Redundant Datacenter Configuration With Antelope

Data Sources

Real Time Data Acquisition System

Real Time Data Processing System
Event processing   ShakeMap processing

Information systems
Event information   ShakeMap information

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Outline

- **System Layout**

- **Network Failover**

- **Application Failover**

System Layout
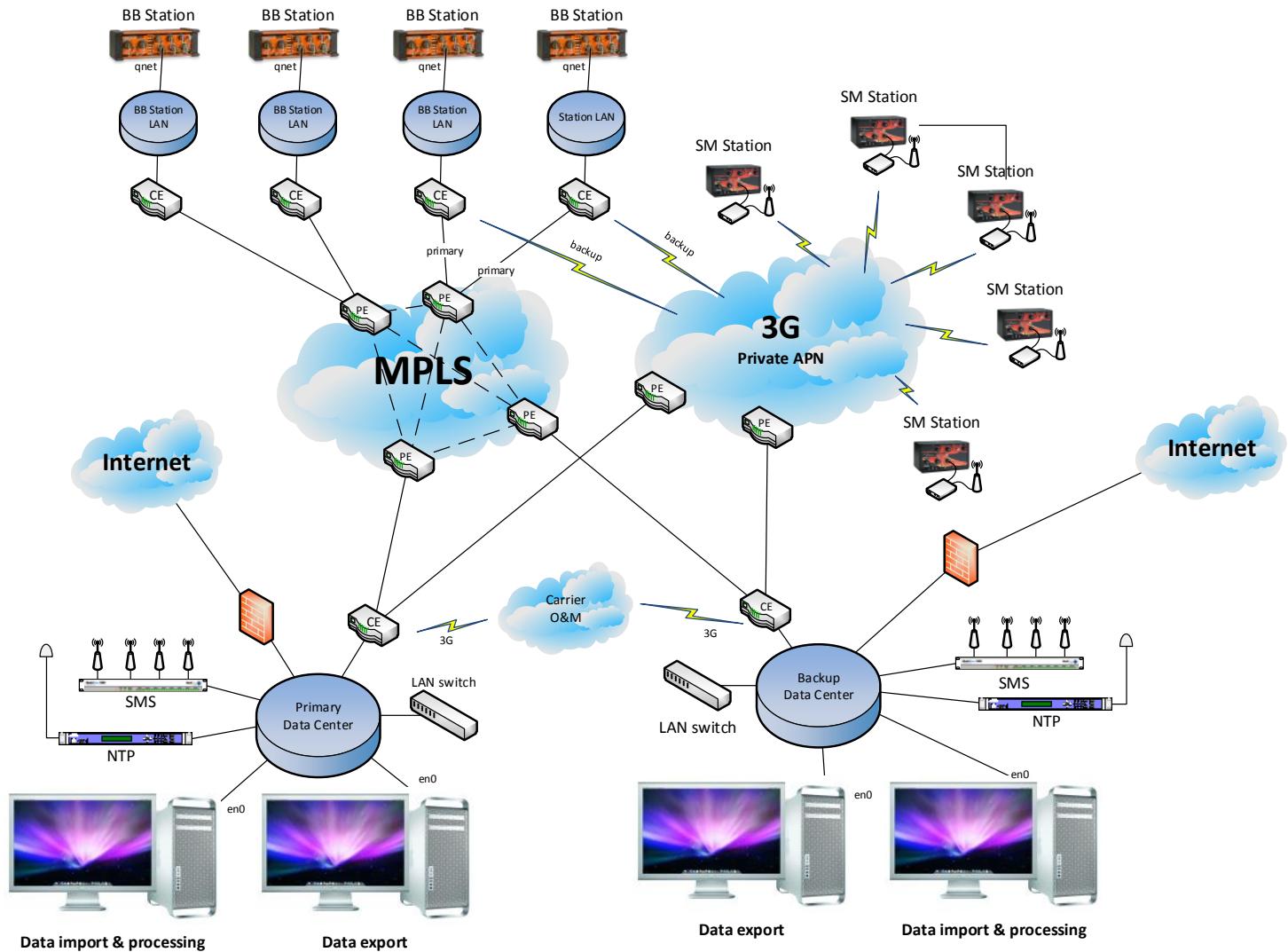
Network failover
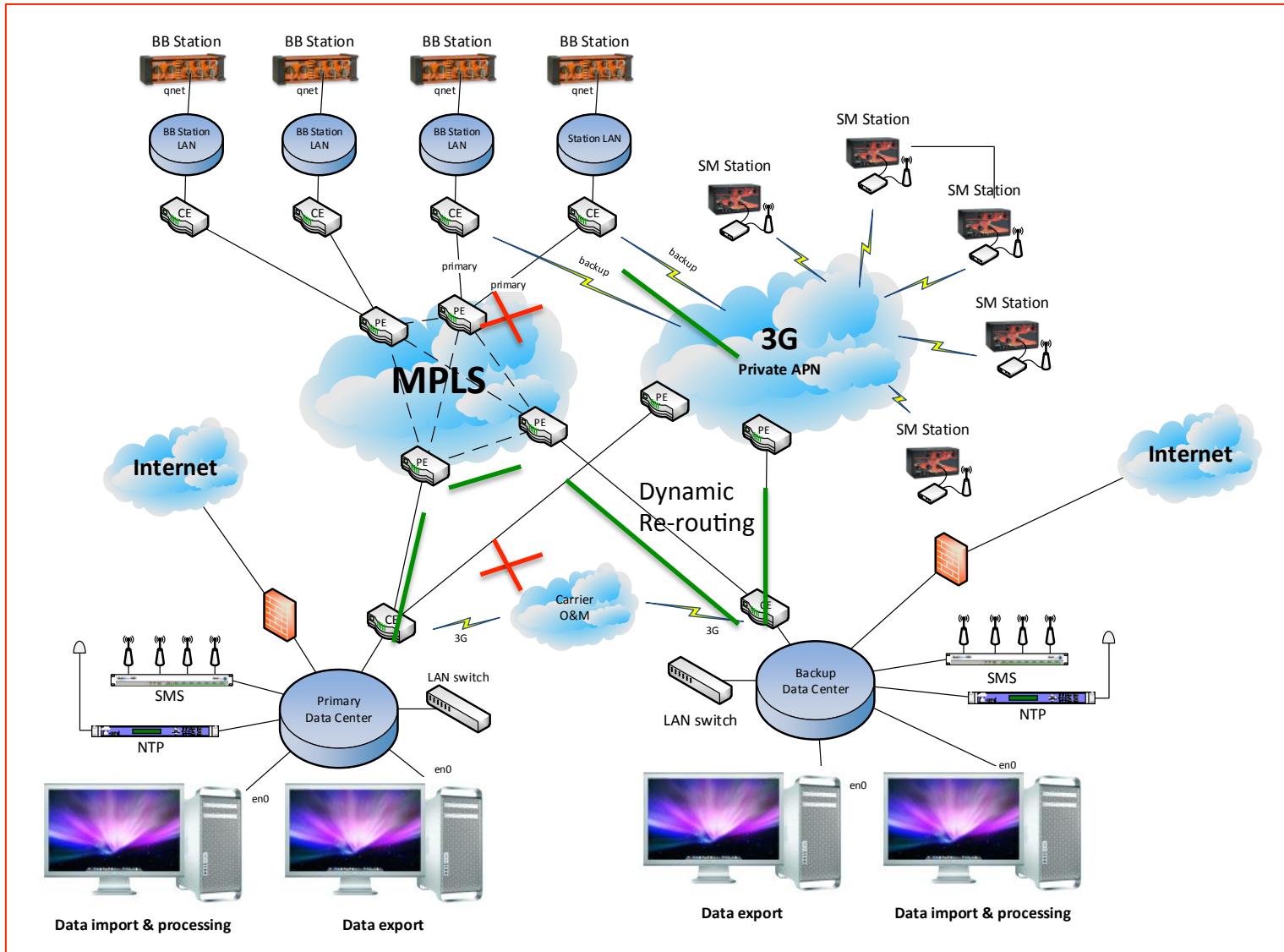
Application Failover: System entities


```
              ┌─────────────────────────┐
              │      Data Sources       │
              └─────────────────────────┘
                         ⌄
        ┌───────────────────────────────────┐
        │  Real Time Data Acquisition System │
        └───────────────────────────────────┘
                         ⌄
        ┌───────────────────────────────────┐
        │  Real Time Data Processing System  │
        ├─────────────────┬─────────────────┤
        │ Event processing│ ShakeMap processing│
        └─────────────────┴─────────────────┘
                         ⌄
        ┌───────────────────────────────────┐
        │       Information systems          │
        ├─────────────────┬─────────────────┤
        │ Event information│ ShakeMap information│
        └─────────────────┴─────────────────┘
```

Application Failover: DataFlow - MS
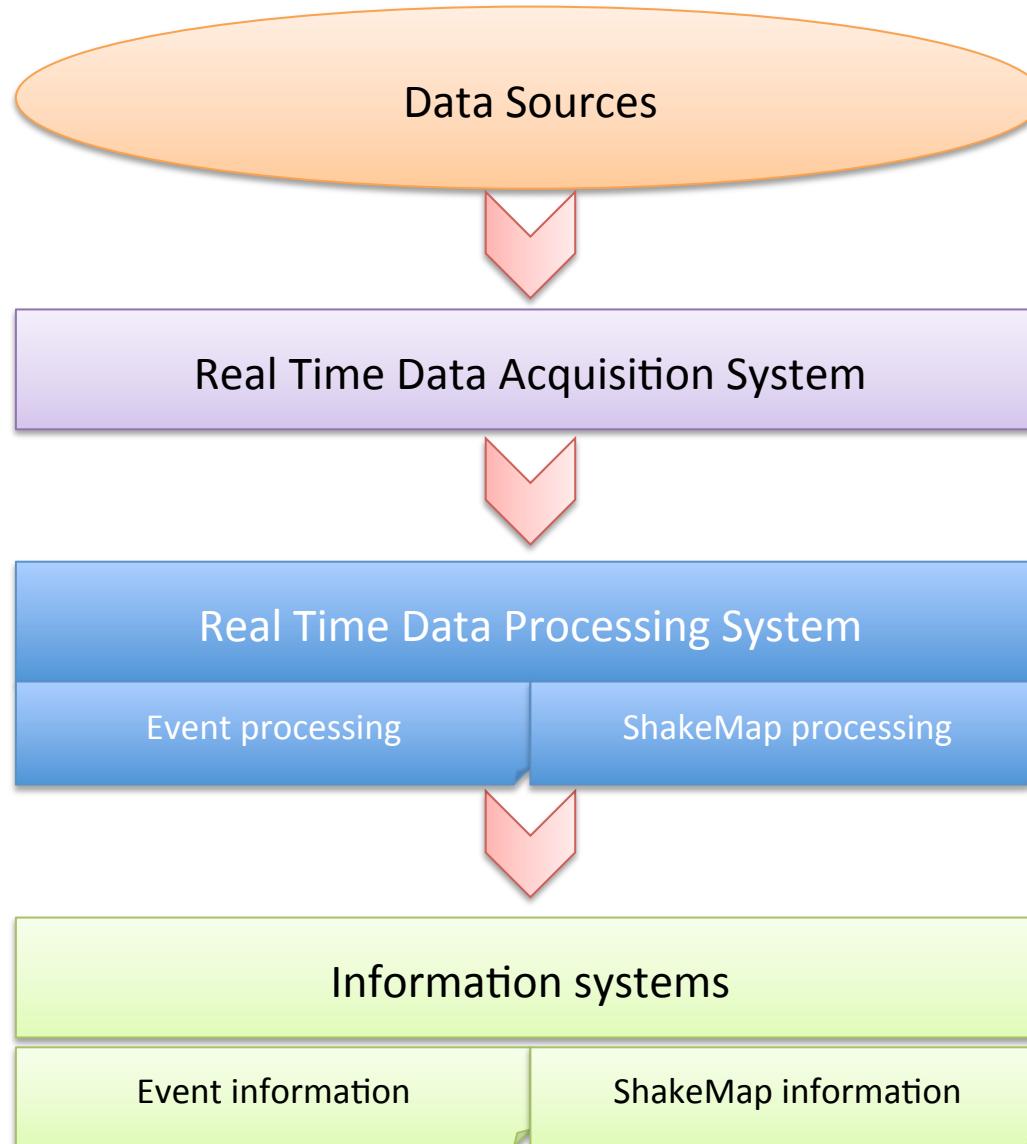
Application Failover: DataFlow - MS

Main System
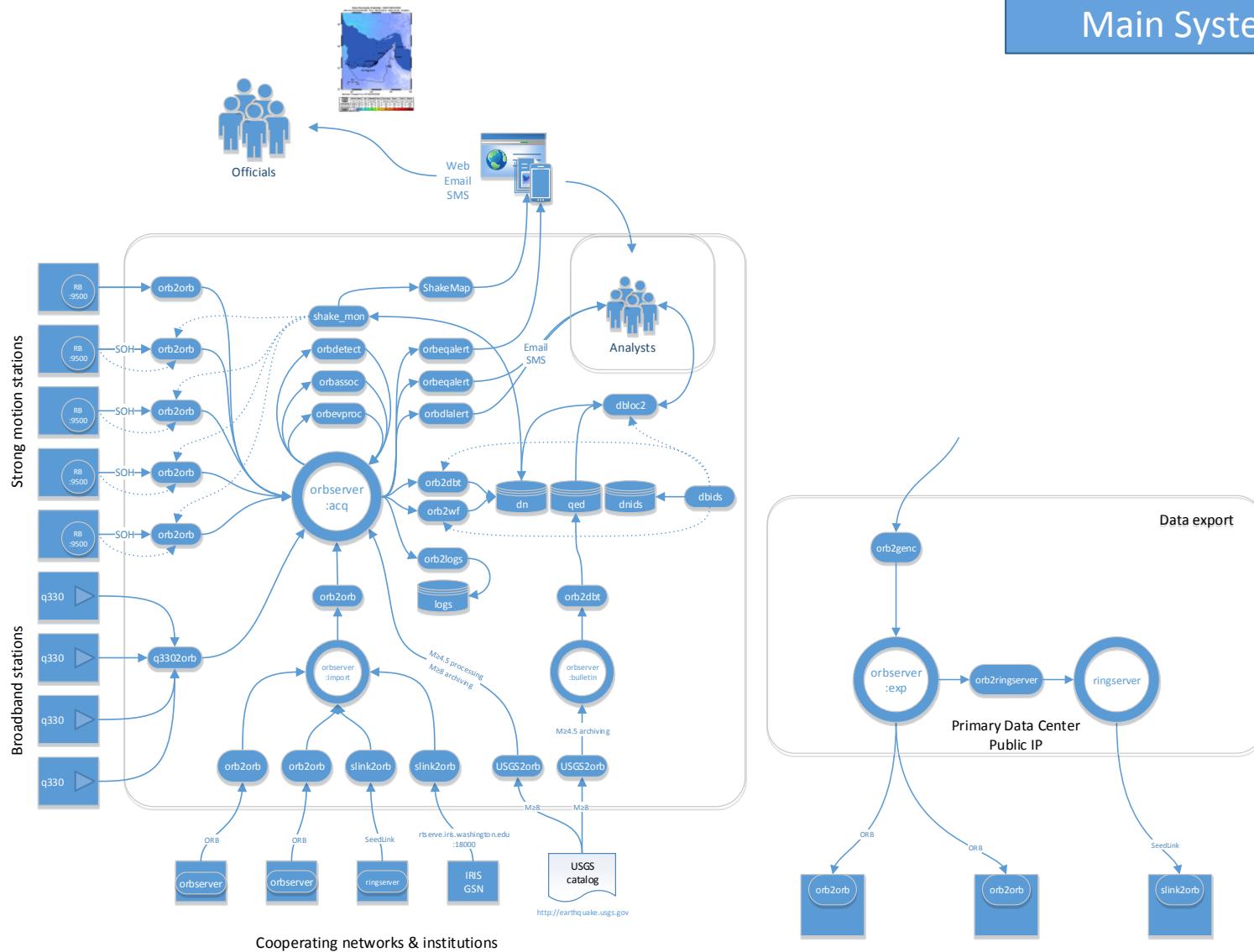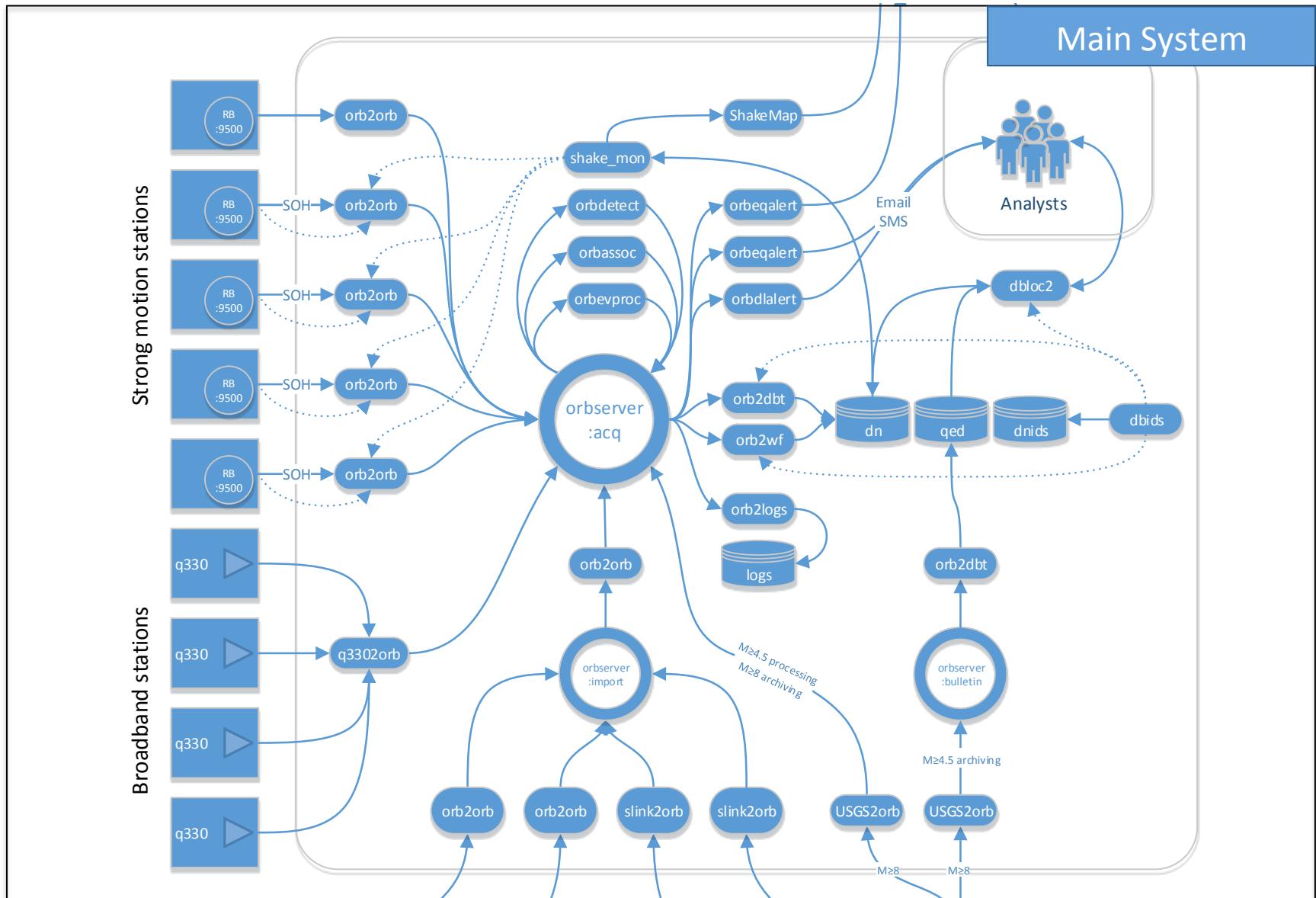
Strong motion stations

Broadband stations

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Application Failover: DataFlow - MS
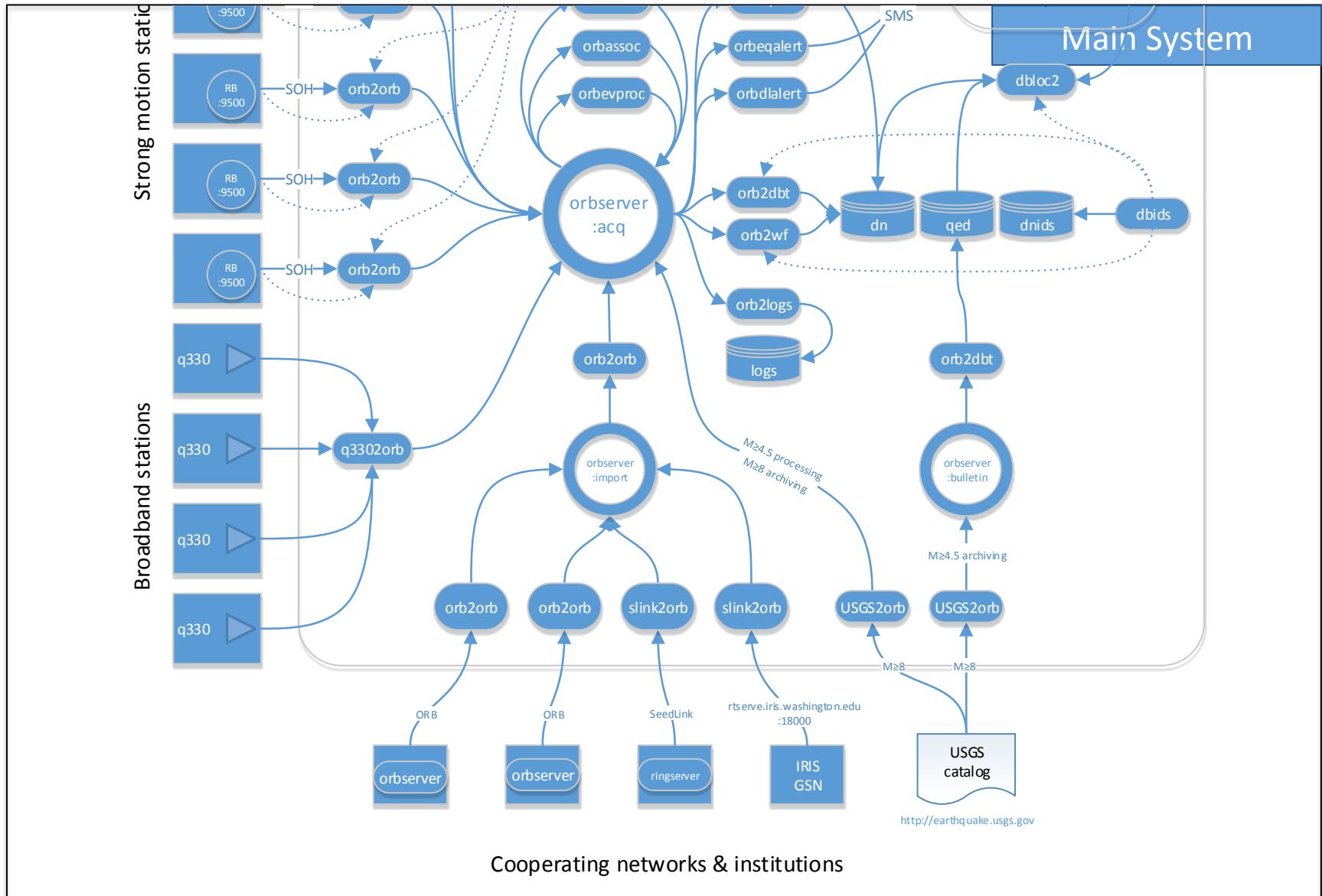
Application Failover: DataFlow - MS
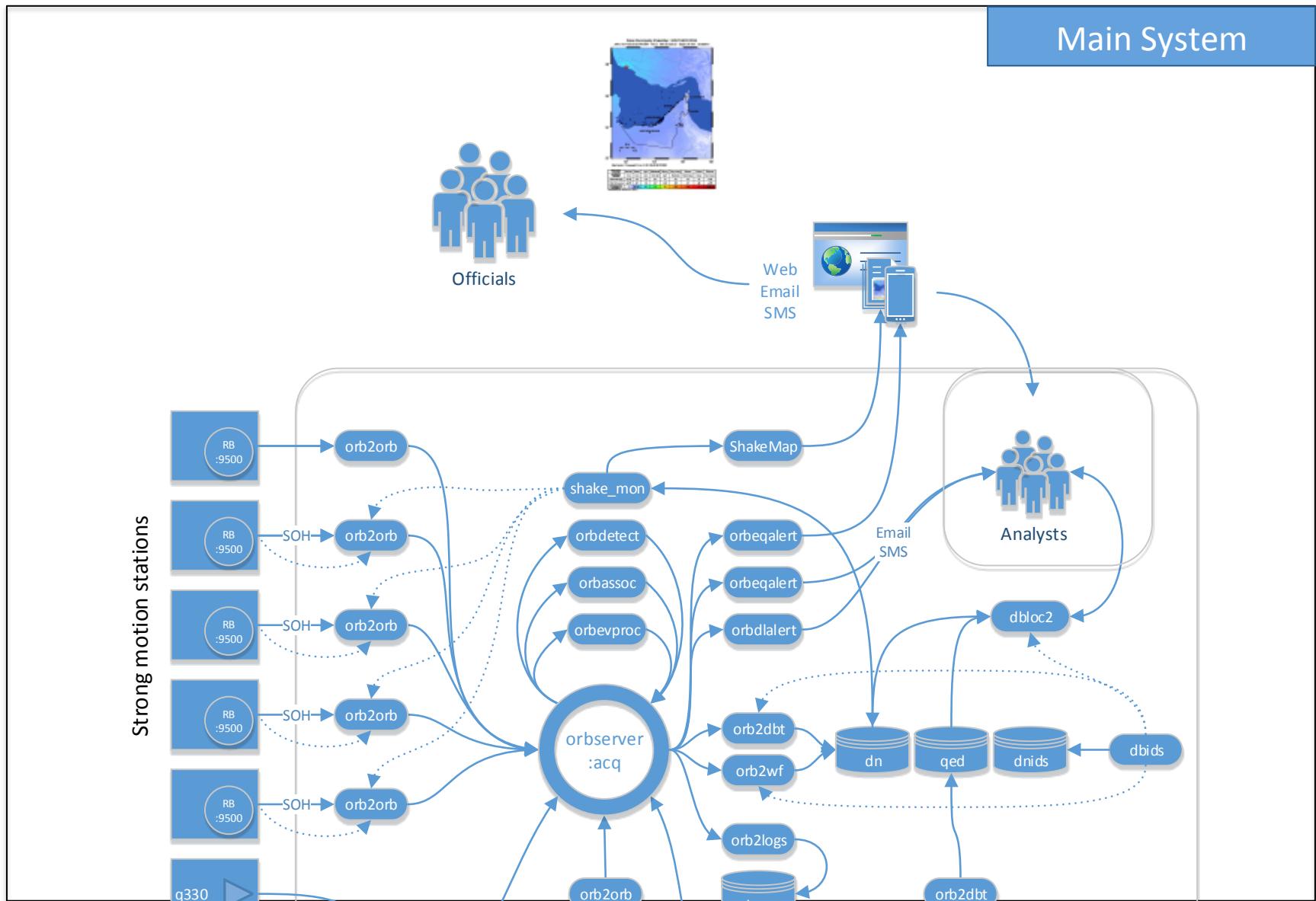
# Application Failover: DataFlow - BUS

Backup System (BUS)
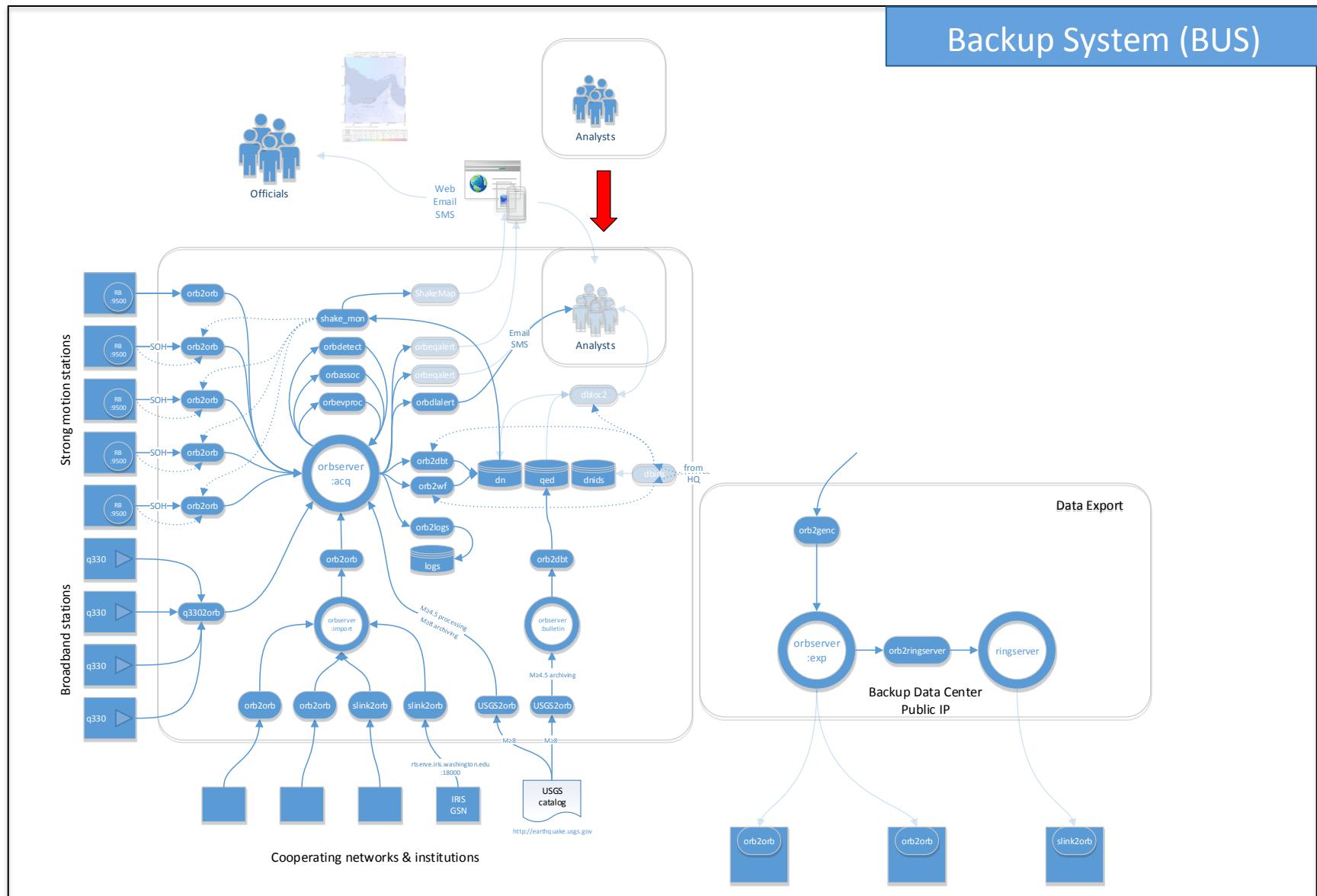
Application Failover
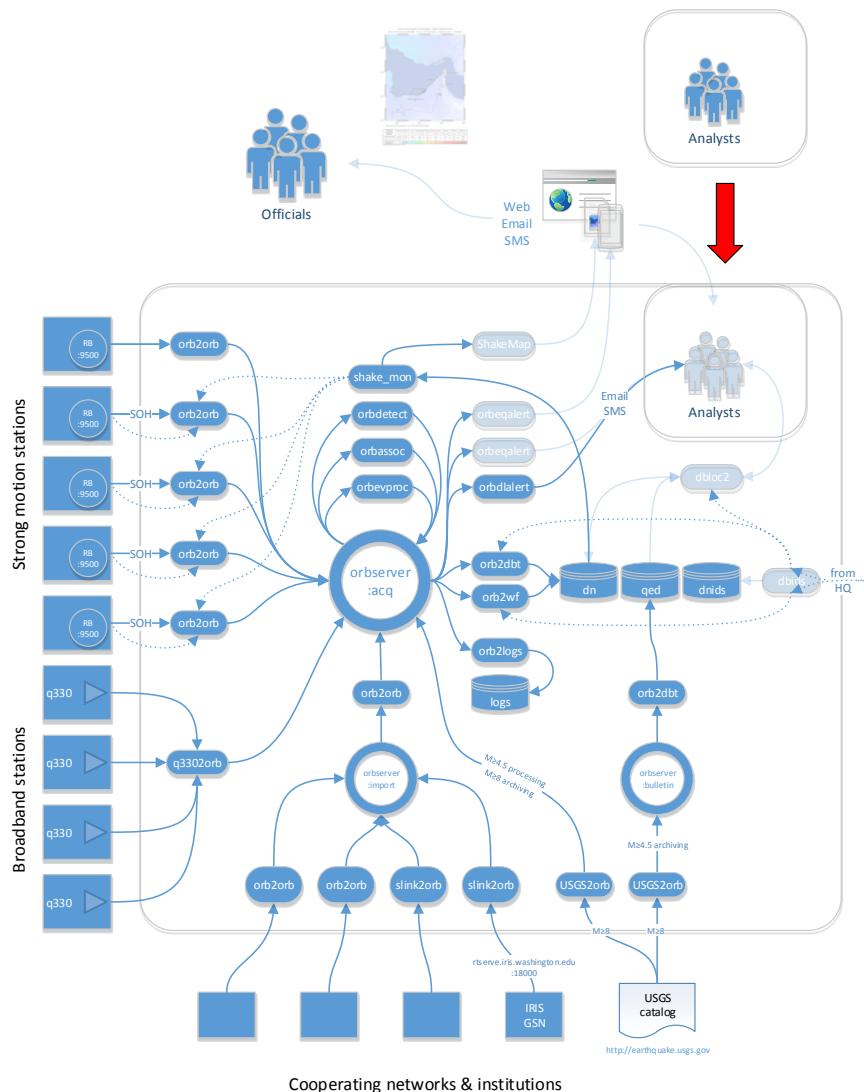
System characteristics

- Concurrent data acquisition

- Processing at both data centers

- Two production databases

- Unique IDs

- lastid replication

- One active information system

Application Failover
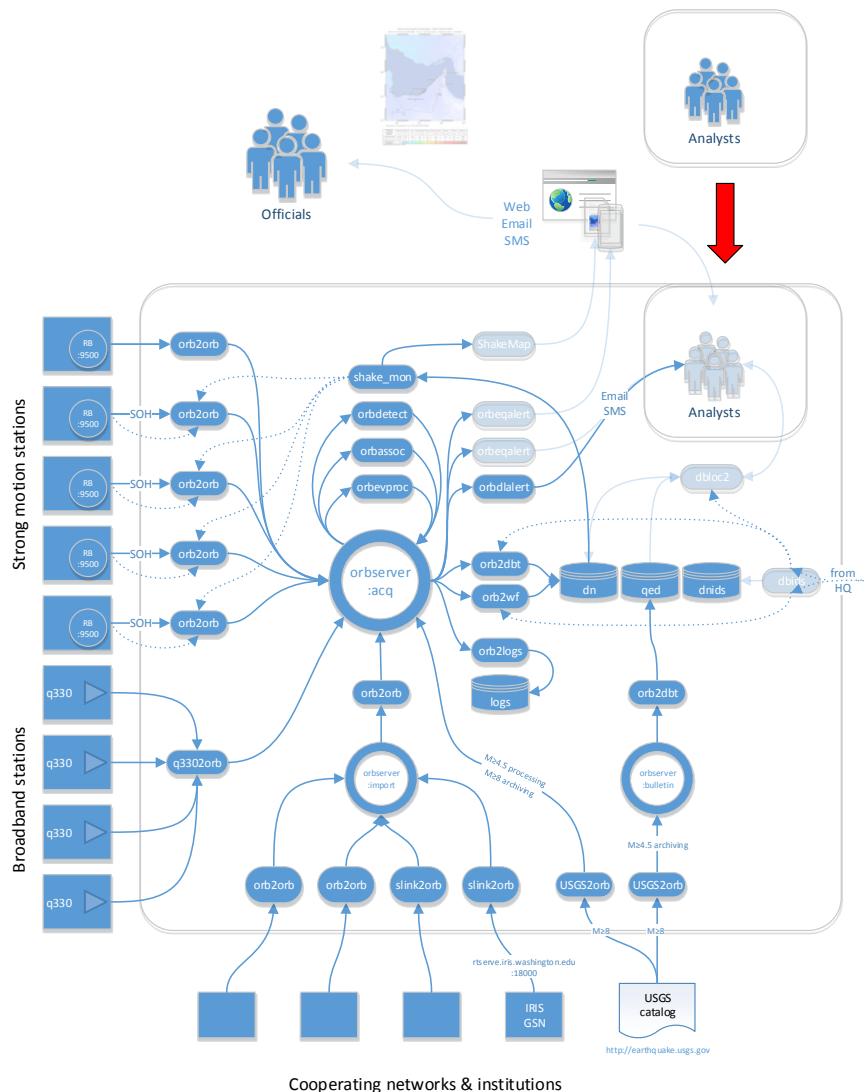
Crucial components

- ID Server (`dbids`)

- ID Replication
  (`dbids.lastid`)

- Monitoring
  (`idserver_connect`)

- Failover time

- Authority

Application Failover
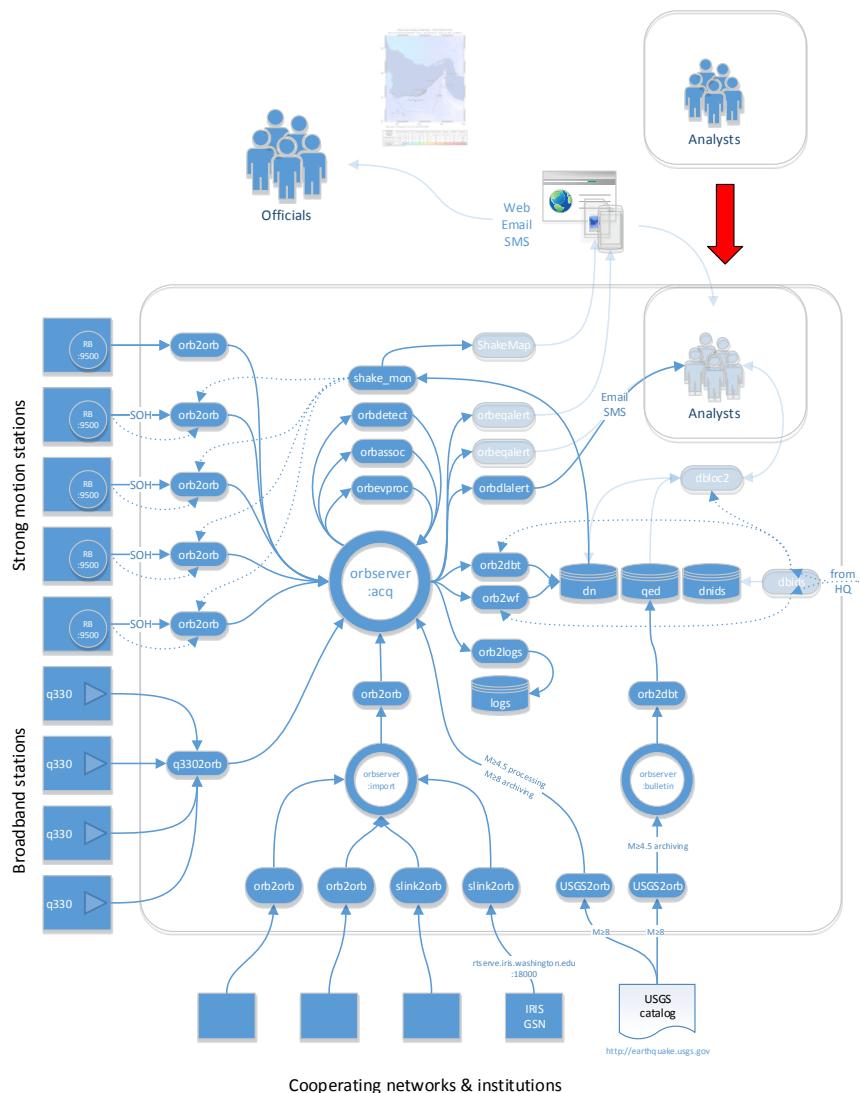
Failover process (auto)

- Initiated by BUS

- Synchronize local dbids.lastid

- Activate dbids

- Change db descriptor to use local dbids

- Restart database writers

- Activate information systems

- Notify operators (Email, SMS)

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Application Failover
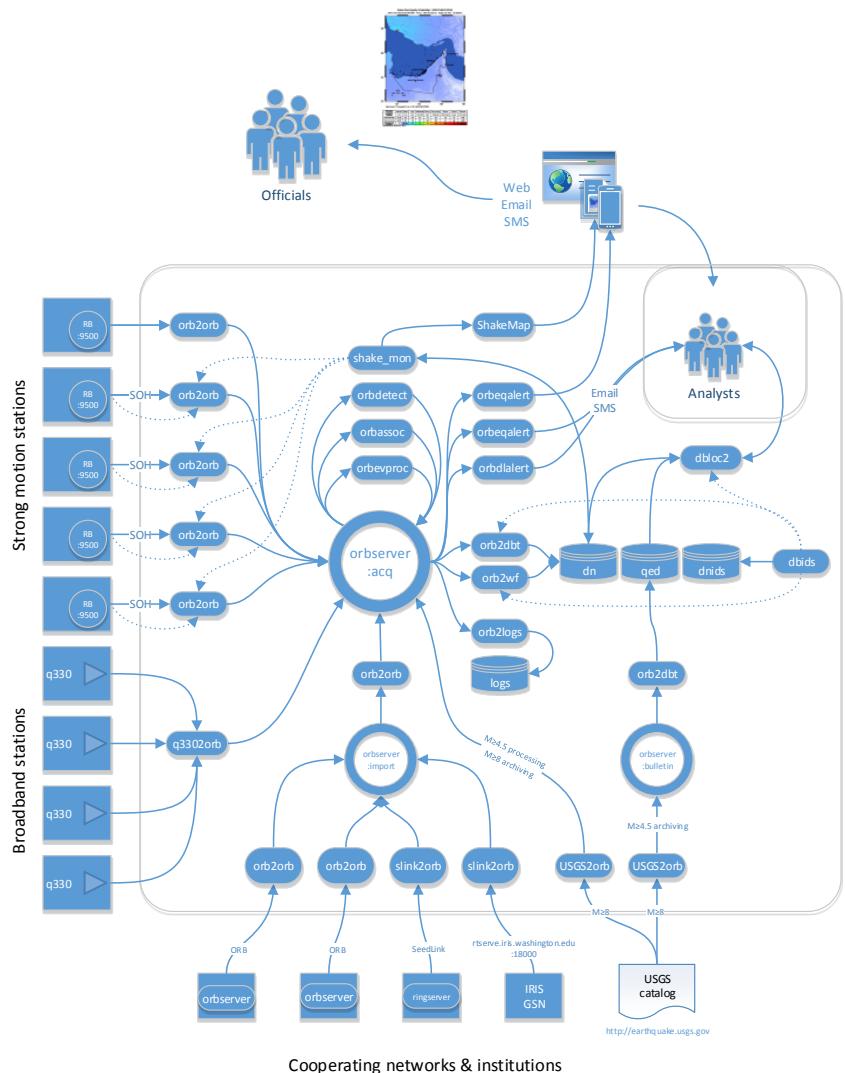
Post failover

- BUS providing database IDs

- BUS has authoritative database

- BUS feeding information to the world

- BUS prevents activation of dbids on MS (armed)

Application Failover

Failback (manual)

MS	BUS

- Check db consistency
- Start rtexec (if not running)
- Verify data flow

- Stop db writers (orb2wf & orb2dbt)
- Stop dbids
- Replicate dbids.lastid to MS
- Change db descriptor
- Stop monitoring MS

- Check db consistency vs dbids.lastid
- Start dbids

- Start db writers
- Start Monitoring MS
- Stop information systems

- Start information systems

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Application Failover

Data Recovery

BUS

- Extract data to external disk (e.g. USB)

```
trexcerpt -v -e  db/db <external disk> <starttime> <endtime>
```

MS

- Stop database writers
- Merge data from external disk

```
trexcerpt -v -a -e <external disk> <starttime> <endtime>
```

- Start database writers

Application Failover

Final note

Important

- Written procedures for stressful situations
- Drills and dry-runs for application and network
- At least once a year
- Revise procedures if needed

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Redundant Data Center Configuration

THANK YOU