



# Visual Storage Intelligence®

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## User Guide

Version | 1

## Version History

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1		7/22/2016	Initial Release
2			
3			

## CONTENTS

1. Overview .....	8
1.1. Purpose of this Document.....	8
1.2. Scope .....	8
2. Navigation .....	9
2.1. Top Navigation .....	9
2.1.1. Home .....	9
2.1.2. Upload .....	9
2.1.3. Admin .....	9
2.1.4. Profile .....	11
2.2. Left Navigation .....	11
2.2.1. Search.....	11
2.2.2. Collection Date Filter .....	12
2.2.3. View by Device or Host name .....	12
2.2.4. Add a Folder .....	13
2.3. Sorting and Filtering Columns .....	13
2.4. Downloading reports.....	15
2.5. Page Navigation.....	15
2.6. Graph Navigation .....	15
3. Home Page.....	16
3.1. Description .....	16
4. Business Unit Reports .....	17
4.1. IT Dashboard .....	17
4.1.1. Description .....	17
4.1.2. Field Definition .....	17
4.2. Capacity .....	18
4.2.1. Usage by Category.....	18
4.2.2. Usage by Application .....	19
4.2.3. Capacity Planning Report .....	20
4.3. Provisioning.....	21
4.3.1. Description .....	21
4.3.2. Field Definition .....	21
4.4. Array Reports .....	22
4.4.1. Description .....	22
4.4.2. Field Definition .....	22
4.5. Performance Summary.....	22

4.5.1.	Performance Summary Report.....	22
4.5.2.	Performance Detail Report.....	23
4.6.	Tier Summary .....	24
4.6.1.	Storage (GB) by Business Unit by Tier .....	24
4.6.2.	Storage (Cost) by Business Unit by Tier.....	24
4.6.3.	Business Unit Tier Summary Report.....	25
4.7.	Utilization .....	26
4.7.1.	Utilization Trend Summary.....	26
4.7.2.	Capacity Utilization.....	27
4.7.3.	Performance Utilization .....	28
4.8.	Forecasting .....	29
5.	Enterprise Reports .....	30
5.1.	Enterprise Summary.....	30
5.1.1.	Description .....	30
5.1.2.	Field Definition .....	30
5.2.	Enterprise Health .....	31
5.2.1.	Description .....	31
5.2.2.	Field Definition .....	31
5.3.	Enterprise Disk Type by Storage Array .....	32
5.3.1.	Description .....	32
5.3.2.	Field Definition .....	32
5.4.	Enterprise Utilization Report.....	33
5.4.1.	Description .....	33
5.4.2.	Field Definition .....	33
6.	Device Reports .....	34
6.1.	SAN Summary.....	34
6.1.1.	Description .....	34
6.1.2.	Field Definition .....	34
6.2.	Detailed Reports.....	35
6.2.1.	Provisioning Report .....	35
6.2.2.	Firmware Summary .....	35
6.2.3.	Free Space by Disk Group.....	36
6.2.4.	Storage by Server by Disk Type .....	37
6.2.5.	Storage Group Summary .....	38
6.3.	Device Health .....	39
6.3.1.	Description .....	39
6.3.2.	Field Definition .....	39
6.4.	Physical Diagram .....	40

- 6.4.1. Description ..... 40
- 6.4.2. Field Definition ..... 40
- 6.5. Performance Reports ..... 41
  - 6.5.1. IOPS by Array ..... 41
  - 6.5.2. CPU Utilization ..... 42
  - 6.5.3. MB/Sec by Array ..... 43
- 6.6. History ..... 44
  - 6.6.1. Description ..... 44
  - 6.6.2. Field Definition ..... 44
- 7. Host LUN Summary ..... 45
  - 7.1. Description ..... 45
  - 7.2. Field Definition ..... 45
- 8. Need Help? ..... 46
  - 8.1. Online Documentation ..... 46
  - 8.2. Support ..... 46

## TABLE OF FIGURES

Figure 1: Performance Thresholds Exceeded Report .....	17
Figure 2: Capacity Thresholds Exceeded Report .....	17
Figure 3: Capacity Usage by Category Graph .....	18
Figure 4: Capacity Usage by Application Graph GB.....	19
Figure 5: Storage Usage by Application Graph (%).....	19
Figure 6: Capacity Planning Report .....	20
Figure 7: Provisioning Report .....	21
Figure 8: Array Report .....	22
Figure 9: Performance Summary Report.....	22
Figure 10: Performance Detail Report .....	23
Figure 11: Storage (GB) by Business Unit by Tier Graph .....	24
Figure 12: Storage (Cost) by Business Unit by Tier Graph.....	25
Figure 13: Business Unit Tier Summary Report.....	25
Figure 14: Utilization Trend Summary Graph.....	26
Figure 15: Capacity Utilization Graph and Report.....	27
Figure 16: Performance Utilization Graph and Report .....	28
Figure 17: Forecasting Report .....	29
Figure 18: Enterprise Summary Report.....	30
Figure 19: Enterprise Health Report.....	31
Figure 20: Enterprise Disk Type by Storage Array Graph and Report .....	32
Figure 21: Enterprise Utilization Report.....	33
Figure 22: SAN Summary Report.....	34
Figure 23: Provisioned Report.....	35
Figure 24: Firmware Summary .....	36
Figure 25: Free Space by Disk Group.....	36
Figure 26: Storage by Server by Disk Type .....	37
Figure 27: Storage Group Summary .....	38
Figure 28: Device Health .....	39
Figure 29: Physical Diagram .....	40
Figure 30: IOPS by Array.....	41
Figure 31: CPU Utilization.....	42
Figure 32: MB/Sec by Array.....	43
Figure 33: History Report .....	44
Figure 34: Host LUN Summary .....	45

## TABLE OF TABLES

Table 1: Performance Thresholds Exceeded Data Elements.....	17
Table 2: Capacity Thresholds Exceeded Data Elements.....	18
Table 3: Storage Usage All Arrays (GB) Data Elements.....	18
Table 4: Storage Usage by Category (GB) Data Elements.....	18
Table 5: Capacity Usage by Application Graph Data Elements.....	19
Table 6: Storage Usage by Application Graph (%).....	20
Table 7: Capacity Planning Report Data Elements.....	21
Table 8: Business Unit Provisioning Data Elements.....	21
Table 9: Array Report Data Elements.....	22
Table 10: Performance Summary Report Data Elements.....	23
Table 11: Performance Detail Report Data Elements.....	24
Table 12: Storage (GB) by Business Unit Tier Graph Data Elements.....	24
Table 13: Storage (Cost) by Business Unit Tier Graph Data Elements.....	25
Table 14: Business Unit Tier Summary Report Data Elements.....	25
Table 15: Utilization Trend Summary Graph Data Elements.....	26
Table 16: Capacity Utilization Graph Data Elements.....	27
Table 17: Capacity Utilization Report Data Elements.....	27
Table 18: Performance Utilization Graph Data Elements.....	28
Table 19: Performance Utilization Report Data Elements.....	28
Table 20: Forecasting Report by Data Center Data Elements.....	29
Table 21: Enterprise Summary Report Data Elements.....	31
Table 22: Enterprise Health Report Data Elements.....	32
Table 23: Enterprise Disk Type by Storage Array Data Elements.....	32
Table 24: Enterprise Utilization Report Data Elements.....	33
Table 25: SAN Summary Data Elements.....	35
Table 26: Provisioned Report Data Elements.....	35
Table 27: Firmware Summary Data Elements.....	36
Table 28: Free Space by Disk Group Data Elements.....	37
Table 29: Storage by Server by Disk Type Data Elements.....	38
Table 30: Storage Group Summary Data Elements.....	38
Table 31: Device Health Data Elements.....	39
Table 32: Physical Diagram Data Elements.....	40
Table 33: IOPS by Array Data Elements.....	41
Table 34: CPU Utilization Data Elements.....	42
Table 35: MB/Sec by Array Data Elements.....	43
Table 36: History Data Elements.....	44
Table 37: Host LUN Summary Data Elements.....	45

## 1. OVERVIEW

Visual Storage Intelligence® (VSI) is a SaaS that provides a visual health analysis of a client's complex SAN environment in minutes.

As the complexity of a storage environment grows, so does the complexity of visualizing and assessing storage utilization. Accordingly, IT departments spend hours assessing, compiling, and trying to predict current and future storage usage – often adding time and money to analyses. VSI quickly helps clients visually map out their SAN storage utilization, configuration, and free space. Without installing anything, VSI's technology provides a true in-depth analysis.

### 1.1. Purpose of this Document

The following document provides the detailed information regarding for the functionality of VSI and how the client can use the reports to review system analytics. Each report is presented with the explanation of how the reporting data is calculated.

### 1.2. Scope

This User Guide is intended for end-user client use and will only include the standard reports. Any custom reports that are required by the client will be documented under separate cover. Database and system administration documentation is not covered in the User Guide.



## 2. NAVIGATION

### 2.1. Top Navigation



The top navigation has the following functionality

#### 2.1.1. Home

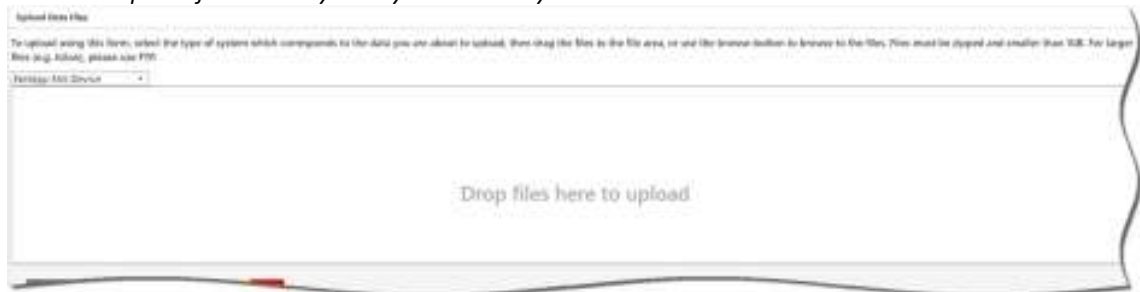
This will take you back to the defined Home page from anywhere in the application.

#### 2.1.2. Upload

In the event the user would like to manually upload a file, it can be completed from this panel.

- First select the type of device, Business Unit Data or PDF file that is to be uploaded.
- The Drop Files dialog box will appear.
- Click in the dialog box and select the location and file for uploading.

*Note: The upload functionality is only accessible by VSI Administrator and Local Administrator.*



#### 2.1.3. Admin

The Admin links provides the following functionality to VSI Administrator and Local Administrator only. This option will be hidden from all other users.



##### 2.1.3.1. Clients


The option to create a new VSI client is only available to VSI Administrator. This icon will be hidden for non-VSI Admins.

##### 2.1.3.2. Users




The option to create, modify or delete a user is only available to VSI Administrator and Local Administrators. For users that do not have this access, the icon will be hidden.

- To setup a user, click *User* on the top navigation.
- The following screen will appear.



- Click on the plus sign icon to add a new user 
  - Complete the form as required.
    - All required fields are identified with a red asterisks. \*
  - A Local Administrator will only have access to setup a User at the level of Normal User for that client environment.
  - Click save to close.



- To edit a user, select the user and then click the pencil icon.  This will open the user form for changes. Once complete, click on the save button.
- To delete a user, select the user and then click the trash can icon.  *NOTE: once deleted, the user cannot be retrieved. A new user profile will have to be setup.*
- To lock out a user, select the user and then click the lock icon.  To unlock the users, select the user and then click the lock icon again.

### 2.1.3.3. All Uploads

All uploads provides a listing of files that have been uploaded to the client’s VSI environment displaying processing status, collection date, devices type, and start/end times.

Upload ID	Client	Uploaded	Collected	Status	Device Type	Original File	File Size	File Size	Multiple
8027	Visual Storage Intelligence	2016-07-14T19:57:57.837000		Failed	NetApp FAS Device	0b445.jpg	2016-07-14T19:57	2016-07-14T19:57	No process
8028	Visual Storage Intelligence	2016-07-14T19:57:57.827000	2016-07-14T09:00:00	Completed	NetApp FAS Device	0b441.jpg	2016-07-14T19:57		No process
8029	Visual Storage Intelligence	2016-07-14T19:57:57.767000	2016-07-14T09:00:00	Completed	NetApp FAS Device	0b443.jpg	2016-07-14T19:57		No process
8030	Visual Storage Intelligence	2016-07-14T19:57:57.738000	2016-07-14T09:00:00	Completed	NetApp FAS Device	0b445.jpg	2016-07-14T19:57		No process
8031	Visual Storage Intelligence	2016-07-14T19:57:57.738000		Completed	NetApp FAS Device	0b448.jpg	2016-07-14T19:57		No process

### 2.1.4. Profile

The User Profile allows for the individual user to modify their first and last name and email address. The user can also change their password from this screen.

**User Profile**

Username:

First Name:

Last Name:

Email:

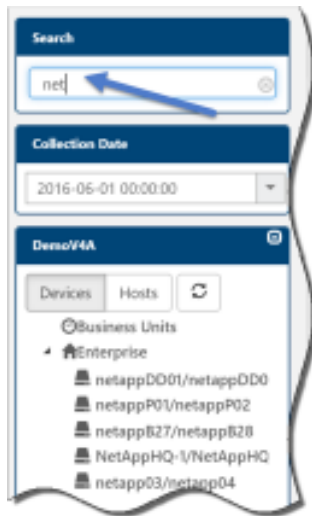
You can change your password here:

## 2.2. Left Navigation

The left navigation allows for the user to search by device, filter the Enterprise and Device reports by data collection date and view the data by Device or Host name.

### 2.2.1. Search

To search for a specific device or host, simply click in the Search dialog box and begin typing. The system will filter all device or host reports based content entered.



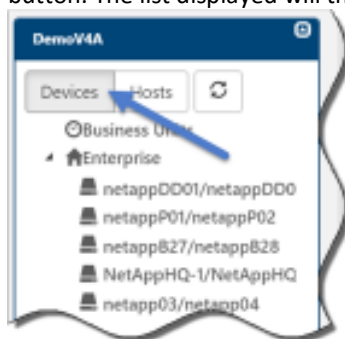
### 2.2.2. Collection Date Filter

Enterprise, Business Unit, Device and Host reports can be filtered by collection dates. When an Enterprise report is initially opened, only the devices or hosts included in the most current data collection will be reflected. If a user would like to review the Enterprise, Business Unit, Device, or Host reports for items that are no longer in service, select the appropriate collection date from the drop down box. This will modify the view to only include those devices or hosts reports that were include in data collection.



### 2.2.3. View by Device or Host name

The devices list can be sorted by Device name or Host name. This is achieved by clicking the Devices of Hosts button. The list displayed will then be sorted by the respective name.



## 2.2.4. Add a Folder

Devices can be easily organized into folders.

- To create a folder, right click on the word Enterprise on the left navigation



- Choose Add Folder, a dialog box will appear



- Enter the name of the folder you wish to create
- Click the accept button
- To move the device into the folder, right click on the device name and drag the device into the folder

To remove the folder, right click on the folder name and select Remove Folder. The device will then be moved to the list under Enterprise in accordance to the selected sort.

## 2.3. Sorting and Filtering Columns

The report tables has been configured with a sorting and filtering feature that allows the user to view the data and easy search for key information.

- To sort the columns, click on the filter icon on the top right side of the column
- The following dialog box will appear



- To sort ascending or descending click the Sort A to Z or Sort Z to A
- Custom filters can be created by selecting Text Filters



- The following dialog box will appear giving the user the option to choose various parameters



- To use the Search tool, begin typing in the Search field, the system is automatically being filtering the data




- To filter the data using the column list of values, deselect the displayed values that are not to be included in the view



- Once the desired sort/filter option has been selected, click OK
- To clear the sort/filter, select Clear Filters




### 2.4. Downloading reports

All reports can be downloaded into PDF files by selecting the Download Files option at the top right side of the report.  Device reports also have the option to download the files into Excel.



### 2.5. Page Navigation

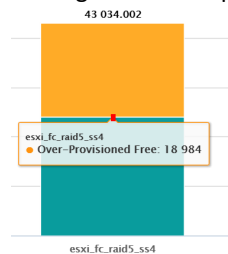
Some tables within VSI will have multiple pages of detailed information. To navigate to the additional pages, select the page number or scroll by selecting the chevron icons. 



### 2.6. Graph Navigation

Several of the graphs within VSI have the ability to toggle to reflect additional data parameters. For these graphs, the user needs to simply click on the graph to toggle the chart.

Hovering over graphical data will present the user with a small dialog box containing additional information relating the item displayed.



## 3. HOME PAGE

### 3.1. Description

Current all users are presented the [Executive Summary](#) when first logged into VSI. Expanded features relating to the Home Page will be available in a future release.



## 4. BUSINESS UNIT REPORTS

### 4.1. IT Dashboard

#### 4.1.1. Description

The IT Dashboard provides a review of arrays by Business Units that have exceeded performance or capacity thresholds.

#### 4.1.2. Field Definition

##### 4.1.2.1. Performance Thresholds Exceeded

Figure 1: Performance Thresholds Exceeded Report

Field Label	Description
MFG	Manufacturer
Array Name	Storage Array Name
Category	Business Unit assigned to the array
Application	Name of the application on the array
Resource Name	Type of resource reporting (i.e. CPU, IO/Sec)
Utilization %	Percentage of the performance that is utilized
Data Center	Physical location of the server
Collection Date	Date the data was collected

Table 1: Performance Thresholds Exceeded Data Elements

##### 4.1.2.2. Capacity Thresholds Exceeded

Figure 2: Capacity Thresholds Exceeded Report

Field Label	Description
MFG	Manufacturer
Category	Business Unit assigned to the array
Application	Name of the application on the array
Array Name	Storage Array Name
Pool Name	Type of array pool reporting
Utilization %	Percentage of the array that is utilized
Usable (GB)	Total usable space in GB on the array
Used (GB)	Amount of GB used on the Array
% Alloc	Percentage of the server capacity that has been allocated to the Business Unit
Data Center	Physical location of the server
Collection Date	Date the data was collected

Table 2: Capacity Thresholds Exceeded Data Elements

## 4.2. Capacity

### 4.2.1. Usage by Category

#### 4.2.1.1. Description

The Usage by Category report reflects the breakdown of array space used in GB's by the various environments. For examples the GB used in the array by Development or Production environments.

#### 4.2.1.2. Field Definition



Figure 3: Capacity Usage by Category Graph

Field Label	Description
Total Space by GB	Space in GB reflected for allocated, unallocated, used and un
All Arrays	All arrays are totalled into one calculation

Table 3: Storage Usage All Arrays (GB) Data Elements

Field Label	Description
Total Space by GB	Space in GB is broken down by category and space type (i.e allocated, unallocated, provisioned, un-provisioned)
Category	Arrays are separated by client defined category (i.e. Production, Development, QA)

Table 4: Storage Usage by Category (GB) Data Elements

## 4.2.2. Usage by Application

### 4.2.2.1. Description

The Usage by Application report reflects the breakdown of array space used in gigabytes or percentage by the various environments. For example, the GB used in the array by Development or Production environments.

*NOTE: By clicking on the % or GB icon on the top right hand corner of the graph, the chart will flip between GB and %.*

### 4.2.2.2. Field Definition



Figure 4: Capacity Usage by Application Graph GB

Field Label	Description
Total Space by GB	Space in GB reflected for Over-provisioned Free, Dedup, Snap, Unprovisioned Free, Provisioned Free and Used
Application	All arrays are totalled into one calculation

Table 5: Capacity Usage by Application Graph Data Elements



Figure 5: Storage Usage by Application Graph (%)

Field Label	Description
Total Space by %	Percentage of arrays reflected for Over-provisioned Free, Dedup, Snap, Unprovisioned Free, Provisioned Free and Used
Application	All arrays are totalled into one calculation

Table 6: Storage Usage by Application Graph (%)

### 4.2.3. Capacity Planning Report

#### 4.2.3.1. Description

The Capacity Planning Report demonstrates the Business Unit’s allocation of usable space by the categories; Provisioned, UnProvisioned, Snap, etc. This report allows the user insight for future planning to ensure committed space on the array is available when required by the Business.

#### 4.2.3.2. Field Definition



Figure 6: Capacity Planning Report

Field Label	Description
MFG	Manufacturer
Category	Business Unit assigned to the array
Application	Name of the application on the array
Usable (GB)	Total physical usable space in GB on the array for the Business Unit
Used (GB)	Amount of actual space used in GB on the Array by the Business Unit
Prov Free (GB)	Calculation of space = Usable less Used
UnProv (GB)	Space on the array that is uncommitted to a Business Unit Calculation of space = Usable less Allocated If the calculation reflects a value of less than 0, the field will only reflect 0
Over Prov (GB)	Space on the array that has been over committed to a Business Unit Calculation of space = Allocated less Usable If the calculation reflects a value of less than 0, the field will only reflect 0
Allocated	Total amount of space that has been committed to the Business Unit
Snap (GB)	Space used for historical data Snap shot to provide delta reporting
% Snap	Calculation of percentage = Snap divided by Usable
% Dedup	Calculation = Dedup savings divided by Useable space % of space saved from deduplication and compression
% Used	Calculation = Used divided by Usable

Field Label	Description
% Prov Free	Calculation = Provisioned divided by Usable
% UnProv	Calculation = Unprovisioned divided by Usable
% OverProv	Calculation = Delta between Allocated and Usable divided by Usable

Table 7: Capacity Planning Report Data Elements

### 4.3. Provisioning

#### 4.3.1. Description

The Provisioning Report allows the client to plan for future capacity or performance needs by application and category with Usage indicators that reflect if the system is in good standing or requires attention.

#### 4.3.2. Field Definition

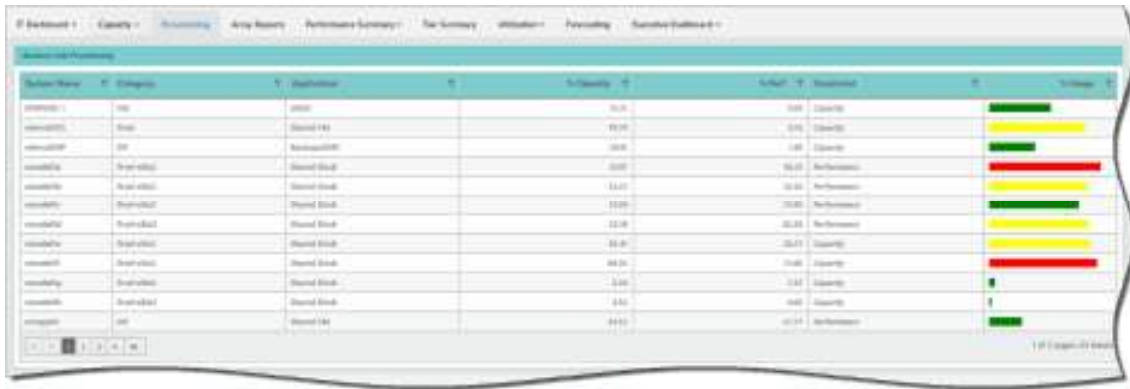


Figure 7: Provisioning Report

Field Label	Description
System Name	Array Name
Category	System functionality type (i.e. Production, Development, QA)
Application	Name of the application on the array
% Capacity	Calculation = Usable divided by Used
% Perf	High Performance Ratio Calculation = Performance divided by Threshold
Constraint	Determined threshold constraint that has been triggered
% Usage	Calculation = Used capacity divided by Usable

Table 8: Business Unit Provisioning Data Elements

## 4.4. Array Reports

### 4.4.1. Description

The Array Report provides a complete listing of all arrays and the associated business units with the amount of space assigned and usable.

### 4.4.2. Field Definition

Array Name	Business Unit	Total Array Usage	Mapped Storage	Used Array Capacity	% of Array
Array1	BU1	1000000	2000000	1000000	50%
Array2	BU2	2000000	4000000	2000000	50%
Array3	BU3	3000000	6000000	3000000	50%
Array4	BU4	4000000	8000000	4000000	50%
Array5	BU5	5000000	10000000	5000000	50%
Array6	BU6	6000000	12000000	6000000	50%
Array7	BU7	7000000	14000000	7000000	50%
Array8	BU8	8000000	16000000	8000000	50%
Array9	BU9	9000000	18000000	9000000	50%
Array10	BU10	10000000	20000000	10000000	50%

Figure 8: Array Report

Field Label	Description
Array Name	System name
Business Unit Name	Defined Business Unit assigned to the array
Mapped Storage	Array storage allocated to the Business Unit
Total Array Usage	The spaced used on the Array by the Business Unit
% of Array	Calculation = Used Array divided by Usable Array

Table 9: Array Report Data Elements

## 4.5. Performance Summary

### 4.5.1. Performance Summary Report

#### 4.5.1.1. Description

Performance Summary Report is an overview of system and application capacity and performance statuses.

#### 4.5.1.2. Field Definition

System Name	Category	Application	Capacity (TB)	Growth to Capacity	Used Capacity	Growth to Full Capacity	Used Storage	Usage % of Total
System1	App1	Application1	1000	100%	1000	100%	1000	100%
System2	App2	Application2	2000	100%	2000	100%	2000	100%
System3	App3	Application3	3000	100%	3000	100%	3000	100%
System4	App4	Application4	4000	100%	4000	100%	4000	100%
System5	App5	Application5	5000	100%	5000	100%	5000	100%
System6	App6	Application6	6000	100%	6000	100%	6000	100%
System7	App7	Application7	7000	100%	7000	100%	7000	100%
System8	App8	Application8	8000	100%	8000	100%	8000	100%
System9	App9	Application9	9000	100%	9000	100%	9000	100%
System10	App10	Application10	10000	100%	10000	100%	10000	100%

Figure 9: Performance Summary Report

Field Label	Description
System Name	Client system name
Category	System functionality type (i.e. Production, Development, QA)
Application	Name of the application on the array
Capacity %	Calculation = Usable divided by Used
Months to Capacity	Estimated number of months until capacity threshold is reached
Performance Capacity %	Performance % (max)
Month to Performance	and days to threshold performance
Perf Resource	CPU, IOPS or mb/sec
Yearly Cap Growth Rate	Calculation = Capacity at time of data collection less begin of period times % of Year
Yearly Perf Growth Rate	Calculation = Performance at time of data collection less begin of period times % of Year

Table 10: Performance Summary Report Data Elements

## 4.5.2. Performance Detail Report

### 4.5.2.1. Description

Performance Detail Report reflects the resource performance growth rates, highlights the resource(s) that will reach the client specific threshold for each array in the application list.

### 4.5.2.2. Field Definition

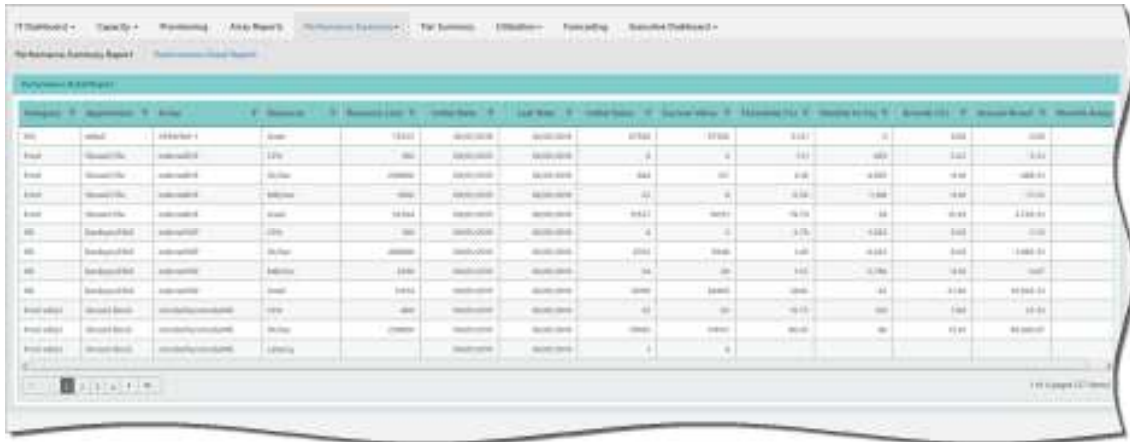


Figure 10: Performance Detail Report

Field Label	Description
Category	Business Unit assigned to the array
Application	Name of the application on the array
Array	Name of system
Resource	Hardware resource
Resource Limit	Resource limits are provided by the customer via SAN capacity file
Initial Date	When hardware was placed into service
Last Date	Last reporting date
Initial Value	Initial investment

Field Label	Description
Current Value	Current value of the resource
Threshold %	Performance divided by Threshold
Months to Capacity	The number of months to reach capacity threshold based on average growth rates
Growth %	Calculation = Delta between the period beginning and the end divided by Usable
Annual Growth	Calculation = Delta between the annual beginning and the end divided by Usable divided by # of months
Months Analysed	Number of months system has been included in statistical reporting

Table 11: Performance Detail Report Data Elements

## 4.6. Tier Summary

### 4.6.1. Storage (GB) by Business Unit by Tier

#### 4.6.1.1. Description

The Storage size in gigabytes by Business Unit by tier demonstrate the current space used in each tier broken down by the associated business unit.

#### 4.6.1.2. Field Definition



Figure 11: Storage (GB) by Business Unit by Tier Graph

Field Label	Description
Tier Space by GB	Space in gigabytes reflected by tier
Business Unit	Defined Business Unit assigned to the tier

Table 12: Storage (GB) by Business Unit Tier Graph Data Elements

### 4.6.2. Storage (Cost) by Business Unit by Tier

#### 4.6.2.1. Description

The Storage cost by Business Unit by tier demonstrate the cost associated with each tier broken down by the associated business unit.



**4.6.2.2. Field Definition**



Figure 12: Storage (Cost) by Business Unit by Tier Graph

Field Label	Description
Tier Cost by \$	Cost incurred by tier
Business Unit	Defined Business Unit assigned to the tier

Table 13: Storage (Cost) by Business Unit Tier Graph Data Elements

**4.6.3. Business Unit Tier Summary Report**

**4.6.3.1. Description**

The Business Unit Tier Summary provides the client a top down view of all tiers sizes and cost associated with the assigned Business Unit.

**4.6.3.2. Field Definition**



Figure 13: Business Unit Tier Summary Report

Field Label	Description
Customer Name	Name of the Business Unit
Tier (n) (GB)	Size of the tier in gigabytes
Tier (n) \$)	Cost of the tier
Total (GB)	Sum of all tiers in gigabytes
Total (\$)	Total cost of all tiers

Table 14: Business Unit Tier Summary Report Data Elements

## 4.7. Utilization

### 4.7.1. Utilization Trend Summary

#### 4.7.1.1. Description

The Utilization Trend Summary outlines the array trending analysis of capacity and performance statistics of all categories based on each date data was collected on the systems.

#### 4.7.1.2. Field Definition



Figure 14: Utilization Trend Summary Graph

Field Label	Description
Percent of Total Capacity and Performance	Combined percentage of all categories for Capacity or Performance
Performance	Calculation = Used Performance divided by Usable Performance for all categories
Capacity	Calculation = Used Capacity divided by Usable Capacity for all categories

Table 15: Utilization Trend Summary Graph Data Elements

## 4.7.2. Capacity Utilization

### 4.7.2.1. Description

The Capacity Utilization report reflects the capacity trending analysis by category based on collection date.

### 4.7.2.2. Field Definition

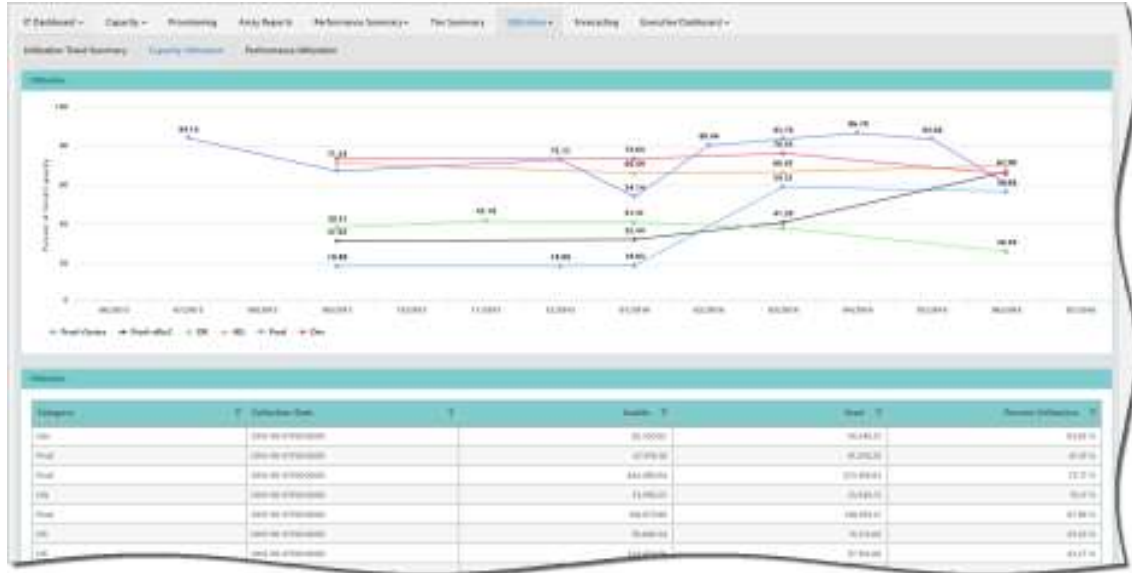


Figure 15: Capacity Utilization Graph and Report

Field Label	Description
Percent of Total Capacity	Combined percentage of all categories for Capacity
Category	Calculation = Used Capacity divided by Usable Capacity by category

Table 16: Capacity Utilization Graph Data Elements

Field Label	Description
Category	Arrays are separated by category (i.e. Production, Development, QA)
Collection Date	Date data was collected from the systems
Usable	Usable capacity reflected in gigabytes
Used	Used capacity reflected in gigabytes
Percent Utilization	Calculation = Used Capacity divided by Usable Capacity

Table 17: Capacity Utilization Report Data Elements

### 4.7.3. Performance Utilization

#### 4.7.3.1. Description

The Performance Utilization report reflects the performance trending analysis by category based on collection date.

#### 4.7.3.2. Field Definition

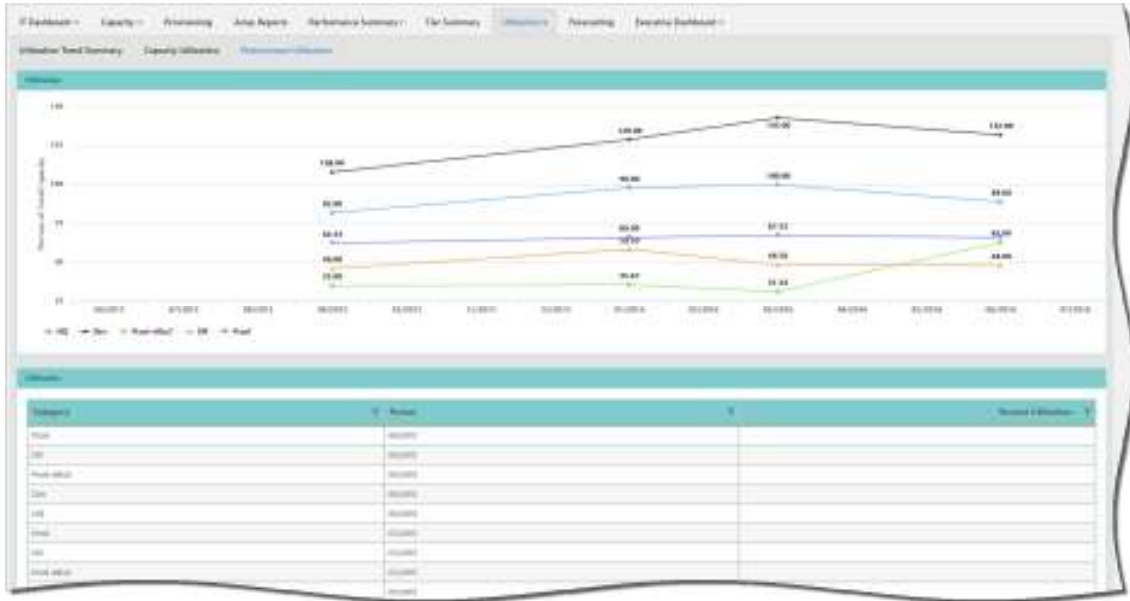


Figure 16: Performance Utilization Graph and Report

Field Label	Description
Percent of Total Capacity	Combined percentage of all categories for Performance
Category	Calculation = Used Performance divided by Usable Performance by category

Table 18: Performance Utilization Graph Data Elements

Field Label	Description
Category	Arrays are separated by category (ie. Production, Development, QA)
Period	Date data was collected from the systems
Percent Utilizations	Calculation = Used Capacity divided by Usable Capacity by category

Table 19: Performance Utilization Report Data Elements

## 4.8. Forecasting

### 4.8.1.1. Description

The forecasting report provides the client insight into system deficiencies that may be approaching or have already been met based on established parameters.

### 4.8.1.2. Field Definition

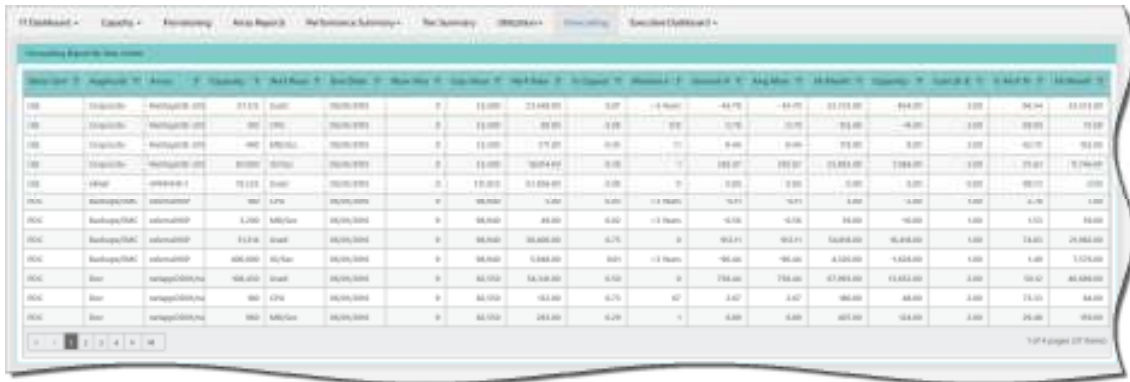


Figure 17: Forecasting Report

Field Label	Description
Data Center	Reporting client data center name
Application	Name of the application on the array
Array	Name of the array
Capacity Limit	Capacity limit for the
Perf Resource	System resource (i.e. MB/Sec, CPU, Used, IO/Sec)
End Date	Collection Date
Num Months	Number of months included in the collected data
Cap Value	Total of allocated capacity
Perf Value	Total of allocated performance
% Capacity Threshold	Capacity threshold determined by the client
Month to Capacity	Calculation = Unused capacity minus threshold capacity divided by average growth rate per month
Growth Per Month	Calculation = The average monthly increase/decrease in resource capacity in gigabytes
Avg Monthly (GB)	Calculation = The average monthly increase/decrease in resource capacity in gigabytes
18 Month Capacity	Calculation = Capacity at time of data collection times Monthly Growth times 18
Capacity Needed	Calculation = Average monthly capacity multiplied by 18 months
Cost (K \$)	Calculation = Total Cost divided by gigabytes times storage needed
% Perf Threshold	Performance threshold determined by the client
18 Month Perf Proj	Calculation = Month Growth times Base times 18
Perf Needed	Calculation = Average monthly performance multiplied by 18 months
Avg Monthly Perf Growth	Calculation = The average monthly increase/decrease in resource performance in gigabytes

Table 20: Forecasting Report by Data Center Data Elements

## 5. ENTERPRISE REPORTS

### 5.1. Enterprise Summary

#### 5.1.1. Description

The Executive Summary report provides the client an overview of all reporting devices highlighting the device disk metrics. This report reflects the most current data collection unless the user selection a different date from the collection data dropdown list.



#### 5.1.2. Field Definition

Field Label	Description
Total Space (GB)	Total of space for all reporting devices in gigabytes
Total Usable (GB)	Total of usable space for all reporting devices in gigabytes
Unprovisioned (GB)	Total of unprovisioned space for all reporting devices in gigabytes
Allocated (%)	Calculation = Allocated space divided by usable space
# Storage Pools	Total number of storage pools for all devices reporting
# Hosts Attached	Total number of hosts for all devices reporting
Used (GB)	Total of usable space for all reporting devices in gigabytes
Total Drive Count	Total number of storage pools for all devices reporting
Dedupe Savings (GB)	Total of Dedup compression savings

Figure 18: Enterprise Summary Report

Field Label	Description
Total Space (GB)	Total of space for all reporting devices in gigabytes
Total Usable (GB)	Total of usable space for all reporting devices in gigabytes
Unprovisioned (GB)	Total of unprovisioned space for all reporting devices in gigabytes
Allocated (%)	Calculation = Allocated space divided by usable space
# Storage Pools	Total number of storage pools for all devices reporting
# Hosts Attached	Total number of hosts for all devices reporting
Used (GB)	Total of usable space for all reporting devices in gigabytes
Total Drive Count	Total number of storage pools for all devices reporting
Dedupe Savings (GB)	Total of Dedup compression savings

Device Name	Individual device name <i>(Hint: to access the detailed device report, simply double click the device name)</i>
Device Type	Name of the device hardware
Raw Disk	Total disk space on the device
Total Allocated	Device space that is currently allocated
Total Free	Device space that is currently free
Total Used	Device space that is currently used
Total Usable	Device space that is currently usable
Total Volumes	Total configured volumes on the device
Host	Number of hosts attached to the array
Buses/Loops	Number of configured buses or loops on the named device
Drive Count	Number of configured drives on the named device

Table 21: Enterprise Summary Report Data Elements

## 5.2. Enterprise Health

### 5.2.1. Description

The Enterprise Health report provides the client a dashboard type indicators to highlight any device that is approaching or reached thresholds that need to be addressed.

### 5.2.2. Field Definition



Figure 19: Enterprise Health Report

Field Label	Description
Device Name	Individual device name <i>(Hint: to access the detailed device report, simply double click the device name)</i>
Device Type	Name of the device hardware
Configuration & Setup	Configuration rules violated (i.e. failed drives and hot spares)
Balance	Even balance allowances within 15%
Server Volume Mapping	Current state of orphaned volumes and hosts without storage mapped

Errors & Other Alerts	Other miscellaneous error reports
Storage Layout	Storage pool layout
Volumes / Snapshots	Snapshot analysis of how much space is stored for snaps and how many snaps

Table 22: Enterprise Health Report Data Elements

### 5.3. Enterprise Disk Type by Storage Array

#### 5.3.1. Description

The Enterprise Disk Type by Storage Array report reflects the types of disk that are located on the storage array and graphically demonstrates the allocation of each type on the array.

#### 5.3.2. Field Definition

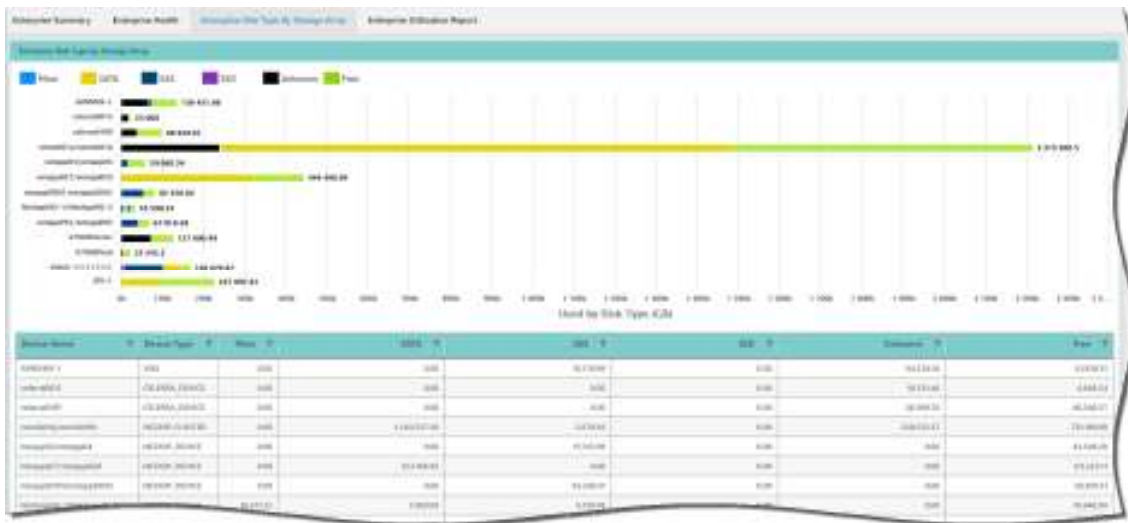


Figure 20: Enterprise Disk Type by Storage Array Graph and Report

Field Label	Description
Device Name	Individual device name <i>(Hint: to access the detailed device report, simply double click the device name)</i>
Device Type	Name of the device hardware
Fibre	The size in gigabytes of Fibre on the array
SATA	The size in gigabytes of SATA on the array
SAS	The size in gigabytes of SAS on the array
SSD	The size in gigabytes of SSD on the array
Unknown	The size in gigabytes of Unknown disk types on the array
Free	Free space available on the array

Table 23: Enterprise Disk Type by Storage Array Data Elements



## 5.4. Enterprise Utilization Report

### 5.4.1. Description

The Enterprise Utilization Report reflects the current utilization as a percentage for a reported device. The chart will also provide color indicators to alert the user if a device requires attention due to approaching thresholds.

### 5.4.2. Field Definition



Figure 21: Enterprise Utilization Report

Field Label	Description
Device Name	Individual device name <i>(Hint: to access the detailed device report, simply double click the device name)</i>
Device Type	Name of the device hardware
Utilization	Calculation = Used divided by Usable

Table 24: Enterprise Utilization Report Data Elements

## 6. DEVICE REPORTS

### 6.1. SAN Summary

#### 6.1.1. Description

The SAN Summary provides a dashboard view of the device, highlighting the disk allocation, drive configuration and storage by used, free and overhead.

*Note the device health message that displays at the top of the report. By clicking this message, the user is taken directly to the Device Health report.*

#### 6.1.2. Field Definition

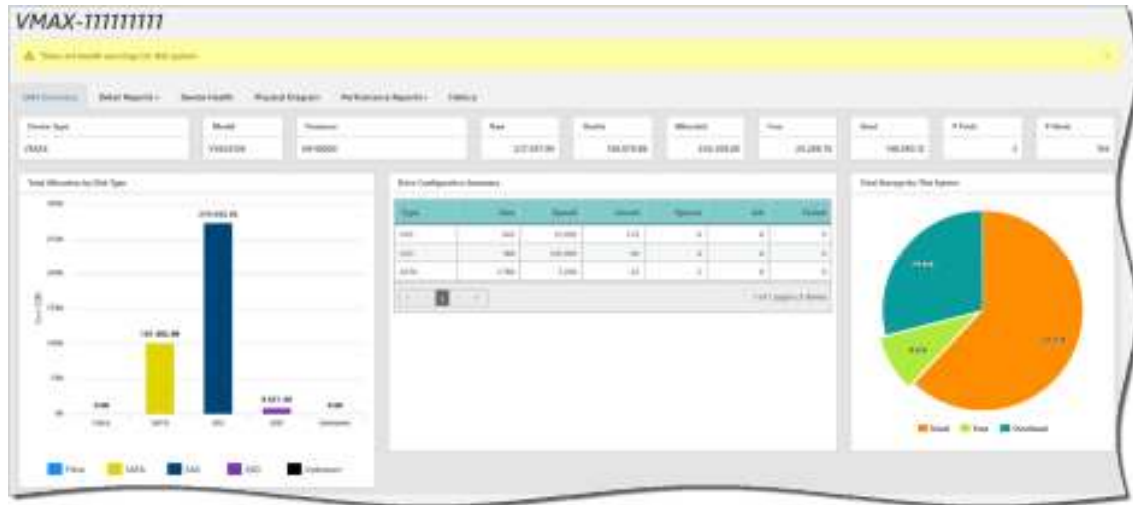


Figure 22: SAN Summary Report

Field Label	Description
Device Type	Displays the device manufacturer
Model	Displays the model of the device
Firmware	Displays the version of firmware on the device at the time the data as collected
Raw	The total disk space when placed into service
Usable	The amount of disk space available at the time the data as collected
Allocation	The amount of disk space allocated at the time the data as collected
Free	The amount of disk space unallocated at the time the data as collected
Used	The amount of disk space used at the time the data as collected
# Pools	Number of pools on the device
# Hosts	Number of hosts associated with the device
Total Allocation by Disk Type	Graph demonstrating the total size of each disk type on the device
Drive Configuration Summary	
Type	Type of drive configuration
Size	Size of the drive
Speed	Speed of the drive

Field Label	Description
Count	Number of drives
Spares	Number of spares
UA	Number of unassigned disks
Failed	Number of times the drive has failed
Total Storage for this System	Graph demonstrating the storage percentages for Used, Free, and Overhead

Table 25: SAN Summary Data Elements

## 6.2. Detailed Reports

### 6.2.1. Provisioning Report

#### 6.2.1.1. Description

The Provisioning Report graphically demonstrate the device disks space by type of provisioned space. Current categories are Over-Provisioned Free, Unprovisioned Free, Provisioned Free, and Pool Used.

#### 6.2.1.2. Field Definition

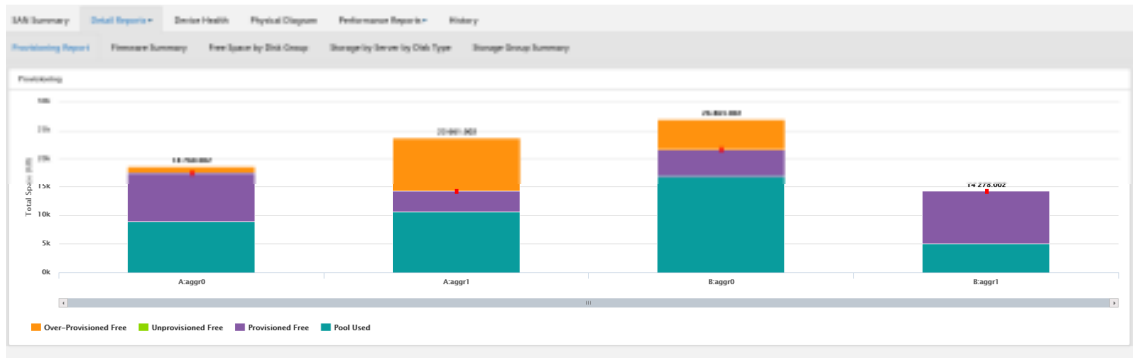


Figure 23: Provisioned Report

Field Label	Description
Total Space	Total space for each disk group
Disk Group	Each disk group is shown by name with space categorized by Over-Provisioned, Unprovisioned Free, Provisioned Free and Pool Used

Table 26: Provisioned Report Data Elements

### 6.2.2. Firmware Summary

#### 6.2.2.1. Description

The Firmware Summary provides the client with information on each product on the device and the version of firmware running on the system as of the collection date.

6.2.2.2. Field Definition

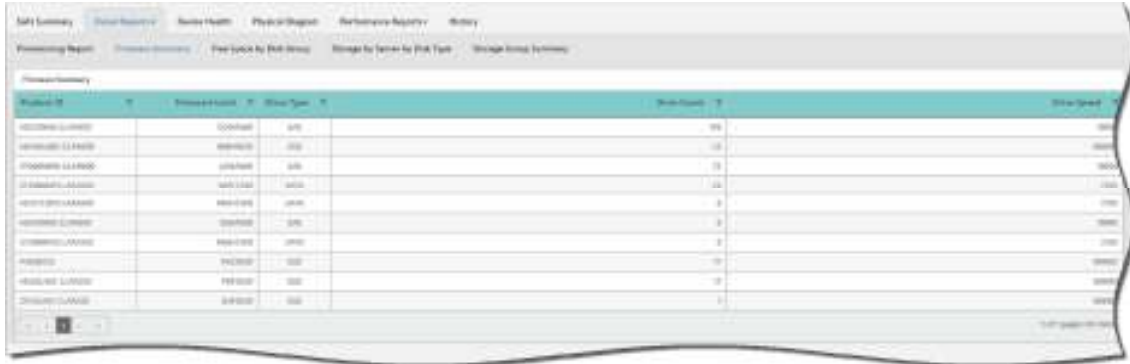


Figure 24: Firmware Summary

Field Label	Description
Product ID	Device Product ID from device file
Firmware Level	Version of the firmware running on the device as of the data collection period
Drive Type	Device disk type (Fibre, SATA, SAS, SSD, Unknown)
Drive Count	Number of drives configured on the device as of the data collection period
Drive Speed	rpm 7200, 10000, 15000 or NA For SSD this is supplied in array data

Table 27: Firmware Summary Data Elements

6.2.3. Free Space by Disk Group

6.2.3.1. Description

The Free Space by Disk Group report breaks down the free space for each group by disk type. This information is reflects the disk type free space categories as a percentage of the total as well as the actual free space size in gigabytes.

6.2.3.2. Field Definition

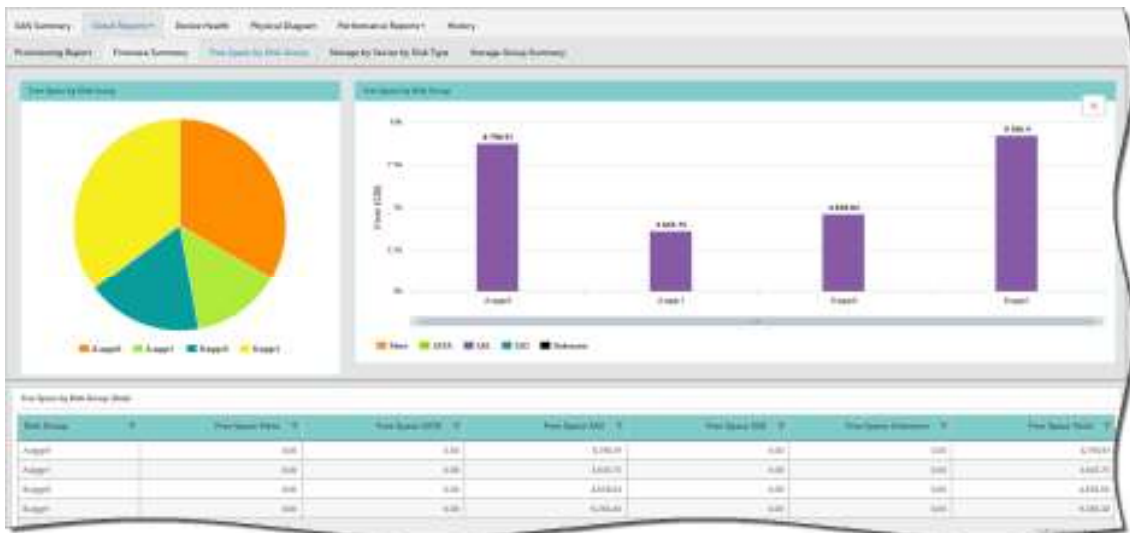


Figure 25: Free Space by Disk Group

Field Label	Description
Free Space by Disk Group	Pie chart reflecting the portion of free space by disk group
Free Space by Disk Group	Bar graph reflecting disk group by size (gigabyte) or percentage of total free space by disk type (Fibre, SATA, SAS, SSD, Unknown) <i>Hint: If the user clicks on the chart, the information will toggle between % and GB</i>
Free Space by Disk Group (Data)	
Disk Group	Disk group reflected by associated name
Free Space Fibre %	Percentage of disk group space allocated to Fibre
Free Space SATA %	Percentage of disk group space allocated to SATA
Free Space SAS %	Percentage of disk group space allocated to SAS
Free Space SSD %	Percentage of disk group space allocated to SSD
Free Space Unknown	Percentage of disk group space allocated to Unknown disk type

Table 28: Free Space by Disk Group Data Elements

## 6.2.4. Storage by Server by Disk Type

### 6.2.4.1. Description

The Storage by Server by Disk Type graphically demonstrates the size in gigabytes of each disk type currently configured on the device at the time of data collection. The disk types currently tracked are Fibre, SATA, SAS, SSD. All other disk types are included in the Unknown category.

### 6.2.4.2. Field Definition



Figure 26: Storage by Server by Disk Type

Field Label	Description
Storage by Server Type	Graph reflecting the allocated space for each host in gigabytes by disk type
Storage by Server Type Data	
Host Name	Client host name
Fibre	Disk storage space in gigabytes on the host for Fibre
SATA	Disk storage space in gigabytes on the host for SATA

Field Label	Description
SAS	Disk storage space in gigabytes on the host for SAS
SSD	Disk storage space in gigabytes on the host for SSD
Unknown	Disk storage space in gigabytes on the host for Unknown disk types
Total	Total gigabytes for all columns

Table 29: Storage by Server by Disk Type Data Elements

## 6.2.5. Storage Group Summary

### 6.2.5.1. Description

The Storage Group Summary report provides detailed information on the storage volume and pools on a device.

### 6.2.5.2. Field Definition

The screenshot shows a web-based interface for the Storage Group Summary report. At the top, there are navigation tabs: 'Home Summary', 'Client Overview', 'Device Health', 'Physical Diagnostics', 'Performance Reports', and 'History'. Below these are sub-tabs: 'Provisioning Report', 'Storage Summary', 'Thin Space by Disk Group', 'Storage by Server by Disk Type', and 'Storage Group Summary'. The main content area displays a table titled 'Storage Group Detail' with the following columns: Pool Name, Volume, Disk Type, Volume Allocated, Volume Used, Pool Size, Pool Used, Pool Allocated, Pool Allocated %, and Pool Used %. The table contains multiple rows of data for different storage groups.

Figure 27: Storage Group Summary

Field Label	Description
Pool Name	Client pool name
Volume	Client volume Name
Disk Type	Device disk type (Fibre, SATA, SAS, SSD, Unknown)
Volume Allocation	Amount of volume allocated as of date of data collection
Volume Used	Amount of volume used in gigabytes
Pool Size	Size of pool in gigabytes
Pool Used	Amount of pool used in gigabytes
Pool Allocated	Amount of pool allocated as of date of data collection
Pool Allocated %	Calculation = Pool Used divided by Pool Size
Pool Used %	Calculation = Pool Allocated divided by Pool Size

Table 30: Storage Group Summary Data Elements

## 6.3. Device Health

### 6.3.1. Description

The Device Health report reflects the health of a device and the area of concern. Alert messages are also included in the report to provide the client additional information.

### 6.3.2. Field Definition

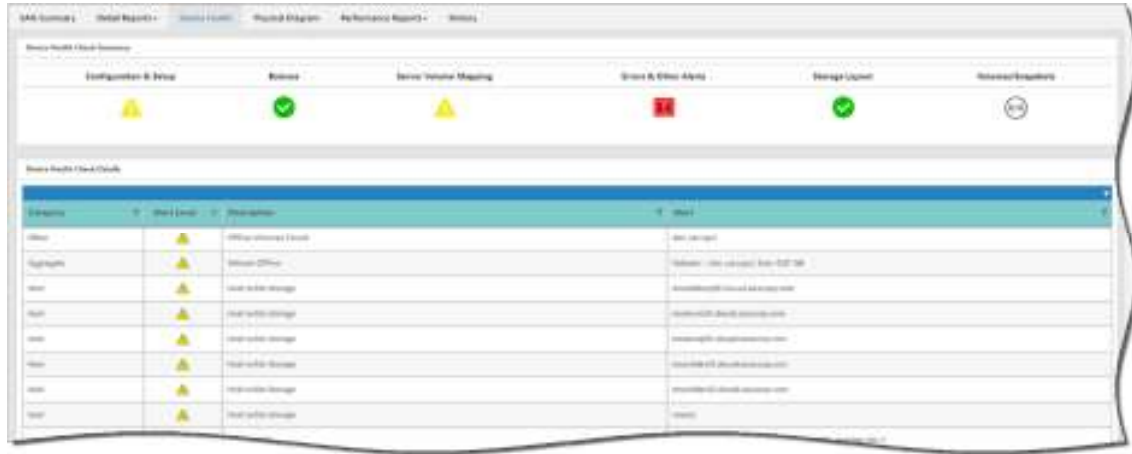


Figure 28: Device Health






Field Label	Description
Category	Device health check category (i.e. Aggregate, Host, Config)
Alert Level	Alert level icon    
Description	Description of the alert
Alert	Alert message providing additional information to assist in research

Table 31: Device Health Data Elements

## 6.4. Physical Diagram

### 6.4.1. Description

The Physical Diagram provides a graphical demonstration of the current device drives. This allows the client to easily identify drives that require attention, hot spares, and XXXX

*Note:* Left click the mouse on a disk icon will provide the user with additional information relating to the drive.  To remove the information box, left click the mouse again on the disk icon.

### 6.4.2. Field Definition

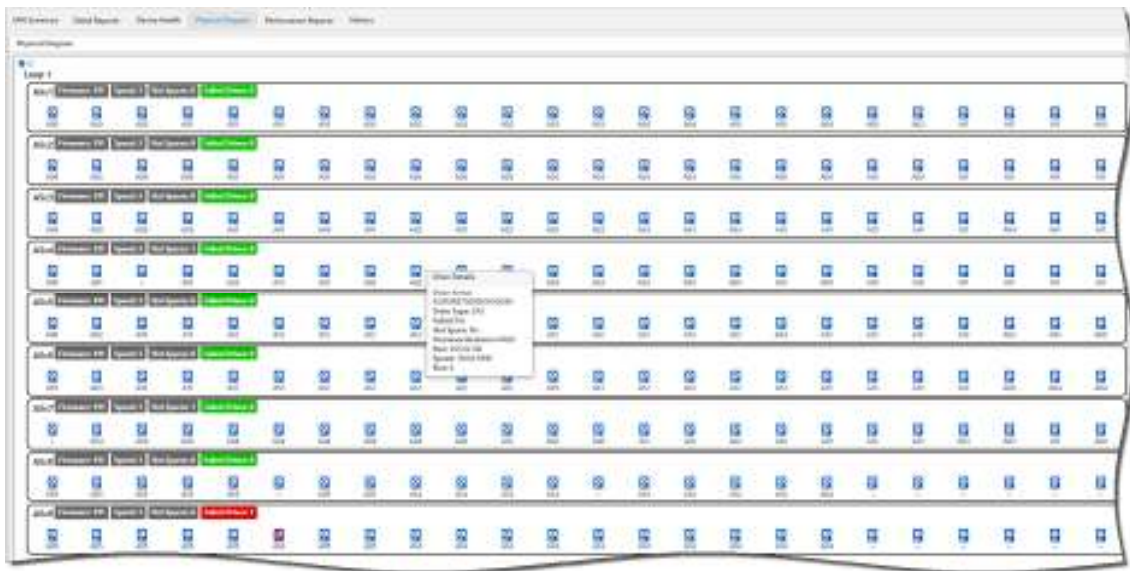


Figure 29: Physical Diagram

Field Label	Description
Firmware	Firmware level of the controller
Speed	Speed in gigabytes of the enclosure
Hot Spares	Number of hot spare drives
Failed Drives	Number of failed drives on

Table 32: Physical Diagram Data Elements



## 6.5. Performance Reports

### 6.5.1. IOPS by Array

#### 6.5.1.1. Description

The IOPS by Array report reflects the device trending performance of IOPS (Input/Output Operations Per Second) over time.

#### 6.5.1.2. Field Definition

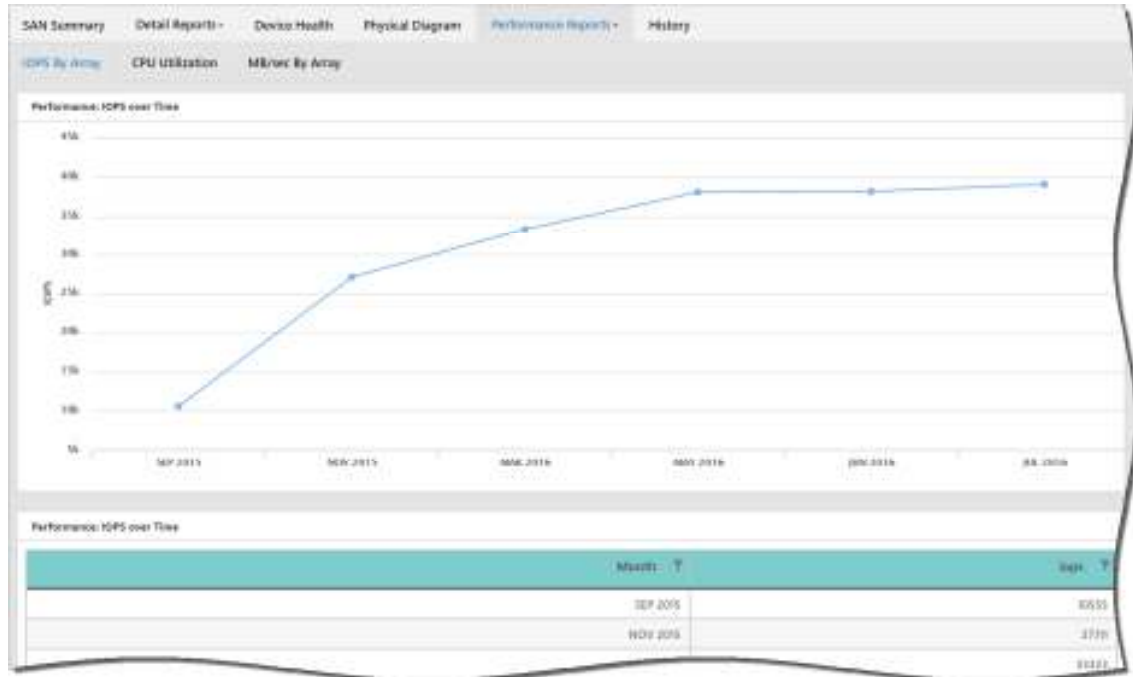


Figure 30: IOPS by Array

Field Label	Description
Month	Calendar month of data collection. <i>In the event a client should collect data more than once per month, the last collection date of the month will be used in this report.</i>
IOPS	Input/output operations per second

Table 33: IOPS by Array Data Elements

## 6.5.2. CPU Utilization

### 6.5.2.1. Description

The CPU Utilization report reflects the array trending performance of CPU utilization over time.

### 6.5.2.2. Field Definition

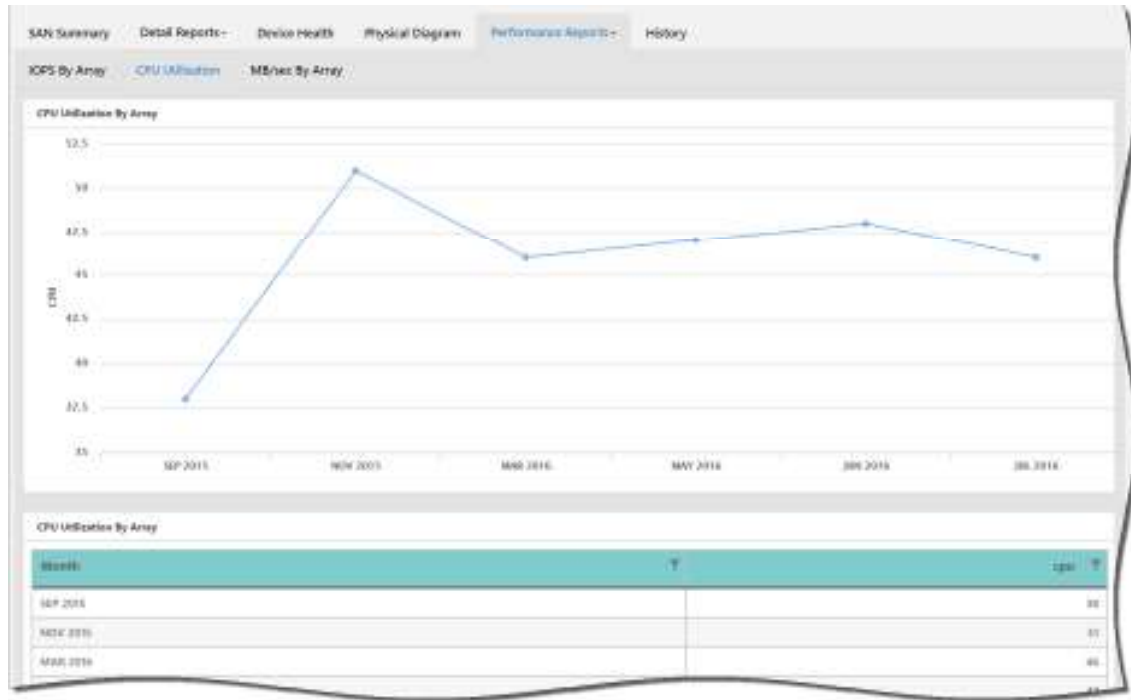


Figure 31: CPU Utilization

Field Label	Description
Month	Calendar month of data collection. <i>In the event a client should collect data more than once per month, the last collection date of the month will be used in this report.</i>
CPU	Utilization costs of each node in the array

Table 34: CPU Utilization Data Elements

### 6.5.3. MB/Sec by Array

#### 6.5.3.1. Description

The MB/Sec by Array report reflects the trending performance of the arrays as it related to megabytes per second.

#### 6.5.3.2. Field Definition

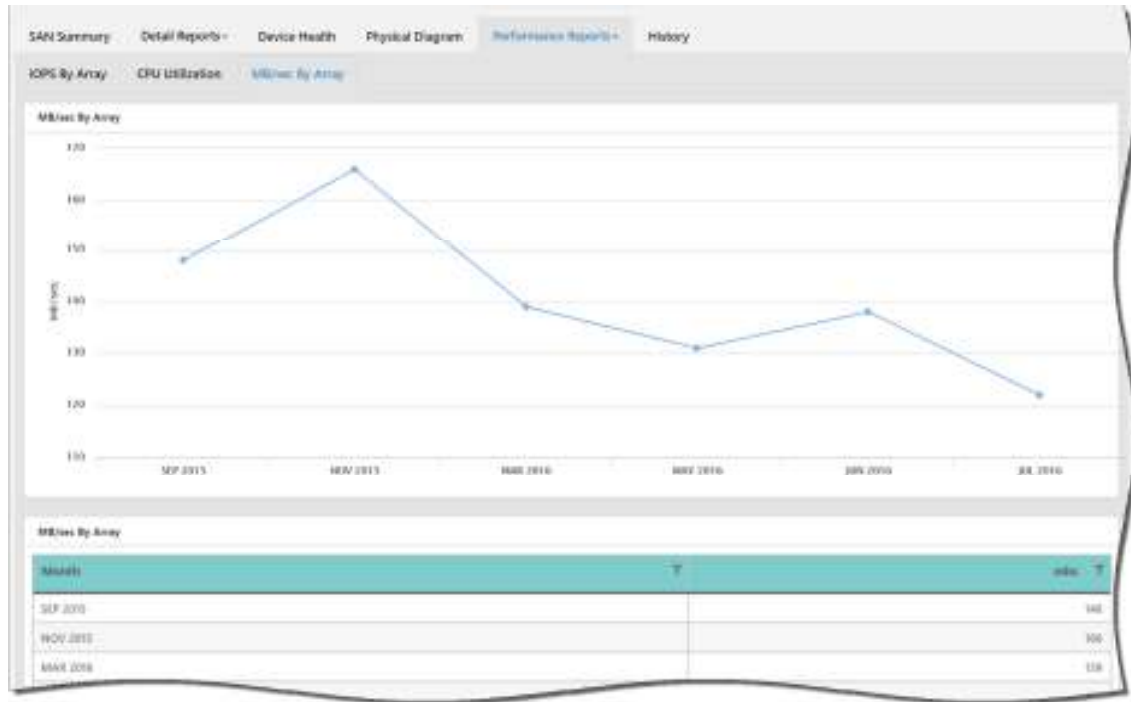


Figure 32: MB/Sec by Array

Field Label	Description
Month	Calendar month of data collection. <i>In the event a client should collect data more than once per month, the last collection date of the month will be used in this report.</i>
MBS	megabytes per second of the array

Table 35: MB/Sec by Array Data Elements

## 6.6. History

### 6.6.1. Description

The History Report reflects the trending space by month for Free, Used, Allocated and Capacity.

### 6.6.2. Field Definition

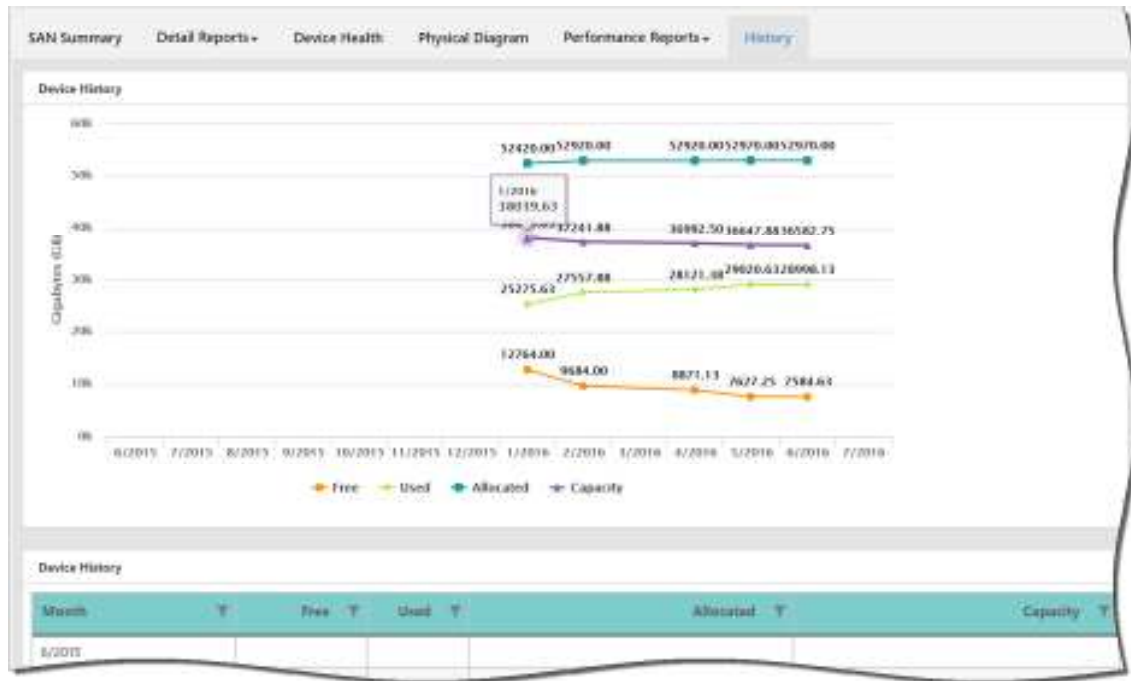


Figure 33: History Report

Field Label	Description
Month	Data collection month and year <i>Note: If a client collects data more than once during the month, the last collection date in that month will be used</i>
Free	Total free space on device as of collection date
Used	Total used space on device as of collection date
Allocated	Total allocated space on device as of collection date
Capacity	Total capacity on device as of collection date

Table 36: History Data Elements

## 7. HOST LUN SUMMARY

### 7.1. Description

The Host LUN Summary provides detailed information on the device disk type (Fibre, SATA, SAS, SSD, Unknown) configured on the Host. Additional details regarding the Pool(s) and volume are provided in the details.

### 7.2. Field Definition

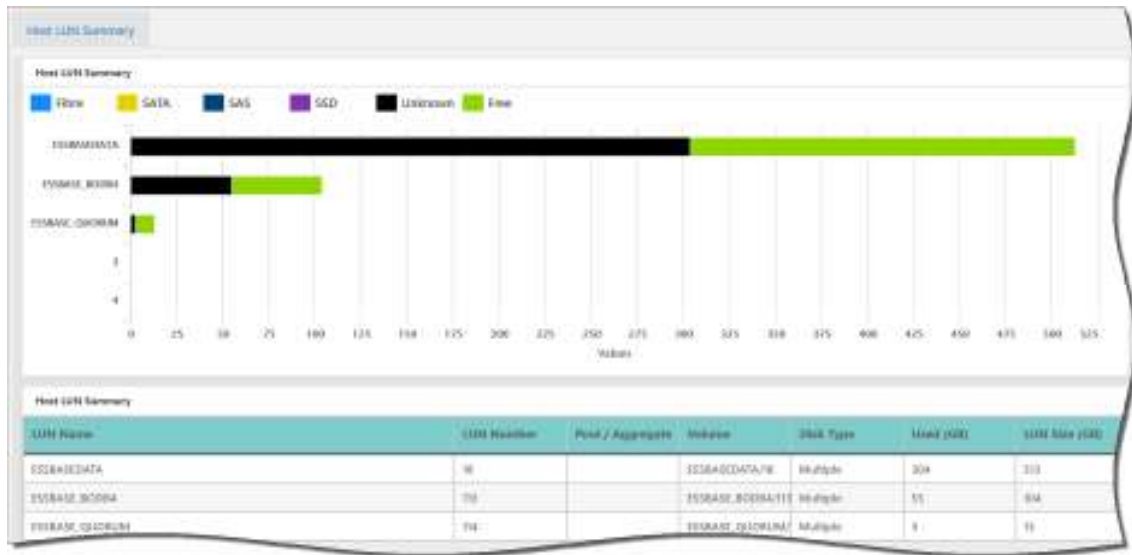


Figure 34: Host LUN Summary

Field Label	Description
Host LUN Summary	Graph reflecting the space on each host LUN that is used by disk type
LUN Name	Client host LUN name
LUN Number	Host LUN number
Pool/ Aggregate	Client pool or aggregate name
Volume	Client volume name
Disk Type	Disk type available on Host
Used (GB)	Space on host LUN that is used as of the data collection date
LUN Size (GB)	Total space on host LUN

Table 37: Host LUN Summary Data Elements

## 8. NEED HELP?

### 8.1. Online Documentation

This document is stored online for easy access. To retrieve the most recent version of this document, simply click on the User Guide option on the top navigation bar.



### 8.2. Support

- To contact the Support Team directly, click on the green Support button at the bottom of any screen



- The following dialog box will appear

A dialog box titled "Contact us" with a close button (X). It contains three input fields: "Your name", "Email address\*", and "How can we help you?". At the bottom, there are "Cancel" and "Send" buttons.

- Complete the requested information
- Click Send
- A response from the Support Team will be sent back via email