



Cloud scaling of Visual Weather

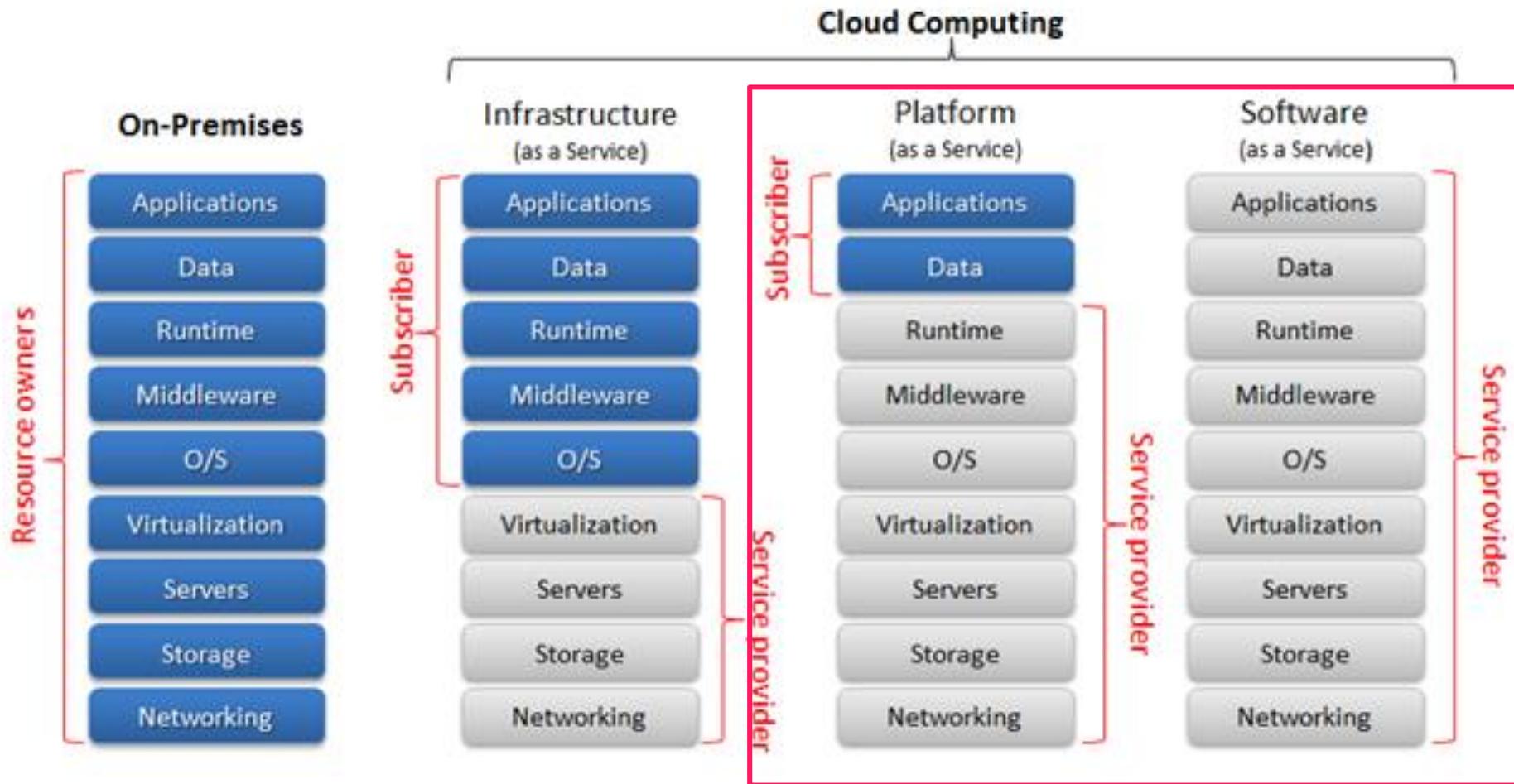
Jozef Matula
CTO

EGOWS

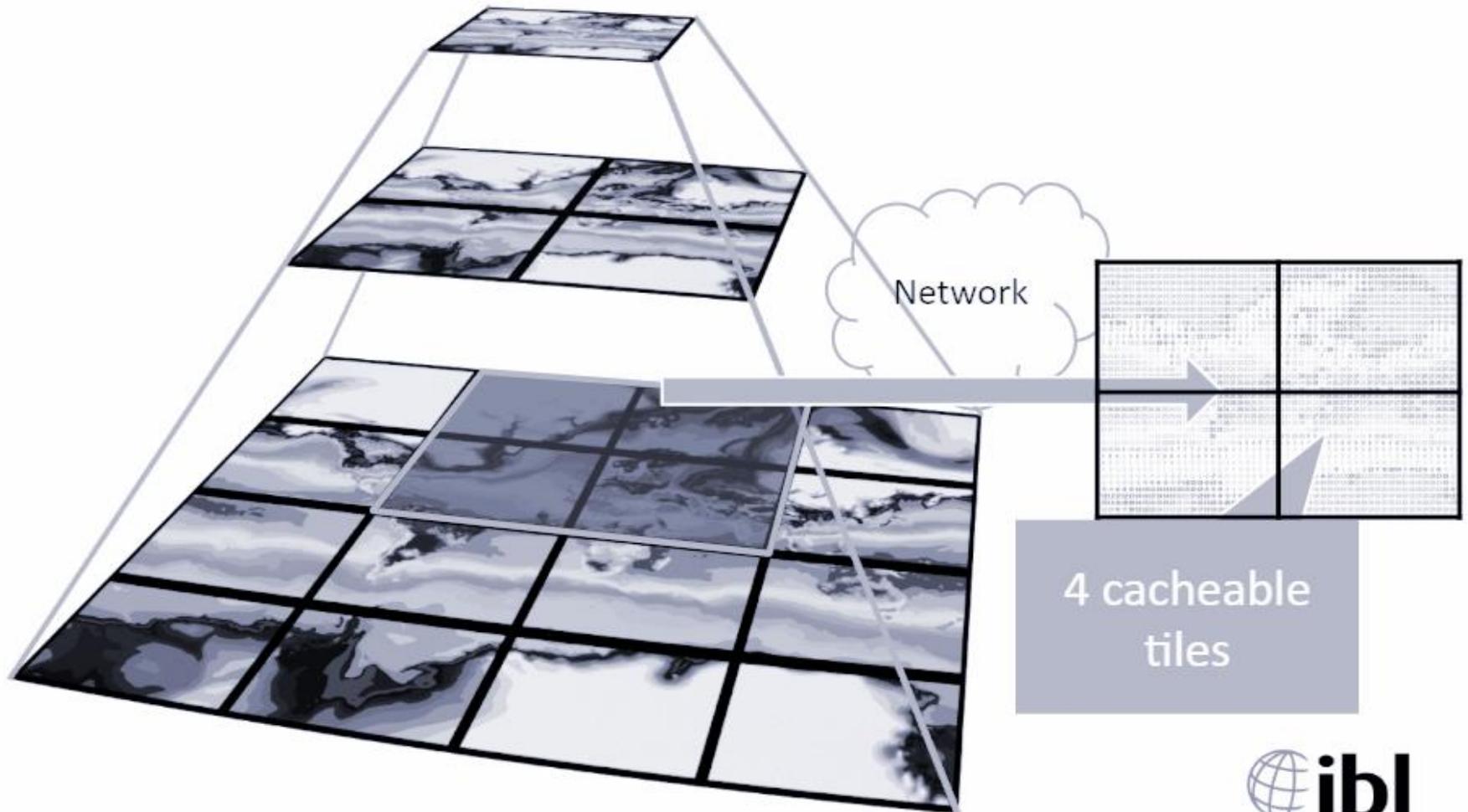
Reading, United Kingdom, 15th-17th October 2018



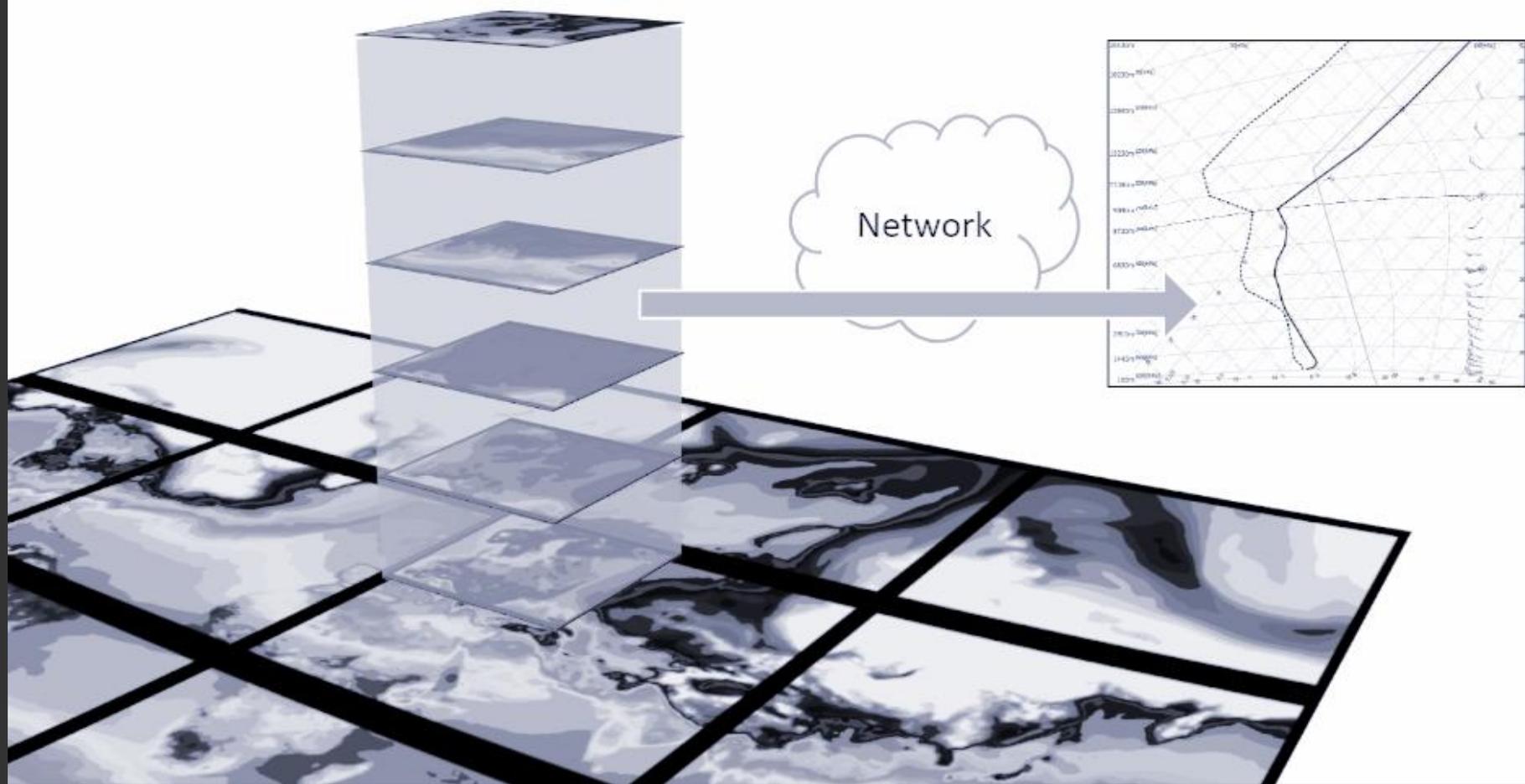
Cloud - Separation of responsibilities



Tiling - Bigger area, full resolution



Point vertical query (client side interpolation) Visual Weather



Grid Processor native API

```
import IBL.Geo as G, IBL.Kernel as K

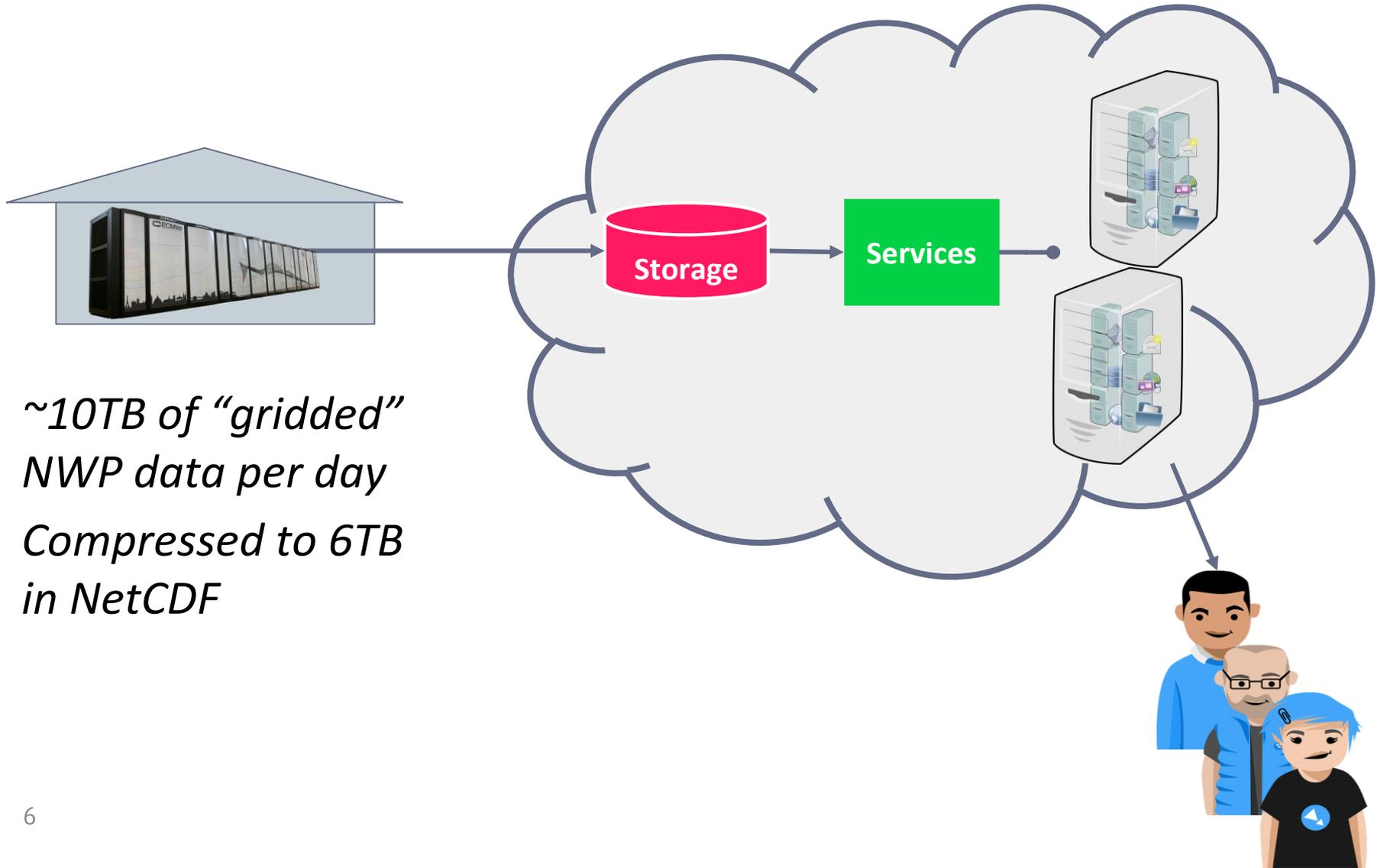
modelId = G.StationId('GFS')
run = K.GridProcessor.getLatestRunFuzzy(modelId)

processor = K.GridProcessor()

result = processor.decodeAndInterpolate(modelId, run,
    500850, # parameter identifier
    12 * 3600, # forecast offset in seconds
    G.GridLevel.fromString('2m'), # vertical level (must exist)
    G.ModelDataSet.REGULAR,
    [K.QueryItem.mkPointQuery(G.Coord.deg(17.1, 48.1))])

print result[0].value, result[0].unit
```

NWP in Cloud idea



Cloud - Scalable technologies



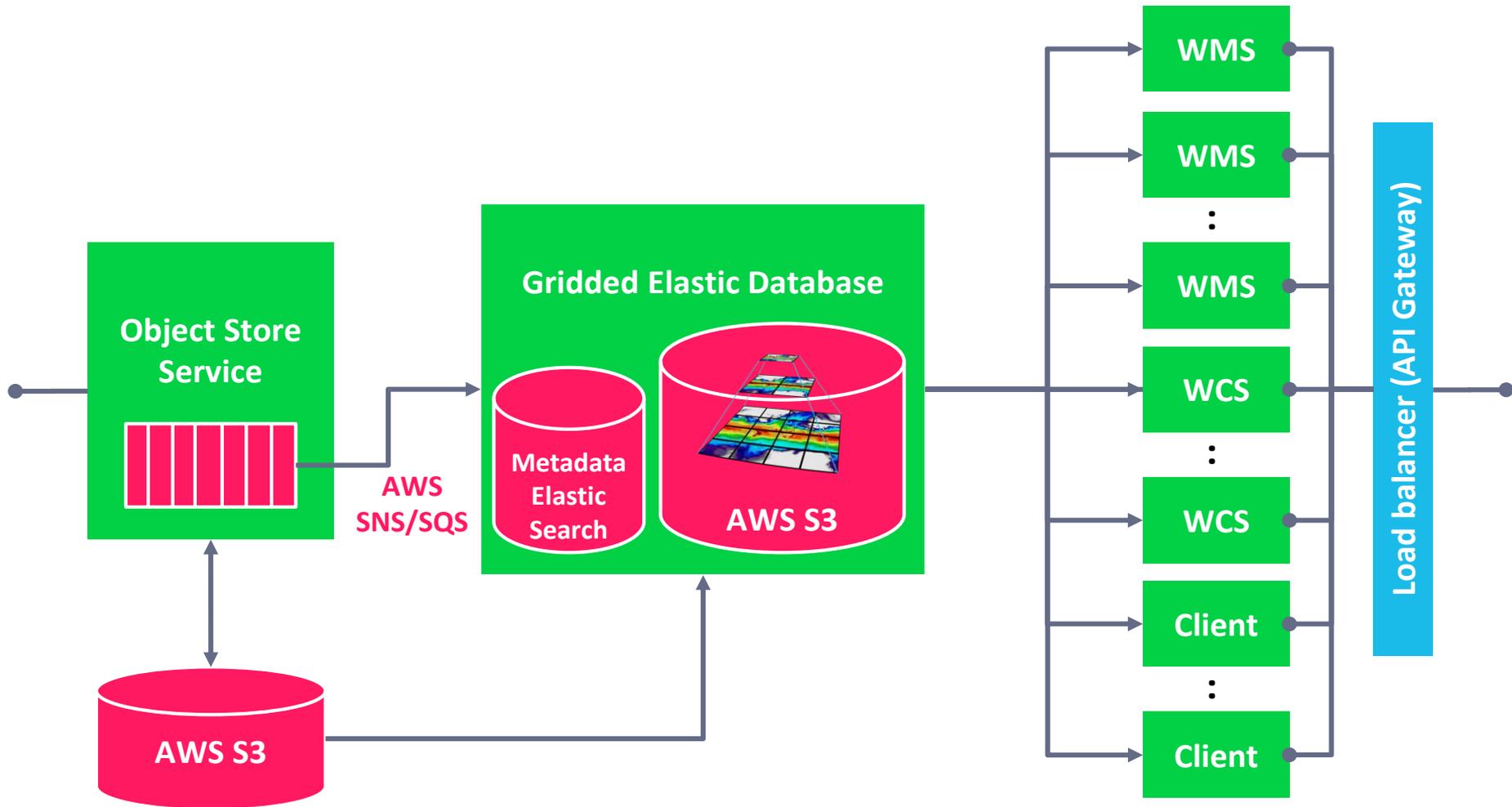
	Amazon AWS	Azure	Google Cloud
Object Storage	S3 (Simple Storage Service)	Azure Blob Storage	Cloud Storage
File Storage	Elastic Block Storage Elastic File System	Premium Storage Account	Cloud Storage + FUSE adapter
Queue/Messaging	Simple Queue Service Simple Notification Service	Storage queues Service Bus	Task Queue Cloud Pub/Sub
Database	Aurora DynamoDB Elasticsearch	SQL Database DocumentDB	Cloud SQL Cloud Datastore
Archive/Backup	Glacier	Azure Backup	Cloud Storage Coldline
Serverless Code	Lambda	Azure Functions	App Engine

Cloud - Scalable technologies

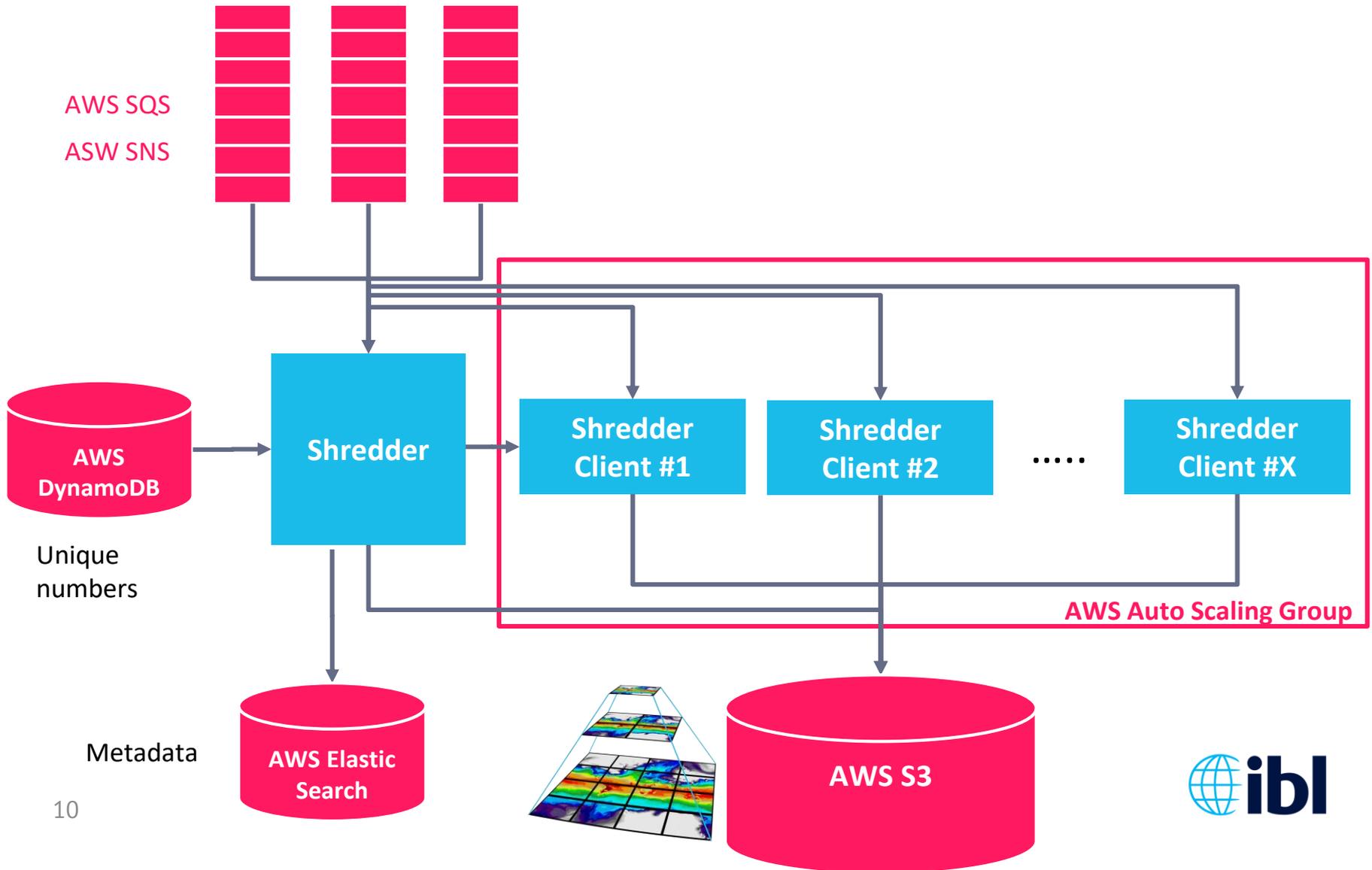


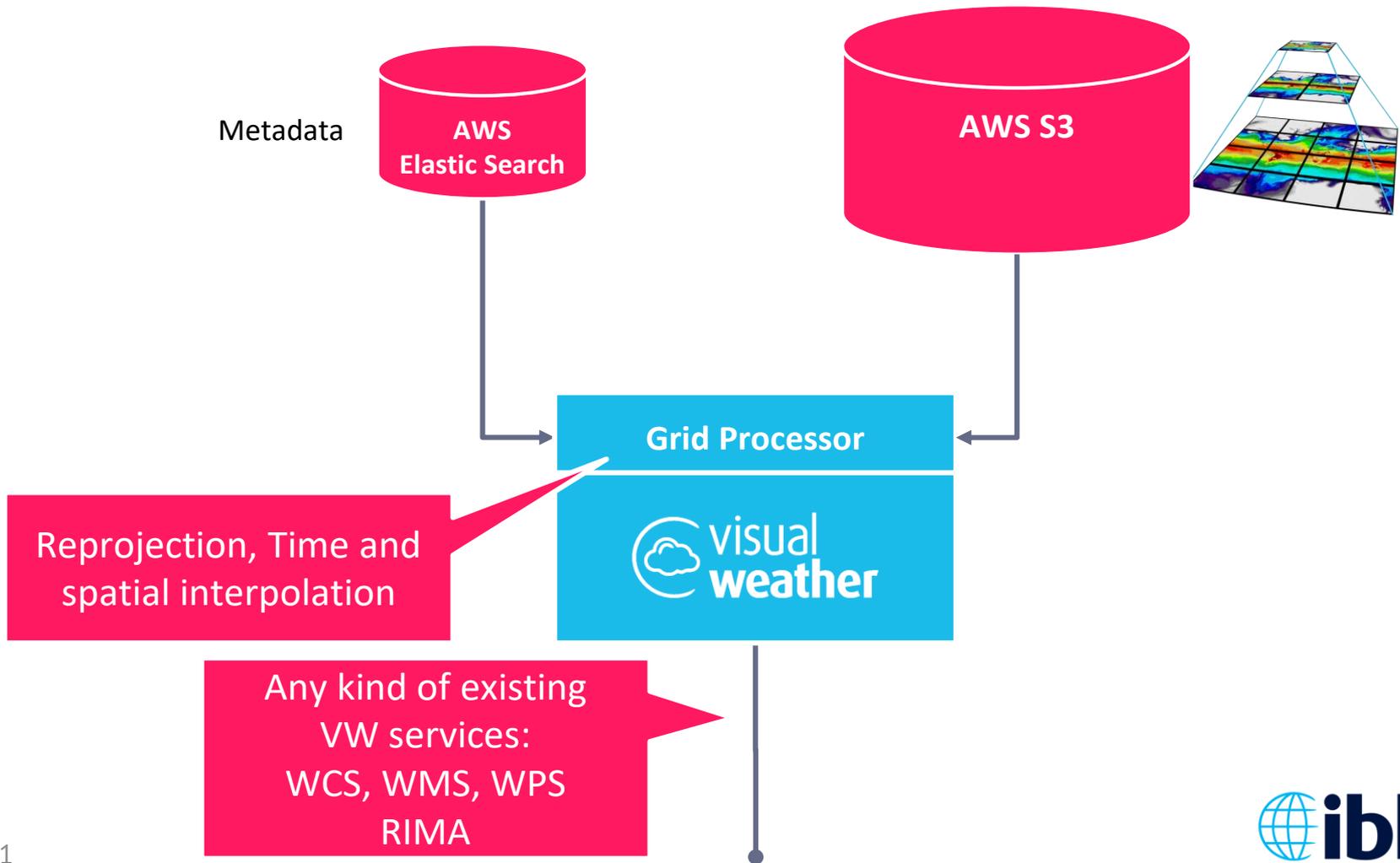
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Cloud processing plan

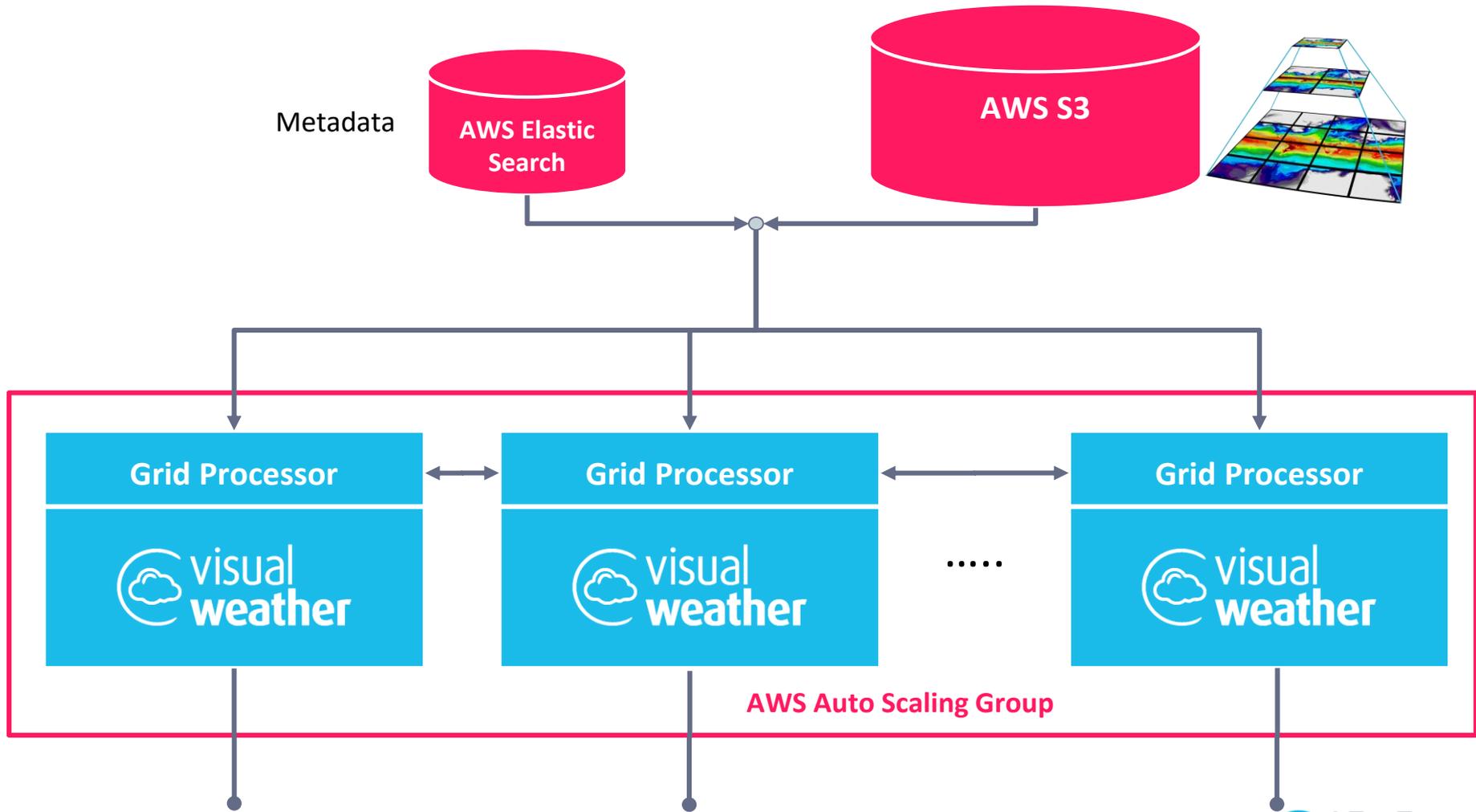


Gridded Elastic Database (G.E.D.)





G.E.D. client scaling



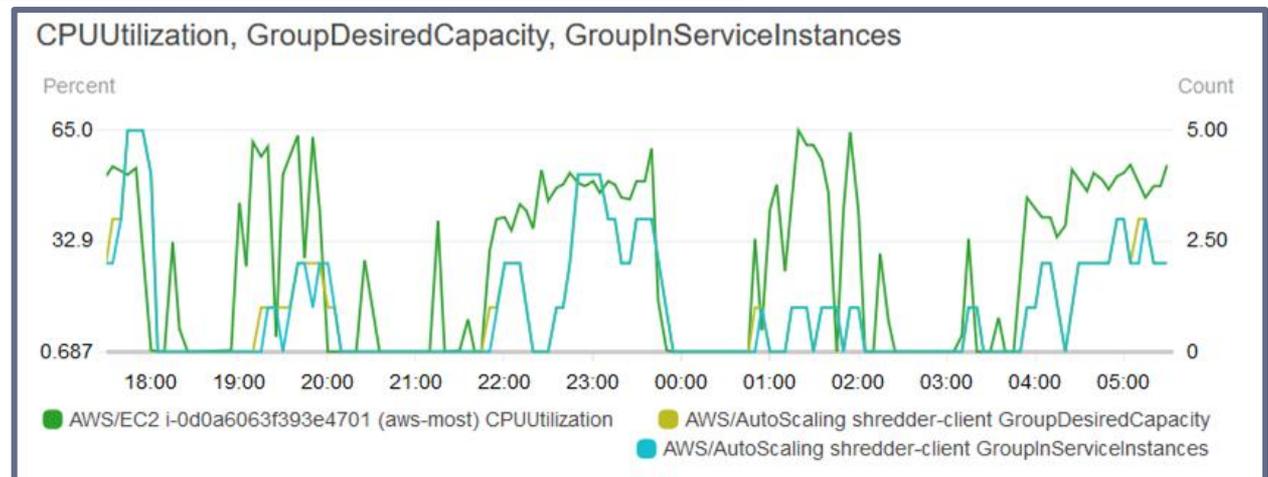
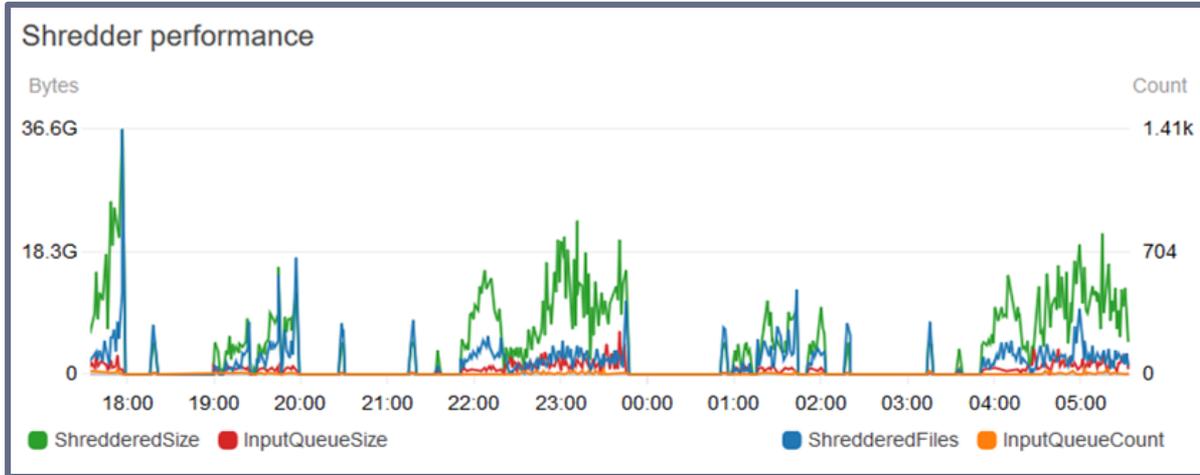
GED Auto Scaling Group

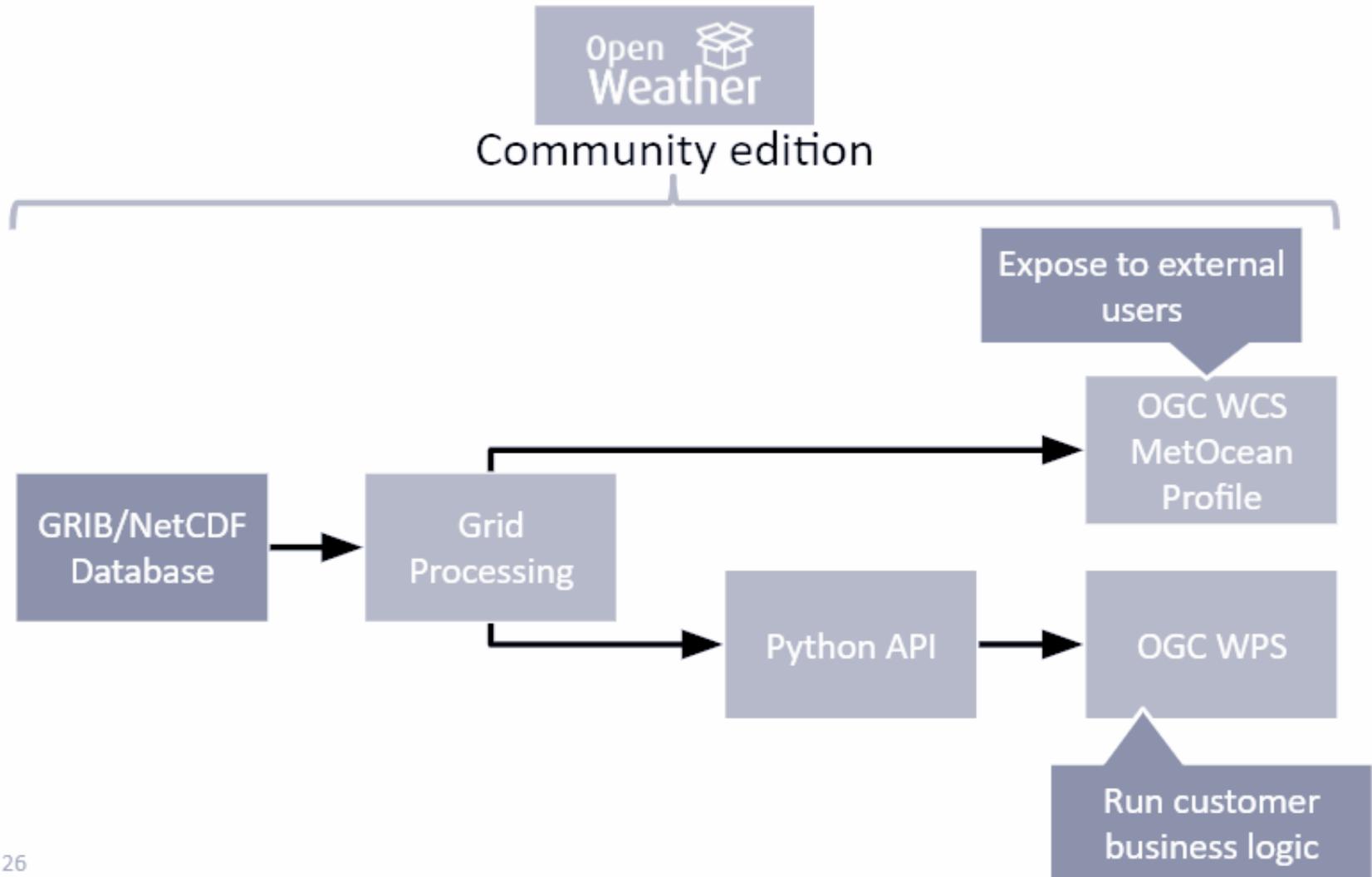
Peak time examples, 4 shredder clients are running

aws:autoscaling:groupName : shredder-client Instance State : Running Add filter

<input type="checkbox"/>	Name	Instance ID	Instance Type	Availability Zone	Instance State
<input checked="" type="checkbox"/>		i-09533d32d6b5b10...	i3.2xlarge	eu-west-2c	● running
<input type="checkbox"/>		i-00ed1b27ad42e3d...	i3.2xlarge	eu-west-2c	● running
<input type="checkbox"/>		i-08bb012f13485506d	i3.2xlarge	eu-west-2c	● running
<input type="checkbox"/>		i-0136e279f9ab7f679	i3.2xlarge	eu-west-2c	● running

GED performance monitoring





Cons of Visual Weather in the Cloud:

- **Very big code base (2GB)**



Cons of Visual Weather in the Cloud:

- Very big code base (2GB)
- Inflexible and relatively slow deployment (a lot of configurations)





A new product
targeting:
Cloud deployments,
Cloud scalability &
API standardisation

Open Weather **does/is**:

- Based on Visual Weather code base
- Include GED (database + client)
- Include web service suite (RIMA, WCS, WMS)

Open Weather **does not**:

- Include majority of VW server components (native database, ingestion and telecommunication subsystem)
- Include user interface of VW
- Include traditional installation and configuration process (replaced by pure git deployment of configuration)

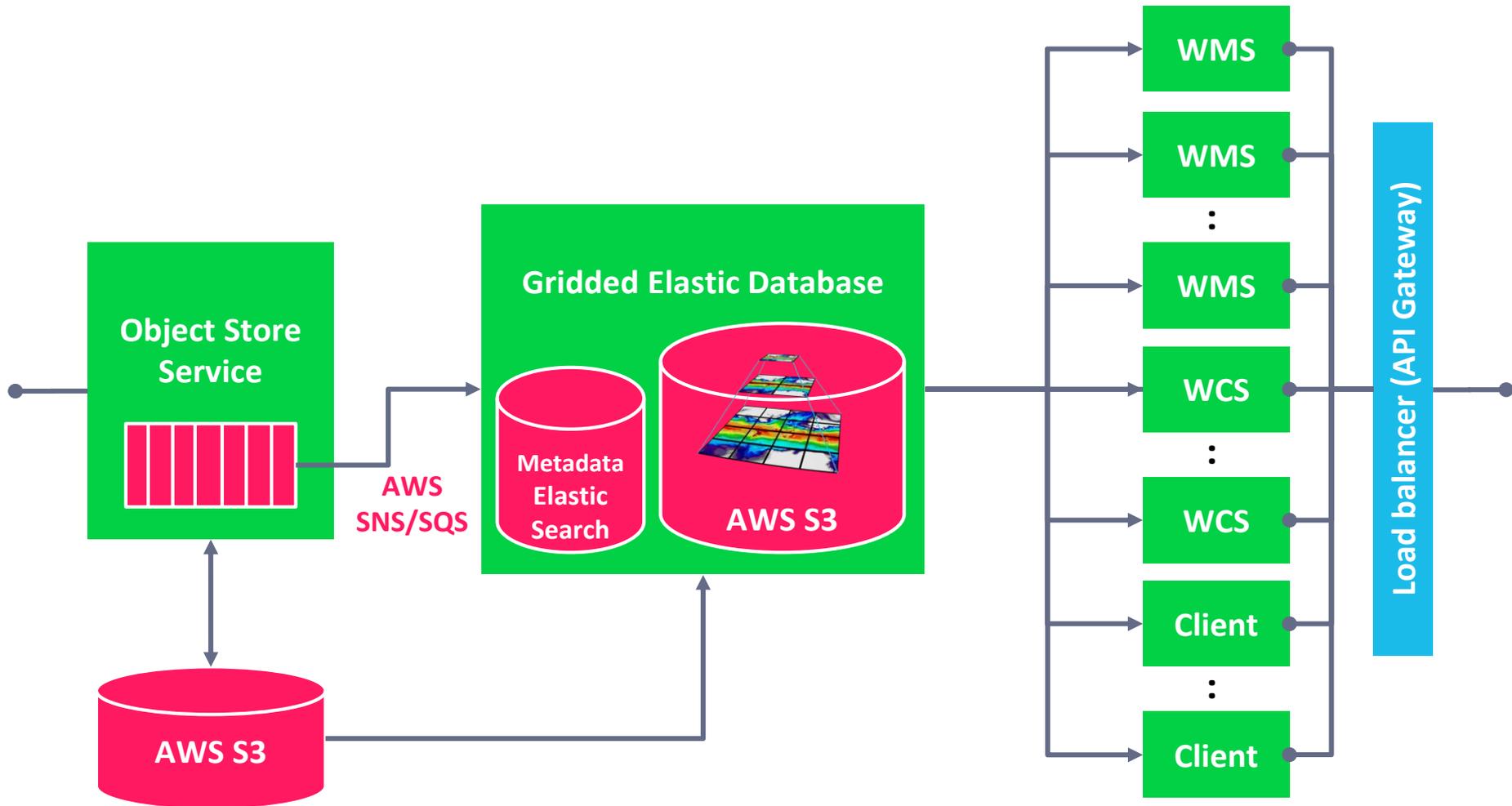
Open Weather **Community Edition**:

- local GRIB/NetCDF ingestion
- GED client
- Includes WCS and RIMA web service (IBL OGC-like grid processing API)
- Limited support

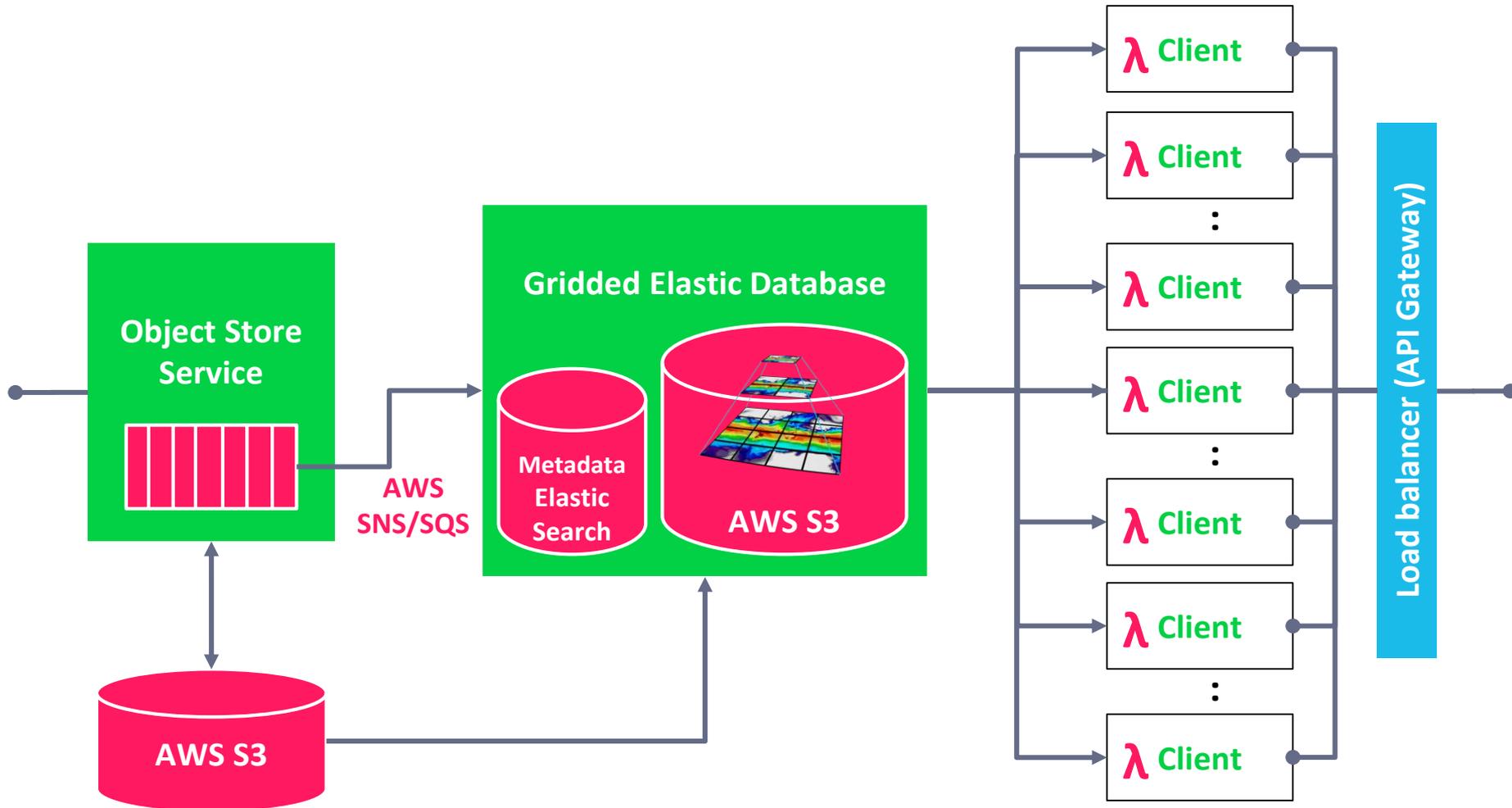
Open Weather **Standard Edition**:

- Includes GED database (the Shredder component)
- Includes full OGC web service suite (WMS, WCS, WPS)
- Python API
- SLA support

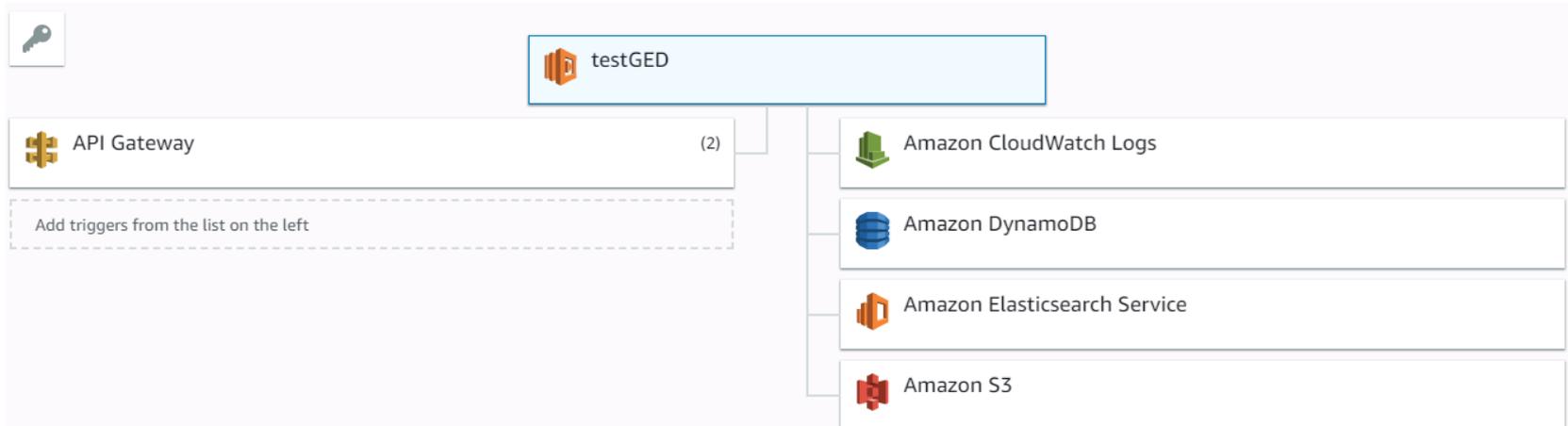
Cloud processing plan



Cloud processing plan - Serverless



- Shrank down version of Open Weather allowing serverless grid processing (because of 250MB AWS Lambda limit).
- Includes GridProcessor capabilities operating over GED client connectivity
- No Web Service APIs, Lambda is a web service over our Python API.



Questions?

