

***Cloud Services  
Bouquet***



## DISCLAIMER

This document has been prepared by Cloud Management Office (CMO) under Ministry of Electronics and Information Technology (MeitY). This document is advisory in nature and aims to provide information in respect of the GI Cloud (MeghRaj) Initiative.

Certain commercial entities, technology, or materials may be identified in this document in order to describe a concept adequately. Such identification is not intended to imply recommendation or endorsement by MeitY.

While every care has been taken to ensure that the contents of this Document are accurate and up to date, the readers are advised to exercise discretion and verify the precise current provisions of law and other applicable instructions from the original sources. It represents practices as on the date of issue of this Document, which are subject to change without notice. The readers are responsible for making their own independent assessment of the information in this document.

In no event shall MeitY or its' contractors be liable for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information) arising out of the use of or inability to use this Document

# Table of Contents

<b>1. Purpose .....</b>	<b>5</b>
<b>2. Background .....</b>	<b>6</b>
<b>3. Cloud Services .....</b>	<b>7</b>
3.1 Basic Cloud Services.....	8
<b>3.1.1 Compute Services .....</b>	<b>8</b>
<b>3.1.2 Storage Services.....</b>	<b>16</b>
<b>3.1.3 Database Services .....</b>	<b>20</b>
<b>3.1.4 Security Services .....</b>	<b>24</b>
<b>3.1.5 Network Services .....</b>	<b>29</b>
<b>3.1.6 Monitoring Services.....</b>	<b>36</b>
<b>3.1.7 Support Services .....</b>	<b>41</b>
3.2 Advanced Cloud Services.....	42
<b>3.2.1 Database Services .....</b>	<b>42</b>
<b>3.2.2 Network Services .....</b>	<b>55</b>
<b>3.2.3 Security Services .....</b>	<b>57</b>
<b>3.2.4 Data Analytics as a Service (DAaaS).....</b>	<b>60</b>
<b>3.2.5 Data Warehousing .....</b>	<b>61</b>
<b>3.2.6 Data Lake Service .....</b>	<b>62</b>
<b>3.2.7 Digital Forensic Service .....</b>	<b>63</b>
<b>3.2.8 AI as service (AlaaS) .....</b>	<b>64</b>
<b>3.2.9 Machine Learning (ML) Service .....</b>	<b>65</b>
<b>3.2.10 Block Chain.....</b>	<b>66</b>
<b>3.2.11 Analytics Services .....</b>	<b>67</b>
<b>3.2.12 Office Productivity Suite.....</b>	<b>69</b>
3.3 Managed Services.....	71
<b>3.3.1 Disaster Recovery as a Service (DRaaS).....</b>	<b>71</b>
<b>3.3.2 Backup as a Service.....</b>	<b>75</b>

## **1. Purpose**

The purpose of this document is to provide a bouquet of Cloud services, empaneled by the Ministry of Electronics & Information Technology (MeitY), which Government Organizations in India can refer to while planning to move their legacy applications to the cloud environment or building their own Cloud native applications. The list of Cloud services provided in this document caters to the normal IT requirements of the Government Organizations. For each of the listed Cloud services, a description of the Cloud service along with the parameters that Government Organizations need to specify for procuring that service, is also provided in this document.

## **2. Background**

Cloud has established its monetary & non-monetary benefits. Government Organizations cannot afford to miss on-boarding the Cloud bandwagon if they want to deliver their services to businesses and consumers resourcefully. However, Cloud Service Providers (CSPs), operating in India, have been offering differing and proprietary Cloud services, and it is very difficult for Government Organizations to compare and select Cloud services that can meet their business and IT requirements.

The Cloud services offered by the global and domestic CSPs vary significantly even if the services are intended to cater to the same requirements of the Government Organizations. The input parameters required to procure the Cloud services, and the measurement / monitoring criteria used to bill the service consumers also vary greatly.

In order to assist the Government Organizations in selecting appropriate Cloud services from the plethora of offerings of CSPs, the common IT requirements of Government Organizations were identified, and an attempt has been made to prepare a list of Cloud services, which are, to a reasonable extent, standardized across all CSPs. Though it is not possible to make an apple to apple comparison between Cloud services offered by various CSPs, the intent of providing this bouquet of Cloud services is to make Government Organizations aware of the common Cloud services which are being offered by the empaneled CSPs and which can be compared, to a reasonable extent, across all CSPs, before taking the decision to procure a Cloud service from a particular CSP.

These issues make it imperative to develop certain guidelines around Cloud adoption and migration process which will assist the Government Departments in assessment of their existing IT platform, evaluating the right Cloud model and the suitable CSP for Cloud enablement of their IT workload(s).

### **3. Cloud Services**

The Cloud services, listed under this section, have been categorized into “Basic Cloud Services”, “Advanced Cloud Services”, “Managed Cloud Services”. The Cloud services listed under the “Basic Cloud Services” are mandatory for all CSPs to offer to the Government Organizations under at least one of the empaneled Cloud Deployment Models. However, the Cloud services listed under the “Advanced Cloud Services” and “Managed Cloud Services” category are optional for the CSPs to offer.

Cloud services, under both the categories, are to be listed on the Government eMarketplace (GeM) platform once they have been successfully empaneled by the MeitY. If a CSP wants to list Cloud services, which are not covered under this document, it needs to follow the due process specified by MeitY to get its services first empaneled with MeitY under the “Advanced Cloud Services”.

While listing their Cloud services on the GeM platform, CSPs will be required to classify their Cloud services into one of the three service models – Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS) – based on the controls identified and defined by MeitY in its Cloud Services Empanelment RFP. CSPs shall also be provided with the option of specifying their Cloud service capabilities on the GeM platform while showing the service definition and service procurement parameters as identified and defined for those services in this document.

For majority of the Cloud services listed in this document, per unit price for various ranges of quantities will be discovered to ensure that Government Organizations get better prices as the quantity increases, e.g., for “Active Directory Services”, monthly and yearly price per user will be discovered for the users up to 100, between 101 and 200, between 201 and 300, between 301 and 400, between 401 and 500, and more than 500.

All the Cloud services mentioned in this bouquet are mandatorily required to meet all the controls, including technical, security and legal, specified in the Cloud Services Empanelment allocation document digital issued by MeitY.

### 3.1 Basic Cloud Services

These services, as mentioned earlier, are mandatory for CSPs to offer. However, CSPs are not required to offer all the SKUs (combinations) of the Cloud services listed under “Basic Cloud Services” category. CSPs will be required to display prices of these basic Cloud services on the Government eMarketplace (GeM).

#### 3.1.1 Compute Services

This service can be used by the Government Organizations to access the virtualized servers offered by the Cloud Service Providers. This bouquet currently includes only two types of compute services – Virtual Machines and Containers. Virtual Machines have been kept under the “Basic Cloud Services” while containers have been categorized under the “Advanced Cloud Services”.

##### 1) Virtual Machine

Virtual Machines (VM) provide the basic IT Infrastructure that can be used by the Government Organizations to run their variety of workloads such as compute-intensive workload, memory-intensive workload, general-purpose workload, etc. All Virtual Machine packages, listed below, are Managed Virtual Machines. CSPs are required to list their prices on GeM platform keeping this in mind. These VMs will be provided with following mandatory inclusions without any extra cost.

Sr. No.	Category	Inclusion <sup>1, 2</sup>
1.	Processor	<ul style="list-style-type: none"> <li>Minimum frequency of 2.0 GHz</li> </ul>
2.	Storage type	<ul style="list-style-type: none"> <li>50 GB of Hard Disk Drive (HDD) storage, OR</li> </ul>

		<ul style="list-style-type: none"> <li>• 50 GB of Solid-State Drive (SSD) storage as required by the Government Organization (additional storage, if required, may be procured separately)</li> </ul>
3.	Operating System	<ul style="list-style-type: none"> <li>• Any supported version of the following operating systems as per the requirement specified by the Government Department<sup>3</sup> <ul style="list-style-type: none"> <li>• Microsoft Windows Server</li> <li>• Red Hat Enterprise Linux</li> <li>• Oracle Linux</li> <li>• SUSE Linux Enterprise Server</li> <li>• CentOS Operating System</li> <li>• Ubuntu Operating System</li> </ul> </li> </ul>
4.	Network	<ul style="list-style-type: none"> <li>• Subnet / network segment capability should be available</li> <li>• VM should be firewall protected</li> <li>• Mapping of Private IPs to Public IPs for inbound / outbound traffic</li> </ul>
5.	Security	<ul style="list-style-type: none"> <li>• Antivirus</li> <li>• Identity and Access Management including Single-Sign On for managing access to Cloud services of the CSP</li> </ul>

		<ul style="list-style-type: none"> <li>• Encryption of data associated with VM</li> <li>• System log should be available</li> <li>• Multi-factor authentication</li> <li>• Hardening &amp; patch management of underlying infrastructure by CSP</li> </ul>
6.	Backup	<ul style="list-style-type: none"> <li>• Entire VM data backup must be available</li> <li>• Backup must be taken at least every week</li> <li>• Backup of VM must be retained for at least 30 days.</li> </ul>
7.	Auto scaling	<ul style="list-style-type: none"> <li>• Ability to auto scale at least horizontally without bringing the virtual machine down</li> </ul>
8.	Service Level Agreement	<ul style="list-style-type: none"> <li>• Virtual Machine Uptime SLA of at least 99.5%</li> </ul>
9.	Scheduling	<ul style="list-style-type: none"> <li>• Scheduling features such as auto start, auto shutdown, etc., without requiring manual intervention</li> </ul>
10.	Turnaround Time	<ul style="list-style-type: none"> <li>• Resource (vCPU, storage, etc.) scaling up and down should be completed within 30 minutes. Alert may be provided.</li> </ul>
11.	Virtual Machine Administration	<ul style="list-style-type: none"> <li>• Basic monitoring tool and dashboard including admin access</li> </ul>

<sup>1</sup> CSPs shall not charge any extra amount from the Government Departments other than the prices discovered for the VMs consumed by the Government Departments.

<sup>2</sup> Discovered prices shall include all prices associated with consuming a service fully.

<sup>3</sup> Price of VM will vary based on the operating system selected by the Government Organization.

Sr. No.	Service Name <sup>4,5</sup>	Service Procurement Parameter					
		Operating System	vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio <sup>6</sup>
1	Virtual Machine Package <sup>4</sup>	<u>Options</u> i. Microsoft Windows Server ii. RedHat Enterprise Linux iii. Oracle Linux	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8 v. 16 vi. 32	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16 v. 32 vi. 64	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1 ii. 1:2 iii. 1:3 iv. 1:4

		iv. SUSE Linux Enterprise Server	vii. 64 viii. 128	vii. 128 viii. 256			
		v. CentOS Operating System		ix. 512 x. 1024			
		vi. Ubuntu Operating System					

<sup>4</sup> For the above configuration of Virtual Machines, hourly, monthly, and yearly prices will be discovered.

<sup>5</sup> In addition to the already specified SKUs, CSPs are allowed to list their own SKUs of the virtual machines on the GeM platform, provided that these SKUs meet all the specified criteria including minimum inclusions.

**<sup>6</sup>Physical Core to vCPU ratio**

Keeping all other parameters same, it is recommended to consider following guidelines while selecting a Virtual Machine for a running a workload.

Physical Core to vCPU ratio	Recommendation
1:1	No performance issues. Recommended for business-critical workloads.
1:2	Optimum performance. Recommended for compute intensive workloads.

1:3	Little performance degradation may be experienced depending on the workload. Recommended for regular and low-priority production workloads.
1:4	May cause performance scarcity. Recommended for non-production and test/development environment.

## 2) Desktop as a Service (DaaS)

Desktop as a Service (DaaS), the cloud services provider hosts the infrastructure, network resources, and storage in the cloud and streams a virtual desktop to the user's device, where the user can access the desktop's data and applications through a web browser or other software.

Sr. No.	Service Name	Service Procurement Parameter			
		Operating System	vCPU	RAM (GB)	Storage (GB)
1	Package	<u>Options</u> i. Microsoft Windows Server ii. RedHat Enterprise Linux	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD

		iii. Oracle Linux	v. 16	v. 32	
		iv. SUSE Linux Enterprise Server	vi. 32	vi. 64	
		v. CentOS Operating System	vii. 64	vii. 128	
		vi. Ubuntu Operating System	viii. 128	viii. 256	
				ix. 512	
				1024	

### 3) Containers

Containers are the lightweight alternatives to Virtual Machines. Containers allow to encapsulate an application’s code, libraries, configuration, and other dependent files into one single package. This packaging of the application and its dependent files offers improved developer productivity and environmental neutrality. The developers can continue focusing on improving/updating their applications without being worried about the different environments, such as development, test, and production, in which their applications would be deployed and run.

Sr. No.	Service Name <sup>1</sup>	Service Procurement Parameter	
		vCPU	RAM (GB)
1	Container as a Service	<u>Options</u> i. 1	<u>Options</u> i. 1

		<ul style="list-style-type: none"> <li>ii. 2</li> <li>iii. 4</li> </ul>	<ul style="list-style-type: none"> <li>ii. 2</li> <li>iii. 3</li> <li>iv. 4</li> <li>v. 5</li> <li>vi. till 32</li> </ul>
--	--	---	---

<sup>1</sup> For the above configuration of containers, per second price will be discovered keeping their intrinsic nature in consideration. Government Organizations will be charged separately for storage and other Cloud services that they consume.

### 3.1.2 Storage Services

#### 1) Block Storage

Used to store data in volumes as blocks. Because the volumes are treated as individual hard disks, block storage works well for storing a variety of applications.

Sr. No.	Service Name <sup>1</sup>	Service Procurement Parameter		
		Storage Type	Storage Amount (GB)	IOPS
1	Block Storage as a Service	<u>Options</u> i. HDD ii. SSD	<u>Options</u> i. 100 ii. 200 iii. 500 iv. 1000 v. 10000 vi. 50000 vii. More than 50000	<u>Options</u> i. <=100 ii. 101 - 300 iii. 301 - 500 iv. 501 - 1000 v. 1001 - 2000 vi. 2001 – 5000 vii. >5000

<sup>1</sup> Hourly, monthly, and yearly price of the above configuration of storage will be discovered.

## 2) Object Storage

Used to store unstructured data such as photos, audio, videos, etc., as objects.

Sr. No.	Service Name <sup>1</sup>	Service Procurement Parameter
		Storage Amount (GB)
1	Object Storage as a Service	<p style="text-align: center;"><u>Options</u></p> <ul style="list-style-type: none"> <li>i. 100</li> <li>ii. 200</li> <li>iii. 500</li> <li>iv. 1000</li> <li>v. 10000</li> <li>vi. 50000</li> <li>vii. More than 50000</li> </ul>

<sup>1</sup> Hourly, monthly, and yearly price of the above configuration of storage will be discovered.

### 3) File Storage

Provides a centralized, hierarchical, and highly accessible location for files, and generally comes at a lower cost than block storage.

Sr. No.	Service Name <sup>1</sup>	Service Procurement Parameter
		Storage Amount (GB)
1	File Storage as a Service	<p style="text-align: center;"><u>Options</u></p> <ul style="list-style-type: none"> <li>i. 100</li> <li>ii. 200</li> <li>iii. 500</li> <li>iv. 1000</li> <li>v. 10000</li> <li>vi. 50000</li> <li>vii. More than 50000</li> </ul>

<sup>1</sup> Hourly, monthly, and yearly price of the above configuration of storage will be discovered.

#### 4) Archival Storage

Used to store information which is accessed infrequently.

Sr. No.	Service Name <sup>1</sup>	Service Procurement Parameter
		Storage Amount (GB)
1	Archival Storage as a Service	<p style="text-align: center;"><u>Options</u></p> <ul style="list-style-type: none"> <li>i. 100</li> <li>ii. 200</li> <li>iii. 500</li> <li>iv. 1000</li> <li>v. 10000</li> <li>vi. 50000</li> <li>vii. More than 50000</li> </ul>

<sup>1</sup> Hourly, monthly, and yearly price of the above configuration of storage will be discovered.

### 3.1.3 Database Services

#### 1) Managed Database as a Service

Database as a Service is a managed service offering by the Cloud Service Providers wherein in operating system and all low-level components such as drivers, I/O, network, etc. are managed and optimized by the Cloud Service Providers. All objects created using "Database as a Service" are transparent to the underlying operating system. Activities such as OS management, antivirus, encryption, hardening, etc. are included under this service. Automated failover, backup & recovery, isolation & security, scaling, automated patching, advanced monitoring, and routine maintenance are responsibilities of the CSP. Each database as a service will be offered by the Cloud Service Providers with a minimum storage inclusion of 50 GB HDD or 50 GB SSD. CSPs shall be required to provide a transparent view of the database activities managed by them.

Sr. No.	Database Service Name <sup>1</sup>	Service Procurement Parameter				
		vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio <sup>7</sup>
1	Microsoft SQL as a Service – Standard Edition	<u>Options</u>	<u>Options</u>	<u>Options</u>	<u>Options</u>	<u>Options</u>
		i. 1	i. 2	i. 50 GB SSD ii. 50 GB HDD	i. Beyond 2020	i. 1:1
		ii. 2	ii. 4			ii. 1:2
		iii. 4	iii. 8			iii. 1:3
		iv. 8	iv. 16			iv. 1:4

Sr. No.	Database Service Name <sup>1</sup>	Service Procurement Parameter				
		vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio <sup>7</sup>
		v. 16 vi. 32 vii. 64 viii. 128	v. 32 vi. 64 vii. 128 viii. 256 ix. 512 x. 1024			
2	Microsoft SQL as a Service – Enterprise Edition	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8 v. 16	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16 v. 32	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1 ii. 1:2 iii. 1:3 iv. 1:4

Sr. No.	Database Service Name <sup>1</sup>	Service Procurement Parameter				
		vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio <sup>7</sup>
		vi. 32 vii. 64 viii. 128	vi. 64 vii. 128 viii. 256 ix. 512 x. 1024			
3	Microsoft SQL as a Service – Web Edition	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8 v. 16 vi. 32	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16 v. 32 vi. 64	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1 ii. 1:2 iii. 1:3 iv. 1:4

Sr. No.	Database Service Name <sup>1</sup>	Service Procurement Parameter				
		vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio <sup>7</sup>
		vii. 64	vii. 128			
		viii. 128	viii. 256			
			ix. 512			
			x. 1024			

<sup>1</sup> For the above configuration of database as a service, hourly, monthly and yearly prices shall be discovered.

For additional managed databases services, please refer "Advanced Cloud Services" section of this document.

### 3.1.4 Security Services

#### 1) Identity and Access Management

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter <sup>1</sup>
			No. of Users
1	Active Directory Services	This service may be used to authenticate and authorize users and computing resources within a network by assigning and enforcing security policies.	<u>Options</u> i. <=100 ii. 101 - 300 iii. 301 – 500 iv. >500

<sup>1</sup> For the above range of users, monthly and yearly price per user will be discovered.

## 2) Hardware Security Module

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter <sup>2</sup>	
			No. of Dedicated HSM Required	Number of RSA 2048-bit Key Generation Per 10 Seconds
1	Cloud Based Hardware Security Module (HSM)	This service can be used where a dedicated hardware security module is required to create, manage, and control keys. The HSM must comply with FIPS 140-2 Level 3 requirements.	<u>Options</u> i. 1 ii. 2 iii. 3 iv. 4 v. 5 vi. Till 10	<u>Options</u> i. 1 ii. 2 iii. 3 iv. 4 v. 5

<sup>2</sup> Hourly, monthly, and yearly prices per dedicated HSM will be discovered for each of the performance categories (number of RSA 2048-bit key generation per 10 seconds).

### 3) Distributed Denial of Services

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>	
			No. of Public IPs to be Protected	Amount of Outbound Data Transfer (TB)
1	Distributed Denial of Service (DDoS)	This service can be used to protect various resources within the Cloud environment of CSP against malicious attempt to disrupt normal traffic of a target, service or network by overwhelming the target or its surrounding infrastructure with a flood of internet traffic.	<u>Options</u> i. Upto 100 ii. Beyond 100	<u>Options</u> i. 0-10 ii. 10-50 iii. 50-150 iv. 150-500 v. Beyond 500

<sup>1</sup> Monthly price per Public IP to be protected and per GB of outbound data transfer will be discovered.

#### 4) TLS / SSL Certificate Management

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter	
			Type of Certificate	No. of Certificates <sup>1</sup>
1	TLS/SSL Certificate Management	This service may be used to request (create), manage, and deploy public and private SSL/TLS certificates in CSP's cloud environment. This service frees the user from the cumbersome process of buying, uploading, and renewing SSL/TLS certificates.	<u>Options</u> i. Public ii. Private	<u>Options</u> i. Upto 1000 ii. Next 9000(1001-10000) iii. Beyond 10000

<sup>1</sup> For each type of certificate, price per certificate will be discovered for the above range of certificates.

## 5) Dual / Multifactor Authentication

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
			No. of Users
1	Dual /Multi Factor Authentication	This service may be used to protect the IT resources by providing an extra layer of security that requires not only a username and password but also other information that user of the service has. The service must provide capability to integrate with LDAP or other directory services.	<u>Options</u> <ul style="list-style-type: none"> <li>i. Upto 100</li> <li>ii. 101-200</li> <li>iii. 201-300</li> <li>iv. 301-400</li> <li>v. 401-500</li> <li>vi. Above 500</li> </ul>

<sup>1</sup> For the above range of users, monthly and yearly price per user will be discovered.

### 3.1.5 Network Services

#### 1) Virtual Network

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
1	Virtual Network	This service may be used to logically segregate the computing resources, such as virtual machines, databases, etc., within a CSP's cloud environment.	<p>None.</p> <p>All CSPs provide virtual network / subnet capability by default to their customers without any extra cost. However, resources used within the virtual network / subnet may be charged by the CSPs.</p>

#### 2) Load Balancer

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
			Throughput (MBPS)
1	Application Load Balancer (Virtual/Physical)	This service may be used to distribute the traffic across many computing resources within the same site to increase the responsiveness and availability of applications.	<p><u>Options</u></p> <p>i. 25</p> <p>ii. 50</p> <p>iii. 100</p>

			<ul style="list-style-type: none"> <li>iv. 200</li> <li>v. 500</li> <li>vi. 1000</li> <li>vii. 5000</li> <li>viii. 10000</li> </ul>
2	Network Load Balancer (Virtual/Physical)	This service may be used to balance the traffic across two WAN links (two different sites).	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. 25</li> <li>ii. 50</li> <li>iii. 100</li> <li>iv. 200</li> <li>v. 500</li> <li>vi. 1000</li> <li>vii. 5000</li> <li>viii. 10000</li> </ul>

<sup>1</sup>Hourly, monthly and yearly prices will be discovered for these configurations of application and network load balancers.

## 3) VPN Gateway

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>	
			Bandwidth (Mbps)	No. of Site-to-Site Connections Required
1	VPN Gateway – Site to Site Connection	This service may be used to establish secure site to site connectivity between the subnets in CSP's environment and Government Organization's on-premises IT infrastructure. It can also be used to provide site to site connectivity two different subnets within the CSP's Cloud environment.	<u>Options</u> i. 50 ii. 100 iii. 200 iv. 500 v. 1000 vi. 5000 vii. 10000	<u>Options</u> i. Upto 30 ii. >30

<sup>1</sup> For the bandwidth mentioned above, price per site-to-site connection for each of the two ranges specified will be discovered.

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>	
			Bandwidth (Mbps)	No. of Point to Site Connections Required
2	VPN Gateway – Point to Site Connection	This service may be used to establish a secure point to site connection between an individual client computer and a subnet in CSP's environment.	<u>Options</u> i. 50 ii. 100 iii. 200 iv. 500 v. 1000 vi. 5000 viii. 10000	<u>Options</u> i. Upto 128 ii. More than 128

<sup>1</sup> For the bandwidth mentioned above, price per point to site connection for each of the two ranges specified will be discovered.

## 4) Firewall

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
			Throughput (MBPS)
1	Firewall (Virtual/Physical)	This service is used to monitor and control the incoming and outgoing traffic of a subnet by configuring some rules.	<u>Options</u> i. 25 ii. 50 iii. 100 iv. 200 v. 500 vi. 1000 vii. 5000 viii. 10000

<sup>1</sup>Hourly, monthly and yearly prices will be discovered for the firewall for the specified throughput.

## 5) Public IP

Sr. No.	Service Name <sup>4,5</sup>	Service Definition	Service Procurement Parameter	
			Type of IP	No. of IPs Needed
6	Public IP	This service can be used to assign Public IP(s) to resources within a subnet in the Cloud environment.	<u>Options</u> i. Static	<u>Options</u> i. 1 ii. 2 iii. 3 iv. 4 v. 5 vi. Till 10

<sup>4</sup> Hourly, monthly, and yearly price per Public IP will be discovered.

<sup>5</sup> CSPs are required to provide IPv6 support without any extra cost.

## 6) Web Application Firewall

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
			Throughput (MBPS)
1	Web Application Firewall	This service may be used to create rules to protect web applications from unwanted web traffic, hacks, brute force attacks, cross-site scripting, SQL injection, and other common exploits. The WAF must also provide protection against the OWASP top ten risks.	<u>Options</u> <ul style="list-style-type: none"> <li>i. 50</li> <li>ii. 100</li> <li>iii. 200</li> <li>iv. 500</li> <li>v. 1000</li> <li>vi. 5000</li> <li>viii. 10000</li> </ul>

<sup>1</sup>Hourly, monthly and yearly prices will be discovered for the Web Application Firewall for the specified throughput.

### 3.1.6 Monitoring Services

#### 1) Log Analysis

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
			Amount of Data to be Analyzed (GB) <sup>1</sup>
1	Log Analyzer	This service may be used to generate insights from of the logs, by running queries against these logs. The service must retain the log for at least 30 days.	<u>Options</u> <ul style="list-style-type: none"> <li>i. Upto 5</li> <li>ii. 5-10</li> <li>iii. 10-50</li> <li>iv. 50-100</li> <li>v. 100-500</li> <li>vi. Above 500</li> </ul>

<sup>1</sup> For the above range of data, monthly price per GB will be discovered. The price includes the prices for data ingestion into the service, data retention and query execution. There not be any additional cost associated with availing this service.

## 2) Operational Metric Collection

Sr. No.	Service Name	Service Definition	Service Procurement Parameter	
			Type of Metric	Number of Metrics <sup>1</sup>
1	Operational Metric Collection	This service may be used to collect the operational metrics such as CPU utilization, memory utilization, etc., defined by the CSP. The service also allows Government Organizations to create their own custom metrics.	<u>Options</u> i. Built in ii. Custom	<u>Options</u> i. Upto 1000 ii. 1001-10000 iii. 10001-100000 iv. Above 100000

<sup>1</sup> For above range of metrics, monthly price per metric will be discovered for both the types – Built-In and Custom.

### 3) Alarm Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
			Number of Alerts <sup>1</sup>
1	Alarm Service	<p>This service may be used to set threshold value for built-in (provided by CSP) and custom (defined by Government Organization) metrics. Once the threshold is reached, an alarm/alert will be triggered, and necessary actions may be taken.</p> <p>*This service may be procured only when the "Operational Metric Collection" service is procured.</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 50</li> <li>ii. 51-100</li> <li>iii. 101-200</li> <li>iv. 200-500</li> <li>v. Above 500</li> </ul>

<sup>1</sup> For the above range of alerts, monthly price per alert will be discovered.

## 4) Notification Service

Sr. No.	Service Name	Service Definition	Number of Notifications
1	Email Notification Service <sup>1</sup>	<p>This service may be used to send email notifications to the target recipient when an alarm / alert is triggered, and the corresponding notification is configured.</p> <p>* This service may be procured only when the "Alarm Service" is procured.</p>	100000
<sup>1</sup> Month <sup>1</sup> Monthly price per 100000 emails will be discovered by price per 100000 emails will be discovered.			
2	SMS Notification Service <sup>2</sup>	<p>This service may be used to send SMS notifications to the target recipient when an alarm / alert is triggered, and the corresponding notification is configured.</p> <p>* This service may be procured only when the "Alarm Service" is procured.</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 100</li> <li>ii. 100-500</li> <li>iii. 501-1000</li> <li>iv. 1001-10000</li> <li>v. 10001-100000</li> </ul>

			vi. Above 100000
<p><sup>2</sup> For each of the ranges specified above, price per SMS will be discovered.</p>			
3	Voice Call Notification Service <sup>3</sup>	<p>This service may be used to send voice call notifications to the target recipient when an alarm / alert is triggered, and the corresponding notification is configured.</p> <p>* This service may be procured only when the "Alarm Service" is procured.</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 100</li> <li>ii. 100-500</li> <li>iii. 501-1000</li> <li>iv. 1001-10000</li> <li>v. 10001-100000</li> <li>vi. Above 100000</li> </ul>
<p><sup>3</sup> For each of the ranges specified above, price per Voice Call will be discovered.</p>			

### 3.1.7 Support Services

Sr. No.	Service Name	Minimum Inclusions*
1	Basic Support Services	(i) 24x7 access to email, chat, and phone support to notify and register the incidents (ii) 24x7 support for general guidance (iii) Response to be made available within 1 hour for any kind of service / system outage
2	Enterprise Support Services	(i) Basic Support Services (ii) Response to be made available within 15 minutes for Business-Critical System outage
* Monthly price for both types of support services shall be discovered.		

## 3.2 Advanced Cloud Services

These services, as mentioned earlier, are optional for CSPs to offer. The prices of these advanced Cloud services may be displayed by the CSPs on the GeM marketplace, or the Government Organizations may discover prices of these advanced Cloud services through the bid process functionality available on the GeM platform.

### 3.2.1 Database Services

#### 1) Managed Database as a Service

Database as a Service is a managed service offering by the Cloud Service Providers wherein in operating system and all low-level components such as drivers, I/O, network, etc. are managed and optimized by the Cloud Service Providers. All objects created using "Database as a Service" are transparent to the underlying operating system. Activities such as OS management, antivirus, encryption, hardening, etc. are included under this service. Automated failover, backup & recovery, isolation & security, scaling, automated patching, advanced monitoring, and routine maintenance are responsibilities of the CSP. Each database as a service will be offered by the Cloud Service Providers with a minimum storage inclusion of 50 GB HDD or 50 GB SSD. CSPs shall be required to provide a transparent view of the database activities managed by them.

Sr. No.	Database Service Name <sup>1</sup>	Service Procurement Parameter				
		vCPU	RAM (GB)	Storage (GB)	CPU Launch Year	Physical Core to vCPU Ratio
1.	MySQL as a Service	<u>Options</u> i. 1	<u>Options</u> i. 2	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1

		<ul style="list-style-type: none"> <li>ii. 2</li> <li>iii. 4</li> <li>iv. 8</li> <li>v. 16</li> <li>vi. 32</li> <li>vii. 64</li> <li>viii. 128</li> </ul>	<ul style="list-style-type: none"> <li>ii. 4</li> <li>iii. 8</li> <li>iv. 16</li> <li>v. 32</li> <li>vi. 64</li> <li>vii. 128</li> <li>viii. 256</li> <li>ix. 512</li> <li>x. 1024</li> </ul>			<ul style="list-style-type: none"> <li>ii. 1:2</li> <li>iii. 1:3</li> <li>iv. 1:4</li> </ul>
2.	PostgreSQL as a Service	<u>Options</u> <ul style="list-style-type: none"> <li>i. 1</li> <li>ii. 2</li> <li>iii. 4</li> <li>iv. 8</li> <li>v. 16</li> <li>vi. 32</li> </ul>	<u>Options</u> <ul style="list-style-type: none"> <li>i. 2</li> <li>ii. 4</li> <li>iii. 8</li> <li>iv. 16</li> <li>v. 32</li> <li>vi. 64</li> </ul>	<u>Options</u> <ul style="list-style-type: none"> <li>i. 50 GB SSD</li> <li>ii. 50 GB HDD</li> </ul>	<u>Options</u> <ul style="list-style-type: none"> <li>i. Beyond 2020</li> </ul>	<u>Options</u> <ul style="list-style-type: none"> <li>i. 1:1</li> <li>ii. 1:2</li> <li>iii. 1:3</li> <li>iv. 1:4</li> </ul>

		vii. 64 viii. 128	vii. 128 viii. 256 ix. 512 x. 1024			
3.	Oracle as a Service	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8 v. 16 vi. 32 vii. 64 viii. 128	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16 v. 32 vi. 64 vii. 128 viii. 256 ix. 512 x. 1024	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1 ii. 1:2 iii. 1:3 iv. 1:4

4.	MariaDB as a Service	<u>Options</u> i. 1 ii. 2 iii. 4 iv. 8 v. 16 vi. 32 vii. 64 viii. 128	<u>Options</u> i. 2 ii. 4 iii. 8 iv. 16 v. 32 vi. 64 vii. 128 viii. 256 ix. 512 x. 1024	<u>Options</u> i. 50 GB SSD ii. 50 GB HDD	<u>Options</u> i. Beyond 2020	<u>Options</u> i. 1:1 ii. 1:2 iii. 1:3 iv. 1:4
----	----------------------	---	---	---	----------------------------------	--

<sup>1</sup> For the above configuration of database as a service, CSPs will be required to provide hourly and/or monthly and/or yearly prices on the GeM platform.

For the following list of database services, CSPs may list their services on the GeM platform clearly providing the service capabilities and service procurement parameters.

Sr. No.	Service Name <sup>1</sup>	Service Definition	Service Procurement Parameter
1.	NoSQL Database as a Service	This service may be used to store and retrieve data in means other than the tabular relations used in relational databases. There are many NoSQL databases available in the market, such as, MongoDB, CouchDB, Memcached, Redis, Cassandra, etc. While listing the NoSQL Database Service on GeM platform, CSPs will clearly specify the databases that they are offering and their capabilities.	To be specified by CSPs

<sup>1</sup> For the above configuration of database as a service, CSPs will be required to provide hourly and/or monthly and/or yearly prices on the GeM platform.

## 2) Database Licenses

CSPs may also offer database licenses to Government Organizations which they can use in that particular CSP's Cloud environment. These are unmanaged databases. All these databases would have enterprise support included.

Sr. No.	Service Name	Service Procurement Parameter
		No. of Licenses <sup>1</sup>

<p>1.</p>	<p>MS SQL Server 2014 Standard Edition</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
<p>2.</p>	<p>MS SQL Server 2014 Enterprise Edition</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
<p>3.</p>	<p>MS SQL Server 2016 Standard Edition</p>	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> </ul>

		<ul style="list-style-type: none"> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
4.	MS SQL Server 2016 Enterprise Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
5.	MS SQL Server 2017 Standard Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>

6.	MS SQL Server 2017 Enterprise Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
7.	MS SQL Server 2019 Standard Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
8.	MS SQL Server 2019 Enterprise Edition	<u>Options</u>  i. Upto 4  ii. Upto 8

		<ul style="list-style-type: none"> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
9.	Oracle 11 Standard Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
10.	Oracle 11 Enterprise Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>

11.	Oracle 12 Standard Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
12.	Oracle 12 Enterprise Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
13.	MySQL Standard Edition	<u>Options</u>  i. Upto 4  ii. Upto 8

		<ul style="list-style-type: none"> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
14.	MySQL Enterprise Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>
15.	PostgreSQL Enterprise Edition	<p><u>Options</u></p> <ul style="list-style-type: none"> <li>i. Upto 4</li> <li>ii. Upto 8</li> <li>iii. Upto 16</li> <li>iv. Upto 32</li> <li>v. More than 32</li> </ul>

16.	MongoDB (NoSQL) Enterprise Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
17.	Cassandra (NoSQL) Enterprise Edition	<u>Options</u>  i. Upto 4  ii. Upto 8  iii. Upto 16  iv. Upto 32  v. More than 32
18.	IBM DB2 Version	<u>Options</u>  i. Upto 4  ii. Upto 8

		<ul style="list-style-type: none"><li>iii. Upto 16</li><li>iv. Upto 32</li><li>v. More than 32</li></ul>
--	--	--

<sup>1</sup> For all the license ranges specified, yearly price per license will be discovered.

### 3.2.2 Network Services

#### 1) Content Delivery Network

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
			Outbound Data Transfer (TB/Month)
1	Content Delivery Network (CDN)	CDN service may be used to securely deliver audio, video, images, data, application, etc., quickly by using the servers closest to each user. CDN reduces load time and saves bandwidth.	Next 350 TB (150–500 TB)/Month Next 350 TB (150–500 TB)/Month

<sup>1</sup> Hourly and monthly price per GB of Outbound Data Transfer will be discovered.

#### 2) MPLS Connectivity (Port Charges)

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
			Throughput (MBPS)
1	MPLS Connectivity (Port Charges)	This service may be used to have a dedicated MPLS connectivity	<u>Options</u>

		<p>between Government Organization's office / data centre with CSP's Cloud environment.</p> <p>(The User Department shall be required to pay separately to the network service provider.)</p>	<ul style="list-style-type: none"> <li>i. 50</li> <li>ii. 100</li> <li>iii. 200</li> <li>iv. 500</li> <li>v. 1000</li> <li>vi. 5000</li> <li>vii. 10000</li> </ul>
--	--	---	--

1 Monthly and yearly price for the above combinations of throughputs will be discovered.

### 3.2.3 Security Services

#### 1) Encryption Services

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Encryption Services	This service may be used to provides protection for data at rest, in transit and in use. Encryption helps address regulatory directives. Controlling access to sensitive data helps defend against ransomware attacks.	To be specified by the CSP

<sup>1</sup> For above range of metrics, monthly price per metric will be discovered for both the types – Built-In and Custom.

#### 2) Security Incident and Event Management

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Security Incident and Event Management	This service helps to collect, aggregate and analyse security logs and events from multiple sources, which in turn helps to identify security threats and incidents leading to responding to them quickly and efficiently.	To be specified by the CSP

### 3) Log Monitoring

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Log Monitoring	This service provides visibility into health and performance of the Cloud environment, identify and troubleshoot problems and detects security threats. Which in term improves the visibility, reliability, security and compliance of overall environment.	To be specified by the CSP

### 4) Digital Forensics

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Digital Forensics	It supports collection, analyzing and preserving digital evidence from Cloud-based systems and applications using commonly available tools. This helps in identifying the sources of attack and can help in recovering lost or deleted data.	To be specified by the CSP

## 5) Cloud workload protection

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Cloud workload protection	These tools protect Cloud workloads from malware, ransomware and other threats. They also offer a range of features like Vulnerability scanning, intrusion detection and prevention, data loss prevention, and compliance reporting.	To be specified by the CSP

### 3.2.4 Data Analytics as a Service (DAaaS)

Sr. No.	Service Name	Service Definition	Service Procurement Parameter	
			Type of Metric	Number of Metrics <sup>1</sup>
1	DAaaS	Data Analytics as Service (DAaaS) is an extensible analytical platform provided using an inhouse data center / Cloud-based delivery model, where various tools for data analytics are available and can be configured by the user to efficiently process and analyze huge quantities of heterogeneous data	<u>Options</u> i. Built in ii. Custom	<u>Options</u> i. Upto 1000 ii. 1001-10000 iii. 10001-100000 iv. Above 100000

### 3.2.5 Data Warehousing

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Data Warehousing Service	This service is for helps executives to organize, understand, and use their data to take strategic decisions and to consolidate historical data analysis.	To be specified by the CSP

### 3.2.6 Data Lake Service

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Data Lake Service	This service will allow to store relational data like operational databases and data from line of business applications, and non-relational data like mobile apps, IoT devices, and social media. They also give the understanding, what data is in the lake through crawling, cataloging, and indexing of data.	To be specified by the CSP

### 3.2.7 Digital Forensic Service

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Digital Forensic service	This service will help in analyzing and identifying the data and security including thefts, crimes, etc.	To be specified by the CSP

### 3.2.8 AI as service (AlaaS)

Sr. No.	Service Name	Service Definition	Service Procurement Parameter	
			Type of Metric	Number of Metrics <sup>1</sup>
1	AlaaS	This service offers pre-trained models, APIs, and tools that enable businesses and developers to integrate AI functionalities into applications, products, or services with ease.	<u>Options</u> i. Built in ii. Custom	<u>Options</u> i. Upto 1000 ii. 1001-10000 iii. 10001-100000 iv. Above 100000

### 3.2.9 Machine Learning (ML) Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
1	ML Service	This service may be used in internet search engines, email filters to sort out spam, websites to make personalized recommendations, banking software to detect unusual transactions, and lots of apps on our phones such as voice recognition, bots, etc.	To be specified by the CSPs

**3.2.10 Block Chain**

Sr. No.	Service Name	Service Definitions	Service Procurement Parameter
1	Blockchain Service	This enhances cloud security through encryption and hashing and prevents data tampering. Blockchain on the cloud offers faster data management.	To be specified by the CSP

### 3.2.11 Analytics Services

#### 1) Streaming Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
1	Video Streaming Service	This service may be used to stream video from various devices located in Government Organization's premises and ingest them into the CSP's environment and provide storage, encryption and video indexing capabilities in real time and batch analysis mode.	To be specified by the CSPs
2	Data Streaming Service	This service may be used to capture and store data from sources such as website clicks, social media activity, location tracking and other events.	To be specified by the CSPs

## 2) Data Processing Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
1	Data Processing using Big Data Frameworks	This service may be used to process huge amount of data using frameworks such as Hadoop, Apache Spark, HBase, Presto, etc.	To be specified by the CSPs

## 3) Data Warehousing Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
1	Data warehouse	This service may be used to host a central repository of information which acts as a single source of truth, and which can be used to generate variety of reports and dashboards to assist in the decision-making process.	To be specified by the CSPs

## 3.2.12 Office Productivity Suite

Sr. No.	Service Name	Service Definition	Service Procurement Parameter
			No. of Users <sup>1</sup>
1	Cloud based Enterprise Office Productivity Suit (COTS) – Microsoft Office 365	Microsoft Office 365	<u>Options</u> i. Up to 300 ii. More than 300
2	Cloud based Enterprise Open-Source Office Productivity Suit	This service provides Office coverage for desktop, laptop, tablets, and smart phones (Android, iOS, and Windows) with per user subscription install rights. There is no need to pay for version upgrades; updates are included in the subscription along with new features rollout regularly.	<u>Options</u> i. Upto 300 ii. More than 300
3	Internal Chat Communication	The service will be responsible for an effective communication among participants within an organization.	To be specified by CSP

4	Dashboard and Reports	The service allows to view the real time reports in a clear graphical representation.	To be specified by CSP
5	Project balance sheet	The service will give the statements that show estimated changes to an organization financial status, including investments, other assets, and liabilities.	To be specified by CSP

<sup>1</sup> For the above range of users, monthly price per user shall be discovered.

### 3.3 Managed Services

The Cloud Services mentioned under Basic and Advanced Cloud Services come with their associated managed services. However, if a Government Organization requires additional managed services, which are not provided as part of the Basic and Advanced Cloud services, they can procure those managed services separately as listed in this section. The managed services listed under this section are optional for CSPs to offer. These managed services have been listed below with a set of indicative inclusions which may change based on the individual Government Organization’s requirements.

Since the scope of the managed services is very wide and vary from customers to customers, Government Organizations will discover the prices of the managed services, tailored to meet their unique requirements, on the GeM platform through the bid functionality available on it.

#### 3.3.1 Disaster Recovery as a Service (DRaaS)

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
1	DRaaS (DC and DR both in the Cloud)	<p>Under this service, Government Organizations will select the required Cloud Services at both DC and DR sites in Cloud and specify the needed RPO and RTO.</p> <p>Service Inclusions:</p> <ul style="list-style-type: none"> <li>• Tool’s disaster recovery management and replication</li> </ul>	<p>Parameters may include RPO, RTO and actual scope of the work.</p> <p>If the same CSP host the data/application of the user and at the same time provides DR as a Service to the same user then DC and DR of the CSP needs to be separated 100 Km apart.</p>

		<ul style="list-style-type: none"> <li>• During the change from DC-Cloud to DR-Cloud or vice-versa (regular planned changes), there should not be any data loss.</li> <li>• There shall be asynchronous replication of data between DC-Cloud and DR-Cloud.</li> <li>• During normal operations, the DC-Cloud will serve the requests. The DR-Cloud site will not be performing any work but will remain on standby.</li> <li>• DC-Cloud Storage shall be replicated (Active-Active) on an ongoing basis at DR-Cloud site, as per the required RPO, RTO and replication strategy.</li> <li>• In the event of a site failover or switchover, DR-Cloud site will take over the active role, and all the requests will be routed through that site.</li> <li>• Application data and application states will be replicated between the two sites so that when an outage occurs, failover to the surviving DR-Cloud can be accomplished within the specified RTO. This is the period during which the compute environment for the application shall be equivalent to DC. The installed application instance and the database shall be usable and the same SLAs as DC-Cloud shall be provided.</li> <li>• The security at the DC-Cloud and DR-Cloud shall be same.</li> <li>• The CSP shall conduct DR drill once in every six months of operation wherein the DC-Cloud has to be deactivated and</li> </ul>	
--	--	---	--

		<p>complete operations shall be carried out from the DR-Cloud site. However, during the change from DC-Cloud to DR-Cloud or vice-versa (or regular planned changes), there should not be any data loss.</p> <ul style="list-style-type: none"> <li>Automated switchover/ failover facilities (during DC-Cloud failure &amp; DR Drills) to be provided</li> <li>The switchback mechanism shall also be automated.</li> </ul>	
2	DRaaS (Only DR in the Cloud)	<p>Under this service, Government Organizations will select the required Cloud Services at the DR site in Cloud and specify the needed RPO and RTO.</p> <p>Service Inclusions:</p> <ul style="list-style-type: none"> <li>Tool's disaster recovery management and replication</li> <li>During the change from DC-Cloud to DR-Cloud or vice-versa (regular planned changes), there should not be any data loss.</li> <li>There shall be asynchronous replication of data between DC-Cloud and DR-Cloud.</li> </ul>	Parameters may include RPO, RTO and actual scope of the work.

		<ul style="list-style-type: none"> <li>• During normal operations, the DC-Cloud will serve the requests. The DR-Cloud site will not be performing any work but will remain on standby.</li> <li>• DC-Cloud Storage shall be replicated (Active-Active) on an ongoing basis at DR-Cloud site, as per the required RPO, RTO and replication strategy.</li> <li>• In the event of a site failover or switchover, DR-Cloud site will take over the active role, and all the requests will be routed through that site.</li> <li>• Application data and application states will be replicated between the two sites so that when an outage occurs, failover to the surviving DR-Cloud can be accomplished within the specified RTO. This is the period during which the compute environment for the application shall be equivalent to DC. The installed application instance and the database shall be usable and the same SLAs as DC-Cloud shall be provided.</li> <li>• The security at the DC-Cloud and DR-Cloud shall be same.</li> <li>• The CSP shall conduct DR drill once in every six months of operation wherein the DC-Cloud has to be deactivated and complete operations shall be carried out from the DR-Cloud site. However, during the change from DC-Cloud to DR-Cloud or vice-versa (or regular planned changes), there should not be any data loss.</li> </ul>	
--	--	---	--

		<ul style="list-style-type: none"> <li>Automated switchover/ failover facilities (during DC-Cloud failure &amp; DR Drills) to be provided</li> <li>The switchback mechanism shall also be automated.</li> </ul>	
--	--	---	--

<sup>1</sup> Actual price will depend on the scope of the work.

### 3.3.2 Backup as a Service

Sr. No.	Service Name	Service Definition	Service Procurement Parameter <sup>1</sup>
1	Backup as a Service	<p>This service may be used to back up virtual machines, storage volumes, file systems and databases within the CSP's own Cloud environment.</p> <p>Following activities are included under this service: monitoring, reporting, notifications/alerts &amp; incident management, backup storage, scheduling &amp; retention, restoration, backup data protection, etc.</p> <p>The backup service should support granular recovery of virtual machines, database servers, Active Directory including AD objects, etc. Government Organization should be able to recover individual files, complete folders, entire drive or complete system to source machine or any other machine available in network.</p> <p>The backup service must provide following capabilities.</p>	Parameters may include type of backup (full backup and incremental backup), frequency of backup (weekly, monthly, etc.), retentions period (7 days, 30 days, etc.) and actual scope of the work.

		<ul style="list-style-type: none"> <li>▪ Compression: Support compression of data at source before backup</li> <li>• Encryption: Support at least 128-bit encryption at source</li> <li>▪ Alert: Support email notification on backup job's success / failure</li> <li>▪ File exclusion: Ability to exclude specific files, folders, or file extensions from backup</li> <li>• Deduplication: Provide deduplication capabilities</li> </ul>	
--	--	---	--

<sup>1</sup> Actual price will depend on the scope of the works