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# GBDX Product Specification

To align with GBDX public beta 7.0

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## Purpose of this Document

The purpose of this Product Specification is to describe the core content, functionality, and services that comprise the GBDX offering.



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## Change Record

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## Table of Contents

<b>1. Product Specification</b> .....	<b>4</b>
1.1 Product Description .....	4
1.1.1 Infrastructure.....	4
1.1.2 GBDX Core Components .....	4
1.2 Datasets .....	6
1.2.1 DigitalGlobe Imagery .....	6
1.2.2 Third-Party Open Source Data .....	8
1.3 Algorithms .....	8
1.4 Access Tools.....	9
1.4.1 Python-based tools suite “gbdxtools” .....	9
1.4.2 GBDX Notebooks.....	9
1.4.3 AnswerFactory Web Interface .....	9
<b>2. Business and Operations</b> .....	<b>9</b>
2.1 Product Tiers and License Types .....	10
2.1.1 Product Tiers .....	10
2.1.2 Download Rights .....	11
2.1.3 Download Restrictions .....	11
2.1.4 License Type .....	11
2.2 Security .....	12
2.3 Support Services .....	12
2.4 Operations and Communication .....	13
2.4.1 Operational Status Updates.....	13
2.4.2 System Maintenance and Planned Service Outages .....	13
2.4.3 Deprecation Policy .....	13
2.4.4 Breaking Change Policy .....	14
<b>3. Export Compliance Policy</b> .....	<b>14</b>
<b>4. Appendix: Definitions and Acronyms</b> .....	<b>15</b>



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## 1. Product Specification

### 1.1 Product Description

GBDX is DigitalGlobe's subscription service that provides users with access to the Geospatial Big Data Platform (The GBDX Platform). This cloud-based platform allows users to search for and acquire imagery and its ancillary data, and to run analytics at almost any scale. Algorithm developers can publish algorithms on the platform for private or public use.

#### 1.1.1 Infrastructure

The GBDX Platform leverages the Amazon Web Services Infrastructure as a Service (IaaS) offering to configure and update resources to meet customer processing requirements. AWS Elastic Compute Cloud (EC2) is used for scalable computing capacity, and AWS Simple Storage Service (S3) provides low-cost, secure, and scalable data storage. DigitalGlobe reserves the right to provision comparable IaaS capabilities from other vendors as appropriate.

The compute environment relies on Docker software and AWS Elastic Compute Cloud (EC2) for the deployment of Algorithms as Tasks within the system. Developers who desire the ability to run algorithms on The GBDX Platform must containerize their algorithms into a standard, uniform Docker Interface.

#### 1.1.2 GBDX Core Components

Core Components make up the baseline functionality and content of The GBDX subscription offering. The following are considered Core Components of GBDX:



Component	Description
<a href="#">Authentication/ Authorization Service</a>	Access to The GBDX Platform resources is controlled by the Authentication and Authorization system. This system is built on top of the Auth0 protocol. The Authentication System generates a token, which provides role-based access to The GBDX resources.
<a href="#">Catalog Service</a>	The Catalog Service enables advanced search capabilities over the imagery and data catalog by Area of Interest (AOI) and by data range. Records can be filtered by properties such as cloud cover percentage, sensor type, and more.
<a href="#">Ordering Service</a>	The Ordering service allows users to request that an image be loaded into the GBDX Platform S3 location, and to find the S3 location of a DigitalGlobe image. Usage of the Ordering Service is controlled by the Authentication and Authorization system and is based on Product Tier.
<a href="#">Task Registry</a>	Algorithm developers can register an Algorithm as a “Task” on The GBDX Platform. Registering a task adds information about that task to the GBDX Task Registry. In addition, it triggers migration of the specified Docker image to The GBDX Platform. Tasks can be made private, public, or restricted to specified accounts. Only a DigitalGlobe Administrator can set a task to “Public”.
<a href="#">Workflow Service</a>	The Workflow Service provides the ability to process and analyze data by running a set of Tasks in a specified order. Tasks are chained together and run in a Workflow. The processing output from a Workflow is saved to either the default S3 location or a user-specified S3 location.
<a href="#">Raster Data Access</a>	Raster Data Access (RDA) is built as microservices using a cloud-native architecture that runs on AWS. RDA enables cloud-based and tile-based access to DigitalGlobe's image library, along with automated analytics which extract location intelligence and actionable insights at a global scale.

In the table above, click the component name in the left-hand column to access the relevant and complete documentation on GBDX University.



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## 1.2 Datasets

The GBDX subscription offering includes DigitalGlobe datasets and datasets from Third Party Providers. DigitalGlobe's Worldview-1, WorldView-2, WorldView-3, QuickBird, and GeoEye-1 datasets are Core Offerings of a GBDX subscription.

Licensing terms for raster and vector-based datasets on GBDX vary depending on the source of the data. There are three primary cost types associated with datasets. These are:

Cost Types	Datasets
DigitalGlobe Data	WorldView-1, WorldView-2, WorldView-3, WorldView-3 SWIR, WorldView-4, GeoEye, IKONOS, QuickBird
Third-party Open Source Data	Landsat-8, Sentinel-2
Third-Party Premium Data	MDA Radarset-2

The datasets described below in section 1.2.1 are available on The GBDX Platform. Datasets are occasionally added or, in rare instances, removed from GBDX. [Datasets on GBDX](#) is the master source for current GBDX datasets information.

Imagery data use is governed by the Terms and Conditions from the data provider. Links to Terms and Conditions are provided with each of the dataset descriptions below.

The availability of third-party open source data on GBDX is subject to the availability of the dataset as open-source data on AWS.

### 1.2.1 DigitalGlobe Imagery

“DigitalGlobe Imagery” refers to licensed images available from DigitalGlobe satellites and their metadata.

#### GeoEye-1

Spectral Bands: panchromatic, multispectral

Resolution: .41-meter panchromatic, 1.65-meter multispectral

Date Range: September 2008 to present

Products available on The GBDX Platform: DigitalGlobe Level 1B

Datasheet: [https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/97/DG\\_GeoEye1.pdf](https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/97/DG_GeoEye1.pdf)

#### IKONOS

Spectral Bands: panchromatic, multispectral 4-band

Resolution: .80-meter panchromatic, 3.2-meter multispectral

Date Range: 2000-2014

Products available on The GBDX Platform: IKONOS Ortho-ready 2A



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Datasheet: [https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/96/DG\\_IKONOS\\_DS.pdf](https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/96/DG_IKONOS_DS.pdf)

### **QuickBird**

Spectral Bands: panchromatic, multispectral

Resolution: .55-meter panchromatic, 2.16 m multispectral

Date Range: 2002-2014

Products Available on The GBDX Platform: DigitalGlobe Level 1B

Datasheet: <https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/100/QuickBird-DS-QB-Prod.pdf>

### **WorldView-1**

Spectral Bands: panchromatic

Resolution: .5 meter

Date Range: September 2007 to present

Products Available on The GBDX Platform: DigitalGlobe Level 1B

Datasheet: [https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/99/WorldView1-DS-WV1\\_V02.pdf](https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/99/WorldView1-DS-WV1_V02.pdf)

### **WorldView-2**

Spectral Bands: panchromatic, multispectral

Resolution: .46-meter panchromatic, 1.85-meter multispectral

Date Range: October 2009 – present

Products Available on The GBDX Platform: DigitalGlobe Level 1B

Datasheet: <https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/98/WorldView2-DS-WV2-rev2.pdf>

### **WorldView-3**

Spectral Bands: panchromatic, multispectral VNIR, SWIR

Resolution: .30-meter panchromatic, 1.2-meter multispectral, 3.7-meter SWIR

Date Range: August 2014 - present

Products Available on The GBDX Platform: DigitalGlobe Level 1B

Datasheet: [https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/95/DG2017\\_WorldView-3\\_DS.pdf](https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/95/DG2017_WorldView-3_DS.pdf)

### **WorldView-4**

Spectral Bands: panchromatic, multispectral

Resolution: .30-meter panchromatic, 1.2-meter multispectral

Date Range: 2017 - present

Products Available on The GBDX Platform: WorldView-4 imagery is only available through Raster Data Access (RDA).

Datasheet: [https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/196/DG2017\\_WorldView-4\\_DS.pdf](https://dg-cms-uploads-production.s3.amazonaws.com/uploads/document/file/196/DG2017_WorldView-4_DS.pdf)



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## 1.2.2 Third-Party Open Source Data

### Landsat-8

Landsat is a joint NASA/USGS program that provides the longest continuous space-based record of Earth's land in existence. Landsat 8 imagery is included in the GBDX Catalog and is available for processing on The GBDX Platform.

Spectral Bands: For information on Landsat-8 bands, see <https://landsat.gsfc.nasa.gov/landsat-8/landsat-8-bands/>

Resolution: 15-meter panchromatic, 30-meter multispectral

Date Range: 2013 – present

Landsat 8 scenes that are available on AWS are cataloged on the GBDX Platform. See <https://docs.opendata.aws/landsat-pds/readme.html> for more information on Landsat scenes.

Terms and Conditions: See <https://landsat.usgs.gov/landsat-data-access> for information on licensing terms for Landsat 8 data.

### Sentinel-2 Data

The Sentinel-2 mission is a collaboration between the European Space Agency (ESA), the European Commission, industry service providers, and data users. Sentinel-2 delivers high-resolution optical images ideal for land monitoring, emergency response, and security services.

Spectral Bands: 13 spectral bands: four bands at 10 meters, six bands at 20 meters and three bands at 60 meters spatial resolution.

Date Range: June 23, 2015 to present

Products available on The GBDX Platform: Level 1-C

Terms and Conditions: View [Terms and Conditions](#).

For more information on Sentinel-2 data, see [Sentinel-2 on AWS](#).

### Third Party Premium Data

MDA's RADARSAT-2 dataset is available as a supplement to a GBDX Subscription.

Spectral Bands: Extra Fine Beam Mode

Date Range: March 2013 to present

Products available on the GBDX Platform: RADARSAT-2 Extra-fine beam mode dataset (SGF Format).

Terms and Conditions: <https://mdacorporation.com/docs/default-source/general-terms-of-use/geospatial-services/gtu.pdf?sfvrsn=4>

## 1.3 Algorithms

GBDX includes a suite of algorithms that can be used to process geospatial data and extract derived information layers. These algorithms include a variety of advanced image processing



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and artificial intelligence machine learning algorithms. Some of the GBDX algorithms are Premium Algorithms which must be purchased at an extra cost, while others are Standard Algorithms which are included with every GBDX paid product tier.

The algorithms available on GBDX are updated regularly and may change during any given annual subscription term period. Availability on The GBDX Platform is based on availability of third-party algorithms. For the current list of algorithms available, please refer to the [GBDX University](#) online documentation. Each algorithm documented on GBDX University has undergone certification review testing. Algorithms that are not documented on GBDX University are not supported or warranted.

Algorithm developers who are interested in offering their algorithm to other GBDX customers may contact [gbdx-support@digitalglobe.com](mailto:gbdx-support@digitalglobe.com) for more information.

Disclaimer: Some certified algorithms on GBDX are submitted by third-party algorithm producers. Third-party content is the sole responsibility of the originator of that content. GBDX is not responsible for any third-party content, whether or not we reviewed or moderated such content.

## 1.4 Access Tools

Users can interact with The GBDX Platform through a variety of tools. Postman is a simple way to interact directly with the APIs. A GBDX Postman collection and installation instructions can be found at <https://gbdxdocs.digitalglobe.com/docs/postman-instructions-collections>

These are some of the tools available for accessing GBDX services and algorithms:

### 1.4.1 Python-based tools suite “gbdxtools”

“Gbdxtools” is a python-based tools suite that runs on the GBDX platform. It is open-sourced and managed by the GBDX team. “Gbdxtools” can be downloaded from this location <https://github.com/DigitalGlobe/gbdxtools>. User documentation is found here <https://gbdxtools.readthedocs.io/en/latest/>.

### 1.4.2 GBDX Notebooks

<https://notebooks.geobigdata.io/>

GBDX Notebooks allows users to run analysis at a limited scale in the Jupyter Notebooks environment. This environment utilizes RDA for imagery access and the python-based gbdxtools libraries for easy access.

### 1.4.3 AnswerFactory Web Interface

<https://gbdxdocs.digitalglobe.com/docs/answerfactory-overview>

AnswerFactory is a web-based interface that allows users to run some of the algorithms available on GBDX to answer business questions inside a browser.

## 2. Business and Operations



## 2.1 Product Tiers and License Types

### 2.1.1 Product Tiers

This table describes the GBDX Product Tiers. These tiers are available with a Developer License or an Internal Use License (described in the next section). The Internal Use license is priced at three times (3x) the Developer License.

	Basic	Advanced	Premium	Custom
<b>Hosting</b>	0.1 TB	1 TB	5 TB	Contact Sales for a tailored offer
<b>Download rights</b>	10%	10%	10%	
<b>License</b>	Developer	Developer	Developer	
<b>Compute Hours</b>	5,000	20,000	60,000	
<b>Additional Storage</b>	0.1 TB	1 TB	5 TB	
<b>Yearly Subscription</b>	USD 30,000	USD 130,000	USD 450,000	

### Definitions

Term	Description
Hosting	The amount of DigitalGlobe data (imagery) included with the subscription fee. Data is calculated per AOI (relevant area inside a strip) and can be accessed multiple times for calculations and information extraction purposes.
Download rights	The amount of data downloadable to the local development environment (for QA / QC purposes only).
Compute hours	<p>GBDX pricing tiers include a specified number of "GBDX Compute Hours". Pricing for compute hours is based on "GBDX Compute Units".</p> <p>1 GBDX Compute Unit (GCU) = 1 hour of processing time on an r4.2xlarge Amazon EC2 instance in the Amazon-US East region*. GCU pricing is based on Amazon's Linux On Demand cost.</p> <p>For more information, see GBDX Compute Hours.</p>
Additional storage	Space available for customer use in the account's AWS S3 bucket (or any other bucket for the purpose of storing results and making additional data available for compute purposes).



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### 2.1.2 Download Rights

The GBDX subscription allows for a specified percentage of hosting data to be downloaded to the customer's local development environment for Quality Assurance (QA) and Quality Control (QC) purposes.

The following example is based on the GBDX Premium Tier.

Hosting = 5 TB

Download Rights = 10%

Customer may download up to 500 GB of applicable data to a local development environment

The following data may be downloaded and will count toward the Download Rights limit:

- DigitalGlobe Imagery that is cataloged on the GBDX Platform and made available in the GBDX S3 location.
- Imagery Derivatives created as a result of running an algorithm on the GBDX Platform. Restrictions apply. See below for Download Restrictions.

Feature Derivatives created as a result of running an algorithm on the GBDX Platform can be downloaded without limitation, and do not count towards the Download Rights limit.

### 2.1.3 Download Restrictions

The following restrictions apply:

- Data and Imagery Derivatives may only be downloaded to a local development environment.
- Data and Imagery Derivatives downloaded from The GBDX Platform may only be used for Quality Assurance and Quality Control purposes.
- DigitalGlobe licenses apply when downloading DigitalGlobe imagery. DigitalGlobe licenses apply when downloading a Derivative product that is the equivalent of a DigitalGlobe product. DigitalGlobe Terms and Conditions, Licensing information, and DigitalGlobe product specifications can be found on the [DigitalGlobe Legal Information](#) page.
- Imagery from Third-party Premium Datasets cannot be downloaded.

### 2.1.4 License Type

There are two license types for GBDX:



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License Type	Description
<b>Developer</b>	Permits an authorized user to access, evaluate, and use imagery, services, and capabilities on GBDX for internal research and development purposes to commercialize any developed capability, either a “Platform Producer Development Addendum” or a Licensed Product Addendum” must be added to the contract and signed.
<b>Internal Use</b>	Permits an authorized user to access, evaluate, use imagery, services, and capabilities and to share derived information only within the user’s company.

## 2.2 Security

The GBDX Security documentation provides a detailed explanation of platform security and user authentication and authorization. See [GBDX Security](#).

## 2.3 Support Services

GBDX Support is available by email during regular business hours, 8:00 AM to 5:00 PM Mountain Standard Time (MST). To contact the GBDX Support team, email [gbdx-support@digitalglobe.com](mailto:gbdx-support@digitalglobe.com).

GBDX Supported Components are documented on GBDX University. Any service or capability that is not documented on GBDX University is not a GBDX Supported Component and is not supported by the GBDX Support team.



## 2.4 Operations and Communication

The policies in this section apply to GBDX Supported Components. Supported components are documented in GBDX University. Any service or capability that is not documented on GBDX University is not governed by these policies.

GBDX Operations provides several communication channels for easy access to relevant information:

GBDX Status Page	<a href="http://status.geobigdata.io/">http://status.geobigdata.io/</a>
Twitter	<a href="http://twitter.com/gbdxreleaselog">http://twitter.com/gbdxreleaselog</a>
Release Notes	<a href="https://gbdxdocs.digitalglobe.com/page/release-notes">https://gbdxdocs.digitalglobe.com/page/release-notes</a>
Email	Announcements including planned service outages, component deprecations, and new features will be sent to all impacted accounts. The email service sends to email addresses associated with GBDX users. Users can opt out of these messages using our automated delivery system.

### 2.4.1 Operational Status Updates

Real-time operational status is provided by component and is available on the GBDX Status Page. The status page allows users to subscribe to all notifications or to subscribe to a specific notification.

### 2.4.2 System Maintenance and Planned Service Outages

The GBDX Platform operates in a manner that allows for regular scheduled maintenance with no customer impact. When planned downtime is required, DigitalGlobe typically provides 24-hour notice via the communication channels listed above. It is possible that less than 24-hour notice will be given if downtime is urgent and critical.

### 2.4.3 Deprecation Policy

GBDX Operations will provide a minimum of 60 calendar day notice when a GBDX Supported Component is deprecated and scheduled for retirement (End of Life). This policy is applicable to the deprecation of imagery datasets, APIs, and certified algorithms.

When a GBDX Supported Component is deprecated, migration instructions will be provided, and a Deprecation Notice will be distributed via the communication channels listed above.

A list of deprecated components and supporting information can also be found here:

<https://gbdxdocs.digitalglobe.com/docs/deprecation-schedule>



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#### 2.4.4 Breaking Change Policy

GBDX Operations will provide 60 calendar day notice when a Breaking Change is planned. Documentation and update instructions will be provided in the notice. See the [GBDX Overview](#) for more information on the breaking change policy.

We version our APIs when breaking changes are made. Breaking changes include:

- A change in the format or schema of a response
- A change in response type.
- API deletions or removal of functionality

We consider the following changes to be non-breaking and backward-compatible, and as such they will not result in up-versioning of the API:

- Adding new endpoints or HTTP methods
- Adding new response parameters or fields
- Adding new optional request fields

### 3. Export Compliance Policy

Access to and use of The GBDX Platform is governed by the DigitalGlobe Export Compliance Policy. The Export Compliance Policy prohibits the use of The GBDX Platform related to certain technologies and end-uses that may be controlled by the International Traffic in Arms Regulations (“ITAR”) or Export Administration Regulations (“EAR”). The Export Compliance Policy states that GBDX may not be used to house, store, or otherwise introduce: ITAR-controlled materials or technical data, encryption technology, weapons technology, or include prohibited users or locations. The Export Compliance Policy is posted to the d GBDX University pages, and can be found here:

[https://notebooks.geobigdata.io/docs/export\\_compliance\\_policy.pdf](https://notebooks.geobigdata.io/docs/export_compliance_policy.pdf)



## 4. Appendix: Definitions and Acronyms

This section provides definitions for acronyms and terminology used in this document.

Term	Definition
Algorithm	A calculation process used to alter, prepare for additional processing, or extract information from geospatial data
Analytics	The systematic computational analysis of geospatial data, derived from datasets on GBDX.
AOI	Area of Interest
API	Application Programming Interface
AWS	Amazon Web Services
Breaking Change	A change to an API that will potentially cause a failure for consumers of that API.
Catalog ID	The unique identifier for a record in the GBDX catalog.
Derivative	Any addition, improvement, update, modification, transformation, adaptation or derivative work of or to a Product, including, without limitation, reformatting of the Product into a different format or media from which it is delivered to Customer; any addition or extraction of data, information or other content to or from the Product; or any copy or reproduction of the Product. A Derivative can be either an Imagery Derivative or Feature Derivative.
EC2	An AWS virtual computing environment, known as an Elastic Compute Cloud
EC2 Instance	A virtual server that runs within an EC2 on AWS infrastructure
GBDX	The subscription service that allows access to The Geo Big Data Platform.
Geospatial Big Data Platform (The GBDX Platform)	The core components and content described in this product spec comprise the Geospatial Big Data Platform
GBDX Supported Component	Any component or feature documented on GBDX University is considered a “GBDX Supported Component.”
IaaS	Infrastructure as a service
Imagery	Satellite imagery data available on GBDX
Premium Algorithm	An algorithm that is available for purchase a subscription add-on.



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Term	Definition
S3	Amazon's web service interface for storing and retrieving data from the cloud, known as Simple Storage Service
Standard Algorithm	An algorithm that is available as part of a GBDX product tier
Task	An algorithm that processes data or performs a function. Tasks are stored in Docker containers and registered in the GBDX task registry, Tasks are chained together and run in workflows
Task Registry	The repository of Dockerized algorithms submitted to GBDX
Third-party Data	Data provided by a third-party source. Some third-party datasets are free and open-source, and some third-party datasets may be purchased as an add-on to a GBDX contract
Third-party Premium Data	Third Party Premium Data refers to data available on GBDX that might require an additional fee for use
Workflow	A set of tasks chained together and run on GBDX to process data



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