How to install the brocade OS on an empty CF drive

Introduction

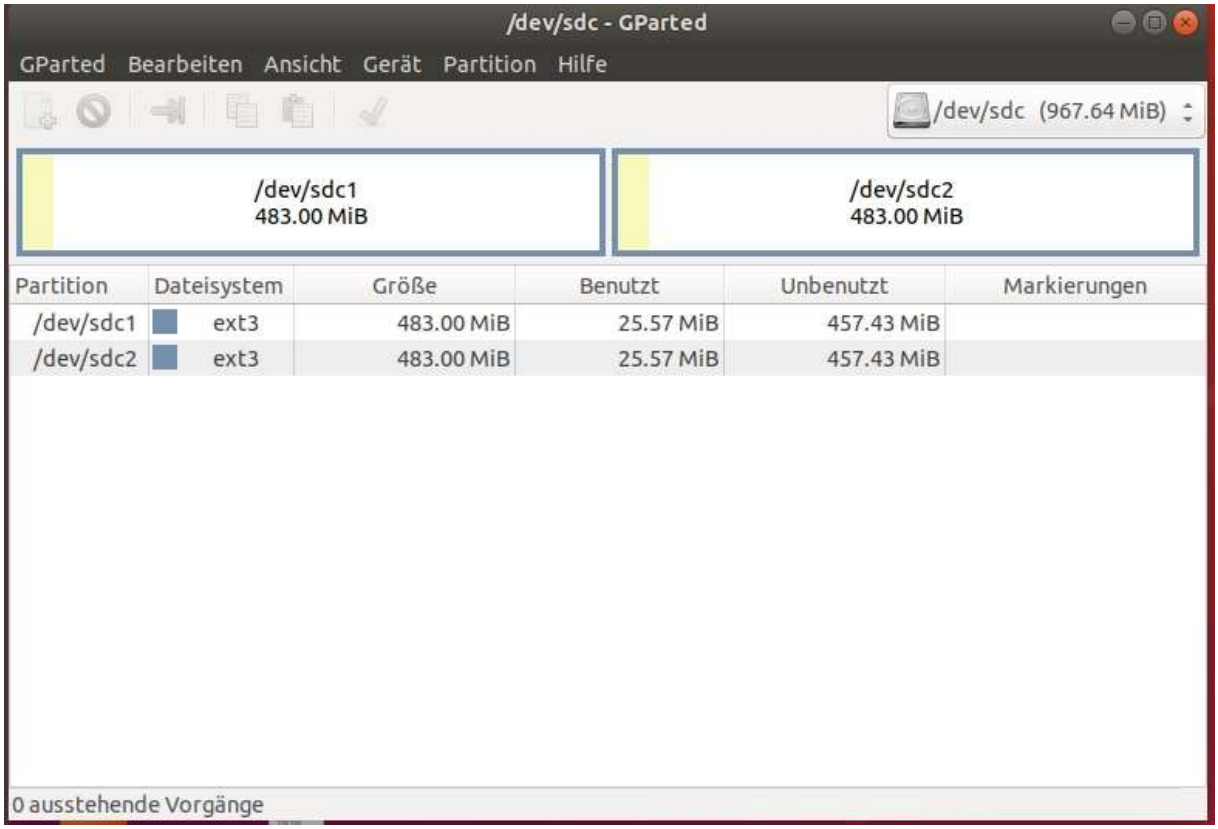
If you open a Brocade SAN switch you'll see a standard CF (Compact Flash) drive. On this drive are stored all the specific information of your switch (licenses, configuration) and your Linux OS that keeps your switch working.
I not aware of a procedure how to install your OS and your specific configuration if this CF drive is replaced by a new one and you don't have a backup available.
Brocade offers a program called firmwareinstall, that installs or upgrade the brocade OS on the second partition. After understanding the brocade boot process I had the idea to create a script similar to firmwaredownload, that to puts all OS-files on a empty CF-drive.

All steps needed are described here.

Create two, empty partitions on your CF-drive

You need a USB card reader for CF.

Put the new CF drive into this reader. Create two primary partitions of the same size on this CF drive (gParted helps a lot):



The filesystem type should be the same as the original. In this case here it is "ext3".

Next Step: Create a fabos-bootable diskimage

You'll find in the appendix two scripts that are been tested under Ubuntu-Linux 18. The scripts need wget, rpm, rpm2cpio, cpio, hdparm, awk, xxd and ssh-keygen to work properly. Use apt-get to install these utilities on your machine.

Some OS messages are in German (sorry!).

```
./installer.sh
mke2fs 1.44.1 (24-Mar-2018)
Geräteblöcke werden verworfen: erledigt
Ein Dateisystem mit 128000 (4k) Blöcken und 128000 Inodes wird erzeugt.
UUID des Dateisystems: 4ab9ee6b-cac8-4df4-8bc1-e566a96be2b2
Superblock-Sicherungskopien gespeichert in den Blöcken:
        32768, 98304

beim Anfordern von Speicher für die Gruppentabellen: erledigt
Inode-Tabellen werden geschrieben: erledigt
Das Journal (4096 Blöcke) wird angelegt: fertig
Die Superblöcke und die Informationen über die Dateisystemnutzung werden
geschrieben: erledigt

Enter ipaddr: 192.168.50.57
Enter Username: admin
Enter Password:
Enter Sourcepath: admin/brocade/v6.2.2f9
ftp://admin:cInoib2016@192.168.50.57/admin/brocade/v6.2.2f9
mount: /mnt: /home/a/install_ohne_switch/hda1_installer3.dsk ist bereits eingehängt.
filename: /SWBD34/release.plist
Extracting Fabric OS 6.2.2f9SWBD21/dir-1.0.4-5.ppc.rpm
Extracting SWBD21/ldconfig-2.16.1-4.ppc.rpm
Extracting SWBD21/glibc-2.3.6-8.ppc.rpm
Extracting SWBD21/glibc-linuxthreads-2.3.6-3.ppc.rpm
Extracting SWBD21/bash-2.04-8.ppc.rpm
Extracting SWBD21/readline-4.1-4.ppc.rpm
Extracting SWBD21/terminfo-11.2.0-6.ppc.rpm
Extracting SWBD21/termcap-1.3-5.ppc.rpm
Extracting SWBD21/fileutils-4.0-4.ppc.rpm
Extracting SWBD21/textutils-1.22-4.ppc.rpm
Extracting SWBD21/setup-6.2.2f9-27.ppc.rpm
Extracting SWBD21/swbd12-setup-1.3.4-4.ppc.rpm
Extracting SWBD21/which-2.12-4.ppc.rpm
Extracting SWBD21/findutils-4.1-4.ppc.rpm
Extracting SWBD21/bzip-1.0.1-4.ppc.rpm
Extracting SWBD21/zlib-1.1.4-5.ppc.rpm
Extracting SWBD21/chkconfig-1.0.0-7.ppc.rpm
Extracting SWBD21/sed-3.02-4.ppc.rpm
Extracting SWBD21/procps-3.3.0-3.ppc.rpm
Extracting SWBD21/psmisc-19.0.0-5.ppc.rpm
Extracting SWBD21/modutils-3.1-9.ppc.rpm
Extracting SWBD21/sin-1.1.0-6.ppc.rpm
Extracting SWBD21/rcinit-1.1.4-9.ppc.rpm
```

Extracting SWBD21/misc-1.0.0-5.ppc.rpm
Extracting SWBD21/pam-0.74-28.ppc.rpm
Extracting SWBD21/util-linux-2.12o-18.ppc.rpm
Extracting SWBD21/sh-utils-2.0-10.ppc.rpm
Extracting SWBD21/popt-1.3-4.ppc.rpm
Extracting SWBD21/grep-2.4.2-4.ppc.rpm
Extracting SWBD21/rpm-4.2-5.ppc.rpm
Extracting SWBD21/sysvinit-2.78-9.ppc.rpm
Extracting SWBD21/man-1.5g-7.ppc.rpm
Extracting SWBD21/less-3.4.0-5.ppc.rpm
Extracting SWBD21/gzip-1.2.4a-4.ppc.rpm
Extracting SWBD21/tar-1.13.19-4.ppc.rpm
Extracting SWBD21/rsync-2.6.9-2.ppc.rpm
Extracting SWBD21/uuid-libs-1.22-4.ppc.rpm
Extracting SWBD21/e2fsprogs-1.38-5.ppc.rpm
Extracting SWBD21/cpio-2.4.2-4.ppc.rpm
Extracting SWBD21/dev-1.4.0-2.ppc.rpm
cpio: dev/initctl nicht erzeugt: Neuere oder gleich alte Version existiert schon
Extracting SWBD21/bootenv-1.0.2-7.ppc.rpm
Extracting SWBD21/wdtd-1.0.0-5.ppc.rpm
Extracting SWBD21/fwdl-1.0.2-45.ppc.rpm
Extracting SWBD21/telnet-server-0.17-7.ppc.rpm
Extracting SWBD21/swbd23-prom-4.6.6-1.ppc.rpm
Extracting SWBD21/kernel-2.6.14.2-4248702025.ppc.rpm
cpio: Can't write over symlinks: ./lib/modules/2.6.14.2/modules.dep

Extracting SWBD21/swbd21-drivers-2.4.19-4.ppc.rpm
Extracting SWBD21/sysklogd-1.4-9.ppc.rpm
Extracting SWBD21/getty-2.0.7j-8.ppc.rpm
Extracting SWBD21/net-tools-1.57-6.ppc.rpm
Extracting SWBD21/vixie-cron-3.0.1-62_4.ppc.rpm
Extracting SWBD21/uucp-1.06-5.ppc.rpm
Extracting SWBD21/portmap-4.0-4.ppc.rpm
Extracting SWBD21/inetd-0.17-8.ppc.rpm
Extracting SWBD21/iptables-1.3-1.ppc.rpm
Extracting SWBD21/tcpd-7.6-4.ppc.rpm
Extracting SWBD21/rsh-server-0.17-4.ppc.rpm
Extracting SWBD21/rsh-0.17-4.ppc.rpm
Extracting SWBD21/openssl-libs-0.9.8-2.ppc.rpm
Extracting SWBD21/openssh-3.5p1-9.ppc.rpm
Extracting SWBD21/openssh-server-3.5p1-9.ppc.rpm
Extracting SWBD21/rusers-server-0.17-4.ppc.rpm
Extracting SWBD21/rdate-990821.0.0-5.ppc.rpm
Extracting SWBD21/logrotate-3.5.4-6.ppc.rpm
Extracting SWBD21/ntp-5.93e-4.ppc.rpm
Extracting SWBD21/pciutils-2.1.8-4.ppc.rpm
Extracting SWBD21/strace-4.2-4.ppc.rpm
Extracting SWBD21/sendmail-8.9-11.ppc.rpm
Extracting SWBD21/iproute2-2.4-10.ppc.rpm
Extracting SWBD21/libxml2-2.6.30-1.ppc.rpm
Extracting SWBD21/fss-6.2.2f9-11.ppc.rpm
Extracting SWBD21/fabos-setup-6.2.2f9-15.ppc.rpm
Extracting SWBD21/fabos-drivers-gz-6.2.2f9-11.ppc.rpm

Extracting SWBD21/fabos-libs-6.2.2f9-11.ppc.rpm
cpio: ./fabos/lib/libisc.so nicht erzeugt: Neuere oder gleich alte Version existiert schon
cpio: ./fabos/lib/libisc.so.1.0 nicht erzeugt: Neuere oder gleich alte Version existiert schon
Extracting SWBD21/fabos-diag-6.2.2f9-13.ppc.rpm
Extracting SWBD21/fabos-6.2.2f9-10.ppc.rpm
cpio: ./etc/fabos/calobject.xsd nicht erzeugt: Neuere oder gleich alte Version existiert schon
Extracting SWBD21/fabos-zoning-6.2.2f9-10.ppc.rpm
Extracting SWBD21/sqlite-3.2.1-4.ppc.rpm
Extracting SWBD21/dhcpcd-1.3-4.ppc.rpm
Extracting SWBD21/fabos-hmon-6.2.2f9-10.ppc.rpm
Extracting SWBD21/fabos-wwnhs-6.2.2f9-10.ppc.rpm
Extracting SWBD21/fabos-man-6.2.2f9-13.ppc.rpm
Extracting SWBD21/fabos-swbd34-6.2.2f9-4.ppc.rpm
Extracting SWBD21/apache-1.3.31-10.ppc.rpm
Extracting SWBD21/fastcgi-2.2-4.ppc.rpm
Extracting SWBD21/fabos-webtools-6.2.2f9-11.ppc.rpm
Extracting SWBD21/fabos-webtoolsez-6.2.2f9-3.ppc.rpm
cpio: ./fabos/webtools/htdocs/wtcommon.jar nicht erzeugt: Neuere oder gleich alte Version existiert schon
Extracting SWBD21/tz-7.11-6.ppc.rpm
Extracting SWBD21/mtracer-tool-2.4.19-13.ppc.rpm
Extracting SWBD21/sysstat-5.0.4-8.ppc.rpm
Extracting SWBD21/ipv6-1.2-8.ppc.rpm
Extracting SWBD21/ipsec-1.0-1.ppc.rpm
Extracting SWBD21/kernel-module-ipsec-2.6.14.2-4248702025.ppc.rpm
cpio: Can't write over symlinks: ./lib/modules/2.6.14.2/kernel

Updating the file system table...
Fixing up pdm wrong directory for rcp
Fixing up /etc/modules.conf...
Fixing fabos/sbin/sname
Add some important empty files
ssh-keygen
Removing temp files
Unmounting hda1_installer3.dsk; Please wait!

The script knows how to handle different brocade distributions (tested with v6.6.2f9 and V7.4.2f/v7.4.2d).

Now put the image files to the cf-drive:

./create_cf.sh
copy files from hda1_installer3.dsk to partition 1
copy files from hda1_installer3.dsk to partition 2
Checksum: 0x452601c1
Enter the following command on your switch console:
setenv OSLoader=ATA()0x00034018;ATA()0x000544f8

If the script is finished (take some time to close the filesystem!), put your cf-drive into your brocade switch.

Enable an access to the serial console and enter the command displayed in the create_cf.sh output:
“setenv OSLoader=ATA()0x00034018;ATA()0x000544f8” + “saveenv”
Now boot the machine!
You’ll see several error messages that are not of interest because a regular “firmwaredownload” is needed now!
Use the account „root“ password „fibranne“ to login and start a standard “firmwaredownload”:

```
firmwaredownload
Server Name or IP Address: 192.168.50.57
User Name: admin
File Name: admin/brocade/v6.2.2f9
Network Protocol(1-auto-select, 2-FTP, 3-SCP, 4-SFTP) [1]: 2
Password:
Server IP: 192.168.50.57, Protocol IPv4
Checking system settings for firmwaredownload...
get release failed
get release failed
/sbin/preinst: [: -lt: unary operator expected
/sbin/preinst: [: too many arguments
System settings check passed.

You can run firmwaredownloadstatus to get the status
of this command.

This command will cause a warm/non-disruptive boot on the switch,
but will require that existing telnet, secure telnet or SSH sessions
be restarted.

Do you want to continue [Y]:

Firmware is being downloaded to the switch. This step may take up to 30 minutes.
2000/01/01-00:07:42, [SULB-1001], 7, CHASSIS, WARNING, SilkWorm200E, Firmwaredownload
command has started.
Preparing for firmwaredownload...
2000/01/01-00:07:42, [SULB-1036], 8, CHASSIS, INFO, SilkWorm200E, The current Version: Fabric OS
vImproper Version String
Start to install packages...
… (download message removed here!)
All packages have been downloaded successfully.
Firmware has been downloaded to the secondary partition of the switch.
2000/01/01-00:23:15, [SULB-1002], 11, CHASSIS, INFO, SilkWorm200E, Firmwaredownload command
has completed successfully.
HA Rebooting ...
```

The machine now starts a clean OS. Install all configuration files and licenses in the usual manner.

Appendix:

Installer.sh

```
#!/bin/bash
# fixed values: ftp-protocol to transfer the files
#             destination filename: hda1_installer3.dsk
#             PLATFORM=SWBD34
FS='ext3'
# PLATFORM=SWBD34 see: switch-types-blads-ids-product-names.pdf
# PLATFORM=SWBD71
PLATFORM=SWBD34
truncate -s 500M hda1_installer3.dsk
TARGET_DEV=hda1_installer3.dsk
mke2fs -F -g32768 -b4096 -j $TARGET_DEV
PROTOCOL=ftp
read -p "Enter ipaddr: " ipaddr
read -p "Enter Username: " user
read -s -p "Enter Password: " pw
echo
ACCOUNT=$user:$pw
read -p "Enter Sourcepath: " SOURCE_PATH
#
TMPMNT='/mnt'
TYPE=release
mount $TARGET_DEV $TMPMNT
/bin/mkdir -p /$PLATFORM
# SOURCE_PATH=192.168.50.57/admin/brocade/v7.4.2f
WGET_PATH=$PROTOCOL://$ACCOUNT@$ipaddr/$SOURCE_PATH
echo $WGET_PATH
wget -a /var/log/wget_clean.log -T 60 --tries=3 -N -nH -P /$PLATFORM
$WGET_PATH/platform_names
wget -a /var/log/wget_clean.log -T 60 --tries=3 -N -nH -P /$PLATFORM
$WGET_PATH/$PLATFORM/release.plist
mount -t $FS $TARGET_DEV /mnt
mkdir /mnt/proc
mkdir /mnt/mnt
mkdir /mnt/lib
mkdir /mnt/lib/modules
ln -sf default /mnt/lib/modules/2.6.14.2
mkdir /mnt/etc
wget -a /var/log/wget_clean.log -T 60 --tries=3 -N -nH -P /$PLATFORM
$WGET_PATH/$PLATFORM/group
mkdir -p /mnt/fabos/share
mkdir -p /mnt/fabos/lib
mkdir /mnt/dev
mkdir -p /mnt/var/lib/rpm
rpm --root /mnt --initdb

function putit()
{
```

```
#  echo "complete Filename" $1
  VALUE="$1"
  fn=${VALUE##*/}
  path=${VALUE%/*}
#  echo $path und $fn
wget -a /var/log/wget_clean.log -T 60 --tries=3 -N -nH -P /mnt/$PLATFORM $WGET_PATH/$path/$fn
cw=`pwd`
cd /mnt
rpm2cpio /mnt/$PLATFORM/$fn | cpio -idm --quiet
cd $cw
}

filename=/$PLATFORM/release.plist
echo filename: $filename

n=1
while read line
do
if [ $n = 1 ];then
  l1=${line#*common}
  line="common$l1"
  echo Extracting $line
  n=2
else
  echo Extracting $line
  putit $line
fi
done < $filename

   echo "Updating the file system table..."

   case "$PLATFORM" in
   "SWBD141" | "SWBD142" |"SWBD148" | "SWBD156" | "SWBD157" | "SWBD158")
   cat > ${TMPMNT}/etc/fstab << EOF
/dev/root   /      $FS rw,noatime  0 0
none       /proc      proc    defaults    0 0
none       /sys       sysfs   defaults    0 0
none       /dev/pts    devpts  mode=620    0 0
EOF

;;
*)
cat > ${TMPMNT}/etc/fstab << EOF
/dev/root        /                $FS      rw,noatime      0 0
none             /proc            proc     defaults        0 0
none             /dev/pts         devpts   mode=620        0 0
EOF
;;
   esac

   echo "Fixing up pdm wrong directory for rcp"
   ln -sf ../usr/bin/rcp /mnt/bin/rcp
```

```
   echo "Fixing up /etc/modules.conf..."

   cat > /mnt/etc/modules.conf << EOF
keep
path=/fabos/modules
alias eth1 eepro100
EOF

echo "Fixing fabos/sbin/sname"
   if [ ! -x /mnt/fabos/sbin/sname ] ; then
        ln -sf ../bin/sname /mnt/fabos/sbin/sname
   fi

echo "Add some important empty files"
touch /mnt/etc/fabos/upgrade_status1
touch /mnt/etc/fabos/licenses
touch /mnt/fabos/share/release
ln -s default /mnt/lib/modules/preferred
mkdir /mnt/var/config
mkdir /mnt/var/tmp

echo "ssh-keygen"
ssh-keygen -q -b 1024 -t rsa -f /mnt/etc/ssh_host_rsa_key -N ''
chmod 600 /mnt/etc/ssh_host_rsa_key
chmod 600 /mnt/etc/ssh_host_rsa_key.pub
ssh-keygen -q -t dsa -f /mnt/etc/ssh_host_dsa_key -N ''
chmod 600 /mnt/etc/ssh_host_dsa_key
chmod 600 /mnt/etc/ssh_host_dsa_key.pub
ssh-keygen -q -t ecdsa -f /mnt/etc/ssh_host_ecdsa_key -N ''
chmod 600 /mnt/etc/ssh_host_ecdsa_key
chmod 600 /mnt/etc/ssh_host_ecdsa_key.pub

echo "Removing temp files"
rm -Rf /mnt/home/*
rm -Rf /mnt/home.??*
rmdir /mnt/home 2> /dev/null
rm  -Rf /mnt/$PLATFORM/*
rmdir /mnt/$PLATFORM

echo Unmounting $TARGET_DEV\; Please wait!
umount /mnt
```

---

create_cf.sh

```
#!/bin/bash
mount /dev/sdb1 /mnt1
mount /dev/sdb2 /mnt2
mount /home/a/install_ohne_switch/hda1_installer3.dsk /mnt
echo copy files from hda1_installer3.dsk to partition 1
cd /mnt ; tar cf - . | (cd /mnt1; tar xf -)
```

```
echo copy files from hda1_installer3.dsk to partition 2
tar cf - . | (cd /mnt2; tar xf -)
# create bindata.bin and fill it with fixed data
awk 'BEGIN {printf("babeface00000001000000000000000\n")}' | xxd -r -p > /home/a/bindata.bin
#get the number of hdparm entries
hdparm --fibmap /mnt1/boot/zImage.tree.initrd | awk 'FNR>4 {sum++} END {printf("%08x\n",sum)}'
| xxd -r -p >> /home/a/bindata.bin
# fill bindata.bin with additional fixed data
awk 'BEGIN {printf("000000000000000000000000\n")}' | xxd -r -p >> /home/a/bindata.bin
#put hdparm numbers into the bindata.bin file
hdparm --fibmap /mnt1/boot/zImage.tree.initrd | awk 'FNR>4 {printf("%08x %08x\n",$2,$4)}' | xxd -r
-p >> /home/a/bindata.bin
#fill bindata.bin with zeros until 1k
xxd -ps -c 1 /home/a/bindata.bin | awk '{sum++} END {for (i=sum;i<1024;i++) printf("00\n")}' | xxd -r
-p >> /home/a/bindata.bin
#produce the checksum
sum="0x"`xxd -g 4 /home/a/bindata.bin | awk '{$2=strtonum("0x" $2);$3=strtonum("0x"
$3);$4=strtonum("0x" $4);$5=strtonum("0x" $5);sum=sum+$2+$3+$4+$5} END {printf("sum:
%08x\n",and(-(sum),0xffffffff))}' | awk '{$2=strtonum("0x" $2);$3=strtonum("0x"
$3);$4=strtonum("0x" $4);$5=strtonum("0x" $5);sum=sum+$2+$3+$4+$5} END
{printf("%08x\n",sum)}'`
echo Checksum: $sum
#put the checksum number at the right position into file bindata1.bin
xxd -ps -c 4 /home/a/bindata.bin | awk s=$sum'{i++;out="$1";if(i==3){printf("%08x\n" ,s)}else{print
$out}}' | xxd -r -p > /home/a/bindata1.bin
#put bindata1.bin to the cf-drive
cp /home/a/bindata1.bin /mnt1/boot/zImage.tree.initrd.map
cp /home/a/bindata1.bin /mnt2/boot/zImage.tree.initrd.map
#read the environment numbers
addr1=`hdparm --fibmap /mnt1/boot/zImage.tree.initrd.map | awk 'FNR>4
{printf("ATA()0x%08x\n",$2)}'`
addr2=`hdparm --fibmap /mnt2/boot/zImage.tree.initrd.map | awk 'FNR>4
{printf("ATA()0x%08x\n",$2)}'`
echo "Enter the following command on your switch console:"
echo "setenv OSLoader=$addr1;$addr2"
umount /dev/sdb1
umount /dev/sdb2

================================================================================
```