



# 가상면접 사례로 배우는 대규모 시스템 설계 기초



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5장

안정 해시 설계

해시 ... ?





“

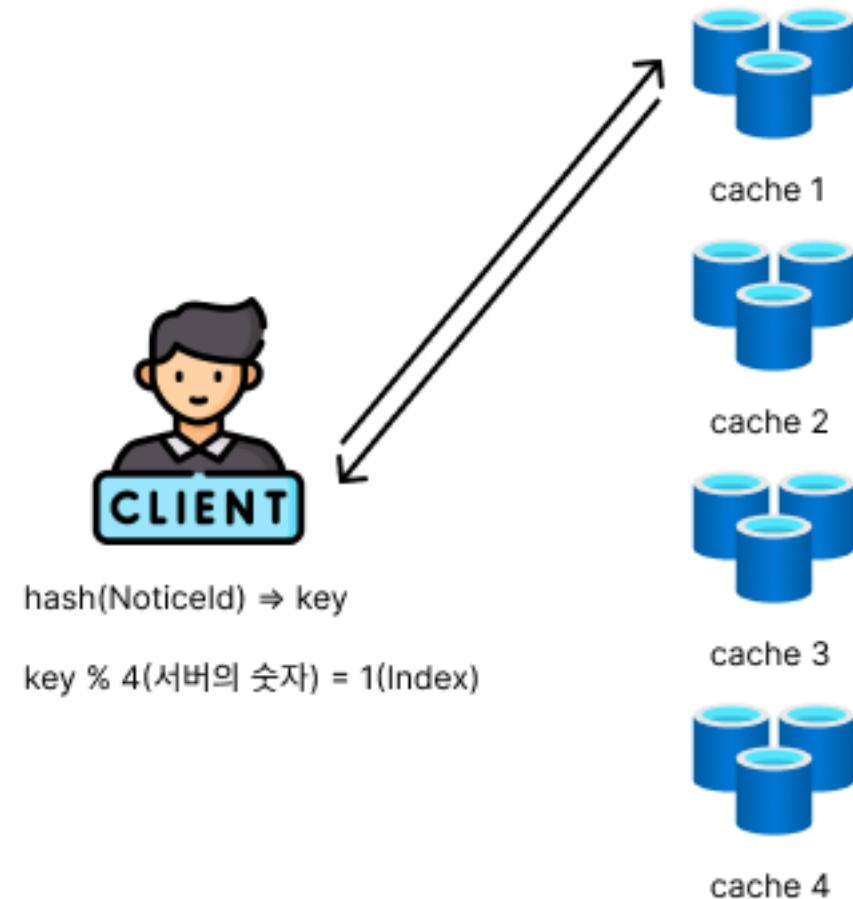
*Hash*

”

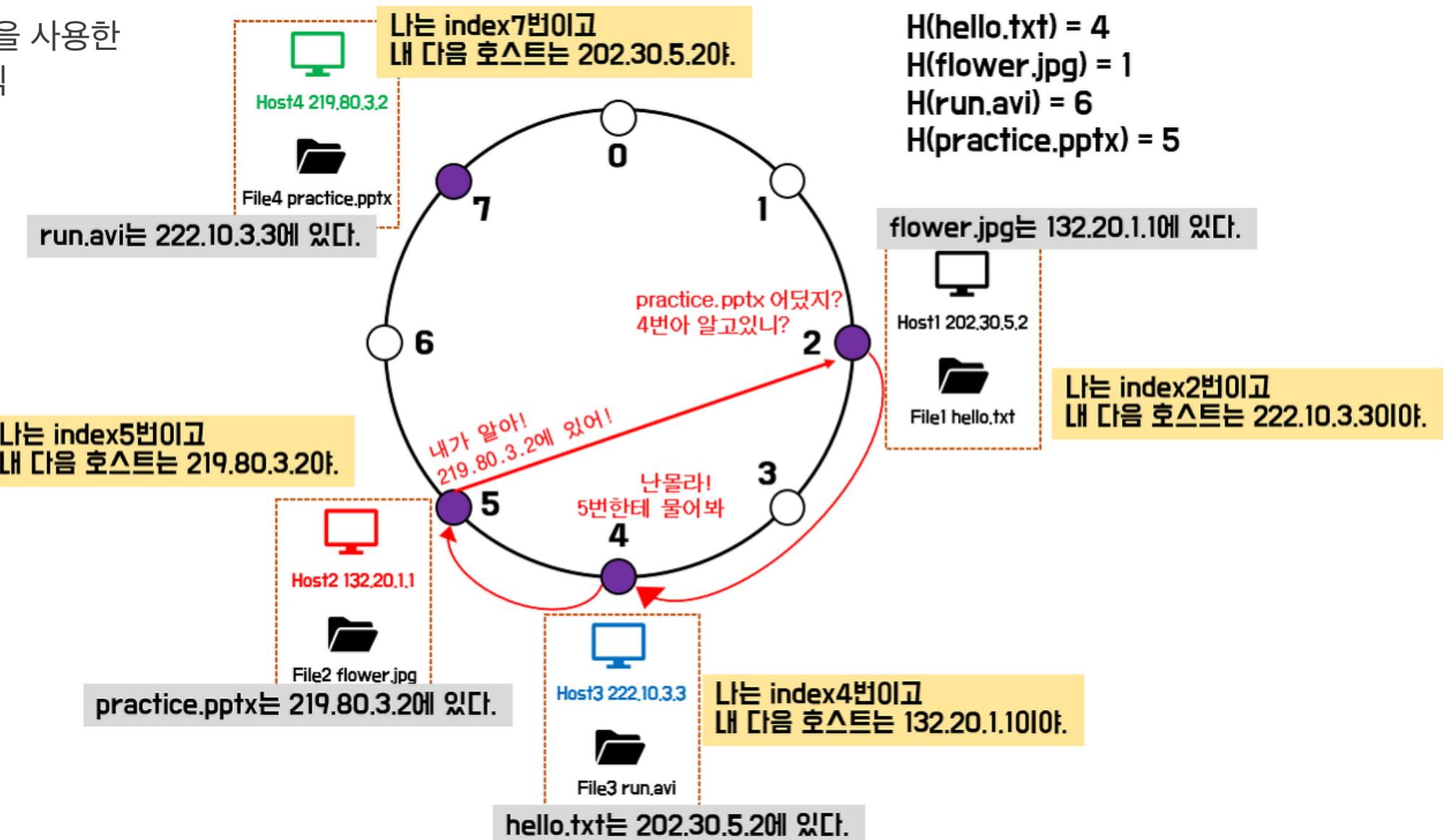
A photograph of a tropical beach. The water is a vibrant turquoise color, and the sky is a clear, pale blue with a few wispy clouds. In the distance, a line of palm trees stands on a sandy shore.

# 1단계 해시 키 재배치 문제

## 5장 예제에 대한 간단한 설명



## 과거 해시 테이블을 사용한 P2P 방식

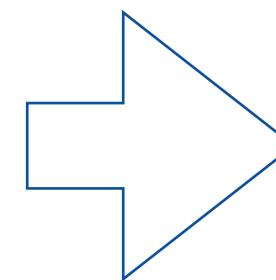




그렇다면 문제는 ?



serverIndex = hash % 4			
Server Index	0	1	2
Servers	server 0	server 1	server 2
Keys	key1 key3	key0 key4	key2 key6

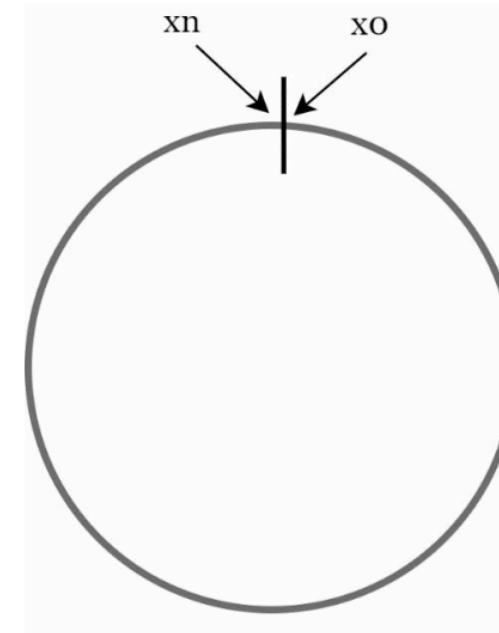


serverIndex = hash % 3			
Server Index	0	1	2
Servers	server 0	server 1	server 2
Keys	key0 <b>key1</b> <b>key5</b> <b>key7</b>	key2 <b>key4</b> key6	key3

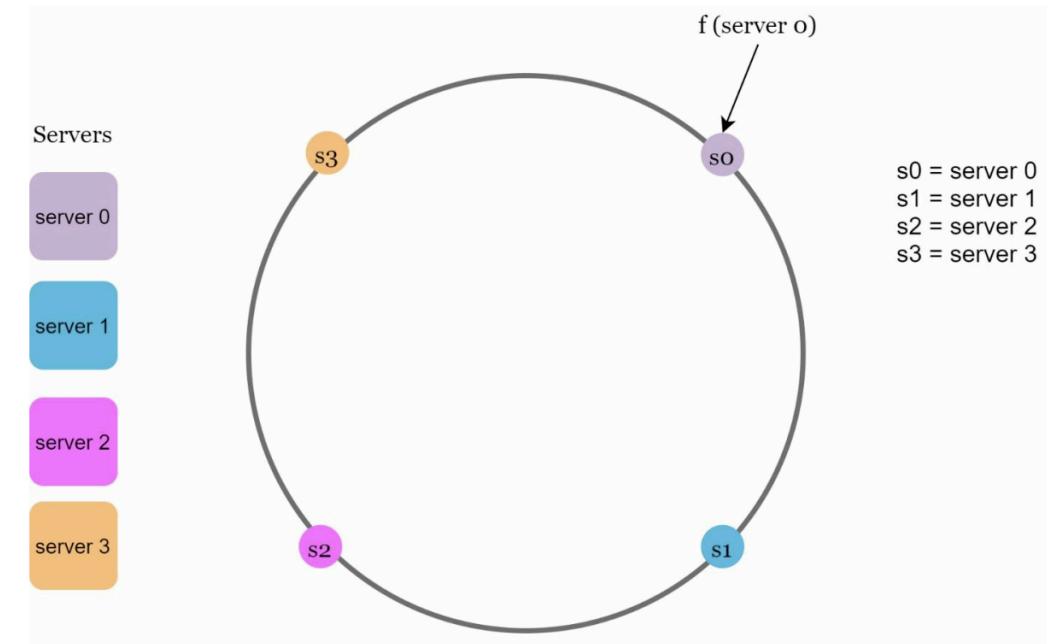
A photograph of a tropical beach at dusk or dawn. The sky is filled with soft, greyish-blue clouds. In the distance, a line of palm trees stands on a dark, sandy beach. The ocean in the foreground is a vibrant turquoise color, with gentle waves lapping onto the shore.

# 2단계 안정 해시

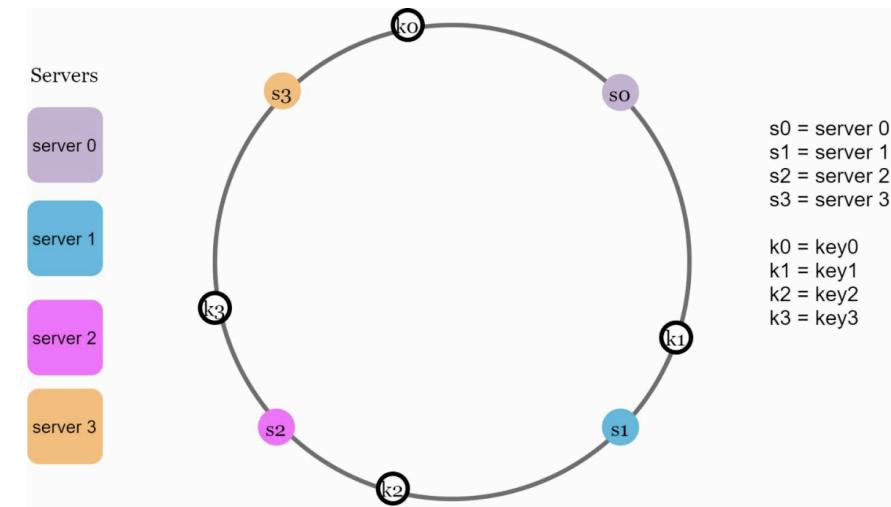
# 해시 공간과 해시 링



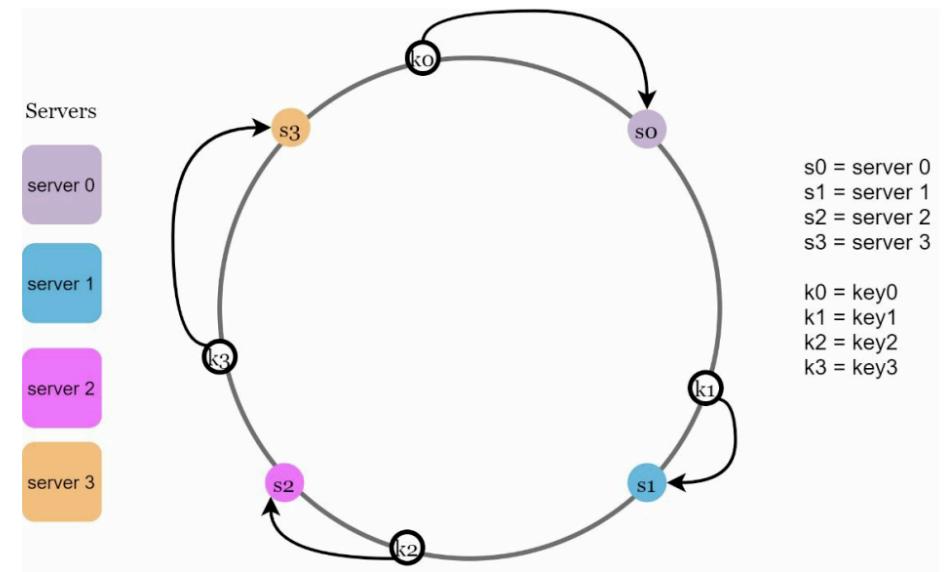
# 해시 서버



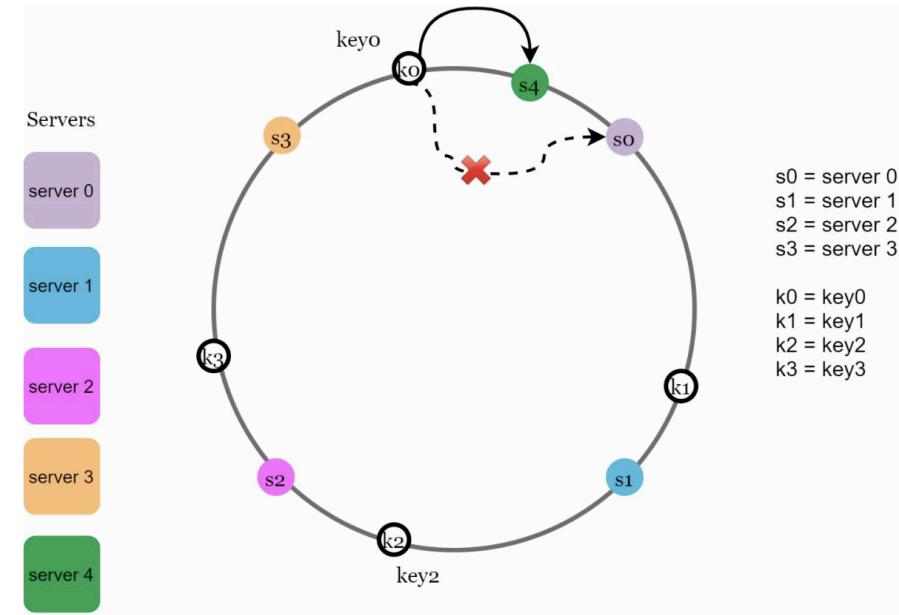
# 해시 키



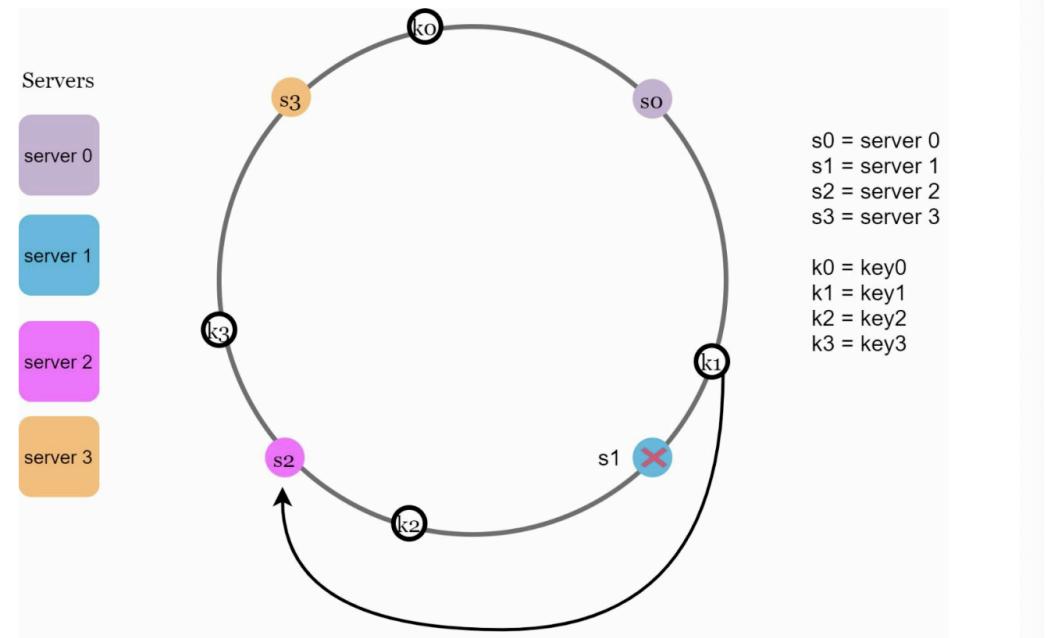
# 서버 조회



# 서버 추가



# 서버 제거

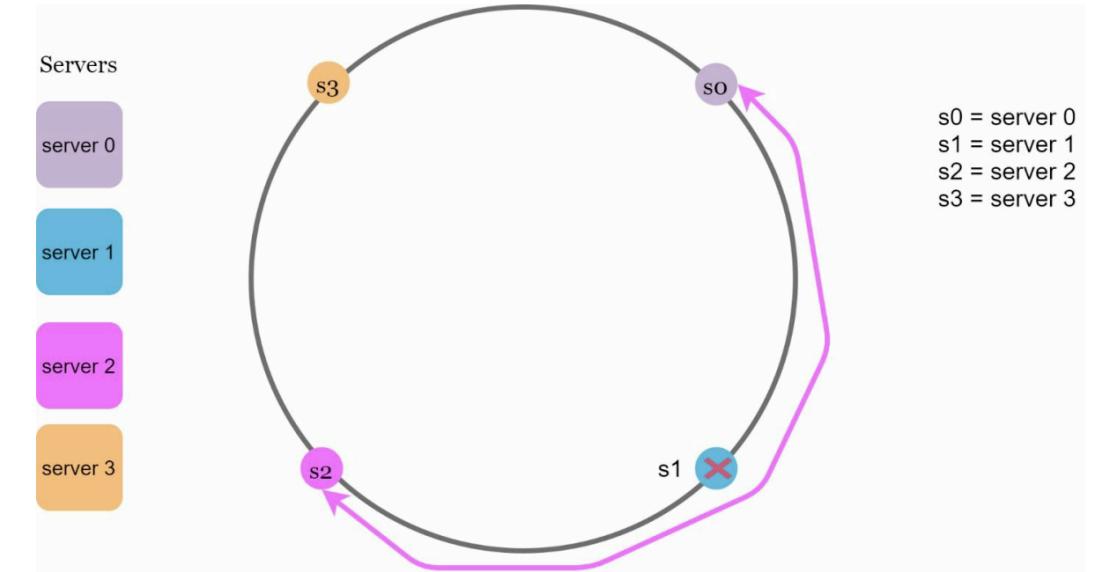




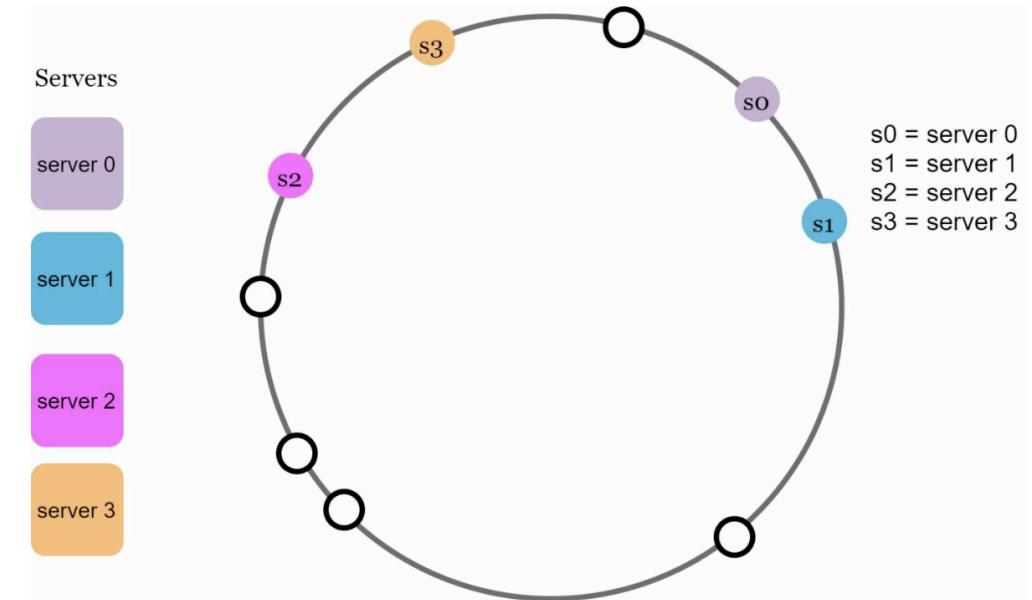
두 가지 문제점



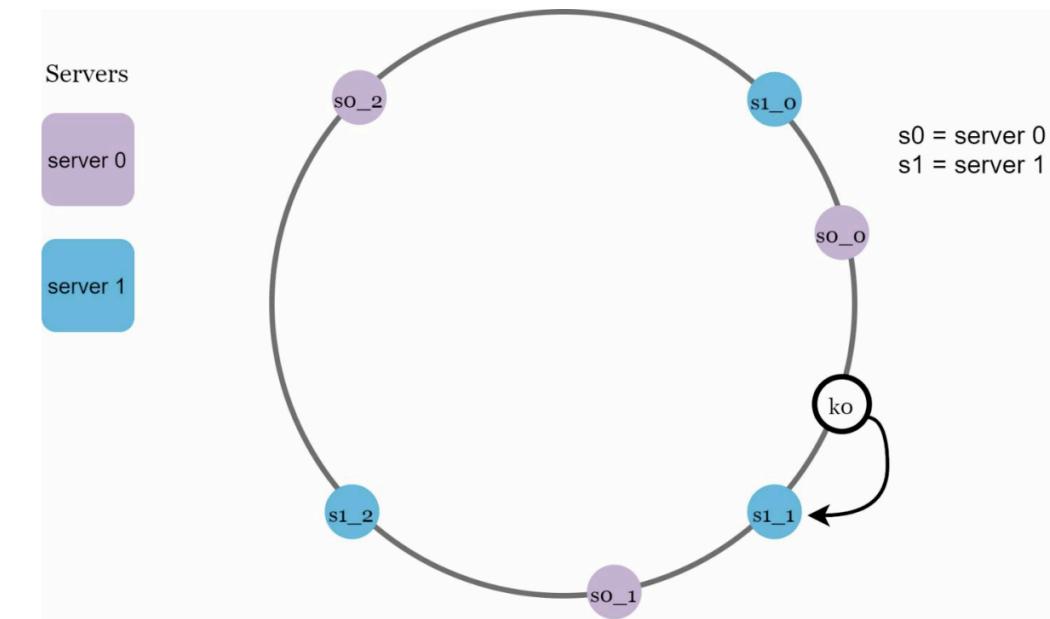
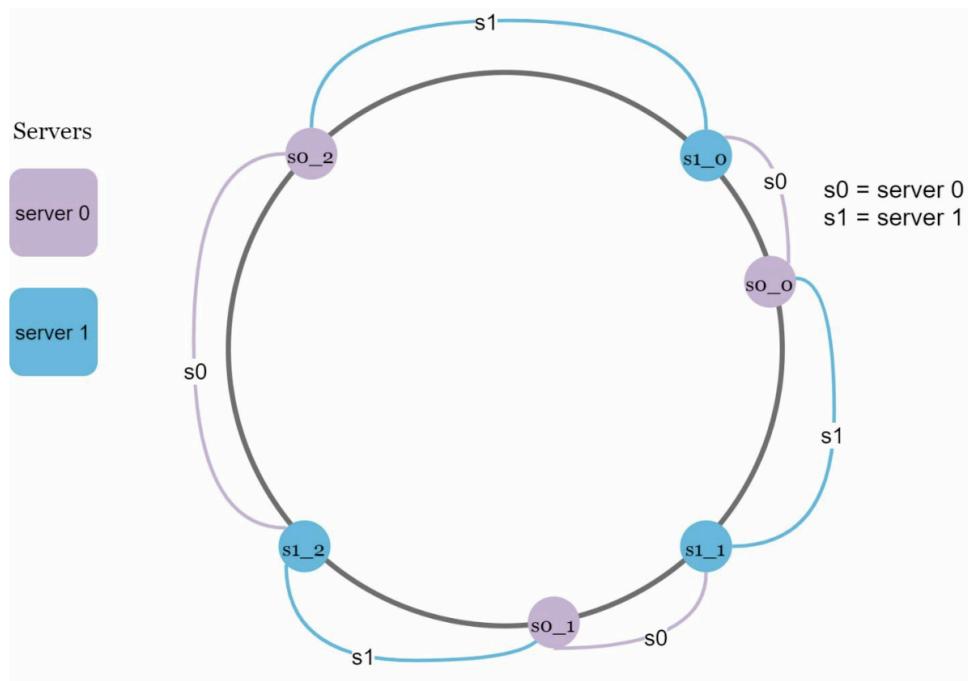
# 첫 번째 균등 유지 불가능



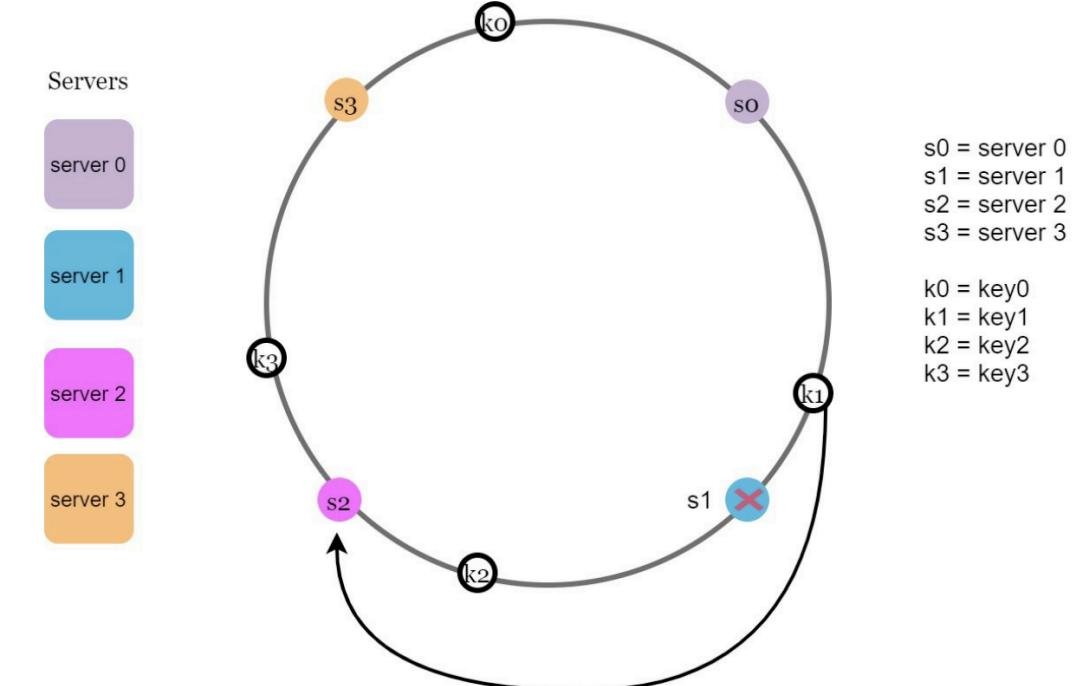
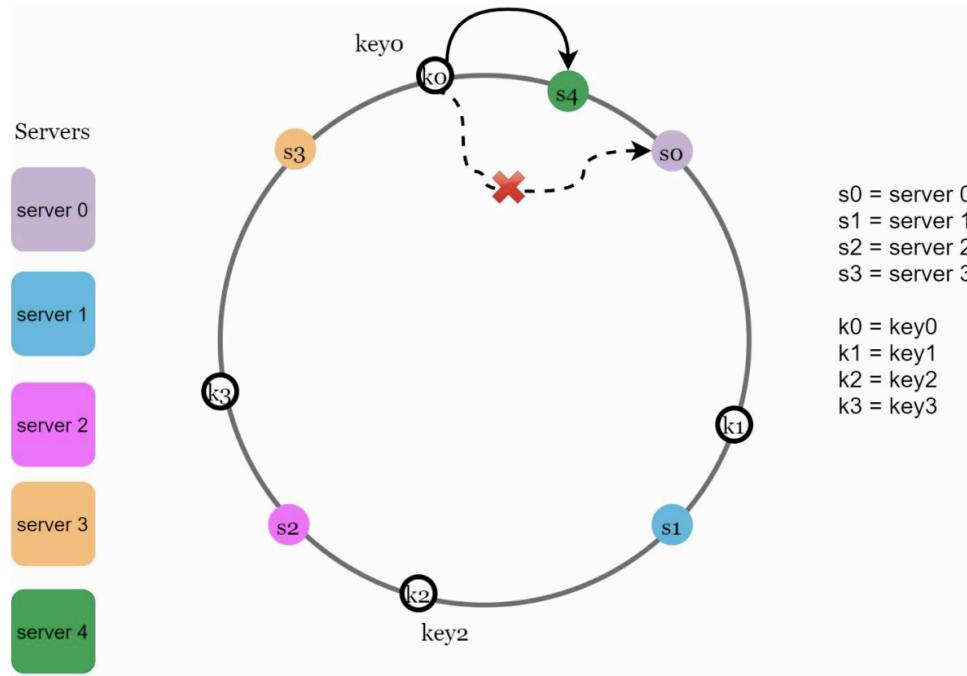
# 두 번째 균등 분포의 어려움



# 가상 노드



# 재배치 할 키 결정



# 3단계 마치며



# 안정해시의 이점

- 서버가 추가되거나 삭제될 때 재배치되는 키의 수가 최소화된다.
- 데이터가 보다 균등하게 분포하게 되므로 수평적 규모 확장성을 달성하기 쉽다.
- 핫스팟 키 문제를 줄인다.  
특정 샤프트에 대한 접근이 지나치게 빈번하면 과부하 문제가 생길 수 있다.



# 안정해시의 사용처

- AWS DynamoDB
- Apache Cassandra 클러스터에서의  
데이터 파티셔닝
- Discord 채팅
- 아카마이 CDN
- 매그레프 네트워크 부하 분산기

## 출처



[https://velog.io/@kshired/%EA%B0%80%EC%83%81-%EB%A9%B4%EC%A0%91-%EC%82%AC%EB%A1%80%EB%A1%9C-%EB%B0%B0%EC%9A%B0%EB%8A%94-%EB%8C%80%EA%B7%9C%EB%AA%A8-%EC%8B%9C%EC%8A%A4%ED%85%9C-%EC%84%A4%EA%B3%84-%EA%B8%B0%EC%B4%88-%EC%95%88%EC%A0%95-%ED%95%B4%EC%8B%9C-%EC%84%A4%EA%B3%84,  
https://ddongwon.tistory.com/76](https://velog.io/@kshired/%EA%B0%80%EC%83%81-%EB%A9%B4%EC%A0%91-%EC%82%AC%EB%A1%80%EB%A1%9C-%EB%B0%B0%EC%9A%B0%EB%8A%94-%EB%8C%80%EA%B7%9C%EB%AA%A8-%EC%8B%9C%EC%8A%A4%ED%85%9C-%EC%84%A4%EA%B3%84-%EA%B8%B0%EC%B4%88-%EC%95%88%EC%A0%95-%ED%95%B4%EC%8B%9C-%EC%84%A4%EA%B3%84,)