

Ripping yarns

Anyone with a computer can 'rip' a CD but that's not the same as providing your customer with a professional transfer service. **Simon Croft** reports on the issues and solutions



So, your customer is convinced of the benefits of placing the CD collection they've amassed onto a server that everyone in the household can access and enjoy. They've even selected the unit that will form the heart of their new entertainment system.

No doubt your customer has better things to do than sit with a stack of discs, populating that server with music files – along with the attendant metadata that enables listeners to ever find them again. In most instances, they're looking to you to take care of that, as part of the service.

The purpose of this article is to look at the potential problems when transferring audio files from CD, the most likely solutions when you have hundreds, or thousands, of hours of material to transfer and the benefits of the strategies to your business.

First, let's look at the potential problems. Naim Audio summarises some of the technical issues very well in its white paper on the Naim CD Ripping Engine. As the record labels realised to their horror some years ago, anyone with a computer can 'rip' a CD these days, and there is no shortage of cheap programs to perform a format conversion.

"PCs have shown that a CD can be copied to hard drive within a couple of minutes," notes Naim's white paper. "Unfortunately, due to the weak error correction system implemented

on audio CDs, the resultant audio files can be not bit perfect.

"The issues can range from subtle but audible unnecessary interpolation, to random clicks and pops when copying used CDs. This type of ripping is known as Burst Mode and assumes that the sectors being read from the disc are perfect; hence a fast copy can be achieved. Some mechanisms provide hardware-assisted correction in this mode, but typically it results in unnecessary interpolation of the audio, rather than trying techniques to get the real audio samples from the disc," notes Naim.

Naim Audio servers use a superior technique to Burst Mode, called Secure Mode Ripping, on a specially selected audio grade CD mechanism. "Secure mode works by using a CD mechanism that does not cache data and reads the sectors multiple times. (It also uses the un-correctable C2 error feedback information supported by the CD mechanism, so known problematic areas can be re-read and handled accordingly.)

The Naim engine typically spins discs at peak speeds of 16x, but when problematic areas of the disc are reached, the disc rotation speed is reduced, as this can help on reading the data off the disc," says its white paper.

Although Naim's approach has identified and addressed some of the technical problems associated with ripping discs, you'll probably in any case be looking for a more 'industrial grade solution' when

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transferring clients' library, probably against a deadline. The chances are you'll want to go down one of two paths, a) get a system capable of large-scale ripping, or b) contract a specialist to do it for you.

Patrick McGrath is director of technology for Ripstation, a company that specialises in making transfer equipment for commercial and private use. He says that there more to a dedicated system than how fast it will rip.

"Speed is certainly one aspect of Ripstation - we can rip up to 80 CD's per hour on a typical system," McGrath allows. "But it's really the automated, hands-off nature of the process that works well for custom installers." Development on Ripstation started back in 2001 and since then, the company has focused on two areas of quality. There's the metadata containing the album and artist information (including cover art). Then there's sonic quality.

"Each rip takes care and attention to both of these aspects and ensures that what the customer gets is the absolute best experience in digital music," assures McGrath. "What we have done in Ripstation is develop the absolute best in ripping technology; we are the only company in the world that solely focuses on this market."

He adds that users' requirements from digital audio files have changed over the years, with the emphasis shifting from low bit-rate MP3s for personal players

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Patrick McGrath, Ripstation

to lossless FLAC files for optimum audio quality (see p16 for a back-grounder on file formats).

Jason Osborne is a director of Move2Digital, a company that offers a specialist service, transferring music libraries from CD to server or NAS drive. He worked as a music engineer and engineer, as well as a DJ, before moving into the IT sector. Although he is concerned that too much music is now produced with reduced dynamic range, so that it sounds its best on personal players with cheap headphones, Osborne says CD remains the de facto distribution medium for listeners who care about quality.

"With SACD already gone the same way as HD-DVD, there isn't another format that is on the horizon that, in terms of sonic quality, is poised to replace the humble CD," he notes. "The typical CI client has always been a big purchaser of CDs and DVDs and I don't believe this trend will change in the near term."

"With audio quality generally being a big factor in this market and download bit-rates being 128 kbps or at best 256kbps, this current generation of CI customers will not change their buying habits and will continue to purchase CDs,

as opposed to downloading an album," says Osborne. "Until the ability to download albums in lossless format is commonplace, the future of CDs is safe."

He adds that his company is increasingly asked to rip music collections to lossless formats such as FLAC or WAV, then produce a secondary set of compressed files for use on personal players, "which Move2Digital does extremely cost-effectively".

Credit where it's due

Creating audio files of appropriate quality is a fundamental but of course, it's the metadata that allows server-based systems to search the library and to display details of the content it holds. Achieving comprehensive and accurate metadata is not as easy as it might first appear.

"For us metadata is key to the user experience," says Ripstation's McGrath. "But it has traditionally been the slow part of a ripping process - being at the mercy of the metadata records held by the online providers always required some element of fixing, or 'grooming' as we call it, after the rip."

"When devices that supported cover art became available in 2003, this became even more time inten-

sive," McGrath notes. "Currently we do smart matching with multiple metadata sources (such as GD3, Gracenote, Tracktype, MusicBrainz) so we read a response from each one and ensure we have the best cross-reference of metadata populated to the albums and tracks."

"The one issue with this is that there can be some inconsistency in the returns," adds McGrath, "so we run on-the-fly grooming to ensure all metadata looks like it comes from one consistent source - this checks everything from capitalisation to boxed-set numbering and composer names."

"As a back-up, we run certification programmes for dealers to ensure they are getting this right every time and have a dedicated metadata support team," McGrath concludes. "The net result is that the completed job requires very little operator intervention for the best possible out-of-the-box customer experience."

For Move2Digital's Osborne, data grooming is part of the added value his company's services deliver to CI's.

"There is real value in leveraging the experience and importantly, the time of a dedicated ripping partner," Osborne affirms. "The actual task of ripping the collection can be time consuming but taking the time to groom the data, that is, check for inconsistencies, source the artwork etc is the more time-intensive process. Just one example of this is the way we



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'We run certification programmes for dealers to ensure they are getting this right every time.'

Patrick McGrath, Ripstation

standardise all composer names.

"To illustrate," says Osborne, "as opposed to having multiple entries that vary from JS Bach, Johann Sebastian Bach to J.S. Bach, we will standardise to Bach. We do this with all composer names. We also correct all variations that you find in box sets and multi CD collections so that the set is consistently named Disk 1, Disk 2 etc and not whatever the metadata source database reports it as, which is often not consistent such as CD 1, Disk 2 etc.

"Then there is correcting the tags when the metadata source database is incorrect etc," Osborne continues. "Dependant on the size and the type of collection, this task could take an additional day to complete. For example, we recently ripped and groomed a collection comprising mainly of Hindi albums and Bollywood soundtracks, where the metadata source didn't even have the major-

ity of albums in its database. This required us to populate the tags manually - time intensive but absolutely vital."

Products and services

Although going the Ripstation route requires an operator, McGrath points out that it is, at heart, Windows-based software and the skill level required to use it is not enormous.

"A typical user operation is: Load CDs, press start, select codec and target device, hit Go. That's it," he explains. "This stems from the early days, where students were employed to do bulk ripping and the staff turnover rate was high, so it has to be quick to learn and easy to use. Support is important to us, and we run a 24/7 team to assist where required."

For its part Move2Digital aims to be as all-embracing as possible in its services, as Osborne explains. "Move2Digital offers a service of purchasing and encoding a bespoke music library, amongst many others. For a client that has just installed a 2TB media server

but has only 150 CDs this can add real value to the proposition."

The concept of adding value seems to be central to Move2Digital, which Osborne says loads Sonos, Imerge, Escient, Linn, Arcam, ReQuest, Crestron and Elan, among others.

"If the client knew that as much attention to detail was to be spent on the encoding of their CD library as the installation of their multi-room system I'm sure that they would expect the cost of CD ripping of their collection to be factored in to the budget on submission," he says.

"A professionally ripped music library should be seen as far more than mere icing on the cake of a luxury entertainment system but an integral part of the delivery. After all, customer excellence is one of the strongest tools we have in an industry that is so reliant on referrals," Osborne concludes. **RSE**

- www.naimaudio.com
- www.ripfactory.com
- www.move2digital.com

COPY PROTECTED CDS

One of the key requirements of a CD ripping engine is to ensure that it can handle a wide range of real world CDs. Nowadays there are plenty of non standard CDs due to copy protections schemes implemented that break compliance with the original Philips Red Book (audio) and Orange Book (audio + data) CD specification. Copy protection schemes fall under four techniques:

CORRUPT TABLE OF CONTENTS (TOC)

Orange and yellow books CD's can have multiple sessions on them. This scheme assumes that an audio CD player will only look at the first TOC entry, while on a computer drive it will read the other TOC entries which are purposely corrupted.

CORRUPT DATA LAYER ON ORANGE BOOK CDS

These CDs are a hybrid of traditional audio tracks and also an optional computer data section. This opens the opportunity for audio CDs to contain multimedia content. Some copy protection schemes use the quirk that if a PC CDROM drive attempts to read a data layer that has unreadable sections on it, then it will give up mounting the disc, so the audio section part of the disc is inaccessible to the computer.

CORRUPT REED-SOLOMON INFORMATION IN THE AUDIO I

The copy protection scheme purposely breaks the error correction information embedded in the audio and forces the player to interpolate. Many ripping systems cannot handle this situation, so they decide that the disc is faulty and abort on ripping the disc. This type of schemes is bad as it makes discs vulnerable to wear and tear and it also affects sound quality.

AUTO-RUN COMPUTER SOFTWARE SUPPLIED ON DATA LAYER OF ORANGE BOOK DISC - BLOCKS ACCESS TO AUDIO

This is a very sinister scheme as it works by automatically installing software on the user's computer that blocks access to the audio tracks on the CD. Some of these small software applications were hidden deep in the operating system of the computer and very difficult to remove. This is known as a Root Kit. Luckily these schemes were short-lived as the system is 'virus like' in the way it achieves its protection method.

TAKEN FROM A NAIM AUDIO WHITE PAPER ON THE NAIM CD RIPPING ENGINE

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