

SCHEDULE E: SERVICE DEFINITION FOR CLOUD STORAGE SERVICE

1. Cloud Storage Service Description

Exponential-e's Cloud Storage Service is a software-defined, cloud-scale, object storage platform.

Exponential-e's Cloud Storage Service provides virtualized software defined storage resources to the Customer allowing the Customer to create and configure their own storage resources via a portal. Exponential-e uses Tier 3 data centres to house the underlying hardware and virtualisation technology which deliver virtual storage resources to multiple customers. Exponential-e shall manage all hardware and software defined storage required to provide the Cloud Storage Service and the portal to enable the Customer to manage and view the virtual resources. The Customer shall be responsible for managing the Stored Data and any software and applications utilizing the Stored Data. Customer access to Stored Data is via the following protocols: Object, HDFS and NFS.

Protocols		Supported	Interoperability
Object	S3	Additional capabilities like Byte range Updates and Rich ACLS	HDFS, NFS
	Atmos	Version 2.0	N/A
	Swift	Version 2.0 APIs and Swift Authentication	HDFS, NFS
	CAS	SDK version 3.1.544 or later	N/A
HDFS		Hadoop version 2.7 compatibility	S3, Swift, NFS
NFS		NFS version 3	S3, Swift, HDFS

The Service is made up of:

- **Object Storage** – amount of space allocated by the Customer when creating a storage resource, measured in GB (1,000,000,000 bytes)

The Service is available in a Protected Zone or Geo-Replicated Zone configuration as follows:

- **Protected Zone:** an Object Storage instance located in a single Exponential-e data centre.
- **Geo-replicated Zone:** an Object Storage instance located across two geographically separate Exponential-e data centres with a "high-availability" configuration.

Management

The Cloud Storage Service will be subject to management by Exponential-e in accordance with Appendix A to this Service Definition.

2. Cloud Storage Service Demarcation Point (SDP)

The Cloud Storage SDP is the point up to which (i) Exponential-e's Cloud Storage Service obligations apply and (ii) the Cloud Storage Service Level Agreement covers. The Cloud Storage SDP is the network-facing ports on the Exponential-e core switches at the Cloud Storage Zone.

3. Target Service Commencement Date

Cloud Storage Service 5 Working Days*

** From order acceptance. Lead-time is subject to confirmation if changes are made by the customer and/or further information comes to light which would have affected the initial design. Exponential-e shall use reasonable endeavors to ensure that the Customer may connect to the Cloud Storage portal over the public internet within this Target Service Commencement Date. However, where the Cloud Storage Service is also part of a solution involving Connectivity Services and/or VDC Services, access to the Cloud Storage Service shall also be dependent upon the lead times for the Connectivity Services and/or VDC Services.*

4. Cloud Storage Service Level Agreement

Availability

The Cloud Storage Service is considered available at the Cloud Storage SDP if the Customer is able to access the Stored Data at the Zone in the case of Single Zone configuration or at either Zone in the case of Dual Zone configuration.

Zones	Availability
Protected Zone	99.99%
Geo-Replicated Zone	99.999%

Durability

Exponential-e uses the Markov Chain data durability model to calculate data durability.

Durability is defined as the 1 - average annual expected loss of data objects as a percentage. The calculation is:

Total objects = Total storage/ Avg. object size



$P(\text{Object loss per year}) = 1 / ((\text{mean time to data loss (MTTDL)} * \text{Total objects}))$

$\text{Durability} = 1 - P(\text{Object loss per year})$

Durability is measured across both Zones in the case of a Dual Zone configuration.

Zones	Durability
Protected Zone	99.999998%
Geo-Replicated Zone	99.999998%

Service Credits

	Measure	Service Credit*
Availability	Below Target	5%
	>0.1 Below Target	10%
	>0.2 Below Target	20%

	Measure	Service Credit*
Durability	Below Target	5%
	>0.1 Below Target	10%
	>0.2 Below Target	20%

* The service credit is applied as a percentage of the Monthly Charge for the Cloud Storage Service for the month concerned. Monthly Charge is the Annual Charge divided by 12 and/or Usage Charges paid for the month concerned (where applicable).

5. Rate Card

The Rate Card for Cloud Storage is available upon request from sales@exponential-e.com.

APPENDIX A: CLOUD STORAGE MANAGEMENT

Exponential-e’s responsibilities with respect to management of the Cloud Storage Service are as follows. The Customer is responsible for all management aspects other than those for which Exponential-e is responsible.

Aspect	Exponential-e’s Responsibilities
Capacity Planning	<ul style="list-style-type: none"> • Ongoing planning for future growth involving trending of data capacity patterns within the storage repository.
Documentation	<ul style="list-style-type: none"> • Maintain solution design documentation for the Cloud Storage Service. • Maintain solution configuration documentation for the Cloud Storage Service. • Implement and maintain version control for all documentation.
Logins	<ul style="list-style-type: none"> • Manage the Cloud Storage service logins with the Cloud Storage Service.
Monitoring	<ul style="list-style-type: none"> • Monitoring & alerting in respect of the Availability of the Cloud Storage Service.
Patch & Firmware Management	<ul style="list-style-type: none"> • Updating Exponential-e’s Physical Cloud Storage Hardware environments, at Exponential-e’s discretion. • Installing critical and security updates onto the elements forming the Cloud Storage Service. • Install non-critical updates onto the elements forming the Cloud Storage Service. • Notify the Customer of proposed updates to the elements forming the Cloud Storage Service. • Carry out software patches to the elements forming the Cloud Storage Service. • Configure all elements forming the Cloud Storage Service for manual update installation by the Service Desk.
Proactive Remediation	<ul style="list-style-type: none"> • Investigate the cause of issues generated through the monitoring and alerting toolsets, or reported by the Customer. • Provide proactive remediation of issues as agreed with the Customer. • Communicate recommended remediation activities to the Customer and request approval from the Customer for carrying out remediation activities.