Обслуживание и диагностика EMC VNX

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OCS DISTRIBUTION

1. **Возможные проблемы в СХД**
   - **Сервера**
   - **Коммутаторы**
   - **Массив**
2. **Методы диагностики ошибок**
   - **Просмотр и сбор логов**
   - **Анализ логов**
   - **Средства диагностики**

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Возможные проблемы в СХД

Обслуживание и диагностика EMC VNX

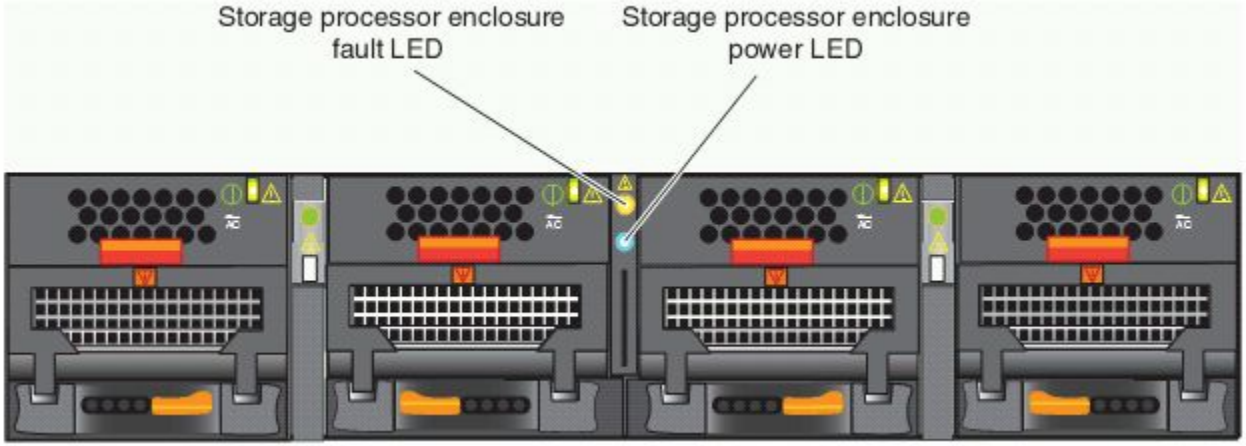
OCS DISTRIBUTION

Возможные проблемы в СХД

1. Ошибки на серверах
   - сбои HBA
   - настройки ПО
2. Ошибки на коммутаторах
   - Сбои SFP
   - Отказ Блоков Питания
   - ПО
3. Ошибки на массиве
   - системные ошибки
   - настройки ПО

Возможные проблемы в СХД

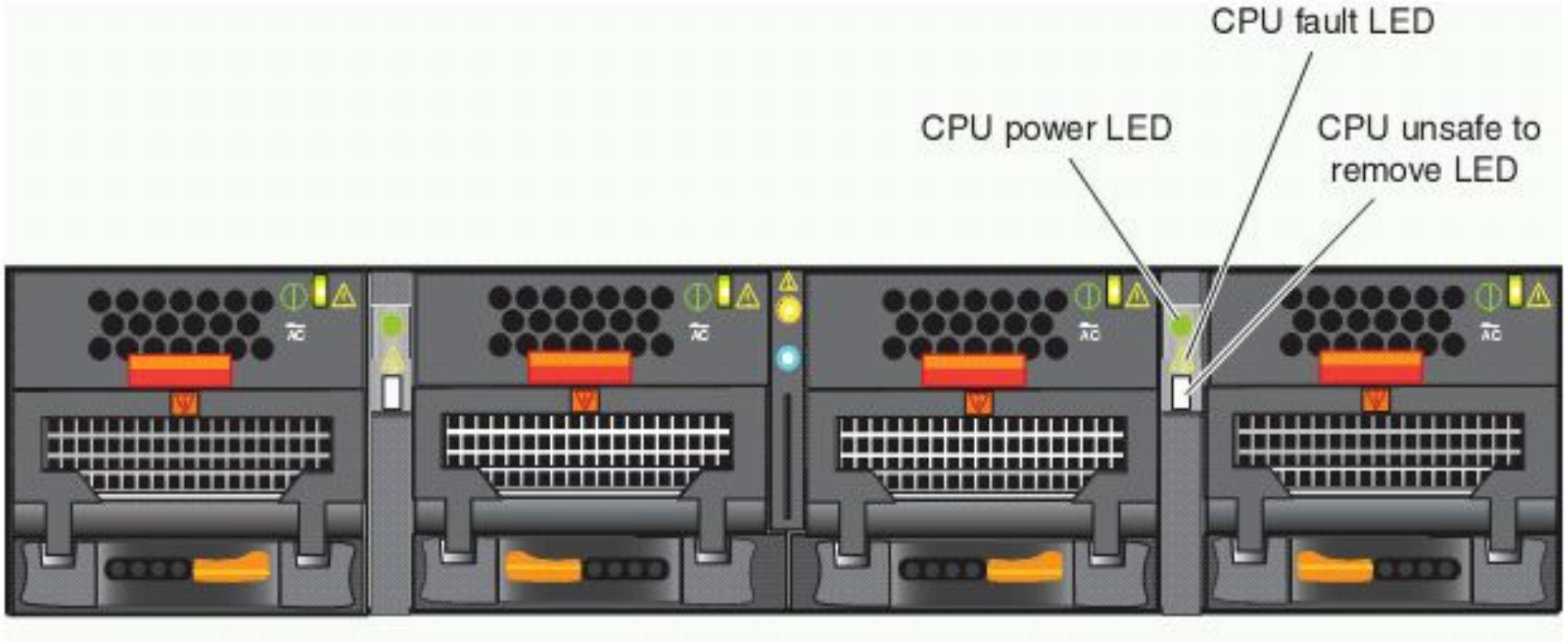
Индикация VNX5700 (подробнее в «Hardware Information Guide»)



LED	Color	State	Description
Power	Blue	On	Storage processor enclosure is powered up and all the FRUs in the enclosure are operating properly
	—	Off	Storage processor enclosure is powered down.
Fault	Amber	On	A FRU failed within the enclosure.
	—	Off	Storage processor enclosure operating normally.

Возможные проблемы в СХД

Индикация VNX5700



Возможные проблемы в СХД

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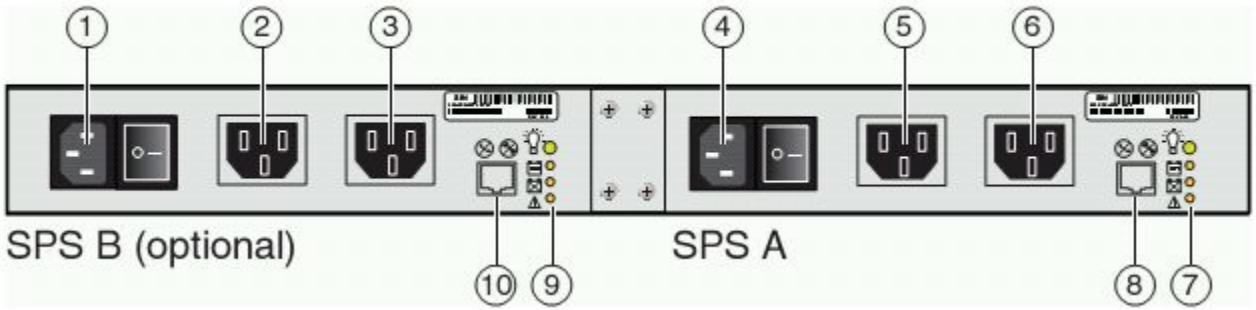
Индикация VNX5700

LED	Color	State	Description
Power	Green	On	Storage processor is powered up and all FRUs in the Data Mover are operating properly.
	—	Off	Storage processor is powered down.
Fault	Amber	On	Storage processor has faulted.
		Blinking	Storage processor goes through six stages of power up: 1. Executes a BIOS check, blinking once every 4 seconds 2. Executes a POST check, blinking once every second 3. Loads the operating system, blinking four times a second
	Blue (see Note)		4. Operating system loaded, blinking once every 4 seconds 5. Operating system starting operating system drivers, blinking once every second 6. Operating system drivers operating, blinking four times a second
	—	Off	Storage processor operating normally.
Unsafe-to-remove	White	On	Storage processor is unsafe to remove.
	—	Off	Storage processor is safe to remove.
Note: The fault LED changes color from amber to blue when the operating system is loading, see step 4 in the description.			

Возможные проблемы в СХД

Индикация VNX (SPS)

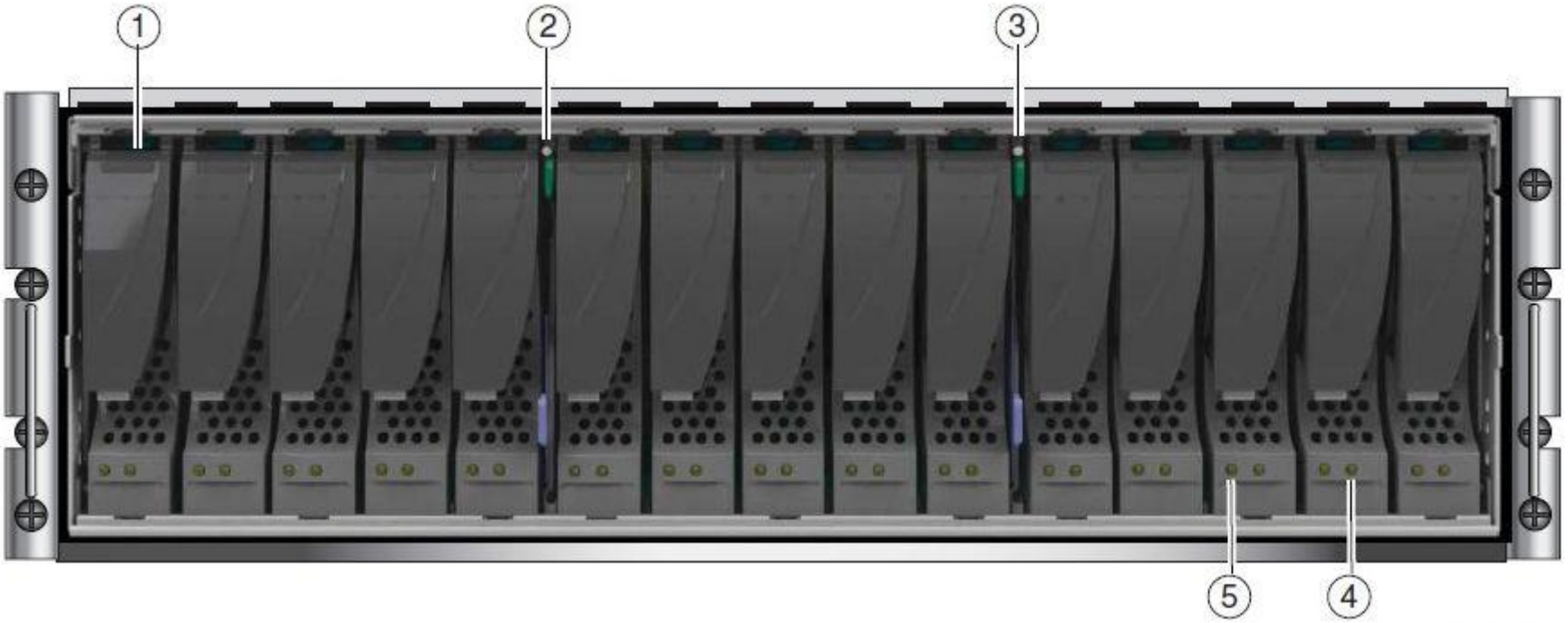


1	SPS B AC power in (recessed plug)	6	Power out socket to LCC A on the 1st DAE (ID 2)
2	Power out socket to LCC B on the 1st DAE (ID 2)	7	Four SPS A status LEDs (green and amber)
3	Power out socket to the SP B power supply on the SPE	8	SPS A to SP A management (RJ-12) connector
4	SPS A AC power in (recessed plug)	9	Four SPS B status LEDs (green and amber)
5	Power out socket to the SP A power supply on the SPE	10	SPS B to SP B management (RJ-12) connector

Led	Color	State	Description
SPS power	Green	On	SPS ready and operating normally; battery fully charged
		Blinking	On/battery charging
	—	Off	Off/disconnected

Возможные проблемы в СХД

Индикация VNX5300

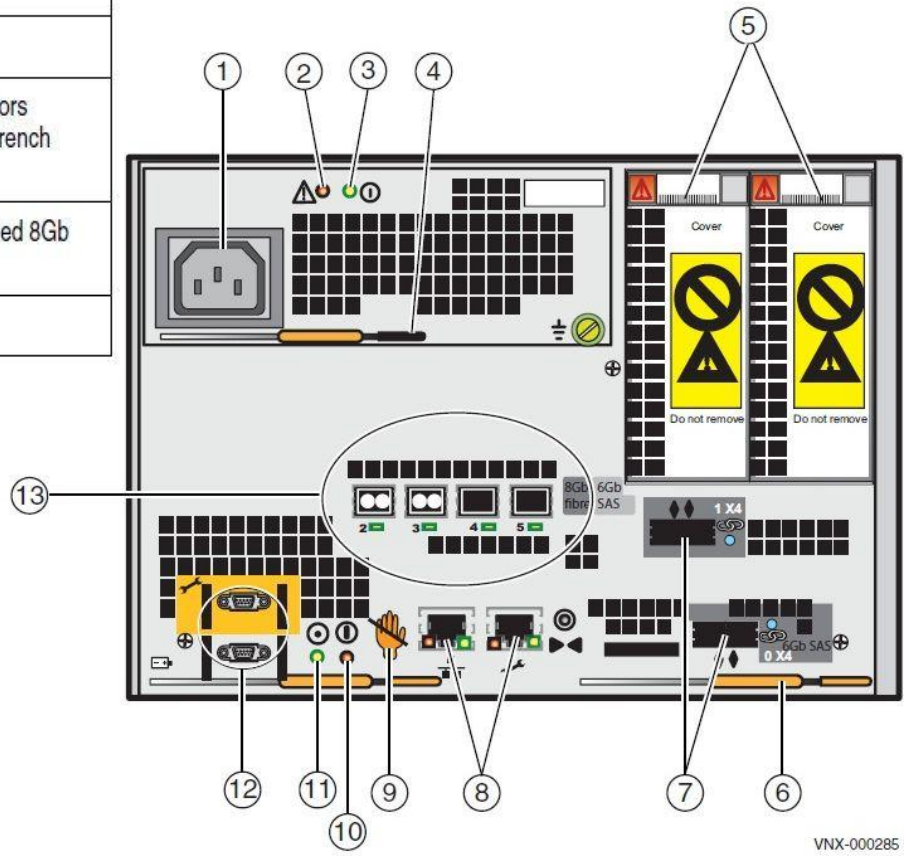


1	3.5-inch 6-Gb/s SAS drives or 6-Gb/s NL-SAS disk drives	4	Disk drive fault LED (amber)
2	DPE fault LED (amber)	5	Disk drive on/activity LED (green)
3	DPE power on LED (blue)		

Возможные проблемы в СХД

Индикация VNX (SP)

1	AC power in connector (recessed plug)	8	Two RJ-45 (management and service laptop) connectors (labeled with a network management symbol and a wrench symbol, respectively)
2	Power supply fault LED (amber)	9	SP unsafe to remove LED
3	Power supply power on LED (green)	10	SP fault LED (amber)
4	Power supply latch handle	11	SP power on LED (green)
5	Two I/O module slots showing one four-port 8-Gb/s Fibre Channel (FC) I/O module and one four-port 1-Gb/s iSCSI I/O module	12	Two RS-232/EIA (micro DB-9) connectors (labeled with a battery symbol and a wrench symbol, respectively)
6	Two SP latch handles (bottom left and right)	13	Four 8-Gb/s Fibre Channel ports (labeled 8Gb fibre 2, 3, 4, and 5)
7	Two 6-Gb/s SAS ports		



Возможные проблемы в СХД

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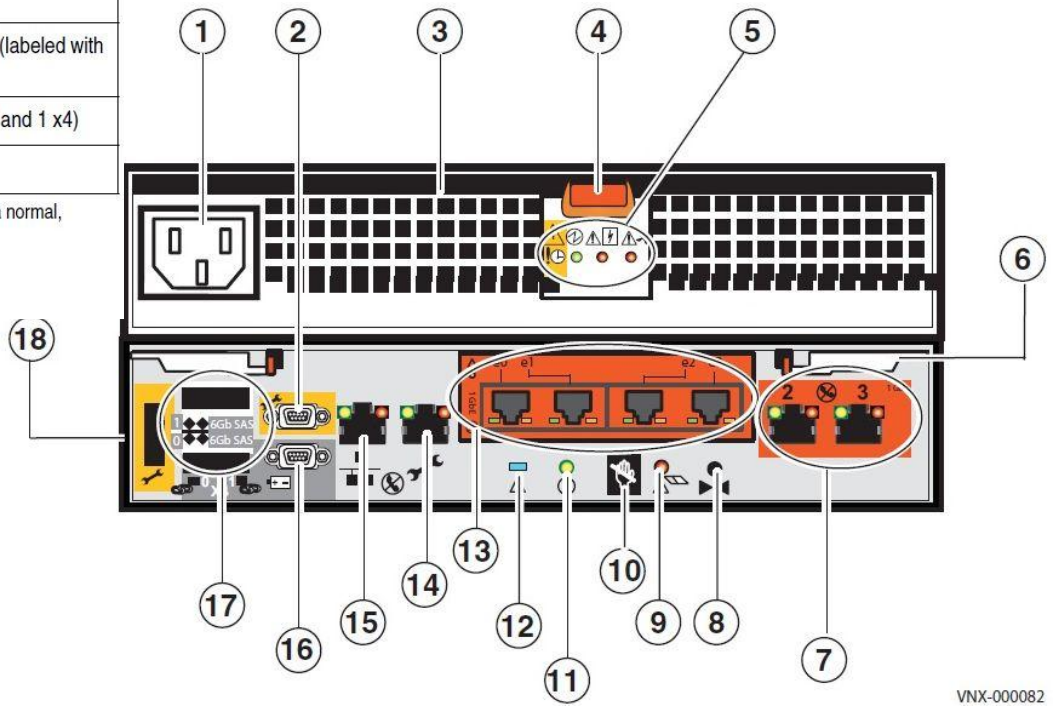
Индикация VNXe3100

1	AC power in connector (recessed plug)	10	SP unsafe to remove LED (white)
2	RS-232/EIA (micro DB-9) connector (labeled with a wrench symbol)	11	SP power LED (green)
3	Power supply module	12	SP status/fault LED (amber/blue[a])
4	Power supply latch handle (top, middle)	13	Four-port 1-Gb/s (1000BASE-T) copper Ethernet I/O personality module (labeled e0. e1, e2, and e3)
5	Power supply module status LEDs	14	Service LAN (RJ-45) port (labeled with a wrench symbol)
6	SP latch handle (middle, left and right)	15	Management LAN (RJ-45) port (labeled with a network management symbol)
7	Two 1-GbE iSCSI (host IP connect) ports (labeled 2 and 3)	16	RS-232/EIA (micro DB-9) connector (labeled with a battery symbol)
8	NMI[b] (password reset) push button	17	Two 6-Gb/s SAS ports (labeled 0 x4 and 1 x4)
9	CRU fault LED (amber)[c]	18	SP

a. The SP fault status LED amber or blue, flashing at different rates, depending on current status of SP. In a normal, operational state, it will be off.

b. NMI = non-maskable interrupt

c. CRU fault LED lights amber when an internal CRU is faulted.



VNX-000082

Методы диагностики ошибок

Обслуживание и диагностика EMC VNX

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Виды логов массива EMC VNX

SPCollect

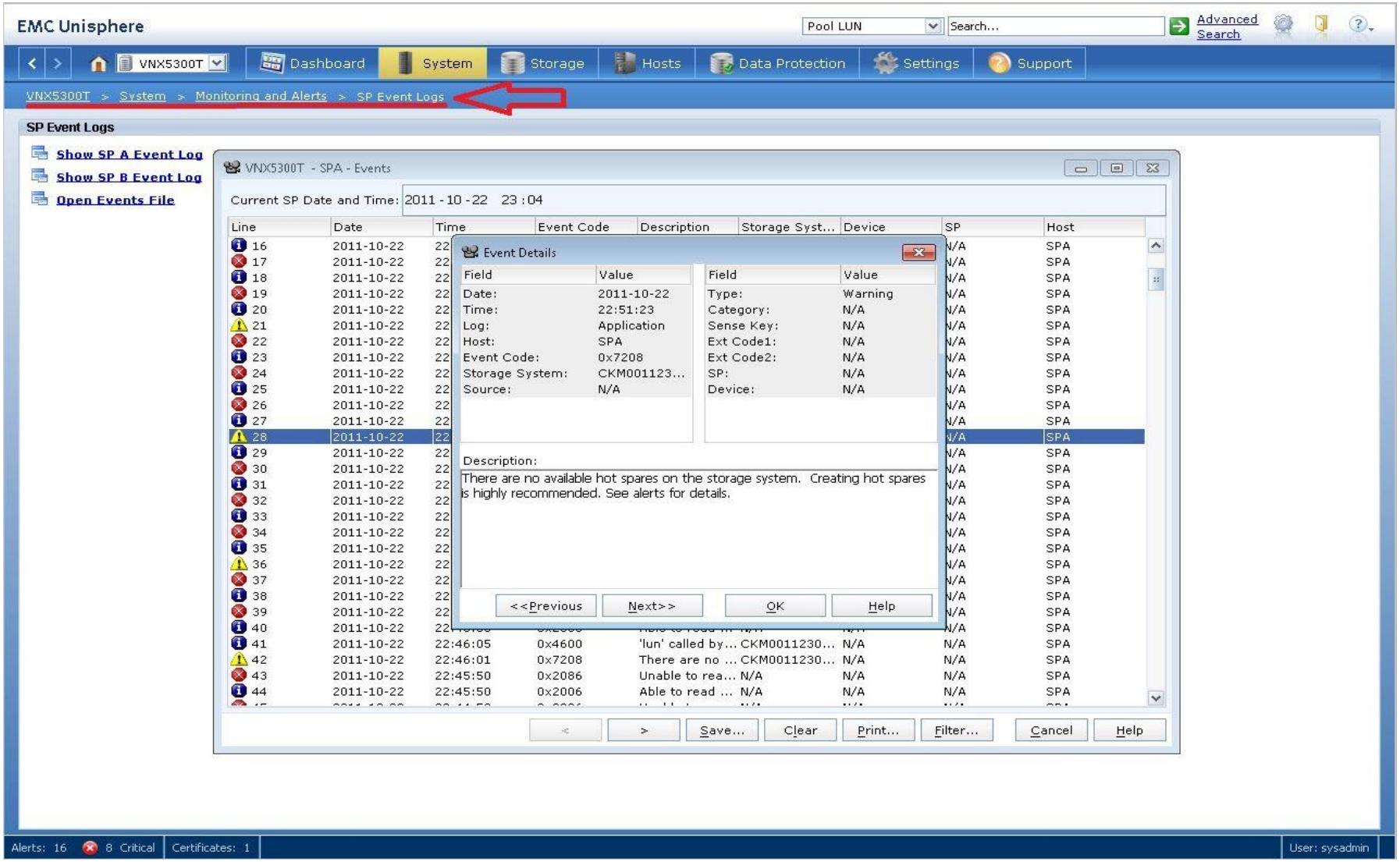
Требуется для всестороннего анализа утилитой CAP и дает полную картину всего происходящего на массиве, включая логи конфигурацию, очевидные проблемы в графическом виде

Event Log (в Unisphere)

Последовательный список событий на массиве

Методы диагностики ошибок

Event Log (в Unisphere)



Сбор SPCollect с массива из NaviCli

Запустить сбор SPCollect-ов на обоих SP командой:

NaviSECCli.exe -h IP_ADDRESS_SP -user USER -password PASSWORD -Scope 0 spcollect

Подождать минут 10 пока соберутся логи. Посмотреть файлы доступные для скачивания можно следующей командой:

NaviSECCli.exe -h IP_ADDRESS_SP -user USER -password PASSWORD -Scope 0 managefiles -list

Забрать последние SPCollect с обоих SP командой:

NaviSECCli.exe -h IP_ADDRESS_SP -user USER -password PASSWORD -Scope 0 managefiles -retrieve -path c:\SPCollects -file FILE_NAME.zip

В примере файлы загрузятся на локальный компьютер в папку **c:\SPCollects**

Параметры в командах это:

IP_ADDRESS_SP - ip адрес SP

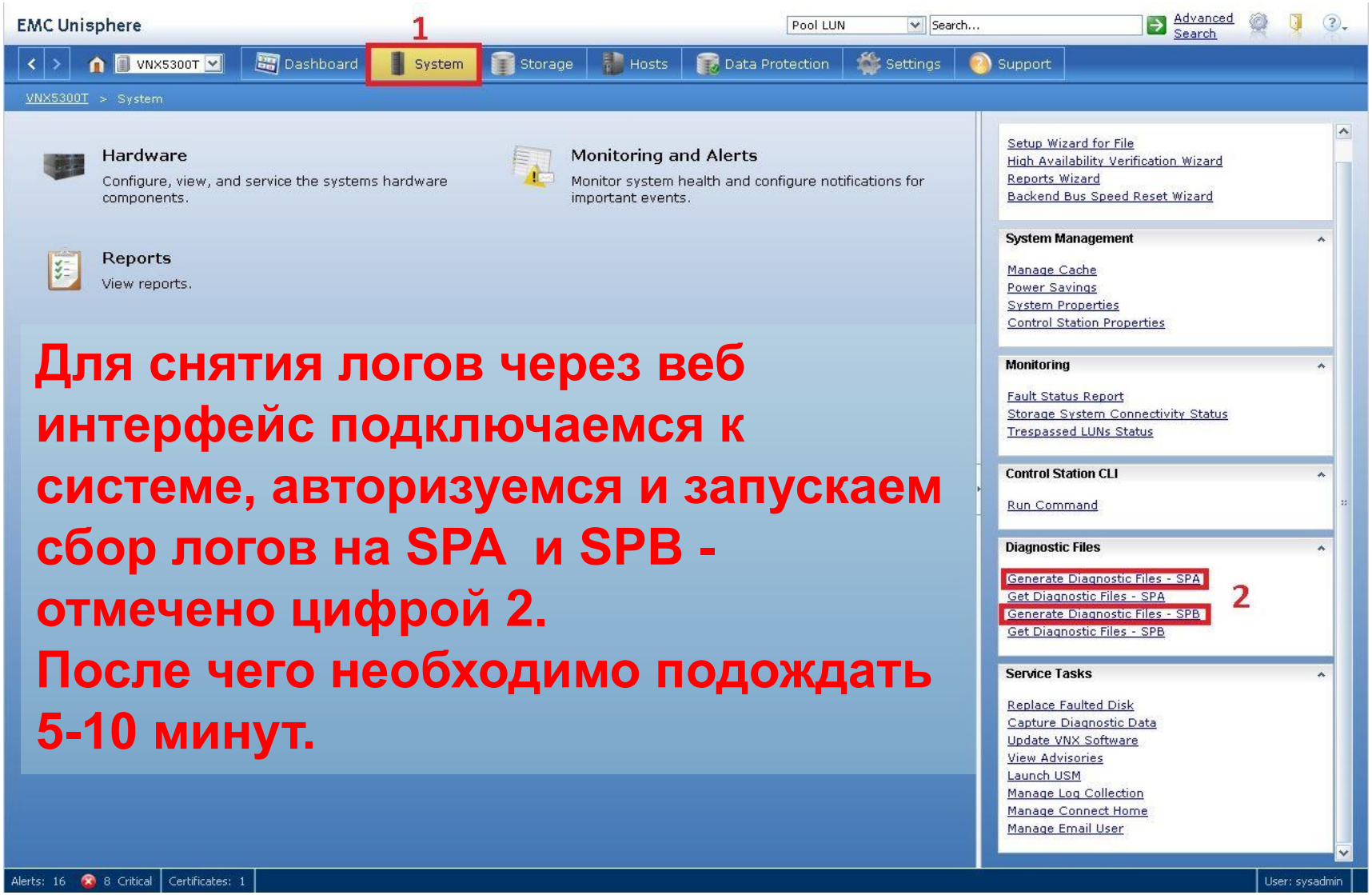
USER - логин пользователя

PASSWORD - пароль пользователя

FILE_NAME.zip - имя загружаемого файла (можно забрать все файлы указав вместо параметра -file параметр -all)

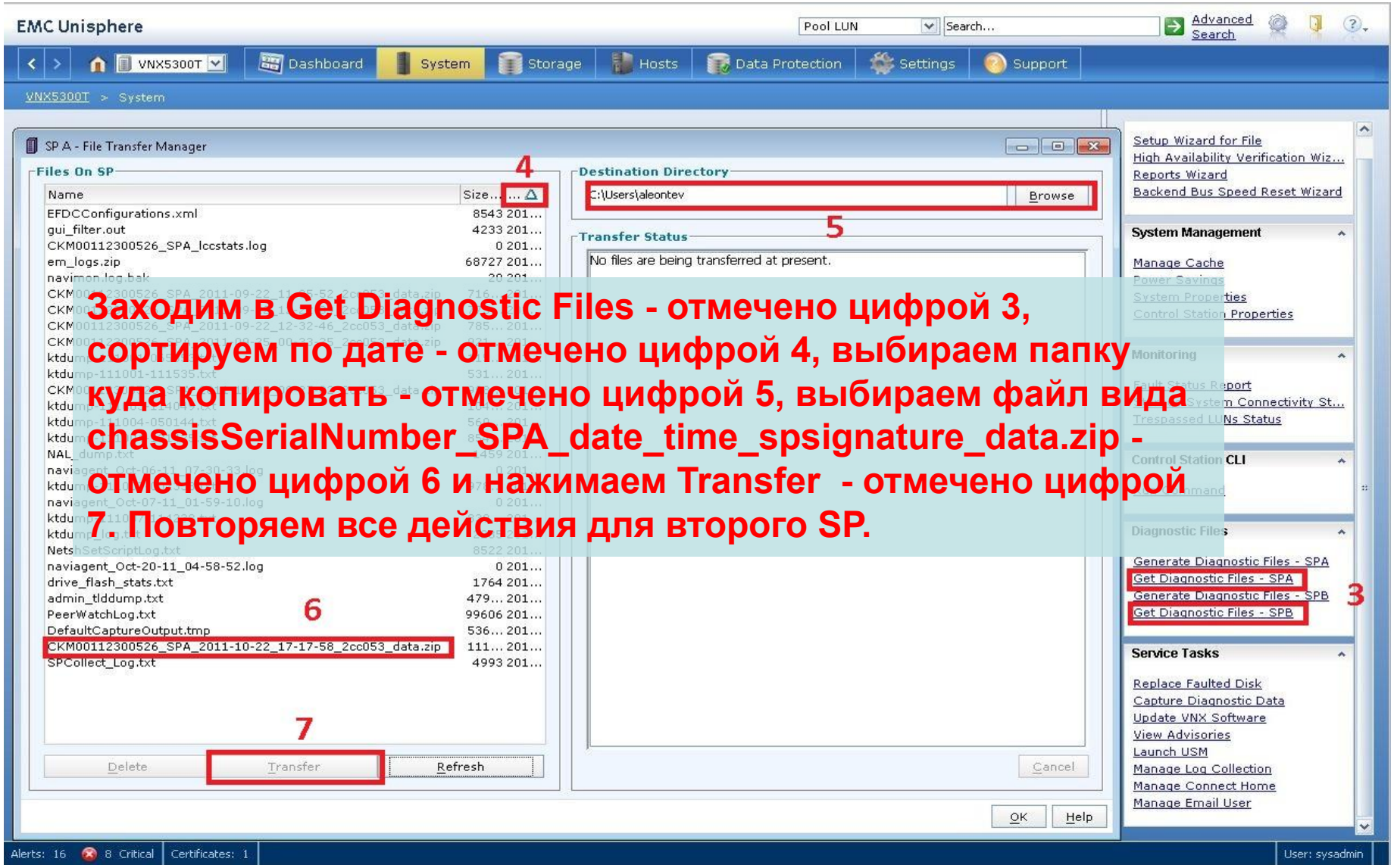
Методы диагностики ошибок

Сбор логов с массива VNX в Unisphere (1/2)



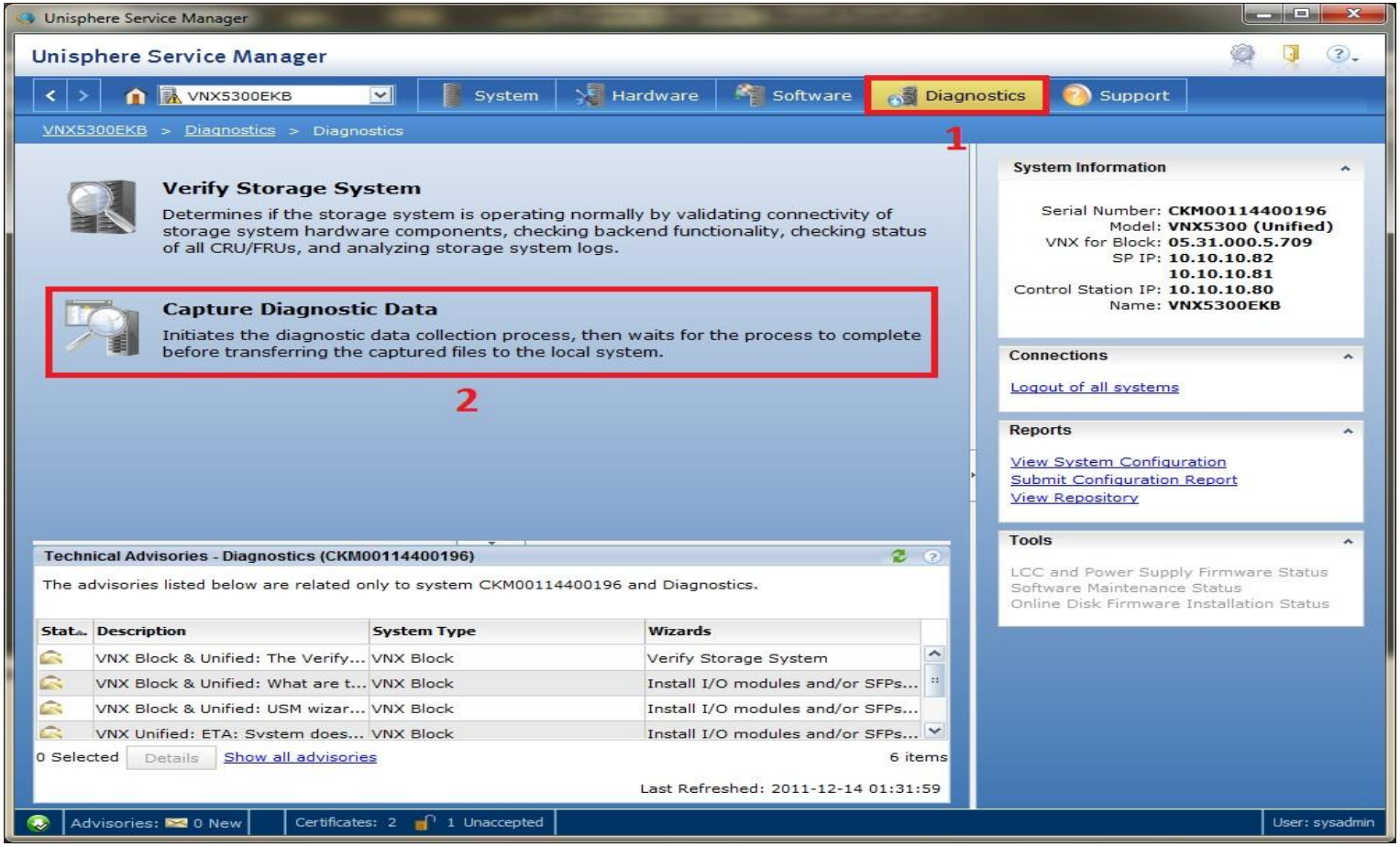
Методы диагностики ошибок

Сбор логов с массива VNX в Unisphere (2/2)



Методы диагностики ошибок

Сбор логов с массива VNX через Unisphere Service Manager

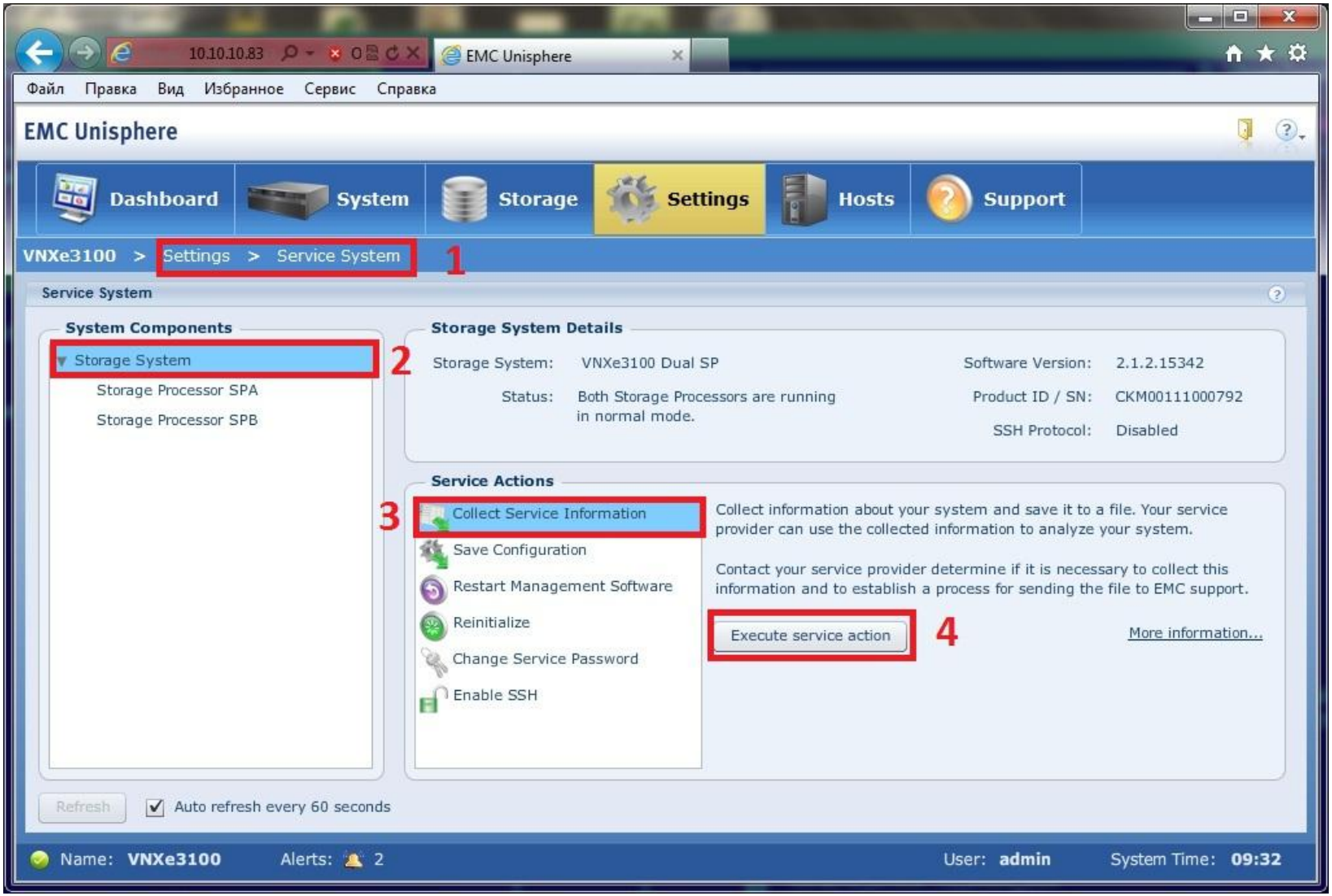


SPCollect-ы сохраняются по следующему пути:

C:\EMC\repository\DiagnosticData\<S/N массива>

Методы диагностики ошибок

Сбор логов с массива VNXe



Методы диагностики ошибок

Сервисные команды VNXe

Подключение консольным кабелем и траблшутинг «VNXe Configuration Utility» (Primus emc264232):
9600 baud, 8 data bits, no parity, 1 stop bit (defaults on most software)

Перевод SP в сервисный режим (выполняется на каждомSP):

```
> svc_rescue_state -s
> svc_shutdown -r
```

Реинициализация массива выполняется с одного SP:

```
> svc_reinit
```

Реимидж массива:

```
> svc_reimage -r
```

Просмотр текущего статуса компонентов массива:

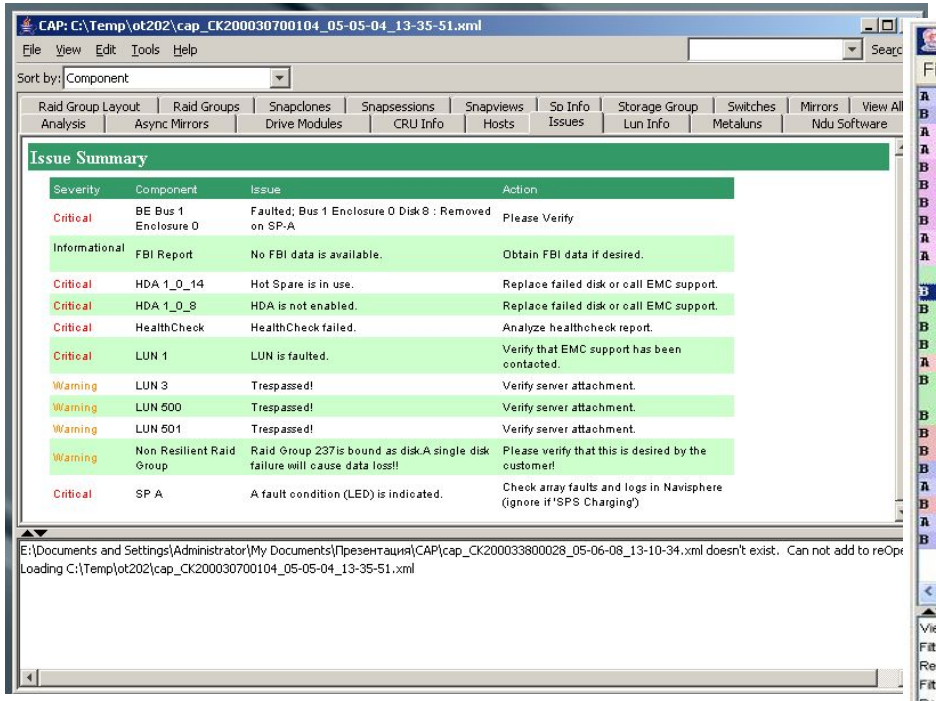
```
> svc_diag --state=cru
```

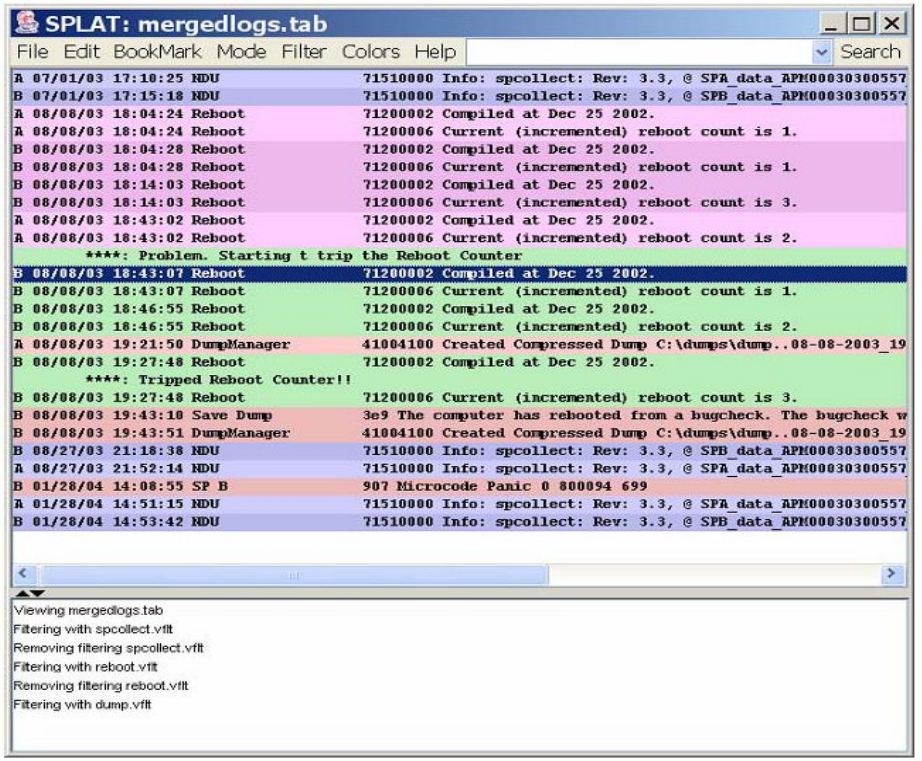
Описание остальных сервисных команд в документе:
300-011-236_VNXe Unisphere CLI User Guide.pdf

Методы диагностики ошибок

Разбор логов

1. CAP2 (Clariion Array Properties)
2. SPLAT (Storage Processor Analyze Tool)





Методы диагностики ошибок

CAP2 отчеты

- Issues
- Sp information
- LUN information
- Drive modules
- RAID Groups
- RAID-Group layout
- MetaLUNs
- Host ports
- CRU information
- SAN Copy
- Snap views
- Snap sessions
- Snap clones
- Mirrors (synchronous)
- Mirrors (asynchronous)
- Storage Groups
- NDU software
- Switches
- Analysis
- Virtual Provisioning

Методы диагностики ошибок

Triiage

Пример запуска из директории с SPCollects:

C:\Users\aleontev>d:

D:\>cd d:\\EMC_incidents\2152

d:\EMC_incidents\2152>triage -l -p -f -c

```
TRiiAGE                          REV: 26.2.7                BUILD DATE: 091211
*****************************************************************************

Input specified:      [ triage -l -p -f -c ]
Generating:           [ full ] TRiiAGE Analysis.
Accessing TOOLS in:   [ C:\Tools ]

03/21/2012 00:32:10   Checking directory for SPcollects.
03/21/2012 00:32:10   Extracting SPcollects.
03/21/2012 00:32:12   Extracting enclosure geometry information.
03/21/2012 00:32:12   Merging and annotating SP event logs.
03/21/2012 00:32:13   Merging standard Ktrace logs.
03/21/2012 00:32:14   Scanning event logs for issues.
03/21/2012 00:32:15   Scanning ktrace logs for issues.
03/21/2012 00:32:15   Annotating ktrace log.
03/21/2012 00:32:17   Analyzing Flare checksum data.
03/21/2012 00:32:18   Creating LUN STATUS report (SPA).
03/21/2012 00:32:18   Creating LUN STATUS report (SPB).
03/21/2012 00:32:18   Creating ARRAY SUMMARY report.
03/21/2012 00:32:18   Creating DISK DETAIL report.
03/21/2012 00:32:19   Creating RESUME report.
03/21/2012 00:32:19   Creating SP STATUS report (SPA).
```

Методы диагностики ошибок

Triiage отчеты

Основной файл отчета: TRiiAGE_full_Analysis.txt
Полное описание смотреть в файле: C:\Tools\TRiiAGE_Companion.doc
Полный лог событий в файле: TRiiAGE_full_SPlogs.txt

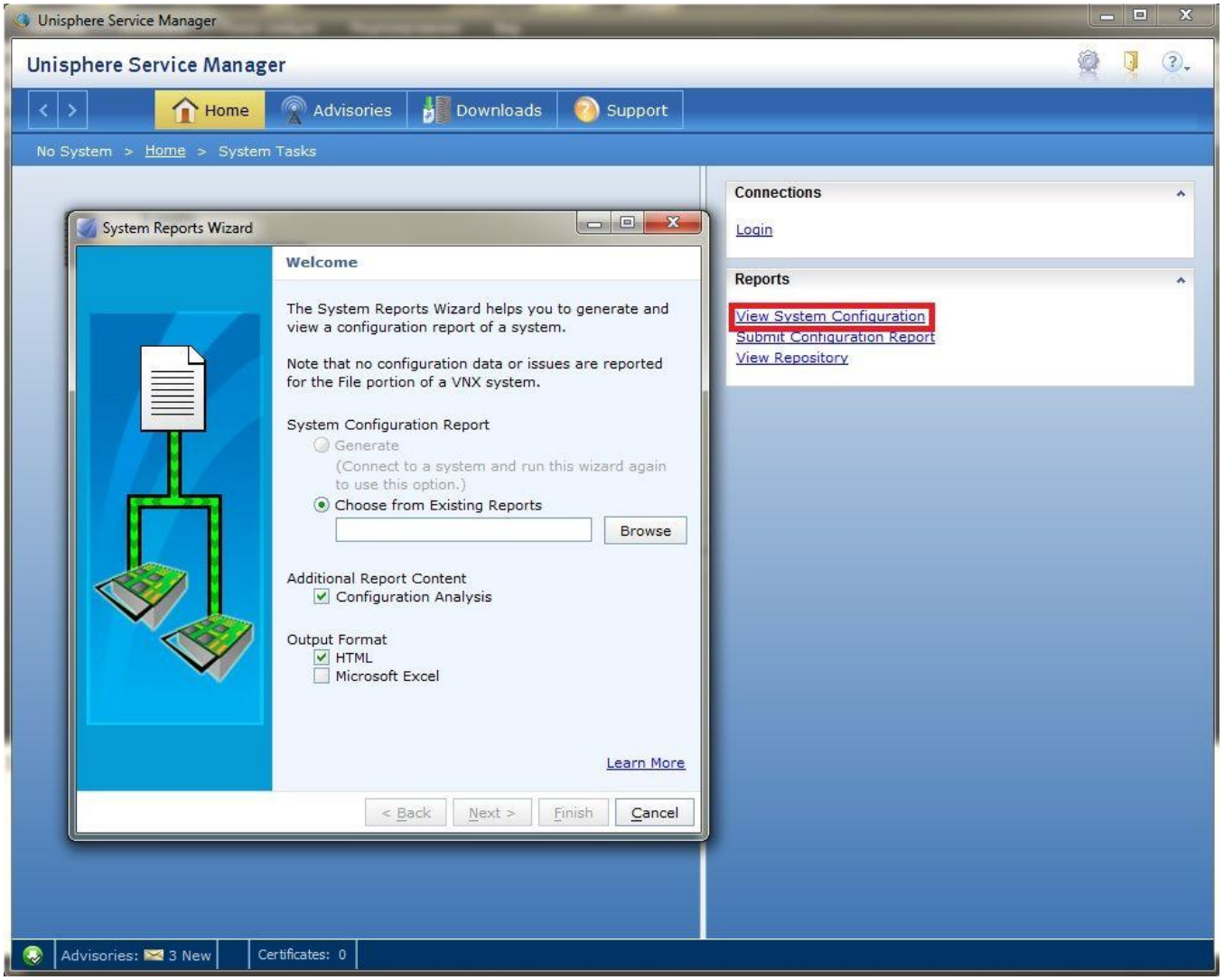
```
********************************************************************************************************
ARRAY CONFIGURATION INFORMATION                                                    [ArrayInfo Script]
********************************************************************************************************
Array Name:                  CK200082700617
Array Serial Number:         CK200082700617
Array Model:                 CX3-40f

                             SPA------------      SPB------------
Array Software Revision:     3.26.40.5.016        3.26.40.5.016
SP Serial Number:            CF2TK082400347       CF2TK082400343
IP Address:                  192.168.0.149        192.168.0.150
PROM Revision:               3.58.00              3.58.00
SP Signature:                2171ba               2170d8
Agent Revision:              6.26.7 (0.87)        6.26.7 (0.87)
SP Memory:                   4096                 4096
SP Time:                     08/29/2011 03:26:56  08/29/2011 03:25:38
Read Cache State:            ENABLED              ENABLED
Write Cache State:           ENABLED              ENABLED
Read Cache Size:             1012                 1012
Write Cache Size:            2004                 2004
Greater WC Availability:     N/A                  N/A
System Fault LED:            ON                   ON
Enclosures:                  5                    5
Disks:                       64                   64

Enclosure                    SPA Type     Vers F  SPB Type     Vers F  Notes
Bus 0 Enclosure 0            DAE3P        7.76    DAE3P        7.76    Stiletto 4G DAE
Bus 0 Enclosure 1            DAE3P        7.79    DAE3P        7.79    Stiletto 4G DAE
Bus 1 Enclosure 0            DAE3P        7.79 *  DAE3P        7.79 *  Stiletto 4G DAE
```

Методы диагностики ошибок

Анализ текущей конфигурации массива через USM



Виды ошибок

Ошибки массива

- Ошибки дисков
- Ошибки Storage Processor’ов
- Ошибки LCC/BCC
- Ошибки PS и SPS

Ошибки хостов

- Ошибки HBA
- Ошибки ПО (PowerPath, Naviagent)

Ошибки коммутаторов

- Ошибки SFP
- Ошибки настройки

Критические ошибки дисков (emc123689)

A	09/29/11 03:12:38 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:12:39 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:12:46 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:12:48 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:12:55 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:12:57 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:13:03 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:13:04 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5
A	09/29/11 03:13:06 Bus0 Enc1 Dsk0	820 Soft Media Error [Bad block]	0	0	5

- **820 – Soft Media Error**
- **920 – Hard Media Error**
- **801 – Потребовался повтор SCSI операции. Успешно.**
- **901 – Потребовался повтор SCSI операции. Неуспешно.**
- **801 и 901 ошибка создается не диском, а LCC и тоже может говорить о неисправности диска.**
- **803 – Рекомендуется заменить диск.**

Background Verify (запуск)

naviseccli -h <SP_IP_address> setsniffer -rg <RAID_group_number> [-bv] [-bvtime <priority>]

*priority - может иметь одно из следующих значений
ASAP = 1 minute per gigabyte or faster.
High = 5 minutes per gigabyte
Medium = 10 minutes per gigabyte
Low = 15 minutes per gigabyte

Вместо –rg можно просто указать ID конкретного луна или ключ -all

Н-р: naviseccli -user admin -password 123456 -scope 0 -h 192.168.3.207 setsniffer 3 -bv -bvtime medium

В примере будет выполнен BV для луна, имеющего ID 3 на массиве.

Background Verify (проверка статуса)

Проверять статус процесса можно командой:
naviseccli -user USERNAME -password PASSWORD -scope 0 -h IP_ADDRESS getsniffer –rg

H-p: naviseccli -user admin -password P@ssw0rd -scope 0 -h 10.10.10.45 getsniffer -rg 1

Ничего не происходит

Currently Running Full Unit Verify

Verify State: Idle
Percent Complete: 0
Corrected Uncorrectable
Checksum errors 0 0
Write Stamp errors 0 0
Time Stamp errors 0 0
Shed Stamp errors 0 0

Идет BV

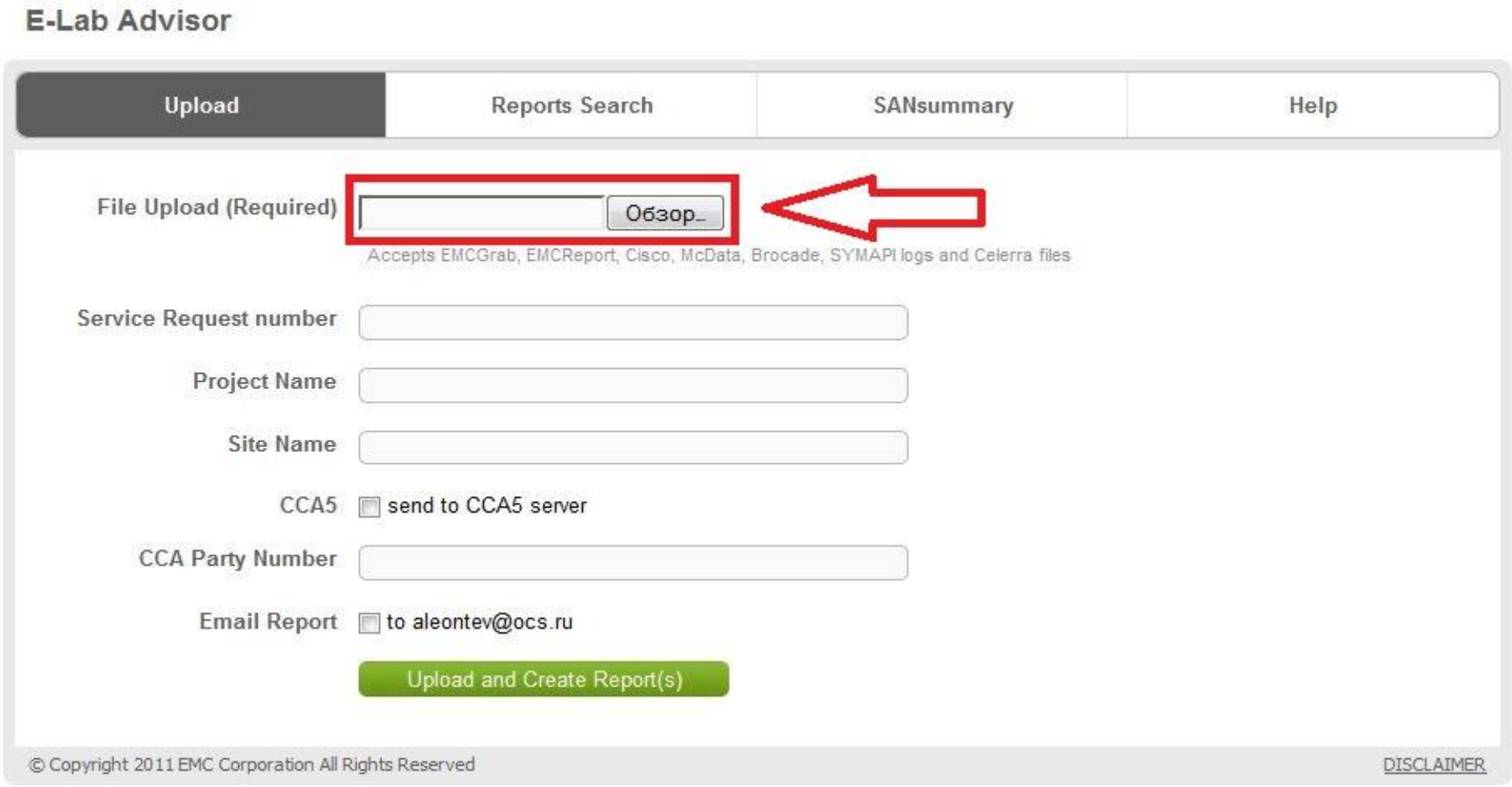
Currently Running Full Unit Verify

Verify State: Sniff Running
Percent Complete: 60
Corrected Uncorrectable
Checksum errors 0 0
Write Stamp errors 0 0
Time Stamp errors 0 0
Shed Stamp errors 0 0

Методы диагностики ошибок

E-lab Advisor

Support > Product and Diagnostic Tools > Environment Analysis Tools > E-Lab Advisor

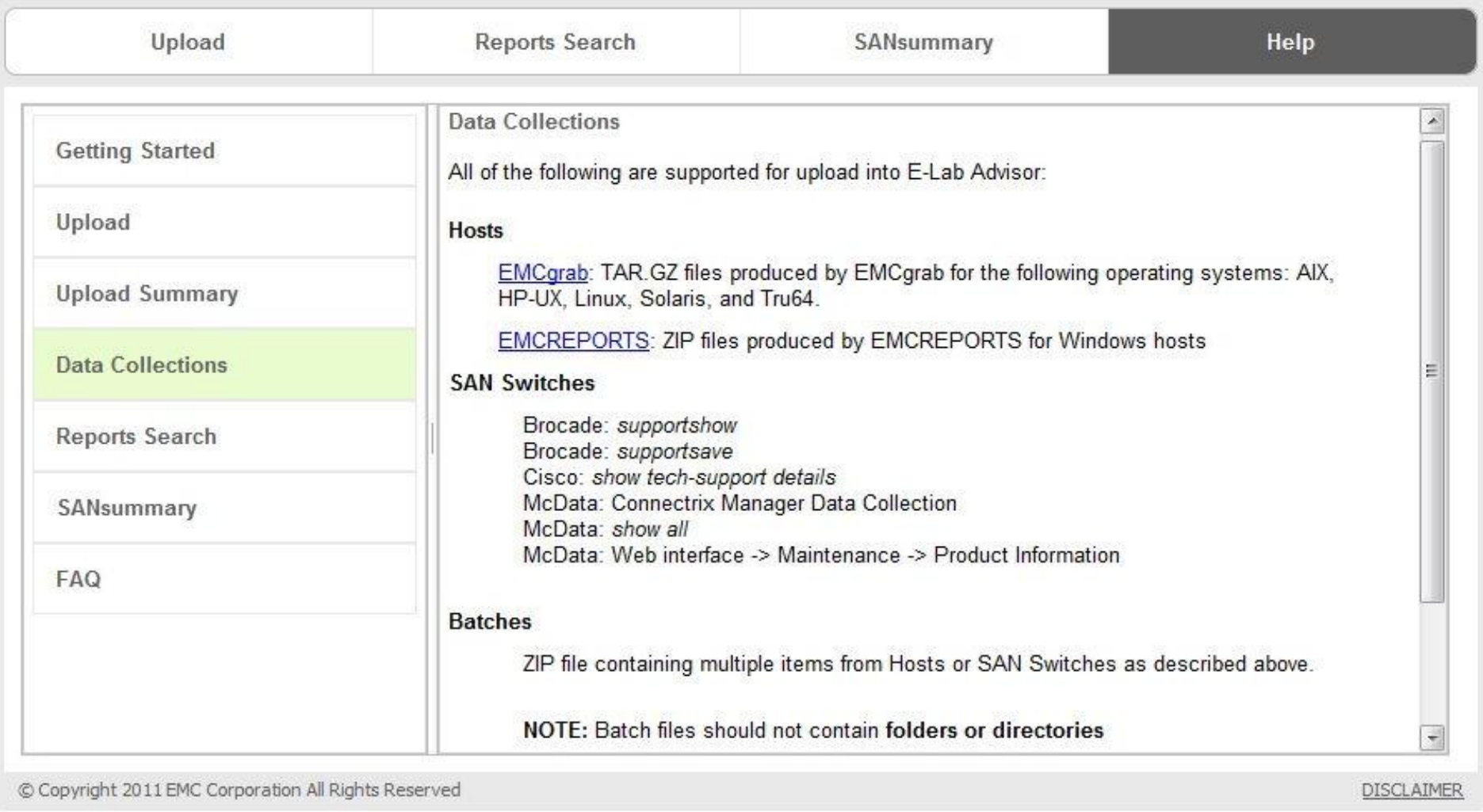


Методы диагностики ошибок

E-lab Advisor (справка)

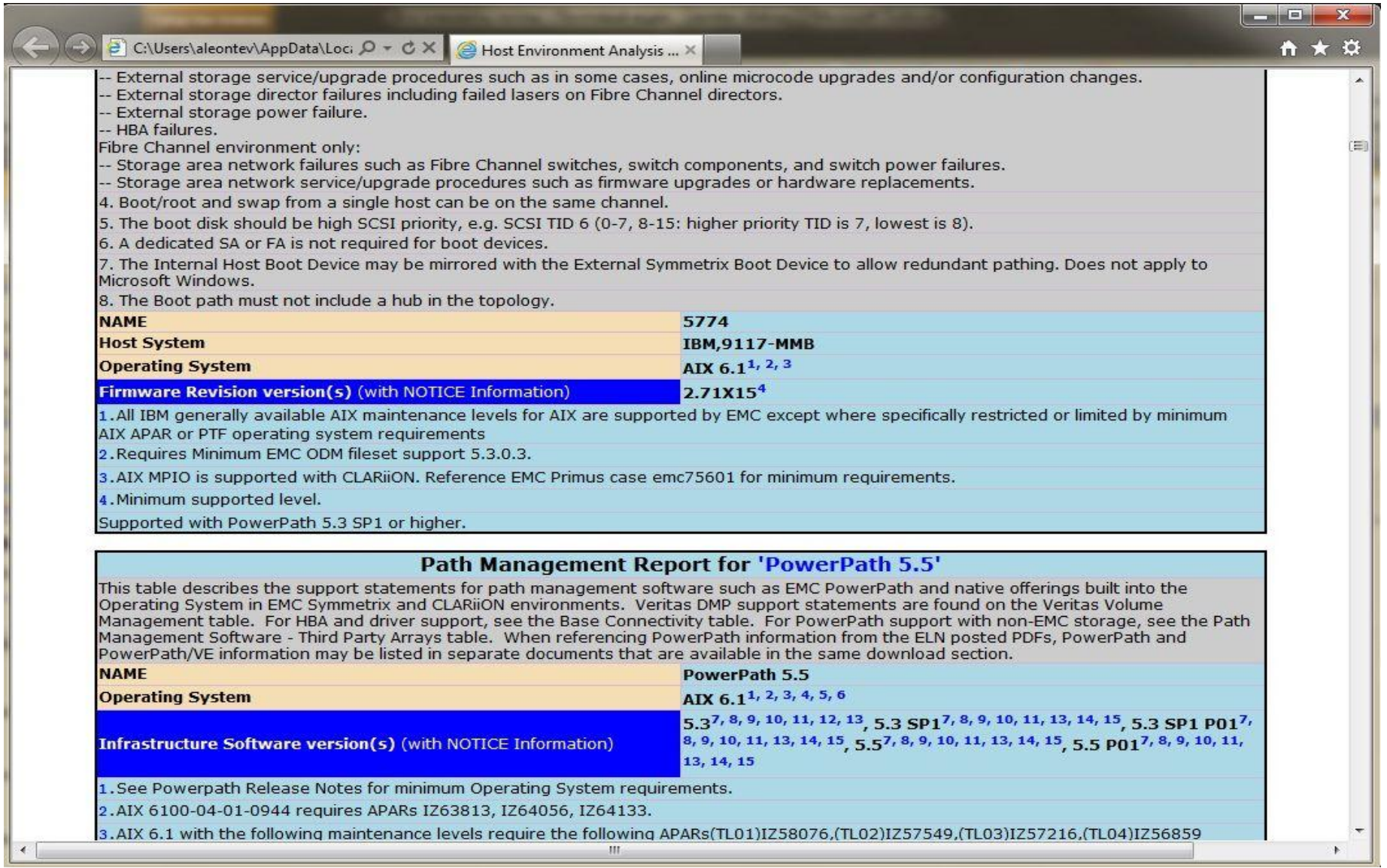
E-Lab Advisor

http://elabadvisor.emc.com/



Методы диагностики ошибок

E-lab Advisor (отчет)



C:\Users\aleontev\AppData\Loc... Host Environment Analysis ...

-- External storage service/upgrade procedures such as in some cases, online microcode upgrades and/or configuration changes.
-- External storage director failures including failed lasers on Fibre Channel directors.
-- External storage power failure.
-- HBA failures.
Fibre Channel environment only:
-- Storage area network failures such as Fibre Channel switches, switch components, and switch power failures.
-- Storage area network service/upgrade procedures such as firmware upgrades or hardware replacements.
4. Boot/root and swap from a single host can be on the same channel.
5. The boot disk should be high SCSI priority, e.g. SCSI TID 6 (0-7, 8-15: higher priority TID is 7, lowest is 8).
6. A dedicated SA or FA is not required for boot devices.
7. The Internal Host Boot Device may be mirrored with the External Symmetrix Boot Device to allow redundant pathing. Does not apply to Microsoft Windows.
8. The Boot path must not include a hub in the topology.

NAME	**5774**
Host System	**IBM,9117-MMB**
Operating System	**AIX 6.1**[1, 2, 3]
Firmware Revision version(s) (with NOTICE Information)	**2.71X15**[4]

1. All IBM generally available AIX maintenance levels for AIX are supported by EMC except where specifically restricted or limited by minimum AIX APAR or PTF operating system requirements
2. Requires Minimum EMC ODM fileset support 5.3.0.3.
3. AIX MPIO is supported with CLARiiON. Reference EMC Primus case emc75601 for minimum requirements.
4. Minimum supported level.

Supported with PowerPath 5.3 SP1 or higher.

Path Management Report for 'PowerPath 5.5'

This table describes the support statements for path management software such as EMC PowerPath and native offerings built into the Operating System in EMC Symmetrix and CLARiiON environments. Veritas DMP support statements are found on the Veritas Volume Management table. For HBA and driver support, see the Base Connectivity table. For PowerPath support with non-EMC storage, see the Path Management Software - Third Party Arrays table. When referencing PowerPath information from the ELN posted PDFs, PowerPath and PowerPath/VE information may be listed in separate documents that are available in the same download section.

NAME	**PowerPath 5.5**
Operating System	**AIX 6.1**[1, 2, 3, 4, 5, 6]
Infrastructure Software version(s) (with NOTICE Information)	**5.3**[7, 8, 9, 10, 11, 12, 13], **5.3 SP1**[7, 8, 9, 10, 11, 13, 14, 15], **5.3 SP1 P01**[7, 8, 9, 10, 11, 13, 14, 15], **5.5**[7, 8, 9, 10, 11, 13, 14, 15], **5.5 P01**[7, 8, 9, 10, 11, 13, 14, 15]

1. See Powerpath Release Notes for minimum Operating System requirements.
2. AIX 6100-04-01-0944 requires APARs IZ63813, IZ64056, IZ64133.
3. AIX 6.1 with the following maintenance levels require the following APARs(TL01)IZ58076,(TL02)IZ57549,(TL03)IZ57216,(TL04)IZ56859

Спасибо за внимание!

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