Capgemini

26th Oct 2023

MICROSERVICES – IN DEPTH

Expert Connect Session

Speaker

Chandra Mouli

Solution Architect

AGENDA

- Recap
  - Overview of Microservices Architecture & Challenges
  - Microservices Patterns
- Microservices main characteristics
- Service infrastructure principles
- Q&A
- Think out of the box

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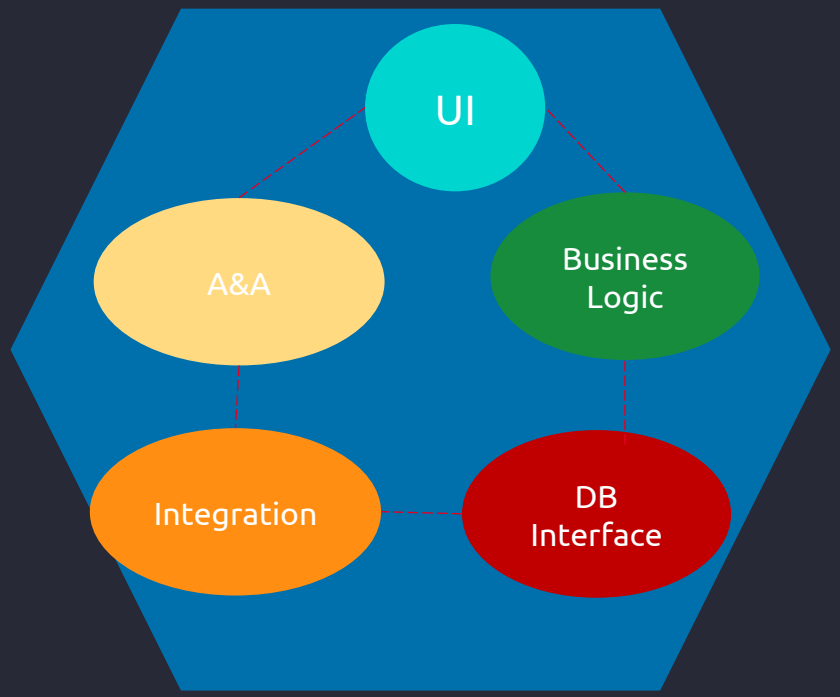
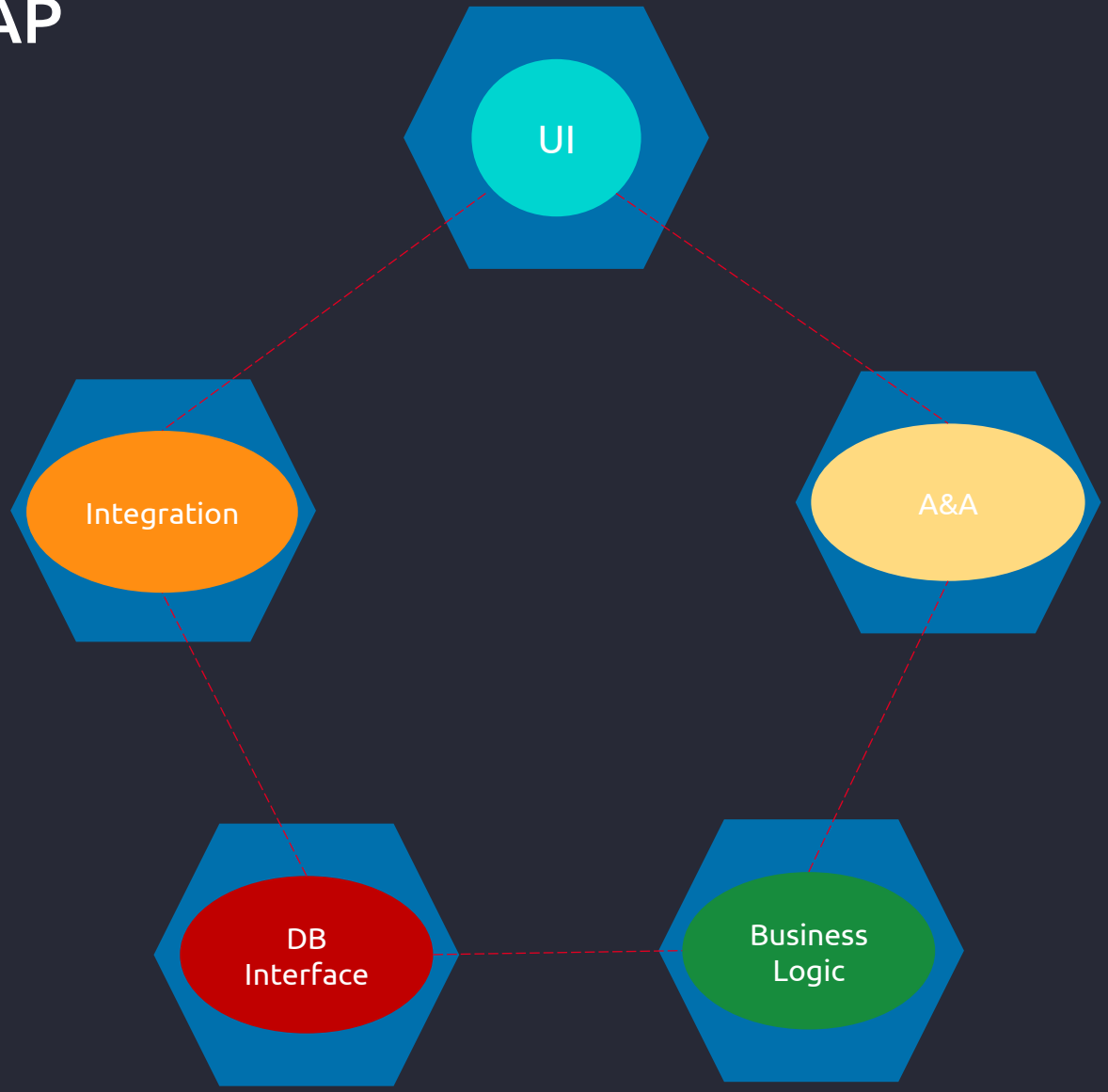
WHO AM I?

- 20+ years of IT Experience
- Role - Solution Architect
- Expertise in
  - System Design
  - Java & J2EE Development
  - Cloud
  - Integration

OVERVIEW OF **MICROSERVICES - RECAP**

- What is Microservice Architecture?
- When should we choose microservice architecture?
- Challenges in Microservices





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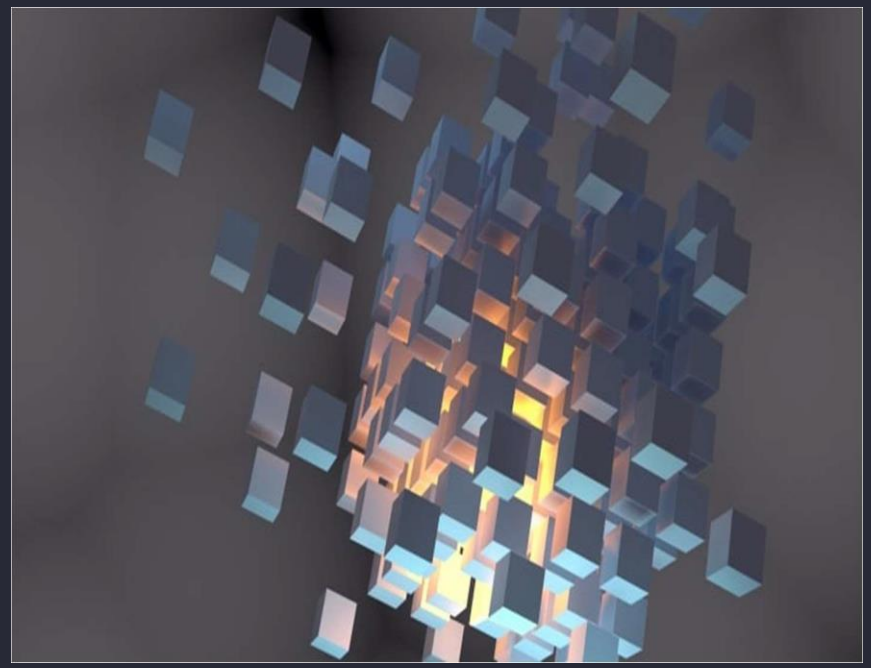
MICROSERVICES MAIN CHARACTERISTICS

A ‘good’ microservice have 7 main characteristics

1. Fine-grained capabilities that are *stateless* *Eg:A&A*
2. Well *defined interfaces* which ‘hide’ how the service is executed. *Eg: Forex rate & Collect payment from different bank*
3. A ‘very loosely-coupled’ approach (can change one service without impacting another)
4. Autonomous, explicitly versioned & completely independent
5. stupid – “do one thing, and do it well”
6. cost and value fully defined
7. Disposable



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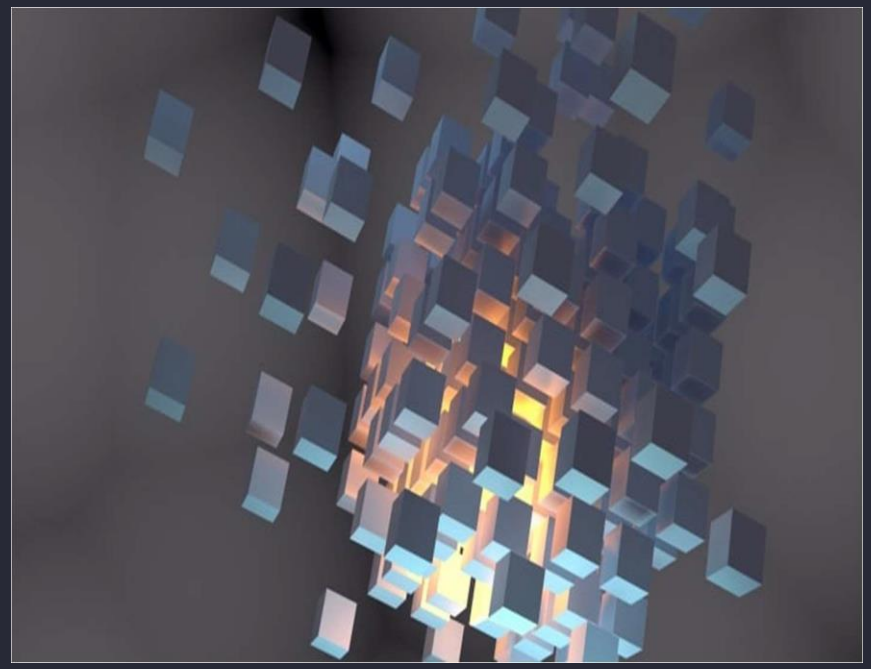
SERVICE INFRASTRUCTURE PRINCIPLES

A ‘good’ microservice have 7 main characteristics

1. Utility based
2. Open standards based
3. Multi-Tenant support
4. Technology independent & virtualized
5. Service oriented
6. Scalable
7. Fit-for-purpose
8. Sustainable
9. Automated
10. Modularity



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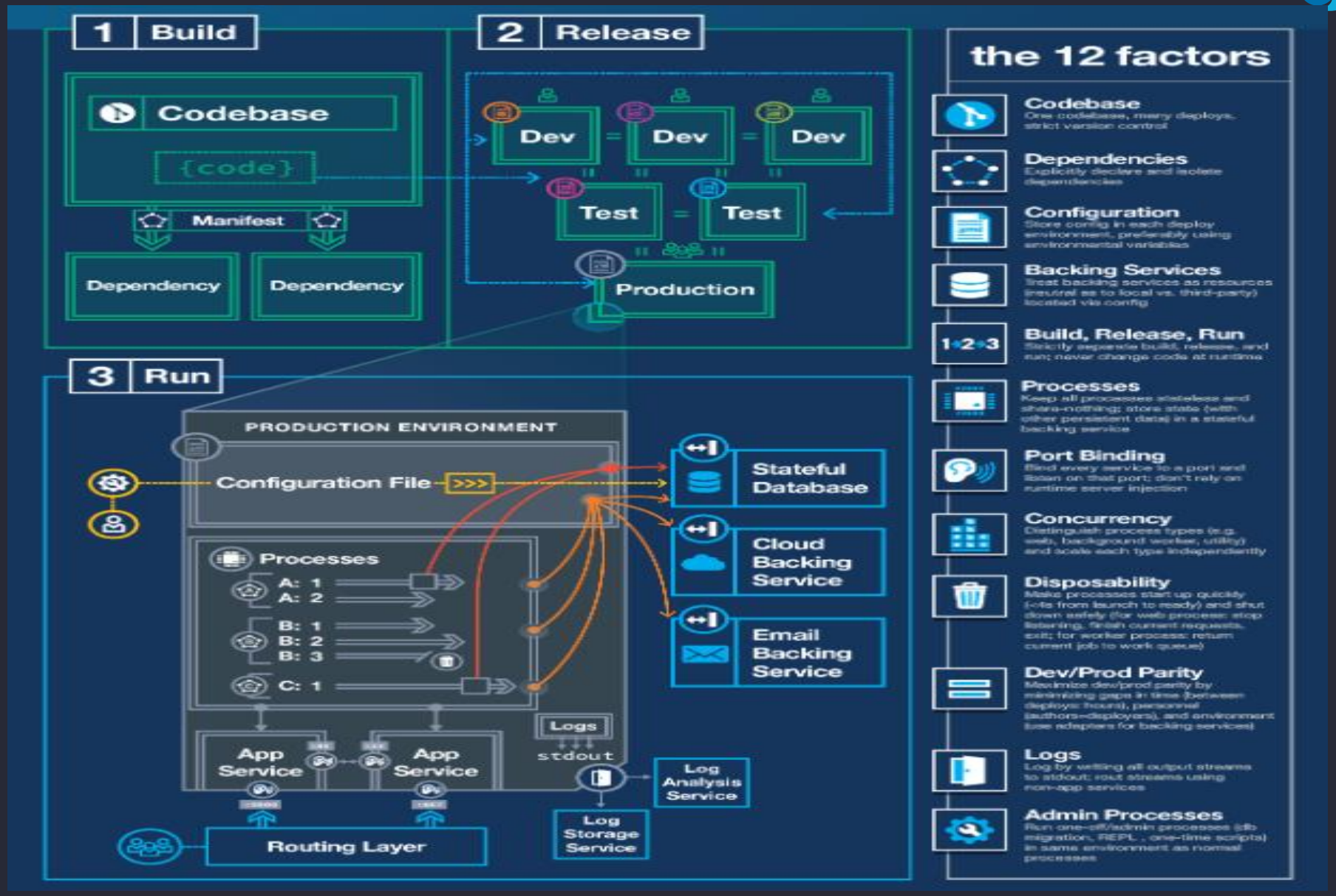
12-FACTOR APP



https://12factor.net/

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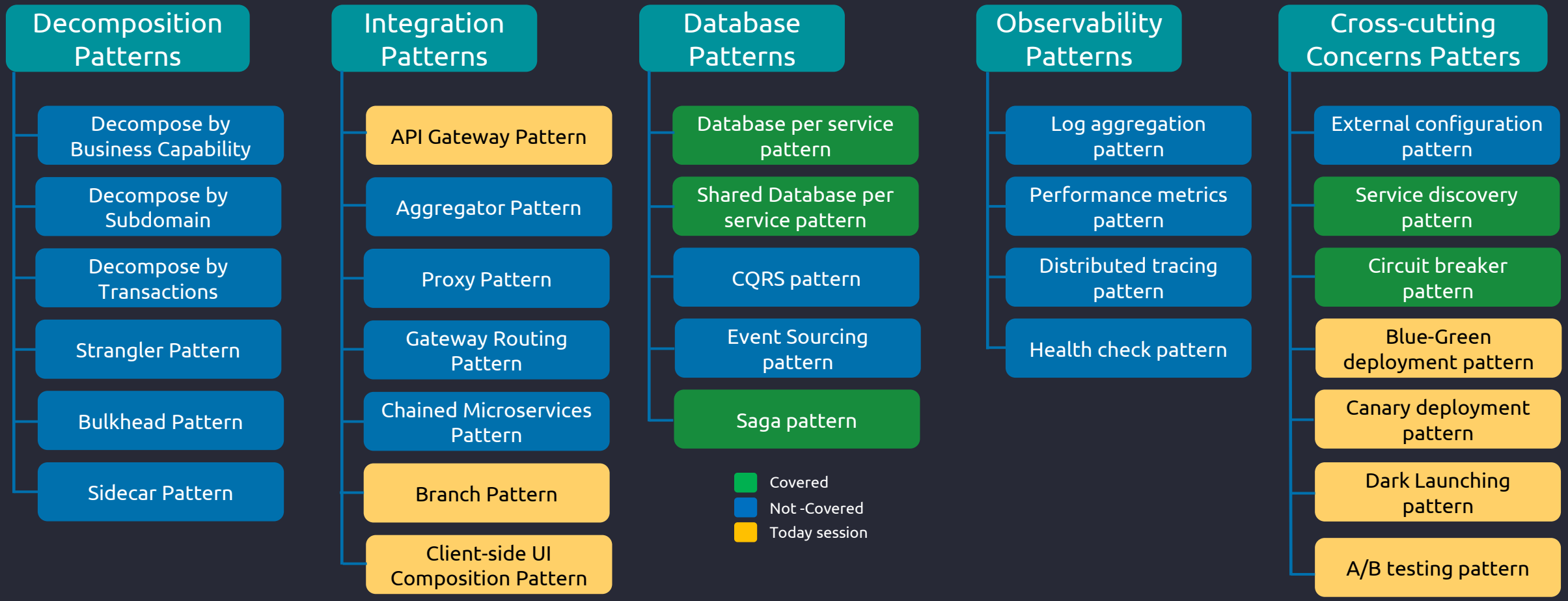
SOME MORE DESIGN PATTERNS



https://microservices.io/patterns/
https://dennylesmana.medium.com/microservices-deployment-patterns-ca1343c89e13

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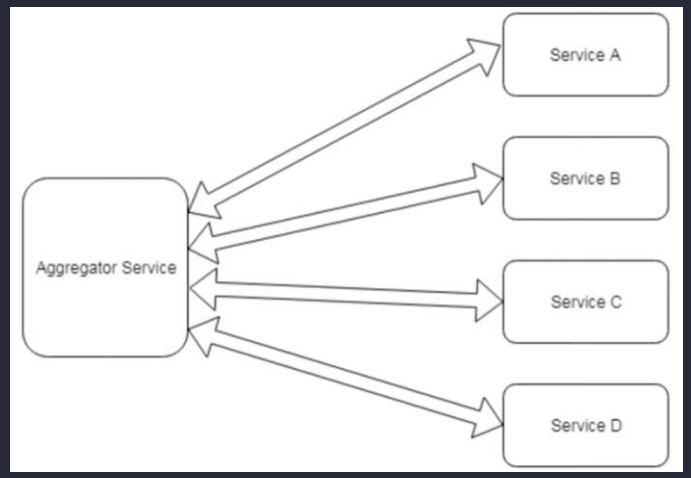
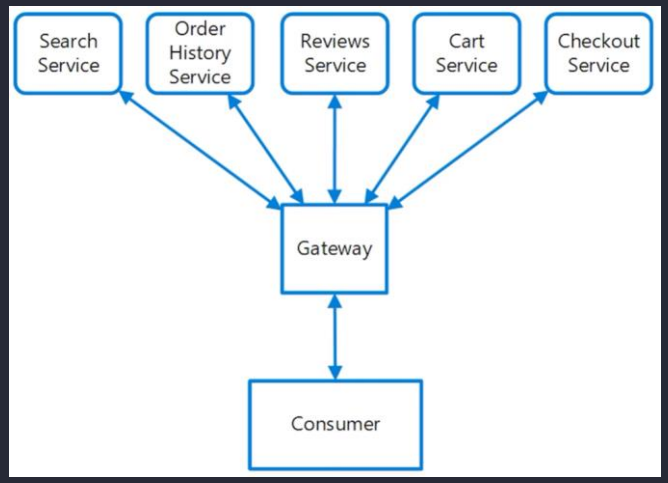
SOME MORE DESIGN PATTERNS

API Gateway Features

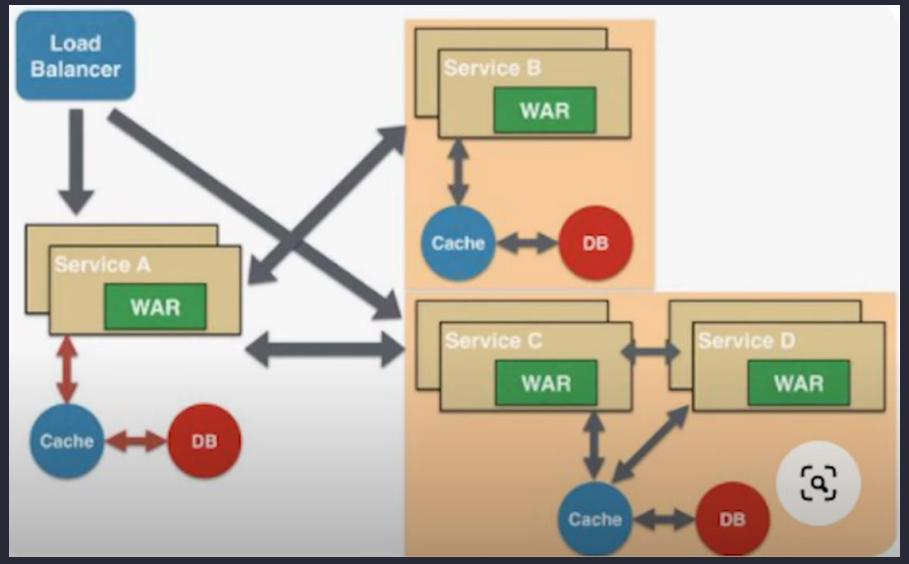
- Authentication and authorisation
- Service discovery integration
- Response caching
- SSL Termination
- Retry policies, circuit breaker, and Quality-of-Service
- Rate limiting and throttling
- Logging, tracing, correlation
- Headers, query strings, and claims transformation



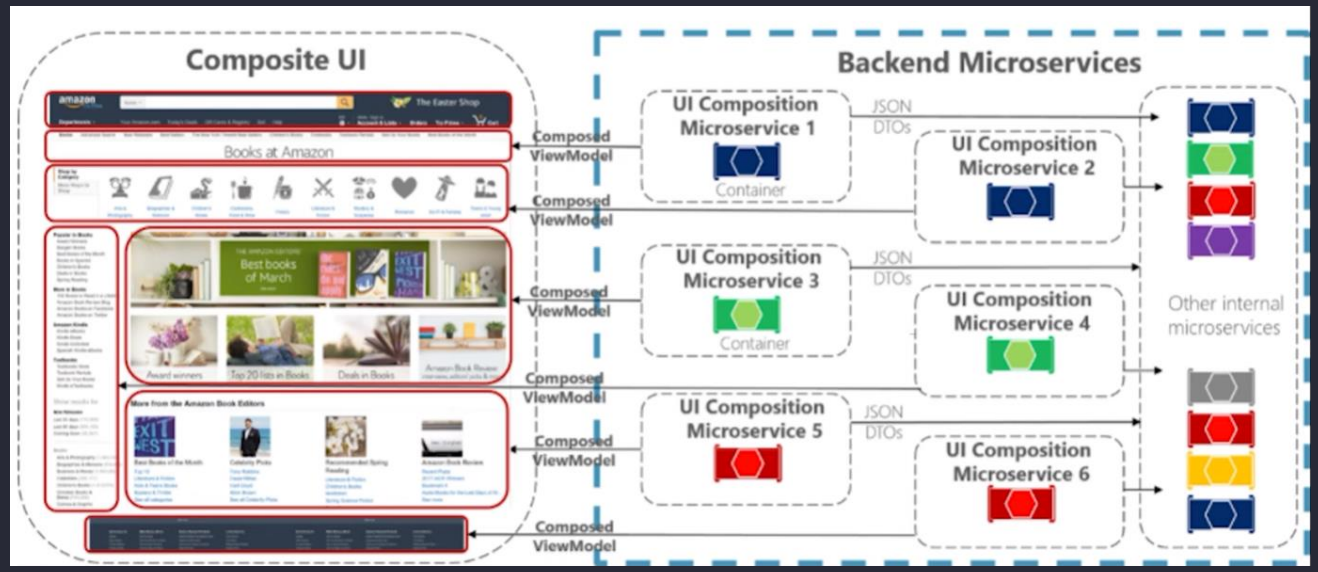
Aggregator Pattern



Gateway routing Pattern



Branch Pattern



Client-side UI Composition Pattern

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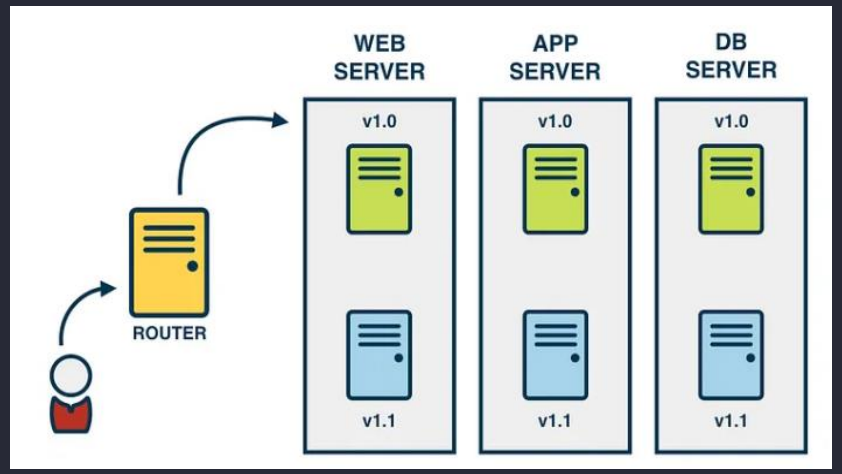
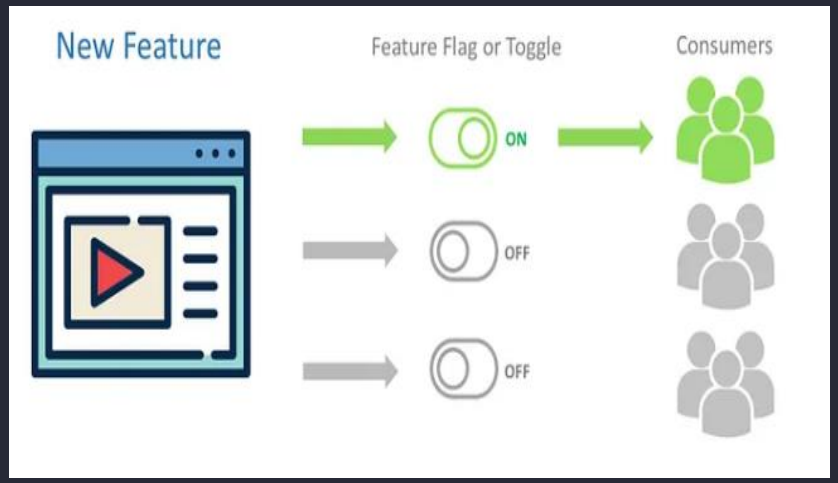
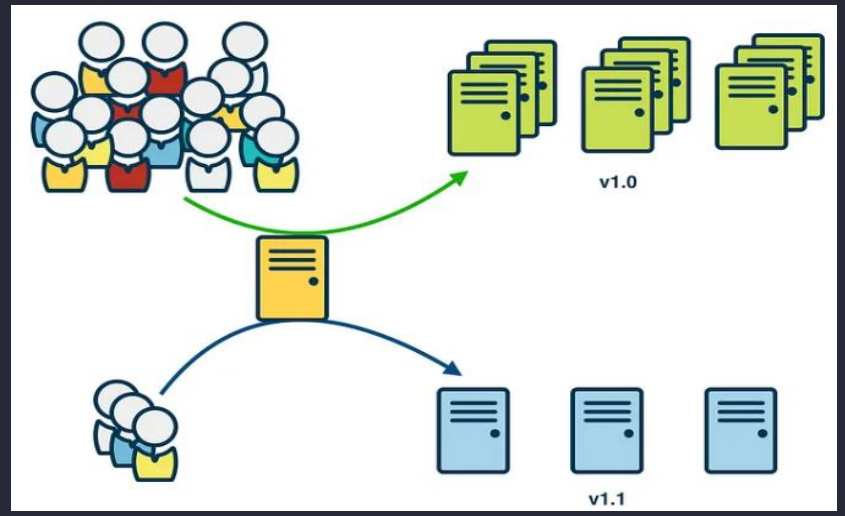
SOME MORE DESIGN PATTERNS



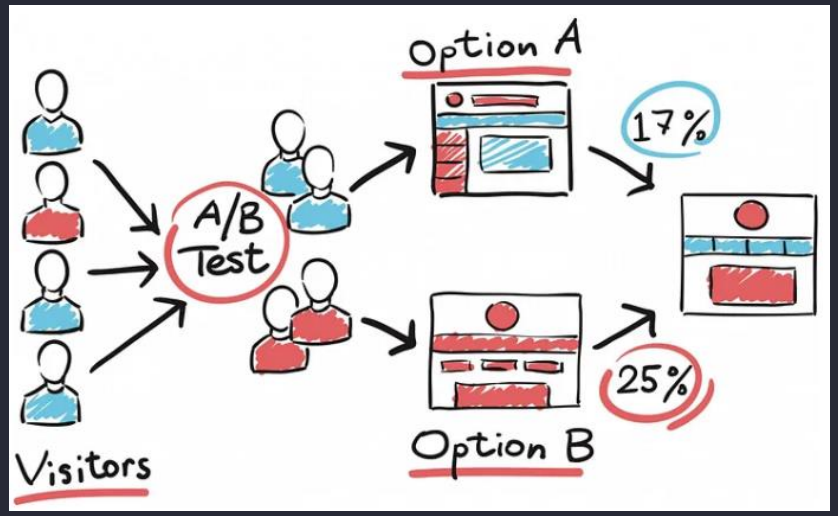
Blue/Green deployment



Dark Launching



Canary Deployment



A/B Testing

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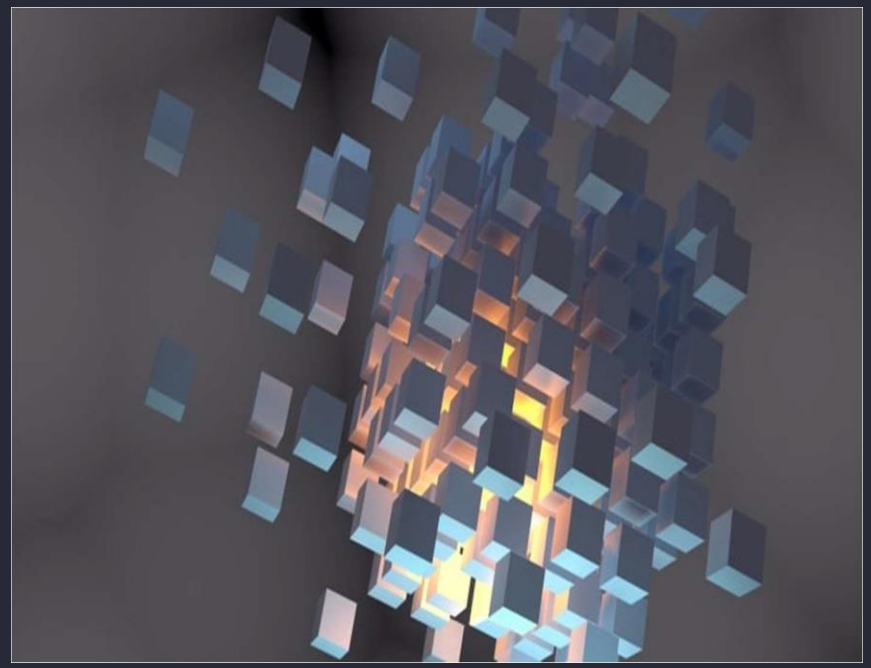
CHALLENGES

1. Logging.
2. Monitoring.
3. Service impact (Caused By One Service, Can Cause Trouble Elsewhere)
4. Version management & Cyclic dependency
5. Container Security

.. more



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Q & A

THINK OUT OF THE BOX

- Microservices based framework to provide basic CRUD operation (Plug and Play)

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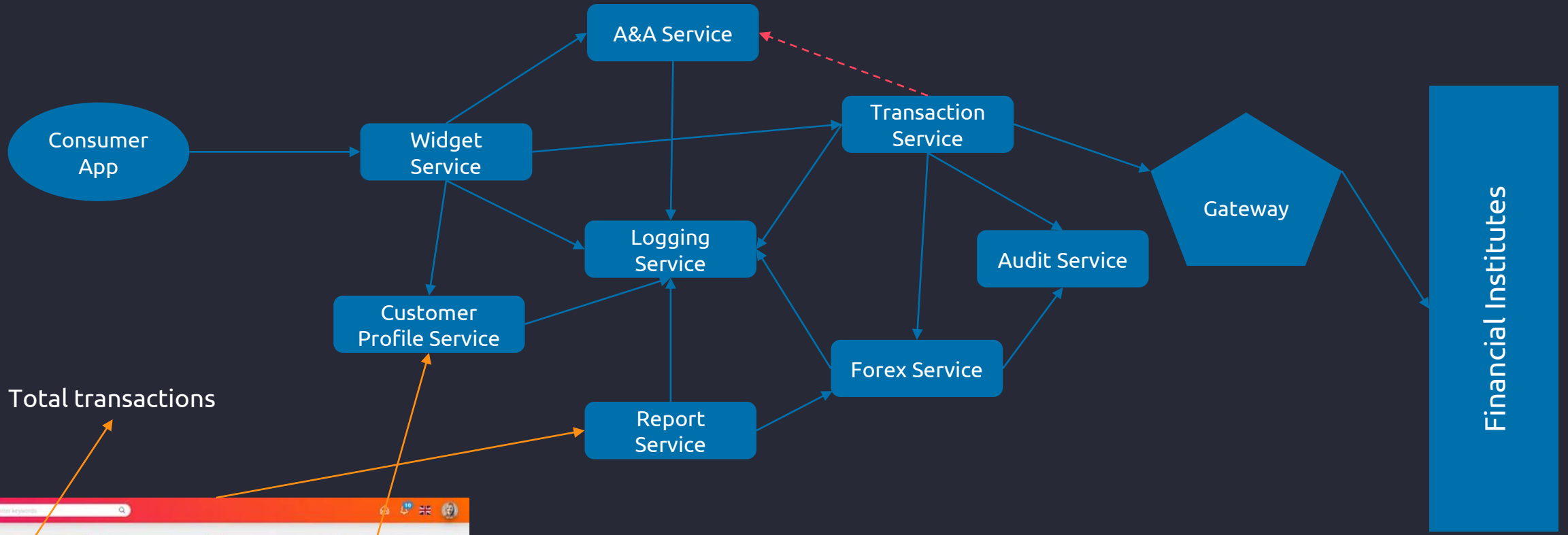
THINK OUT OF THE BOX



What all design patterns implemented in Simple Payment processing with Audit tracing and widget style implementation ?

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THANK YOU