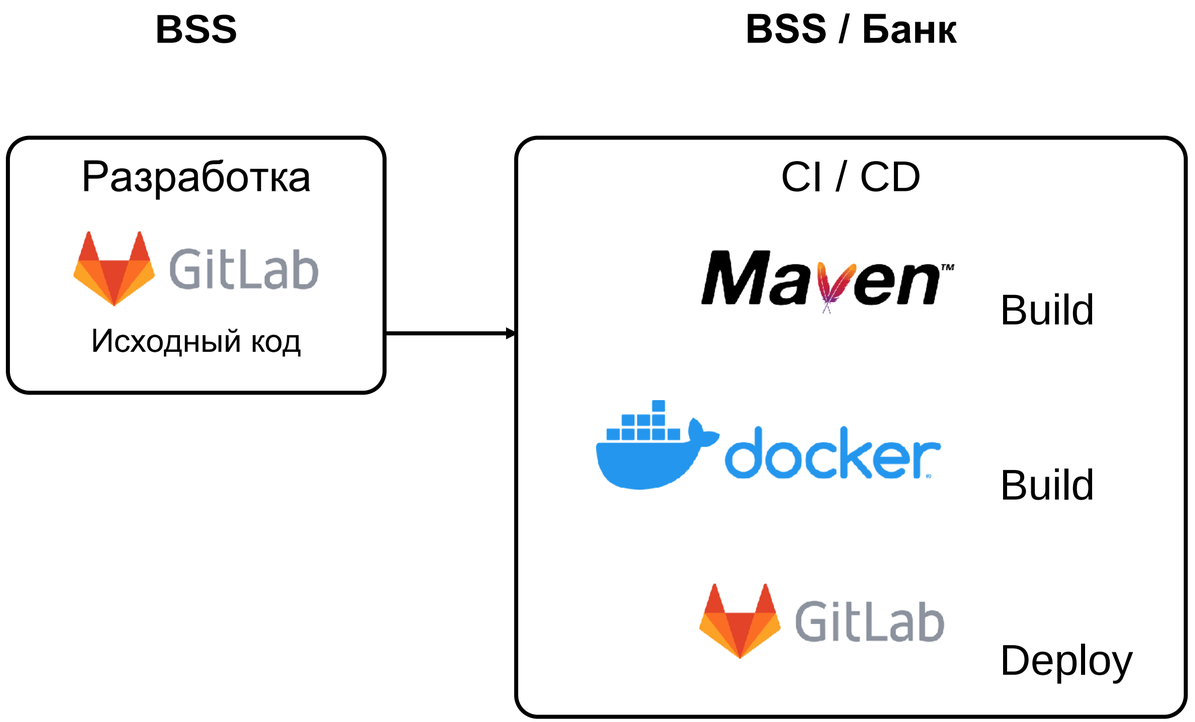
Развертывание в микросервисной платформе

BSS

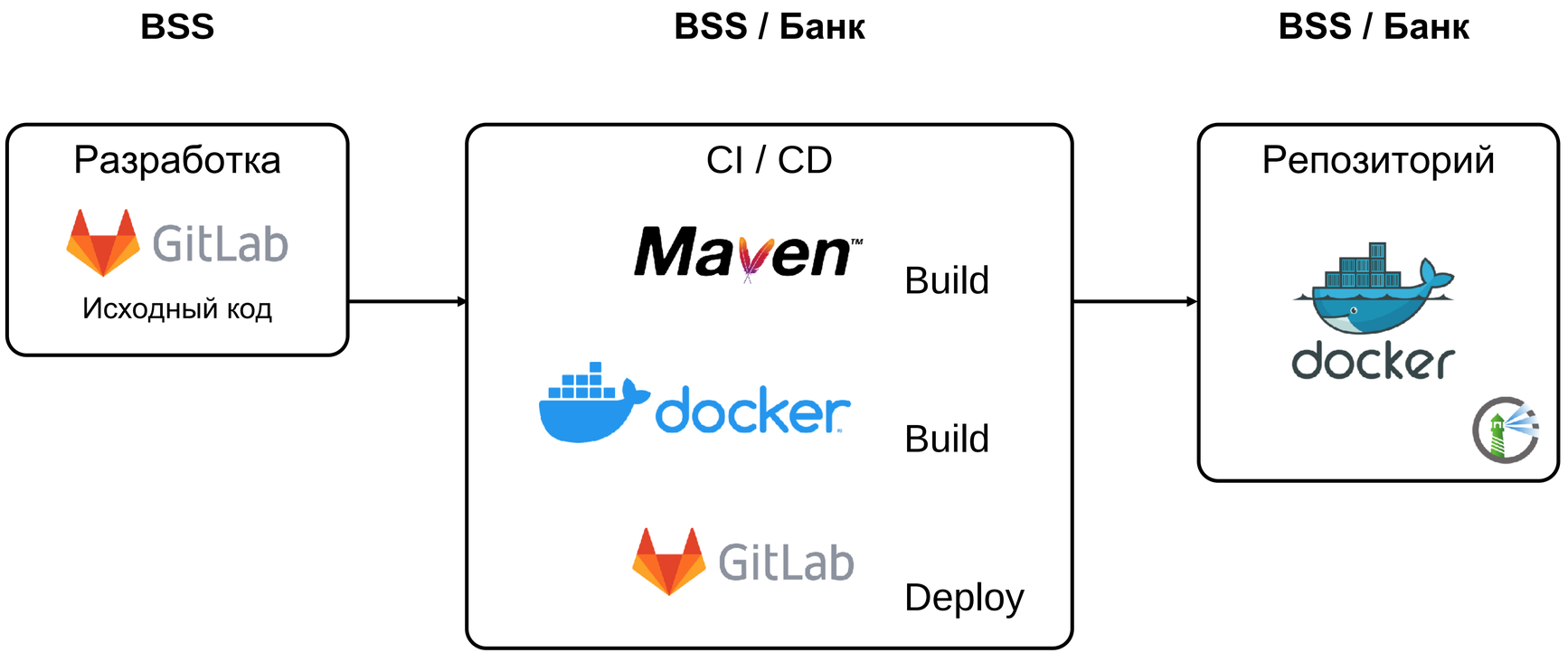
Разработка

Исходный код

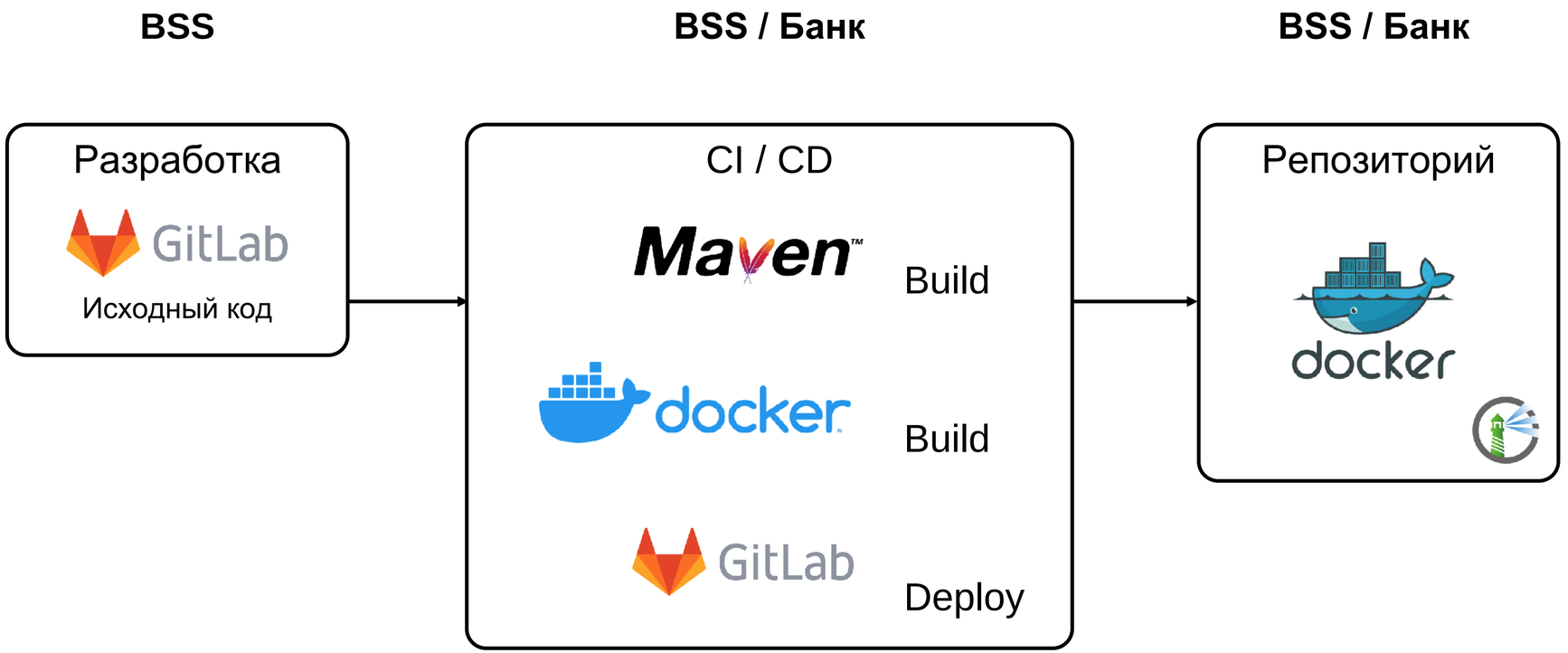
Развертывание в микросервисной платформе



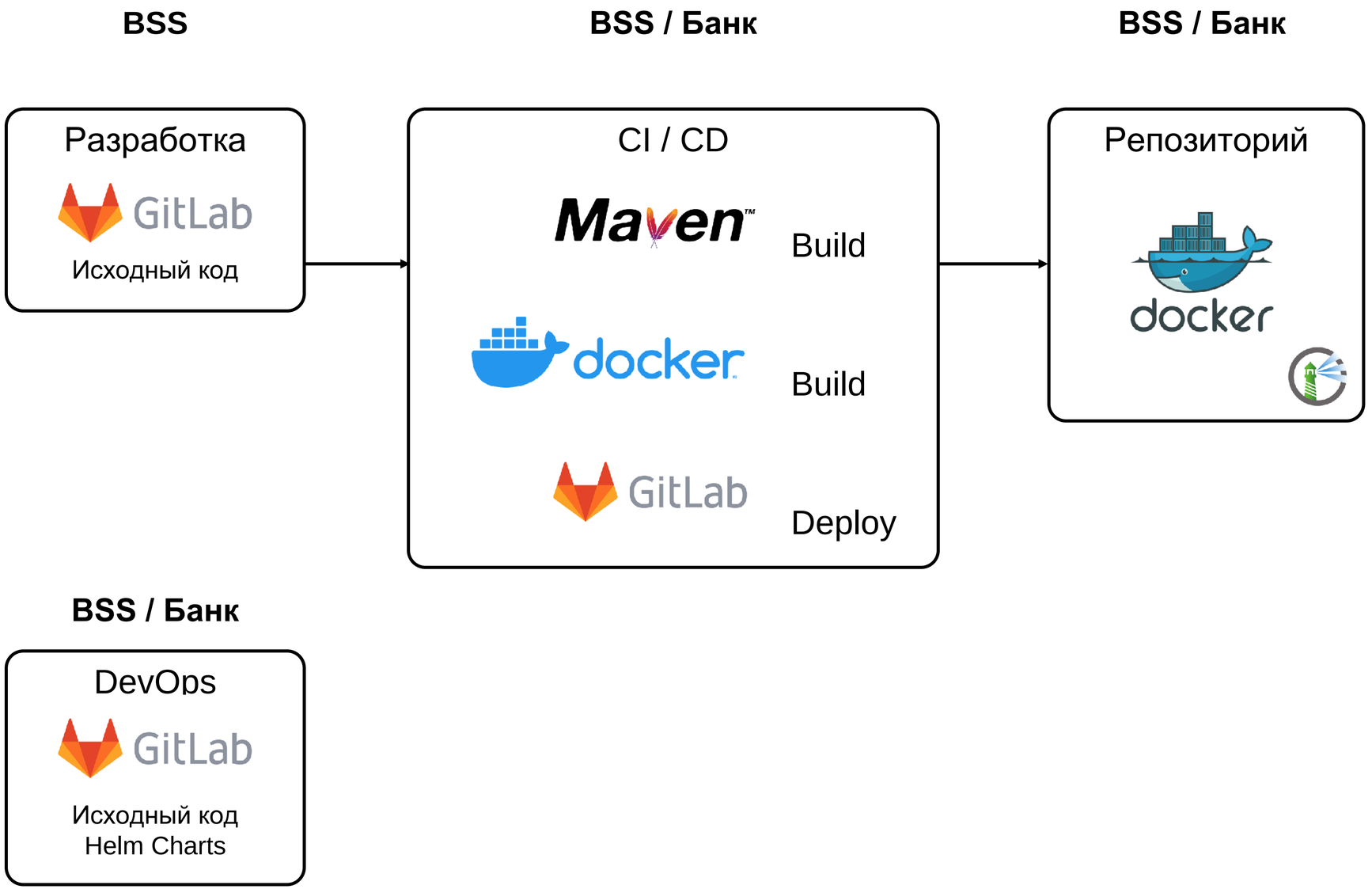
Развертывание в микросервисной платформе



Развертывание в микросервисной платформе



Развертывание в микросервисной платформе



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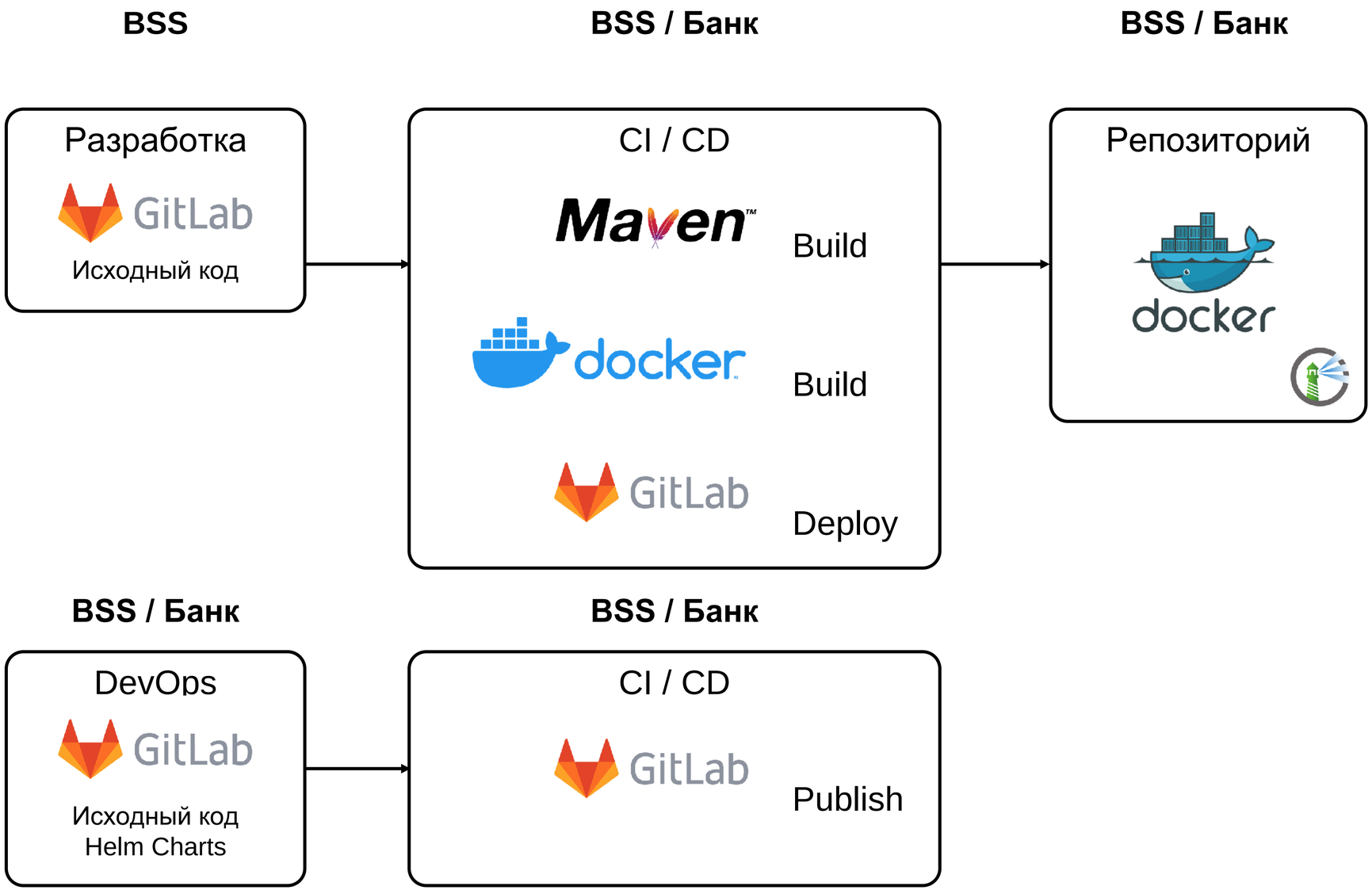

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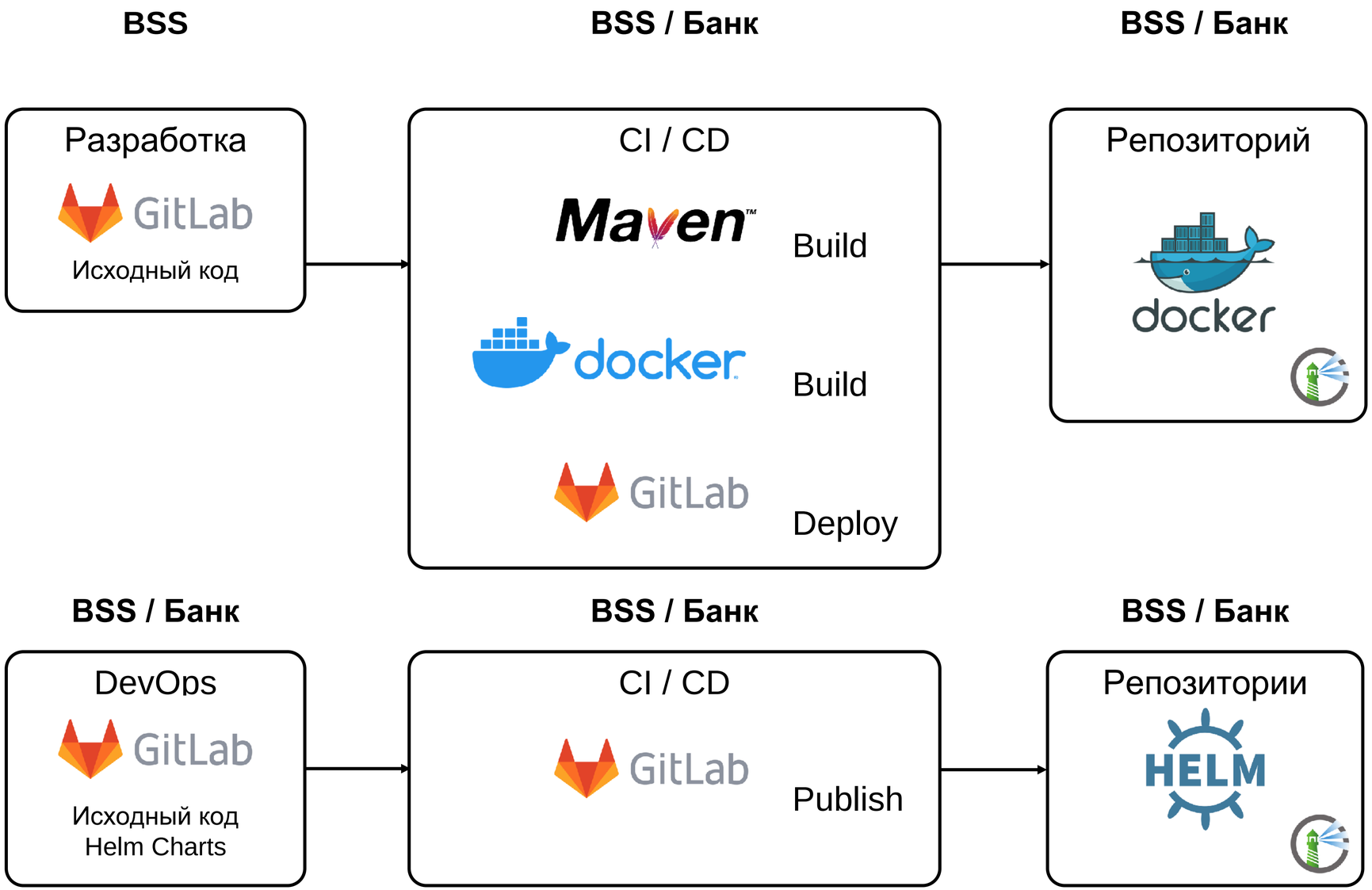

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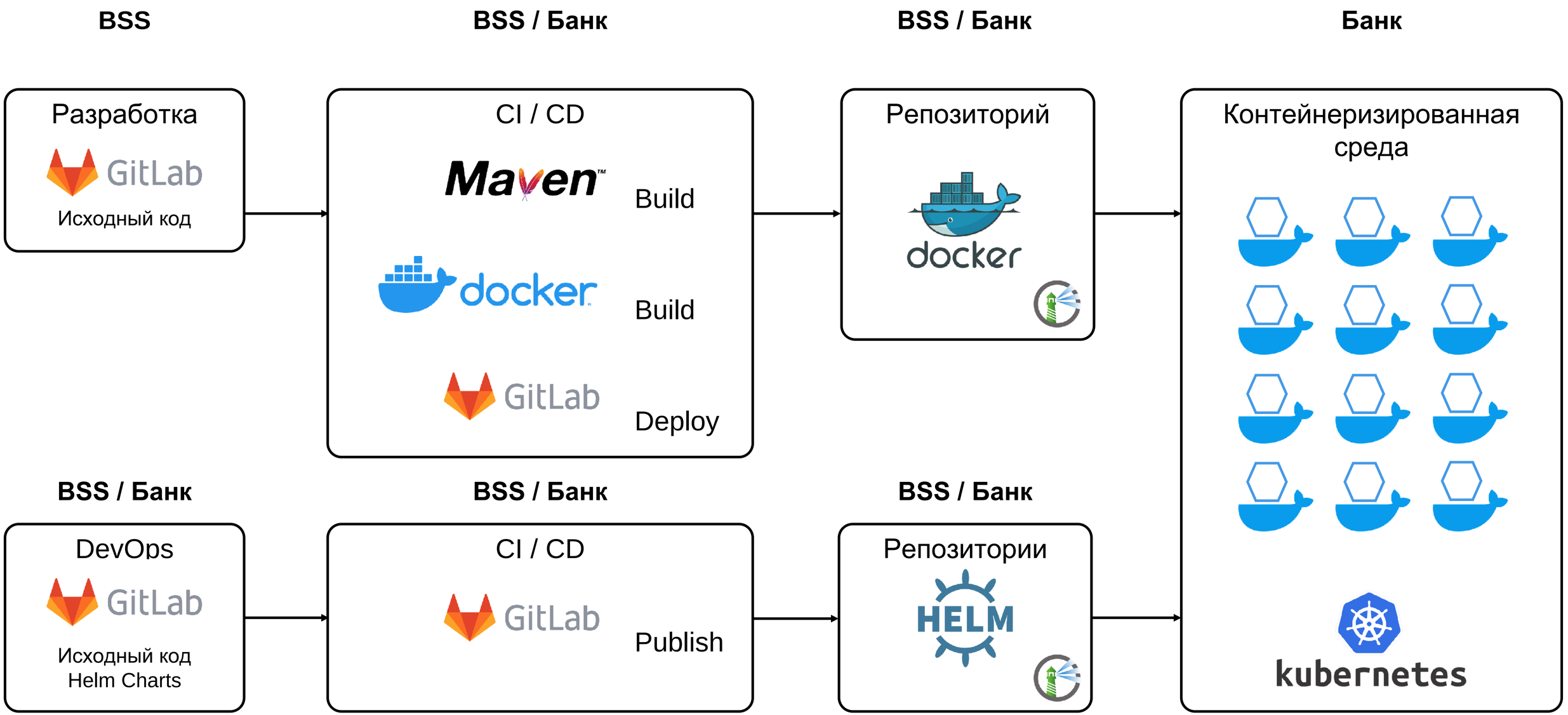


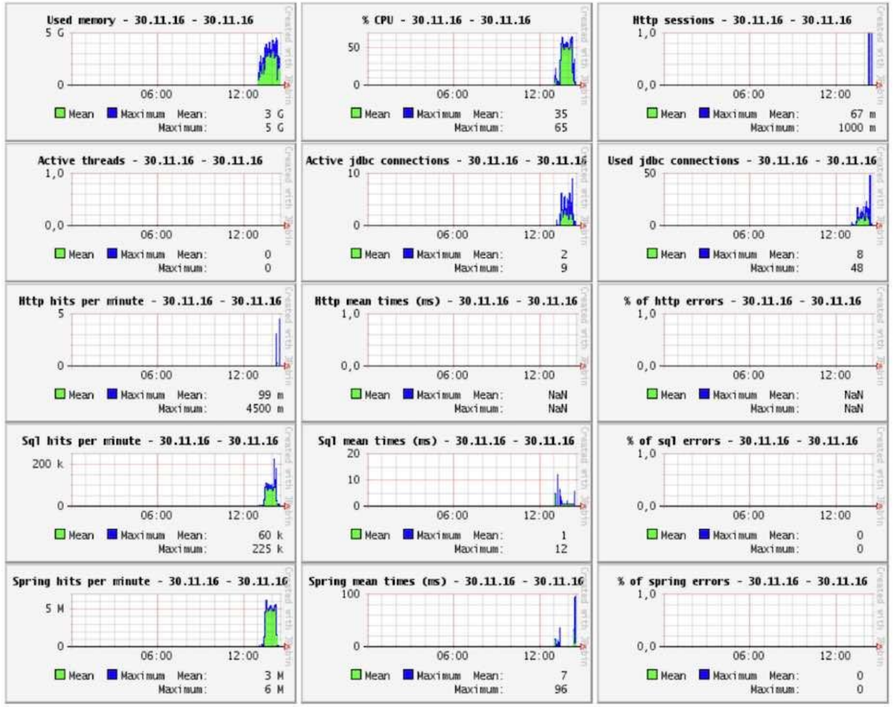
BSS

Мониторинг

Мониторинг раньше

Monitoring JavaMelody on /sbns-app_VM-LT-APP-02 - 30.11.16 - 30.11.16

Statistics of JavaMelody monitoring taken at 30.11.16 14:32 on /sbns-app_VM-LT-APP-02 (Sbns application server)



Statistics http - 30.11.16 - 30.11.16

Request	% of cumulative time	Hits	Mean time (ms)	Max time (ms)	Standard deviation	% of cumulative cpu time	Mean cpu time (ms)	% of system error	Mean size (Kb)	Mean hits sql	Mean time sql (ms)
http global	100,00	11	485	4 179	1 229	100,00	80	0,00	16	2	5
http warning	83,12	2	2 221	4 179	2 769	10,40	46	0,00	90	0	0
http severe	0,00	0	-1	0	-1	0,00	-1	0,00	0	-1	-1

0 hits/min on 4 requests

Monitoring JavaMelody on /sbns-app_VM-LT-APP-02 - 30.11.16 - 30.11.16

Detailed statistics http - 30.11.16 - 30.11.16

Request	% of cumulative time	Hits	Mean time (ms)	Max time (ms)	Standard deviation	% of cumulative cpu time	Mean cpu time (ms)	% of system error	Mean size (Kb)	Mean hits sql	Mean time sql (ms)
/auth/index.jsp GET	83,12	2	2 221	4 179	2 769	10,40	46	0,00	90	0	0
/auth/prelogin.html POST	9,43	2	252	271	26	49,27	218	0,00	0	6	12
/ GET	5,65	5	60	147	79	33,45	59	0,00	0	0	0
/auth/login.html POST	1,80	2	45	53	7	6,89	30	0,00	0	8	16

0 hits/min on 4 requests

Detailed statistics sql - 30.11.16 - 30.11.16

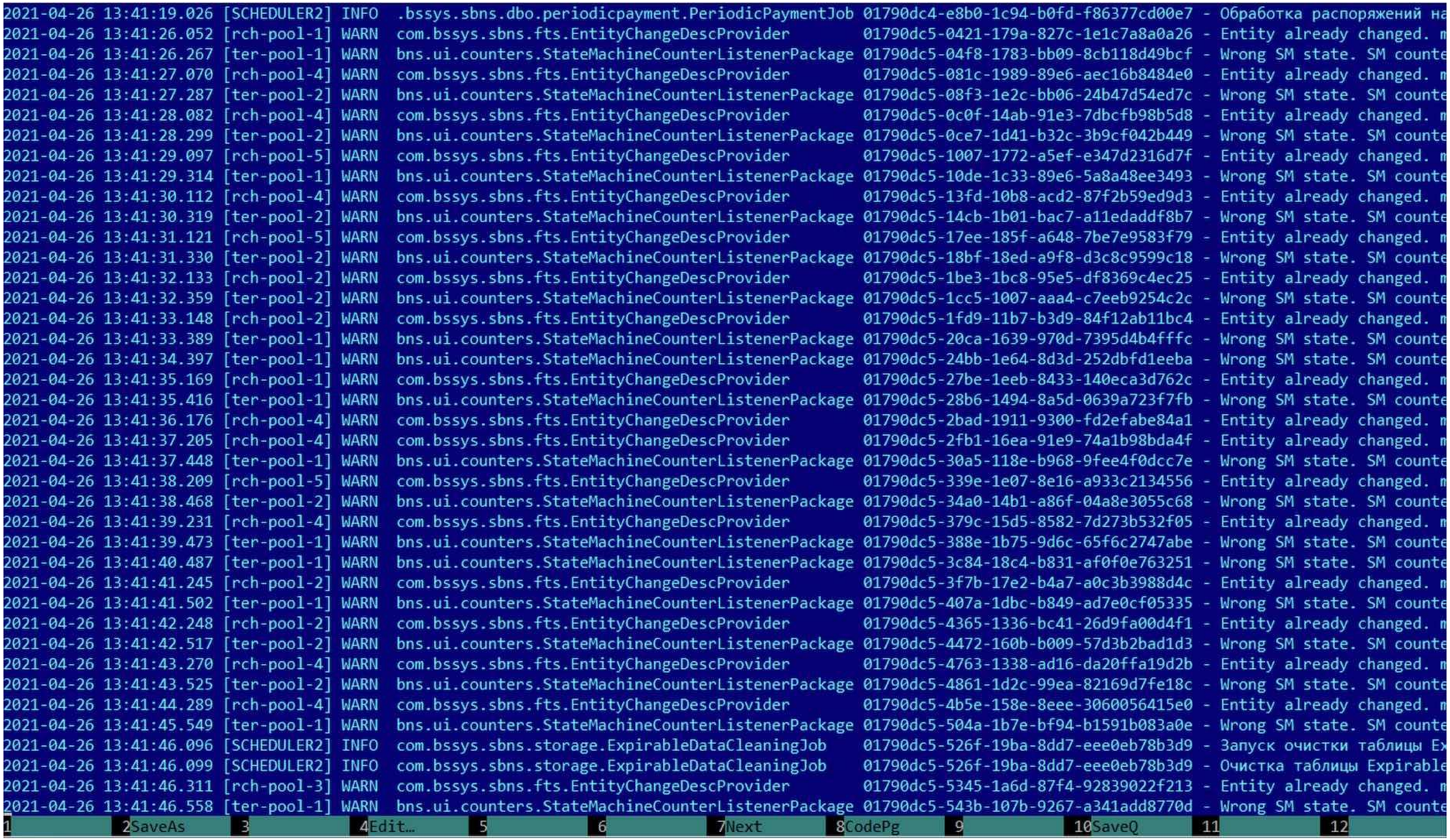
Request	% of cumulative time	Hits	Mean time (ms)	Max time (ms)	Standard deviation	% of system error
select * from (select row_.*, rownum rownum_ from (select this_.LOGINTIME as y0_, this_.IPADDRESS as y1_ from SBNS_USER_LOGIN_EVENT this_ where this_.USERID=? and this_.STATUS=? order by this_.LOGINTIME desc) row_ where rownum <= ?) where rownum_ > ?	6,80	15 551	35	3 949	83	0,00
select * from (select r030x0_.ID as col_0_0_, r030x0_.DOCNUMBER as col_1_0_, r030x0_.DOCDATE as col_2_0_, r030x0_.CURRENTSTATENAMESYS as col_3_0_, r030x0_.RECEIVERNAME as col_4_0_, r030x0_.RECEIVERINN as col_5_0_, r030x0_.RECEIVERACCOUNT as col_6_0_, r030x0_.PAYMENTPURPOSE as col_7_0_, r030x0_.PAYERNAME as col_8_0_, r030x0_.PAYERACCOUNT as col_9_0_, r030x0_.DOCUMENTSUM as col_10_0_, r030x0_.PAYERBANKBIC as col_11_0_, r030x0_.MBASTATENAME as col_12_0_, r030x0_.DOCUMENTSUM as col_13_0_, r030x0_.MPID as col_14_0_ from SBNS_RPAYORDER r030x0_ where (r030x0_.TEMPLATE=? or r030x0_.TEMPLATE is null) and r030x0_.DELETETIME=? and r030x0_.ARCHIVETIME=? and (r030x0_.ORGTYPE=? or r030x0_.ORGTYPE is null) and (r030x0_.ORGID in (?)) and (r030x0_.ACCOUNTID in (? , ?) or r030x0_.ACCOUNTID is null) order by r030x0_.LASTMODIFYDATE desc, r030x0_.ID desc) where rownum <= ?	5,34	5 541	78	2 246	195	0,00
select statemachi0_.ID as ID2_526_0_, statemachi0_.ARCHIVETIME as ARCHIVETIME3_526_0_, statemachi0_.DELETETIME as DELETETIME4_526_0_, statemachi0_.SYSCREATETIME as SYSCREATETIME5_526_0_, statemachi0_.VERSION as VERSION6_526_0_, statemachi0_.CURRENTSTATENAMESYS as CURRENTSTATENAMESY7_526_0_, statemachi0_.STATEMACHINECLASSID as STATEMACHINECLASSI8_526_0_, statemachi0_.DTYPE as DTYPE1_526_0_ from SBNS_SM_INSTANCE statemachi0_ where statemachi0_.ID=?	4,89	444 809	0	385	2	0,00
select usersessio0_.ID as ID1_569_, usersessio0_.ARCHIVETIME as ARCHIVETIME2_569_, usersessio0_.DELETETIME as DELETETIME3_569_, usersessio0_.SYSCREATETIME as SYSCREATETIME4_569_, usersessio0_.VERSION as VERSION5_569_, usersessio0_.AKEY as AKEY6_569_, usersessio0_.USERSESSIONID as USERSESSIONID8_569_, usersessio0_.VALUE as VALUE7_569_ from SBNS_USERSESSION_DATA usersessio0_ where usersessio0_.USERSESSIONID=?	3,81	283 796	1	2 228	6	0,00
select usersessio0_.SESSIONID as SESSIONID1_132_0_, usersessio0_.CHANNELTYPE as CHANNELTYPE2_132_0_, usersessio0_.LASTACCESS as LASTACCESS3_132_0_, usersessio0_.LASTCHECKED as LASTCHECKED4_132_0_, usersessio0_.LASTEVENTCALLTIME as LASTEVENTCALLTIME5_132_0_, usersessio0_.LASTNODENAME as LASTNODENAME6_132_0_, usersessio0_.POINTNAME as POINTNAME7_132_0_, usersessio0_.TOKENSID as TOKENSID8_132_0_, usersessio0_.USERID as USERID9_132_0_, usersessio0_.USERNAME as USERNAME10_132_0_ from SBNS_CURRENTSESSION usersessio0_ where usersessio0_.SESSIONID=?	2,96	250 150	0	1 911	4	0,00
insert into SBNS_SM_HISTORY (ARCHIVETIME, DELETETIME, SYSCREATETIME, VERSION, ENTERDATE, STATECOMMENT, STATE_MACHINE_ID, STATENAMESYS, USERNAME, ID) values (?, ?, ?, ?, ?, ?, ?, ?, ?, ?)	2,92	20 361	11	335	12	0,00
select * from (select row_.*, rownum rownum_ from (select r020x0_.ID as col_0_0_, r020x0_.ACCOUNT as col_1_0_, r020x0_.ORGNAME as col_2_0_, r020x0_.FROMDATE as col_3_0_, r020x0_.DOCDATE as col_4_0_, r020x0_.STATE as col_5_0_, r020x0_.INBOUNDBALANCE as col_6_0_, r020x0_.CREDITRETURN as col_7_0_, r020x0_.DEBETRETURN as col_8_0_, r020x0_.OUTBOUNDBALANCE as col_9_0_, r020x0_.CURRISOCODE as col_10_0_, r020x0_.BANKBIC as col_11_0_, r020x0_.BANKNAME as col_12_0_, r020x0_.ISFINAL as col_13_0_ from SBNS_RURSTATEMENT r020x0_ where r020x0_.ARCHIVETIME=? and r020x0_.DELETETIME=? and 1=1 order by r020x0_.FROMDATE desc, r020x0_.ACCOUNT asc, r020x0_.ID asc) row_ where rownum <= ?) where rownum_ > ?	2,81	6	38 300	65 111	27 128	0,00
select dependenta0_.ACTUATING_ATTRIBUTE_ID as ACTUATING_ATTRIBUT7_414_0_, dependenta0_.ID as ID1_417_0_, dependenta0_.ID as ID1_417_1_, dependenta0_.ARCHIVETIME as ARCHIVETIME2_417_1_, dependenta0_.DELETETIME as DELETETIME3_417_1_, dependenta0_.SYSCREATETIME as SYSCREATETIME4_417_1_, dependenta0_.VERSION as VERSION5_417_1_, dependenta0_.ACTUATING_ATTRIBUTE_ID as ACTUATING_ATTRIBUT7_417_1_, dependenta0_.DEPENDENT_ATTRIBUTE_ID as DEPENDENT_ATTRIBUT6_417_1_ from SBNS_PROTOTYPE_DEP_ATTR dependenta0_ where dependenta0_.ACTUATING_ATTRIBUTE_ID=?	1,91	162 880	0	1 915	9	0,00
select values0_.ATTRIBUTEID as ATTRIBUTEID8_414_0_, values0_.ID as ID1_420_0_, values0_.ID as ID1_420_1_, values0_.ARCHIVETIME as ARCHIVETIME2_420_1_, values0_.DELETETIME as DELETETIME3_420_1_, values0_.SYSCREATETIME as SYSCREATETIME4_420_1_, values0_.VERSION as VERSION5_420_1_, values0_.ATTRIBUTEID as ATTRIBUTEID8_420_1_, values0_.INDEXNUM as INDEXNUM6_420_1_, values0_.VALUE as VALUE7_420_1_ from SBNS_PROTOTYPE_VALUE values0_ where values0_.ATTRIBUTEID=?	1,89	163 033	0	1 909	6	0,00
select prototypef0_.PROTOTYPEATTRIBUTEID as PROTOTYPEATTRIBUT15_414_0_, prototypef0_.ID as ID1_418_0_, prototypef0_.ID as ID1_418_1_, prototypef0_.ARCHIVETIME as ARCHIVETIME2_418_1_, prototypef0_.DELETETIME as DELETETIME3_418_1_, prototypef0_.SYSCREATETIME as SYSCREATETIME4_418_1_, prototypef0_.VERSION as VERSION5_418_1_, prototypef0_.FILTERBOOLEANVALUE as FILTERBOOLEANVALUE6_418_1_, prototypef0_.FILTERCOLUMN as FILTERCOLUMN7_418_1_, prototypef0_.FILTERCONDITION as FILTERCONDITION8_418_1_, prototypef0_.FILTERDATEVALUE as FILTERDATEVALUE9_418_1_, prototypef0_.FILTERMONEYVALUE as FILTERMONEYVALUE10_418_1_, prototypef0_.FILTERNUMERICVALUE as FILTERNUMERICVALU11_418_1_, prototypef0_.FILTERSTRINGVALUE as	1,82	162 370	0	1 910	6	0,00

Мониторинг в микросервисной платформе

BSS

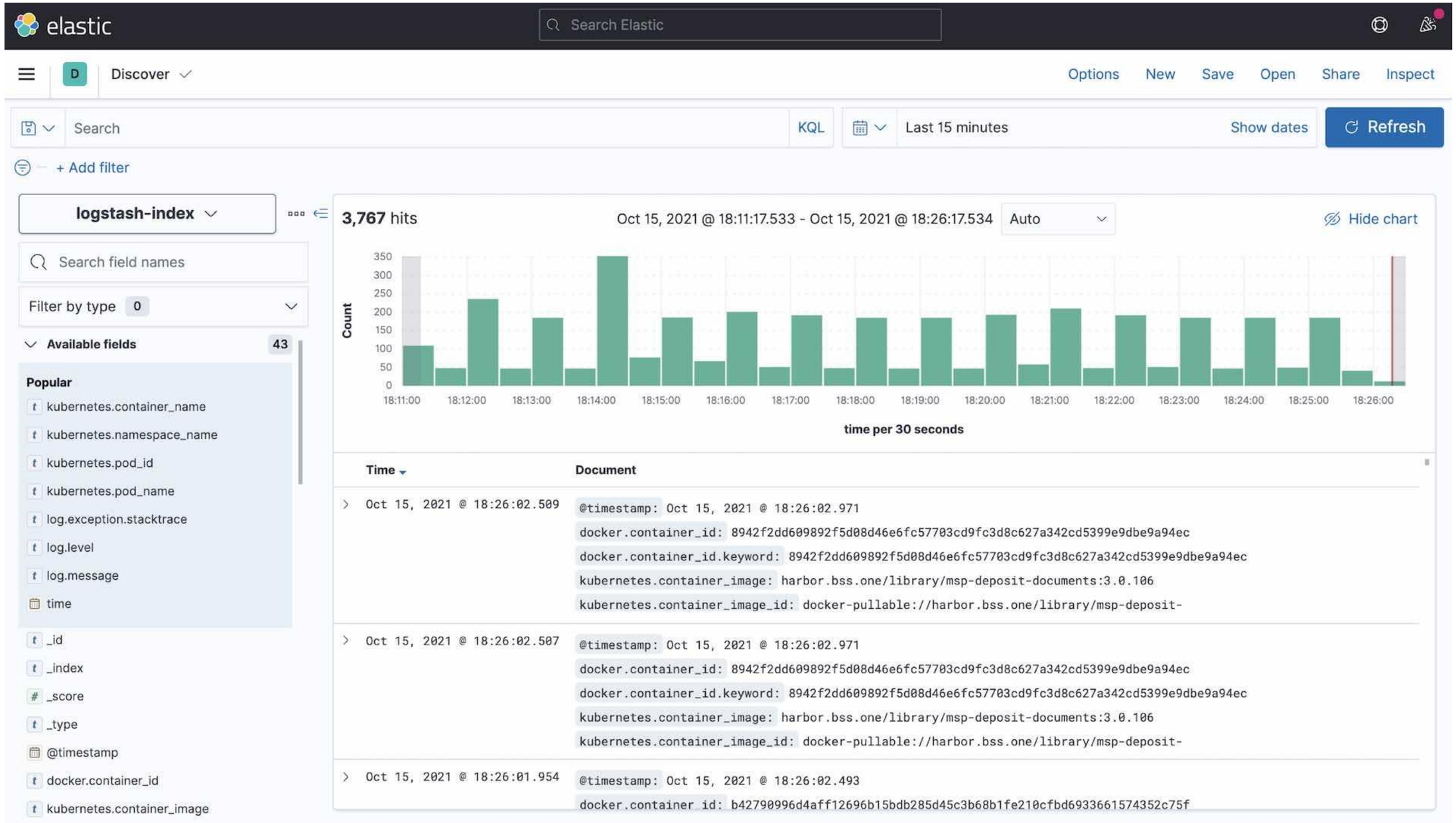
Логирование

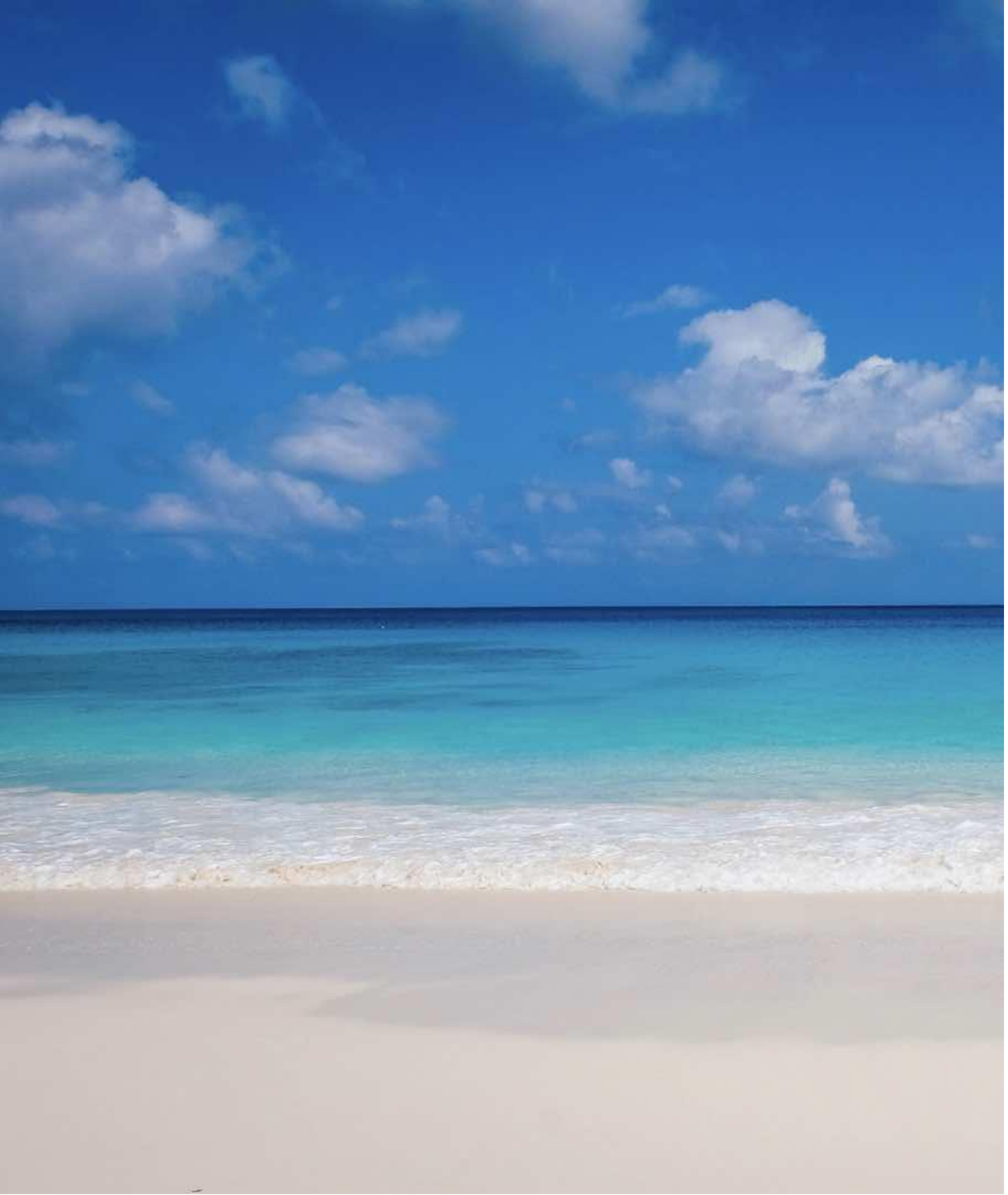
Логирование раньше



```
2021-04-26 13:41:19.026 [SCHEDULER2] INFO  .bssys.sbns.dbo.periodicpayment.PeriodicPaymentJob 01790dc4-e8b0-1c94-b0fd-f86377cd00e7 - Обработка распоряжений на
2021-04-26 13:41:26.052 [rch-pool-1] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-0421-179a-827c-1e1c7a8a0a26 - Entity already changed. m
2021-04-26 13:41:26.267 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-04f8-1783-bb09-8cb118d49bcf - Wrong SM state. SM counte
2021-04-26 13:41:27.070 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-081c-1989-89e6-aec16b8484e0 - Entity already changed. m
2021-04-26 13:41:27.287 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-08f3-1e2c-bb06-24b47d54ed7c - Wrong SM state. SM counte
2021-04-26 13:41:28.082 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-0c0f-14ab-91e3-7dbcfb98b5d8 - Entity already changed. m
2021-04-26 13:41:28.299 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-0ce7-1d41-b32c-3b9cf042b449 - Wrong SM state. SM counte
2021-04-26 13:41:29.097 [rch-pool-5] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-1007-1772-a5ef-e347d2316d7f - Entity already changed. m
2021-04-26 13:41:29.314 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-10de-1c33-89e6-5a8a48ee3493 - Wrong SM state. SM counte
2021-04-26 13:41:30.112 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-13fd-10b8-acd2-87f2b59ed9d3 - Entity already changed. m
2021-04-26 13:41:30.319 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-14cb-1b01-bac7-a11edaddf8b7 - Wrong SM state. SM counte
2021-04-26 13:41:31.121 [rch-pool-5] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-17ee-185f-a648-7be7e9583f79 - Entity already changed. m
2021-04-26 13:41:31.330 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-18bf-18ed-a9f8-d3c8c9599c18 - Wrong SM state. SM counte
2021-04-26 13:41:32.133 [rch-pool-2] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-1be3-1bc8-95e5-df8369c4ec25 - Entity already changed. m
2021-04-26 13:41:32.359 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-1cc5-1007-aaa4-c7eeb9254c2c - Wrong SM state. SM counte
2021-04-26 13:41:33.148 [rch-pool-2] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-1fd9-11b7-b3d9-84f12ab11bc4 - Entity already changed. m
2021-04-26 13:41:33.389 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-20ca-1639-970d-7395d4b4fffc - Wrong SM state. SM counte
2021-04-26 13:41:34.397 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-24bb-1e64-8d3d-252dbfd1eeba - Wrong SM state. SM counte
2021-04-26 13:41:35.169 [rch-pool-1] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-27be-1eeb-8433-140eca3d762c - Entity already changed. m
2021-04-26 13:41:35.416 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-28b6-1494-8a5d-0639a723f7fb - Wrong SM state. SM counte
2021-04-26 13:41:36.176 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-2bad-1911-9300-fd2efabe84a1 - Entity already changed. m
2021-04-26 13:41:37.205 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-2fb1-16ea-91e9-74a1b98bda4f - Entity already changed. m
2021-04-26 13:41:37.448 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-30a5-118e-b968-9fee4f0dcc7e - Wrong SM state. SM counte
2021-04-26 13:41:38.209 [rch-pool-5] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-339e-1e07-8e16-a933c2134556 - Entity already changed. m
2021-04-26 13:41:38.468 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-34a0-14b1-a86f-04a8e3055c68 - Wrong SM state. SM counte
2021-04-26 13:41:39.231 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-379c-15d5-8582-7d273b532f05 - Entity already changed. m
2021-04-26 13:41:39.473 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-388e-1b75-9d6c-65f6c2747abe - Wrong SM state. SM counte
2021-04-26 13:41:40.487 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-3c84-18c4-b831-af0f0e763251 - Wrong SM state. SM counte
2021-04-26 13:41:41.245 [rch-pool-2] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-3f7b-17e2-b4a7-a0c3b3988d4c - Entity already changed. m
2021-04-26 13:41:41.502 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-407a-1dbc-b849-ad7e0cf05335 - Wrong SM state. SM counte
2021-04-26 13:41:42.248 [rch-pool-2] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-4365-1336-bc41-26d9fa00d4f1 - Entity already changed. m
2021-04-26 13:41:42.517 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-4472-160b-b009-57d3b2bad1d3 - Wrong SM state. SM counte
2021-04-26 13:41:43.270 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-4763-1338-ad16-da20ffa19d2b - Entity already changed. m
2021-04-26 13:41:43.525 [ter-pool-2] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-4861-1d2c-99ea-82169d7fe18c - Wrong SM state. SM counte
2021-04-26 13:41:44.289 [rch-pool-4] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-4b5e-158e-8eee-3060056415e0 - Entity already changed. m
2021-04-26 13:41:45.549 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-504a-1b7e-bf94-b1591b083a0e - Wrong SM state. SM counte
2021-04-26 13:41:46.096 [SCHEDULER2] INFO  com.bssys.sbns.storage.ExpirableDataCleaningJob    01790dc5-526f-19ba-8dd7-eee0eb78b3d9 - Запуск очистки таблицы Ex
2021-04-26 13:41:46.099 [SCHEDULER2] INFO  com.bssys.sbns.storage.ExpirableDataCleaningJob    01790dc5-526f-19ba-8dd7-eee0eb78b3d9 - Очистка таблицы Expirable
2021-04-26 13:41:46.311 [rch-pool-3] WARN  com.bssys.sbns.fts.EntityChangeDescProvider        01790dc5-5345-1a6d-87f4-92839022f213 - Entity already changed. m
2021-04-26 13:41:46.558 [ter-pool-1] WARN  bns.ui.counters.StateMachineCounterListenerPackage 01790dc5-543b-107b-9267-a341add8770d - Wrong SM state. SM counte
1          2SaveAs    3          4Edit…     5          6          7Next      8CodePg    9          10SaveQ    11         12
```

Логирование в микросервисной платформе





BSS

Цели

- **Быстрая поставка**
- **Упрощение совместной с банками разработки на базе SDK**
- **Возможность отдельного внедрения продуктов без внедрения всего ДБО**
- **Повышение производительности и отказоустойчивости**
- **Возможность частичной модернизации ДБО в микросервисной архитектуре**

Ключевые преимущества

- **Поставка продуктов**
- **Развертывание решения**
- **Мониторинг**
- **Логирование**

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Фонд Министерства цифрового развития, связи и массовых коммуникаций Российской Федерации

BSS for Everyone.

Спасибо за внимание!

Дмитрий Свалов, Технический директор, BSS

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