XYZ Logistics International has 3 data centers in US, UK and India. Each data center has 3 replica nodes. The possible route and use cases for consignment are

1. India <-> UK <-> US
   1. Shipper from India can send consignments to US
   2. Shipper from US can send consignments to India
   3. XYZ Logistics can deliver these consignments via UK
   4. XYZ Logistics agents can lookup shipment details by source location
   5. XYZ Logistics agents can lookup shipment details by destination location
   6. XYZ Logistics agents can lookup shipment details by waybill number
   7. Customer can monitor and track the shipment details by waybill number
2. India <-> UK
   1. Shipper from India can send consignments to UK
   2. Shipper from UK can send consignments to India

**Note:** Above points from 1.d to 1.g are also applicable here

1. UK <-> US
   1. Shipper from UK can send consignments to US
   2. Shipper from US can send consignments to UK

**Note:** Above points from 1.d to 1.g are also applicable here

**Solution:**

It will be required to create multiple keyspaces for each route. This will help in maintaining the data replication only at required hop. One global keyspace will be there to monitor the consignment status.

* One Keyspace named shipment\_india\_uk\_us at each node of India, UK and US data center

CREATE KEYSPACE IF NOT EXISTS shipment\_ india\_uk\_us

WITH REPLICATION = {‘class’: ‘NetworkTopologyStrategy’, ‘india’ : 3, ‘uk’ : 2, ’us’ : 3 };

* One Keyspace named shipment\_uk\_us at each node of UK and US data center.

CREATE KEYSPACE IF NOT EXISTS shipment\_uk\_us

WITH REPLICATION = {‘class’: ‘NetworkTopologyStrategy’, ‘uk’ : 3, ’us’ : 3 }

* One Keyspace named shipment\_ india\_uk at each node of UK and US data center.

CREATE KEYSPACE IF NOT EXISTS shipment\_ india\_uk

WITH REPLICATION = {‘class’: ‘NetworkTopologyStrategy’, ‘india’ : 3, ‘uk’ : 3 }

* One global Keyspace named global\_shipment\_track at every data centers i.e. UK, US and India.

CREATE KEYSPACE IF NOT EXISTS global\_shipment\_track

WITH REPLICATION = {‘class’: ‘NetworkTopologyStrategy’, ‘india’ : 3, ‘uk’ : 3, ’us’ : 3 };

* Create one User defined Type for customer address

CREATE TYPE IF NOT EXISTS ADDRESS (

name text,

street text,

city text,

state text,

country text,

zip text,

phone list<text>,

email text

);

* Create following Column Families at following Keyspaces
  + Shipment\_ india\_uk\_us
  + shipment\_ uk\_us
  + shipment\_ india\_uk

CREATE TABLE IF NOT EXISTS shipment\_detail (

Source\_zone\_id TEXT,

Destination\_zone\_id TEXT,

Waybill\_no UUID,

source\_address frozen <ADDRESS>,

destination\_address frozen <ADDRESS>,

package\_type TEXT,

priority TEXT,

dispatch\_date TIMESTAMP,

exp\_delivery\_date TIMESTAMP,

Actual\_delivery\_date TIMESTAMP,

current\_status TEXT,

item\_name TEXT,

Is\_returned BOOLEAN,

Is\_damaged BOOLEAN,

Remarks TEXT,

PRIMARY KEY ( (source\_zone\_id, destination\_zone\_id), waybill\_no)

);

CREATE TABLE IF NOT EXISTS shipment\_detail\_source\_location (

Source\_zone\_id TEXT,

Destination\_zone\_id TEXT,

Waybill\_no UUID,

source\_address frozen <ADDRESS>,

destination\_address frozen <ADDRESS>,

package\_type TEXT,

priority TEXT,

dispatch\_date TIMESTAMP,

exp\_delivery\_date TIMESTAMP,

Actual\_delivery\_date TIMESTAMP,

current\_status TEXT,

item\_name TEXT,

Is\_returned BOOLEAN,

Is\_damaged BOOLEAN,

Remarks TEXT,

PRIMARY KEY ( source\_zone\_id, waybill\_no)

);

CREATE TABLE IF NOT EXISTS shipment\_detail\_destination\_location (

Source\_zone\_id TEXT,

Destination\_zone\_id TEXT,

Waybill\_no UUID,

source\_address frozen <ADDRESS>,

destination\_address frozen <ADDRESS>,

package\_type TEXT,

priority TEXT,

dispatch\_date TIMESTAMP,

exp\_delivery\_date TIMESTAMP,

actual\_delivery\_date TIMESTAMP,

current\_status TEXT,

item\_name TEXT,

Is\_returned BOOLEAN,

Is\_damaged BOOLEAN,

Remarks TEXT,

PRIMARY KEY (destination\_zone\_id, waybill\_no)

);

CREATE TABLE shipment\_detail\_by\_waybillno (

source\_zone\_id text,

destination\_zone\_id text,

waybill\_no uuid,

actual\_delivery\_date timestamp,

current\_status text,

destination\_address frozen<address>,

dispatch\_date timestamp,

exp\_delivery\_date timestamp,

is\_damaged boolean,

is\_returned boolean,

item\_name text,

package\_type text,

priority text,

remarks text,

source\_address frozen<address>,

PRIMARY KEY (waybill\_no)

);

* Create following Column Family at the keyspace global\_shipment\_track
  + shipment\_track

CREATE TYPE IF NOT EXISTS ADDRESS (

name text,

street text,

city text,

state text,

country text,

zip text,

phone list<text>,

email text

);

CREATE TYPE IF NOT EXISTS TRACK(

location text,

zone text,

update\_date TIMESTAMP,

remarks text

);

CREATE TABLE IF NOT EXISTS shipment\_track (

waybill\_no UUID,

source\_address frozen <ADDRESS>,

destination\_address frozen <ADDRESS>,

route\_path List<frozen<TRACK>>,

PRIMARY KEY (waybill\_no)

);