Is your VMS a Digital Fortress ?

written by Vlado Damjanovski (www.vidilabs.com)
(24 May 2018)

If one thing makes the CCTV industry an interesting one - it is the amazingly quick development of products and technologies. If you want to be on top of things and embrace the new possibilities coming your way, you need to constantly research, read, get some hands-on experience and see how things work.

In the past year or so, I spent considerable time researching and analysing the current Video Management Systems (VMS) trends and products. I had a casino consulting project coming up and I needed to refresh my knowledge. From being deeply connected with some of the pioneering names, such as Maxpro and Dallmeier, in my past consultancy, I needed to move on, get out of my comfort zone and see for myself what else is happening out there.

In this article I am not going to talk about cameras (which is my real speciality, I will leave this for another time), but rather about the current VMS technology, the replacement of the video matrix switcher - what was once the heart of a CCTV system.

I remember some of the very first VMSs, about15 years ago, were very cumbersome, slow and expensive. I also remember that the acronym VMS, initially meant Virtual Matrix Switcher, Virtual - being the switching that instead of being inside a physical analogue matrix, became a network switching with the appearance of the IP cameras on the market. Gradually, the Video Management System acronym became more common and a more suitable description of what the VMS functions are - managing video, alarms, motion detected events and interfacing to third party systems.

While the analogue matrix switchers had video input cards with certain capacity, and any camera could be plugged into it (the only choice was PAL or NTSC), the VMSs introduced the concept of camera licences per channel. The licensing per channel was introduced because the IP cameras in the beginning of their evolution came out without any standard format, as there was none. Every camera manufacturer had their own protocols, compression and imaging formats. This was the case simply because the technology evolution was faster than the standards development. It just caught the industry off guard. There were simply - no standards (in fact in Australia we still don't have any, as we are waiting for the Standards Australia to process the adoptation of IEC 62676). So, creative VMS manufacturers invested a lot in writing interfaces to each camera model they could get hold of, and sell such a development based on camera licences.

This enabled for VMS companies to pop like mushrooms, from Russia to Brazil, to try their luck and build computer based VMSs.

So, how good are the VMSs today?

I will try and answer this question through a practical analysis of one particular company which is half Australian, half Brazilian, and which, after learning their qualities, I respect highly - Digifort.

The VMS manufacturers today offer integration of thousands of different IP camera models (always updating), although the newly created interface protocol called ONVIF got accepted by the IEC 62676 series of standards so that all manufacturers offer it is an additional communication protocol for their cameras. This means you should be able to connect your cameras via ONVIF if you don't have the particular camera model in the VMS database.

The VMS manufacturers still charge licences per camera channel, but almost all of them offer ONVIF connectivity as well. Some VMS charge only once, others ask for recurring licences. Some charge additionally per clients connecting to the VMS, for additional Video Contents Analytics, others charge annually for maintenance and support. So you need to be aware of similar "hidden costs".

Last year I was approached to do a consultancy for a casino in Europe, and I had to start researching the current VMS market. Not long after that an opportunity came up to meet with Mr.Tooma Chong, Director of Digifort, based in Sydney. After I told him about my interest in the VMSs he invited me to visit Digifort stand at the Intersec show in Dubai. This is where, he said, Digifort is a household name in the UAE and they were going to show case their latest system in full glory to the many customers they have there.

Tooma is a smart businessman and straight forward shooter. He is in charge of Australia and the rest of the world market, excluding the Americas. He knows that his product is special and wants to show me that. The founders and developers of Digifort are based in Sao Paolo in Brazil. An unusual venture, to say the least, but certainly a productive one. As you could guess, Digifort is quite well known in South America, but (I didn't expect) also in the Middle East, UAE and the GCC countries.

Since I was already travelling to Europe, and I usually stop-over in Dubai, I got intrigued. I have been to many shows around the world, but not in Dubai, so I promised I will visit Intersec. I have been in Dubai a few times long time ago (over 20 years to be more accurate), so I was eager to see how much has changed. I was interested to see how this market is developing in general, but I was also now keen to learn more about Digifort.

Visiting Dubai is always an eye opener. No matter how much you have seen it on TV, you need to see it live. An amazing empty desert transformed into a mega-city with the best and mostest in architecture and design. A city of lights and sparkling buildings reaching the sky. Yes, a lot has changed since my last visit.

The Intersec show was bigger than I expected, and right there, in front of the main entrance, I was welcomed by a huge Digifort gate. Digifort really seems to be a household name in the UAE and the Middle East countries.

Thousands of people from different parts of the world rushing in to get inside the huge halls of the international centre. Wow, this was really impressive!

I easily found Digifort stand, and I was unexpectedly impressed. Many guests attending the stand talking to all Digifort staff, just proved what Tooma was telling me a couple of months earlier was really true. It seems that more people knew of them in this market then in Australia.

I stood at their stand, watched and learned what the Digifort VMS was capable of. I must admit I was sceptical at first. I have seen many systems in my lifetime, and expected that this will be one of the similar mediocre products.
Very soon I was proven wrong.
I was actually blown away by the VMS easy of use and quick response. PTZ control was instant, without noticeable latency. Images were quite sharp and clear, which obviously would depend on the cameras first, but the decoding and scaling of the same images was quick and responsive.

The Digifort ad says that they have the largest number of camera models integrated (although, to be honest, I have heard the same statement from almost every VMS manufacturer) and they certainly have the ONVIF integration also (in case you can't find your camera model). Digifort also claims backward compatibility of older camera models and never drop drivers. Cameras integrated from day one will still be working with their latest software version.

More importantly, and more impressive for me, was the Digifort integrated analytics. Not just automatic Licence Plates Recognition (LPR) and Face Identification (FI), but also an actual multi-functional traffic analysis, both for pedestrians and vehicles. This was shown through their integrated Video Synopsis module. I was really impressed with the various features of it. Video playback showing a big round-about with five entrances and a lot of traffic going in and out. Tooma showed me a simple filter by two clicks of a mouse selecting red cars going clock-wise direction and bang - all red cars going clock-wise time compressed and shown on the filtered video clip. If you spotted the vehicle you were looking for. Just click on it and playback only that event. Easy, intuitive and fast.

Next, he showed me a heat map of the traffic showing which round-about entries and exits have the most traffic. Heat map is indicated with different colour lines tracing the vehicles paths, from green for light, yellow for medium and red for heavy traffic. Something that could be extremely useful to people like RMS. They can easily detect or analyse traffic congestion areas and get an alarm if they wish to.

Another analytics was shown on a pedestrian bridge, where hundreds of people were walking randomly in different directions, some of them on bicycles, others running, with back-packs, and alike. It was so easy to select any particular type of people, filtered by direction of movement, colour of their clothes, speed of movement or even if they are male or female. A real-time and fast VCA that works as expected, and can be applied as well in searching a recorded footage. A very neat analytics indeed that can save hundreds of hours of tedious work to the operators, or warn them if a suspicious person or vehicle is coming in the camera view.

Digifort is, without any doubt, smarter and faster then I thought. To be fair in my assessment, I visited other VMS stands and watched and listened to what they were showing and saying so that I can make an objective assessment. Other VMSs have progressed nicely from the time I saw them first as well. So the actual distinction between various VMSs would be in the small but important differences.
When you compare two or three similar cars and you want to buy one, you start going in-depth and in detailed analysis like which one is faster, but also which one has better fuel economy, easier to drive, safer, etc. It is very similar with the VMSs today.

So, in addition to the fluency and speed of working with the VMS and the intelligent VCA, another important consideration is the integration with third party systems. Especially the Access Control, Building Management and others.

Today's growing demand for smarter solutions requires leadership and critical infrastructure to provide just that. The critical infrastructure in Digifort case is their smart, fast and responsive SDK and API. This is the core source of integration with other technology partners to create a comprehensive solution. Not all SDKs are the same. Smart SDK/API makes integration easy and fast. Digifort claims that their SDK/API is smart and very responsive.

While walking around and visiting many hardware manufacturers, I got into discussions, presenting myself as a potential customer, and heard various comments, such as that Digifort has one of the best SDK/API. Others even said that they have some of the fastest HTTP/HTTPS alarm responses. This is very important when your VMS is responding to alarms. Delays of a couple of seconds may mean that it could be too late for an effective alarm response. When using third party (unknown) video stream, often RTSP streams are used, but in the case of Digifort they can do RTSP of a playback as well. This could be very useful in integration.

I was impressed with the stability of the system itself. In the many hours of me watching and listening the demos that the Digifort sales guys did, I never saw a lockup or system freeze, which is so common for most Windows based systems. When I asked how is that achieved, they said that Digifort is proven to be extremely stable because of their solid coding and performance driven philosophy. More responsive and less CPU intensive than many of the competitors, they said. An additional important reason for this I would add is the knowledge of the product by the Digifort staff. There was no question which I asked that was not answered completely and in detail. Having a manufacturer's staff that is confident and knowledgeable gives even more assurances to the would be buyers.

One of the key underlying structures of any VMS is the database. Too often people have been burnt by Microsoft SQL due to licensing issues or limitation this database offers. Many manufacturers I know are using My SQL instead, which used to be an open source free database, but sadly became chargeable after Oracle bought it out. I was pleased to learn that Digifort uses another open source database which is still free - the Firebird database engine. This one runs on Windows, Linux and Unix OS, requires no updates and it does not rely on Microsoft framework. Since Firebird is leaner and faster database - it results in ability to handle more cameras per server. With the latest Firebird, this is even further optimised, which is why Digifort LPR detection engine worked very fast despite having thousands of vehicles in its database.

Digifort comes in four "flavours": Explorer, Standard, Professional, and Enterprise. They are all compatible to offer a truly scalable solution. An important cost saving compared to other VMSs is that Digifort licenses are perpetual with no ongoing annual fees. Upgrades are free within the same "flavour".

Another thing that I heard quite few times from Tooma and the boys is that they are very proud of the very low traffic bandwidth Digifort uses for the operation. Once you start working with the software this could really be sensed in the speed of switching cameras, PTZ control or alarm response, but also in fast playback and finding events using VCA.

They were also proud to point out that their advanced multi-processor motion detection capability uses the lowest amount of CPU power from any other VMS, and it is capable of processing motion detection from I-frames only, saving further on the number crunching processes.

To prove how competitive their system is, Tooma gave me a list of recent prestigious projects, which have been won not only because of its functionality, but also because it required less hardware and thus was cheaper.

- ADNEC (Abu Dhabi National Exhibition Centre) with 1200 HD cameras, where a reputable competing VMS quoted 28 servers, Digifort did it with 7 main servers and 2 fail-overs. This took virtually 3 years, although initially Digifort were not even considered, because they did not have enterprising failover, but once they developed their own, much better fail-over than the competitors, the customer decided for Digifort.

- A project in India with 3600 cameras (mixed 720HD and 1080HD), a reputable competing product quoted 83 servers, Digifort won the project with 18 main servers and offered 5 fail-over servers.
- A project in Iran, called Rosha Mall, with 500 of 1080HD cameras, a reputable competing product proposed 5 servers, Digifort did it with 2 main servers, and each other acting as a fail-over to the other.
- Last, but not least, a Grand Millenium project in Abu Dhabi, with 1050 of 1080HD cameras, a reputable competitor offered 20 servers, while Digifort won the project with 12 servers and 2 fail-over servers, with capability to extend to 1500 cameras.

Digifort comes with an interesting free utility called Digifort Insight, which allows any network PC, within the same network, to be able to stream to Digifort server, just like a camera stream and be recorded and viewed live. Users from a client can take over control of that PC as a remote desktop.

Many large systems cannot be imagined without a redundancy. For this reason, in addition to working with redundant disk arrays servers (RAID), many VMSs also offer the fail-over ability, just in case the whole server fails. Digifort is no different, and offers fail-over ability, but not just a standard fail-over of the camera's on a failed server, but also fail-over of the LPR, VCA and I/O controllers.

Certainly, as you would expect from a modern VMS, there are unlimited multi-screen styles you can create, use maps, multi-functional PTZ keyboards and the ability to do anything with Digifort with just 3 clicks away. Remote connectivity with smart devices is easy and quick, supporting full frame rate.

So, what are my final impressions?

Well, I am very happy to see such a well developed product, which is partially Australian owned. Digifort can easily compete with the biggest and most popular names out there.
If you are thinking of upgrading to a new and better VMS for your site, you should certainly give Digifort a go.
Not only you may save money, but actually you will find things that you may have thought belong to the future - but they are possible right now with Digifort.