Endpoints and storage locations

Sending a REST API request or configuring a storage client requires setting a target endpoint or URL. Each storage location has its own set of URLs.

A bucket's resiliency is defined by the endpoint used to create it. *Cross Region* resiliency will spread your data across several metropolitan areas, while *Regional* resiliency will spread data across a single metropolitan area. *Single Data Center* resiliency spreads data across multiple appliances within a single data center. Regional and Cross Region buckets can maintain availability during a site outage.

Compute workloads co-located with a Regional Object Storage endpoint will see lower latency and better performance. For workloads requiring Cross Region resiliency, performance impacts are mitigated via geo endpoint routes connecting to the nearest Cross Region metropolitan area.

Some workloads may benefit from using a Single Data Center endpoint. Data stored in a single site is still distributed across many physical storage appliances, but is contained within a single data center. This can improve performance for compute resources within the same site, but will not maintain availability in the case of a site outage. Single Data Center buckets do not provide automated replication or backup in the case of site destruction, so any applications using a single site should consider disaster recovery in their design.

All requests must use SSL when using IAM, and the service will reject any plaintext requests.

All IBM® Cloud Object Storage endpoints support TLS 1.2 encryption.

**Endpoint Types**

IBM Cloud® services are connected to a three-tiered network, segmenting public, private, and management traffic.

* **Private endpoints** are available for most requests originating from within IBM Cloud. Private endpoints provide better performance and do not incur charges for any outgoing or incoming bandwidth even if the traffic is cross regions or across data centers. **Whenever possible, it is best to use a private endpoint.**
* **Public endpoints** can accept requests from anywhere and charges are assessed on outgoing bandwidth. Incoming bandwidth is free. Public endpoints should be used for access not originating from an IBM Cloud cloud computing resource.
* **Direct endpoints** are used in Bring-Your-Own-IP scenarios, generally for requests originating from [resources within VPCs](https://cloud.ibm.com/docs/vpc?topic=vpc-about-vpc). Like Private endpoints, Direct endpoints provide better performance over Public endpoints and do not incur charges for any outgoing or incoming bandwidth even if the traffic is cross regions or across data centers. Directions for connecting to IBM Cloud Object Storage from VPC are available [here](https://cloud.ibm.com/docs/vpc-on-classic?topic=vpc-on-classic-connecting-to-ibm-cloud-object-storage-from-a-vpc).

Requests must be sent to the endpoint associated with a given bucket's location. If you aren't sure where a bucket is located, there is an [extension to the bucket listing API](https://cloud.ibm.com/docs/cloud-object-storage/api-reference?topic=cloud-object-storage-compatibility-api-bucket-operations#compatibility-api-list-buckets-extended) that returns the location and storage class information for all buckets in a service instance.

**Regional Endpoints**

Buckets that are created at a regional endpoint distribute data across three data centers that are spread across a metro area. Any one of these data centers can suffer an outage or even destruction without impacting availability.

PublicPrivateDirect

| **Region** | **Type** | **Endpoint** |
| --- | --- | --- |
| US South | Public | s3.us-south.cloud-object-storage.appdomain.cloud |
| US East | Public | s3.us-east.cloud-object-storage.appdomain.cloud |
| EU United Kingdom | Public | s3.eu-gb.cloud-object-storage.appdomain.cloud |
| EU Germany | Public | s3.eu-de.cloud-object-storage.appdomain.cloud |
| AP Australia | Public | s3.au-syd.cloud-object-storage.appdomain.cloud |
| AP Tokyo | Public | s3.jp-tok.cloud-object-storage.appdomain.cloud |
| AP Osaka | Public | s3.jp-osa.cloud-object-storage.appdomain.cloud |
| Table 1. Regional Endpoints | | |

**Cross Region Endpoints**

Buckets that are created at a cross region endpoint distribute data across three regions. Any one of these regions can suffer an outage or even destruction without impacting availability. Requests are routed to the nearest Cross Region metropolitan area by using Border Gateway Protocol (BGP) routing. In an outage, requests are automatically rerouted to an active region. Advanced users who want to write their own failover logic can do so by sending requests to a [tethered endpoint](https://cloud.ibm.com/docs/cloud-object-storage/info?topic=cloud-object-storage-advanced-endpoints) and bypassing the BGP routing.

PublicPrivateDirect

| **Region** | **Type** | **Endpoint** |
| --- | --- | --- |
| US Cross Region | Public | s3.us.cloud-object-storage.appdomain.cloud |
| EU Cross Region | Public | s3.eu.cloud-object-storage.appdomain.cloud |
| AP Cross Region | Public | s3.ap.cloud-object-storage.appdomain.cloud |
| Table 2. Cross Region Endpoints | | |

**Single Data Center Endpoints**

Single data centers are not colocated with IBM Cloud services, such as IAM or Key Protect, and offer no resiliency in a site outage or destruction.

If a networking failure results in a partition where the data center is unable to access IAM, authentication and authorization information is read from a cache that might become stale. This cached data might result in a lack of enforcement of new or altered IAM policies for up to 24 hours.

PublicPrivateDirect

| **Region** | **Type** | **Endpoint** |
| --- | --- | --- |
| Amsterdam, Netherlands | Public | s3.ams03.cloud-object-storage.appdomain.cloud |
| Chennai, India | Public | s3.che01.cloud-object-storage.appdomain.cloud |
| Hong Kong S.A.R. of the PRC | Public | s3.hkg02.cloud-object-storage.appdomain.cloud |
| Mexico City, Mexico | Public | s3.mex01.cloud-object-storage.appdomain.cloud |
| Milan, Italy | Public | s3.mil01.cloud-object-storage.appdomain.cloud |
| Montrèal, Canada | Public | s3.mon01.cloud-object-storage.appdomain.cloud |
| Oslo, Norway | Public | s3.osl01.cloud-object-storage.appdomain.cloud |
| Paris, France | Public | s3.par01.cloud-object-storage.appdomain.cloud |
| San Jose, US | Public | s3.sjc04.cloud-object-storage.appdomain.cloud |
| São Paulo, Brazil | Public | s3.sao01.cloud-object-storage.appdomain.cloud |
| Seoul, South Korea | Public | s3.seo01.cloud-object-storage.appdomain.cloud |
| Singapore | Public | s3.sng01.cloud-object-storage.appdomain.cloud |
| Toronto, Canada | Public | s3.tor01.cloud-object-storage.appdomain.cloud |
| Table 3. Single Data Center Endpoints | | |

**EU-Managed Endpoints**

The Activity Tracker and Logging Service with LogDNA can archive to a bucket at specific IBM Cloud Object Storage instances. This table shows the EU-Managed locations of Object Storage instances for archiving events.

| **Object Storage bucket location** | **Resiliency** | **City** |
| --- | --- | --- |
| ams03 | Single Site | Amsterdam |
| eu-de | Regional | Frankfurt |
| eu-gb | Regional | London |
| mil01 | Single Site | Milan |
| osl01 | Single Site | Oslo |
| par01 | Single Site | Paris |
| eu-geo | Cross Region | Amsterdam, Frankfurt, Milan |
| Table 4. EU-managed Endpoints | | |

**Resource Configuration Endpoints**

Requests made using the Resource Configuration API are sent to a global endpoint, regardless of the bucket's location.

| **Type** | **Endpoint** |
| --- | --- |
| Public | config.cloud-object-storage.cloud.ibm.com/v1 |
| Private | config.private.cloud-object-storage.cloud.ibm.com/v1 |
| Direct | config.direct.cloud-object-storage.cloud.ibm.com/v1 |

**Decommissioned locations**

Over time, it may be necessary for locations to transform from a Single Data Center to a Regional configuration, or for a location to be decommissioned entirely. These situations will require users to migrate data from one bucket to another. Please consult this [guide for migrating a bucket using Rclone](https://cloud.ibm.com/docs/services/cloud-object-storage/iam?topic=cloud-object-storage-region-copy).

| **Region** | **Type** | **Endpoint** |
| --- | --- | --- |
| Melbourne, Australia | Public | s3.mel01.cloud-object-storage.appdomain.cloud |
| Melbourne, Australia | Private | s3.private.mel01.cloud-object-storage.appdomain.cloud |
| Melbourne, Australia | Direct | s3.direct.mel01.cloud-object-storage.appdomain.cloud |
| Table 5. Decommissioned Endpoints | | |