

# Huawei Storage Common Maintenance Skills

2020/9/2



Security Level:





# Foreword

The routine maintain including proactive alarm monitoring, health check, patch upgrade and software upgrade.

Huawei provides **SmartKit** and **eService** cloud management platform to simplify Deployment, Maintenance, Troubleshooting, etc.

The course introduces how to maintain Huawei storage product by SmartKit, eService, make sure the storage and service running stably.

# Contents

- 1. Storage Alarm Monitoring**
2. Storage Inspection
3. Storage Software Upgrade
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# Alarm and Event

There're 4 severity levels of alarms, Critical, Major, Warning and Info. Critical alarm need to pay attention and take immediate action. Major alarm need to be handled as soon as possible.

Ways to monitor storage alarm:

- Check alarm indicators in data center
- Login Device Manager or CLI command line to check alarm status
- Configure alarm notification by email, SM, Syslog server, SNMP Trap server, Huawei eService Call home. Third-part management software like Zabbix, UIM are supported.

# Alarm Masking

## ✓ Mask from CLI command line

```
admin:/>change alarm_mask alarm_id_list=0xF0C90003 mask_switch=on
```

WARNING: You are about to enable the alarm masking function. This operation will make the masked alarms are neither reported to the DeviceManager nor sent by email, short message, or syslog. But the alarm masking function does not affect email test alarms and short message test alarms.

Suggestion: Before performing this operation, ensure that the alarms need to be masked.

Have you read warning message carefully?(y/n)y

Are you sure you really want to perform the operation?(y/n)y

Change alarm 0xF0C90003 mask switch successfully.

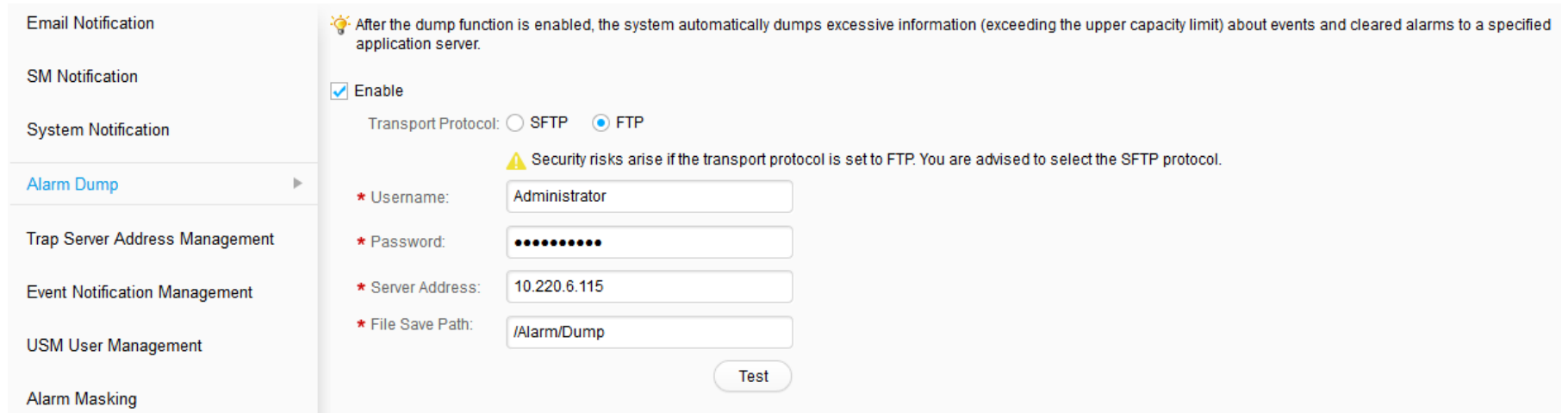
## ✓ Mask from Device Manager

The screenshot shows the 'Alarm Masking' configuration page in the Device Manager. The left sidebar has 'Alarm Masking' selected. The main area displays a table of alarms with the following columns: Alarm Name, Alarm ID, Category, Severity, Status, and Action. The 'Invalid License' alarm (ID 0xF0C90003) is selected. At the bottom, the 'Enable Alarm Masking' button is highlighted.

Alarm Name	Alarm ID	Category	Severity	Status	Action
Remote Replication Fails To ...	0xF01C0006	replication pair	Major	Disable	Not Exist
License Is About To Expire	0xF0C90001	license	Warning	Disable	Exist
License Has Expired	0xF0C90002	license	Major	Disable	Not Exist
<input checked="" type="checkbox"/> Invalid License	0xF0C90003	license	Critical	Disable	Not Exist
CPU Utilization Is Too High	0xF0C90004	controller	Warning	Disable	Not Exist
Memory Utilization Is Too High	0xF0C90005	controller	Warning	Disable	Not Exist
The System Has Entered Saf...	0xF0C90006	system	Critical	Disable	Not Exist
Failed To Monitor A Disk Encl...	0xF0CE0001	enclosure	Critical	Disable	Not Exist
Disk Enclosure Quantity Exce...	0xF0CE0002	enclosure	Warning	Disable	Not Exist
Failed To Identify A Controller ...	0xF0CE0004	enclosure	Major	Disable	Not Exist
Disk Enclosure Temperature ...	0xF0CE0005	enclosure	Major	Disable	Not Exist
Engine Or Disk Enclosure Te...	0xF0CE0007	enclosure	Major	Disable	Not Exist
Controller Enclosure Temper...	0xF0CE0008	enclosure	Major	Disable	Not Exist
Controller Enclosure Temper...	0xF0CE0009	enclosure	Critical	Disable	Not Exist

# Alarm Dump

Recommend to configure alarm dump to archive history alarm for further troubleshooting



The screenshot shows a configuration page for 'Alarm Dump'. On the left is a navigation menu with the following items: Email Notification, SM Notification, System Notification, Alarm Dump (highlighted in blue), Trap Server Address Management, Event Notification Management, USM User Management, and Alarm Masking. The main content area contains a warning icon and text: 'After the dump function is enabled, the system automatically dumps excessive information (exceeding the upper capacity limit) about events and cleared alarms to a specified application server.' Below this is a checked 'Enable' checkbox. The 'Transport Protocol' is set to 'FTP' (selected with a radio button), with 'SFTP' as an alternative. A yellow warning triangle icon is followed by the text: 'Security risks arise if the transport protocol is set to FTP. You are advised to select the SFTP protocol.' There are four input fields: 'Username' with the value 'Administrator', 'Password' with masked characters, 'Server Address' with the value '10.220.6.115', and 'File Save Path' with the value '/Alarm/Dump'. A 'Test' button is located at the bottom right of the form.

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# SmartKit Scenario-Based tools

- ✓ Tools controlled by user privilege
- ✓ Follow the wizard to complete the operation in various maintenance scenarios.

The screenshot displays a grid of seven scenario-based tool cards in the SmartKit interface. Each card features an icon, a title, a list of sub-tools, and a 'More >' link. The following table summarizes the content of each card:

Scenario	Sub-tools
Site Deployment Delivery	<ul style="list-style-type: none"><li>Site Deployment Quality Inspect...</li><li>UltraPath Installation</li><li>SNS Switch-Dedicated Site Dep...</li></ul>
Routine Maintenance	<ul style="list-style-type: none"><li>Health Check</li><li>SNS Switch Inspector</li><li>FusionStorage Block 6.X Inspec...</li></ul>
Troubleshooting	<ul style="list-style-type: none"><li>Storage Information Collection</li></ul>
Upgrade/Patch Installation	<ul style="list-style-type: none"><li>Upgrade Consultant</li><li>Pre-upgrade Site Survey</li><li>Device Upgrade</li><li>Hot Patch Installation</li></ul>
Capacity Expansion	<ul style="list-style-type: none"><li>Expansion Evaluation</li><li>Add Controllers</li><li>Add Disks/Disk Enclosures/Dis...</li><li>Expand Disk Domain / Storage ...</li></ul>
Migration	<ul style="list-style-type: none"><li>Pre-migration Site Survey</li><li>Pre-migration Site evaluation</li><li>MigrationDirector for NAS</li><li>MigrationDirector for Third Party ...</li></ul>
Parts Replacement	<ul style="list-style-type: none"><li>Parts Replacement</li></ul>



# SmartKit Tool Installation

- ✓ Different tools have different privilege control policy.
  - Hot Patch Installation tool applicable for product user, channel engineer, Huawei engineer
  - Device Upgrade tool applicable only for channel engineer and Huawei engineer
- ✓ Two ways to install tools in SmartKit
  - Download tool package from Support website and import to SmartKit
  - Directly install/upgrade from SmartKit, must authenticate user account and connect to Internet

All  Upgradable  Not Installed

Search 1   2

<input type="checkbox"/>	<b>FusionStorage OBS Service Test</b> FusionStorage_OBS_8.0.0.1_SelfTest.	Storage Distributed Storage	Site Deploy...	Not Installed <a href="#">Version</a>
<input type="checkbox"/>	<b>UltraPath Installation</b> <span>Hot</span> Provides one-site wizard-based UltraPath software installa...	Storage Enterprise Storage	Site Deploy...	Installed <a href="#">Version</a> <input type="button" value="Uninstall"/>

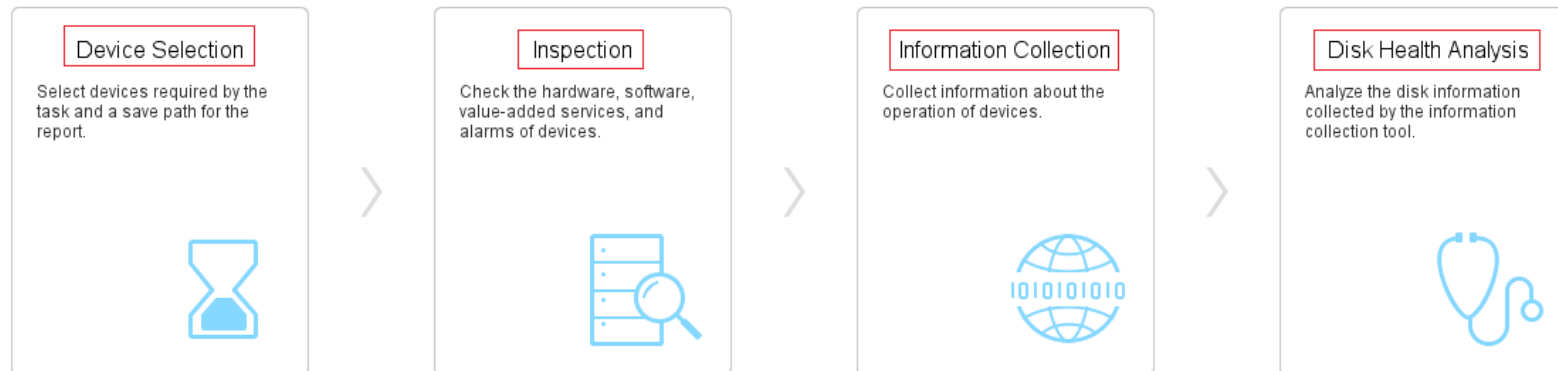
# Health Check

- ✓ Inspect both OS configuration and storage health status
- ✓ Collect storage log if there's failed inspections item
- ✓ Analyze disk health status if needed

## Health Check

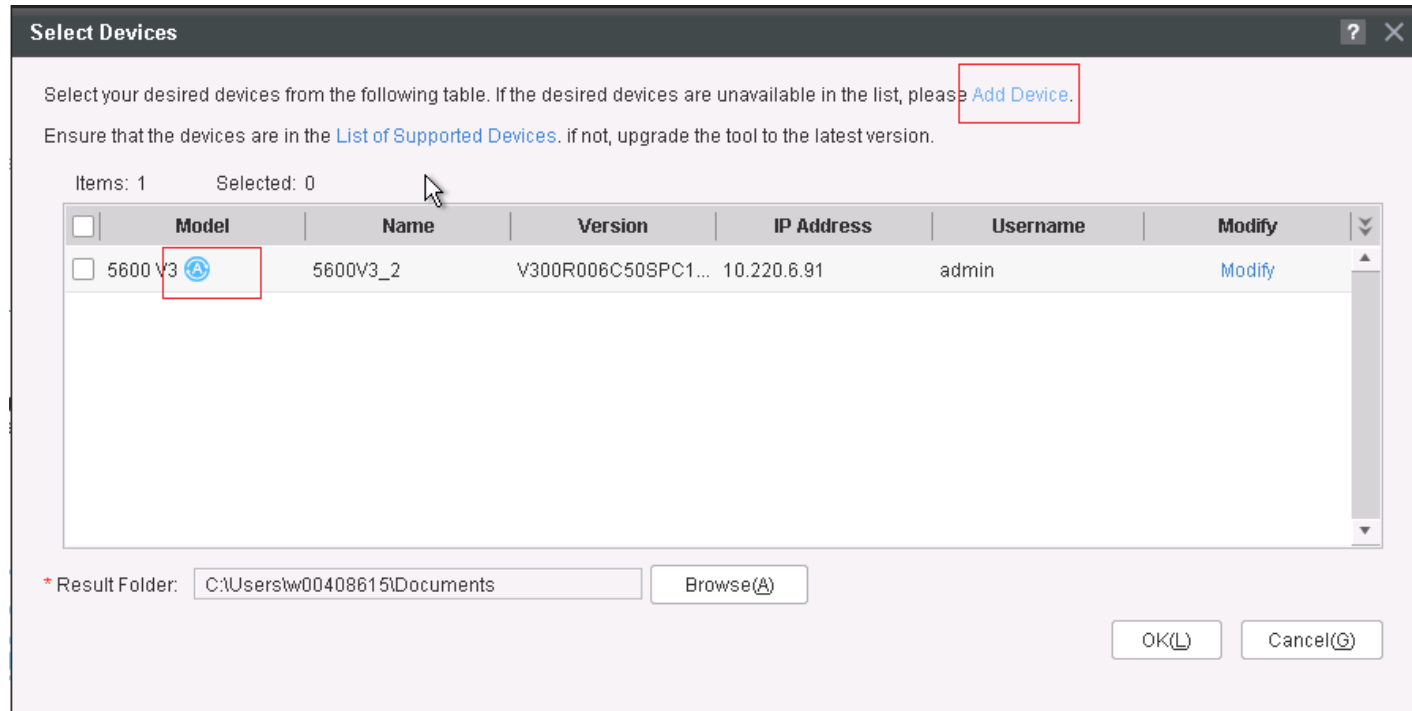
Used in the routine maintenance scenario of enterprise storage, OceanStor 9000, and FusionStorage, involving inspection, log collection, and disk health analysis.

 [Execute again](#)  [View report](#)



# HyperMetro Solution Inspection

Recommended to add both storage and typical hosts to inspect the whole solution together. Otherwise, some of the cross storage related configured can't be inspected





# Routine Inspection Plan

## Daily:

Check alarm indicators in datacenter

Check alarm status

## Quarterly:

Basic inspection and check risky and failed items

## Yearly:

Analyze disk health status (More frequently after 3 years)

Check Heat Dissipation, Dust, Vibration, Noise, etc.

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# Huawei Software Introduction

- ✓ Old Version Naming Policy: for example V300R006C50SPC100
  - V version means platform version
  - R version means Feature collection release
  - C version means Enhanced function release
  - SPC version means cold patch for bug fix
  - SPH version means hot patch for bug fix
- ✓ New Version Naming Policy(Start from Dorado V6): 6.0.1.SPH5. Similar like old version naming policy.
- ✓ Recommended software version and patch has thumb up label.

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OceanStor Dorado 3000 V6 6.0.0.SPH7 

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# Hot Patch Upgrade Principle

- ◆ Replace the Function/Code in memory
- ◆ No impact to service, but high workload may impact hot patch installation as the function/code may be frequently invoked/called.
- ◆ Hot patch can be uninstalled in command line(only delete in emergency situation, recommend to operate with TAC support).

```
developer:/>delete hotpatch
```

```
DANGER: You are going to delete the hot patch. This operation fails the existing hot patch.
```

```
Suggestion: Before you perform this operation, ensure that the correct patch is selected.
```

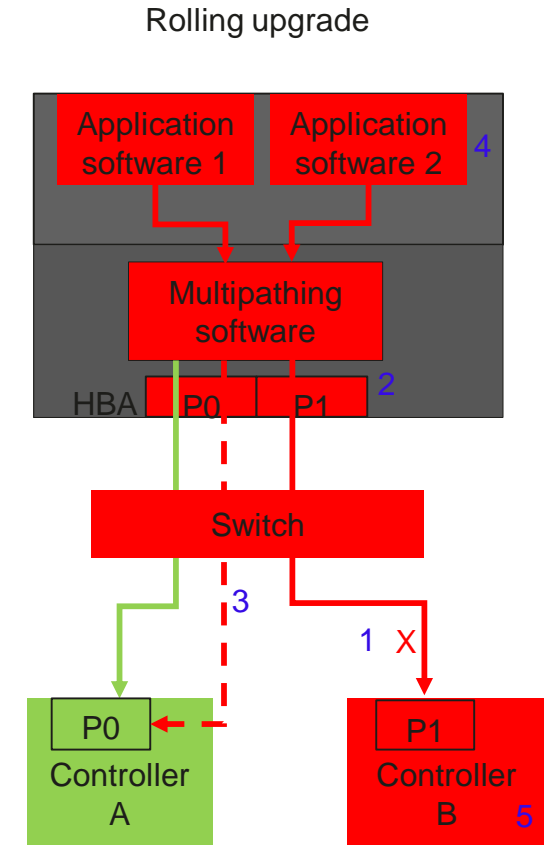
```
Have you read danger alert message carefully?(y/n)y
```

```
Are you sure you really want to perform the operation?(y/n)y
```

```
Processing... /
```

# Rolling Upgrade Principle

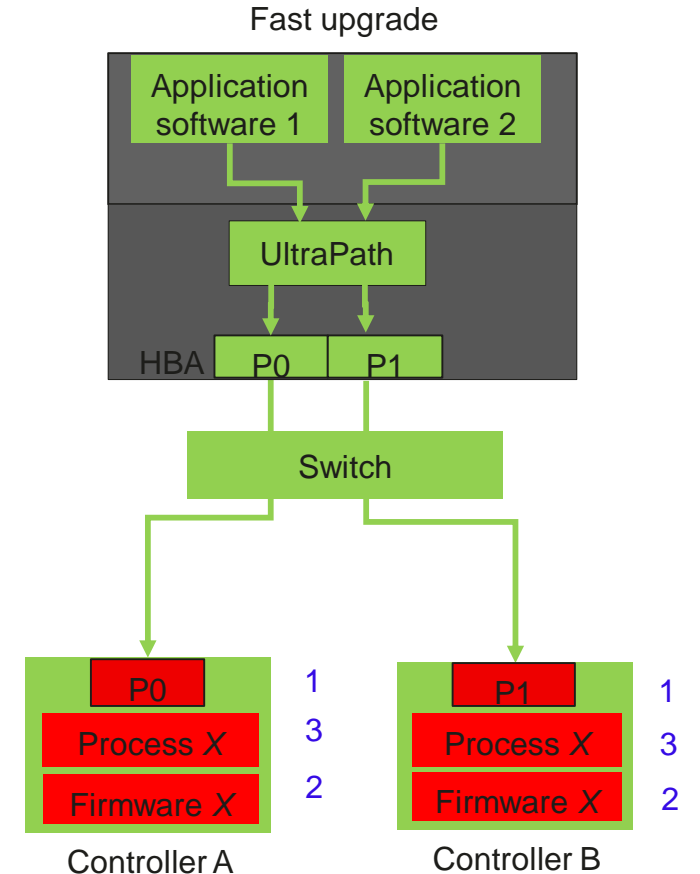
- ✓ Upgrade controllers in batches
- ✓ Upload firmware and software package -> Offline controller -> Upgrade firmware(BIOS, SES, SAS, etc.) -> Install software to system disk -> Reboot controller
- ✓ Shutdown P1 -> Host HBA report link fault -> Multipath software failover path to alive controller -> Application retries IO within a timeout period.
- ✓ Risk of rolling upgrade:
  - If the timeout period is shorter than that of the HBA driver, services will be interrupted.
  - Configuration issue cause path can't failover





# Fast Upgrade Principle(Dorado V6)

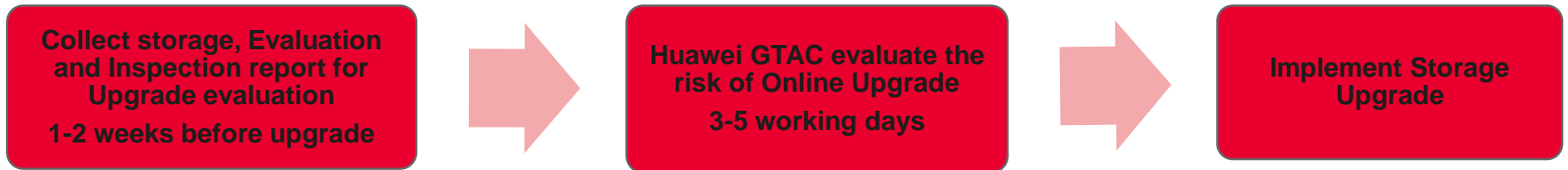
- ✓ Upgrade all the controllers at the same time
- ✓ Upload firmware and software package -> Upgrade firmware(SES, SAS, etc.) -> Upgrade component-based software
- ✓ Front-end interface module remain the host sessions -> The upgrade duration of I/O components is less than one second, the software upgrade duration is less than 10 seconds, and I/Os are not interrupted.
- ✓ Not all the software version support fast upgrade, around 2 years' internal





# Software Upgrade Process

Base line version upgrade only applicable for channel engineer and Huawei engineer, which is controlled by the upgrade tool. The recommended process for Baseline Version upgrade:

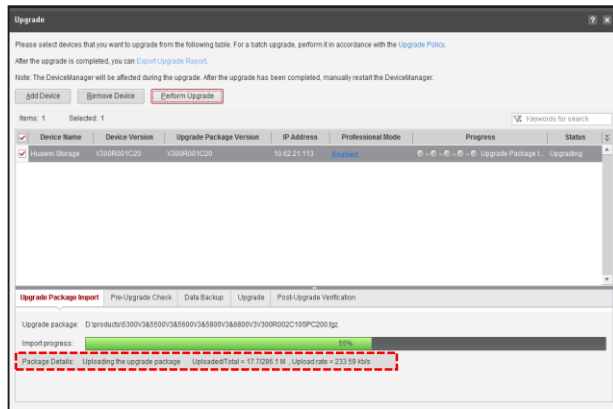


## Note:

- ① If skilled end customer need to do the upgrade by himself, download and import Array Upgrade tool for him, launch the tool without authenticate user account.
- ② For HyperMetro solution, should add host and both storages to Inspection tool and collect HyperMetro Inspection report.
- ③ Use the latest SmartKit and Array Upgrade tool

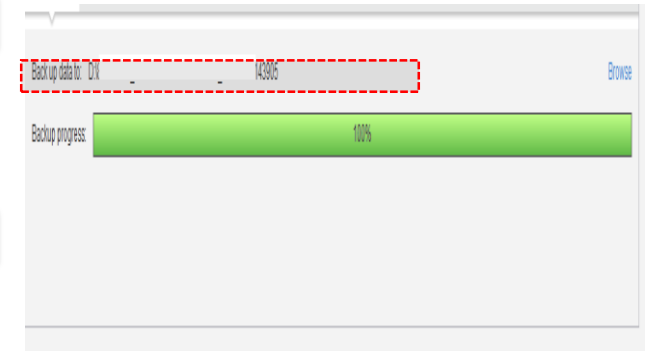
# Upgrade Operation

Strictly follow the upgrade guide released with software version



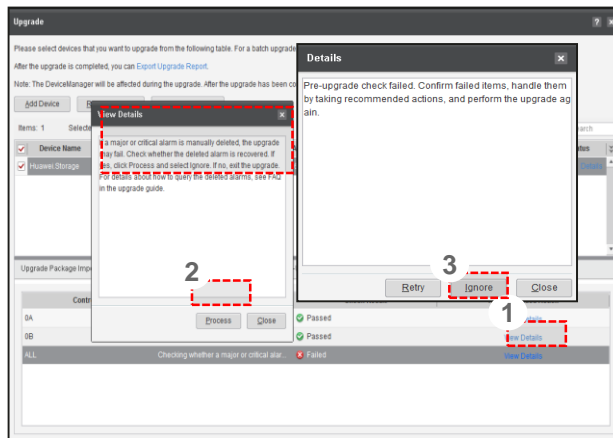
## Importing the upgrade package

Click **Perform Upgrade**, and then select and import the upgrade package. The progress bar is visible at bottom of the page.



## Pre-upgrade check

Check whether upgrade requirements are met. Based on the check results, you can view the errors, rectification suggestions, and handling operations.

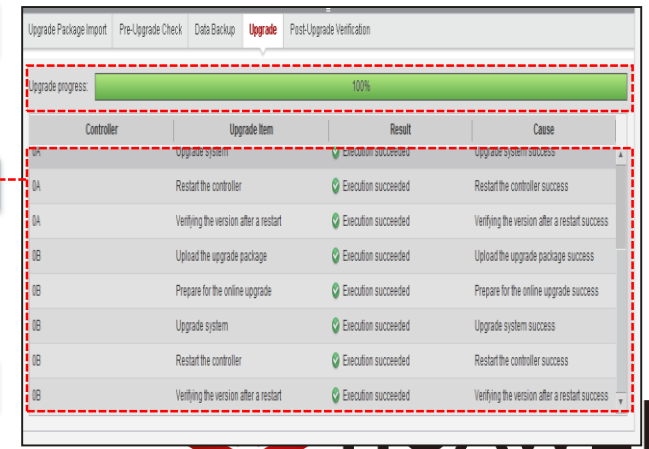


## Backup data

Backup the system configuration and license.

## Performing upgrade

During the upgrade process, the upgrade progress and process details are displayed on the **Upgrade** page.



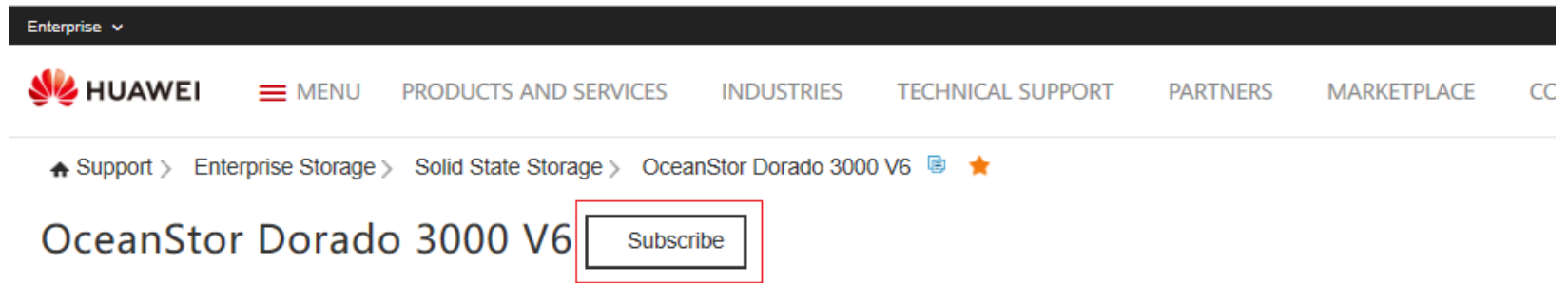
## Post-upgrade check

Check the basic status of the device.



# Storage Upgrade Plan

- ❑ Subscribe product notification on Support website



- ❑ Recommend to install the latest hot patch
- ❑ Recommend to install baseline version for new feature, big fix, Huawei notification.  
Normally, once per year

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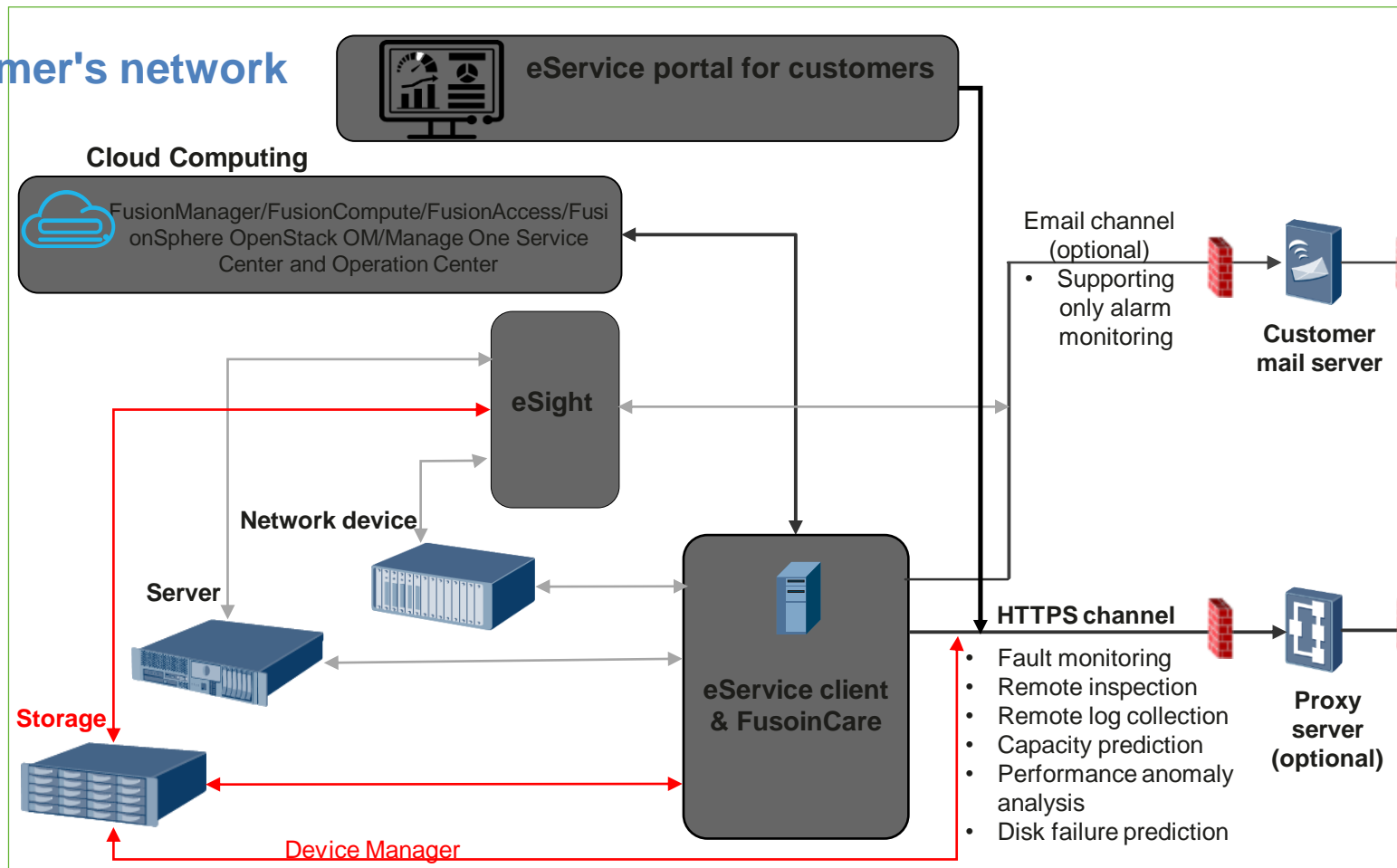


# eService Access

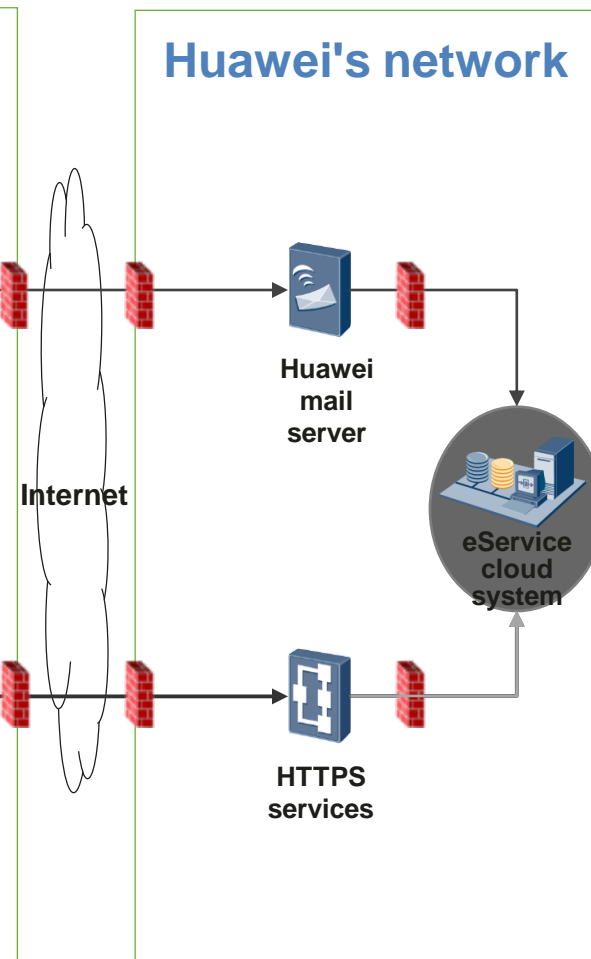
- Two main functions for eService
  - Call home service -- Controlled by eService contract
  - eService cloud management system -- Controlled by license
- The main procedures for eService access :
  - ① Prepare authorization letter(get template from support website)
  - ② <https://support.huawei.com/enterprise/en/enterprise-storage/eservice-pid-22379482>
  - ③ Software installation/configuration
  - ④ Contact TAC for authentication
  - ⑤ Self-access eService cloud management system

# eService System Architecture

## Customer's network



## Huawei's network



Email channel (optional)

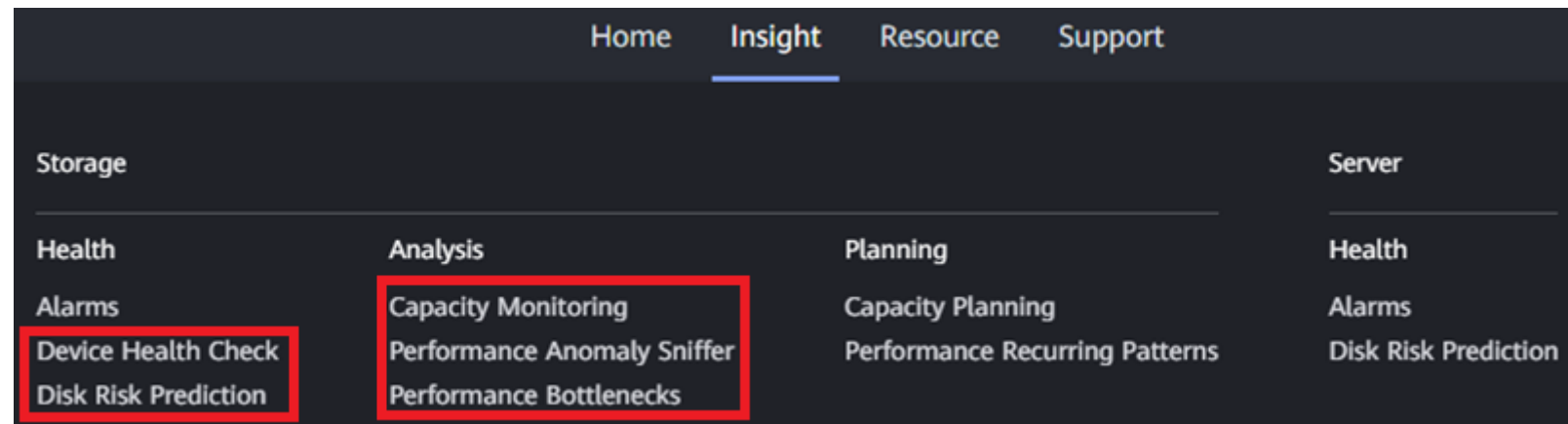
- Supporting only alarm monitoring

HTTPS channel

- Fault monitoring
- Remote inspection
- Remote log collection
- Capacity prediction
- Performance anomaly analysis
- Disk failure prediction

# eService Maintenance Functions

- ✓ Automatic alarm reporting and SR creation for all IT devices
- ✓ Risky Disk Identification
- ✓ Capacity trend predication
- ✓ Performance bottleneck predication
- ✓ Remote log collection and inspection (TAC engineer)
- ✓ Remote patch installation(Dorado V6) (TAC engineer)





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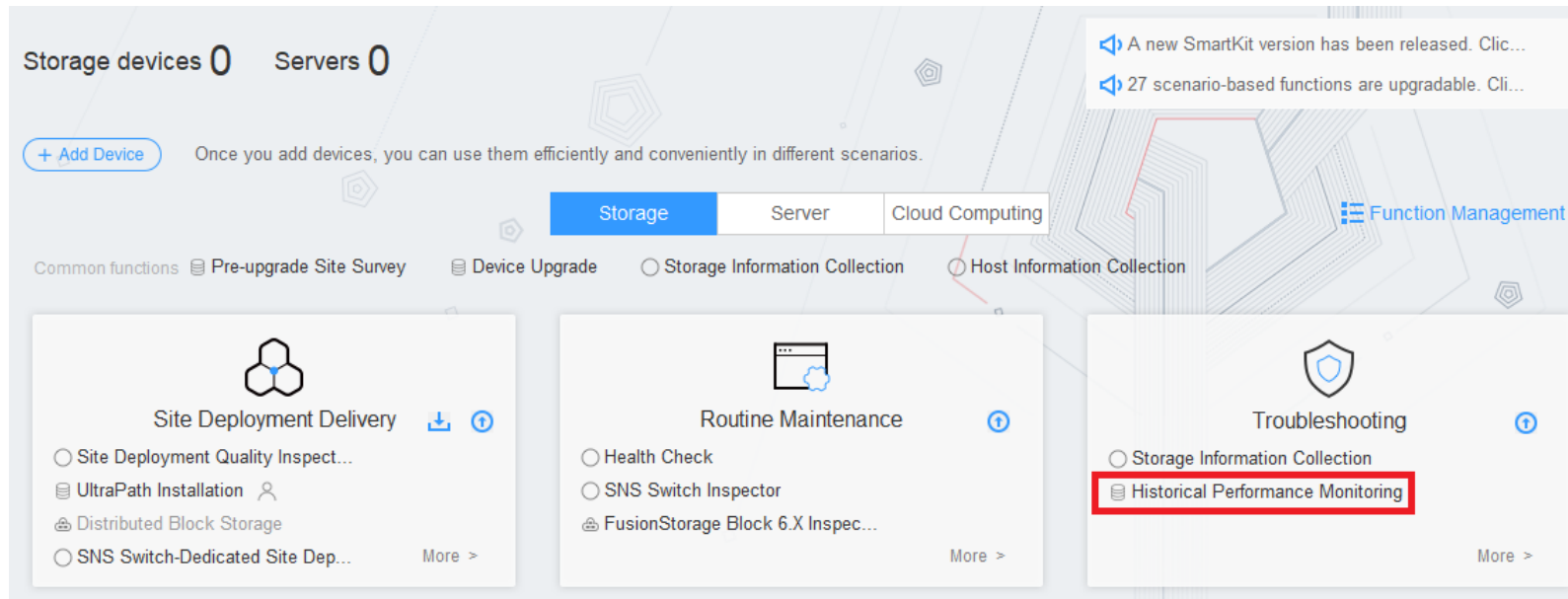


# Useful Resources

- Production Documentation(Including KB, Bulletins, Forum):  
<https://support.huawei.com/enterprise/en/category/enterprise-storage-pid-1482606575525?submodel=software>
- HyperMetro Solution Documentation: <https://support.huawei.com/enterprise/en/itsolution/bc-dr-solution-pid-21316944/doc>
- Storage Demo: <https://support.huawei.com/enterprise/en/tool/storage-simulator-TL1000000114>
- Compatibility Check: <http://support-open.huawei.com/ready/pages/user/compatibility/support-matrix.jsf>
- eDesigner:  
<http://app.huawei.com/unistar/edesigner/solutionAction!showHome.action?CsrfToken=fcf7b0643f8f4b37a35f70c25f9e1ff9>

# Performance Log Collection

- For dual-controller storage , export performance log files by SFTP tool or SmartKit (Historical Performance Monitoring)
- For Quad-controller storage(single engine), export performance log files by SmartKit





# Storage Command Line

- CLI: Command-line interface (CLI) views include the developer view, diagnostic view, engineer view, and user view. Users in different views have different operation permissions.
- Minisystem Mode: When a storage system fails to be started up or continuously resets, the storage system directly goes to a special mode, the minisystem mode. The minisystem mode is used for IP address change and environment recovery if system startup fails or an IP address is lost. Minisystem mode also can be used to diagnose network, by ping, telnet, tcpdump.sh etc.
- Serial Port mode: The serial port mode allows users to log in to a storage system using serial ports. Normally, we can use serial port mode to initialize password, or access BMC to diagnose hardware.

# Thank you.

Bring digital to every person, home and organization for a fully connected, intelligent world.

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