

DELL EMC DEPLOYMENT TOOL KIT (DTK) PORTING GUIDE

Author: H E Ramesha

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Version Tracking

Date	Version	Changes	By
14/11/2017	0.1	Initial draft	Ramesha HE
20/11/2017	0.2	Updated marketing comments and added two new sections 11 & 12.	Ramesha HE
11/12/2017	1.0	Updated marketing comments	Ramesha HE

1 Overview

This Porting guide is an orientation towards DTK deprecation plan, for an existing user to self-sustain DTK environment and a smooth transition from DTK to RACADM. This guide used as a reference manual to add boot critical drivers and controller to support for the Dell Power Edge server platforms till 14G.

This document helps to understand DTK utilities and scripts and transition guidelines for RACADM deployment and configuration of Dell PowerEdge servers in Windows and Linux environments.

To update or modify the DTK pre-boot environment user should have the following prerequisite setup for Linux and Windows operating systems.

2 Linux build setup

DTK Linux ELI is based out of CentOS 7.x distribution, to modify or update on released DTK ELI environment, user should have a similar operating system distribution build environment corresponding to DTK ELI release version. While setting up the build environment for DTK ELI update or modification, select identical kernel version which is carried on the DTK bootable ELI.

The build environment should be included with all the development packages, build packages and kernel header packages to modify the DTK pre-boot environment.

2.1 How to get DTK ELI distribution and kernel version

You can download the DTK bootable ELI from support.dell.com and extract the distribution and kernel version to setup their build environment using below commands after booting into DTK ELI.

1. **cat /etc/centos-release** (i.e. gets you the ELI distribution version)
2. **uname -a** (i.e. gets you the ELI kernel version)

```
Please press Enter to activate this console.
Running /etc/profile
-sh-4.2#
-sh-4.2#
-sh-4.2# cat /etc/centos-release
CentOS Linux release 7.2.1511 (Core)
-sh-4.2#
-sh-4.2#
-sh-4.2# uname -a
Linux localhost 3.10.0-327.el7.x86_64 #1 SMP Thu Nov 19 22:10:57 UTC 2015 x86_64 x86_64 x86_64 GNU/Linux
-sh-4.2#
```

2.3 Windows build setup

DTK Windows release has a self-extractable binary which contain boot critical drivers, operating system installation sample scripts and system configuration tools. To create a DTK pre-boot image user should install Microsoft Assessment and Deployment Kit (Windows ADK) based on ADK support matrix.

The following matrix should be used to create a DTK windows bootable image to support Microsoft Windows distributions.

Windows ADK version	Build Environment (Operating System used to install ADK)	Bootable Image used for supporting Microsoft Windows.
Windows 8 (WinPE 4.0)	Windows Server 2012 OS	Windows Server 2012 OS
Windows 8.1 (WinPE 5.x)	Windows Server 2012 R2 OS	Windows Server 2012 R2 OS
Windows 10 (WinPE 10.0)	Windows Server 2016 OS	Windows Server 2016 OS

2.4 How to get Windows ADK

Windows ADK can be downloaded and installed from <https://docs.microsoft.com/en-us/windows-hardware/get-started/adk-install>


3 Software Package Download

DTK last and earlier releases will continue to be available post DTK deprecation on web download for 11G to 14G supported server platforms. You can download DTK Linux and Windows releases binaries by selecting platform and operating system from www.support.dell.com.


3.1 Downloading Linux pre-boot DTK ELI

- Go to www.support.dell.com
- Go to **All products / Servers, Storage, & Networking / PowerEdge**
- Select **PowerEdge R940**
- Go to **Drivers & downloads**
- Select Category as **System Management** and Operating system type as **Red Hat Enterprise Linux 7**, and download the DTK Pre-BOOT ISO.

Example:

 **Dell OpenManage Deployment Toolkit(Linux)**
xxxx for OM xxxx

Systems Management

xx xxx xxxx' 

Category: Systems Management

Importance: Optional

Version: A00

Release Date: xx xxx xxxx

File Name: DTK_XXX_XXXX_Linux64_A00.iso [Other formats](#)


File size: xxxx MB

Description: The Dell OpenManage Deployment Toolkit (DTK) includes a set of utilities for configuring Dell PowerEdge systems as part of the Operating System deployment. Available as extractable files for Windows and an ISO for Linux, it is designed for customers who have existing scripted installation processes.


3.2 Downloading Windows Self extractable DTK Binary.

- Go to www.support.dell.com
- Go to **All products / Servers, Storage, & Networking / PowerEdge**
- Select **PowerEdge R940**
- Go to **Drivers & downloads**
- Select Category as **System Management** and Operating system type as **Windows Server 2012 R2**, and download Windows Self extractable binary.

Example:

 **Dell OpenManage Deployment Toolkit**
(Windows) xxxx for OM xxxx

Systems Management

xx xxx xxxx 

Category: Systems Management

Importance: Optional

Version: A00

Release Date: xx xxx xxxx

File Name: DTKxxxx-WINPE-xxxx_A00.exe

File size: 1xxxx2 MB

Description: The Dell OpenManage Deployment Toolkit (DTK) includes a set of utilities for configuring Dell PowerEdge systems as part of the Operating System deployment. Available as extractable files for Windows and an ISO for Linux, it is designed for customers who have existing scripted installation processes.

4 Building Driver Source

DTK pre-boot environment carries boot critical drivers to support new Dell server hardware components like PERC, Network controller and Chipset etc.

DTK Linux ELI uses CentOS 7.x distribution, requires new driver to support the Dell server component hardware along with inbox drivers. The component vendors support pre compiled driver binaries only on Red Hat and SUSE Enterprise distribution.

New Dell server components require a driver source compilation to get a binaries to work on DTK ELI environment. To get the driver binaries following steps need to be performed:

1. Download the driver from support.dell.com
2. Unzip driver source file on Linux build environment

Example:

```
[root@localhost driverfix]# ls
Intel_LAN_18.5.0_Linux_Source_X09.tar.gz
[root@localhost driverfix]# tar -zxvf Intel_LAN_18.5.0_Linux_Source_X09.tar.gz
Intel_LAN_18.5.0_Linux_Source_X09/
Intel_LAN_18.5.0_Linux_Source_X09/readme.txt
Intel_LAN_18.5.0_Linux_Source_X09/release.txt
Intel_LAN_18.5.0_Linux_Source_X09/Source/
Intel_LAN_18.5.0_Linux_Source_X09/Source/base_drivers/
Intel_LAN_18.5.0_Linux_Source_X09/Source/base_drivers/i40e-2.1.31.tar.gz
Intel_LAN_18.5.0_Linux_Source_X09/Source/base_drivers/igb-5.3.5.12.tar.gz
Intel_LAN_18.5.0_Linux_Source_X09/Source/base_drivers/ixgbe-5.2.4.tar.gz
Intel_LAN_18.5.0_Linux_Source_X09/Source/vf_drivers/
Intel_LAN_18.5.0_Linux_Source_X09/Source/vf_drivers/i40evf-3.0.14.tar.gz
Intel_LAN_18.5.0_Linux_Source_X09/Source/vf_drivers/ixgbev-4.2.2.tar.gz
[root@localhost driverfix]#
```

3. Follow the steps explained in README.TXT or INSTALL.TXT of driver source.
4. On successful compilation of the driver source produce a “*.ko” binary files.

Example:

```
[root@localhost Intel_LAN_18.5.0_Linux_Source_X09]# ls
i40e-2.1.31  readme.txt  release.txt
[root@localhost Intel_LAN_18.5.0_Linux_Source_X09]# cd i40e-2.1.31/
[root@localhost i40e-2.1.31]# ls
COPYING  i40e.7  i40e.spec  pci.updates  README  scripts  src  SUMS
[root@localhost i40e-2.1.31]# cd src/
[root@localhost src]# ls
common.mk          i40e_client.c  i40e_dcb_nl.c  i40e_ethtool.c  i40e_lan_hmc.c  i40e_prototype.h
i40e_adminq.c      i40e_client.h  i40e_debugfs.c  i40e.h          i40e_lan_hmc.h  i40e_ptp.c
i40e_adminq_cmd.h  i40e_common.c  i40e_devids.h  i40e_helper.h   i40e_main.c     i40e_register.h
i40e_adminq.h      i40e_dcb.c     i40e_diag.c    i40e_hmc.c      i40e_nvme.c     i40e_status.h
i40e_alloc.h       i40e_dcb.h     i40e_diag.h    i40e_hmc.h      i40e_osdep.h    i40e_trace.h
[root@localhost src]# make
make[1]: Entering directory `/usr/src/kernels/3.10.0-327.el7.x86_64'
CC [M] /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e_main.o
CC [M] /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e_ethtool.o
LD [M] /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e.o
Building modules, stage 2.
MODPOST 1 modules
CC /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e.mod.o
LD [M] /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e.ko
make[1]: Leaving directory `/usr/src/kernels/3.10.0-327.el7.x86_64'
[root@localhost src]#
```

5. Copy *.ko file as explained in the section 5 (Adding New Drivers)

5 Adding New Drivers

New driver injection into DTK bootable image to support PERC, Network and Chipset hardware is critical. PERC controller driver used for VD creation and Network driver used for OS Deployment. You should follow the steps mentioned below to inject the drivers.

5.1 How to add driver into DTK ELI (Linux)

Download the DTK image as explained in the Section 3, mount bootable ISO and copy the content into new repository <NewDTKImage> on DTK Linux build environment.

1. Create a directory name <NewDTKImage> in DTK Linux build environment.
2. Copy downloaded <DTKELI.ISO> to <NewDTKImage> folder.
3. Create a directory <isomount> to mount the Bootable ISO inside <NewDTKImage> folder.
4. Mount <DTKELI.ISO> on <isomount> folder using “-oloop” option
5. Create a new directory <ramdisk> inside <NewDTKImage> and copy **initrd.img** from **isomount/isolinux/SA.2** path to <ramdisk> folder.
6. Create a new directory <isoimage> inside <NewDTKImage> and copy all the content from mount folder <isomount> to <isoimage>.

Example:

```
[root@localhost newDTKImage]# ls
BootableDTKELI.ISO
[root@localhost newDTKImage]# mkdir isomount
[root@localhost newDTKImage]# mount -oloop BootableDTKELI.ISO isomount/
mount: /dev/loop0 is write-protected, mounting read-only
[root@localhost newDTKImage]# ls isomount/
docs  EFI  efiboot.img  isolinux  LICENSING  README  RPMs
[root@localhost newDTKImage]# mkdir ramdisk
[root@localhost newDTKImage]# cp isomount/isolinux/SA.2 ramdisk/
[root@localhost newDTKImage]# mkdir isoimage
[root@localhost newDTKImage]# cp isomount/* isoimage/ -r
[root@localhost newDTKImage]# ls isoimage/
docs  EFI  efiboot.img  isolinux  LICENSING  README  RPMs
[root@localhost newDTKImage]#
```

7. Change directory to <ramdisk> and check the compressed cpio archive file **SA.2**
8. Rename **SA.2** to **SA.gz** and uncompress using “gunzip” tool.
9. Copy SA into new folder <initrad> inside <ramdisk> and extract (**SA**) using cpio tool.

Example:

```
[root@localhost ramdisk]# cp ../isoimage/isolinux/SA.2 .
[root@localhost ramdisk]# ls
SA.2
[root@localhost ramdisk]# file SA.2
SA.2: gzip compressed data, from Unix, last modified: Thu Nov  2 19:03:25 2017, max compression
[root@localhost ramdisk]# mv SA.2 SA.gz
[root@localhost ramdisk]# gunzip SA.gz
[root@localhost ramdisk]# ls
SA
[root@localhost ramdisk]# file SA
SA: ASCII cpio archive (SVR4 with no CRC)
[root@localhost ramdisk]# mkdir initrd
[root@localhost ramdisk]# mv SA initrd/
[root@localhost ramdisk]# cd initrd/
[root@localhost initrd]# ls
SA
[root@localhost initrd]# cpio -idv < SA
```

5.1.1 DTK ELI root filesystem

Extracted “cpio” archive (SA) on “initrd” repository used as root filesystem, should modify or update the driver for newer hardware components on this repository.

Example:

```
[root@localhost initrd]# ls
bin boot dev etc home init lib lib64 media mnt opt proc root run SA sbin shutdown srv sys sysroot tmp usr var
[root@localhost initrd]#
```

5.1.2 Create <initrd.img> using Dracut tool

1. Copy newly compiled driver binary (i.e. **i40e.ko**) into “<initrd root filesystem path>/lib/modules/3.10.0-327.el7.x86_64/extra/”
2. Add new driver as explained in the section for Sample dracut.conf file and create a new SA.2 image as explained in the example.
3. Copy new **SA.2** image into <NewDTKImage/isoimage/isolinux/> path and create the new DTK bootable ISO as explained in section 10.

Example:

```
[root@localhost initrd]# pwd
/root/NewDTKImage/ramdisk/initrd
[root@localhost initrd]# ls
bin boot dev etc home init lib lib64 media mnt opt proc root run SA sbin shutdown srv sys sysroot tmp usr var
[root@localhost initrd]# cp /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e.ko lib/modules/3.10.0-327.el7.x86_64/extra/ -i
cp: overwrite 'lib/modules/3.10.0-327.el7.x86_64/extra/i40e.ko'? y
[root@localhost initrd]# cd ..
[root@localhost ramdisk]# dracut SA.img 3.10.0-327.el7.x86_64 -c dracut.conf --include /root/NewDTKImage/ramdisk/initrd/ /
[root@localhost ramdisk]#
[root@localhost ramdisk]# ls
dracut.conf initrd SA.img
[root@localhost ramdisk]# file SA.img
SA.img: gzip compressed data, from Unix, last modified: Sun Nov 12 14:24:12 2017, max compression
[root@localhost ramdisk]# mv SA.img SA.2
[root@localhost ramdisk]# cp SA.2 ../isoimage/isolinux/ -i
cp: overwrite '../isoimage/isolinux/SA.2'? y
[root@localhost ramdisk]#
```

5.1.3 Sample dracut.conf file

Sample Dracut.conf file is a reference to create a (**SA.2**) initial ramdisk image with the new drivers.

Example:

```
# Sample dracut config file

#drivers+= " <kernel modules> "
omit_drivers+="compat"
# additional kernel modules to the default
add_drivers+="dell_rbu dcdbas ipmi_devintf ipmi_msghandler ipmi_poweroff ipmi_ssif ipmi_watchdog ipmi_si bnx2i bnx2 bnx2x cnic mlx_compat mlx4_core
mlx5_core mlx4_en mlx4_ib megaraid_sas be2net qla2xxx igb ixgbe i40e i40evf igbvf ixgbev tg3 sg mptctl "
# list of kernel filesystem modules to be included in the generic initramfs
#filesystems+="

drivers_dir="/lib/modules/3.10.0-327.el7.x86_64"
# build initrd only to boot current hardware
#hostonly="yes"
#
fw_dir="/tmp/rhel7/x86_64"
# install local /etc/mdadm.conf
```

5.2 Adding new driver for Windows bootable image

DTK windows pre-boot image should be created, due to Microsoft WinPE (Windows Pre-boot Environment) re-distribution license limitation. Pre-compiled drivers for the newer server hardware support are available on www.support.dell.com

Download the respective WinPE drivers and extract the Microsoft certified drivers from Dell software bundle (SWB) and inject into WinPE as outlined in the below matrix:

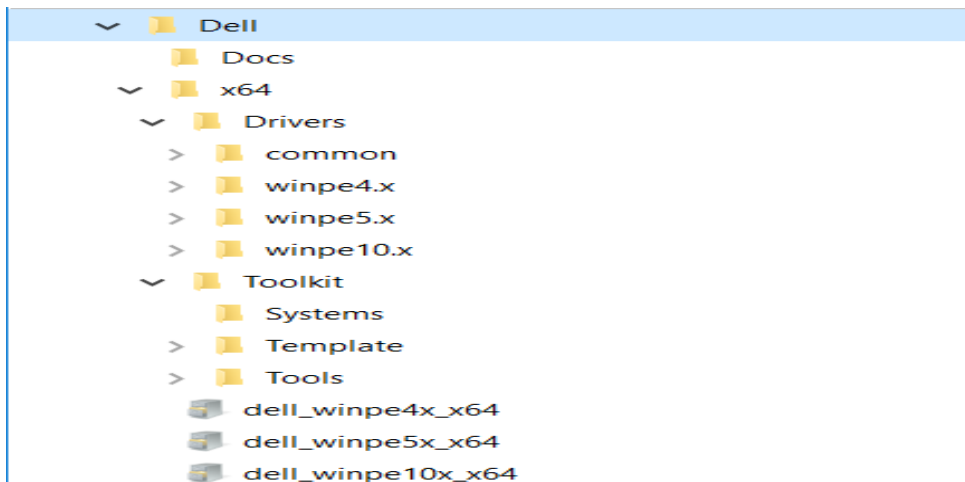
OS Type and repository	ADK (WinPE Version)
Microsoft Server 2012 (win2012)	WinPE4.x (i.e. repository name in DTK)
Microsoft Server 2012 R2 (win2012_r2)	WinPE5.x (i.e. repository name in DTK)
Microsoft Server 2016 (win2016)	WinPE10.x (i.e. repository name in DTK)

5.2.1 How to inject new driver on the WinPE

Download and extract information of DTK Windows self-extractable image as explained in section 3.2.

Steps to inject new drivers:

1. Click on self-extractable DTK release
2. Extracted DTK Windows release shows below repository structure.

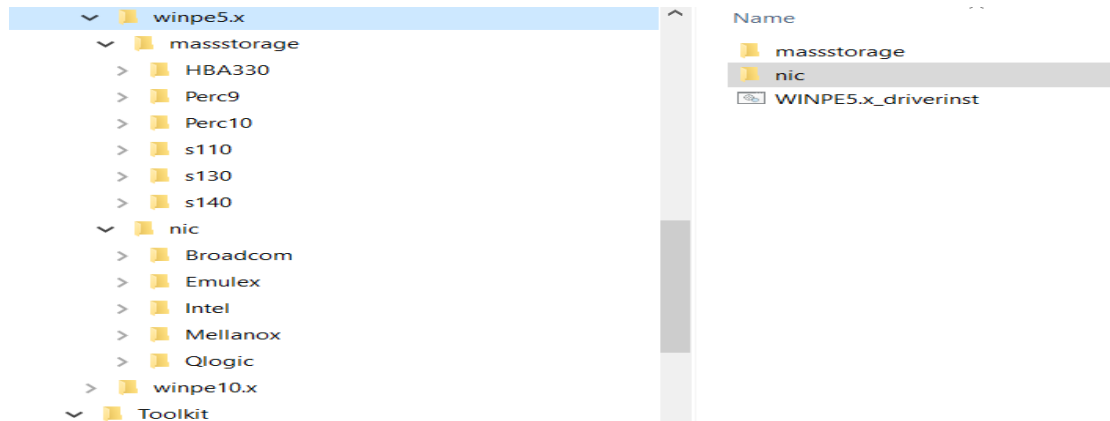


3. Copy respective component driver from the extracted software bundle, based on matrix listed in section 5.2.

Example (i.e. User wants to support new Intel network controller on Windows server 2012 R2 operating system):

- Get the driver from the Intel SWB folder win2012_r2
- Copy WinPE5.x->nic->Intel->(SWB NAME)

NOTE: Copy driver binaries onto the respective component named directory to add the support for new hardware.



4. Remove the following lines from “WinPE.x_driverinst.bat” file to add newer driver support into WinPE bootable image.

```
@echo -----
@echo ~0(extract cab file at proper location)
@echo -----
for /F "delims=" %%i in ('dir /ad /b ') do rmdir "%%i" /s/q || del "%%i" /s/q
expand ..\..\dell_winpe5x_x64.cab -F:* ..\..\Drivers\
```

5. Select build server shows in tables on section 2.3 and follow steps explained section 10 to create a Windows Bootable Image.

6. Supporting new Platforms

DTK Bootable image performs platform check during boot process, if there is a mismatch in the system ID during boot, system is redirected to reboot screen. To support new PowerEdge server in DTK follow steps as below.

6.1 Adding new platform into DTK ELI (Linux)

Download the DTK ELI image as explained on the section 3 and mount bootable ISO and copy the content into new repository <NewDTKImage> on DTK Linux build environment.

1. Create a directory name <NewDTKImage> in DTK Linux build environment.
2. Copy downloaded <DTKELI.ISO> to < NewDTKImage> folder.
3. Create a directory <isomount> to mount the Bootable ISO inside < NewDTKImage> folder.
4. Mount <DTKELI.ISO> on <isomount> folder using “-oloop” option
5. Create a new directory <ramdisk> inside <NewDTKImage> and copy **initrd.img** form **isomount/isolinux/SA.2** path to <ramdisk> folder.
6. Create a new directory <isoimage> inside <NewDTKImage> and copy all the content form mount folder <isomount> to <isoimage>.

Example:

```
[root@localhost newDTKImage]# ls
BootableDTKELI.ISO
[root@localhost newDTKImage]# mkdir isomount
[root@localhost newDTKImage]# mount -oloop BootableDTKELI.ISO isomount/
mount: /dev/loop0 is write-protected, mounting read-only
[root@localhost newDTKImage]# ls isomount/
docs  EFI  efiboot.img  isolinux  LICENSING  README  RPMs
[root@localhost newDTKImage]# mkdir ramdisk
[root@localhost newDTKImage]# cp isomount/isolinux/SA.2 ramdisk/
[root@localhost newDTKImage]# mkdir isoimage
[root@localhost newDTKImage]# cp isomount/* isoimage/ -r
[root@localhost newDTKImage]# ls isoimage/
docs  EFI  efiboot.img  isolinux  LICENSING  README  RPMs
[root@localhost newDTKImage]#
```

7. Change directory to <ramdisk> and check the compressed cpio archive file **SA.2**
8. Rename **SA.2** to **SA.gz** and uncompress using “gunzip” tool.
9. Copy SA into new folder <initrad> inside <ramdisk> and extract (**SA**) using “cpio” tool.

Example:

```
[root@localhost ramdisk]# cp ../isoimage/isolinux/SA.2 .
[root@localhost ramdisk]# ls
SA.2
[root@localhost ramdisk]# file SA.2
SA.2: gzip compressed data, from Unix, last modified: Thu Nov  2 19:03:25 2017, max compression
[root@localhost ramdisk]# mv SA.2 SA.gz
[root@localhost ramdisk]# gunzip SA.gz
[root@localhost ramdisk]# ls
SA
[root@localhost ramdisk]# file SA
SA: ASCII cpio archive (SVR4 with no CRC)
[root@localhost ramdisk]# mkdir initrd
[root@localhost ramdisk]# mv SA initrd/
[root@localhost ramdisk]# cd initrd/
[root@localhost initrd]# ls
SA
[root@localhost initrd]# cpio -idv < SA
```

Extracted “cpio” archive (SA) on “initrad” repository used as root filesystem, should modify or update the driver for newer hardware components on this repository.

```
[root@localhost initrd]# ls
bin boot dev etc home init lib lib64 media mnt opt proc root run SA sbin shutdown srv sys sysroot tmp usr var
[root@localhost initrd]#
```

6.1.1 Create <initrd.img> by adding system ID

1. Added system ID into “<initrd root filesystem path>/opt/dell/toolkit/bin/sys.ini”

Example:

```
07F7=PER7415
07F9=PER7425
07FC=PER840
```

<System ID> = <Platform Name>

2. Copy **dracut.conf** section 5.1.3 (**dracut.conf**) into <ramdisk> folder and create a new SA.2 image as explained in the example.

```
[root@localhost initrd]# pwd
/root/NewDTKImage/ramdisk/initrd
[root@localhost initrd]# vi ./opt/dell/toolkit/bin/sys.ini
[root@localhost initrd]# cd ..
[root@localhost ramdisk]# dracut SA.img 3.10.0-327.el7.x86_64 -c dracut.conf --include /root/NewDTKImage/ramdisk/initrd/ /
```

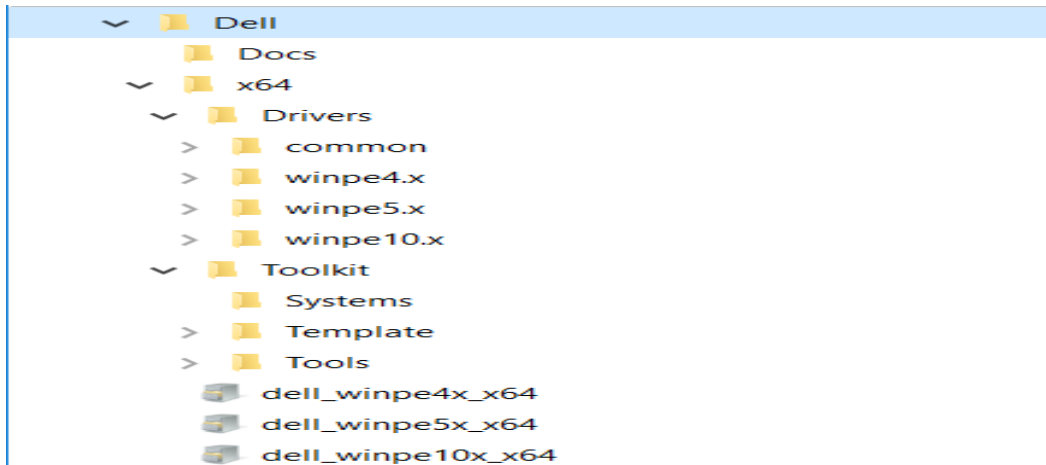
3. Copy new **SA.2** image into <NewDTKImage/isoimage/isolinux/> path and create the new DTK bootable ISO as explained in section 10.

6.2 Adding new platform into Windows Bootable Image

Download and extract information of DTK Windows self-extractable image as explained in section 3.2.

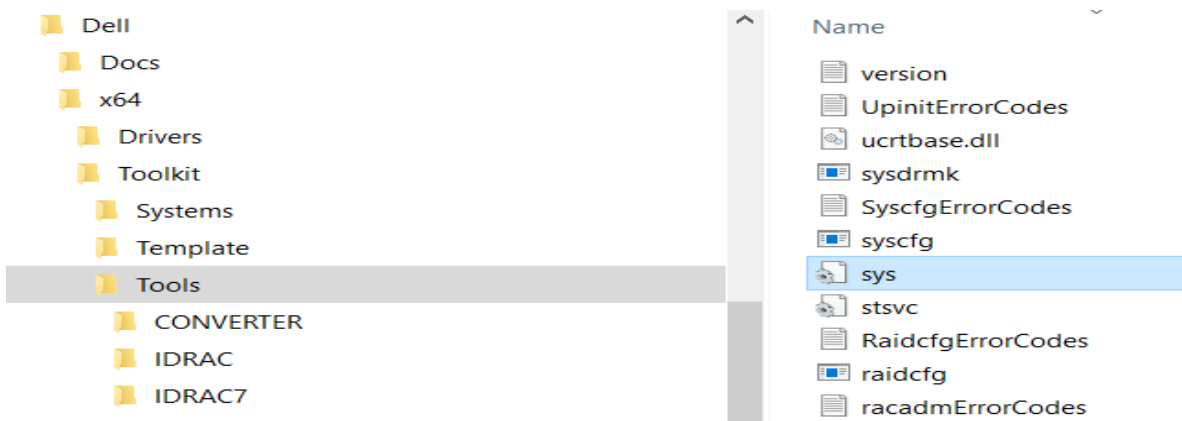
Steps to add new platform into DTK Windows release:

1. Click on self-extractable DTK release
2. Extracted DTK Windows release shows below repository structure



3. Modify "sys.ini" file add system ID and platform name.

- Goes to Dell->Toolkit->Tools->sys.ini and edit to add new system ID and platform.



Example:

```
07F7=PER7415
07F9=PER7425
07FC=PER840
```

<System ID> = <Platform Name>

4. Select build server shows in tables on section 2.3 and follow steps explained section 10 to create a Windows Bootable Image.

7. Extracting RAMDISK

DTK bootable ELI ISO carries the required boot critical drivers inside initial RAMDISK. RAMDISK in DTK named as SA.2 carries root filesystem for pre-boot environment.

Steps To modify the SA.2 (RAMDISK):

1. Download DTK ELI image as explained on the section 3 and mount bootable ISO
2. Copy SA.2 RAMDISK image **isomount/isolinux/SA.2** from mount path.
3. Rename **SA.2** to **SA.gz** and decompress using “**gunzip**” tool.
4. Copy SA into new folder <initrd> and extract (**SA**) using “**cpio**” tool.

```
[root@localhost ramdisk]# cp ../isoimage/isolinux/SA.2 .
[root@localhost ramdisk]# ls
SA.2
[root@localhost ramdisk]# file SA.2
SA.2: gzip compressed data, from Unix, last modified: Thu Nov  2 19:03:25 2017, max compression
[root@localhost ramdisk]# mv SA.2 SA.gz
[root@localhost ramdisk]# gunzip SA.gz
[root@localhost ramdisk]# ls
SA
[root@localhost ramdisk]# file SA
SA: ASCII cpio archive (SVR4 with no CRC)
[root@localhost ramdisk]# mkdir initrd
[root@localhost ramdisk]# mv SA initrd/
[root@localhost ramdisk]# cd initrd/
[root@localhost initrd]# ls
SA
[root@localhost initrd]# cpio -idv < SA
```

Extracted “cpio” archive (SA) on “initrd” repository used as root filesystem, modify or update and add support for newer hardware components and platforms.

```
[root@localhost initrd]# ls
bin boot dev etc home init lib lib64 media mnt opt proc root run SA sbin shutdown srv sys sysroot tmp usr var
[root@localhost initrd]#
```

8. Driver Injection to RAMDISK

As prerequisite, you should complete the steps explained in the section 7, before proceeding to driver injection into RAMDISK (SA.2).

1. Copy newly compiled driver into “<initrd base directory>/lib/modules/3.10.0-327.el7.x86_64/extra/”
2. Add new driver as explained in the section 5.1.3 (**dracut.conf**) file and create a new SA.2 image as explained below.

Example:

```
[root@localhost initrd]# pwd
/root/NewDTKImage/ramdisk/initrd
[root@localhost initrd]# ls
bin boot dev etc home init lib lib64 media mnt opt proc root run SA sbin shutdown srv sys sysroot tmp usr var
[root@localhost initrd]# cp /root/driverfix/Intel_LAN_18.5.0_Linux_Source_X09/i40e-2.1.31/src/i40e.ko lib/modules/3.10.0-327.el7.x86_64/extra/ -i
cp: overwrite 'lib/modules/3.10.0-327.el7.x86_64/extra/i40e.ko'? y
[root@localhost initrd]# cd ..
[root@localhost ramdisk]# dracut SA.img 3.10.0-327.el7.x86_64 -c dracut.conf --include /root/NewDTKImage/ramdisk/initrd/ /
[root@localhost ramdisk]#
[root@localhost ramdisk]# ls
dracut.conf initrd SA.img
[root@localhost ramdisk]# file SA.img
SA.img: gzip compressed data, from Unix, last modified: Sun Nov 12 14:24:12 2017, max compression
[root@localhost ramdisk]# mv SA.img SA.2
[root@localhost ramdisk]# cp SA.2 ../isoimage/isolinux/ -i
cp: overwrite '../isoimage/isolinux/SA.2'? y
[root@localhost ramdisk]#
```

9. Sample Script Download

All the sample scripts used in DTK ELI and Windows build are uploaded in Dell Tech Center portal and are referenced here.

<http://en.community.dell.com/techcenter/extras/m/mediagallery/20444856>

<Windows_SampleScript.zip> (i.e. zip file contains Windows OS deployment for all supported OS scripts, DTKtoRACADM convertor and driver injection scripts for all supported WinPE)

<http://en.community.dell.com/techcenter/extras/m/mediagallery/20444857>

<Linux_SampleScript.zip> (i.e. archive file contains Linux OS deployment for all supported OS scripts and DTKtoRACADM convertor)

9.1 DTK to RACADM Convertor

The DTK SYSCFG deployment scripts are converted to equivalent RACADM scripts, which helps in migration to utilize RACADM in the deployment solution. The utility has the conversion tool for converting the SYSCFG scripts in both environments: Microsoft Windows and Linux operating systems. Starting 12th generation of PowerEdge servers and later, selected set of SYSCFG commands are a part of the DTK sample scripts.

More information: <http://www.dell.com/support/manuals/us/en/04/dell-openmanage-deployment-toolkit-v5.4/dtk Ug5.4/dtktoracadm?guid=guid-89599c2e-c8a1-4953-978b-5ac1559dfb27&lang=en-us>

10. Creating a Bootable ISO

DTK Bootable ISO is available only for Linux environment. But Windows ISO need to be created by you, based on the operating system and Windows ADK type. In case you have customized Linux bootable ISO to add new driver and platforms you have to re-create the bootable ISO as explained in following sections.

10.1 Creating Linux bootable ISO

1. Download DTK ELI image as explained in the section 3 and mount bootable ISO
2. Create a directory **<isomount>** to mount the Bootable ISO inside
3. Create a directory **<newisomount>** and copy all the contents from the **<isomount>** location
4. Overwrite the SA.2 image with the modified new SA.2 image on
"**<newisomount>/isomount/isolinux/**"
5. Run the following command on the DTK ELI build environment to create a new Bootable ISO ELI <
mkisofs -o /tmp/newdtk.iso -b isolinux/isolinux.bin -c isolinux/boot.catalog --no-emul-boot --boot-load-size 4 --boot-info-table -eltorito-alt-boot -e efiboot.img -no-emul-boot -J -R -V "newdtk" . >

Example:

```
[root@localhost newisomount]#  
[root@localhost newisomount]# pwd  
/root/NewDTKImage/newisomount  
[root@localhost newisomount]# ls  
docs EFI efiboot.img isolinux LICENSING README RPMs  
[root@localhost newisomount]# mkisofs -o /tmp/newdtk.iso -b isolinux/isolinux.bin -c isolinux/boot.catalog --no-emul-boot --boot-load-size 4 --boot-info-table  
-eltorito-alt-boot -e efiboot.img -no-emul-boot -J -R -V "newdtk" .  
I: -input-charset not specified, using utf-8 (detected in locale settings)  
Using USBSE000.MOD;1 for ./EFI/BOOT/x86_64-efi/usbserial_pl2303.mod (usbserial_ftdi.mod)  
Using USBSE001.MOD;1 for ./EFI/BOOT/x86_64-efi/usbserial_ftdi.mod (usbserial_common.mod)  
Using SEARCE000.MOD;1 for ./EFI/BOOT/x86_64-efi/search_fs_uuid.mod (search_fs_file.mod)  
Using PASSW000.MOD;1 for ./EFI/BOOT/x86_64-efi/password_pbkdf2.mod (password.mod)
```

10.2 Creating Windows bootable ISO

Choose the Windows build environment as explained in section 2.3.

1. For creation of WinPE4.0 (For more information, see Dell Deployment ToolKit User's Guide 6.1)

- Use Windows Server 2012 OS where ADK can be installed
- Download and extract DTKx.x.x-WINPE-xxxx.exe at any location on local box.
- Go to Start->Program->Windows kit->windows ADK
- Open "Deployment and Imaging Tools Environment" as an **administrator**
- Navigate(cd) to path \$drive\Dell\x64\Drivers\winpe4.x
- Run **WINPE4.0_driverinst.bat** <WIMPATH> <DTKPATH>
where <WIMPATH> is the destination path to create the directory structure for Windows PE and
<DTKPATH> is the path for the Dell drivers in the extracted DTK toolkit.
- For example, **WINPE4.0_driverinst.bat C:\WinPE40 C:\DELL\x64\DRIVERS.**

2. For creation of WinPE5.x (For more information, see Dell Deployment ToolKit User's Guide 6.1)

- Use Windows Server 2012 R2 OS where we can install ADK.
- Download and extract DTKx.x.x-WINPE-xxxx.exe at any location on local box.
- Go to Start->Program->Windows kit->windows ADK
- Open "Deployment and Imaging Tools Environment" as an **administrator**
- Navigate(cd) to path \$drive\Dell\x64\Drivers\winpe5.x
- Run **WINPE5.x_driverinst.bat** <WIMPATH> <DTKPATH>
where <WIMPATH> is the destination path to create the directory structure for Windows PE and <DTKPATH> is the path for the Dell drivers in the extracted DTK toolkit.
- For example, **WINPE5.x_driverinst.bat C:\WinPE50 C:\DELL\x64\DRIVERS.**

3. For creation of WinPE10.x (For more information, see Dell Deployment ToolKit User's Guide 6.1)

- Use Windows Server 2016 OS where ADK can be installed.
- Download and extract DTKx.x.x-WINPE-xxxx.exe at any location on local box.
- Go to Start->Program->Windows kit->windows ADK
- Open "Deployment and Imaging Tools Environment" as an **administrator**
- Navigate(cd) to path \$drive\Dell\x64\Drivers\winpe10.x
- Run **WINPE10.x_driverinst.bat** <WIMPATH> <DTKPATH>
where <WIMPATH> is the destination path to create the directory structure for Windows PE and <DTKPATH> is the path for the Dell drivers in the extracted DTK toolkit.
- For example, **WINPE10.x_driverinst.bat C:\WinPE10 C:\DELL\x64\DRIVERS.**

11 Alternate configuration tools

DTK support pre-boot configuration tools, such as SYSCFG and RAIDCFG which is used for configuring BIOS and PERC controllers. On post deprecation of DTK i.e. 15G onwards only RACADM would support those new platforms and that DTK will be sustained for currently shipping and earlier supported platforms (11G to 14G) until those platforms themselves pass their end of support life (EOSL) threshold. Dell recommends DTK customers to transition to RACADM tools for configuring the BIOS and PERC controller in pre-boot environment.

Please refer below URL for RACADM CLI Guide & user manual:

http://topics-cdn.dell.com/pdf/idrac9-lifecycle-controller-v3.00.00.00%20reference%20guide_en-us.pdf

http://topics-cdn.dell.com/pdf/idrac9-lifecycle-controller-v3.00.00.00_user's%20guide_en-us.pdf

RACADM Wiki link:

<http://en.community.dell.com/techcenter/systems-management/w/wiki/3205.racadm-command-line-interface-for-drac>

12 Reference manuals

DTK User Guide:

http://www.dell.com/support/manuals/us/en/19/openmanage-deployment-toolkit-v6.1/dtk_6.1_users_guide/introduction?guid=guid-79f3180b-c9a1-4a72-8f8d-7b61d3d42ee6&lang=en-us

DTK Installation Guide:

http://www.dell.com/support/manuals/us/en/19/openmanage-deployment-toolkit-v6.1/dtk_6.1_install_guide/introduction?guid=guid-dfb80164-a77e-424b-9e15-37918d4520d5&lang=en-us

DTK Command Line Interface Reference Guide:

http://www.dell.com/support/manuals/us/en/19/openmanage-deployment-toolkit-v6.1/dtk_6.1_cli_reference_guide/introduction?guid=guid-fd4371b0-b331-4348-abab-db0b7f898373&lang=en-us

RACADM Command Line Interface Guide:

http://topics-cdn.dell.com/pdf/idrac9-lifecycle-controller-v3.00.00.00%20reference%20guide_en-us.pdf

RACADM User Guide:

http://topics-cdn.dell.com/pdf/idrac9-lifecycle-controller-v3.00.00.00_user's%20guide_en-us.pdf