

Documentation de la Phase 2 du Projet de Réseau Social en Microservices

Introduction

Cette documentation décrit la deuxième phase du projet de réseau social, qui se concentre sur l'optimisation de l'architecture en microservices. Cette phase vise à intégrer des technologies spécifiques pour renforcer l'application et garantir une performance optimale

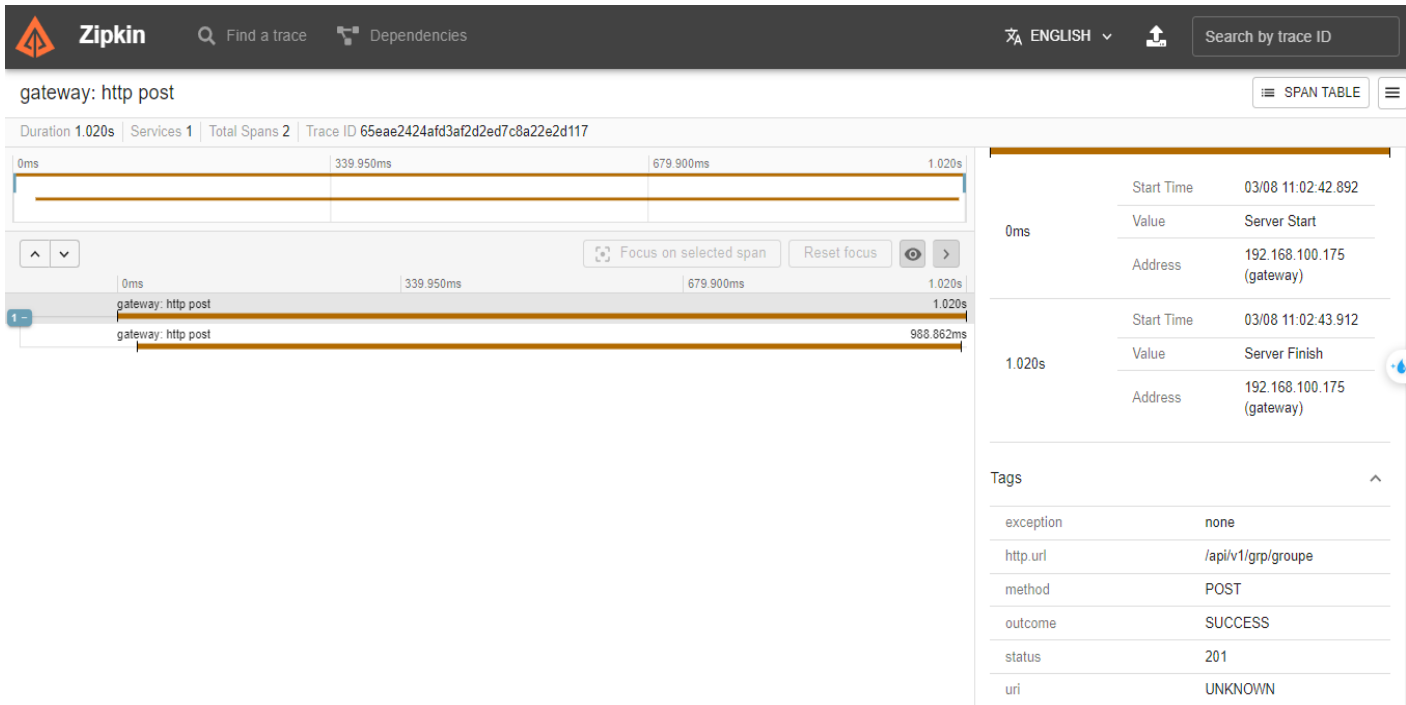
Objectifs

- Optimisation de l'architecture en microservices : Améliorer la performance, la résilience et la scalabilité de l'application.
- Intégration de technologies avancées : Utiliser Zipkin, Spring Cloud Gateway, Resilience4j, Spring Cloud Load Balancer et Apache Kafka pour renforcer l'application.
- Amélioration de l'expérience utilisateur et de l'efficacité opérationnelle : Assurer une application robuste, flexible et hautement performante.

Technologies Intégrées

Zipkin

- Objectif : Traçage des requêtes pour surveiller les performances des microservices.
- Fonctionnalités : Identification des goulots d'étranglement, optimisation du débit global.



Zipkin					Find a trace		Dependencies		ENGLISH		Search by trace ID	
					+		RUN QUERY					
Results					EXPAND ALL		COLLAPSE ALL		Service filters			
Root					Start Time		Spans		Duration			
▼	gateway: http post	2 hours ago (03/08 11:02:42.892)		2	1.020s		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:39.444)		1	82.787ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:03:19.145)		2	60.752ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:14.937)		1	48.647ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:32.171)		1	30.346ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:57.252)		1	29.412ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:13.195)		1	28.016ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:11.593)		1	27.175ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:35.200)		1	26.412ms		SHOW					
▼	gateway: http post	2 hours ago (03/08 11:01:37.011)		1	25.968ms		SHOW					

Spring Cloud Gateway

- Objectif : Gestion du trafic entre les microservices.
- Fonctionnalités : Distribution équilibrée des charges, sécurité renforcée grâce à l'authentification et l'autorisation centralisées.

Resilience4j

- Objectif : Amélioration de la résilience des microservices.
- Fonctionnalités : Circuit breaker, rétentive, fallback pour tolérance aux pannes et récupération gracieuse.

```

{
  "status": "UP",
  "components": {
    "circuitBreakers": {
      "status": "UP",
      "details": {
        "likeservice": {
          "status": "UP",
          "details": {
            "failureRate": "-1.0%",
            "failureRateThreshold": "50.0%",
            "slowCallRate": "-1.0%",
            "slowCallRateThreshold": "100.0%",
            "bufferedCalls": 0,
            "slowCalls": 0,
            "slowFailedCalls": 0,
            "failedCalls": 0,
            "notPermittedCalls": 0,
            "state": "CLOSED"
          }
        }
      }
    }
  }
}

```

```

{
  "status": "UP",
  "components": {
    "circuitBreakers": {
      "status": "UP",
      "details": {
        "userservice": {
          "status": "UP",
          "details": {
            "failureRate": "-1.0%",
            "failureRateThreshold": "50.0%",
            "slowCallRate": "-1.0%",
            "slowCallRateThreshold": "100.0%",
            "bufferedCalls": 0,
            "slowCalls": 0,
            "slowFailedCalls": 0,
            "failedCalls": 0,
            "notPermittedCalls": 0,
            "state": "CLOSED"
          }
        }
      }
    }
  }
}

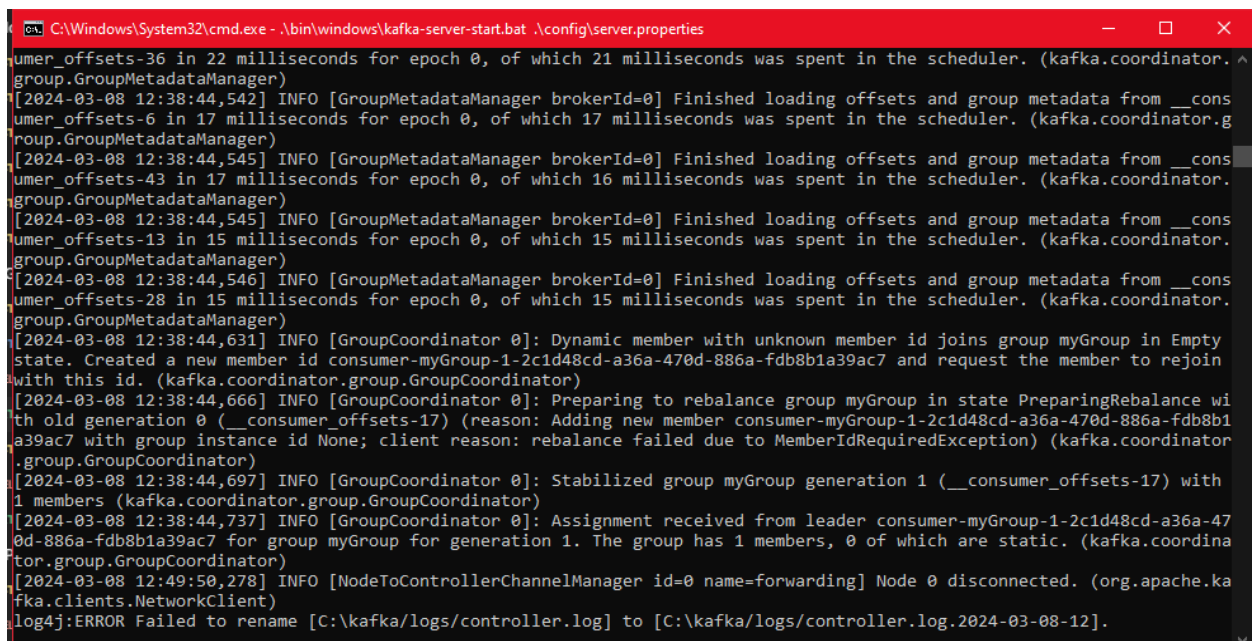
```

Spring Cloud Load Balancer

- Objectif : Optimisation de la répartition de charge.
- Fonctionnalités : Utilisation efficace des ressources, scalabilité horizontale.

Apache Kafka

- Objectif : Gestion de la messagerie entre microservices.
- Fonctionnalités : Communication asynchrone, orchestration efficace des événements.



```
C:\Windows\System32\cmd.exe - \bin\windows\kafka-server-start.bat \config\server.properties
...
[2024-03-08 12:38:44,542] INFO [GroupMetadataManager brokerId=0] Finished loading offsets and group metadata from __consumer_offsets-36 in 22 milliseconds for epoch 0, of which 21 milliseconds was spent in the scheduler. (kafka.coordinator.group.GroupMetadataManager)
[2024-03-08 12:38:44,542] INFO [GroupMetadataManager brokerId=0] Finished loading offsets and group metadata from __consumer_offsets-6 in 17 milliseconds for epoch 0, of which 17 milliseconds was spent in the scheduler. (kafka.coordinator.group.GroupMetadataManager)
[2024-03-08 12:38:44,545] INFO [GroupMetadataManager brokerId=0] Finished loading offsets and group metadata from __consumer_offsets-43 in 17 milliseconds for epoch 0, of which 16 milliseconds was spent in the scheduler. (kafka.coordinator.group.GroupMetadataManager)
[2024-03-08 12:38:44,545] INFO [GroupMetadataManager brokerId=0] Finished loading offsets and group metadata from __consumer_offsets-13 in 15 milliseconds for epoch 0, of which 15 milliseconds was spent in the scheduler. (kafka.coordinator.group.GroupMetadataManager)
[2024-03-08 12:38:44,546] INFO [GroupMetadataManager brokerId=0] Finished loading offsets and group metadata from __consumer_offsets-28 in 15 milliseconds for epoch 0, of which 15 milliseconds was spent in the scheduler. (kafka.coordinator.group.GroupMetadataManager)
[2024-03-08 12:38:44,631] INFO [GroupCoordinator 0]: Dynamic member with unknown member id joins group myGroup in Empty state. Created a new member id consumer-myGroup-1-2c1d48cd-a36a-470d-886a-fdb8b1a39ac7 and request the member to rejoin with this id. (kafka.coordinator.group.GroupCoordinator)
[2024-03-08 12:38:44,666] INFO [GroupCoordinator 0]: Preparing to rebalance group myGroup in state PreparingRebalance with old generation 0 (__consumer_offsets-17) (reason: Adding new member consumer-myGroup-1-2c1d48cd-a36a-470d-886a-fdb8b1a39ac7 with group instance id None; client reason: rebalance failed due to MemberIdRequiredException) (kafka.coordinator.group.GroupCoordinator)
[2024-03-08 12:38:44,697] INFO [GroupCoordinator 0]: Stabilized group myGroup generation 1 (__consumer_offsets-17) with 1 members (kafka.coordinator.group.GroupCoordinator)
[2024-03-08 12:38:44,737] INFO [GroupCoordinator 0]: Assignment received from leader consumer-myGroup-1-2c1d48cd-a36a-470d-886a-fdb8b1a39ac7 for group myGroup for generation 1. The group has 1 members, 0 of which are static. (kafka.coordinator.group.GroupCoordinator)
[2024-03-08 12:49:50,278] INFO [NodeToControllerChannelManager id=0 name=forwarding] Node 0 disconnected. (org.apache.kafka.clients.NetworkClient)
log4j:ERROR Failed to rename [C:\kafka\logs\controller.log] to [C:\kafka\logs\controller.log.2024-03-08-12].
```

```
C:\Windows\System32\cmd.exe - .\bin\windows\zookeeper-server-start.bat .\config\zookeeper.properties
er.server.watch.WatchManagerFactory)
[2024-03-08 12:31:27,893] INFO zookeeper.snapshotSizeFactor = 0.33 (org.apache.zookeeper.server.ZKDatabase)
[2024-03-08 12:31:27,893] INFO zookeeper.commitLogCount=500 (org.apache.zookeeper.server.ZKDatabase)
[2024-03-08 12:31:27,898] INFO zookeeper.snapshot.compression.method = CHECKED (org.apache.zookeeper.server.persistence.SnapStream)
[2024-03-08 12:31:27,903] INFO Reading snapshot c:\kafka\zookeeper-data\version-2\snapshot.0 (org.apache.zookeeper.server.persistence.FileSnap)
[2024-03-08 12:31:27,906] INFO The digest value is empty in snapshot (org.apache.zookeeper.server.DataTree)
[2024-03-08 12:31:27,923] INFO 29 txns loaded in 8 ms (org.apache.zookeeper.server.persistence.FileTxnSnapLog)
[2024-03-08 12:31:27,924] INFO Snapshot loaded in 31 ms, highest zxid is 0x1d, digest is 45688453965 (org.apache.zookeeper.server.ZKDatabase)
[2024-03-08 12:31:27,925] INFO Snapshotting: 0x1d to c:\kafka\zookeeper-data\version-2\snapshot.1d (org.apache.zookeeper.server.persistence.FileTxnSnapLog)
[2024-03-08 12:31:27,926] INFO Snapshot taken in 1 ms (org.apache.zookeeper.server.ZooKeeperServer)
[2024-03-08 12:31:27,933] INFO zookeeper.request_throttler.shutdownTimeout = 10000 ms (org.apache.zookeeper.server.RequestThrottler)
[2024-03-08 12:31:27,933] INFO PrepRequestProcessor (sid:0) started, reconfigEnabled=false (org.apache.zookeeper.server.PrepRequestProcessor)
[2024-03-08 12:31:27,953] INFO Using checkIntervalMs=60000 maxPerMinute=10000 maxNeverUsedIntervalMs=0 (org.apache.zookeeper.server.ContainerManager)
[2024-03-08 12:31:27,954] INFO ZooKeeper audit is disabled. (org.apache.zookeeper.audit.ZKAuditProvider)
[2024-03-08 12:31:46,293] INFO Expiring session 0x100192dba420000, timeout of 18000ms exceeded (org.apache.zookeeper.server.ZooKeeperServer)
[2024-03-08 12:31:46,307] INFO Creating new log file: log.1e (org.apache.zookeeper.server.persistence.FileTxnLog)
```

```
@Configuration
public class KafkaTopicConfig {

    @Value("quickstart-events")
    private String topicName;

    // spring bean for kafka topic
    @Bean
    public NewTopic topic(){
        return TopicBuilder.name(topicName)
            .build();
    }
}
```

```

@Service
public class postProducer {

    private static final org.slf4j.Logger LOGGER = LoggerFactory.getLogger(postProducer.class);

    @Autowired
    private KafkaTemplate<String, PostDto> kafkaTemplate;

    public void sendMessage(PostDto event){
        LOGGER.info(String.format("Post event => %s", event.toString()));

        Message<PostDto> message = MessageBuilder
            .withPayload(event)
            .setHeader(KafkaHeaders.TOPIC, headerValue: "quickstart-events")
            .build();
        kafkaTemplate.send(message);
    }
}

```

```

public class GroupConsumer {

    @Autowired
    private IGroupeService groupeService;

    @KafkaListener(topics = "quickstart-events", groupId = "myGroup", containerFactory = "kafkaListenerContainerFactory")
    public void consume(PostDto postDto) {
        GroupeDto group = groupeService.getGroupeById(postDto.getGroupeId());
        groupeService.deleteGroupe(postDto.getGroupeId(), group.getAdminId());
        System.out.println("Consumed message: upp" + postDto);
    }
}

```

Conclusion

L'intégration de ces technologies avancées est cruciale pour consolider l'architecture en microservices et garantir une application de réseau social moderne, robuste, flexible et hautement performante. Cette phase du projet vise à atteindre de nouveaux sommets en termes d'efficacité opérationnelle et d'expérience utilisateur.