

SpringOne Platform by Pivotal.

Deploying Spring Boot Apps on Kubernetes

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Two Hot Technologies



<https://trends.google.com/trends/explore?q=kubernetes,spring%20boot>

About Me

Thomas Risberg (@trisberg)

- Member of the Spring engineering team at Pivotal
- Contributing to Project riff and Spring Cloud Data Flow
- Joined the Spring Framework open source project in 2003 working on JDBC support



Pair programming with Spring Team

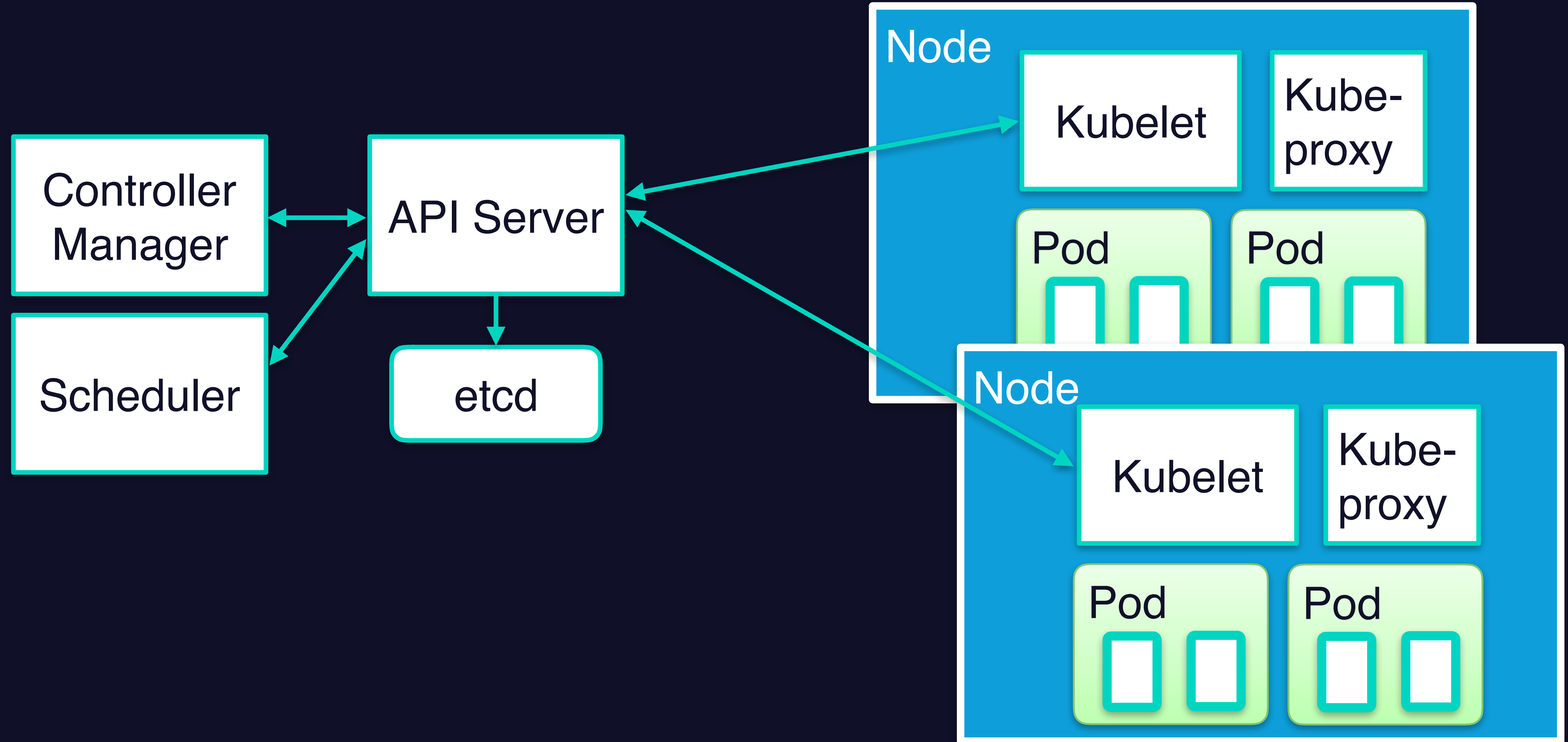


Pairing with Google Engineering Team?

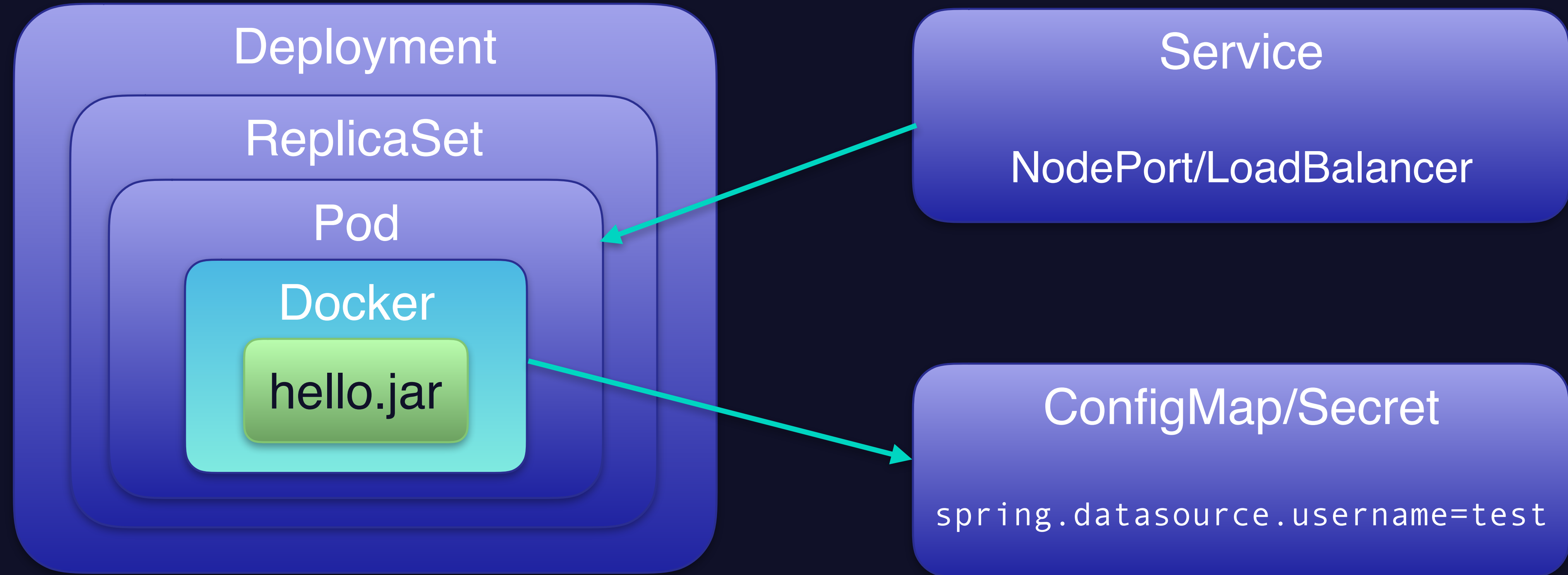
Kubernetes builds upon 15 years of experience of running production workloads at Google, combined with best-of-breed ideas and practices from the community.

<https://kubernetes.io/>

Kubernetes Architecture



Kubernetes Resources



Demo

Simple Hello Spring Boot/Kubernetes app deployment

<https://github.com/trisberg/slp2017-boot-k8s/blob/master/demo-hello.adoc>

Building Apps for Kubernetes



<https://twitter.com/kelseyhightower/status/903640408613306369>

Contracts exposed to the apps by the platform



<https://twitter.com/kelseyhightower/status/903643916599046145>

Externalized Configuration

- Environment variables
 - Easy to set in `deployment.yaml`
 - Might need to use `SPRING_APPLICATION_JSON` for map based properties
- ConfigMaps and Secrets
 - Can be set using environment or mounted as config files
- Use Spring Cloud Config Server
- Init container can write properties file to shared volume

Demo

Simple REST Repository App as part of a Microservice Architecture

<https://github.com/trisberg/slp2017-boot-k8s/blob/master/demo-actors.adoc>

<https://github.com/trisberg/slp2017-boot-k8s/blob/master/demo-microservices.adoc>

<https://github.com/trisberg/boot-k8s-microservices/tree/slp2017>

Mount ConfigMaps

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: actors
  labels:
    app: actors
data:
  application.yaml: |-
    security:
      basic:
        enabled: false
    spring:
      datasource:
        url: jdbc:mysql://${MYSQL_SERVICE_HOST}:${MYSQL_SERVICE_PORT}/mysql
        username: root
        password: ${MYSQL_ROOT_PASSWORD}
        driverClassName: com.mysql.jdbc.Driver
        testOnBorrow: true
        validationQuery: "SELECT 1"
```

```
spec:
  containers:
    - name: actors
      image: trisberg/actors:0.0.1-SNAPSHOT
  ...
  volumeMounts:
    - name: application-config
      mountPath: "/config"
      readOnly: true
  volumes:
    - name: application-config
      configMap:
        name: actors
        items:
          - key: application.yaml
            path: application-kubernetes.yaml
```


Access Secrets in Env Var

```
apiVersion: v1
kind: Secret
metadata:
  name: mysql
  labels:
    app: mysql
data:
  mysql-root-password: eW91cnBhc3N3b3Jk
```

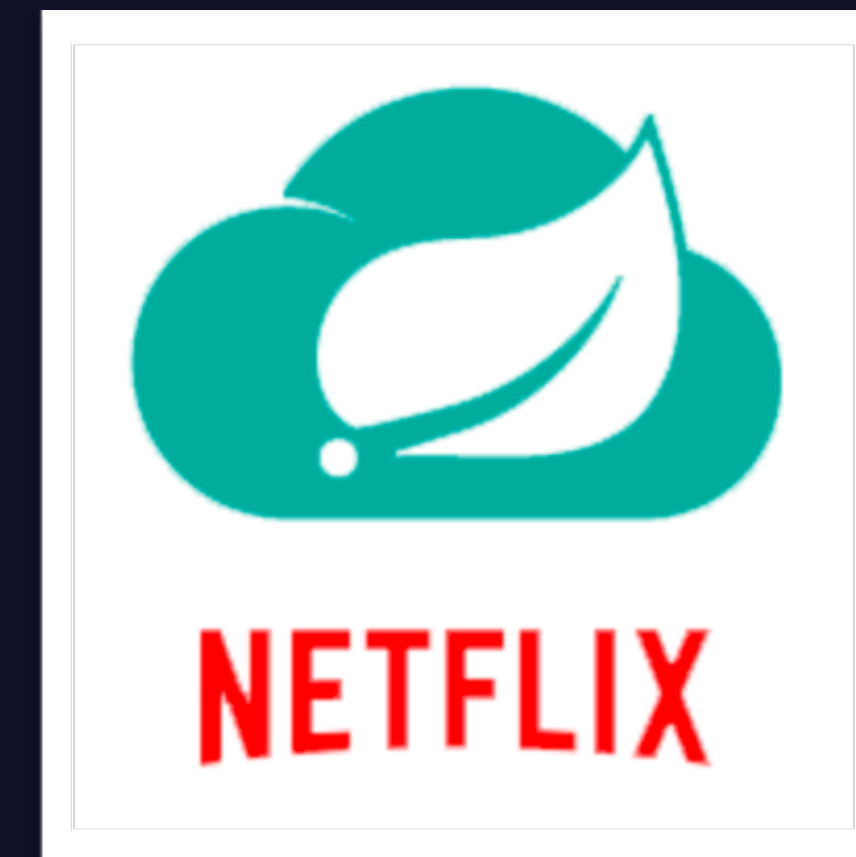
```
env:
- name: SERVER_PORT
  value: '80'
- name: SPRING_PROFILES_ACTIVE
  value: kubernetes
- name: MYSQL_ROOT_PASSWORD
  valueFrom:
    secretKeyRef:
      name: mysql
      key: mysql-root-password
```

Microservice Architecture Concerns

- Externalized Configuration ✓
 - ConfigMap and Secrets
- Service Discovery ✓
 - DNS, DiscoveryClient
- Circuit-breaker
- Distributed Tracing
- Metrics
- Log aggregation

Microservice Runtime Management

- Circuit-breaker - Netflix Hystrix
- Distributed Tracing - Spring Cloud Sleuth / Zipkin
- Metrics - Spring Boot Actuator / Micrometer



- Service Mesh - Istio
 - load balancing / routing
 - policy enforcement
 - telemetry and reporting



Log Aggregation

- Spring Cloud Sleuth
 - <https://cloud.spring.io/spring-cloud-sleuth/>
- Stackdriver
 - <https://kubernetes.io/docs/tasks/debug-application-cluster/logging-stackdriver/>
- Elasticsearch and Kibana
 - <https://kubernetes.io/docs/tasks/debug-application-cluster/logging-elasticsearch-kibana/>
- Loggly
 - <https://www.weave.works/blog/log-aggregation-kubernetes-loggly/>

Packaging



- **Helm**

- The package manager for Kubernetes

- https://docs.helm.sh/using_helm/#quickstart-guide

- **KubeApps**

- Discover & launch great Kubernetes-ready apps

- <https://kubernetes.io/>

- **Example**

- <https://github.com/trisberg/boot-k8s-microservices/tree/s1p2017>

Spring Cloud for Kubernetes

- Fabric8 team created spring-cloud-kubernetes
 - DiscoveryClient for Kubernetes
 - ConfigMap and Secrets PropertySource
 - Ribbon discovery in Kubernetes
 - Zipkin discovery in Kubernetes
 - and more ...
- Now available in spring-cloud-incubator on GitHub
- Could join the Spring Cloud Release train for Greenwich sometime next year



Learn More. Stay Connected.

Kubernetes for the Spring Developer - Wednesday 03:20 Room: 2024

<https://github.com/spring-cloud-incubator/spring-cloud-kubernetes>

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 @s1p #springone