BROADCOM®

Emulex® HBA Capture Utility

User Guide
Release 14.2

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Chapter 1: Introduction

The Emulex® HBA Capture utility is a device driver utility that collects information from operating systems, Emulex software, and Emulex adapters. Use this information to examine the functionality of the drivers.

The Emulex HBA Capture utility checks the library dependencies for the internal tool in the utility. This tool collects basic information and ASIC firmware dumps. If the dependencies check failed (missing dependencies exist), you can select to continue collecting the remaining system logs without using the internal tool.

Data collected by the Emulex HBA Capture utility is compressed into a single file that can be sent to Broadcom® Technical Support for analysis when debugging systems or for diagnostic purposes.

The Emulex HBA Capture utility supports the following Emulex FC adapters:

- LPe31000-series adapters
- LPe32000-series adapters
- LPe35000-series adapters
- LPe36000-series adapters

1.1 Abbreviations

Table 1: Acronyms and Abbreviations

Acronym/Abbreviation	Description
INET	Internet Network Protocol
I/O	input/output
MPIO	multipath I/O
NVMe	nonvolatile memory express
RPM	Red Hat Package Manager
SMBIOS/DMI	System Management BIOS/Desktop Management Interface
SSH	Secure Shell
UUID	universally unique identifier

Chapter 2: Running the Emulex HBA Capture Utility

You can run the Emulex HBA Capture utility on any of the following operating systems. For specific supported distributions, refer to the Emulex HBA Capture Utility release notes for the applicable release.

- Windows
- Linux
- Citrix
- Solaris (supports inbox Solaris drivers only)
- VMware ESXi

NOTE: Release 12.4 and later of the Emulex HBA Capture utility do not support the Citrix 8.1 and Citrix 8.2 operating systems. Use release 12.2 of the Emulex OneCapture™ utility instead.

The Emulex HBA Capture utility is installed as a single `.exe` or `.sh` file. Download the appropriate `Emulex_HBA_Capture` file to each of the systems from which you want to collect data, and extract the `.exe` file or the `.sh` file.

- For Windows systems, download the `Emulex_HBA_Capture_Win_<version>.zip` file, and extract the `HBACapture.exe` file.
- For Linux systems, download the `Emulex_HBACapture_Linux_<version>.tgz` file, and extract the `HBACapture_Linux.sh` file.
- For Citrix systems, download the `OneCapture_Linux_<version>.tgz` file, and extract the `OneCapture_Linux.sh` file.
- For Solaris systems, download the `Emulex_HBA_Capture_Solaris_<version>.tgz` file, and extract the `HBACapture_Solaris.sh` file.
- For ESXi 7.0 and earlier systems, download the `Emulex_HBA_Capture_ESX_<version>.tgz` file to the ESXi host, and extract the `HBACapture_ESX.sh` file.
- For ESXi 8.0 and later systems, download the `Emulex_HBA_Capture_ESX80_<version>.tgz` file to the ESXi host, and extract the `HBACapture_ESX80.sh` file.

NOTE: In release 14.2, the `OneCapture` file names and scripts were renamed to `Emulex_HBA_Capture` (or a variant) to align with the utility name. This change does not apply to files and scripts for Citrix systems because they use an earlier release.

You can run the Emulex HBA Capture utility from any directory or folder on your computer. Output is generated as an HTML file. The output data can vary according to the system type in use.

2.1 Choosing a Capture Type

Using the Emulex HBA Capture utility, you can select one of five capture types: basic, full, safe, minimal, or custom. This section describes the available capture types.

2.1.1 Basic Capture

For all operating systems except ESXi 8.0, basic capture is the default selection. Typically, use basic capture unless instructed by Broadcom Technical Support to use one of the other types. Basic capture is not supported on the ESXi 8.0 operating system.

Basic capture does not reset live adapters, and it does not restart dead adapters. That is, live adapters remain alive, and dead adapters remain dead.

Basic capture performs the following actions:
- Captures all the available configuration files and log files
- Captures the existing adapter dump files (if present)
- Captures the existing flash-resident dump file (if present) after an unexpected occurrence

NOTE: Basic capture does not initiate an immediate firmware dump on an adapter if it might disrupt service.

2.1.2 Full Capture

Full capture performs the following actions:
- Captures all the available configuration files and log files
- Captures all existing adapter dump files (if present)
- Captures the existing flash-resident dump file (if present)
- Initiates a dump on specified adapters, and creates a dump file called `<filename>.bin`

If you perform a full capture with the `/Adapters` parameter specified for some adapters, the following actions occur:
- A full capture is performed on adapters that are listed in the `/Adapters` parameter.
- A basic capture is performed on all other adapters.

ATTENTION: Full capture might reset the adapter and cause disruption during the immediate firmware dump when it is generated.

2.1.3 Safe Capture

Safe capture collects all of the available current information and any existing adapter dump files, but it does not perform any new dumps. I/O is not interrupted on any adapters. Use this parameter to collect existing logs and dumps when it is important not to interrupt I/O or if the adapter for which information is being collected is a boot device.

Safe capture performs the following actions:
- Captures all of the available configuration files and log files
- Captures all existing adapter dump files (if present)

2.1.4 Minimal Capture

Minimal capture collects only firmware dumps. Use this parameter to collect captured files when time is critical.

Minimal capture is supported in Linux and ESXi 7.0 only. It is not supported in ESXi 8.0 or Solaris. In Windows, you can limit the data collection to a firmware dump by using the custom capture feature.

2.1.5 Custom Capture

Custom capture allows you to select from a variety of capture parameters. You select the components to capture in the check box list or with the `/Component` parameter in the CLI.

2.2 Running the Emulex HBA Capture Utility on Windows

You can run the Emulex HBA Capture utility for Windows using the GUI or the CLI. This section describes both methods.

ATTENTION: Before running the Emulex HBA Capture utility, quiesce the port.

To run the Emulex HBA Capture utility on Windows using the GUI, perform the following steps:

1. Download the `Emulex_HBA_Capture_<version>.zip` file.

2. Uncompress the file.

3. Launch the `HBACapture.exe` file from Windows.

NOTE: Although you can run the Emulex HBA Capture utility as a regular user, for best results, run the utility as the administrator or as a user with administrator privileges.

> To run the Emulex HBA Capture utility as an administrator, no special steps are required. Access to all output files is unrestricted.
>
> To run the Emulex HBA Capture utility as a user with administrator privileges, the GUI prompts you to enter an administrator user name and password.
>
> To run the Emulex HBA Capture utility without administrator privileges, the GUI prompts you to enter an administrator user name and password. Access to output files might be restricted. In this case, you must give the desired user access to the output folder. Typically, this folder is in `\Users\Administrator\Documents\Emulex`.

4. From the pop-up window, select where you want the output file stored. You can leave the default path or specify a different one.

5. From the drop-down menu, select the capture type you want to use. You can select **Basic**, **Safe**, **Full**, or **Custom**. See Section 2.1, Choosing a Capture Type, for a description of the parameters.

6. Click **OK**. If you selected a full capture or a firmware adapter dump, select the adapters for which you want to collect data and click **OK**.

Figure 1: Selecting Devices from Which to Capture a Full Dump
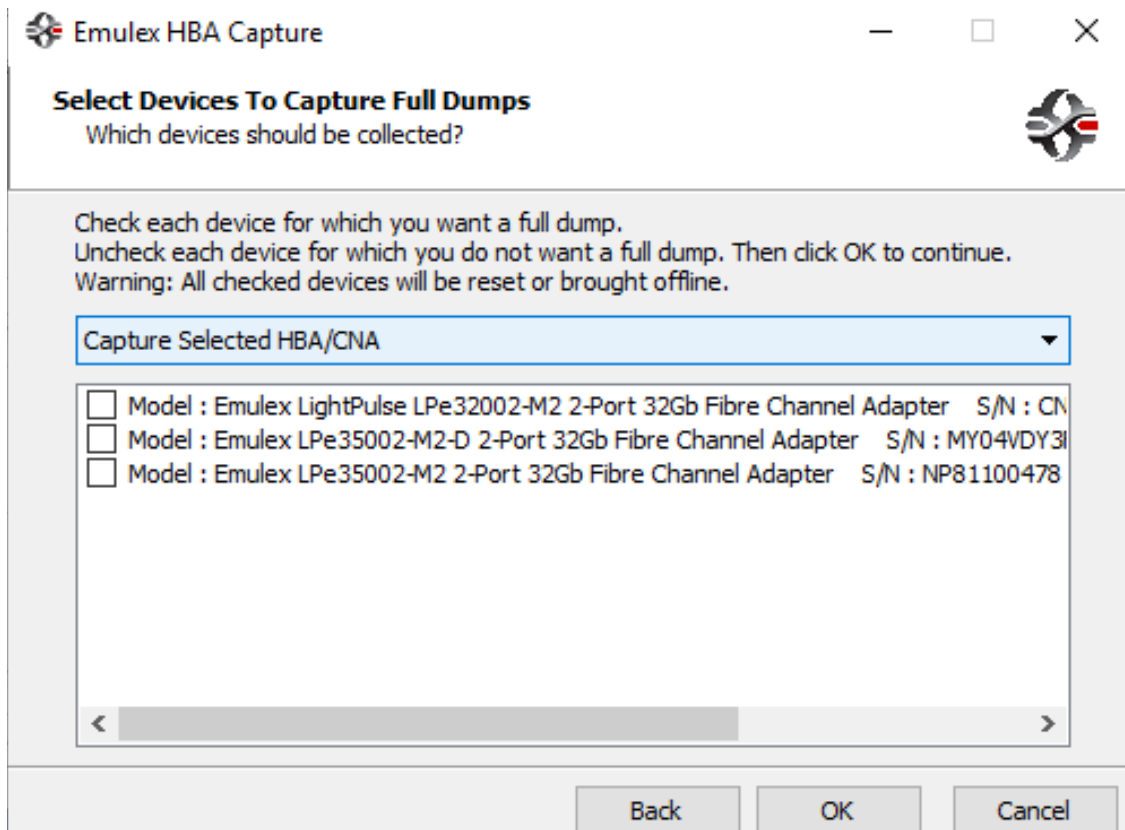
7. Select the specific items that you want to generate in the capture. For example, under **Adapter Dump Information**, you can select the following options:

   – **Adapter Basic Information** performs a basic capture.
   – **HBA Transceiver Data** captures data about the transceivers installed on the HBA.
   – **HBA Resident Dump** captures existing dump files.
   – **HBA FW Log** generates a firmware log for the selected adapters.
   – **HBA Firmware Dump** generates and captures a firmware dump.

Figure 2: Selecting the Capture Level
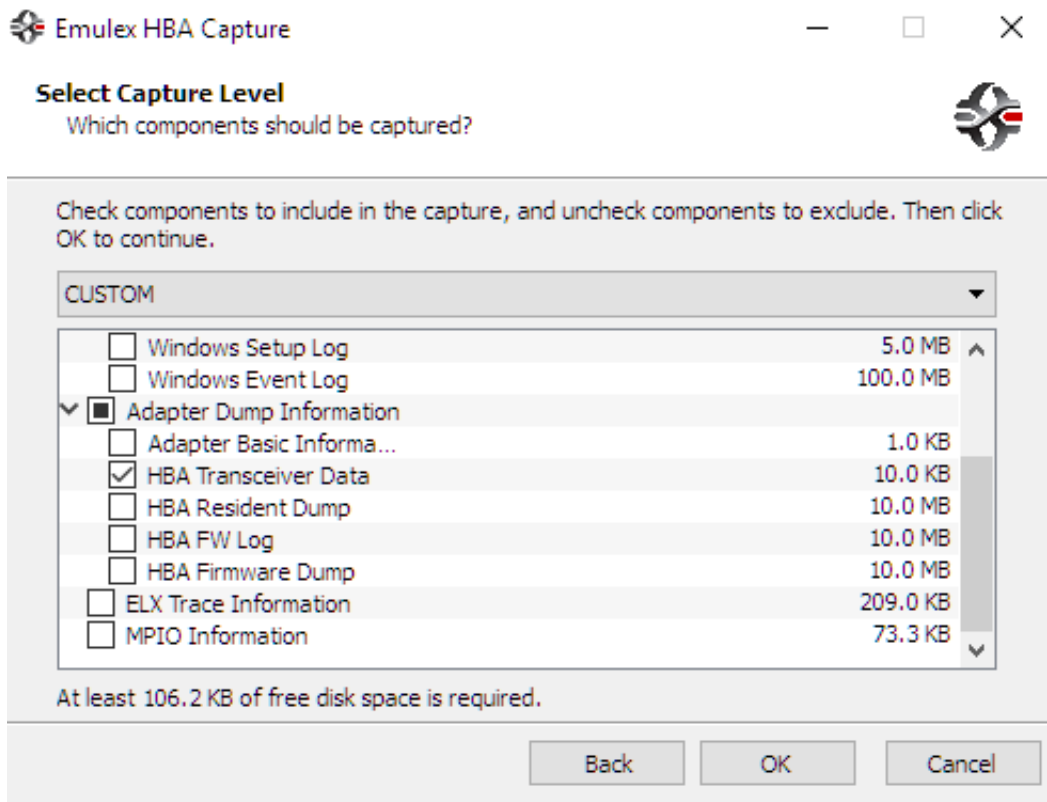
Following is a complete list of the options you can select:

   – **System Information**
   – **Driver Information**
   – **Disk Information**
   – **ElxSEstats log**
   – **Windows Information**
     • **Windows Setup Log**
     • **Windows Event Log**
   – **EHM Information**
     • **EHM Log**
     • **EHM Status**
     • **EHM Dumps (Auto & Old dump)**
     • **NVME Information**

- **HBA Information**
  - **HBA List**
  - **HBA Attributes**
- **Adapter Dump Information**
  - **Adapter Basic Information**
  - **HBA Transceiver Data**
  - **HBA Resident Dump**
  - **HBA FW Log**
  - **HBA Firmware Dump**
- **ELX Trace Information**
- **MPIO Information**

8. Click **OK**. The Emulex HBA Capture utility gathers the requested information and places the resulting file in the specified folder

   A dialog similar to the following is displayed.

Figure 3: Capture Completed Successfully Dialog
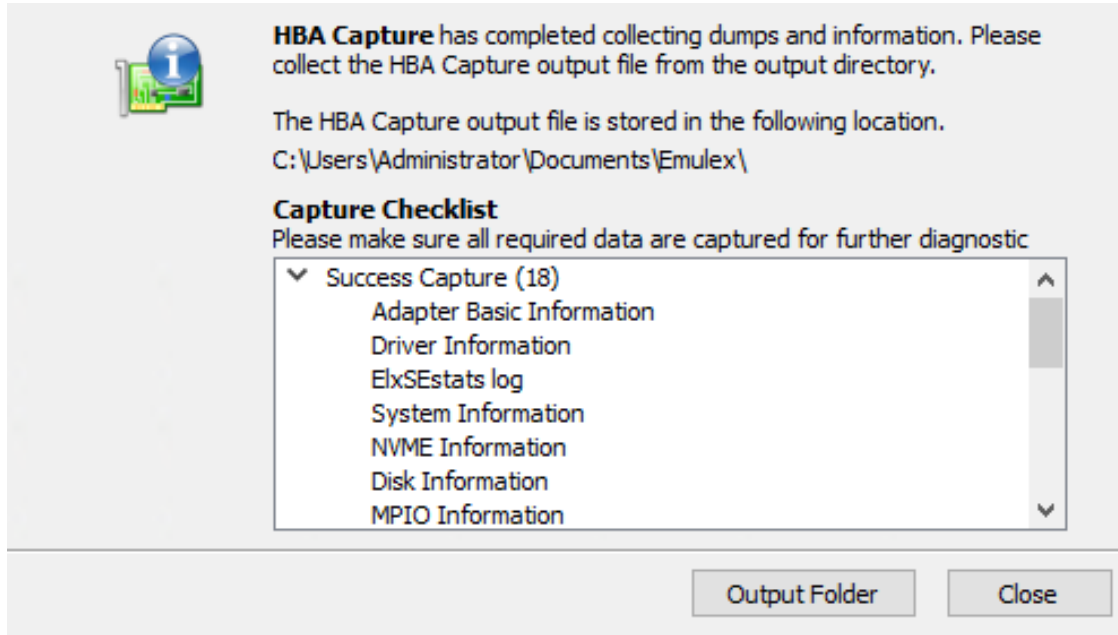
You can expand the **Success Capture** line to view the items that were captured. In particular, you can determine whether you have the captures requested by Broadcom Technical Support:

- To verify that a `.bin` file was created for each requested adapter, expand the **HBA Firmware Dump** line.
- To determine whether any resident dumps were captured, expand the **HBA Resident Dump** line.

  A resident dump is a dump that already resides on the adapter. A resident dump is not a requirement, but if it exists, it can help Broadcom Technical Support in diagnosing system issues.

If a line indicates that an error is present, you can hover over the line to see the error associated with it.

An asterisk indicates a file that was not created.

9. Click **Output Folder** to open the directory in which the output file is stored and exit the Emulex HBA Capture utility, or click **Close** to exit the Emulex HBA Capture utility.

To run the Emulex HBA Capture utility on Windows from the CLI, perform the following steps:

1. Download the `Emulex_HBA_Capture_Win_<version>.zip` file.

2. Uncompress the file.

3. Run the `HBACapture.exe` command from a DOS command shell. You must specify one of the parameters provided in Section 2.2.3, Windows Command Line Interface Parameters.
   – To run the Emulex HBA Capture utility as an administrator, no special steps are required. Access to all output files is unrestricted.
   – To run the Emulex HBA Capture utility as a user with administrator privileges, start the DOS command shell with `Run As Administrator`, and then enter an administrator user name and password. Access to all output files is unrestricted.
   – To run the Emulex HBA Capture utility without administrator privileges, start the DOS command shell with `Run As Administrator`, and then enter an administrator user name and password. Access to output files might be restricted. In this case, you must give the desired user access to the output folder. Typically, this folder is in `\Users\Administrator\Documents\Emulex`.

NOTE: Although you can run the Emulex HBA Capture utility as a regular user, for best results, run it as the administrator or as a user with administrator privileges.

4. At the command line, define the type of capture you want. See Section 2.1, Choosing a Capture Type, for a description of the parameters.

See Section 2.2.3, Windows Command Line Interface Parameters, for a list of the available commands.

2.2.1 Output File

The Emulex HBA Capture utility creates a single zip file containing all of the captured components. This zip file is named `HbaCapture_Windows_<date-time>.zip`. The file is located in the following directories, depending on whether you run the Emulex HBA Capture GUI or the CLI.

- For the GUI, the output directory is `MyDocuments\Emulex`.
- For the CLI, the default output directory is the working directory from which you run the CLI. The default output directory can be overridden; see Section 2.2.3, Windows Command Line Interface Parameters.

Most items in the output zip file can be examined directly from the zip file, without the need to unzip the entire file. The exception is the `HbaCapture_Windows.html` file, which is a navigable directory of the captured components. When you launch this file in your browser, you can browse through the captured objects, but you must unzip the output file first.

The adapter dump files are placed in a directory called `Core Dump`. Typically, you do not need to unzip these files individually because Broadcom Technical Support will normally request the entire output zip file.

ATTENTION: You must ensure that the adapter dump file in the `Core Dump` directory has been created properly. This file is critical for proper diagnostics. You can examine the component files in the `.zip` file before you send the `.zip` file to Broadcom Technical Support. A `.txt` file that contains an adapter list is also available in the same directory. This file allows you to verify whether all corresponding adapters are properly listed for capture purposes.

NOTE: To capture the HBA firmware log on the Windows operating system, the `FwLogBufferCnt` driver parameter must be enabled. Refer to the *Emulex Drivers for Windows User Guide* for instructions on setting this parameter.

2.2.2 Output Summary File

The Emulex HBA Capture utility produces an output summary file at the end of the capture process. The file displays an onscreen list of the critical items that should have been captured, and a status as to whether the capture was successful, so you can verify whether the collected output is valid. The following is an example of an output summary file:

```
C:\Users\Administrator\Desktop\14.2\HBACapture_14.2.123.4>HBACapture.exe /F /A=ALL
....
....
HBA Capture Output File :
C:\Users\Administrator\Desktop\14.2\HBACapture_14.2.123.4\HbaCapture_Windows_2022-09-15_145652.zip
Failed Capture count: 0
Success Capture Count: 18

Captured Dumps:
* CoreDump\adapter_0_2022-09-15_145723.bin (2.5 MB)
* CoreDump\adapter_3_2022-09-15_145833.bin (2.4 MB)
* CoreDump\adapter_1_2022-09-15_145742.bin (1.9 MB)
* CoreDump\adapter_2_2022-09-15_145807.bin (2.3 MB)
* CoreDump\Adapter.txt (2.0 KB)
```

The file is included in the generated output file for use by Broadcom Technical Support for additional debug purposes.

2.2.3 Windows Command Line Interface Parameters

The following is an example of Windows command syntax:
```
HBACapture.exe /FullCapture /Adapters=0,2 /Directory=C:\Capture\LP /FileName=output.zip
```

The following CLI parameters are available for Windows.

/? or /H or /help

Displays a brief guide on command usage and supported parameters.

/L or /ListAdapters

Lists the discovered adapters. The list parameter shows each adapter's adapter number (0, 1, . . .), which is used in the dump command for the `/Adapters` parameter.

/Quiet or /Q

Forces the capture without displaying warning messages or prompts.

/Directory=<*OutputDirectory*> or /D=<*OutputDirectory*>

Specifies a directory in which the Emulex HBA Capture utility will create the output zip file. If this parameter is not used, the default is the working directory from which you run the CLI. For example:
```
HBACapture.exe /Directory=C:\Users\Administrator\Desktop\Dump
```

/Filename=<*OutputFilename*> or /N=<*OutputFilename*>

Specifies the file name that the Emulex HBA Capture utility uses when it creates the output zip file. If this parameter is not used, the default is `HBACapture_Windows_<date-time>.zip`. For example:
```
HBACapture.exe /Filename=example1.zip
```

/BasicCapture or /B

Specifies the basic capture type. For example:
```
HBACapture.exe /BasicCapture
```

/SafeCapture or /S

Specifies the safe capture type. For example:
```
HBACapture.exe /SafeCapture
```

/FullCapture or /F

Specifies the full capture type. Use both the `/FullCapture` and `/Adapters` parameters. For example:
```
HBACapture.exe /FullCapture /Adapters=0
HBACapture.exe /FullCapture /Adapters=2,3
HBACapture.exe /FullCapture /Adapters=all
```

ATTENTION: This parameter can temporarily interrupt I/O on live adapters, and it can force live adapters offline.

/Adapters=<*AdapterNumber* | <*list*> | all>

Use this parameter only with `/FullCapture`. This parameter specifies the adapters for which the Emulex HBA Capture utility will perform a full dump. For example:
- Perform a full dump on adapter 0 only:
  ```
  HBACapture.exe /FullCapture /Adapters=0
  ```
- Perform a full dump on adapters 2 and 3 only:
  ```
  HBACapture.exe /FullCapture /Adapters=2,3
  ```
- Perform a full dump on all adapters:
  ```
  HBACapture.exe /FullCapture /Adapters=all
  ```

/Components=< <*component*> | <*list*> >

The Emulex HBA Capture utility collects several types of components by default, such as driver information and disk information. This parameter specifies the individual components to be captured while ignoring all the rest. You can specify a single component, or a list of components, separated by commas. For example:

Capture system information only:
```
HBACapture.exe /Components=system
```

Capture system information and driver information only:

`HBACapture.exe /Components=system,driver`

Following is a list of the available components:

- `autopilot` – AutoPilot Installer information
- `disk` – Disk information
- `driver` – Driver information
- `elxtrace` – ELX trace information
- `sestats` – `SEstats` log
- `system` – System information
- `hba/attr` – HBA attributes
- `hba/fwlog` – HBA firmware log
- `hba/info` – HBA information
- `hba/list` – HBA basic list
- `hba/residentdump` – Resident dump
- `hba/xcvr` – Transceiver data
- `mpio` – MPIO information
- `ehm/dumps` – Dumps collected in the Emulex HBA Manager dump folder
- `ehm/log` – Emulex HBA Manager log
- `ehm/nvme` – NVMe information
- `ehm/status` – Emulex HBA Manager status
- `win/event` – Windows event log
- `win/setup` – Windows setup log

NOTE: To capture the HBA firmware log (`hba/fwlog`) on the Windows operating system, the `FwLogBufferCnt` driver parameter must be enabled. Refer to the *Emulex Drivers for Windows User Guide* for instructions on setting this parameter.

2.3 Running the Emulex HBA Capture Utility on Linux, Citrix, and Solaris

NOTE: While Linux offers the option to select a destination directory for the dump files, the Emulex HBA Capture utility does not. If you specify a destination directory for the dump files other than the default directory, the dump files are not created.

The following distributions are included for Linux, Citrix, and Solaris Emulex HBA Capture utilities:

- Linux: `Emulex_HBA_Capture_Linux_<version>.tgz` (including the `HBACapture_Linux.sh` file)
- Citrix: `OneCapture_Linux_<version>.tgz` (including the `OneCapture_Linux.sh` file)
- Solaris: `Emulex_HBA_Capture_Solaris_<version>.tgz` (including the `HBACapture_Solaris.sh` file)

For Linux:

- You must have executable permission for root where the script is executed.
- The following library files must be installed to run the Emulex HBA Capture utility:
  - `linux-vdso.so`
  - `libstdc++.so`
  - `libgcc_s.so`
  - `libc.so`

- libm.so
- libz.so
- libpci.so
- libpthread.so
- libnl.so
- librt.so
- libresolv.so

■ The Emulex HBA Capture utility must be able to access the following directories:
- /var/log/
- /sys/class/
- /proc/
- /etc/
- /boot/
- /usr/sbin/ocmanager/

NOTE: For Solaris systems, if the Emulex HBA Manager application was not installed or allowed, only a degraded capture is available.

For Linux, Citrix, and Solaris systems, if the Emulex HBA Manager application is installed, the Emulex HBA Capture utility collects data related to the Emulex HBA Manager application.

ATTENTION: Before running the Emulex HBA Capture utility, quiesce the port.

To run the Emulex HBA Capture utility on Linux, Citrix, and Solaris systems, perform the following steps:

1. Log in as `root`.

2. Copy the Emulex HBA Capture kit onto the system through SSH or another method, and uncompress the script file.
   - For Linux systems, download the `Emulex_HBA_Capture_Linux_<version>.tgz` file, and extract the `HBACapture_Linux.sh` file.
   - For Citrix systems, download the `OneCapture_Linux_<version>.tgz` file, and extract the `OneCapture_Linux.sh` file.
   - For Solaris systems, download the `Emulex_HBA_Capture_Solaris_<version>.tgz` file, and extract the `HBACapture_Solaris.sh` file.

3. Run the shell script for the corresponding system, for example (Linux, Citrix, and Solaris):
   ```
   ./HBACapture_Linux.sh --BasicCapture
   ```
   or for Citrix:
   ```
   ./OneCapture_Linux.sh --BasicCapture
   ```
   See Section 2.3.3, Linux, Citrix, and Solaris CLI Parameters, for parameters.

4. Change the script to executable mode, for example, `chmod 777 HBACapture`.

   The progress of the script is displayed. For example:
   ```
   Running Emulex HBA Capture Solaris, version
   Emulex Corporation Report Utility
   Started at Wednesday, January 25, 2023 12:50:42 PM CST
   Initializing report environment for host:solaris
   Collecting System Information...
   [-]     1%                              uname -a
   ```

5. After the Emulex HBA Capture script finishes gathering information, it creates a zipped tarball file in its current working directory. Open that file to view the captured information.

2.3.1 Output File

The Emulex HBA Capture utility creates a single `.tgz` file containing all the captured components. This `.tgz` file is named `HbaCapture_Linux_<date-time>.tgz`. This file is placed in the working directory from which you run the Emulex HBA Capture utility.

To examine the items in the output `.tgz` file, first untar it. This action creates a directory in the current working directory called `dump`. It also creates a file in the current working directory called `HbaCapture-Linux.html`.

`HbaCapture-Linux.html` is a navigable directory of the captured components. When you launch this file in your browser, you can browse through the captured objects. Or, you can examine the captured components directly by browsing through the folders and files in the `dump` directory.

The adapter dump files are placed in a directory called `dump/Core Dump`. Typically, you do not need to examine these files individually, because Broadcom Technical Support usually requests the entire output `.tgz` file.

ATTENTION: You must ensure that the adapter dump file in the `Core Dump` directory has been created properly. This file is critical for proper diagnostics. You can examine the component files in the `.tgz` file before you send the `.tgz` file to Broadcom Technical Support. A `.txt` file that contains an adapter list is also available in the same directory. This file allows you to verify whether all corresponding adapters are properly listed for capture purposes.

NOTE: To capture the HBA firmware log on the Linux or Citrix operating system, the `lpfc_ras_fwlog_buffsize` driver parameter must be enabled. Refer to the *Emulex Drivers for Linux User Guide* for instructions on setting this parameter. (This parameter is not supported on the Solaris operating system.)

2.3.2 Output Summary File

The Emulex HBA Capture utility produces an output summary file at the end of the capture process. The file displays an onscreen list of the critical items that should have been captured, and a status as to whether the capture was successful, so you can verify whether the collected output is valid. The following is an example of an output summary file:

```
[root@HOSTA-83 RT12.8]# ./HBACapture_Linux.sh -A=2 -F
Verifying archive integrity...  100%   All good.
Uncompressing Emulex HBA Capture - Copyright(c) 2012-2022 Broadcom. All Rights Reserved. The term
'Broadcom' refers to Broadcom Inc. and/or its subsidiaries.  100%
The following adapter(s) were selected for firmware dump : 2
Beginning full capture.

  You have chosen a capture which might cause an adapter reset during triggered firmware dump
  Adapter reset will cause temporary interruption of I/O.

  Do not use this option if the adapter is the boot device.
  If you must perform a dump on the boot adapter, use --SafeCapture option.

Do you wish to continue this capture? (y/n) y
Running Broadcom ECD HBA Capture Linux, version 14.2.123.4
Started at Tue Sep 15 09:16:56 PDT 2022
Initializing report environment for host:HOSTA-83
Collecting System Information...
Capture Completed
Capture Checklist - Please make sure all required file are properly captured for further diagnostic
==================================
* SUCCESS: SN37A28332 HBA 2 firmware dump collected - Adapter_2_2022-09-15_091649.bin
```

```
* SUCCESS: Kernel log messages file collected - messages-old.tgz
* SUCCESS: Kernel log warn file collected - warn-old.tgz
* SUCCESS: /var/crash kernel crash dump is collected - /var/crash
=================================
 [/] Generating Compressed Capture...
Done
HbaCapture_Linux_2022-09-15_091649.tgz is under current directory /RT14.0
```

The file is included in the generated output file for use by Broadcom Technical Support for additional debug purposes.

2.3.3 Linux, Citrix, and Solaris CLI Parameters

The following CLI parameters are available for Linux, Citrix, and Solaris.

-h or --help

Displays the help text.

-L or --ListAdapters

Lists the discovered adapters. The `ListAdapters` parameter shows each adapter's adapter number (0, 1, . . .), which is used in the `dump` command for the `--Adapters` parameter.

-Q or --Quiet

Forces the capture without displaying a warning message or prompt.

-X or --NoCrashDump

Does not collect crash dump files under `/var/crash`. For example:
```
./HBACapture_Linux.sh --NoCrashDump
```

-B or --BasicCapture

Specifies the basic capture type. To specify a basic capture, omit the `--FullCapture` and `--Adapters` parameters. For example:
```
./HBACapture_Linux.sh --BasicCapture
```

-F or --FullCapture

Specifies the full capture type. To specify a full capture, use both the `--FullCapture` and `--Adapters` parameters. For example:

```
./HBACapture_Linux.sh --FullCapture --Adapters=0
./HBACapture_Linux.sh --FullCapture --Adapters=2,3
./HBACapture_Linux.sh --FullCapture --Adapters=all
```

CAUTION! This parameter can temporarily interrupt I/O on live adapters, and it can force live adapters offline.

-S or --SafeCapture

Specifies the safe capture type. To specify a safe capture, use the `-S` or `--SafeCapture` parameter with no other parameters. For example:

```
./HBACapture_Linux.sh -S
./HBACapture_Linux.sh --SafeCapture
```

-M or --MinimalCapture

Specifies the minimal capture type. The following items are captured by a minimal capture:

- Kernel logs
- Kernel configurations
- Adapter information

To specify a minimal capture, use the `-M` or `--MinimalCapture` parameter with a full or basic capture. For example:

```
./HBACapture_Linux.sh -A=All -M -F
./HBACapture_Linux.sh --MinimalCapture
```

-A=<*AdapterNumber* | *<list>* | *all*> or --Adapters=<*AdapterNumber* | *<list>* | *all*>

Use only with the `--FullCapture` parameter. This parameter specifies the adapters for which the Emulex HBA Capture utility performs a dump. For example:

- To perform a full dump on adapter 0 only:
  ```
  /HBACapture_Linux.sh --FullCapture --Adapters=0
  ```
- To perform a full dump on adapters 2 and 3 only:
  ```
  /HBACapture_Linux.sh --FullCapture --Adapters=2,3
  ```
- To perform a full dump on all adapters:
  ```
  /HBACapture_Linux.sh --FullCapture --Adapters=all
  ```

NOTE: You must indicate the adapter by specifying `--Adapters=<AdapterNumber>`.

2.4 Running the Emulex HBA Capture Utility on VMware ESXi

Before running the Emulex HBA Capture utility on VMware ESXi systems, you must enable the ESXi shell by performing the following steps:

1. Press **F2** on the ESXi main screen.

2. Go to **Troubleshooting Options**.

3. Select **Enable ESXi shell**.

NOTE: You can also run the `HBACapture_ESX.sh` or file or the `HBACapture_ESX80.sh` file by `SSH` to the ESXi host.

ATTENTION: Before running the Emulex HBA Capture utility, quiesce the port.

4. Log in as `root`.

5. Download the zipped script file `Emulex_HBA_Capture_ESX_<version>.tgz` or
    `Emulex_HBA_Capture_ESX80_<version>.tgz`.

6. Extract the script file by running one of the following command:
    - `tar -zxvf Emulex_HBA_Capture_ESX_<version>.tgz`
    or
    - `tar -zxvf Emulex_HBA_Capture_ESX80_<version>.tgz`

7. From the directory in which the Emulex HBA Capture utility is installed, show the available target volumes by typing the
    following command:
    `./HBACapture_ESX.sh [-T | --ShowVolumes]`
    or
    `./HBACapture_ESX80.sh [-T | --ShowVolumes]`
    For example:
```
HBACapture_ESX.sh -T
--ShowVolumes selected
Volume 1 - Free Space: 124.74 GB  ID: 5cda6c82-71f0aac9-1c10-6cae8b28bff2
Volume 2 - Free Space:  74.25 GB  ID: 5cf0d241-316731c7-c7b6-6cae8b28bff2
Volume 3 - Free Space: 298.30 GB  ID: 5cfe03ef-947bed28-ff50-6cae8b28bff2
Volume 4 - Free Space: 582.79 GB  ID: 5d063468-3a72fe82-aceb-6cae8b28bff2
Volume 5 - Free Space:  99.06 MB  ID: bb894070-bfa41e5c-f8e7-9344aaa42144
Volume 6 - Free Space:  91.83 MB  ID: e1ef2d7e-70e76701-9a79-b952624b88f2
Volume 7 - Free Space: 112.01 MB  ID: 5cf0be05-43b674ab-6fc6-6cae8b28bff2
Volume 8 - Free Space:   3.97 GB  ID: 5cf0be0e-92b37a55-4f7f-6cae8b28bff2
Volume 9 - Free Space:  92.85 MB  ID: 1f78a579-3243d0d4-4105-f65095b681c8
Volume 10 - Free Space:   3.96 GB  ID: 5cfe03f7-b158c5e1-541d-6cae8b28bff2
Volume 11 - Free Space:  76.76 MB  ID: 5cfe03dd-60bde046-5df3-6cae8b28bff2
Volume 12 - Free Space:  92.86 MB  ID: 7b86cf79-6cf0d08f-591c-7fd4ff210e44
```

NOTE: Before release 12.4 of the Emulex OneCapture utility, the `-T` parameter displayed the volume ID as the volume's
         UUID. It now displays the volume ID as an index number, in addition to the UUID, which is still displayed. You can
         specify either volume ID format with the `-V` parameter. In addition, the free space on each volume is now displayed.

8. You can select the target volume for the dump by typing the following optional command:
    `[-V | --Volume]=<volume_id>`
    For best results, specify a large local volume. A message warns you if less than 500 MB of free space exists on the
    specified volume.
```
No Volume specified, suggest to use the largest volume found
   Volume ID: 5d063468-3a72fe82-aceb-6cae8b28bff2 Free Space: 582.79 GB
Do you want to use the largest volume above as output directory? (Y/N)Please answer (Y)es or (N)o,
using Y/N
Do you want to use the largest volume above as output directory? (Y/N)Y
5d063468-3a72fe82-aceb-6cae8b28bff2 selected as output directory
```

NOTE: Before release 12.4 of the Emulex OneCapture utility, `volume_id` corresponded to the UUID that was displayed
         by the `-T` parameter. Now you can enter the volume index number displayed by the `-T` parameter (for example,
         `-V=1`) instead of the UUID (for example, `-V=5cda6c82-71f0aac9-1c10-6cae8b28bff2`).

9. Run the shell script for the corresponding systems with the selected options. For example:

    ```
    ./HBACapture_ESX.sh --Volume=1 --BasicCapture
    ```

    The progress of the script is displayed in the following example:

    ```
    Verifying archive integrity... All good.
    Uncompressing Emulex HBA Capture ESX - Copyright(c) 2012-2022 Broadcom. All Rights Reserved. The
    term 'Broadcom' refers to Broadcom Inc. and/or its subsidiaries.............
    --Volume selected 5cda6c82-71f0aac9-1c10-6cae8b28bff2.
    Beginning basic capture.
    Emulex HBA Capture ESXi, version 14.0.123.4
    Started at Mon Sep 28 12:40:25 UTC 2022
    Initializing report environment for host:dell94
    Collecting System Information...
      [-] Obtaining vm-support...
      [-] Obtaining Firmware Dump
      [/] Gathering Logs...
      [/] Gathering kv_pages...
      [-] Generating Compressed Capture...
      [-] HBACapture_ESX_2022-09-28_124023.tgz is under /vmfs/volumes/5cda6c82-71f0aac9-1c10-
    6cae8b28bff2.
    ```

2.4.1 Output File

The Emulex HBA Capture utility creates a zipped tarball file. This file is placed in the volume that you created. Open the file to view the information. For example:

```
HbaCapture_ESX_2022-09-28_124023.tgz is under /vmfs/volumes/cda6c82-71f0aac9-1c10-6cae8b28bff2.
```

NOTE: To capture the HBA firmware log on the VMware operating system, either the `lpfc_ras_fwlog_buffsize` driver parameter or the `setfwlog esxcli` command must be enabled. Refer to the *Emulex Drivers for VMware ESXi User Guide* for instructions on enabling these settings.

2.4.2 Output Summary File on ESXi 7.0

The Emulex HBA Capture utility produces an output summary file at the end of the capture process. The file displays an onscreen list of the critical items that should have been captured, and a status as to whether the capture was successful, so you can verify whether the collected output is valid. The following is an example of an output summary file on ESXi 7.0:

```
[root@dhcp-10-123-164-141:/vmfs/volumes/5cda6c82-71f0aac9-1c10-6cae8b28bff2/Build] sh
HBACapture_ESX.sh -V=1 -F -A=ALL
Verifying archive integrity... All good.
Uncompressing Emulex HBA Capture ESX - Copyright(c) 2012-2022 Broadcom. All Rights Reserved. The term
'Broadcom' refers to Broadcom Inc. and/or its subsidiaries.
..........
Volume 1 selected
Volume ID 5cda6c82-71f0aac9-1c10-6cae8b28bff2
Beginning full capture.
'-A' selected adapters all
ALL adapters were selected to do dead dump

  You have chosen a capture which includes an adapter reset.
  Adapter reset will cause temporary interruption of I/O.

  Do not use this option if the adapter is the boot device.
  If you must perform a dump on the boot adapter, use --SafeCapture option.

Do you wish to continue this capture? (y/n) Please answer yes or no, using y/n
```

```
Do you wish to continue this capture? (y/n) y
Emulex HBA Capture ESXi, version 14.0.123.4
Started at Mon Sep 28 12:40:23 UTC 2022
Initializing report environment for host:dhcp-10-123-164-141.dhcp.broadcom.net
Collecting System Information...
[-] Obtaining vm-support...
[|] Obtaining Firmware Dump
[\] Obtaining FW Log
[-] Gathering Logs...
[/] Gathering NVME information...
[|] Gathering kv_pages...
[\] Capture Checklist - Please make sure all required file are properly captured for further diagnostic
=================================
vmsupport - SUCCESS: VMsupport collected
Adapter_0_2022-06-18_192504.dmp - SUCCESS: Saturn HBA 0 collected dump
Adapter_1_2022-06-18_192504.bin - SUCCESS: LPe31002-M6 HBA 1 firmware dump collected
Adapter_2_2022-06-18_192504.bin - SUCCESS: SN37A28328 HBA 2 firmware dump collected
./Adapter-1-Function-0-20190618-192952.txt - SUCCESS: HBA 1 collected FW log
./Adapter-2-Function-0-20190618-192954.txt - SUCCESS: HBA 2 collected FW log
lpfc-kv-pages.txt - SUCCESS: lpfc kv-page collected
=================================
[/] Generating Compressed Capture...
[\] HBACapture_ESX_2022-09-28_124023.tg
```

The file is included in the generated output file for use by Broadcom Technical Support for additional debug purposes.

2.4.3 Output Summary File on ESXi 8.0

The Emulex HBA Capture utility produces an output summary file at the end of the capture process. The file displays an onscreen list of the critical items that should have been captured, and a status as to whether the capture was successful, so you can verify whether the collected output is valid. The following is an example of an output summary file on ESXi 8.0:

```
[root@dhcp-10-123-180-115:~] ./HBACapture_ESX80.sh -V=1 -F -w=10:00:00:10:9b:e5:22:d2


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Volume 1 selected
Volume ID 62d6948b-151311e1-cd42-6805caee4556
Beginning full capture.

   You have chosen a capture which might cause an adapter reset during triggered firmware dump
   Adapter reset will cause temporary interruption of I/O.

   Do not use this option if the adapter is the boot device.

Do you wish to continue this capture? (y/n) y
Emulex HBA Capture ESXi, version 14.2.440.0
Started at Fri Dec 2 05:26:17 UTC 2022
Initializing report environment for host:dhcp-10-123-180-115.dhcp.broadcom.net

   [/] Triggering new dump...
Triggering firmware dump on vmhba1
   [-] Obtaining firmware dump...
Initiating livedump...
   [/] Capturing dump...
   [-] Created file /vmfs/volumes/62d6948b-151311e1-cd42-6805caee4556/HBACapture_ESX80_2022-12-
02_052610/coredumps/elxzdumpcore.1
```

```
   [\] Completed dump capture.
Obtaining vm-support...
   [/]
SUCCESS: VMsupport collected
Generating Emulex HBA Capture bundle..
Generating Compressed Capture...
   [|] HbaCapture_2022-12-02_052610.tgz is under /vmfs/volumes/62d6948b-151311e1-cd42-6805caee4556
```

2.4.4 ESXi Command Line Interface Parameters

NOTE: The HBA Capture utility for the ESXi 8.0 operating system has been changed to comply with VMware security requirements. Differences from ESXi 7.0 and earlier operating system versions are indicated in this section.

The following additional information applies to the Emulex HBA Capture utility for the ESXi 8.0 operating system:

- Instead of using the `--ListAdapters` command to determine the adapters to use with the `--AdapterNumber` command, use the WWPN of the desired adapter or adapters.

- If firmware logging has been enabled using the `lpfc_ras_fwlog_buffsize` driver parameter, firmware logs are automatically collected by the driver as part of any safe capture, full capture, or other options that capture dumps.

- When a safe capture or full capture is performed, the script creates a kernel dump `zdump` file, such as `vmkernel-zdump.1`, under the `/var/core/` directory. This file includes the firmware dump, and it includes firmware logs if firmware logging is enabled.

- You can manually stop the script from running by pressing **Ctrl + C**. If the script is manually stopped and restarted, the information acquired in the first run is lost, and only the information acquired in the second run is kept.

The following CLI parameters are available for ESXi systems.

`-h` or `--help`

Displays the help text.

`-T` or `--ShowVolumes`

Lists the available volumes. The Volume IDs given can be used in a `-V` or `--Volume` parameter.

NOTE: Before release 12.4, the `-T` parameter displayed the volume ID as the volume's UUID. It now displays the volume ID as an index number, in addition to the UUID, which is still displayed. You can specify either volume ID format with the `-V` parameter. In addition, the free space on each volume is now displayed.

`-V` or `--Volume` (optional)

Sets up the dump volume. For example:
```
./HBACapture_ESX.sh --Volume=1
```

For best results, specify a large local volume for the dump. A message warns you if less than 500 MB of free space exists on the specified volume.

If the `-V` parameter is not issued, a message asks if you want to use the volume with the largest amount of free space detected. Type **Y** to continue.

NOTE: Before the 12.4 release, the `volume_id` variable corresponded to the UUID that was displayed by the `-T` parameter. Now you can enter the volume index number displayed by the `-T` parameter (for example, `-V=1`) instead of the UUID (for example, `-V=5c77bd01-08da2264-08dd-34800d185c82`).

-L or --ListAdapters

Lists the discovered adapters. The `ListAdapters` parameter shows each adapter's adapter number (0, 1, . . .), which is used in the dump command for the `--Adapters` parameter.

-Q or --Quiet

Forces the capture without displaying a warning message or prompt.

-B or --BasicCapture

Specifies the basic capture type. To specify a basic capture, omit the `--FullCapture` and `--Adapters` parameters. For example:

```
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --BasicCapture
```

NOTE: The `-B` or `--BasicCapture` command is not supported on the ESXi 8.0 operating system.

-F or --FullCapture

Specifies the full capture type. To specify a full capture, use both the `--FullCapture` and `--Adapters` parameters. For example:

```
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --FullCapture --Adapters=0
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --FullCapture --Adapters=2,3
./HBACapture_ESX.sh -V=538555c4-c83454f8-d9d2-f04da23f74e4 --FullCapture --Adapters=all
```

ATTENTION: This parameter can temporarily interrupt I/O on live adapters and can force live adapters offline.

NOTE: The `--Adapters` parameter is not supported on the ESXi 8.0 operating system.

-S or --SafeCapture

Specifies the safe capture type. To specify a safe capture, use the `-S` or `--SafeCapture` parameter with no other options. For example:

```
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 -S
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --SafeCapture
```

-M or --MinimalCapture

Specifies the minimal capture type. The -M option omits the collection of vm-support data. To specify a minimal capture, use the -M or --MinimalCapture parameter with no other options. For example:
```
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 -M
./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --MinimalCapture
```

NOTE: The -M or --MinimalCapture command is not supported on the ESXi 8.0 operating system.

-A=<*AdapterNumber* | *<list>* | all> or --Adapters=<*AdapterNumber* | *<list>* | all>

Specifies the adapters for which the Emulex HBA Capture utility will perform a full dump. Use the parameter only with the -F or --FullCapture parameter. For example:
- To perform a full dump on adapter 0 only:
  ```
  ./HBACapture_ESX.sh --Volume=538555c4-c83454f8-d9d2-f04da23f74e4 --FullCapture --Adapters=0
  ```
- To perform a full dump on adapters 2 and 3 only:
  ```
  ./HBACapture_ESX.sh --FullCapture --Adapters=2,3
  ```
- To perform a full dump on all adapters:
  ```
  ./HBACapture_ESX.sh --FullCapture --Adapters=all
  ```

NOTE: You must indicate the adapter by specifying --Adapters=<*AdapterNumber*>.

NOTE: The -A or --Adapters command is not supported on the ESXi 8.0 operating system. Use the -W or --Wwpns parameter to identify the WWPNs of adapters on which a dump operation is to be performed. You can identify multiple WWPNs by separating them with commas. The HBACapture_ESX80.sh script ignores invalid WWPNs.

-SVM or --SkipVMsupport

This option causes the Emulex HBA Capture utility to skip the collection of vm-support data. You can collect the vm-support data manually using any of the following commands:
- With the local ESXi:
  ```
  vm-support -w <path_to_destination_directory>
  ```
- With a remote system:
  a. Using any HTTP client, download the following resource:
  ```
  https://<ESX host name or IP address>/cgi-bin/vm-support.cgi.
  ```
  b. Download the resource using the wget utility on a Linux or other Posix client, such as the vSphere Management Assistant appliance.
  ```
  wget <ESX host name or IP address>/cgi-bin/vm-support.cgi
  ```
  A compressed bundle of logs is produced on the client at the specified location.
  c. Using a Linux or Posix client, such as the vSphere Management Assistant appliance, log in to the ESXi host, and run the vm-support parameter with the streaming option enabled, specifying a new local file. A compressed bundle of logs is produced on the client at the specified location. For example:
  ```
  ssh root@<ESX host name or IP address> vm-support -s > vm-support-<Host name>.tgz
  ```

Chapter 3: Collected Data

By default, the Emulex HBA Capture utility collects existing firmware dumps. For forced dumps, Emulex adapters are made unavailable during Emulex HBA Capture utility execution. The adapters are made available again after the dumps are created and captured.

To skip collecting existing dumps, perform one of the following actions:

- For Linux and Solaris systems, use the `/SafeCapture` parameter.
- For Windows and VMware systems, choose `Safe` mode, or uncheck dump options in the GUI. Use the `/SafeCapture` parameter, or specify the `/component` option to choose the necessary items in the CLI.

To collect forced dumps, perform one of the following actions:

- For Linux and Solaris systems, use the `/FullCapture` parameter.
- For Windows and VMware systems, choose full capture, or select options in GUI interface. Use the `/FullCapture` parameter, or specify the `/component` option to choose the necessary items in the CLI.

The Emulex HBA Capture utility cannot collect data for certain nondefault library commands. However, you can install add-on packages for those commands if the packages are compatible with your system.

The following list of packages might not be included with default installations. Install these packages to capture the most data.

- For Linux:
  - `sysstat` – To use `iostat mpstat`
  - `hwinfo` – To use `hwinfo`
  - `sg3_utils` – To use `sg_map`
  - `dmidecode` – To use `dmidecode` and `biosdecode`
  - `smbios-utils` – To use `smbios`
  - `netstat-nat` – To use `netstat`
  - `libblkid` – To use `blkid`
  - `procps` – To use `vmstat`
  - `device-mapper-multipath` – To use `multipath`
  - `bridge-utils` – To use `brctl`
  - `libvirt-utils` – To use `virsh`
- For Solaris:
  - `pciconf` – To use `pciconf`
  - `prtdiag` – To use `prtdiags`

NOTE: Emulex HBA Capture utility packet data can be captured as part of the memory dump within the firmware dump.

The following sections describe, by operating system, the information collected by the Emulex HBA Capture utility.

3.1 Windows Systems

The following information is available from Windows systems.

Table 2: Windows Information Collected

Type	Information
AutoPilot Report	FC
HBA firmware dump	OneKat adapter list
	OneKat adapter dumps
Disk	Disk detail
Driver Configuration	`Devcon` collected information
	`<HKLM>/Hardware/DeviceMap/Scsi`
	`Driverquery` collected information
ElxTrace	Trace messages
MPIO Information	`mpclaim -s`
	`mpclaim -e`
	`mpclaim -v`
Emulex HBA Manager Application Information	`Hbacmd version`
	`Hbacmd ListHBAs` (local)
	`Hbacmd HbaAttribute` (local)
	`Hbacmd PortAttribute` (local)
	`Hbacmd nvme-list`
	`Hbacmd nvme-list-ctrl`
	`Hbacmd nvme-id-ctrl`
	`Hbacmd nvme-list-ns`
	`Hbacmd nvme-get-feature`
	`RM.log`
	Emulex HBA Manager installer log
System Configuration	System information
	System inventory
	PCI information
	CPU information
	CPUEx information
Win Logs	Windows logs
Win Setup Log	Windows setup log
Windows Information	Broadcom services status
	`setupapi.*.log`
	Event logs

3.2 Linux Systems

The following information is available from Linux systems.

Table 3: Linux Information Collected

Type	Information	Parameter
Adapter Info	`Onekat` adapter list	—
Crash Dump	`kdump`	`/var/crash`[a]
Device Interrupts	Emulex device interrupts counter, in 5-second intervals	—
Driver Information	RPM packages with an `elx` prefix name	—
	Loaded kernel modules with an `elx` prefix name	—
	`lpfc` kernel module information	`modinfo lpfc`
FC-Specific Information	—	`modinfo`
		`SCSI device info`
		`SCSI class information`
Hardware Information	System hardware description through SMBIOS/DMI	`dmidecode`
HBACMD	`listhbas`	—
	`version`	—
	`hbaattr` (local HBA only)	—
	`hbacmd nvme-list-linux`	—
	`hbacmd nvme-list-ns-linux`	—
Kernel Configuration	Compile-time kernel configuration	`/proc/config.gz`
	`xinetd` configuration, network services daemon configuration	—
	Module loading configuration	`/proc/modprobe.conf`
Kernel Information	CPU structures	`/proc/cpuinfo`
	Memory structures	`/proc/meminfo`
	Kernel version	`/proc/version`
	System uptime	`/proc/uptime`
	Kernel boot parameters	`/proc/cmdline`
	System memory mapping	`/proc/iomem`
	Memory zones and virtual memory	`/proc/zoneinfo`
	Devices group	`/proc/partitions`
	Kernel caches	`/proc/slabinfo`
	Network device status	`/proc/net/dev`
	SCSI devices	`/proc/scsi/scsi`
Kernel Log	`dmesg` kernel log	—
Kernel Runtime Parameters	List of all kernel runtime parameters	—
Library Information	The version number for the following libraries: ■ `libdfc` ■ `libHBA`	—
MPIO Info	`multipath -ll`	`/etc/multipath.conf`

Table 3: Linux Information Collected (Continued)

Type	Information	Parameter
Network Statistics	Summary statistics for each protocol	—
	Table of all available network interfaces	—
	All current TCP connections	—
	Routing table	—
Emulex HBA Manager Application Information	RPM packages with an `elx` prefix name	—
	Running status of the process `hbanywhere`	—
	Running status of the process `ocmanager`	—
	List of executable files with an `elx` prefix name	—
	`rm.log`	—
	`utils-install.log`	—
	`Installer.log`	—
PCI Information	Tree diagram containing all buses, bridges, devices, and connections. Verbose and detailed information plus PCI configuration space dump on devices with Emulex vendor ID.	—
System Information	Kernel version	—
	Distributed version	—
	Kernel modules currently loaded	`lsmod`
	Kernel memory allocations	`numastat`
	Running processes	`ps`
	Running tasks	`top`
	Processors statistics	`mpstat`
	Memory statistics	`free`
	Installed packages	`rpm -qa`
	Block devices	`lsblk -fmt`
Virtualization Logs	—	`/var/log/xen/xend.log`
		`/var/log/libvirt/libvirtd.log`
Virtual Memory Statistics	Various event counters and memory statistics	—
	Disk statistics	—
	`slabinfo`	—

a. Use only the `/var/crash` directory for crash dump files. Dump files will not be created under any other path.

3.3 Solaris Systems

The following information is available from Solaris systems.

NOTE: Solaris support is available for Solaris inbox drivers only.

Table 4: Solaris Information Collected

Type	Information	Parameter
HBA Firmware Dump	`hbacmd dump`	—
	`hbacmd dump down`	—
Crash Dump	`kdump`	`/var/crash`[a]
Device Interrupts	Emulex device interrupts counter, 5 seconds	—

Table 4: Solaris Information Collected (Continued)

Type	Information	Parameter
Hardware Information	BIOS information	`smbios`
	PCI buses information	`scanpci`
	System peripherals information	`prtconf -v`
	System peripherals tree	`prtconf -vp`
	Host HBA information	`fcinfo hba-port`
HBACMD	`listhbas`	—
	`version`	—
	`hbaattr` (local only)	—
	`portattr` (local only)	—
Kernel Configuration	System parameters	`/etc/system`
	Kernel symbols	`nm -x /dev/ksysm	grep OBJ`
Kernel Log	`dmesg` kernel log	—
Kernel Parameters	System definition	`sysdef -D`
	System definition, in device tree format	`sysdef -dD`
	Kernel statistics	`kstat`
Network Statistics	Per-protocol statistics	`netstat -s`
	ARP tables	`netstat -p`
	All TCP statistics	`netstat -aP tcp`
	Routing tables	`netstat -rn`
	Multicast memberships	`netstat -g`
	INET family streams statistics	`netstat -idm -f inet`
Emulex HBA Manager Application Information	Running status of the process `hbanywhere`	—
	Running status of the process `ocmanager`	—
	List of executables with an `elx` prefix name	—
	`rm.log`	—
	`utils-install.log`	—
	`installer.log`	—
System Information	Kernel version	`uname -a`
	Network interface	`ifconfig -a`
	Processors information	`psrinfo -pv`
	Swap information	`swap -s`
	Last reboot time	`last reboot`
	Uptime	`uptime`
	Running tasks	`top -d 5 -n 2`
	Running processes	`ps -ef)`
	Loaded modules	`modinfo`
	Service status	`svcs`
	Device status	`cfgadm -al`
System Statistics	System events since boot	`vmsat -s`
	Paging activity in 5 seconds	`vmstat -p 1 5`

a. Use only the `/var/crash` directory for crash dump files. Dump files will not be created under any other path.

3.4 VMware Systems

The following information is available from VMware systems.

Table 5: ESXi 7.0 Information Collected

Type	Information
HBA Dump	HBA firmware dump
	`Onekat` adapter list
Log Configuration	`/tmp/*.log`
	`/etc/cim/emulex/*.log`
	`/etc/cim/emulex/*.dmp`
	`/etc/cim/emulex/*.conf`
VM_KV_PAGE	`vm_kv_page -v`
	`lpfc-kv-pages.txt`
	`vm_kv_page -q all -p all`
	`lpfc-kv-pages.txt`
VMware `vm-support` package (as provided by the default manifest in ESXi)	Active directory
	CIM
	Configuration
	Crash
	Fault
	File system
	Hardware
	Unresponsive VM
	Installer
	Logs
	Network
	Performance snapshot
	Storage
	System
	Testing
	Userworld
	Virtual
	Host profiles

Table 6: ESXi 8.0 Information Collected

Type	Information
HBA Dump	HBA firmware dump
VMware `vm-support` package (as provided by the default manifest in ESXi)	Active directory
	Configuration
	Crash
	Fault
	File system
	Hardware
	Unresponsive VM
	Installer
	Logs
	Network
	Performance snapshot
	Storage
	System
	Testing
	Userworld
	Virtual
	Host profiles

Chapter 4: Troubleshooting

This section describes circumstances under which your system might operate in an unexpected manner, and it offers resolutions for each situation.

NOTE: If an operating system is not specified, the issue is applicable to all operating systems.

Table 7: Emulex HBA Capture Troubleshooting

Situation	Resolution
Adapter information was not captured.	1. Install the Emulex HBA Capture utility on the system on which you are collecting data. 2. Install the driver for the devices on the system. The drivers must be installed before driver information is available for capture. 3. Install the Emulex HBA Manager application from the Broadcom website at www.broadcom.com.
The HTML file displays a `missing Data File` error.	Verify that the zip file has been extracted completely from the archive folder before you open the HTML file.

Emulex HBA Capture scripts can generate the error messages described in the following table.

Table 8: Emulex HBA Capture Script Error Messages

Message Text	Cause and Action	Status Code on Exit
`--FullCapture not valid (OS not supported)`	The Emulex HBA Capture utility does not support this operating system or Linux distribution; the Emulex HBA Capture utility does not exit.	—
`--ListAdapters not valid (OS not supported)`	The Emulex HBA Capture utility does not support this operating system or Linux distribution; the Emulex HBA Capture utility exits immediately.	0
`--ListAdapters selected` `FreeBSD do not support FC adapter dump`	The dump tool does not support FreeBSD; the Emulex HBA Capture utility exits immediately.	0
`Adapter $index does not exist` `Please re-select adapters to do dead dump`	The specified adapter number does not exist in the system; the Emulex HBA Capture utility exits immediately.	0
`Do not use this option if the adapter is the boot device.` `If you must perform a dump on the boot adapter, use --SafeCapture option.`	You are running the Emulex HBA Capture utility on an adapter that is configured as a boot device; you are prompted whether to continue. Use `--SafeCapture` (in Linux and VMware) or `/SafeCapture` (in Windows) to run the Emulex HBA Capture utility on a boot device.	0

`Dump tool has missing dependencies:`
`<missing packages>`
`If you must perform a dump on this system, please fix those missing packages.`
	A required library file is missing; you are prompted whether to continue.
	See the list of library files required for Linux in Section 2.3, Running the Emulex HBA Capture Utility on Linux, Citrix, and Solaris.
		0

Table 8: Emulex HBA Capture Script Error Messages (Continued)

Message Text	Cause and Action	Status Code on Exit
`Invalid options. --FullCapture requires the --Adapters option.` `Please specify the adapters for which you want to collect dead dumps.` `Use --ListAdapters to obtain the adapter numbers.` `Use --Adapters to specify the desired dump adapters.` `Syntax:` ` --Adapters=<AdapterNum1 [,AdapterNum2,...]	all>zz` `Example,` ` to dump adapters 2 and 3:` ` --Adapters=2,3` ` to dump all the adapters reported by --ListAdapters:` ` --Adapters=all`	The `--FullCapture` parameter was specified, but no adapter option was specified; the Emulex HBA Capture utility exits immediately.	0
`Emulex HBA Capture is already running, please run only one instance at a time`	Another instance of the Emulex HBA Capture utility has been detected; the Emulex HBA Capture utility exits immediately.	0

`Emulex HBA Capture requires the libnl1 package.`
`You must install it manually, and then re-run Emulex HBA Capture.`
`To install the libnl1 package, use "apt-get install libnl1".`
	The `libnl1` package is not installed; the Emulex HBA Capture utility exits immediately.
	See the list of library files required for Linux in Section 2.3, Running the Emulex HBA Capture Utility on Linux, Citrix, and Solaris.
		0

`onekat is not available for this distro` `If you must perform a dump on this system, please use an updated Emulex HBA Capture`	The version of the Emulex HBA Capture utility that you are using does not support the operating system distribution; you are prompted whether to continue.	0
`option '-A'	'--Adapters' invalid.` `please add '-F'	'--FullCapture' if you wish to collect dead dumps`	An adapter number was specified, but full capture was not specified; the Emulex HBA Capture utility exits immediately.	0
`Please make sure you are using valid options` `'-H'	'-h'	'--help' to see help`	An unsupported parameter was specified; the Emulex HBA Capture utility exits immediately.	0
`Please specify only one of the Capture Type.` `You could choose only one of -B, -S, or -F.`	More than one capture parameter was specified; you must choose only one. The Emulex HBA Capture utility exits immediately.	0
`Some Critical information will be missed if OCM is missing` `Do you wish to continue this capture? (y/n)`	In Solaris, the Emulex HBA Manager application is not installed on the system; you are prompted whether to continue.	0

`This script only support the following Unix variants`
`* Linux`
`* Solaris`
`* FreeBSD`
	An unsupported operating system was detected; the Emulex HBA Capture utility exits immediately.	0

`Unsupported architecture: <detected architecture>`	Only the following architectures are supported: ■ i386 ■ x86_64 If another architecture is detected, the Emulex HBA Capture utility exits immediately.	-1

Table 8: Emulex HBA Capture Script Error Messages (Continued)

Message Text	Cause and Action	Status Code on Exit
user cancelled capture, will generate zip for data already captured	You pressed **Ctrl+C** to cancel a currently running script; the Emulex HBA Capture utility generates a .zip file of the data that has been collected and then exits.	0
We do not support Adapter Dumps for your Operating system. Currently Support Only SLES, RHEL, Citrix XenServer and Oracle Linux (UEK).	A Linux operating system was detected, but adapter dumps are not available for the detected operating system type or distribution; you are prompted whether to continue.	0
You have chosen a capture which includes a dead dump. Dead dump causes the adapter to be taken offline. A system reboot is required to bring the adapter back online. Do not use this option if the adapter is the boot device. If you must perform a dump on the boot adapter, use --SafeCapture option.	In the Solaris operating system, the dump you selected requires the adapter to be taken offline; you are prompted whether to continue.	0
You have chosen a capture which includes an adapter reset. Adapter reset will cause temporary interruption of I/O	The dump you selected requires an adapter reset; you are prompted whether to continue.	0
You must run this as root.	The script is being run under a non-root user; the Emulex HBA Capture utility exits immediately.	1
Emulex HBA firmware dump capture is in progress.. Retry once the existing script terminates.	You can run only one instance of the HBACapture_ESX80.sh script at a time. If the script stops unexpectedly and you run the script again, this message might appear. If the message appears, delete the /scratch/elxdumpbin file.	N/A