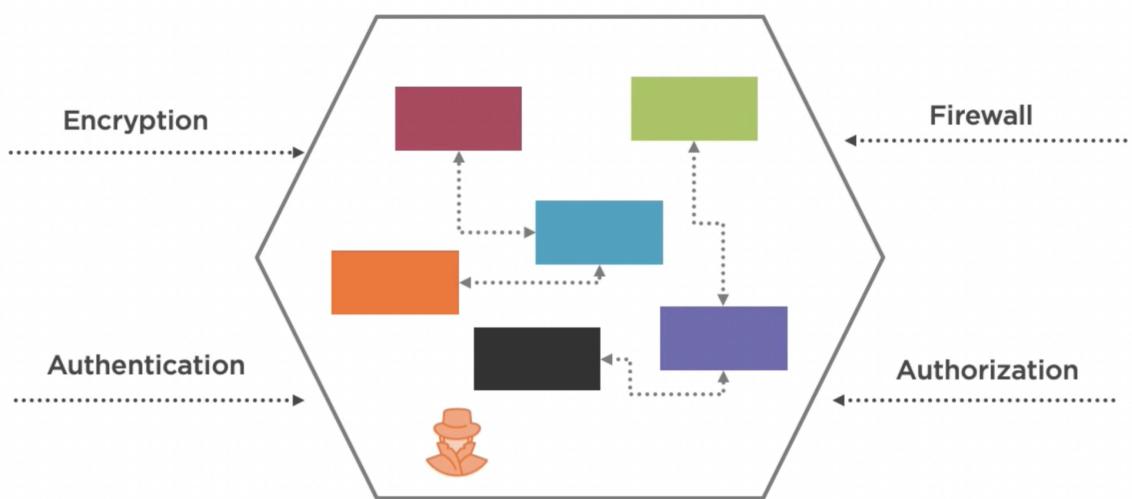
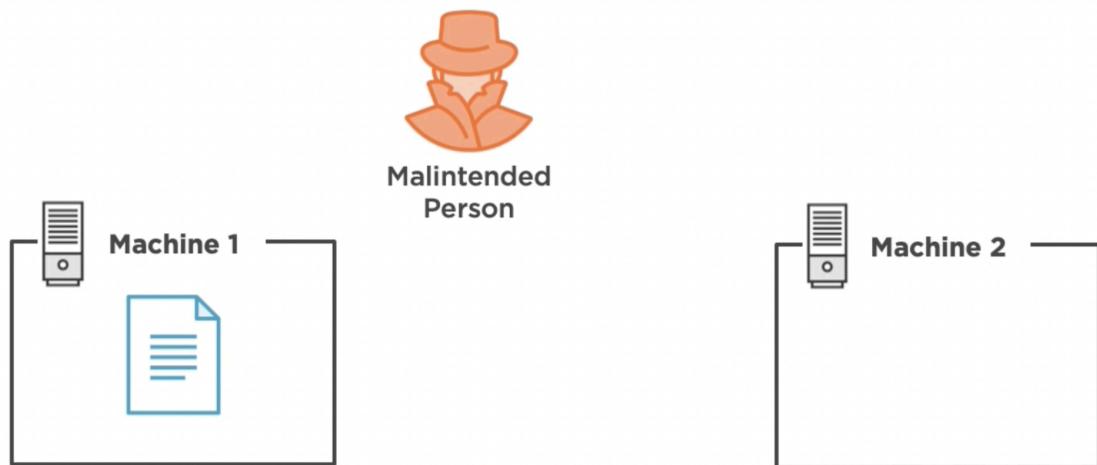


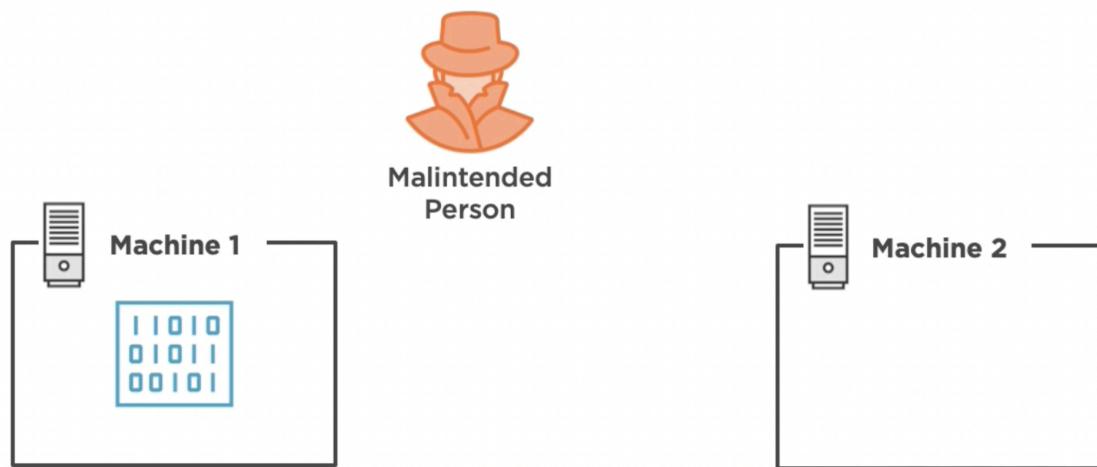
Castle Security



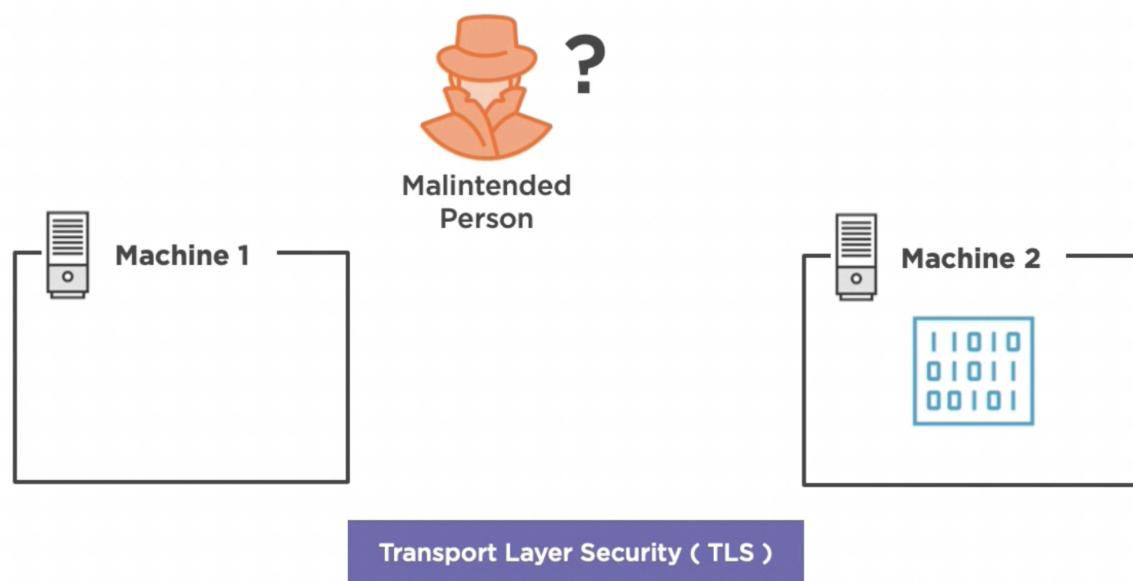
Data Security



Data Encryption



Data Encryption



Cryptography



Symmetric
Encryption



Asymmetric
Encryption

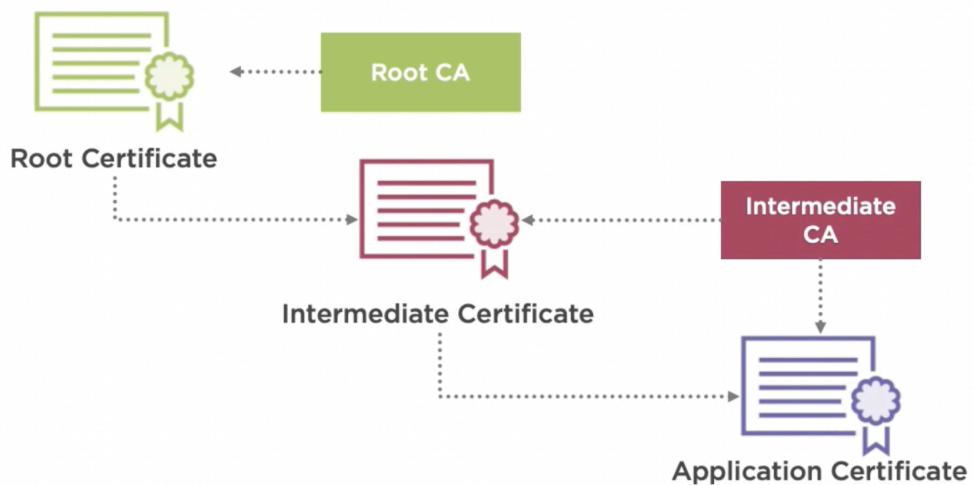


Certificates

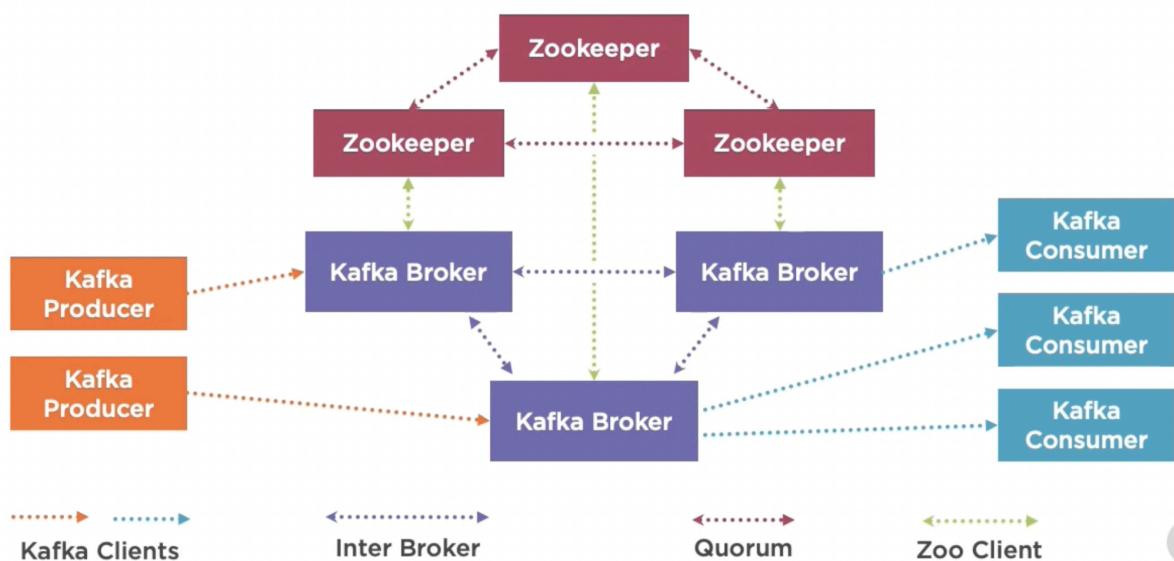
Public Key Infrastructure (PKI)



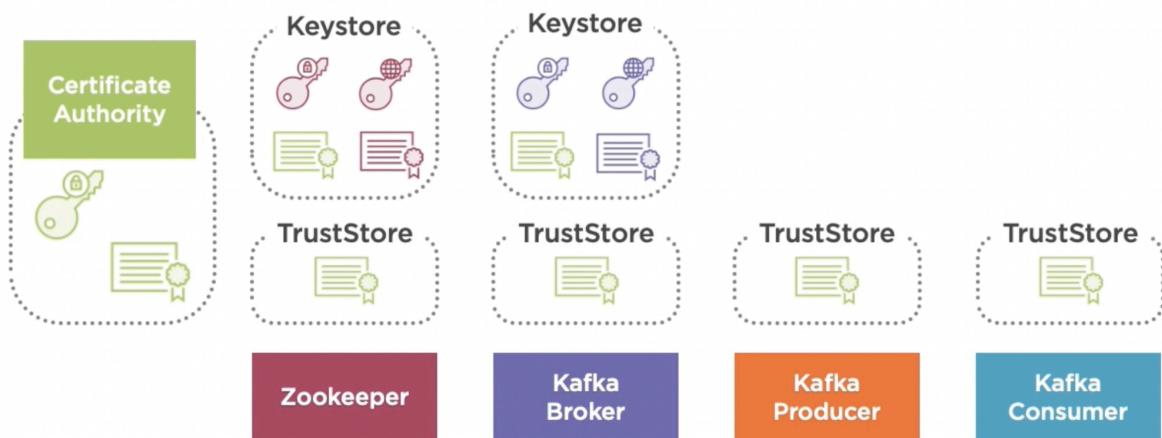
Chain of Trust



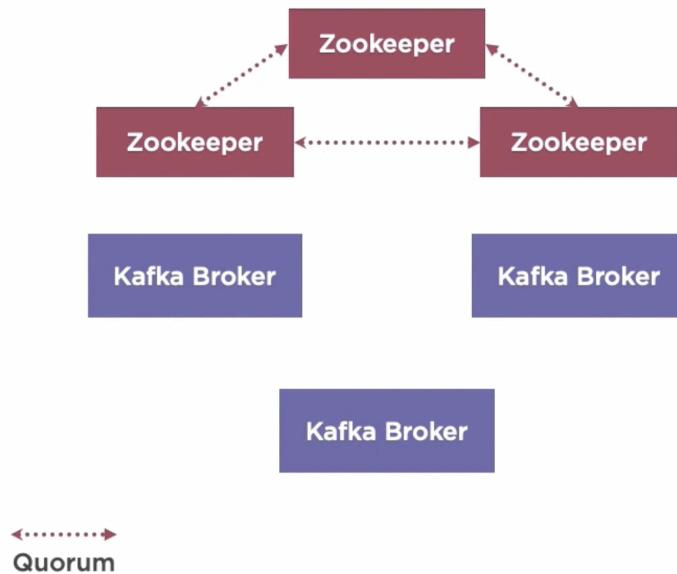
Communication Encryption



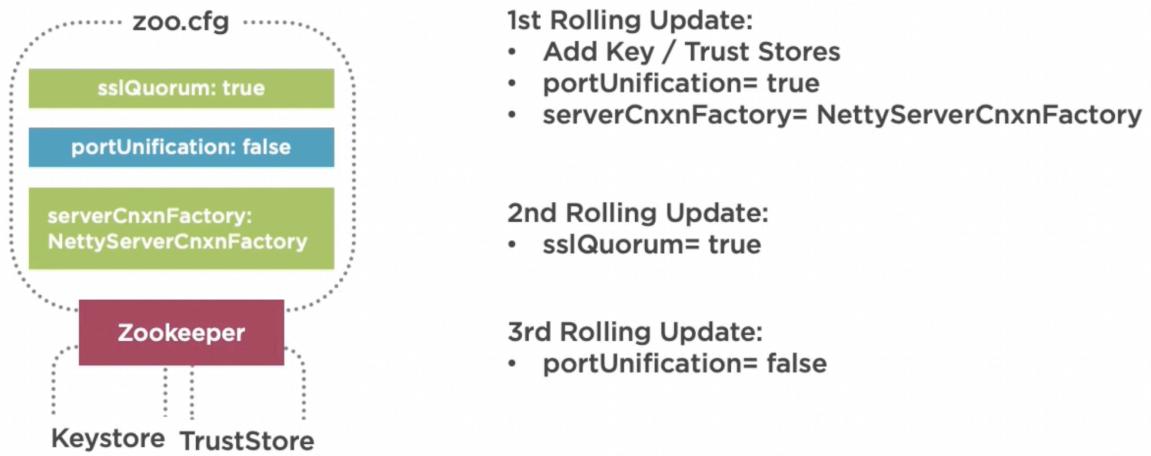
Kafka PKI Setup



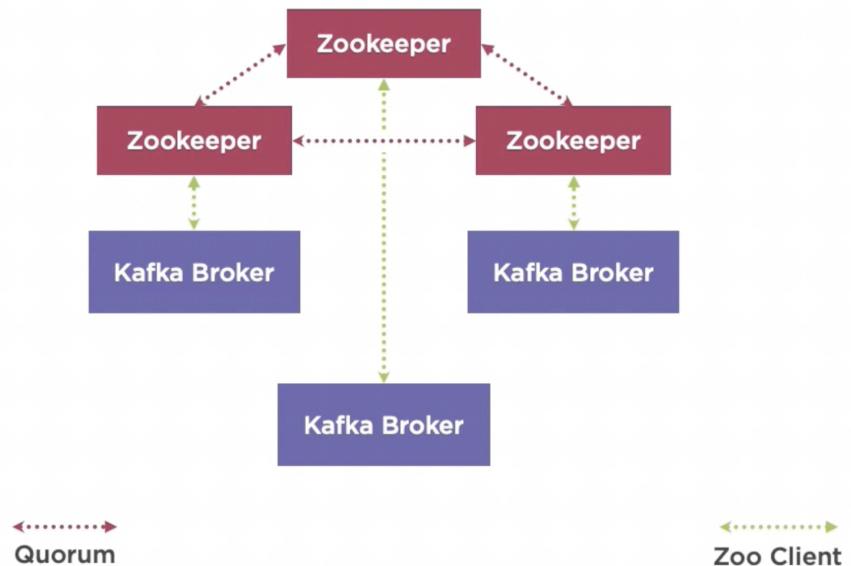
Zookeeper Security



Zookeeper Quorum SSL



Zookeeper Security



Zookeeper-Broker SSL

Rolling Restart:

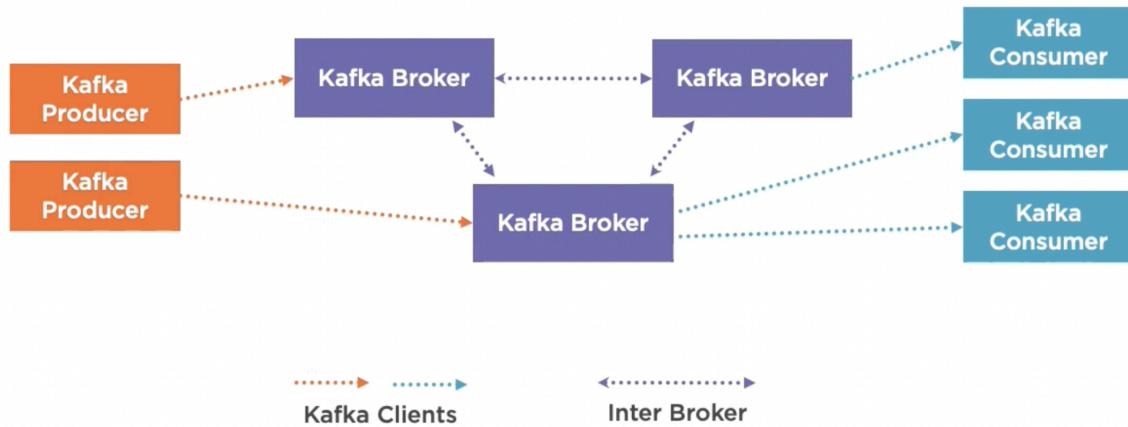
- Open Secure Client Port

Rolling Restart:

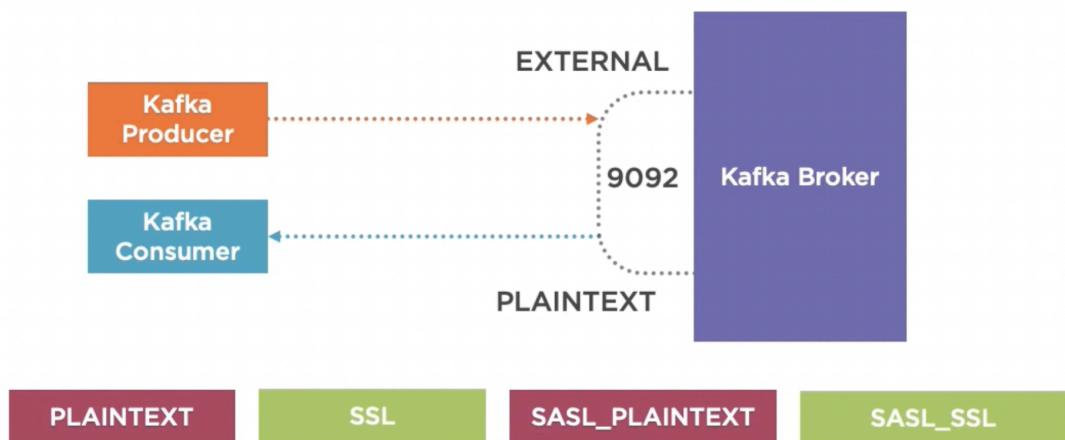
- Add Key / Trust Stores
- Zoo SSL Client Enabled
- Netty Client Cnxn Socket



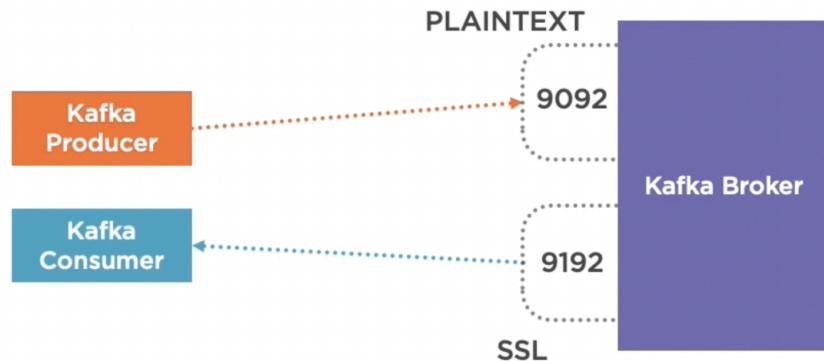
Kafka Security



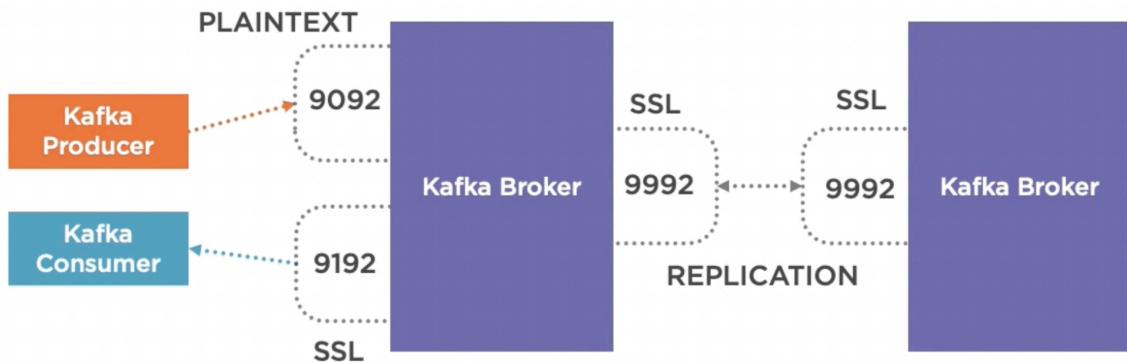
Kafka Listeners



Kafka Listeners



Kafka Listeners



Kafka Listeners Configuration

```
listeners: UNSECURED://127.0.0.1:9092, SECURED://localhost:9192  
listener.security.protocol.map: UNSECURED:PLAINTEXT, SECURED:SSL  
advertised.listeners: UNSECURED://broker-1:9092, SECURED://172.32.42.80:9192
```

```
listener.name.unsecured.max.connections: ...  
listener.name.secured.keystore.location: .....  
listener.name.secured.truststore.password: .....
```

```
security.inter.broker.protocol: SSL
```

```
inter.broker.listener.name: SECURED
```

Performance Degradation

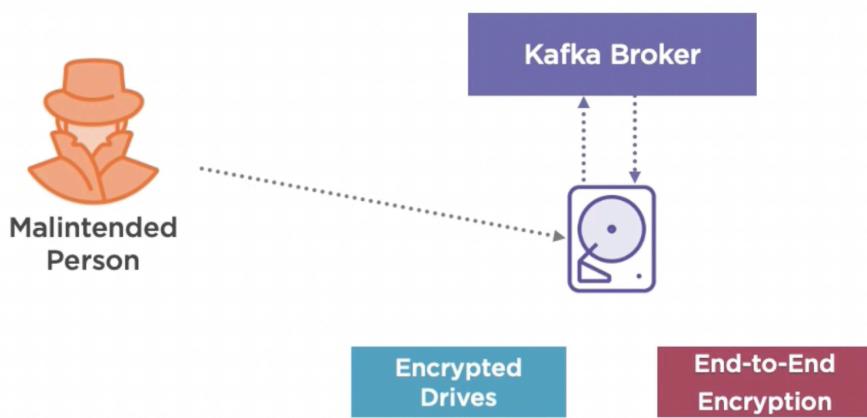
30%

Java 8

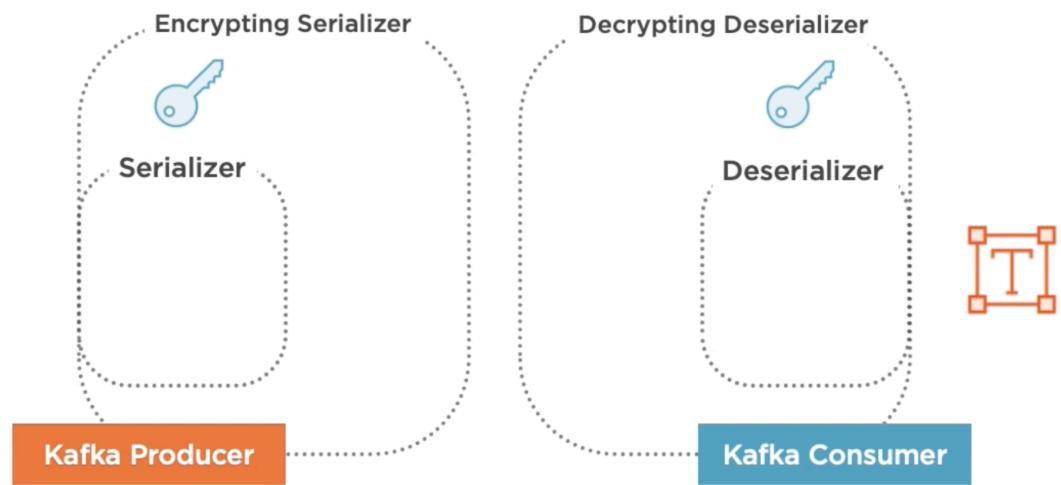
10%

Java 9+

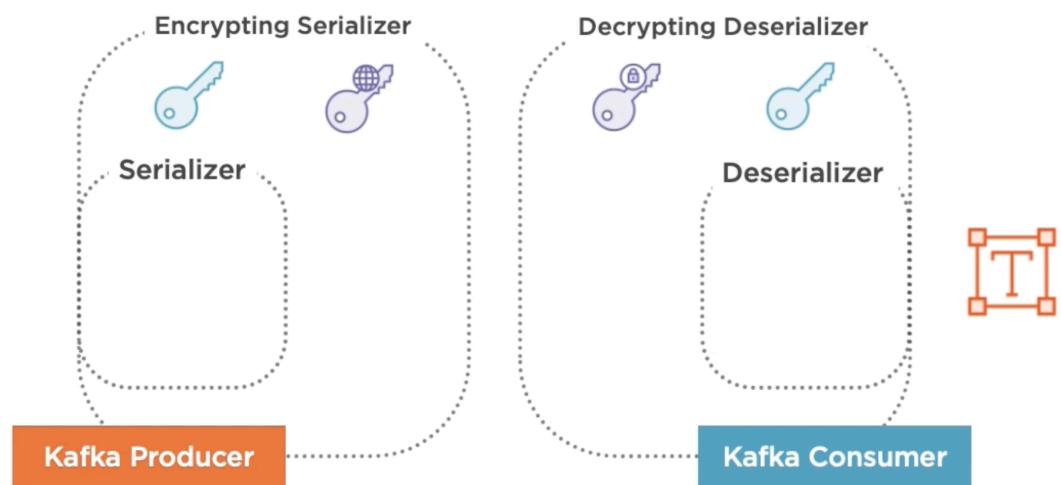
Data Security



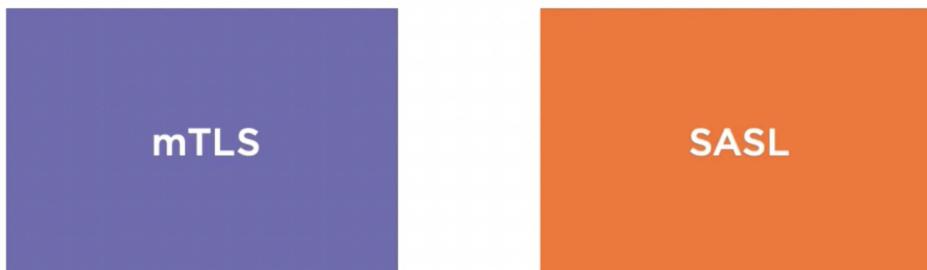
End-To-End Encryption



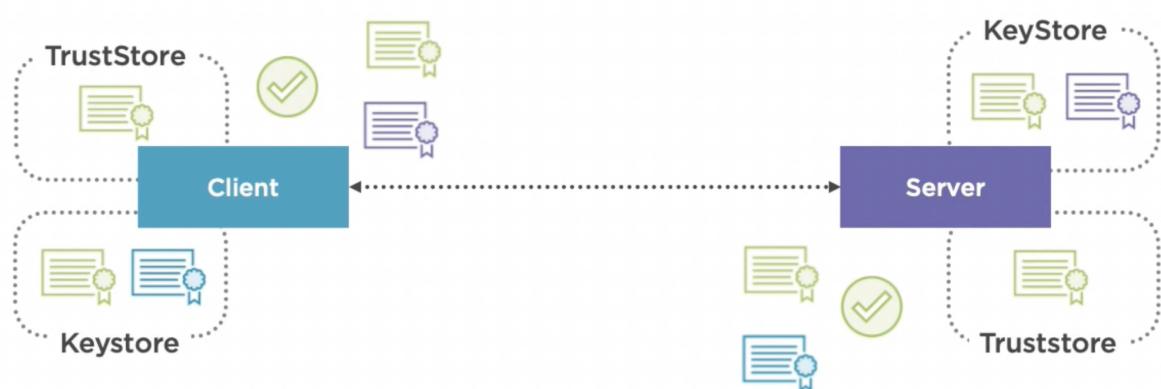
End-To-End Encryption



Kafka Authentication Frameworks

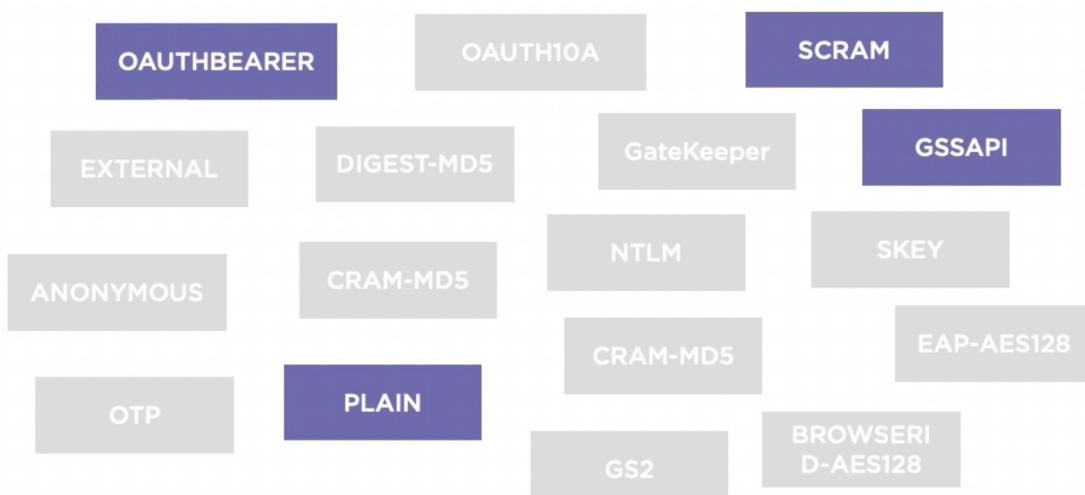


Mutual TLS



Simple Authentication and Security Layer

SASL Mechanisms





JAAS

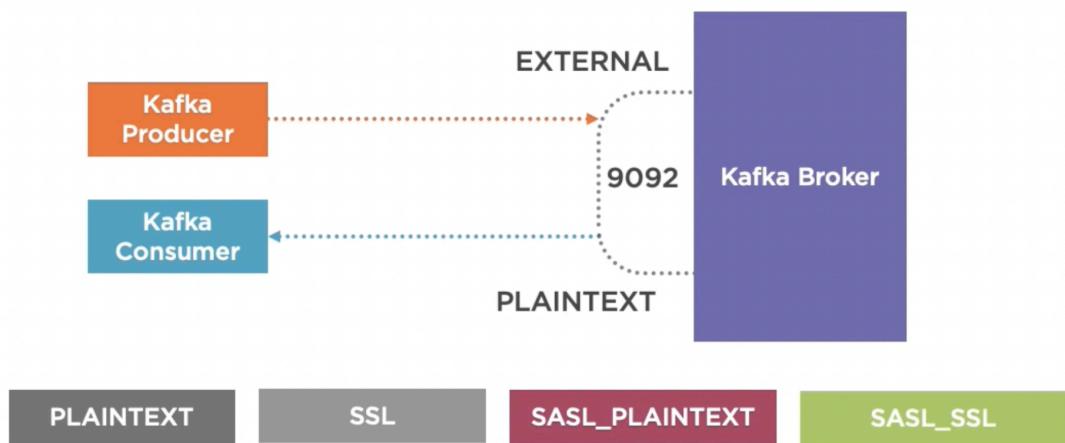
Java Authentication and Authorization Service is the Java implementation of the Pluggable Authentication Module (PAM)

JAAS Configuration Files

Authentication
*.conf

Authorization
.policy

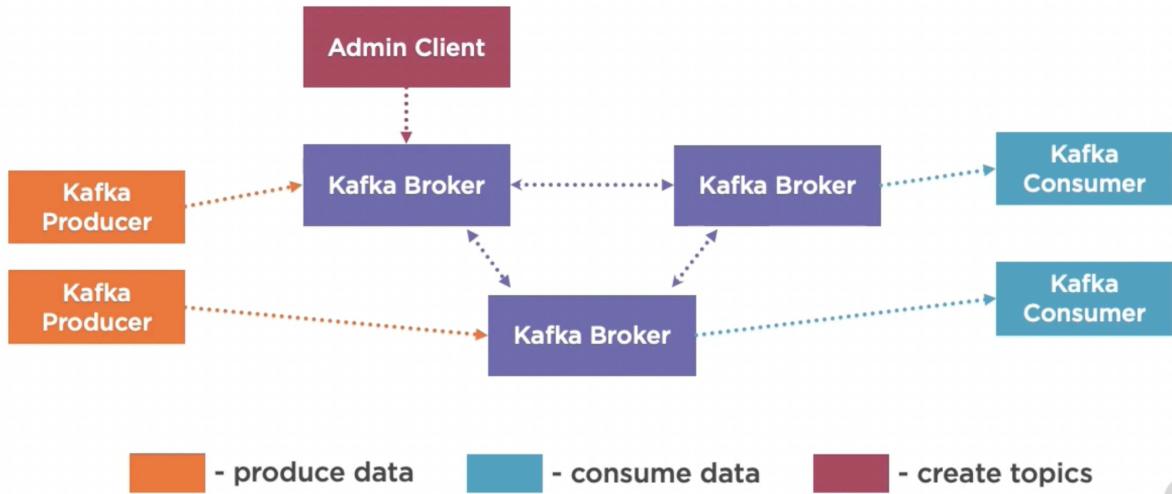
Kafka Listeners



Authorizing Clients



Authorizing Clients



Access Control Lists

(**ACLs**)