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# Amazon Elastic Block Store

## API Reference

**API Version 2019-11-02**



## **Amazon Elastic Block Store: API Reference**

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# Welcome

You can use the Amazon Elastic Block Store (EBS) direct APIs to directly read the data on your EBS snapshots, and identify the difference between two snapshots. You can view the details of blocks in an EBS snapshot, compare the block difference between two snapshots, and directly access the data in a snapshot. If you're an independent software vendor (ISV) who offers backup services for EBS, the EBS direct APIs make it easier and more cost-effective to track incremental changes on your EBS volumes via EBS snapshots. This can be done without having to create new volumes from EBS snapshots.

This API reference provides detailed information about the actions, data types, parameters, and errors of the EBS direct APIs. For more information about the elements that make up the EBS direct APIs, and examples of how to use them effectively, see [Accessing the Contents of an EBS Snapshot](#) in the *Amazon Elastic Compute Cloud User Guide*.

This document was last published on December 23, 2019.

# Actions

The following actions are supported:

- [GetSnapshotBlock](#) (p. 3)
- [ListChangedBlocks](#) (p. 5)
- [ListSnapshotBlocks](#) (p. 8)

# GetSnapshotBlock

Returns the data in a block in an Amazon Elastic Block Store snapshot.

## Request Syntax

```
GET /snapshots/snapshotId/blocks/blockIndex?blockToken=BlockToken HTTP/1.1
```

## URI Request Parameters

The request requires the following URI parameters.

### **blockIndex** (p. 3)

The block index of the block from which to get data.

Obtain the `BlockIndex` by running the `ListChangedBlocks` or `ListSnapshotBlocks` operations.

### **BlockToken** (p. 3)

The block token of the block from which to get data.

Obtain the `BlockToken` by running the `ListChangedBlocks` or `ListSnapshotBlocks` operations.

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

### **snapshotId** (p. 3)

The ID of the snapshot containing the block from which to get data.

Length Constraints: Minimum length of 1. Maximum length of 64.

Pattern: `^snap-[0-9a-f]+$`

## Request Body

The request does not have a request body.

## Response Syntax

```
HTTP/1.1 200
x-amz-Data-Length: DataLength
x-amz-Checksum: Checksum
x-amz-Checksum-Algorithm: ChecksumAlgorithm

BlockData
```

## Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The response returns the following HTTP headers.

**Checksum (p. 3)**

The checksum generated for the block, which is Base64 encoded.

Length Constraints: Maximum length of 64.

**ChecksumAlgorithm (p. 3)**

The algorithm used to generate the checksum for the block, such as SHA256.

Length Constraints: Maximum length of 32.

Valid Values: `SHA256`

**DataLength (p. 3)**

The size of the data in the block.

The response returns the following as the HTTP body.

**BlockData (p. 3)**

The data content of the block.

## Errors

For information about the errors that are common to all actions, see [Common Errors \(p. 16\)](#).

**ResourceNotFoundException**

The specified resource does not exist.

HTTP Status Code: 404

**ValidationException**

The input fails to satisfy the constraints of the EBS direct APIs.

HTTP Status Code: 400

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)
- [AWS SDK for .NET](#)
- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for JavaScript](#)
- [AWS SDK for PHP V3](#)
- [AWS SDK for Python](#)
- [AWS SDK for Ruby V2](#)

# ListChangedBlocks

Returns the block indexes and block tokens for blocks that are different between two Amazon Elastic Block Store snapshots of the same volume/snapshot lineage.

## Request Syntax

```
GET /snapshots/secondSnapshotId/changedblocks?  
firstSnapshotId=FirstSnapshotId&maxResults=MaxResults&pageToken=NextToken&startingBlockIndex=StartingBlockIndex  
HTTP/1.1
```

## URI Request Parameters

The request requires the following URI parameters.

### FirstSnapshotId (p. 5)

The ID of the first snapshot to use for the comparison.

Length Constraints: Minimum length of 1. Maximum length of 64.

Pattern: `^snap-[0-9a-f]+$`

### MaxResults (p. 5)

The number of results to return.

Valid Range: Minimum value of 100. Maximum value of 10000.

### NextToken (p. 5)

The token to request the next page of results.

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

### secondSnapshotId (p. 5)

The ID of the second snapshot to use for the comparison.

Length Constraints: Minimum length of 1. Maximum length of 64.

Pattern: `^snap-[0-9a-f]+$`

### StartingBlockIndex (p. 5)

The block index from which the comparison should start.

The list in the response will start from this block index or the next valid block index in the snapshots.

## Request Body

The request does not have a request body.

## Response Syntax

```
HTTP/1.1 200  
Content-type: application/json
```



```
{
  "BlockSize": number,
  "ChangedBlocks": [
    {
      "BlockIndex": number,
      "FirstBlockToken": "string",
      "SecondBlockToken": "string"
    }
  ],
  "ExpiryTime": number,
  "NextToken": "string",
  "VolumeSize": number
}
```

## Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The following data is returned in JSON format by the service.

### BlockSize (p. 5)

The size of the block.

Type: Integer

### ChangedBlocks (p. 5)

An array of objects containing information about the changed blocks.

Type: Array of [ChangedBlock \(p. 13\)](#) objects

### ExpiryTime (p. 5)

The time when the `BlockToken` expires.

Type: Timestamp

### NextToken (p. 5)

The token to use to retrieve the next page of results. This value is null when there are no more results to return.

Type: String

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

### VolumeSize (p. 5)

The size of the volume in GB.

Type: Long

## Errors

For information about the errors that are common to all actions, see [Common Errors \(p. 16\)](#).

### ResourceNotFoundException

The specified resource does not exist.

HTTP Status Code: 404

**ValidationException**

The input fails to satisfy the constraints of the EBS direct APIs.

HTTP Status Code: 400

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)
- [AWS SDK for .NET](#)
- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for JavaScript](#)
- [AWS SDK for PHP V3](#)
- [AWS SDK for Python](#)
- [AWS SDK for Ruby V2](#)

# ListSnapshotBlocks

Returns the block indexes and block tokens for blocks in an Amazon Elastic Block Store snapshot.

## Request Syntax

```
GET /snapshots/snapshotId/blocks?  
maxResults=MaxResults&pageToken=NextToken&startingBlockIndex=StartingBlockIndex HTTP/1.1
```

## URI Request Parameters

The request requires the following URI parameters.

### MaxResults (p. 8)

The number of results to return.

Valid Range: Minimum value of 100. Maximum value of 10000.

### NextToken (p. 8)

The token to request the next page of results.

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

### snapshotId (p. 8)

The ID of the snapshot from which to get block indexes and block tokens.

Length Constraints: Minimum length of 1. Maximum length of 64.

Pattern: `^snap-[0-9a-f]+$`

### StartingBlockIndex (p. 8)

The block index from which the list should start. The list in the response will start from this block index or the next valid block index in the snapshot.

## Request Body

The request does not have a request body.

## Response Syntax

```
HTTP/1.1 200  
Content-type: application/json  
  
{  
  "Blocks": [  
    {  
      "BlockIndex": number,  
      "BlockToken": "string"  
    }  
  ],  
}
```

```
"BlockSize": number,  
"ExpiryTime": number,  
"NextToken": "string",  
"VolumeSize": number  
}
```

## Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The following data is returned in JSON format by the service.

### Blocks (p. 8)

An array of objects containing information about the blocks.

Type: Array of [Block \(p. 12\)](#) objects

### BlockSize (p. 8)

The size of the block.

Type: Integer

### ExpiryTime (p. 8)

The time when the `BlockToken` expires.

Type: Timestamp

### NextToken (p. 8)

The token to use to retrieve the next page of results. This value is null when there are no more results to return.

Type: String

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

### VolumeSize (p. 8)

The size of the volume in GB.

Type: Long

## Errors

For information about the errors that are common to all actions, see [Common Errors \(p. 16\)](#).

### ResourceNotFoundException

The specified resource does not exist.

HTTP Status Code: 404

### ValidationException

The input fails to satisfy the constraints of the EBS direct APIs.

HTTP Status Code: 400

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS Command Line Interface](#)
- [AWS SDK for .NET](#)
- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for JavaScript](#)
- [AWS SDK for PHP V3](#)
- [AWS SDK for Python](#)
- [AWS SDK for Ruby V2](#)

# Data Types

The Amazon Elastic Block Store API contains several data types that various actions use. This section describes each data type in detail.

**Note**

The order of each element in a data type structure is not guaranteed. Applications should not assume a particular order.

The following data types are supported:

- [Block \(p. 12\)](#)
- [ChangedBlock \(p. 13\)](#)

# Block

A block of data in an Amazon Elastic Block Store snapshot.

## Contents

### **BlockIndex**

The block index.

Type: Integer

Required: No

### **BlockToken**

The block token for the block index.

Type: String

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

Required: No

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for Ruby V2](#)

# ChangedBlock

A block of data in an Amazon Elastic Block Store snapshot that is different from another snapshot of the same volume/snapshot lineage.

## Contents

### **BlockIndex**

The block index.

Type: Integer

Required: No

### **FirstBlockToken**

The block token for the block index of the `FirstSnapshotId` specified in the `ListChangedBlocks` operation. This value is absent if the first snapshot does not have the changed block that is on the second snapshot.

Type: String

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

Required: No

### **SecondBlockToken**

The block token for the block index of the `SecondSnapshotId` specified in the `ListChangedBlocks` operation.

Type: String

Length Constraints: Maximum length of 256.

Pattern: `^[A-Za-z0-9+/=]+$`

Required: No

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- [AWS SDK for C++](#)
- [AWS SDK for Go](#)
- [AWS SDK for Java](#)
- [AWS SDK for Ruby V2](#)



# Common Parameters

The following list contains the parameters that all actions use for signing Signature Version 4 requests with a query string. Any action-specific parameters are listed in the topic for that action. For more information about Signature Version 4, see [Signature Version 4 Signing Process](#) in the *Amazon Web Services General Reference*.

**Action**

The action to be performed.

Type: string

Required: Yes

**Version**

The API version that the request is written for, expressed in the format YYYY-MM-DD.

Type: string

Required: Yes

**X-Amz-Algorithm**

The hash algorithm that you used to create the request signature.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Valid Values: `AWS4-HMAC-SHA256`

Required: Conditional

**X-Amz-Credential**

The credential scope value, which is a string that includes your access key, the date, the region you are targeting, the service you are requesting, and a termination string ("aws4\_request"). The value is expressed in the following format: `access_key/YYYYMMDD/region/service/aws4_request`.

For more information, see [Task 2: Create a String to Sign for Signature Version 4](#) in the *Amazon Web Services General Reference*.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

**X-Amz-Date**

The date that is used to create the signature. The format must be ISO 8601 basic format (YYYYMMDD'THHMMSS'Z'). For example, the following date time is a valid X-Amz-Date value: `20120325T120000Z`.

Condition: X-Amz-Date is optional for all requests; it can be used to override the date used for signing requests. If the Date header is specified in the ISO 8601 basic format, X-Amz-Date is

not required. When X-Amz-Date is used, it always overrides the value of the Date header. For more information, see [Handling Dates in Signature Version 4](#) in the *Amazon Web Services General Reference*.

Type: string

Required: Conditional

#### **X-Amz-Security-Token**

The temporary security token that was obtained through a call to AWS Security Token Service (AWS STS). For a list of services that support temporary security credentials from AWS Security Token Service, go to [AWS Services That Work with IAM](#) in the *IAM User Guide*.

Condition: If you're using temporary security credentials from the AWS Security Token Service, you must include the security token.

Type: string

Required: Conditional

#### **X-Amz-Signature**

Specifies the hex-encoded signature that was calculated from the string to sign and the derived signing key.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

#### **X-Amz-SignedHeaders**

Specifies all the HTTP headers that were included as part of the canonical request. For more information about specifying signed headers, see [Task 1: Create a Canonical Request For Signature Version 4](#) in the *Amazon Web Services General Reference*.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

# Common Errors

This section lists the errors common to the API actions of all AWS services. For errors specific to an API action for this service, see the topic for that API action.

**AccessDeniedException**

You do not have sufficient access to perform this action.

HTTP Status Code: 400

**IncompleteSignature**

The request signature does not conform to AWS standards.

HTTP Status Code: 400

**InternalFailure**

The request processing has failed because of an unknown error, exception or failure.

HTTP Status Code: 500

**InvalidAction**

The action or operation requested is invalid. Verify that the action is typed correctly.

HTTP Status Code: 400

**InvalidClientTokenId**

The X.509 certificate or AWS access key ID provided does not exist in our records.

HTTP Status Code: 403

**InvalidParameterCombination**

Parameters that must not be used together were used together.

HTTP Status Code: 400

**InvalidParameterValue**

An invalid or out-of-range value was supplied for the input parameter.

HTTP Status Code: 400

**InvalidQueryParameter**

The AWS query string is malformed or does not adhere to AWS standards.

HTTP Status Code: 400

**MalformedQueryString**

The query string contains a syntax error.

HTTP Status Code: 404

**MissingAction**

The request is missing an action or a required parameter.

HTTP Status Code: 400

**MissingAuthenticationToken**

The request must contain either a valid (registered) AWS access key ID or X.509 certificate.

HTTP Status Code: 403

**MissingParameter**

A required parameter for the specified action is not supplied.

HTTP Status Code: 400

**OptInRequired**

The AWS access key ID needs a subscription for the service.

HTTP Status Code: 403

**RequestExpired**

The request reached the service more than 15 minutes after the date stamp on the request or more than 15 minutes after the request expiration date (such as for pre-signed URLs), or the date stamp on the request is more than 15 minutes in the future.

HTTP Status Code: 400

**ServiceUnavailable**

The request has failed due to a temporary failure of the server.

HTTP Status Code: 503

**ThrottlingException**

The request was denied due to request throttling.

HTTP Status Code: 400

**ValidationError**

The input fails to satisfy the constraints specified by an AWS service.

HTTP Status Code: 400