



A VoIP Recorder from the Ground Up

History of the RBR2600 Recorder

In 2001, Red Box Recorders decided to develop a brand new voice recorder optimised for the emerging VoIP market. As a starting point, we took a blank piece of paper and applied to it the combined knowledge and skills of a company that had been writing digital voice recorders since 1990.

We already had some experience recording VoIP, having previously written a product called voiplog®. This taught us two main lessons: a VoIP standard is not to be relied upon and VoIP generates a **lot** of data.

Based on our experiences, we made a list of all the things that we felt were important and developed them into a set of design principles.

As well as offering all of the features one would expect from a 21st Century voice recorder, we had to consider the specific needs of VoIP. These fell into three camps; VoIP connectivity, storage and scalability.

VoIP Connectivity

Given the wide range of VoIP standards and the huge variability of these 'standards', it was imperative that the recorder be able to support the full range and be easily upgraded should they change. Importantly, the 'core' of the recorder should be immune from change so that the overall product stability would be preserved.

To achieve this we designed a core recorder that simply collected data and stored it, using a database that had a flexible format.

The connectivity was dealt with using a concept we called 'protocol processors' (PP) which took the data from the network and decoded it, passing the data that needed to be recorded to the 'core' and creating and updating database records as calls started and ended.

This design has proved very effective, we can add new types of VoIP very quickly just by creating a PP and making no other changes to the recorder. Whenever a manufacturer 'improves' their IPT protocols we can quickly modify our PP and the recorder core remains completely stable with no failures reported for several years now.

This approach has also allowed us to produce some interesting solutions such as a Radar data recorder, a Tetra digital radio recorder and we can also take data from line cards and turn it into an IP stream, which gives us connectivity for 'legacy' ISDN, Digital extensions and analogue phones.



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Storage

We knew that a lot of storage was required because our approach meant that we simply put the VoIP data into the Call Store in its *raw* form.

Our use of PP's meant that the data throughput would be satisfactory to record a large number of calls – we don't *mess* with the data, what you hear when you replay a call is what was on the wire when the call was made. We have found that our decision not to compress the call data was the right one. Examining some of our competitors' products, we have found that this dramatically limits scalability, all for the price of a larger hard disk!

We knew that we would be recording vast quantities of data (3.2 megabytes per second for 200 calls) and large numbers of simultaneous calls (200 at once) and so writing to lots of files on the disk was not an option – we would require server class RAID arrays just for a basic recorder. Instead we chose to simply tag and write the data onto the disk as it was received. This approach gives several advantages: very high throughput, allows the use of high capacity slower hard drives and means that it is almost impossible for a call to be found if the hard disk is 'hacked'.

Other benefits are that data is written very soon after acquisition (typically less than 10 seconds), so in the event of a failure we still keep the data almost up to the point of failure, minimising data loss.

Scalability

We felt that VoIP, more than any other form of telephony, challenged us greatly in the area of scalability.

With VoIP you could easily just have one phone (for example SIP) or have a small number of phones at a branch office or as teleworkers connected back to the main PBX using an IP gateway. Alternatively, VoIP could be deployed right across the enterprise.

Producing a recorder that could scale from one phone to many hundreds whilst still retaining its core characteristics and keeping costs down to maintain competitiveness for the smaller site, was a major challenge!

We did this in a couple of ways; by making a CD Edition which could be installed on customer supplied equipment and by making a virtue out of a necessity in reducing the amount of software that requires licence fees.

We have ended up with a recorder that can now record over 200 simultaneous phone calls in a single box (multiple recorders can be installed on a site) and that can scale up from there as Moore's Law allows.



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Conclusion





Much more could be written about the technical virtues of the Red Box Recorders RBR2600, including its ability as a migration product allowing the use of 'legacy' recording now but easy migration to VoIP without the need to re-train.

Our competitor's products have their pros and cons but many come from startup companies who do not understand the needs of the market, particularly the European market. Others are simply bolt-ons to long-in-the-tooth products and seem to be there just in case VoIP takes off and they need a product to sell!

With the RBR2600 you have a product that meets the needs of the VoIP recording market natively. It is a mature product (first install October 2001) that is very stable and comes from a company whose first interest is VoIP recording and does not merely see VoIP as small potatoes.

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