



Redfish OOBM Reference

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Points of Contact

For further assistance with an HGST product, contact Platform Engineering technical support. Please be prepared to provide the following information: Serial Number (S/N), product name, model number, and a brief description of the issue.

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<http://support.hgst.com>

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1 OOBM Overview

The Out-of-Band-Management interface used in HGST storage platforms is an implementation of DMTF's Redfish® API, an open industry standard specification and schema that helps enable simple and secure management of modern scalable platform hardware. By specifying a RESTful interface and utilizing JSON and OData, Redfish helps customers integrate solutions within their existing tool chains. The primary use cases for the Redfish OOBM are the following:

- Locating platforms and platform components using the identification LEDs
- Gathering system health information
- Updating firmware

The purpose of this document is to provide information specific to HGST's implementation of the Redfish API. For more in depth information regarding Redfish, see [Helpful References](#).

1.1 Helpful References

The following is the list of referenced documents and documents that support user development using HGST's implementation of the Redfish API.

- DMTF Redfish Scalable Platforms Management API Specification Version 1.2.0 https://www.dmtf.org/sites/default/files/standards/documents/DSP0266_1.2.0.pdf
- DMTF Redfish Schema DSP8010 2017.1 <https://www.dmtf.org/standards/redfish>
- IETF RFC 3986 T. Berners-Lee et al, Uniform Resource Identifier (URI): Generic Syntax, <http://www.ietf.org/rfc/rfc3986.txt>
- IETF RFC 4627, D. Crockford, The application/json Media Type for JavaScript Object Notation (JSON), <http://www.ietf.org/rfc/rfc4627.txt>
- IETF RFC 5789, L. Dusseault et al, PATCH method for HTTP, <http://www.ietf.org/rfc/rfc5789.txt>
- IETF RFC 5280, D. Cooper et al, Web linking, <http://www.ietf.org/rfc/rfc5280.txt>
- IETF RFC 5988, M. Nottingham, Web linking, <http://www.ietf.org/rfc/rfc5988.txt>
- IETF RFC 6901, P. Bryan, Ed. et al, JavaScript Object Notation (JSON) Pointer, <http://www.ietf.org/rfc/rfc6901.txt>
- IETF RFC 6906, E. Wilde, The 'profile' Link Relation Type, <http://www.ietf.org/rfc/rfc6906.txt>
- IETF RFC 7230, R. Fielding et al., Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing, <http://www.ietf.org/rfc/rfc7230.txt>
- IETF RFC 7231, R. Fielding et al., Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content, <http://www.ietf.org/rfc/rfc7231.txt>
- IETF RFC 7232, R. Fielding et al., Hypertext Transfer Protocol (HTTP/1.1): Conditional Requests, <http://www.ietf.org/rfc/rfc7232.txt>
- IETF RFC 7234, R. Fielding et al., Hypertext Transfer Protocol (HTTP/1.1): Caching, <http://www.ietf.org/rfc/rfc7234.txt>
- IETF RFC 7235, R. Fielding et al., Hypertext Transfer Protocol (HTTP/1.1): Authentication, <http://www.ietf.org/rfc/rfc7235.txt>
- ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards, <http://isotc.iso.org/livelink/livelink.exe?func=ll&obj Id=4230456&obj Action=browse&sort=subtypeH>
- JSON Schema, Core Definitions and Terminology, Draft 4 <http://tools.ietf.org/html/draft-zyp-json-schema-04.txt>
- JSON Schema, Interactive and Non-Interactive Validation, Draft 4 <http://tools.ietf.org/html/draft-fge-json-schema-validation-00.txt>

- OData Version 4.0 Part 1: Protocol. 24 February 2014. <http://docs.oasis-open.org/odata/odata/v4.0/os/part1-protocol/odata-v4.0-os-part1-protocol.html>
- OData Version 4.0 Part 2: URL Conventions. 24 February 2014. <http://docs.oasis-open.org/odata/odata/v4.0/os/part2-url-conventions/odata-v4.0-os-part2-url-conventions.html>
- OData Version 4.0 Part 3: Common Schema Definition Language (CSDL). 24 February 2014. <http://docs.oasis-open.org/odata/odata/v4.0/os/part3-csdl/odata-v4.0-os-part3-csdl.html>
- OData Version 4.0: Core Vocabulary. 24 February 2014. <http://docs.oasis-open.org/odata/odata/v4.0/os/vocabularies/Org.OData.Core.V1.xml>
- OData Version 4.0 JSON Format. 24 February 2014. <http://docs.oasis-open.org/odata/odata-json-format/v4.0/os/odata-json-format-v4.0-os.html>
- OData Version 4.0: Units of Measure Vocabulary. 24 February 2014. <http://docs.oasis-open.org/odata/odata/v4.0/os/vocabularies/Org.OData.Measures.V1.xml>
- Simple Service Discovery Protocol/1.0. 28 October 1999. <http://tools.ietf.org/html/draft-cai-ssdp-v1-03>
- The Unified Code for Units of Measure. <http://www.unitsofmeasure.org/ucum.html>
- W3C Recommendation of Cross-Origin Resource Sharing. 16 January 2014. <http://www.w3.org/TR/cors/>
- SNIA TLS Specification for Storage Systems. 20 November 2014. <http://www.snia.org/tls/>
- DMTF DSP0270 Redfish Host Interface Specification, http://www.dmtf.org/sites/default/files/standards/documents/DSP0270_1.0.pdf

1.2 Common Redfish Properties

There are a number of properties that are common to most objects. This section enumerates and describes those properties.

1.2.1 Id

The Id property of a resource uniquely identifies the resource within the Resource Collection that contains it. The value of Id shall be unique across a Resource Collection.

1.2.2 Name

The Name property is used to convey a human readable moniker for a resource. The type of the Name property shall be string. The value of Name is NOT required to be unique across resource instances within a Resource Collection.

1.2.3 Description

The Description property is used to convey a human readable description of the resource. The type of the Description property shall be string.

1.2.4 Status

The Status property represents the status of a resource. The value of the status property is a common status object type as defined by this specification. By having a common representation of status, clients can depend on consistent semantics. The Status object is capable of indicating the current intended state, the state the resource has been requested to change to, the current actual state and any problem affecting the current state of the resource.

The Status object contains three distinct properties that provide information about the health of the containing object. The following table describes these properties in general terms. For more information on the definition of these terms see [Table 6: SES Code to OOBM Status Map](#) on page 14.

Table 1: Status Properties

Property	Description
State	Describes whether the referenced object/resource is enabled or disabled.
Health	Describes the operational status of the referenced resource only.
HealthRollup	Describes the operational status of the referenced resource as well as its contingent resources. See the Related Items property to see what resources are related to this status.

1.2.5 Links

The Links property represents the links associated with the resource, as defined by that resource's schema definition. All associated reference properties defined for a resource shall be nested under the links property. All directly (subordinate) referenced properties defined for a resource shall be in the root of the resource.

1.2.6 Members

The Members property of a Resource Collection identifies the members of the collection.

1.2.7 RelatedItem

The RelatedItem property represents links to a resource (or part of a resource) as defined by that resources schema definition. This is not intended to be a strong linking methodology like other references. Instead it is used to show a relationship between elements or sub-elements in disparate parts of the service. For example, since "Fans" may be in one area of the implementation and "Processors" in another, RelatedItem can be used to inform the client that one is related to the other (in this case, the fan is cooling the processor).

1.2.8 Actions

The Actions property contains the actions supported by a resource.

1.2.9 OEM Property

This section describes the OEM property and how to leverage it to store OEM specific properties. This content is provided here for convenience and is adapted from the Redfish 1.2.0 specification available [here](#). Refer to this specification for further information.

OEM-specified objects that are contained within the Oem property shall be valid JSON objects that follow the format of a Redfish complex type. The name of the object (property) shall uniquely identify the OEM or organization that manages the top of the namespace under which the property is defined. This is described in more detail in the following clause. The OEM-specified property shall also include a type property that provides the location of the schema and the type definition for the property within that schema. The Oem

property can simultaneously hold multiple OEM-specified objects, including objects for more than one company or organization.

```
<Schema Name="MyCompany.v1_2_0">
  ...

  <ComplexType Name="Campaign">
    <Property Name="slogan" Type="Edm.String"/>
    <Property Name="disclaimer" Type="Edm.String"/>
  </ComplexType>
  ...
</Schema>
```

1.3 Supported HTTP Request Headers

Note: The following is the list of supported response headers in HGST's implementation of the Redfish API along with descriptions taken from the [Redfish 1.2.0 Specification](#).

Table 2: Supported HTTP Headers

Header	Supported Values	Description
Accept	RFC 7231	Indicates to the server what media type(s) this client is prepared to accept. Services shall support requests for resources with an Accept header including application/json or application/json;charset=utf-8. Services shall support requests for metadata with an Accept header including application/xml or application/xml;charset=utf-8.
Content-Type	RFC 7231	Describes the type of representation used in the message body. Content-Type shall be required in requests that include a request body. Services shall accept Content-Type values of application/json or application/json;charset=utf-8.
Content-Length	RFC 7231	Describes the size of the message body. An optional means of indicating size of the body uses Transfer-Encoding: chunked, which does not use the Content-Length header. If a service does not support Transfer-Encoding and needs Content-Length instead, the service will respond with status code 411 .
ETags	RFC 7231	An identifier for a specific version of a resource, often a message digest. HGST has implemented the Strong model of ETags. Additionally, we return the current valid ETag in the error response to a PATCH request which had an invalid (out-of-date) ETag.

Header	Supported Values	Description
OData Version	4.0	Services shall reject requests which specify an unsupported OData version. If a service encounters a version that it does not support, the service should reject the request with status code [412] (#status-412). If client does not specify an Odata-Version header, the client is outside the boundaries of this specification.
Authorization	RFC 7235	Required for Basic Authentication
Host	RFC 7230	Required to allow support of multiple origin hosts at a single IP address.
Origin	W3C CORS	Used to allow web applications to consume Redfish Service while preventing CSRF attacks.

1.4 Supported HTTP Response Headers

Note: The following is the list of supported response headers in HGST's implementation of the Redfish API along with descriptions taken from the [Redfish 1.2.0 Specification](#).

Table 3: Supported HTTP Headers

Header	Supported Values	Description
OData-Version	4.0	Describes the OData version of the payload that the response conforms to.
Content-Type	RFC 7231	Describes the type of representation used in the message body. Content-Type shall be required in requests that include a request body. Services shall accept Content-Type values of application/json or application/json;charset=utf-8.
Content-Length	RFC 7231	Describes the size of the message body. An optional means of indicating size of the body uses Transfer-Encoding: chunked, which does not use the Content-Length header. If a service does not support Transfer-Encoding and needs Content-Length instead, the service will respond with status code 411 .
ETag	RFC 7231	An identifier for a specific version of a resource, often a message digest. HGST has implemented the Strong model of ETags.
Server	RFC 7231	Required to describe a product token and its version. Multiple product tokens may be listed.

Header	Supported Values	Description
Link	See the Redfish 1.2.0 Specification for more details.	See the Redfish 1.2.0 Specification for more details.
Access-Control-Allow-Origin	W3C CORS	Prevents or allows requests based on originating domain. Used to prevent CSRF attacks.
Allow	POST, PUT, PATCH, DELETE, GET, HEAD	Shall be returned with a 405 (Method Not Allowed) response to indicate the valid methods for the specified Request URI. Should be returned with any GET or HEAD operation to indicate the other allowable operations for this resource.
WWW-Authenticate	RFC 7235	Required for Basic Authentication.

1.5 Supported HTTP Methods

The following table lists the HTTP methods supported by the OOBM.

Table 4: HTTP Methods Supported

HTTP Method	Description
GET	Used to collect a JSON formatted response from the resource targeted.
POST	Used to create resources nested within the object targeted. This method is used to instantiate Redfish Actions in the OOBM such as Chassis.Reset
PATCH	Updates the targeted object with new key/value pairs. Key value pairs that are not submitted in the request will remain unchanged.
DELETE	Used to delete an entry in the targeted object. Must be formatted in as a JSON object.
HEAD	HEAD is identical to GET except that the server won't return a message-body in the response.

1.6 HTTP Response Codes

The following table lists the possible HTTP response codes possible from each OOBM API target. Error messages will return a JSON formatted response body with the error code listed.

Table 5: HTTP Response Codes by Target

Target	Status Codes
/redfish	200, 405
/redfish/v1	200, 405
/redfish/v1/odata	200, 405
/redfish/v1/\$metadata	200, 405

Target	Status Codes
/redfish/v1/Chassis	200, 401, 403, 405
/redfish/v1/Chassis/Enclosure	200, 401, 403, 405
/redfish/v1/Chassis/Enclosure/Actions/Chassis.Reset	400, 401, 403, 405
/redfish/v1/Chassis/Enclosure/Actions/Chassis.Locate	200, 400, 401, 403, 405
/redfish/v1/Chassis/Enclosure/Actions/Chassis.PowerMode	200, 400, 401, 403, 405
/redfish/v1/Chassis/Enclosure/Thermal	200, 401, 403, 405
/redfish/v1/Chassis/Enclosure/Power	200, 401, 403, 405
/redfish/v1/Chassis/IOModule[AB]FRU	200, 401, 403, 405
/redfish/v1/Chassis/IOModule[AB]FRU/Chassis.Reset	200, 400, 401, 403, 405
/redfish/v1/Chassis/IOModule[AB]FRU/Chassis.Locate	200, 400, 401, 403, 405
/redfish/v1/Chassis/PowerSupply[AB]FRU	200, 401, 403, 405
/redfish/v1/Chassis/PowerSupply[AB]FRU/Chassis.Locate	200, 400, 401, 403, 405
/redfish/v1/Systems	200, 401, 403, 405
/redfish/v1/Systems/Self	200, 401, 403, 405
/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset	200, 400, 401, 403, 405
/redfish/v1/Systems/Self/Storage	200, 401, 403, 405
/redfish/v1/Systems/Self/Storage/[Enclosure Logical ID]	200, 401, 403, 404, 405
/redfish/v1/Systems/Self/Storage/[Enclosure Logical ID]/Drives/[Id]	200, 401, 403, 404, 405
/redfish/v1/Systems/Self/Storage/[Enclosure Logical ID]/Drives/[Id]/Actions/Drive.Power	200, 400, 401, 403, 404, 405
/redfish/v1/Systems/Self/Storage/[Enclosure Logical ID]/Drives/[Id]/Actions/Drive.Locate	200, 400, 401, 403, 404, 405
/redfish/v1/Systems/Self/EthernetInterfaces	200, 401, 403, 405
/redfish/v1/Systems/Self/EthernetInterfaces/IOModule[AB]	200, 204, 401, 403, 404, 405
/redfish/v1/AccountService	200, 401, 403, 405
/redfish/v1/AccountService/Accounts	200, 201, 401, 405
/redfish/v1/AccountService/Accounts/[Id]	200, 204, 401, 403, 404, 405
/redfish/v1/AccountService/Roles	200, 401, 405
/redfish/v1/AccountService/Roles/Administrator	200, 401, 404, 405
/redfish/v1/AccountService/Roles/Operator	200, 401, 404, 405
/redfish/v1/AccountService/Roles/ReadOnly	200, 401, 404, 405
/redfish/v1/UpdateService	200, 401, 405

Target	Status Codes
/redfish/v1/UpdateService/FirmwareInventory	200, 401, 405
/redfish/v1/UpdateService/FirmwareInventory/[component]	200, 401, 405
/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate	202, 401, 405
/redfish/v1/UpdateService/Actions/UpdateService.FWActivate	200, 400, 401, 405
/redfish/v1/UpdateService/Actions/UpdateService.TLSUpdate	201, 400, 401, 405

1.7 Mapping Status Codes to SES Statuses

The following table maps relates SES based status codes to the Status Codes in the Redfish OOBM.

Table 6: SES Code to OOBM Status Map

SES Element Status Code	Status.State	Status.Health	Comments
0 - Unsupported Also, any other ESC value	Starting	Warning	
1 - OK	Enabled	OK	
2 - Critical	Enabled	Critical	
3 - Non-Critical	Enabled	Warning	
4 - Unrecoverable	Disabled	Critical	Unsupported drive type
5 - Not Installed	Absent	OK	
6 - Unknown	Starting	Warning	Drive temperature not read yet. Lost communication with I ² C slave
7 - Not Available	StandbyOffline	Warning	Temperature of unsupported drive
8 - No Access	StandbyOffline	Warning	Temperature of powered off drive

Note: When a drive is powered off, the drive's status will be as follows:

```
{
  . . .
  "Status" : {
    "State" : "StandbyOffline",
    "Health" : "OK",
    "HealthRollup" : "OK"
  },
  . . .
}
```

1.8 Security

The HGST implementation of Redfish supports Transport Layer Security (TLS) version 1.1 and the "Basic Authentication" model for user account authentication over HTTPS.

1.8.1 Authentication

The OOBM implements the Basic Auth authentication model. This means that every call to the OOBM must also contain account an authentication header populated with user credentials for a user account with the appropriate roles and privileges. This is a strict requirement for authentication of the all targets in the OOBM except /redfish and /redfish/v1. The following is an example using Basic Auth credentials in a POST call to power down a drive:

```
POST /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/1/Actions/Drive.Power
HTTP/1.1
Authorization: Basic USERNAME:PASSWORD
Content-Type: application/json;charset=utf-8
OData-Version: 4.0
{
  "PowerState": "Off"
}
```

The session management service is not implemented currently in the OOBM.

1.8.2 Roles and Privileges

The three standard Redfish roles are the Administrator, the Operator, and ReadOnly, and each has a different amount of privileges. This section describes the privileges and roles in detail.

Privileges

Login: The Login privilege allows the user to login and access information from system resources. This privilege is required to send GET requests to resources in the Chassis objects. The login privilege is accessible from the Administrator, Operator, and ReadOnly roles.

ConfigureManager: The ConfigureManager privilege is used to configure manager resources.

ConfigureUsers: The ConfigureUsers privilege is used to make changes to the AccountService object. It allows the creation and modification of users accounts. This includes changing usernames and passwords, changing roles and privileges for existing user accounts, and creating new user accounts. This privilege is also the only one that allows one to view the /Roles URI.

ConfigureSelf: ConfigureSelf allows a user to change his own password with a PATCH command.

ConfigureComponents: This is the primary privilege that allows the user account to make POST and PATCH commands to system components. This allows the configuration of networking info, upgrading firmware, and changing system settings.

Roles

Administrator: The Administrator role is the role with the most privileges in the standard configuration. This account has all of the privileges enabled.

Operator: The Operator role is has the Login, ConfigureSelf, and ConfigureComponents privileges enabled. This is the role that can be surfaced to programs and developers that should be able to perform GETs to the Chassis and System objects to retrieve system data, and performs POSTs to configure system components. Operator role accounts can also reach the /UpdateService and /AccountService URIs

ReadOnly: The ReadOnly role is only allowed the Login privilege. This account should be used primarily for performing GET commands to the Chassis object to get information on the Thermal or Power status of the enclosure. This user can also read information on drives at /Systems/Self/Storage/<enc logical id>/Drives/#.

1.8.3 Redfish Account Management

The AccountService object is a member of the ServiceRoot object and is used to create, modify, and delete user accounts and user privileges. A user account object must have a user name, password, and a role.

Note: Roles and Privileges are currently not configurable.

The Ultrastar Data102 comes with three pre-existing user accounts, each with a different pre-configured role. The following table lists the pre-configured accounts with their corresponding role and the privileges available to that role.

Table 7: Pre-Configured Roles

Account ID	Default UN:PW	Role	Privileges
1	admin:admin	Administrator	Login ConfigureManager ConfigureUsers ConfigureSelf ConfigureComponents
2	operator:operator	Operator	Login ConfigureSelf ConfigureComponents
3	readonly:readonly	ReadOnly	Login ConfigureSelf

2 Common User Workflows

The section provides some steps to follow for common user workflows using the OOBM.

2.1 Upgrading Firmware Using the OOBM

Note: The product must be registered in order to download firmware updates.

1. Open a web browser and navigate to: <http://www.hgst.com/>.
2. Navigate to the Platforms page by clicking **Products > Platforms**. The Platforms page will appear.

Figure 1: Platforms Page



Home Page > Platforms

Platforms

3. Locate the product that will be upgraded in the list and click **Learn More**.
4. Access the Customer Technical Support and Downloads page by clicking the **Support** button. The Customer Technical Support and Downloads page will appear in a new tab.

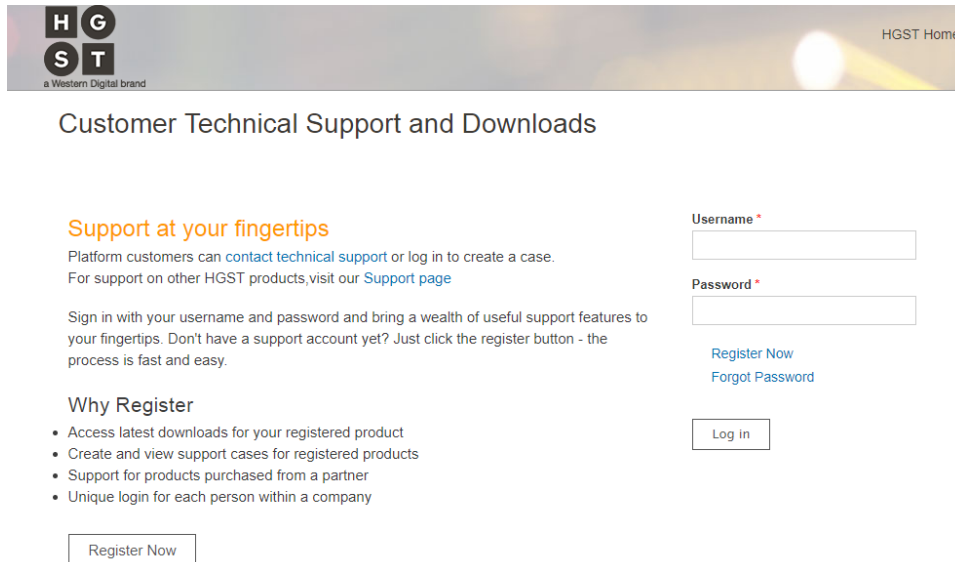
Figure 2: Support Button



5. Log in to the Customer Technical Support and Downloads page using a username and password. To get a username and password click **Register Now** and fill out the form.

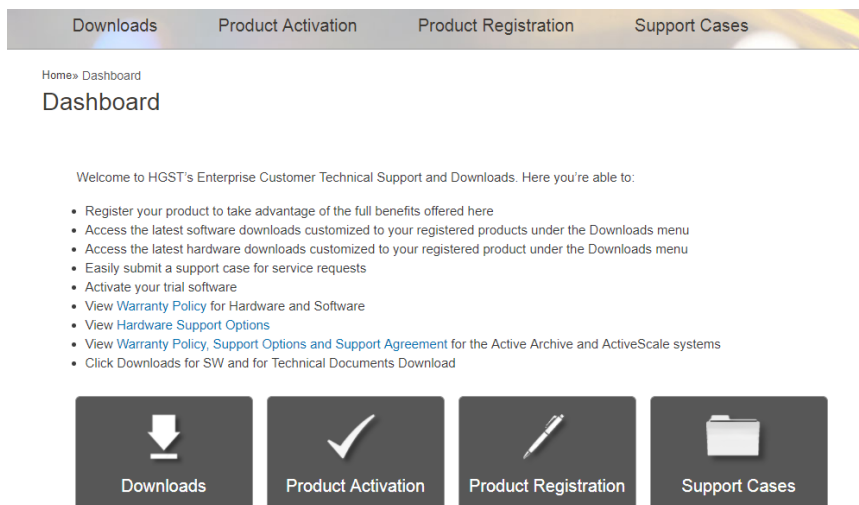
Note: If the product has not been registered, complete the registration first before continuing.

Figure 3: Customer Technical Support and Downloads



6. Access the product Downloads by clicking **Downloads** in the Dashboard. The Downloads page will appear.

Figure 4: Dashboard



7. Select the product that will be upgraded from the Downloads list. The product downloads will appear.
8. View the firmware download options by clicking Ultrastar Data102 Chassis Firmware.
9. Download the firmware by clicking **Download** next the latest firmware .tar.gz file.

The product firmware will download.

10. Extract the file to the file path that will be used for installation.
11. Use the Simple.Update action on the UpdateService object as shown in the following example:

```
POST /redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate HTTP/1.1
Authorization: Basic USERNAME:PASSWORD
Content-Type: application/json;charset=utf-8
Content-Length: <computed length>
OData-Version: 4.0
{
  "ImageURI": "tftp://10.0.0.2/wdc_firmware_0001-001.tar.gz"
}
```

Note: TFTP or HTTP are supported for this

The response to a SimpleUpdate action will be HTTP Response Code '202 Accepted.' This means that the request has been accepted for processing, but the processing has not been completed. The Location header shall be set to a URL that can be queried to determine the status of the operation.

12. To check the status of the update process, send a GET request to the following target

```
/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate/Status
```

13. When the code load is finished, activate the new firmware by using the FWActivate action on the UpdateService object as shown in the following example:

```
POST /redfish/v1/UpdateService/Actions/UpdateService.FWActivate HTTP/1.1
Authorization: Basic USERNAME:PASSWORD
Content-Type: application/json;charset=utf-8
Content-Length: <computed length>
OData-Version: 4.0
```

The firmware update is now complete.

2.2 Managing User Accounts

An account can be created by making a POST call to the redfish/v1/AccountService/Accounts object using an account with the ConfigureUsers privilege. The POST requires the following data parameters:

Table 8: Required Data Parameters

Parameter	Purpose
UserName	Sets the account's username.
Password	Sets the account's password
RoleId	Defines the role assigned to the created account. Possible values are "Administrator", "Operator", or "ReadOnly".

The following is an example of the creation of a user account POST using cURL.

```
curl -u admin:adminPW
-X POST https://192.168.1.1/redfish/v1/Chassis/Enclosure/Actions/Chassis.PowerMode
-h Content-Type: application/json;charset=utf-8
-h Content-Length: [Length of JSON object]
-d {
  "UserName": "NewUser",
  "Password": "ABCDEF123456",
  "RoleId": "Administrator",
}
```

User accounts can be updated using the PATCH method. Make a patch call to the account object that should be updated and include in the message body the JSON formatted key/value pairs that you wish to update. A full object body with all key value pairs is not required. A user account with the ConfigureUsers privilege will be able to configure other user account's credentials, roles, and Id. The ConfigureSelf privilege allows a user to make changes to its own account, such as a password change.

An account can be removed using the DELETE method. A DELETE call made to an account object does not require content be in a message body. To delete a user account, the account that is being used to make the DELETE call must have the ConfigureUsers privilege.

2.3 Locating the IP Addresses of the Ultrastar Data102

This sections provides methods for finding the IP addresses to assigned to the OOBM.

2.3.1 Redfish Discovery

The Redfish API leverages the Simple Service Discovery Protocol (SSDP) for network resource discovery. This allows the Ultrastar Data102 to be discovered on the network without resorting to ping-sweeps or other complicated discovery methods.

To perform this discovery process, perform an M-SEARCH query for the Search Target: ST: URN:dmtf-org:service:redfish-rest:1. What will return are the networking details of Redfish managed resources available on the network. Use the following diagram as an example of how to structure this M-SEARCH query.

Figure 5: Refish Discovery



The OOBM IP address may then be matched to the enclosure by comparing serial number under <https://<OOBM-IP-addr>/redfish/v1/Chassis/Enclosure> to the enclosure's serial number found in SES Page 7.

```
{
  "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
  "@odata.id": "/redfish/v1/Chassis/Enclosure",
  "@odata.type": "#Chassis.v1_2_0.Chassis",
  "Name": "Chassis",
  "Id": "Enclosure",
  "ChassisType": "RackMount",
  "Manufacturer": "WDC",
  "Model": "Mt Madonna 4U102",
  "SerialNumber": "Serial Number",
  . . .
}
```

```
# sg_ses -p7 --index=enc,0 /dev/sg3
WDC Mt Madonna 4U102 0016
Primary enclosure logical identifier (hex): 5000ccab04000980
Element Descriptor In diagnostic page:
generation code: 0x0
element descriptor list (grouped by type):
  Element 0 descriptor: ENCLOSURE,1ES0249,USCSJ03717EA0008,1EB0221,Serial Number
```

2.3.2 Locating the IP Addresses via SES

The IP addresses of the Ultrastar Data102 is identifiable via a host system through the following SES command:

```
# sg_ses -p 7 /dev/sg0 --index=esc,1
WDC 4U102 0012
Primary enclosure logical identifier (hex): 5000ccab03000000
Element Descriptor In diagnostic page:
generation code: 0x0
element descriptor list (grouped by type):
  Element 1 descriptor: ESCE IOMB,,,5000CCAB0300007C,10.202.237.249
```

2.4 Updating Network Settings

The network settings of the Ultrastar Data102 can be set or updated using `/redfish/v1/Systems/Self/EthernetInterfaces/IOModuleA`. The IPv4 address, Subnet Mask, and Gateway can be set in a PATCH call to IOModuleA to update the IPv4 object contained in the IOModuleA.

Note: Networking address, subnet mask, and gateway all requires an ASCII, dot-separated value.

Table 9: Required Data Parameters

Parameter	Description
Address	Sets the IPv4 to the address given in the API call.

Parameter	Description
SubnetMask	Used to identify network address of an IP address by performing a bitwise AND operation on the netmask.
AddressOrigin	Defines how the IPv4 address should be set. Possible values are "Static" "DHCP".
Gateway	Set this parameter to the gateway defined for this network.

By default, the Ultrastar Data102 is set to have DHCP activated and the system will configure network settings when it is connected to a network with a DHCP server. In this case, SubnetMask and Gateway or invalid. Use this object to change this behavior and specify these values.

2.5 Finding the Enclosure Logical ID

The Enclosure Logical ID relates to a SAS address that is unique to each system. This address is used to address many of the targets available to the OOBM Redfish API. To find this ID, make a GET call to the /redfish/v1/Systems/Self/Storage target. This target will return the Storage object that lists the Members associated with Storage. Under the @odata.id property listed in the Member object will be a target to the Enclosure Logical ID. Here is an example response from the Storage object:

```
{
  "@odata.context": "/redfish/v1/$metadata#StorageCollection.StorageCollection",
  "@odata.id": "/redfish/v1/Systems/Self/Storage",
  "@odata.type": "#StorageCollection.StorageCollection",
  "Name": "Storage Collection",
  "Members@odata.count": 1,
  "Members": [{"@odata.id": "/redfish/v1/Systems/Self/Storage/5000CCAB03000000"}],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

The Enclosure Logical ID is in bold. This is the ID used when making API calls to drives, and is a member object of the Storage object.

2.6 Activating Identification LEDs

The following components inside the Ultrastar Data102 have identification LEDs that can be activated using the #Chassis.Locate action:

- PSU - /redfish/v1/Chassis/PowerSupply[A/B]FRU/Actions/Chassis.Locate",

Note: Sending this command will light the enclosures identification LED, not the actual LED on the PSU.

- Drives - /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/<Drive ID #>/Actions/Chassis.Locate,
- IOMs - /redfish/v1/Systems/Self/EthernetInterfaces/IOModule[AB]Chassis.Locate",
- Enclosure - /redfish/v1/Chassis/Enclosure/Actions/Chassis.Locate",

To activate an LED, make a POST call to the appropriate target object with the following:

```
curl -u admin:adminPW
-h Content-Type: application/json;charset=utf-8
-X POST https://[target IP/Domain]/redfish/v1/Chassis/Enclosure/Actions/Chassis.Locate
-d {
  "LocateState": "On"
}
```

2.7 Resetting the Authentication Database



Caution: Resetting the authentication database will **reset all user accounts to the default** and is only recommended if there access to all administrator accounts is impossible due to lost passwords or other complications. This reset **must** be done in-band over SAS to ensure physical



access to the system.

Resetting the authentication database must be done in-band using SES commands. The following are SG3_Utils commands that will reset the authentication database on each of IOMs. If only one IOM is present, only the command for IOMA is necessary.

To reset the auth DB on IOM A:

```
sg_senddiag --pf --raw=04,00,00,05,02,00,02,00,00 <sep device>
```

To reset the auth DB on IOM B:

```
sg_senddiag --pf --raw=04,00,00,05,02,00,02,01,00 <sep device>
```

3 Redfish API Reference

Table 10: Root Targets

Target	Required Privilege
/redfish	None
/redfish/v1	None
/redfish/v1/odata	None
/redfish/v1/\$metadata	None

Table 11: Chassis Targets

Target	Required Privilege
/redfish/v1/Chassis	Login
/redfish/v1/Chassis/Enclosure	Login
/redfish/v1/Chassis/Enclosure/Thermal	Login
/redfish/v1/Chassis/Enclosure/Power	Login
/redfish/v1/Chassis/IOModule[A/B]FRU	Login
/redfish/v1/Chassis/PowerSupply[A/B]FRU	Login

Table 12: System Targets

Target	Required Privilege
/redfish/v1/Systems	Login
/redfish/v1/Systems/Self	Login
/redfish/v1/Systems/Self/Storage	Login
/redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>	Login
/redfish/v1/Systems/Self/EthernetInterfaces	ConfigureComponents
/redfish/v1/Systems/Self/EthernetInterfaces/IOModule[AB]	ConfigureComponents

Table 13: Account Service Targets

Target	Required Privilege
/redfish/v1/AccountService	ConfigureUsers ConfigureSelf
/redfish/v1/AccountService/Accounts	ConfigureUsers ConfigureSelf
/redfish/v1/AccountService/Accounts/<Id>	ConfigureUsers ConfigureSelf
/redfish/v1/AccountService/Roles	ConfigureUsers
/redfish/v1/AccountService/Roles/Administrator	ConfigureUsers

Target	Required Privilege
/redfish/v1/AccountService/Roles/Operator	ConfigureUsers
/redfish/v1/AccountService/Roles/ReadOnly	ConfigureUsers

Table 14: Update Service Targets

Target	Required Privilege
/redfish/v1/UpdateService	ConfigureComponents
/redfish/v1/UpdateService/FirmwareInventory	ConfigureComponents

3.1 /redfish/v1

The following is an example of a GET response from the /redfish/v1 target:

```
{
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot.ServiceRoot",
  "@odata.id": "/redfish/v1/",
  "@odata.type": "#ServiceRoot.v1_2_0.ServiceRoot",
  "Id": "RootService",
  "Name": "Root Service",
  "RedfishVersion": "1.2.0",
  "UUID": ".....",
  "Chassis": {"@odata.id": "/redfish/v1/Chassis"},
  "Systems": {"@odata.id": "/redfish/v1/Systems"},
  "AccountService": {"@odata.id": "/redfish/v1/AccountService"},
  "UpdateService": {"@odata.id": "/redfish/v1/UpdateService"},
  "Links": {},
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.2 /redfish/v1/\$metadata

The following is an example of a GET response from the /redfish/v1/\$metadata target:

```
<?xml version="1.0" encoding="UTF-8"?>
<edmx:Edmx xmlns:edmx="http://docs.oasis-open.org/odata/ns/edmx" Version="4.0">
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ServiceRoot_v1.xml">
    <edmx:Include Namespace="ServiceRoot"/>
    <edmx:Include Namespace="ServiceRoot.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/AccountService_v1.xml">
    <edmx:Include Namespace="AccountService"/>
    <edmx:Include Namespace="AccountService.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Chassis_v1.xml">
    <edmx:Include Namespace="Chassis"/>
    <edmx:Include Namespace="Chassis.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ChassisCollection_v1.xml">
```

```

    <edmx:Include Namespace="ChassisCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ComputerSystem_v1.xml">
    <edmx:Include Namespace="ComputerSystem"/>
    <edmx:Include Namespace="ComputerSystem.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ComputerSystemCollection_v1.xml">

    <edmx:Include Namespace="ComputerSystemCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/EthernetInterface_v1.xml">
    <edmx:Include Namespace="EthernetInterface"/>
    <edmx:Include Namespace="EthernetInterface.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference
Uri="http://redfish.dmtf.org/schemas/v1/EthernetInterfaceCollection_v1.xml">
    <edmx:Include Namespace="EthernetInterfaceCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Manager_v1.xml">
    <edmx:Include Namespace="Manager"/>
    <edmx:Include Namespace="Manager.v1_0_3"/>
    <edmx:Include Namespace="Manager.v1_1_1"/>
    <edmx:Include Namespace="Manager.v1_2_1"/>
    <edmx:Include Namespace="Manager.v1_3_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ManagerAccount_v1.xml">
    <edmx:Include Namespace="ManagerAccount"/>
    <edmx:Include Namespace="ManagerAccount.v1_0_3"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ManagerNetworkProtocol_v1.xml">

    <edmx:Include Namespace="ManagerNetworkProtocol"/>
    <edmx:Include Namespace="ManagerNetworkProtocol.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ManagerAccountCollection_v1.xml">

    <edmx:Include Namespace="ManagerAccountCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ManagerCollection_v1.xml">
    <edmx:Include Namespace="ManagerCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Power_v1.xml">
    <edmx:Include Namespace="Power"/>
    <edmx:Include Namespace="Power.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Processor_v1.xml">
    <edmx:Include Namespace="Processor"/>
    <edmx:Include Namespace="Processor.v1_0_3"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/ProcessorCollection_v1.xml">
    <edmx:Include Namespace="ProcessorCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Role_v1.xml">
    <edmx:Include Namespace="Role"/>
    <edmx:Include Namespace="Role.v1_1_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/RoleCollection_v1.xml">

```

```

    <edmx:Include Namespace="RoleCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Session_v1.xml">
    <edmx:Include Namespace="Session"/>
    <edmx:Include Namespace="Session.v1_1_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Thermal_v1.xml">
    <edmx:Include Namespace="Thermal"/>
    <edmx:Include Namespace="Thermal.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="redfish/v1http://redfish.dmtf.org/schemasExtensions_v1.xml">
    <edmx:Include Namespace="RedfishExtensions.v1_0_0" Alias="Redfish"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/IPAddresses_v1.xml">
    <edmx:Include Namespace="IPAddresses"/>
    <edmx:Include Namespace="IPAddresses.v1_0_4"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/MemoryCollection_v1.xml">
    <edmx:Include Namespace="MemoryCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/MemoryMetrics_v1.xml">
    <edmx:Include Namespace="MemoryMetrics"/>
    <edmx:Include Namespace="MemoryMetrics.v1_0_1"/>
    <edmx:Include Namespace="MemoryMetrics.v1_1_1"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Memory_v1.xml">
    <edmx:Include Namespace="Memory"/>
    <edmx:Include Namespace="Memory.v1_0_1"/>
    <edmx:Include Namespace="Memory.v1_1_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/PhysicalContext_v1.xml">
    <edmx:Include Namespace="PhysicalContext"/>
    <edmx:Include Namespace="PhysicalContext.v1_0_3"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Privileges_v1.xml">
    <edmx:Include Namespace="Privileges"/>
    <edmx:Include Namespace="Privileges.v1_0_3"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Redundancy_v1.xml">
    <edmx:Include Namespace="Redundancy"/>
    <edmx:Include Namespace="Redundancy.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Resource_v1.xml">
    <edmx:Include Namespace="Resource"/>
    <edmx:Include Namespace="Resource.v1_0_3"/>
    <edmx:Include Namespace="Resource.v1_1_2"/>
    <edmx:Include Namespace="Resource.v1_2_1"/>
    <edmx:Include Namespace="Resource.v1_3_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/StorageCollection_v1.xml">
    <edmx:Include Namespace="StorageCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Storage_v1.xml">
    <edmx:Include Namespace="Storage"/>
    <edmx:Include Namespace="Storage.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/Drive_v1.xml">

```

```

    <edmx:Include Namespace="Drive"/>
    <edmx:Include Namespace="Drive.v1_2_0"/>
  </edmx:Reference>
  <edmx:Reference
Uri="http://redfish.dmtf.org/schemas/v1/SoftwareInventoryCollection_v1.xml">
    <edmx:Include Namespace="SoftwareInventoryCollection"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/SoftwareInventory_v1.xml">
    <edmx:Include Namespace="SoftwareInventory"/>
    <edmx:Include Namespace="SoftwareInventory.v1_1_1"/>
  </edmx:Reference>
  <edmx:Reference Uri="http://redfish.dmtf.org/schemas/v1/UpdateService_v1.xml">
    <edmx:Include Namespace="UpdateService"/>
    <edmx:Include Namespace="UpdateService.v1_2_0"/>
  </edmx:Reference>
  <edmx:DataServices>
  <Schema xmlns="http://docs.oasis-open.org/odata/ns/edm" Namespace="Service">
    <EntityContainer Name="Service" Extends="ServiceRoot.v1_0_0.ServiceContainer"/>
  </Schema>
  </edmx:DataServices>
</edmx:Edmx>

```

3.3 /redfish/v1/odata

The following is an example of a GET response from the /redfish/v1/odata target:

```

{
  "@odata.context": "/redfish/v1/$metadata",
  "@odata.id": "/redfish/v1/odata",
  "value": [
    {
      "url": "/redfish/v1/$metadata",
      "name": "$metadata",
      "kind": "Singleton"
    },
    {
      "url": "/redfish/v1/odata",
      "name": "odata",
      "kind": "Singleton"
    },
    {
      "url": "/redfish/v1",
      "name": "ServiceRoot",
      "kind": "Singleton"
    },
    {
      "url": "/redfish/v1/Chassis",
      "name": "Chassis",
      "kind": "Singleton"
    },
    {
      "url": "/redfish/v1/Systems",
      "name": "Systems",

```

```

        "kind": "Singleton"
    },
    {
        "url": "/redfish/v1/AccountService",
        "name": "AccountService",
        "kind": "Singleton"
    },
    {
        "url": "/redfish/v1/UpdateService",
        "name": "UpdateService",
        "kind": "Singleton"
    }
]
}

```

3.4 /redfish/v1/Chassis

The following is an example of a GET response from the /redfish/v1/Chassis target:

```

{
  "@odata.context": "/redfish/v1/$metadata#ChassisCollection.ChassisCollection",
  "@odata.id": "/redfish/v1/Chassis",
  "@odata.type": "#ChassisCollection.ChassisCollection",
  "Name": "Chassis Collection",
  "Members@odata.count": 5,
  "Members": [
    {"@odata.id": "/redfish/v1/Chassis/Enclosure"},
    {"@odata.id": "/redfish/v1/Chassis/IOModuleAFRU"},
    {"@odata.id": "/redfish/v1/Chassis/IOModuleBFRU"},
    {"@odata.id": "/redfish/v1/Chassis/PowerSupplyAFRU"},
    {"@odata.id": "/redfish/v1/Chassis/PowerSupplyBFRU"}
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.5 /redfish/v1/Chassis/Enclosure

3.5 Example Response

The following is an example of a GET response from the /redfish/v1/Chassis/Enclosure target:

```

{
  "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
  "@odata.id": "/redfish/v1/Chassis/Enclosure",
  "@odata.type": "#Chassis.v1_2_0.Chassis",
  "Name": "Chassis",
  "Id": "Enclosure",
  "ChassisType": "RackMount",
  "Manufacturer": "WDC",
  "Model": "4U102",
  "SerialNumber": "USCSJ03717EA0008",
}

```

```

"PartNumber": "1ES0249",
"IndicatorLED": "Blinking",
"Status": {
  "State": "Enabled",
  "Health": "OK",
  "HealthRollup": "OK"
},
"Actions": {
  "#Chassis.Reset": {
    "title": "Action for resetting the enclosure.",
    "target": "/redfish/v1/Chassis/Enclosure/Actions/Chassis.Reset"
  },
  "Oem": {"WDC": {
    "#Chassis.Locate": {
      "title": "Turn on/off the enclosure's ident LED.",
      "target": "/redfish/v1/Chassis/Enclosure/Actions/Chassis.Locate",
      "LocateState@Redfish.AllowableValues": [
        "On",
        "Off"
      ]
    },
    "#Chassis.PowerMode": {
      "title": "Set the Power Mode of the Enclosure.",
      "target": "/redfish/v1/Chassis/Enclosure/Actions/Chassis.PowerMode",
      "PowerMode@Redfish.AllowableValues": [
        "Normal",
        "Low"
      ]
    }
  }}
},
"Thermal": {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal"},
"Power": {"@odata.id": "/redfish/v1/Chassis/Enclosure/Power"},
"Links": {
  "Contains@odata.count": 4,
  "Contains": [
    {"@odata.id": "/redfish/v1/Chassis/IOModuleAFRU"},
    {"@odata.id": "/redfish/v1/Chassis/IOModuleBFRU"},
    {"@odata.id": "/redfish/v1/Chassis/PowerSupplyAFRU"},
    {"@odata.id": "/redfish/v1/Chassis/PowerSupplyBFRU"}
  ],
  "Storage@odata.count": 1,
  "Storage": [{"@odata.id": "/redfish/v1/Systems/Self/Storage/5000CCAB04000980"}]
},
"Oem": {"WDC": {
  "PowerMode": "Normal",
  "Copyright": "Copyright 2017 Western Digital Corporation"
}}
}

```

3.6 /redfish/v1/Chassis/Enclosure/Thermal

3.6 Example Response

The following is an example of a GET response from the /redfish/v1/Chassis/Enclosure/Thermal target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Thermal.Thermal",
  "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal",
  "@odata.type": "#Thermal.v1_2_0.Thermal",
  "Name": "Thermal",
  "Id": "Thermal",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Temperatures": [
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Temperatures/1",
      "MemberId": "1",
      "Name": "TEMP SLOT 000",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "ReadingCelsius": 24,
      "UpperThresholdNonCritical": 56,
      "UpperThresholdCritical": 59,
      "LowerThresholdNonCritical": 8,
      "LowerThresholdCritical": 6
    },
    .....
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Temperatures/128",
      "MemberId": "128",
      "Name": "TEMP PSU B PRI",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "ReadingCelsius": 46,
      "UpperThresholdNonCritical": 100,
      "UpperThresholdCritical": 109,
      "LowerThresholdNonCritical": 5,
      "LowerThresholdCritical": 1
    }
  ],
  "Fans": [
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/1",
      "MemberId": "1",
      "FanName": "FAN ENCL 1",
      "Status": {
        "State": "Enabled",
```

```

        "Health": "OK",
        "HealthRollup": "OK"
    },
    "Reading": 100,
    "ReadingUnits": "Percent"
},
.....
{
    "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/8",
    "MemberId": "8",
    "FanName": "FAN PSU B",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "Reading": 100,
    "ReadingUnits": "Percent"
}
],
"Redundancy": [
    {.....
        "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Redundancy/ExternalFans",

        "MemberId": "ExternalFans",
        "Name": "External Fans Redundancy",
        "Mode": "N+m",
        "MaxNumSupported": 4,
        "MinNumNeeded": 3,
        "Status": {
            "State": "Enabled",
            "Health": "OK",
            "HealthRollup": "OK"
        },
        "RedundancySet": [
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/1"},
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/2"},
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/3"},
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/4"}
        ]
    },
    {
        "@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Redundancy/InternalFans",

        "MemberId": "InternalFans",
        "Name": "Internal Fans Redundancy",
        "Mode": "N+m",
        "MaxNumSupported": 2,
        "MinNumNeeded": 1,
        "Status": {
            "State": "Enabled",
            "Health": "OK",
            "HealthRollup": "OK"
        },
        "RedundancySet": [
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/5"},
            {"@odata.id": "/redfish/v1/Chassis/Enclosure/Thermal#/Fans/6"}
        ]
    }
]

```



```

    ]
  }
],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.7 /redfish/v1/Chassis/Enclosure/Power

The following is an example of a GET response from the /redfish/v1/Chassis/Enclosure/Power target:

```

{
  "@odata.context": "/redfish/v1/$metadata#Power.Power",
  "@odata.id": "/redfish/v1/Chassis/Enclosure/Power",
  "@odata.type": "#Power.v1_2_0.Power",
  "Name": "Power",
  "Id": "Power",
  "PowerSupplies": [
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/PowerSupplies/A",
      "Name": "PSU A",
      "MemberId": "A",
      "Manufacturer": "DELTA",
      "Model": "DPS-1600AB-12",
      "PowerCapacityWatts": 1600,
      "FirmwareVersion": "0.01",
      "SerialNumber": "-----",
      "PartNumber": "DPS-1600AB-12",
      "IndicatorLED": "Off",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "RelatedItem": [{"@odata.id": "/redfish/v1/Chassis/PowerSupplyAFRU"}]
    },
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/PowerSupplies/B",
      "Name": "PSU B",
      "MemberId": "B",
      "Manufacturer": "DELTA",
      "Model": "DPS-1600AB-12",
      "PowerCapacityWatts": 1600,
      "FirmwareVersion": "0.01",
      "SerialNumber": "-----",
      "PartNumber": "DPS-1600AB-12",
      "IndicatorLED": "Off",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "RelatedItem": [{"@odata.id": "/redfish/v1/Chassis/PowerSupplyBFRU"}]
    }
  ],
}

```

```

"Voltages": [
  {
    "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/Voltages/1",
    "MemberId": "1",
    "Name": "VOLT PSU A AC",
    "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
    },
    "ReadingVolts": 206.75,
    "UpperThresholdNonCritical": 249.7,
    "UpperThresholdCritical": 256.3,
    "LowerThresholdNonCritical": 190.3,
    "LowerThresholdCritical": 183.7
  },
  .....

  {
    "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/Voltages/8",
    "MemberId": "8",
    "Name": "VOLT IOM B 12V",
    "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
    },
    "ReadingVolts": 11.75,
    "UpperThresholdNonCritical": 12.6,
    "UpperThresholdCritical": 13.2,
    "LowerThresholdNonCritical": 11.1,
    "LowerThresholdCritical": 10.8
  }
],
"Redundancy": [{
  "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/Redundancy/PowerSupplies",
  "MemberId": "PowerSupplies",
  "Name": "Power Supplies Redundancy",
  "Mode": "N+m",
  "MaxNumSupported": 2,
  "MinNumNeeded": 1,
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  }
}],
"RedundancySet": [
  {"@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/PowerSupplies/A"},
  {"@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/PowerSupplies/B"}
]
},
"Oem": {"WDC": {
  "Currents": [
    {
      "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/Currents/1",

```

```

        "MemberId": "1",
        "Name": "CURR PSU A IN",
        "Status": {
            "State": "Enabled",
            "Health": "OK",
            "HealthRollup": "OK"
        },
        "ReadingAmps": 2.71,
        "UpperThresholdNonCritical": 9.6,
        "UpperThresholdCritical": 9.64,
        "LowerThresholdNonCritical": 0,
        "LowerThresholdCritical": 0
    },
    .....
    {
        "@odata.id": "/redfish/v1/Chassis/Enclosure/Power#/Currents/8",
        "MemberId": "8",
        "Name": "CURR IOM B 5V",
        "Status": {
            "State": "Enabled",
            "Health": "OK",
            "HealthRollup": "OK"
        },
        "ReadingAmps": 22.25,
        "UpperThresholdNonCritical": 84.75,
        "UpperThresholdCritical": 90,
        "LowerThresholdNonCritical": 0,
        "LowerThresholdCritical": 0
    }
    ],
    "Copyright": "Copyright 2017 Western Digital Corporation"
}}
}

```

3.8 /redfish/v1/Chassis/IOModule[A/B]FRU

The following is an example of a GET response from the /redfish/v1/Chassis/IOModule[A/B]FRU target:

```

{
    "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
    "@odata.id": "/redfish/v1/Chassis/IOModuleAFRU",
    "@odata.type": "#Chassis.v1_2_0.Chassis",
    "Name": "Chassis",
    "Id": "IOModuleAFRU",
    "ChassisType": "Module",
    "Manufacturer": "WDC",
    "Model": "IOM PART NUM",
    "SerialNumber": "IOM SERIAL NUM",
    "PartNumber": "IOM PART NUM",
    "IndicatorLED": "Off",
    "Status": {
        "State": "Enabled",

```

```

    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Actions": {
    "#Chassis.Reset": {
      "title": "Action for resetting the IOM.",
      "target": "/redfish/v1/Chassis/IOModuleAFRU/Actions/Chassis.Reset"
    },
    "Oem": {"WDC": {"#Chassis.Locate": {
      "title": "Turn on/off the IOM's ident LED.",
      "target": "/redfish/v1/Chassis/IOModuleAFRU/Actions/Chassis.Locate",
      "LocateState@Redfish.AllowableValues": [
        "On",
        "Off"
      ]
    }}}
  },
  "Links": {
    "ContainedBy@odata.count": 1,
    "ContainedBy": {"@odata.id": "/redfish/v1/Chassis/Enclosure"}
  },
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.9 /redfish/v1/Chassis/PowerSupply[A/B]FRU

The following is an example of a GET response from the /redfish/v1/Chassis/PowerSupply[A/B]FRU target.:

```

{
  "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
  "@odata.id": "/redfish/v1/Chassis/PowerSupplyAFRU",
  "@odata.type": "#Chassis.v1_2_0.Chassis",
  "Name": "PSU A",
  "Id": "PowerSupplyAFRU",
  "ChassisType": "Module",
  "Manufacturer": "DELTA",
  "Model": "DPS-1600AB-12",
  "SerialNumber": "-----",
  "PartNumber": "DPS-1600AB-12",
  "IndicatorLED": "Off",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Actions": {"Oem": {"WDC": {"#Chassis.Locate": {
    "title": "Turn on/off the PSU's ident LED.",
    "target": "/redfish/v1/Chassis/PowerSupplyAFRU/Actions/Chassis.Locate",
    "LocateState@Redfish.AllowableValues": [
      "On",
      "Off"
    ]
  }}}},
  "Links": {

```

```

    "ContainedBy@odata.count": 1,
    "ContainedBy": {"@odata.id": "/redfish/v1/Chassis/Enclosure"}
  },
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.10 /redfish/v1/Systems

The following is an example of a GET response from the /redfish/v1/Systems target:

```

{
  "@odata.context":
"/redfish/v1/$metadata#ComputerSystemCollection.ComputerSystemCollection",
  "@odata.id": "/redfish/v1/Systems",
  "@odata.type": "#ComputerSystemCollection.ComputerSystemCollection",
  "Name": "Systems",
  "Members@odata.count": 1,
  "Members": [{"@odata.id": "/redfish/v1/Systems/Self"}],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.11 /redfish/v1/Systems/Self

3.11 Example Response

The following is an example of a GET response from the /redfish/v1/Systems/Self target:

```

{
  "@odata.context": "/redfish/v1/$metadata#ComputerSystem.ComputerSystem",
  "@odata.id": "/redfish/v1/Systems/Self",
  "@odata.type": "#ComputerSystem.v1_2_0.ComputerSystem",
  "Name": "Computer System",
  "Id": "Self",
  "SystemType": "Physical",
  "Actions": {"#ComputerSystem.Reset": {
    "title": "Action for resetting the enclosure.",
    "target": "/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset"
  }},
  "Storage": {"@odata.id": "/redfish/v1/Systems/Self/Storage"},
  "EthernetInterfaces": {"@odata.id": "/redfish/v1/Systems/Self/EthernetInterfaces"},

  "Oem": {"WDC": {
    "SASHostPorts": [
      {
        "@odata.id": "/redfish/v1/Systems/Self#/SASHostPorts/HostPort_1",
        "Name": "CONN HOST 00",
        "Id": "1",
        "IsCableConnected": true
      },
      .....
    ]
  }}
}

```

```

"@odata.id": "/redfish/v1/Systems/Self#/SASHostPorts/HostPort_12",
>Name": "CONN HOST 11",
>Id": "12",
>IsCableConnected": false
}
],
>SASExpanders": [
>{
>@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/PrimaryA",
>Name": "EXP IOMA 0",
>Id": "PrimaryA",
>FirmwareVersion": "0016-023",
>Status": {
>State": "Enabled",
>Health": "OK",
>HealthRollup": "OK"
},
>Identifiers": {
>DurableName": "5000CCAB040009BD",
>DurableNameFormat": "NAA"
},
>Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_PrimarySXP"}]}
},
>{
>@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/Sec1A",
>Name": "EXP IOMA 1",
>Id": "Sec1A",
>FirmwareVersion": "0016-023",
>Status": {
>State": "Enabled",
>Health": "OK",
>HealthRollup": "OK"
},
>Identifiers": {
>DurableName": "5000CCAB040009BF",
>DurableNameFormat": "NAA"
},
>Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_Sec1SXP"}]}
},
>{
>@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/Sec2A",
>Name": "EXP IOMA 2",
>Id": "Sec2A",
>FirmwareVersion": "0016-023",
>Status": {
>State": "Enabled",
>Health": "OK",
>HealthRollup": "OK"
},
>Identifiers": {
>DurableName": "5000CCAB040009FF",
>DurableNameFormat": "NAA"
},
>Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_Sec2SXP"}]}
}

```

```

    },
    {
      "@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/PrimaryB",
      "Name": "EXP IOMB 0",
      "Id": "PrimaryB",
      "FirmwareVersion": "0016-023",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "Identifiers": {
        "DurableName": "5000CCAB040009FD",
        "DurableNameFormat": "NAA"
      },
      "Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_PrimarySXP"}]}
    },
    {
      "@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/Sec1B",
      "Name": "EXP IOMB 1",
      "Id": "Sec1B",
      "FirmwareVersion": "0016-023",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "Identifiers": {
        "DurableName": "5000CCAB040009F9",
        "DurableNameFormat": "NAA"
      },
      "Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_Sec1SXP"}]}
    },
    {
      "@odata.id": "/redfish/v1/Systems/Self#/SASExpanders/Sec2B",
      "Name": "EXP IOMB 2",
      "Id": "Sec2B",
      "FirmwareVersion": "0016-023",
      "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
      },
      "Identifiers": {
        "DurableName": "5000CCAB040009FB",
        "DurableNameFormat": "NAA"
      },
      "Links": {"RelatedTo": [{"@odata.id":
"/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_Sec2SXP"}]}
    }
  ],
  "Copyright": "Copyright 2017 Western Digital Corporation"
}
}
}

```

3.12 /redfish/v1/Systems/Self/Storage

The following is an example of a GET response from the /redfish/v1/Systems/Self/Storage target:

```
{
  "@odata.context": "/redfish/v1/$metadata#StorageCollection.StorageCollection",
  "@odata.id": "/redfish/v1/Systems/Self/Storage",
  "@odata.type": "#StorageCollection.StorageCollection",
  "Name": "Storage Collection",
  "Members@odata.count": 1,
  "Members": [{"@odata.id": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical
ID>"}],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.13 /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>

The following is an example of a GET response from the /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID> target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Storage.Storage",
  "@odata.id": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>",
  "@odata.type": "#Storage.v1_2_0.Storage",
  "Name": "Mt Madonna 4U102",
  "Id": "<Enclosure Logical ID>",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Links": {
    "Enclosures@odata.count": 1,
    "Enclosures": [{"@odata.id": "/redfish/v1/Chassis/Enclosure"}]
  },
  "Drives": [
    {"@odata.id": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/1"},
    .....
    {"@odata.id": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical
ID>/Drives/102"}
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```


3.14 /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/<Drive ID>

The following is an example of a GET response from the /redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/<Drive ID> target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Drive.Drive",
  "@odata.id": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical ID>/Drives/1",
  "@odata.type": "#Drive.v1_2_0.Drive",
  "Name": "SLOT 000",
  "Id": "1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Actions": {"Oem": {"WDC": {
    "#Drive.Power": {
      "title": "Power on/off the drive.",
      "target": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical
ID>/Drives/1/Actions/Drive.Power",
      "PowerState@Redfish.AllowableValues": [
        "On",
        "Off"
      ]
    },
    "#Drive.Locate": {
      "title": "Turn on/off the drive's ident LED.",
      "target": "/redfish/v1/Systems/Self/Storage/<Enclosure Logical
ID>/Drives/1/Actions/Drive.Locate",
      "LocateState@Redfish.AllowableValues": [
        "On",
        "Off"
      ]
    }
  }}},
  "IndicatorLED": "Off",
  "Model": "HUH721010ALE604",
  "Revision": "LHGNW21D",
  "CapacityBytes": 10000831348736,
  "BlockSizeBytes": 512,
  "RotationSpeedRPM": 7200,
  "CapableSpeedGbs": 12,
  "NegotiatedSpeedGbs": 6,
  "FailurePredicted": false,
  "Protocol": "SATA",
  "MediaType": "HDD",
  "Manufacturer": "HGST",
  "SerialNumber": "7PG2JRPR",
  "PartNumber": "HUH721010ALE604",
  "Identifiers": [{
    "DurableName": "Base SAS Address",
    "DurableNameFormat": "NAA"
  }],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
```

```
}

```

3.15 /redfish/v1/Systems/Self/EthernetInterfaces/IOModule[A/B]

3.15 Example Response

The following is an example of a GET response from the /redfish/v1/Systems/Self/EthernetInterfaces/IOModule[A/B] target:

```
{
  "@odata.context": "/redfish/v1/$metadata#EthernetInterface.EthernetInterface",
  "@odata.id": "/redfish/v1/Systems/Self/EthernetInterfaces/IOModuleA",
  "@odata.type": "#EthernetInterface.v1_2_0.EthernetInterface",
  "Name": "IOM A Ethernet Interface",
  "Id": "IOModuleA",
  "LinkStatus": "LinkUp",
  "PermanentMACAddress": "00:0C:CA:04:00:16",
  "SpeedMbps": 1000,
  "HostName": "morgan-a",
  "FQDN": "morgan-a.hgst.com",
  "IPv4Addresses": [{
    "Address": "IP Address",
    "SubnetMask": "255.255.252.0",
    "AddressOrigin": "DHCP",
    "Gateway": "10.202.236.1"
  }],
  "NameServers": [
    "10.86.1.1",
    "10.86.2.1",
    "10.80.99.21"
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.16 /redfish/v1/AccountService

The following is an example of a GET response from the /redfish/v1/AccountService target:

```
{
  "@odata.context": "/redfish/v1/$metadata#AccountService.AccountService",
  "@odata.id": "/redfish/v1/AccountService",
  "@odata.type": "#AccountService.v1_2_0.AccountService",
  "Id": "AccountService",
  "Name": "Account Service",
  "Description": "Out-of-Band Management User Accounts",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "ServiceEnabled": true,
}
```

```

"MinPasswordLength": 8,
"MaxPasswordLength": 128,
"Accounts": {"@odata.id": "/redfish/v1/AccountService/Accounts"},
"Roles": {"@odata.id": "/redfish/v1/AccountService/Roles"},
"Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.17 /redfish/v1/AccountService/Accounts

The following is an example of a GET response from the /redfish/v1/AccountService/Accounts target:

```

{
  "@odata.context":
"/redfish/v1/$metadata#ManagerAccountCollection.ManagerAccountCollection",
  "@odata.id": "/redfish/v1/AccountService/Accounts",
  "@odata.type": "#ManagerAccountCollection.ManagerAccountCollection",
  "Name": "Accounts Collection",
  "Description": "Out-of-Band Management User Accounts",
  "Members@odata.count": 3,
  "Members": [
    {"@odata.id": "/redfish/v1/AccountService/Accounts/1"},
    {"@odata.id": "/redfish/v1/AccountService/Accounts/2"},
    {"@odata.id": "/redfish/v1/AccountService/Accounts/3"}
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.18 /redfish/v1/AccountService/Accounts/[ID]

3.18 Example Response

The following is an example of a GET response from the /redfish/v1/AccountService/Accounts/[ID] target:

```

{
  "@odata.context": "/redfish/v1/$metadata#ManagerAccount.ManagerAccount",
  "@odata.id": "/redfish/v1/AccountService/Accounts/1",
  "@odata.type": "#ManagerAccount.v1_1_0.ManagerAccount",
  "Name": "User Account",
  "Id": "1",
  "Description": "User Account",
  "UserName": "admin",
  "Password": "null",
  "Enabled": true,
  "Locked": false,
  "RoleId": "Administrator",
  "Links": {"Role": {"@odata.id": "/redfish/v1/AccountService/Roles/Administrator"}},
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}

```

3.19 /redfish/v1/AccountService/Roles

3.19 Example Response

The following is an example of a GET response from the /redfish/v1/AccountService/Roles target:

```
{
  "@odata.context": "/redfish/v1/$metadata#RoleCollection.RoleCollection",
  "@odata.type": "#RoleCollection.RoleCollection",
  "@odata.id": "/redfish/v1/AccountService/Roles",
  "Name": "Role Collection",
  "Description": "OOBM User Roles",
  "Members@odata.count": 3,
  "Members": [
    {"@odata.id": "/redfish/v1/AccountService/Roles/Administrator"},
    {"@odata.id": "/redfish/v1/AccountService/Roles/Operator"},
    {"@odata.id": "/redfish/v1/AccountService/Roles/ReadOnly"}
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.20 /redfish/v1/AccountService/Roles/Administrator

3.20 Example Response

The following is an example of a GET response from the /redfish/v1/AccountService/Roles/Administrator target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Role.Role",
  "@odata.id": "/redfish/v1/AccountService/Roles/Administrator",
  "@odata.type": "#Role.v1_1_0.Role",
  "Name": "User Role",
  "Id": "Administrator",
  "Description": "Administrator User Role",
  "IsPredefined": true,
  "AssignedPrivileges": [
    "Login",
    "ConfigureManager",
    "ConfigureUsers",
    "ConfigureComponents",
    "ConfigureSelf"
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.21 /redfish/v1/AccountService/Roles/Operator

3.21 Example Response

The following is an example of a GET response from the /redfish/v1/AccountService/Roles/Operator target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Role.Role",
  "@odata.id": "/redfish/v1/AccountService/Roles/Operator",
  "@odata.type": "#Role.v1_1_0.Role",
  "Name": "User Role",
  "Id": "Operator",
  "Description": "Operator User Role",
  "IsPredefined": true,
  "AssignedPrivileges": [
    "Login",
    "ConfigureComponents",
    "ConfigureSelf"
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.22 /redfish/v1/AccountService/Roles/ReadOnly

3.22 Example Response

The following is an example of a GET response from the /redfish/v1/AccountService/Roles/ReadOnly target:

```
{
  "@odata.context": "/redfish/v1/$metadata#Role.Role",
  "@odata.id": "/redfish/v1/AccountService/Roles/ReadOnly",
  "@odata.type": "#Role.v1_1_0.Role",
  "Name": "User Role",
  "Id": "ReadOnly",
  "Description": "ReadOnly User Role",
  "IsPredefined": true,
  "AssignedPrivileges": [
    "Login",
    "ConfigureSelf"
  ],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```

3.23 /redfish/v1/UpdateService

The following is an example of a GET response from the /redfish/v1/UpdateService target:

```
{
  "@odata.context": "/redfish/v1/$metadata#UpdateService.UpdateService",
  "@odata.id": "/redfish/v1/UpdateService",
  "@odata.type": "#UpdateService.v1_2_0.UpdateService",
}
```

```

    "Id": "UpdateService",
    "Name": "Update Service",
    "Description": "View firmware Inventory and update enclosure firmware.",
    "ServiceEnabled": true,
    "Actions": {
      "#UpdateService.SimpleUpdate": {
        "title": "Update Enclosure Firmware",
        "target": "/redfish/v1/UpdateService/Actions/UpdateService.SimpleUpdate",
        "TransferProtocol@Redfish.AllowableValues": [
          "HTTP",
          "TFTP"
        ],
        "ImageURI": {
          "type": "string",
          "description": "This parameter shall contain a URI referencing a software image to be retrieved by the UpdateService for the purpose of installing software contained within the image."
        }
      },
      "Oem": {"WDC": {
        "#UpdateService.FWActivate": {
          "title": "Activate the downloaded firmware.",
          "target": "/redfish/v1/UpdateService/Actions/UpdateService.FWActivate"
        },
        "#UpdateService.CertificateUpdate": {
          "title": "Replace the TLS Certificate.",
          "target":
"/redfish/v1/UpdateService/Actions/UpdateService.CertificateUpdate"
        },
        "#UpdateService.KeyUpdate": {
          "title": "Replace the TLS encryption key.",
          "target": "/redfish/v1/UpdateService/Actions/UpdateService.KeyUpdate"
        }
      }}
    },
    "FirmwareInventory": {"@odata.id": "/redfish/v1/UpdateService/FirmwareInventory"},
    "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
  }

```

3.24 /redfish/v1/UpdateService/FirmwareInventory

3.24 Example Response

The following is an example of a GET response from the /redfish/v1/UpdateService/FirmwareInventory target:

```

{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory",
  "@odata.context":
"/redfish/v1/$metadata#SoftwareInventoryCollection.SoftwareInventoryCollection",
  "@odata.type": "#SoftwareInventoryCollection.SoftwareInventoryCollection",
  "Members@odata.count": 8,
  "Name": "Firmware Inventory Collection",
  "Members": [

```

```
{
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_OOBM"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_PrimarySXP"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_Sec1SXP"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleA_Sec2SXP"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_OOBM"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_PrimarySXP"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_Sec1SXP"},
  "@odata.id": "/redfish/v1/UpdateService/FirmwareInventory/IOModuleB_Sec2SXP"}
],
  "Oem": {"WDC": {"Copyright": "Copyright 2017 Western Digital Corporation"}}
}
```