



STORAGE ARRAY MANAGEMENT WITH MOBILE APPS

EMC Proven[®] Professional Knowledge Sharing 2013



Vincenzo Orlando
SAN and Storage Administrator
enzorlando@gmail.com

EMC²

Table of contents

Introduction 4

Mobile Apps 5

 Main operating systems for mobile devices and APP distributions..... 5

 State of the art..... 6

 Unisphere APP considerations 6

 Function to create a logical device..... 10

 LUN masking and unmasking 10

References 12

Table of Figures

Figure 1: Storage Array Management GUIs examples.....	6
Figure 2: Unisphere web GUI – System List menu	7
Figure 3: Unisphere web GUI – Alerts menu	7
Figure 4: Main menu example (a) and System List view example (b) for Unisphere APP	7
Figure 5: CLARiiON secondary menu in Unisphere web GUI version.....	8
Figure 6: CLARiiON menu example (a) and System option example (b) for Unisphere APP	8
Figure 7: Esempio di menu non essenziale	9
Figure 8: Create LUN function in Unisphere GUI	10
Figure 9: LUN Masking with Unisphere GUI	11

Disclaimer: The views, processes or methodologies published in this article are those of the author. They do not necessarily reflect EMC Corporation's views, processes, or methodologies.

Introduction

Today's storage array vendors typically provide a combination of the following three solutions for management, monitoring, and reporting:

- Command Line Interface
- Web-based Graphical User Interface
- Client-based Graphical User Interface

These tools enable checking the health of a storage array and its components, configuration of logical devices, masking to external servers, displaying actual configuration, and so on.

However, using CLI on tablets and smartphones is not easy due to their small keyboards. Commands are quite long and it is hard to type them in with a touch keyboard.

Web-based GUIs are designed for PCs with MS Windows and Linux operating systems. They often use Java, don't require installation and, consequently, don't use a great deal of computing resources on the client PC. Despite a good browser, they have too many features to be used on a tablet.

Client-based GUI are designed for PC as well and are bound to a specific operating system version. They also require the installation of a client that uses computing resources on the client PCs.

There is a growing need for remote storage activities. Storage and SAN Administrators would like to be able to provide new logical volumes, create RAID groups, monitor system health, and perform daily activities as they would normally using a MS Windows or Linux PC, while avoiding the dimensions and weight of these devices.

Many administrators use a tablet or a smartphone to do several things, except for their Storage Arrays or FC Directors. While administrators would welcome the ability to satisfy a request for supply from their home, or look for an alert from a restaurant, or expand a logical pool from the park, this is not practical since only GUIs for MS Windows or Linux workstations are currently available.

None of the existing products has an App for Storage and SAN Administrators! Clearly, a GUI application for tablets and smartphones can improve the quality of their life!

This article focuses on generic issues about Storage and SAN Administrator apps for mobile devices, regardless of the specific operating system used.

Mobile Apps

A mobile app is an application designed for mobile devices, such as tablets and smartphones. Compared to a traditional application, a Mobile App has two main differences: the device on which it is used and a reduction in complexity that, through the elimination of extra elements, makes it lighter and faster.

Essentially, the App's main feature is to omit unnecessary elements.

Numerous types of Apps are sold, for example those used for e-commerce, electronic mail, calendar, contacts, games, for listening to the radio, TV, social networks, etc.

According to a research carried out from comScore in May 2012, Mobile Apps are used much more than the web. Yet, none of the existing products has an app for Storage and SAN Administrators!

Due to the small displays (maximum 10 inches) and the reduced memory and storage capacity of mobile devices, Mobile Apps are becoming essential. They must hold only necessary features, focusing on the health system and provisioning of new LUN's. Additionally, they should avoid long lists, for example through the use of a good layout and filter system. Finally, they should have a good monitoring system so as to avoid accidental deletion of important data.

Main operating systems for mobile devices and APP distributions

The most useful operating systems for mobile devices are:

1. Android (Google)¹
2. iOS (Apple)²

Android is the most widespread operating system for mobile devices and it is free. Since Android development is open there are many digital distributors.

The official distributor is Google Play³, which in 2012, surpassed 25 billion of downloaded applications in less than four years⁴. Other distributors are Amazon App-Shop⁵ and AppBrain⁶.

iOS is the operating system for Apple's iPhone, iPod, and iPad. The Apps official distributor in iOS environment is App Store.

State of the art

Today, most vendors provide a graphical user interface (GUI) for management of their products. However, these computer programs are very complex, often slow, and using them is difficult, particularly if the PC has a reduced computing capacity.

Some examples are:

Vendor	Application	Storage Array
EMC ⁷	Unisphere	CLARiiON, VNX, Celerra Series
EMC	SMC	Symmetrix/VMAX Series
HP ⁸	Storagework	XP Series
HP	Inform Management Console	3Par Series
IBM ⁹	TotalStorage Productivity Center	DS Series

Figure 1: Storage Array Management GUIs examples

These products were designed to be used on PCs; therefore, they are inadequate for tablets or smartphones. Vendors developed some apps as a way to advertise their products. For example HP StorageInfo¹⁰ Version 1.2.8 shows overview and technical characteristics for each HP storage array image, while NetApp Support¹¹ and EMC Support App¹² were developed to provide support and NetApp Document Search¹³ to look for documentation.

However, none enable storage array monitoring and management.

Unisphere¹⁴ App considerations

EMC enables management of its storage arrays such as CLARiiON, VNX, and VMAX through the Unisphere application.

The layout of Unisphere web GUI for PC is shown in Figure 2.

The main menu shows five secondary menus: Dashboard, System List, Domains, Alerts, and Support. For each selected menu, a corresponding list of information is shown. Figures 2 and 3, for example, show List and Alerts.

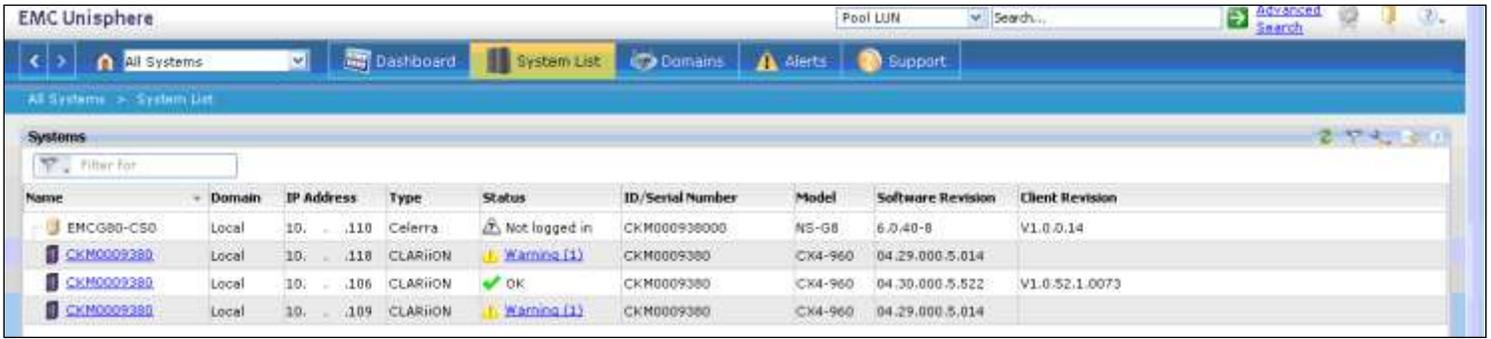


Figure 2: Unisphere web GUI – System List menu

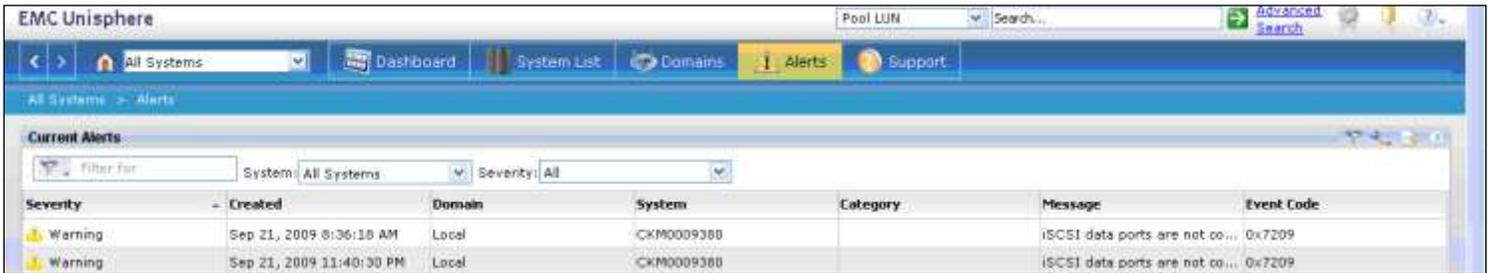
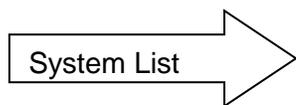
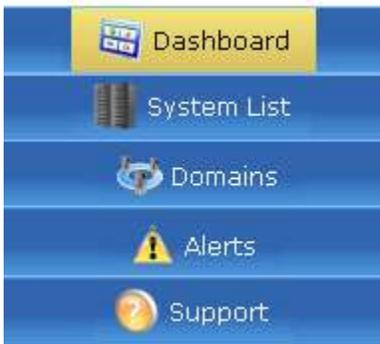


Figure 3: Unisphere web GUI – Alerts menu

This layout is not suitable for smartphones because of the small screen. It would be better to choose a menu such as the one shown in Figure 4a. The System List menu should show a shorter list of only essential information about the managed items (Figure 4b).



Name	Type	Model	IP Address
EMCG80-CS0	Celerra	NS-G8	10. . . 10
CKM0009380	CLARiiON	CX4-960	10. . . 18
CKM0009380	CLARiiON	CX4-960	10. . . 06
CKM0009380	CLARiiON	CX4-960	10. . . 09

a)

b)

Figure 4: Main menu example (a) and System List view example (b) for Unisphere App

The secondary menu changes depending on the choice from the main menu. Figure 5 shows an example of a CLARiiON secondary menu in Unisphere web GUI version.

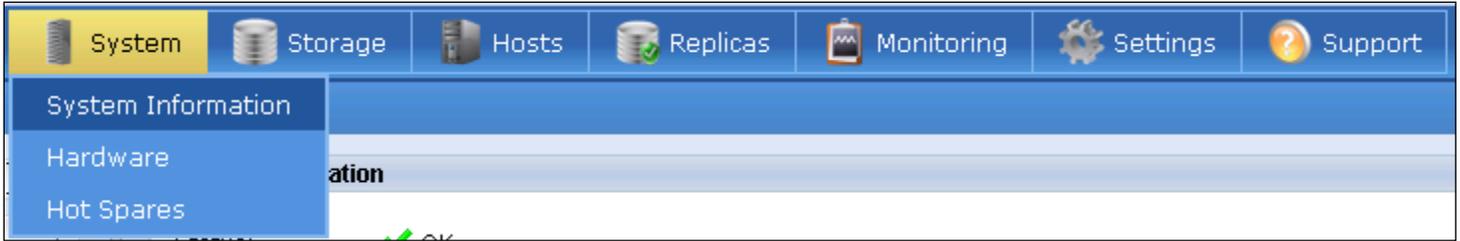


Figure 5: CLARiiON secondary menu in Unisphere web GUI version

This menu cannot be used on touch screen devices because of the animations.

It should be adapted for touch screen devices as shown in Figure 6.

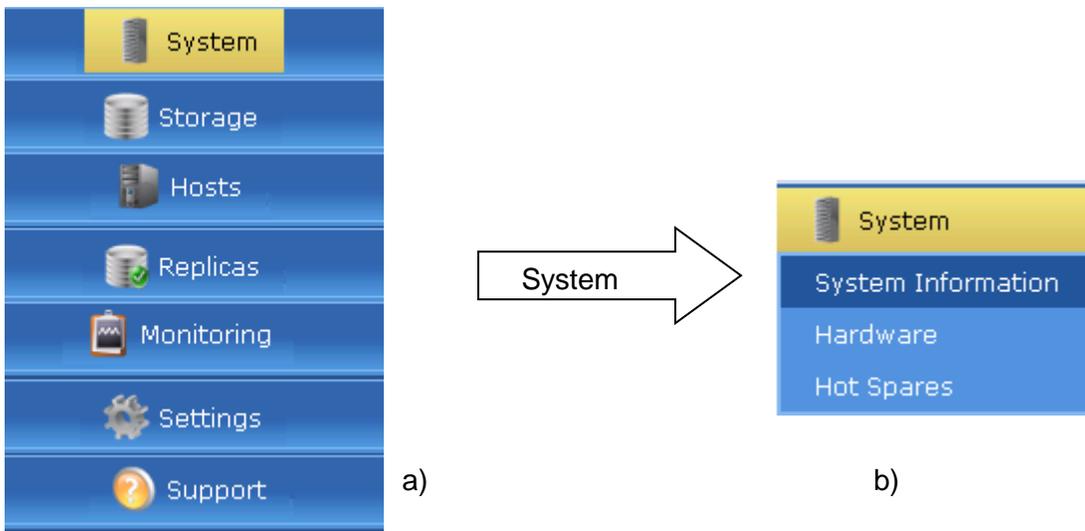


Figure 6: CLARiiON menu example (a) and System option example (b) for Unisphere APP

This is an example of a menu that is not suitable for an App because it contains too many animations and illustrations.

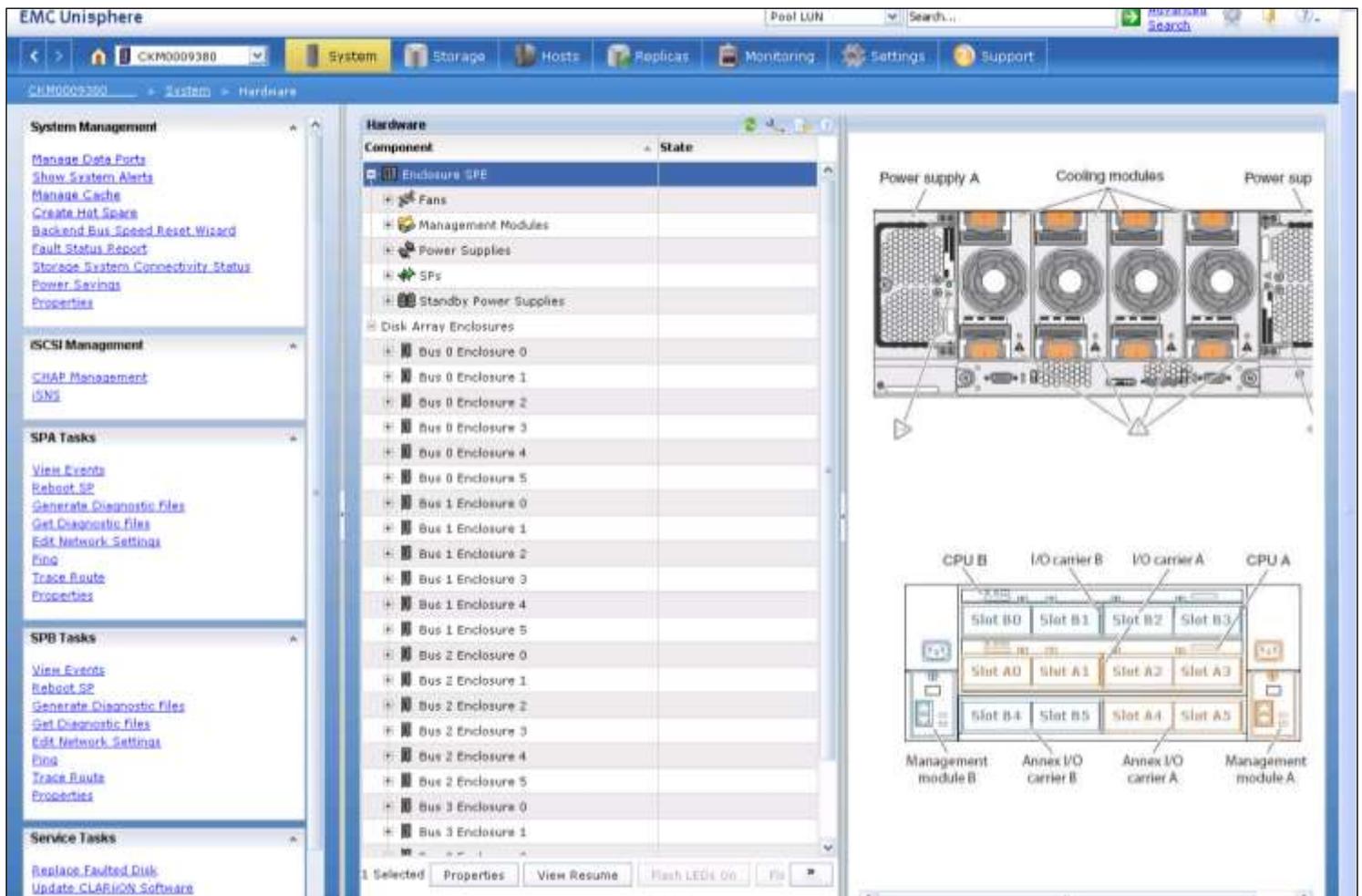


Figure 7: Esempio di menu non essenziale

Function to create a logical device

The functions used to create logical devices produces a pop up by clicking on the right button of the mouse. This choice is not possible with touch screen Apps since they do not have a mouse.

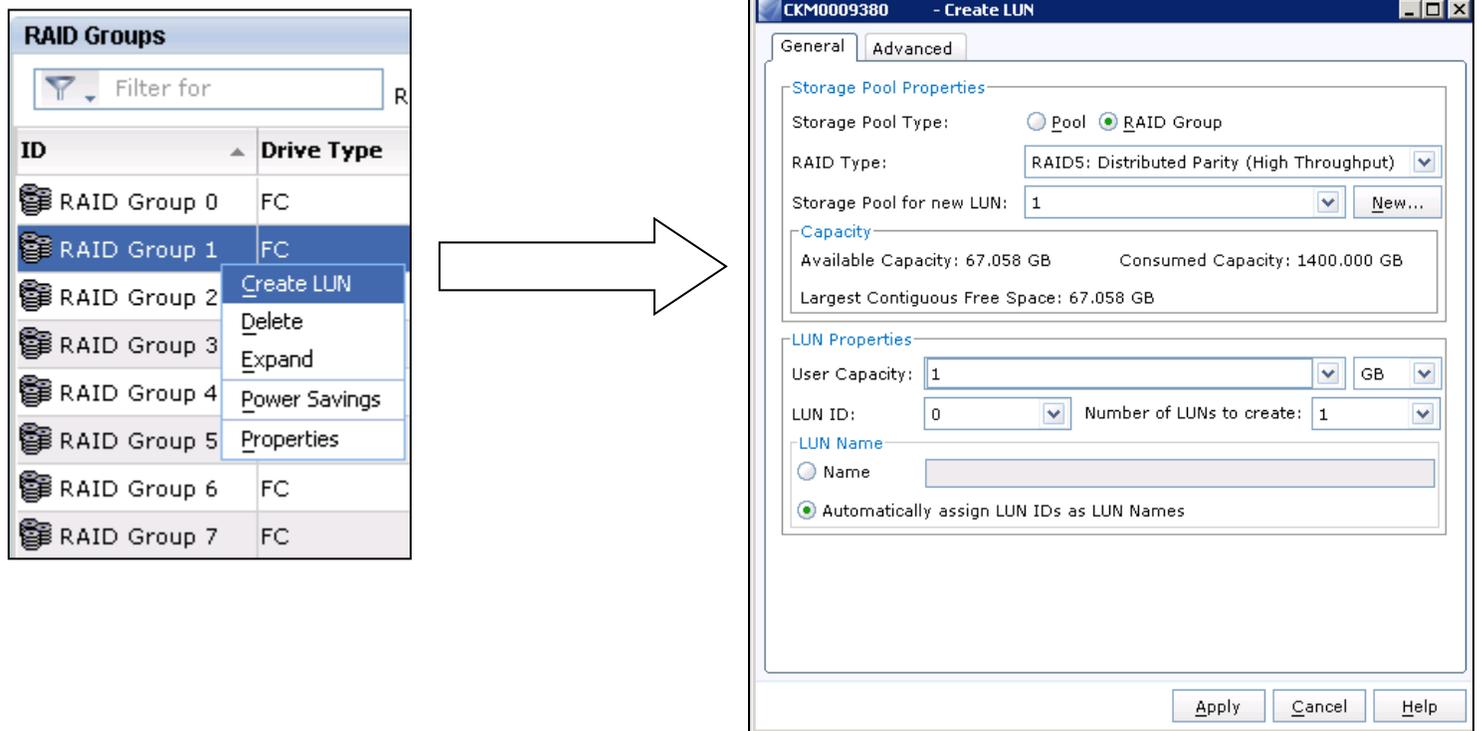


Figure 8: Create LUN function in Unisphere GUI

In this case, choices should be cascaded.

For example: Create LUN > choose RAID Group > fill in LUN parameters and apply.

LUN masking and unmasking

The pull-down method is not adequate for LUN masking on mobile devices. However, it is possible to add filters for the different choices so that long lists can be avoided. An app enables adding or cancelling a LUN to/from the storage group with a tap of a finger though this could be quite risky. Therefore, it is important to introduce adequate alerts.

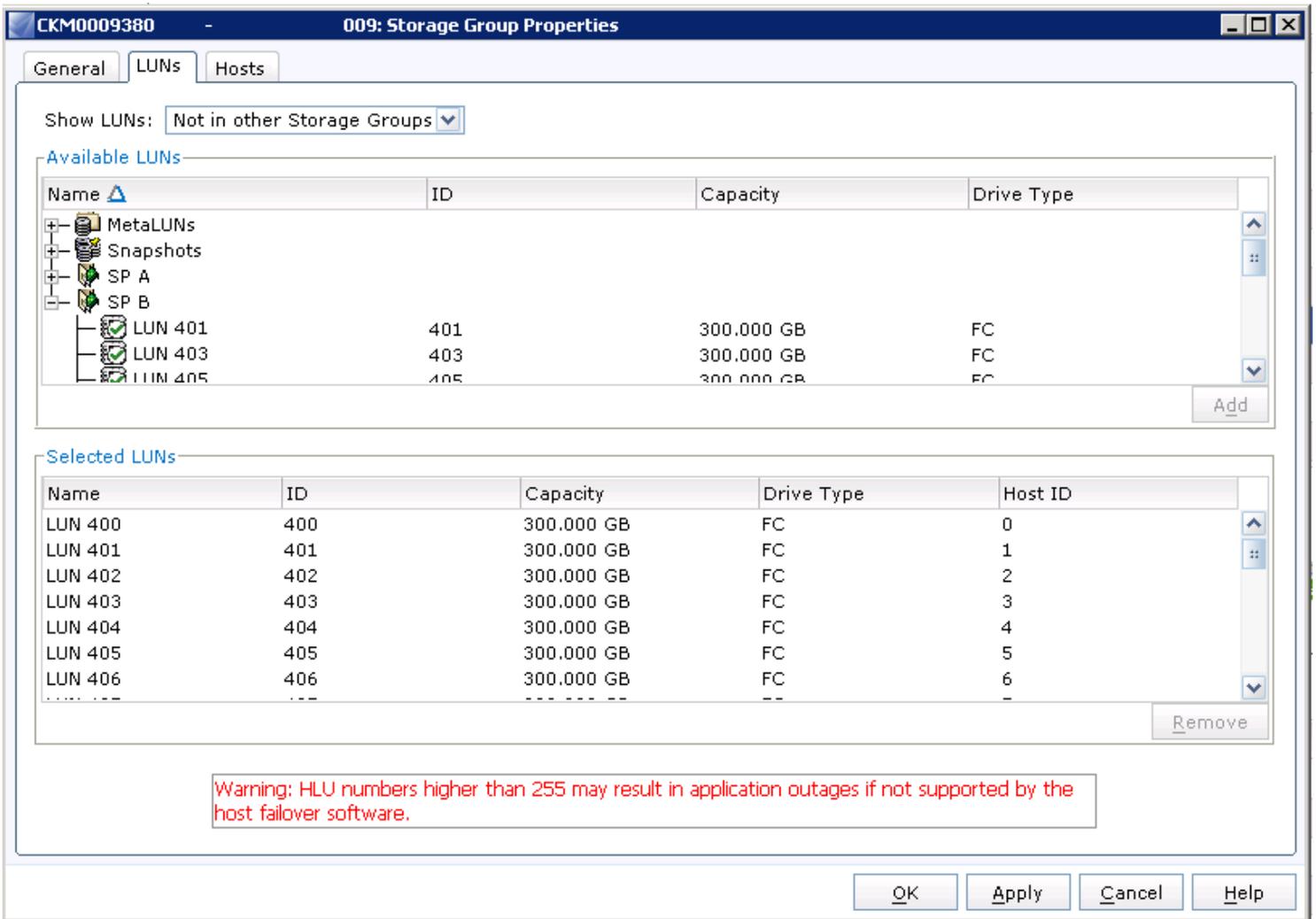


Figure 9: LUN Masking with Unisphere GUI

References

1 <http://www.android.com/>

2 <http://www.apple.com/it/ios/>

3 <https://play.google.com/store>

4 <http://www.t3.com/news/google-play-store-hits-25-billion-app-downloads>

5 <http://www.amazon.com/mobile-apps/b?ie=UTF8&node=2350149011>

6 <http://www.appbrain.com/>

7 <http://www.emc.com>

8 <http://www.hp.com>

9 <http://www.ibm.com>

10 copyright 2012 Hewlett-packard, written by Larry Bonnette HP Storage Technical Marketing Houston

11 <http://www.netapp.com/us/support/asup-app.aspx>; <https://play.google.com/store/apps/developer?id=NetApp,+Inc>

12 <http://www.emc.com/apps/support-mobile.htm>

13 <http://www.netapp.com/us/support/asup-app.aspx>; <https://play.google.com/store/apps/developer?id=NetApp,+Inc>

¹⁴ UNISPHERE is an EMC2 product. <http://www.emc.com/storage/vnx/unisphere.htm>

Biography

Vincenzo Orlando is a SAN and Storage Administrator for a large IT company in Naples, Italy. He holds a bachelor's degree in Computer Science achieved at Federico II University, in Naples. He has experience with EMC, HP, IBM, and HDS storage as well as Brocade and McData FC switches and directors environments. He is a certified EMC Proven Professional Storage Administrator Symmetrix Solutions Specialist.

Thanks to Margherita De Rogatis and Daniela Bianca for support.

EMC believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

THE INFORMATION IN THIS PUBLICATION IS PROVIDED "AS IS." EMC CORPORATION MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO THE INFORMATION IN THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Use, copying, and distribution of any EMC software described in this publication requires an applicable software license.