General---iNTRODUCTION

Q-1: What are these 'CloneCDs' really ?
A-1: CloneCDs are RAW copies of retail PC Games that use various protections to
verify their authenticity, essentially CloneCDs should not require any kind
of emulation or loaders to run.

Q-2: Why 'CloneCDs' what are they for ?
A-2: They are primarily used as backup copies of your retail game, that when
burnt work as your retail, without compromising the integrity of either the
protection or content.

Q-3: Why should I burn a CloneCD when I can easily find and apply 'Crack' ?
A-3: First of all you will need an updated 'Crack' each time a game is patched,
currently there is no way of knowing if an updated 'Crack' is possible,
Game software Publishers use copy protections mainly for their ability
to withstand any manipulation to the protected executables,
while 'CloneCDs' leave software untouched, and instead focus on producing a
replica of the retail disc, that is guaranteed to work after numerous
patches and updates, in the end it is a matter of individual choice and
preference.

Q-4: What is the difference between a CloneCD and CloneDVD ?
A-4: Basically besides the obvious difference in format, 'CloneDVDs' cannot be
burnt RAW, this is disabled on all DVDR* Drives, so a 'CloneDVD' will always
require emulation and/or a loader to run, CloneDVDs are therefore not our
primary choice.

**Q-5: What are 'Emulation' and 'Loaders' and why are they considered
a bad thing ?**
A-5: They both require an additional software to run the protected game.
'Emulation' will try to fool the protection engine that authenticity
of your software is valid, this is usually a resident program that activates
when a specific command is sent to the CD/DVD drive, this is easily blacklisted
and is therefore inefficient. 'Loaders' are addition to the 'Emulation'
that attempt to prevent it from being detected or disabled, the risk of
system instability is unavoidable, and unless there is no better way
of making your backup copy work, they should not be used altogether.

Q-6: If burning these 'CloneCDs' is required, do I need specific hardware in order to get a working backup copy ?
A-6: Good hardware is always recommended, this does not mean the most expensive one or the best is required, in practice any CDRW/DVDRW burner is able to produce working 'CloneCDs' if you follow the instructions and stay away from using 'Emulation' or 'Loaders' that are frequently getting blacklisted by a software update of the protection engine.

Q-7: How does a 'Protection Engine' work, what is its main function and purpose ?
A-7: The main focus of current PC-CDROM Game protections is to prevent cracking, backward engineering and mass manufacturing copyrighted software, operations include scanning for possible emulation, virtual drive detection, media is scanned for ability to write or format, the three of the currently most popular protections that we will be covering in this Q&A are also checking for specific anomalies that are present on the retail disc and help verify its authenticity.

Q-8: What about quality assurance, how do I know my CloneCD image qualifies current standards and requirements ?
A-8: There are a number of applications used typical for each protection to make sure it is 100% before actually burn testing, these are CDMage scan that will determine if the image structure is unmodified and weather or not it contains unwanted errors, DPMViewer or BWAReader will show if the physical sector scan is clean and correct. Quality is top priority when it comes to CloneCDs, if the image is less than perfect, it may fail to run.

Q-9: How come this Q&A is only covering SafeDisc, SecuROM and StarForce ?
A-9: These 3 protections are the only ones possible to Clone 1:1 that is a fully working standalone CDs that run exactly as retail, without compromising or editing the contents or integrity, these are so called 'True Clones' the methods we use cloning them have proven to be the best available, since there are currently no rules concerning CloneCDs in the community, the aim of this Q&A is to implement Quality Control.

Q-10: Is it true that Cloning requires no talent, very little effort and no basic intelligence to accomplish ?
A-10: Yes, this is true, in theory ANYONE can make a CloneCD, however practice has shown otherwise, unfortunately attaining quality is not possible when you do not know what you are doing, information available is usually outdated and based on rumors instead of facts and tutorials will prefer one method to the other for other reasons then user benefit. Given all these misguidances, it is apparent that intelligence is definitely necessary, at least to filter out the spam.

Q-1: What is 'SafeDisc' who made it and how does it work ?
A-1: SafeDisc is a protection engine developed by Macrovision, its
main function is encrypting, anticracking and emulation detection,
current version 4.xx is extremely difficult to circumvent even for
an experienced cracker, there is probably no question of actual
possibility to crack, but requires a lot of time, since with each
updated version new and improved security system is introduced,
this will soon mean that the community is forced to find and learn
burning CloneCDs or wait literally weeks for a NoCD.

Q-2: What kind of 'Emulation' is safedisc currently blacklisting ?
A-2: Latest versions 4.6x blacklist Slysoft's CloneCD and CloneDVD entirely,
not to mention its virtual drive, if you have this application installed,
SafeDisc CloneCD backups will not run, Daemon Tools 4 v-drive and
Alcohol 120% v-drive will not work because of implementation of 'IDE Priority'
this means that v-drives on SCSI bus are ignored, if any IDE optical drives
are found, their respective Emulation options are totally useless/nonworking.

**Q-3: What are your recommendations, do I need specific hardware to
burn 'SafeDisc' CD ?**
A-3: Burning is necessary, since software emulation and virtual
drives are easily blacklisted by the next patch of game in question.
The good news are that most new Quality CDRW/DVDRW Drives are fully
capable of burning a working backup, Plextor, LiteON, LG and Asus
can currently burn SafeDisc without modifying the so called
'weak sectors' their main superiority is hardware 'correct EFM encoding'
which is essential to pass the verification system, alternatively if you
do not own any of the above mentioned Drives, use 'Bypass EFM Error'
in Alcohol 120% SafeDisc 2/3 profile.

Q-4: What about Format of a SafeDisc image, does it really matter ?
A-4: The only advantage of a CloneCD format (.ccd) is that you can
easily use it for either application and it doesn't have to be converted
in order to scan for possible unwanted errors, other than that, both
formats will produce a working CloneCD.

**Q-5: Does media or recording speed have a significant impact on the
outcome ?**
A-5: Low burning speed is highly recommended for a quality backup, the
result is faster authentication, your CloneCDs should work without any
kind of problems even if you burn it at 52x, provided it is readable by
your ROM device, use 4x-16x for best results. There are no media preference
other than faster loading times and verification, if the quality of the
media is very bad the SafeDisc loader may time out in some extremely rare cases.

Q-6: How will I know my backup image is top quality ?
A-6: Use CDMage 1.05b to scan the image, there should be approximately
580+ specially designed errors placed on the first 10.000-11.000
sectors, with unused/empty content.
```
* #| Sector|Sync|Header|Subheader|EDC|Intermediate|ECC P|ECC Q|Severity|Content of sector
  1|  1 045| No |  No  |  N/A  |Yes|   No     | Yes | Yes |Medium  |unused/empty
  1| 10 359| No |  No  |  N/A  |Yes|   No     | Yes | Yes |Medium  |unused/empty
```
*(as example this is a CDMage scan - first and last sectors of a SafeDisc image)

Q-7: Why does this CloneCD only work from a CD/DVD-Rom and not from CDRW/DVDRW ?
A-7: SafeDisc protection engine uses something called 'ATIP Checker' Basically this
is a default command that is frequently used by your burner to register size and
ability to write to your CDR/CDRW media, SafeDisc performs this scan it to establish
weather or not the media is burnt or printed. Currently there is a way to hide
or block this ability by Alcohol 120% 'Ignore Media Type' however running
CloneCDs is always recommended from a *-ROM drive that by default doesn't
support 'ATiP Checker' command, since it isn't required for its only function.

Q-8: What about CloneDVDs, why is it impossible to make them work burnt ?
A-8: This is unfortunately a hardware issue, apparently DVDs cannot be burnt
RAW mode, which is necessary to reproduce the SafeDisc verification
signature, the only possible, but currently unavailable solution to this
might be either modified firmware or a 'chipped' DVDRW Drive.

Q-9: How can I run a CloneDVD or CloneCD mounted ?
A-9: With recent versions of SafeDisc 4.6x you will have to resort
to using 'Loaders' to run the game mounted, such as antiblaxx, sd4 hider etc..
to resolve emulation detection and blacklisting.

---SecuROM---BWClones:

Q-1: Introducing SecuROM ?
A-1: SecuROM is being developed by Sony DADC and is an advanced
protection engine that is currently one of the most popular and
most difficult to reverse engineer or 'crack' it uses media to
identify authenticity, unlike SafeDisc this protections main
feature is to prevent mass manufacturing or printing of unlicenced
or black market copies, authentication of the CD/DVD works like
an optical key, the transparent layer that otherwise serves to protect
the media contents from physical damage is especially modified to verify
with the software, this is implemented at the stage of printing retail
discs.

Q-2: This sounds like an impossible thing to Clone, how was this done ?
A-2: This is true, for a while it was impossible, until the BlindWrite
founder and main programmer was blessed with a stroke of genius, and found
an actual solution, which was later 'borrowed' by the Alcohol 120% team
but never practically implemented for some reason. This was indeed a
revolution in Cloning that nobody expected, a scanner of the SecuROM
physical signature key combined with blackcheck's twinsector patcher
the result was 'BWClones' that work up to date and will continue
working until SecuROM totally changes their method of protection.

**Q-3: 'Twinsector patcher' 'Physical signature scanner' what are they
and how do they work ?**
A-3: There are two applications 'BWA Reader' and Alcohol 120%
'DPM Measurement' that scan the surface of the CD/DVD for anomalies
or indences that are used by SecuROM to verify authentication,
these scans are saved in respective applications native format
*.BWA and *.MDS and can be viewed with either 'BWA Reader 5.1'
and 'DPM Viewer' the difference between the two is that BWA Reader
is able to clean any minor quality issues, if the *.BWA or *.MDS
is in very bad shape, cleaning it is impossible and will result
in a non working BWClone. Twinsector burning is implemented by
BlindWrite 4.5.7 and has been canned with later versions 5.xx
in favor of compatibility, the process of twinsector burning
is displacement of sectors, sectors are duplicated where the
indences of the Physical Scan occur, this introduces possible
problems installing from twinsector patched CDR Media, High Precision
CDRW/DVDRW/CDROM/DVDROM drives will react and 'choke' on what
looks like read errors, this can be bypassed installing from
mounted image or an alternative drive with a good error skipping
capabilities, such as the LiteON and LG.

Q-4: Are there alternatives to twinsector method burn of SecuROM BWClones ?
A-4: The best way to burn SecuROM is if you happened to be a lucky
owner of a Plextor Premium, that burns the actual indences onto
the surface of the CD by using one of its features of manipulating
laser voltage, the electronic signature is then duplicated to the point
of being able to be reproduced 1:1 using BWA Reader or DPM Measurement scan,
this is indeed a most excellent way to burn a Clone. The only application
that has miraculously come up with this functionality is once again
'VSO Software-BlindWrite' thus solving all compatibility issues.

Q-5: Why do you suggest using BlindWrite 4.5.7 and not later versions ?
A-5: This is the last version that doesn't require third party tools to
burn twinsector method, its 'Autoplay Emulation' and 'Patin Couffin'
drivers can be easily updated by installing latest version, it is therefore
highly recommended in favor of user comfort and the possibility of burning
BWClones with full flexibility of choice between 3 options of preference,
'Twinsector' 'Plextor Premium' and 'Autoplay Emulation'. Standard format
for BWClone images should be *.BWT *.BWI *.BWS *.BWA both at the stage
of imaging and writing.

Q-6: What is the difference between Alcohol 120% 'twincreator' and BlindWrite 4.5.7 ?
A-6: The Alcohol 120% 'twincreator' is based on old code and method of patching
the image with 'twinsectors' originally this application was made by 'blackcheck'
and abandoned still in its beta for unknown reasons, the only thing 'twincreator'
added it seems is compatibility with *.mdf *.mds files, BlindWrite 4.5.7 has
since then improved this method and instead of prepatching strategy,
twinsectors are burnt onto the CD itself, this eliminates most installation
compatibility issues.
Furthermore 'twincreator' extends the image size compromising its original
integrity making installation and even mounting onto virtual-drive a complete
disaster.

**Q-7: What are the main quality concerns with BWClones, how can a 'PROPER' image
be verified ?**
A-7: There are two things that can influence the difference between working and
nonworking BWClone, the state of 'Physical Signature' integrity that can be viewed
using 'BWA Reader' or 'DPM Viewer' the *.BWA should have a nice curve with no 'spikes'
and 2-4 areas where the surface of the CD ranges from lower to standard in a
key-like patterned formation.
Secondly there is a 'Read Error' that is located three sectors prior to
last sector, this can be confirmed by converting the *.BWI image format to *.bin
using 'isobuster' in order to scan it with 'CDMage'.

**Q-8: What about Alcohol 120% 'RMPS' and BlindWrite 4,5.xx 'AutoPlay' is Emulation
totally out of the question for running SecuROM ?**
A-8: Emulation is and will always be lacking any kind of guaranteed functionality,
due to the fact that as soon as new or improved Emulation methods are released, they
are just as quickly blacklisted or totally bypassed with the next minor update of
the protection engine, BlindWrite 'AutoPlay' has been known to work in more cases
than Alcohol 120% 'RMPS'.
With CloneDVDs of SecuROM there are however no alternatives than using these or other
applications that attempt software Emulation, Anti-blacklisting etc..

---Starforce---SFClones:

Q-1: What kind of copy protection engine is 'StarForce' ?
A-1: StarForce was developed in Russia and only recently has become a popular choice of publishers in the west. This protection system has earned the respect of both crackers and cloners of the community, and a reputation of being one of the hardest and most complex, for a time even believed to be unbeatable. There are a lot of rumors and very little of which is actual information that can be called facts, from what we understand, StarForce uses optical signature to verify authenticity similar to that of SecuROM, the difference is that StarForce installs its own Drivers that operate on system level and therefore have the availability for custom commands and a more precise process of verification.

Q-2: Cloning StarForce is still possible, how does it work ?
A-2: The method of SFCloning is done by first thoroughly measuring where the StarForce verification occur, in order to establish points of reference and configure the patcher, second stage is imaging and prepatching then rescanning, since SFClones are highly media dependant, exact values need to be added for each to expand compatibility, the differences are minor but unforgiving, StarForce verification engine requires near perfect precision to authenticate. The process itself is complex and time consuming however the result is most definitely worth the effort.

Q-3: What does the 'PatcherTool' do exactly ?
A-3: This most excellent tool was created by one of our coders and is intended to provide the community with multiple choice of media brands, it simplifies the patching process thereby allowing the possibility to add several configurations of prepatching RAW image with corresponding media values, currently you can choose between 5 different quality CDRs that are available worldwide, these are :
PLATINUM 52x PHILIPS 52x FUJIFILM 52x SONY 48x and TDK 52x

Q-4: When burning SFClone I get "Keep TOC as on source CD, write until end of image file"
what does it mean ?
A-4: While Prepatching a 'Subchannel' is included with information relevant to run the SFCloneCD, *Table Of Contents* integrity is simply not changed to register the added 'Subchannel' info, nothing is lost or modified with the image itself.

Q-5: Why does running a burnt SFCloneCD only work from CD/DVD-ROM Device ?
A-5: StarForce uses 'ATiP Checking' to identify if the media is CDR/CDRW
or printed retail, this is only accessible with all standard CDRW/DVDRW Devices
and unfortunately can not be blocked/hidden by available applications such as
Alcohol 120 'Ignore Media Type'. If you own a Plextor CDRW/DVDRW you can use
'Plextools' to hide 'ATiP' information on it since this is done at a different
level.

Q-6: How does StarForce treat 'Emulation' ?
A-6: StarForce has supreme emulation detection engine, which is updated with every
following version, there are currently a few 'loaders' that remove all your
'IDE' optical drives, forcing StarForce to run the image mounted on a virtual-drive
such as 'Daemon-Tools 4' subsequently, additional applications must be used in order
to hide/block it from detection, Basically you will need to arm yourself
'to the teeth' with system resident emulation/loaders that may or may not enable
you to run a RAW/Unpatched image and hope your Windows(tm) stays stable and functional.
Once again as with previous protection engines, there are no alternatives to running
CloneDVDs of StarForce, Emulation cannot be avoided, CD versions are therefore
our preference and priority, because of their complete independence to installed or
running software.

---Endnotes---MiRROR

As a final word, this Q&A was made because of all the confusion concerning Cloning and CloneCDs, hopefully things are clearer now that a detailed explanation has been presented, cracking is becoming a very difficult thing to accomplish, even with all the skill and experience of seasoned crews, recent changes and customization of popular copy protection systems need to be approached using manual tools and methods, since it sometimes takes nearly a month to produce a NoCD, the community will have to accept and learn what to do with CloneCDs especially how to establish 'Quality Control' acceptance of these is still not fully decided, however most surely understand the necessity and can no longer avoid their practical appliance.

Sincerely,
MiRROR