Overview

HPE Data Services

Every organization wants to unleash the power of their data to drive digital transformation. But fragmented data management tools, manual processes, and infrastructure silos spanning edge to cloud are impeding data-driven innovation and agility and creating business risk.

HPE Data Services – delivered through the Data Services Cloud Console – break down the barriers and remove the complexity that beset data and infrastructure management today—empowering organizations to transform faster with unified data operations as a service. It's a suite of software-as-a-service (SaaS) designed to bring the cloud experience to wherever data lives, unify data management across the data lifecycle, and accelerate innovation for data-driven apps and insights.

At A Glance

HPE Data Services are consumed through the Data Services Cloud Console, a cloud-native destination that abstracts and orchestrates infrastructure and data workflows from edge-to-cloud. Data Services Cloud Console transforms complex data operations into a simplified and integrated experience across clouds through a comprehensive set of cloud platform services, cloud infrastructure services, and cloud data services.

Key Features and Benefits

Deliver cloud operations for data infrastructure

Organizations want the cloud agility for their data infrastructure wherever it's located — be that on-premises, at the edge, or in the cloud. By separating the control plane from the underlying hardware and moving it to the cloud, Data Services Cloud Console offers a SaaS console that delivers HPE Data Services to unify management silos under a single web interface with global visibility and a consistent experience from edge to cloud. This abstraction of control enables a suite of cloud infrastructure services that radically simplifies how customers manage infrastructure at scale, and across the lifecycle.

Standard Features

Data Services Cloud Console Architecture

Data Services Cloud Console is built on a unique cloud-native architecture that abstracts and controls infrastructure and data workflows across the data lifecycle – test/dev, production, protection, to analytics – and infrastructure lifecycle – deploy, manage, upgrade, and scale – from edge-to-cloud (see Figure 1). It is designed to simplify and integrate data operations through a comprehensive set of cloud platform services, cloud infrastructure services, and cloud data services. Data Services Cloud Console is a highly extensible, API-first control plane that provides a fully programmable single API end-point in the cloud. This enables customers to automate data infrastructure management at cloud speed and scale with their orchestration tool of choice.

Northbound APIs through a unified API namespace also facilitate a portfolio of data services that can be HPE-built, or in the future, partner-delivered, or custom applications.

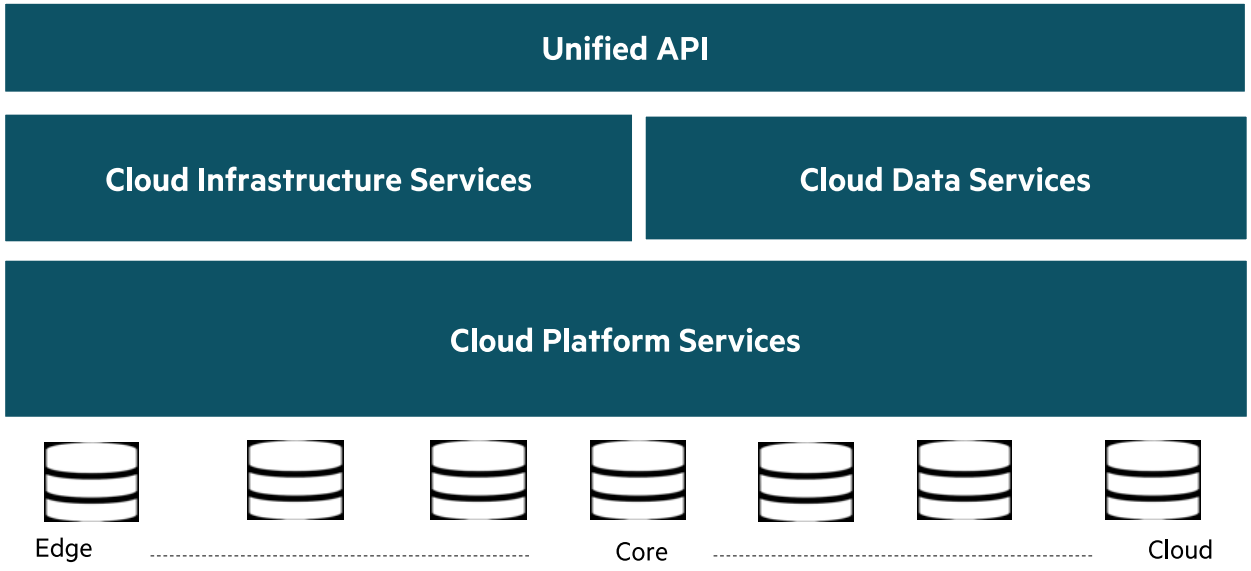

Figure 1: Data Services Cloud Console Architecture

HPE Data Services – delivered through the Data Services Cloud Console - are designed to simplify data operations by providing a single destination for a comprehensive set of data and infrastructure services.

Cloud infrastructure services automate infrastructure management at scale, bringing cloud operational agility across the lifecycle – from deployment to upgrade. Two services are initially introduced:

HPE Data Services Portfolio

HPE Data Ops Manager to simplify Infrastructure Operations with cloud agility

HPE Data Ops Manager lets customers manage their fleet from anywhere - simplifying infrastructure operations with cloud agility. It delivers global unified management, enabling customers to manage data infrastructure across edge to cloud from a single web interface. Everything organizations need to easily manage their fleet of data infrastructure across its lifecycle is available at their fingertips with an intuitive SaaS-based user experience – accessible from anywhere and from any device. Deploy apps faster by transforming provisioning from LUN-based to intent-based. Orchestrate infrastructure workflows at scale so managing hundreds of systems is as simple as managing one. Deploy, manage infrastructure on demand with simple discovery, activation, and configurations. Everything is delivered as-a-service so for our customers there is no software to deploy, manage or maintain.

Standard Features

Capabilities include:

- Dashboard of systems with capacity distribution based on Tiers, top 5 systems listing by capacity and performance at system and volume level.
- Snapshot management
- Rapid provisioning of clones
- Alerts and notifications
- Capacity and performance trends
- Availability and capacity management
- Audit logging
- Role based access controls
- Configure replication partners
- Software update notifications
- Perform software update for a storage system
- Self-upgrade of drives, enclosures and node upgrade on HPE Alletra 9000 systems
- Self-upgrade for drives on HPE Alletra 6000 systems
- Group and Pool management for HPE Alletra 6000 systems
- Automatic software update support for HPE Alletra 6000 and HPE Nimble
- One-step software updates allows installation of each update in the sequence of updates from the current software version to the target version
- Serviceability of components for HPE Alletra 6000 for Drive, USB boot drive, Fan, and Controllers
- Serviceability of components for HPE Alletra 9000 and Primera systems for physical drives
- Enhanced reporting capabilities for HPE GreenLake for Block Storage, HPE Alletra 9000 and HPE Primera 600 Storage systems:
    - Two new charts have been added to trend I/O Size and Queue Length
    - Pre-defined templates are available for top volume paths by read latency, top volume sets by read IOPS, top host ports by write throughput.
    - Customize views by resource type for volumes, volume sets, host ports and hosts with Top-6 or Select-10 with sorting by metric.
    - View and compare performance metrics across remote copy links using the custom reports
    - Reports can be downloaded as CSV or PDF
- Enhanced reporting capabilities for HPE Alletra 6000, HPE Alletra 5000 and HPE Nimble systems:
    - Three charts available to show IOPS, throughput and latency trends for Volume(s) and Pool(s).
    - Two predefined templates have been added: Top volume by read latency and write latency that can be customized by resource type for volumes with Top-6 sorting by metric or Select-10 and for Pools with Select-10.
    - Reports can be downloaded as CSV or PDF
- Extended reporting that helps analyze and troubleshoot performance issues of a storage system and its volumes:
    - Headroom utilization with analysis breakdown by Top-5 volume contribution available for HPE GreenLake for Block Storage, HPE Alletra 9000, and HPE Primera 600 storage systems.
    - Top Volume Hotspots by Latency provides anomaly detection to identify outliers available for HPE GreenLake for Block Storage
- Data-at-rest encryption support for HPE GreenLake for Block Storage, HPE Alletra 9000, and HPE Primera storage systems.
- Replication support between HPE GreenLake for Block Storage, HPE Alletra 9000 and HPE Primera 600 storage systems
- Support wildcard (*) for iSCSI Initiator

For the latest updates please refer to Data Ops Manager release notes in HPE GreenLake Platform.

Standard Features

Block Storage an easy-to-use service that abstracts managing hardware for application owners and provides on-prem cloud experience. Capabilities include:

- Lifecycle of Block Provisioning
- Intent based provisioning of application data with recommendation of headroom availability, which indicates the relative ability of a storage system to support a proposed workload without experiencing performance degradation. Furthermore, with a remote protection policy for the volumes, recommendation is based on headroom availability in the source and partner systems.
- Dashboard and inventory of volumes
- Pre-defined protection policies for both local and remote protection
- Replication and Management of restore points
- Customize columns in table view for volume inventory
- Create volumes without exporting to a host group
- Customize LUN ID while creating volumes
- View host paths information in host detail page
- Create and manage volume clones
- Virtual lock support for HPE Alletra 9000 and HPE Primera systems
- Extended reporting for volume-level insights for HPE GreenLake for Block Storage system:
    - Latency variation insights, mapped as annotations to the Latency chart
    - Workload drift insights, mapped as annotations to the Throughput chart
- Multi-factor authentication support for HPE Alletra 5000, HPE Alletra 6000 and HPE Nimble Storage systems. New protection panel that displays the level of protection applied to the volumes in the data center.

For the latest updates please refer to Block Storage release notes in HPE GreenLake Platform.

Setup Service is a cloud-based app that uses wizards to help you set up and initialize newly installed HPE Alletra storage systems. Initialization includes checks of hardware readiness, power redundancy, optimal data cabling, and health of the components. Initial set of capabilities include:

- HPE Alletra Setup wizard guides the user for initial setup of the system
- HPE Alletra Blueprint wizard guides the user to create blueprints that can be applied for one or more system.

Intent-based Provisioning

Intent-based Provisioning eliminates guesswork and spreadsheets by ensuring workloads are always deployed on the right resource. It leverages real-time context into resource headroom and application-specific SLAs to optimize where your data is stored — automatically.
Intent-based provisioning, combined with role-based access control, enables self-service provisioning without the need for storage expertise. It enables developers to deploy applications faster by shortening data infrastructure provisioning from days to minutes. This accelerates application development cycles and makes possible the effortless app-provisioning experience demanded by today's fast-paced dev/ops processes.

Cloud Platform Services Powered by a Proven Platform

Data Services Cloud Console is built on a proven cloud platform which provides:

- Proven Technology: Built on the trusted technology foundation of Aruba Central, which today has several years in the field, serving 90,000 customers and millions of end devices connected to clusters deployed around the world.
- Secure by Design: This foundation ensures the secure management of global infrastructure and data services with multi-level advanced security capabilities that include encrypted connectivity to assets through certificates and tunnels, multi-factor authentication, auditing and role-based access control policies.
- Cloud Native: Data Services Cloud Console is architected as a framework of microservices and workflows which enables the rapid development, deployment and scaling of new services with a consistent user experience. It provides the foundation for a portfolio of HPE data services that will become seamlessly available to customers to simplify how they manage infrastructure and data.

Standard Features

Cloud Platform Services consist of a group of microservices, developed to provide infrastructure for the cloud operations and data management services. These services are not standalone services, but rather enablers or components of the higher-level applications. Each of these microservices is leveraged by multiple customer-facing standalone services. The advantage of having a set of common foundational services is twofold: it provides a consistent customer experience across applications and improves efficiency in developing and bringing those applications to market.
These microservices deliver a spectrum of visibility as far as the customer is concerned. Two examples follow to illustrate. The Tunnel service is an example of an "invisible" microservice, meaning that is totally transparent to the user. The "Global Search microservice, on the other hand, illustrates an example of one directly usable (visible) to the customer.

Tunnel Microservice

It provides an essential, secure link between the customer-facing cloud service and on-premises elements/devices that the service needs to interface with (for instance, a storage array). Any service talking to an on-premises device will leverage this service. HPE Data Ops Manager will use this service to get information from the array on available capacity, events, or any other array-specific information that needs to be collected.

Any service talking to an on-premise device will leverage this service. HPE Data Ops Manager will use this service to receive information from the array on available capacity, events, or any other array-specific information that needs to be collected.

Available microservices:

- Public APIs (coming later in the year)
- UI Portal
- Tunnel Connectivity
- Tasks
- Audit
- Role based access Control (Authorization)
- Issues/Alerts
- Authentication.

Service and Support

Get the most from your HPE products with the expertise you need at every step of your IT journey. **HPE Services** help you lower your risks and overall costs using automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally.

Your HPE Data Ops Manager subscription will give you access to the following enterprise-level support:

- 24x7 telephone and email support for all entitled HPE Data services available through Data Services Cloud Console
- Direct connection to support
- Guidance and troubleshooting of any configuration and interoperability within your cloud and/or on-premises environment
- Services-term period is same term as the one for your storage device support term period.

Configuration Information

Startup and Configuration

Getting your HPE Data Services application ready to manage your array requires 3 simple steps.

1. Provisioning the Subscription Key
2. Onboarding your device after account creation (first time only)
3. Connecting your array to Data Services Cloud Console.

Step 1: Provisioning the Subscription Key

When acquiring your new HPE Alletra Storage Array, a new HPE Data Ops Manager subscription is included. You will need to activate your subscription key by using the standard HPE software subscription process.

Here are the basic steps:

- Before your storage device leaves the HPE Factory, you will receive an e-mail confirming your order, and providing a link to "HPE Software Center" to activate your subscription key
- Click on the embedded link and proceed to "My HPE SW Center"
- For existing customers, please log in with your HPE Passport credentials and follow the instructions
- New users can easily create an HPE Passport account in the same page, if they do not have one
- After successful log in, users will be presented with a summary of their order
- Proceed to activate the subscription
- You will arrive at a downloadable page containing the array serial number (SN), the Subscription key, and cloud.hpe.com/portal
- Save this information, which will be required for device onboarding in the application.

Step 2: Onboarding your device.

Proceed to setup your accounts and onboard your application and device:

- Login to cloud.hpe.com/portal to set up your user account (first time only).
- Next, you will be asked to create your Cloud Account. This represents your company account and will contain all your users, devices and applications. This will be done the first time only by the customer's cloud account administrator.
- Proceed to the Application Catalogue. Select Data Services Cloud Console and Region to provision the Instance. An instance is a compute cluster running in one of the HPE Regions. They are needed to provide adequate scalability and to be compliant with data sovereignty regulations.
- The steps above are all done only the first time.
- Now you can add your storage device (done every time you add a new device). Navigate to the device management section and select --> add device. Provide the requested information: SN and subscription key.
- The device will now appear in the Global inventory for the Account.
- The final step is to assign the device to the specific Data Services Cloud Console instance. Currently, you can have up to three (3) instances. First, navigate to Device management --.> assign device. Select the device, and complete the assignment
- You can now navigate to the main dashboard and proceed to Data Services Cloud Console.

Configuration Information

Step 3: Automatic connection of storage device to Data Services Cloud Console

After the setup is completed and you power on the device, it will establish automatically a secure bi-directional path of communication to the Data Services Cloud Console application instance. No user intervention is required.

At a high level, the process is as follows:

- The storage system connects to the cloud.hpe.com/portal end-point through an encrypted link (mTLS) with its device certificate as client certificate
- Cloud.hpe.com/portal validates the client certificate using its trust anchors. It looks up the customer and Data Services Cloud Console instance
- It returns the address of the Data Services Cloud Console Instance to use
- The storage system connects to the Data Services Cloud Console instance using an encrypted link (mTLS) with its device certificate as the client certificate
- Data Services Cloud Console instance validates client certificate using trust anchors
- It looks up the Tenant ID using the SN and registers the Device ID against the SN
- It calls the token Service to create a JWT Issuer for the Tenant ID and returns the Issuer ID
- Data Services Cloud Console returns the Issuer ID and the storage system adds the Issuer ID to its Trusted Issuer list.

For additional Technical details with configuration and setup, please refer to our Welcome Center at:
https://infosight.hpe.com/welcomecenter/

HPE Data Services SKUs

Data Services Cloud Console is a SaaS-based console that delivers unified data operations as a service through a suite of HPE Data Services. It automates and orchestrates integrated data and infrastructure workflows to deliver cloud operational agility and simplified data management.

There are three factors which impact the quantity of the mandatory subscription SKUs for the Alletra 6000 and 9000 arrays, the array type, drive type and the term of the subscription.

The subscription quantity is calculated based on these three factors, increasing in line with term length, array capacity and performance and drive quantity and capacity. NICs/HBAs and support level do not affect the subscription quantities. The quantity for the Alletra 5000 is one per array.

Description	SKU
HPE Alletra 9000 Software and Support SaaS	S1E74AAE
HPE Alletra 9000 Software and Support SaaS 1-year Subscription	S1E74AAE#CTE
HPE Alletra 9000 Software and Support SaaS 3-year Subscription	S1E74AAE#CTF
HPE Alletra 9000 Software and Support SaaS 4-year Subscription	S1E74AAE#CTG
HPE Alletra 9000 Software and Support SaaS 5-year Subscription	S1E74AAE#CTH
HPE Alletra 9000 Software and Support SaaS 6-year Subscription	S1E74AAE#CTK
HPE Alletra 9000 Software and Support SaaS 7-year Subscription	S1E74AAE#CTL
HPE Alletra 9000 Array Upgrades Software and Support SaaS	S1E75AAE
HPE Alletra 9000 Array Upgrades Software and Support SaaS 1-year Subscription	S1E75AAE#CTE
HPE Alletra 9000 Array Upgrades Software and Support SaaS 3-year Subscription	S1E75AAE#CTF
HPE Alletra 9000 Array Upgrades Software and Support SaaS 4-year Subscription	S1E75AAE#CTG
HPE Alletra 9000 Array Upgrades Software and Support SaaS 5-year Subscription	S1E75AAE#CTH

Configuration Information

Description	SKU
HPE Alletra 9000 Array Upgrades Software and Support SaaS 6-year Subscription	S1E75AAE#CTK
HPE Alletra 9000 Array Upgrades Software and Support SaaS 7-year Subscription	S1E75AAE#CTL
HPE Alletra 6000 Software and Support SaaS	S1E76AAE
HPE Alletra 6000 Software and Support SaaS 1-year Subscription	S1E76AAE#CTE
HPE Alletra 6000 Software and Support SaaS 3-year Subscription	S1E76AAE#CTF
HPE Alletra 6000 Software and Support SaaS 4-year Subscription	S1E76AAE#CTG
HPE Alletra 6000 Software and Support SaaS 5-year Subscription	S1E76AAE#CTH
HPE Alletra 6000 Software and Support SaaS 6-year Subscription	S1E76AAE#CTK
HPE Alletra 6000 Software and Support SaaS 7-year Subscription	S1E76AAE#CTL
HPE Alletra 6000 Array Upgrades Software and Support SaaS	S1E77AAE
HPE Alletra 6000 Array Upgrades Software and Support SaaS 1-year Subscription	S1E77AAE#CTE
HPE Alletra 6000 Array Upgrades Software and Support SaaS 3-year Subscription	S1E77AAE#CTF
HPE Alletra 6000 Array Upgrades Software and Support SaaS 4-year Subscription	S1E77AAE#CTG
HPE Alletra 6000 Array Upgrades Software and Support SaaS 5-year Subscription	S1E77AAE#CTH
HPE Alletra 6000 Array Upgrades Software and Support SaaS 6-year Subscription	S1E77AAE#CTK
HPE Alletra 6000 Array Upgrades Software and Support SaaS 7-year Subscription	S1E77AAE#CTL
HPE Alletra 5010 Software and Support 3-year SaaS	S0L73AAE
HPE Alletra 5010 Software and Support 4-year SaaS	S0L74AAE
HPE Alletra 5010 Software and Support 5-year SaaS	S0L75AAE
HPE Alletra 5030 Software and Support 3-year SaaS	S0L79AAE
HPE Alletra 5030 Software and Support 4-year SaaS	S0L80AAE
HPE Alletra 5030 Software and Support 5-year SaaS	S0L81AAE
HPE Alletra 5050 Software and Support 3-year SaaS	S0L85AAE
HPE Alletra 5050 Software and Support 4-year SaaS	S0L86AAE
HPE Alletra 5050 Software and Support 5-year SaaS	S0L87AAE
HPE Alletra 5030 Software and Support 3-year Upgrade SaaS	S0L91AAE
HPE Alletra 5030 Software and Support 4-year Upgrade SaaS	S0L92AAE
HPE Alletra 5030 Software and Support 5-year Upgrade SaaS	S0L93AAE
HPE Alletra 5050 Software and Support 3-year Upgrade SaaS	S0L97AAE
HPE Alletra 5050 Software and Support 4-year Upgrade SaaS	S0L98AAE
HPE Alletra 5050 Software and Support 5-year Upgrade SaaS	S0L99AAE

Notes: S1E74AAE and S1E76AAE are mandatory SKUs for HPE Alletra 6000 and 9000 base arrays. S1E75AAE and S1E77AAE are for use with Alletra 6000 and 9000 array and capacity upgrades.

Summary of Changes

Date	Version History	Action	Description of Change
06-Nov-2023	Version 11	Changed	Standard Features section was updated
01-May-2023	Version 10	Changed	Configuration Information section was updated. Updated SKU information
06-Mar-2023	Version 9	Changed	Configuration Information section was updated
03-Oct-2022	Version 8	Changed	Standard Features section was updated. Updates to standard features
06-Sep-2022	Version 7	Changed	Standard Features and Configuration Information sections were updated
07-Mar-2022	Version 6	Changed	6 and 7 year subscription options added
21-Feb-2022	Version 5	Changed	Added Block Storage - Preview
06-Dec-2021	Version 4	Changed	Configuration Information section was updated.
02-Aug-2021	Version 3	Changed	New Upgrade SKU added
21-Jun-2021	Version 2	Changed	Overview, Standard Features, Service and Support and Configuration Information section were updated.
04-May-2021	Version 1	New	New QuickSpecs

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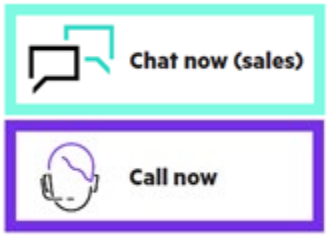

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