HOT TELECOM INSIGHT

Voice virtualization/

> NOWADAYS EVERYTHING IS EVOLVING AT LIGHTNING SPEED AND SO IS VIRTUALIZATION

The power of voice virtualization **today and tomorrow**

It is time for the big virtualization push!

It is some years since we last wrote about virtualization and its impact on the wholesale telecoms industry. So, the start of a New Year is the perfect time to take stock and refresh our thinking on this important topic: The power of voice virtualization today and tomorrow.

Nowadays everything is evolving at lightning speed and so is virtualization: So, how has virtualization itself changed?

The virtualization **journey**

Virtualization 1.0: Cloudification

For many years, telecom networks were comprised of large, purpose designed and built, hunks of hardware. Every element was custom designed for its place in the network, software controlling that hardware was fully integrated into the product and could only be updated with official releases from the vendor. Spare cards were kept of every variant and support costs of 15% of the capital cost were a major part of the operations and maintenance budget.

Things have changed greatly since then, as operators have started to embrace virtualized voice switches, which are the polar opposites of these traditional deployments. Instead of unique designs for line cards, codec boards and the like, the functions performed by those boards, and the specialized chips on them, were replaced by software running on industry standard servers, utilizing the power of modern CPUs to handle the functions required. This was the start of the cloudification era.

This was always a trade-off however, as the variability of demand could, at times, cause the CPU to become a bottleneck which would have to throttle back the throughput to ensure current calls were properly handled.

Virtualization 2.0: Disaggregation

In parallel with these changes in the wholesale voice industry, much more cataclysmic impacts were being felt in the computing world, with the rise of cloud computing. Immense buildings stacked full of servers, ethernet switches and routers were being built around the globe to provide a platform that was infinitely scalable, as demands changed.

But the costs of this technology for the cloud providers was driving another trend – one of disaggregation, as a further step beyond virtualization.

The massive volume of equipment (with its relatively short life span) drove cloud giants to first deploy best of breed software on separately procured server hardware. But they then looked beyond the computing elements to their investments in those switches and routers. This with the aim of delivering the rapid increases in line speed and capacity, without being locked into the solutions from major vendors such as Cisco.

Virtualization 3.0: Merchant silicon

When looking into the future, the answer here, which is driving much investment and development, is the use of merchant silicon. Perhaps this further evolution will be the final step towards fully disaggregated and virtualized networking. Merchant silicon refers to standardized or "off the shelf" application chips designed and manufactured by vendors.

The benefit of these 'off the shelf' programmable chips is that they can fulfil the hardware functions of a high-end Ethernet switch for instance. These can in turn be coupled with open source or best of breed software to complete the design.

> "LOOKING INTO THE FUTURE, THE ANSWER IS MERCHANT SILICON

The same approach has recently been extended to the much more complex IP routers. The mix of merchant silicon chips handling the packet forwarding functions at line speeds with software from other vendors provides the control. This is definitely the way forward. Even Cisco has recently announced changes to offer such merchant silicon solutions separately from their integrated core routers.

Non-virtualization is not an option

The massive scale of cloud computing makes the market for such specialized components a major opportunity for some companies. But what of the impact on voice wholesale, which is where we started this story?

It is clear that there is no end in sight to the power and performance available in the cloud computing environment and so any residual performance issues will rapidly be resolved. Voice networks, at their core, are simply packet forwarding devices with rules set by the routing systems. They rely on underlying IP transport networks, either public or private, but they are not particularly integrated into those.

As a result, virtualization of voice networks into software running in those cloud environments, which can be public clouds from the likes of Amazon or Microsoft, or privately created ones from the major telcos, is almost a foregone conclusion now. It is important to note, however, that not all clouds are created equal. Real-time voice calls have onerous requirements on CPU and memory resources and voice quality rapidly diminishes if this is overloaded. As a result, it is often better to utilize specially designed cloud environments for such real-time services.

With this devolution down to software building blocks, much tighter integration between the reporting of performance of a termination supplier to a destination (both financial and operational) and the routing systems is also the next natural step. The resultant is a near real-time feedback loop driving the path to be followed by the next call or message.

Such a capability is key. Because, as we saw in 2020, changes both planned and unforeseen can result in major shifts in demand. Therefore, traditional approaches of sending an engineer to build out incremental capacity is becoming very difficult to implement and, in some ways, obsolete.

A hands-off virtualized network is almost a requirement nowadays, rather than a "nice to have".

Empowering **ultimate efficiency**

With virtualization being a clear direction for many carriers, where will the differentiators and market leadership come from? We think that there will be two key areas that will distinguish the 'best in breed' carriers in the marketplace going forward: Integration and Efficiency.

Integration

Integration here refers to the ability of the carrier to fulfil their main role (the termination of calls and messages) in the most efficient and accurate fashion.

The need for complete integration is something we have written about in several recent papers. What is required is the full integration of control and routing within the network itself. By definition, virtualization allows both the switching (or session border controller elements) and the routing control elements to be realized in software, running in multiple cloud environments around the world.

Having these elements closer to the customers and their called destinations lowers latency and also provides resilience against natural, and man-made disasters.

But the ability to operate the networking platform in these cloud environments also enables the higher levels of routing management to be tightly integrated as well. This encompasses the systems that are monitoring performance, assessing margin achievement, validating new supplier offers and controlling the routing of each call as it is presented to the network.

No longer will we have monolithic systems back at headquarters that are processing the call detail records and integrating those with new supplier offers to finally generate a new routing plan that is downloaded to network elements. Instead, we must have collocated and integrated solutions that are aware of how calls are being handled in real-time and to adjust the call flows to maximize both performance and margin delivery.

Efficiency

Voice termination margins continue to be low and nothing on the horizon is likely to alter that. As a result, operators globally must offer international voice and messaging termination to their customers, but with minimal effort and cost to themselves.

To make this happen, a fluid wholesale ecosystem should be created. This means carrier partners must first be fully trusted in terms of the quality and reliability of their service and then offer APIs and interfaces to feed the latest pricing details directly into their systems in an agreed format.

With that in place, operators can have their own internal systems work through the different offers and generate their own routing plan with no human involvement. Full ecosystem integration means that as prices change, so does the choice of carrier for a particular destination in real-time. This without the need for manual intervention driving automation further to the forefront.

Similarly, details of the costs of termination must be fed back, together with performance data, to allow the margins and revenue to be reported and monitored, again with no manpower involvement. It then empowers management to see at a glance, critical data in near real-time in their normal performance monitoring reports.

Any changes they need can be implemented in their systems and automatically forwarded onto the wholesale carrier through those APIs. With such an integrated system, the international carrier becomes a true partner to the retail operators. Translating into ultimate efficiency for all involved, along with longevity and sustainability.

> "A HANDS-OFF VIRTUALIZED NETWORK IS A MUST-HAVE **NOT A NICE-TO-HAVE**

Not as simple **as it looks**

The benefits are clear, but what about the difficulty of getting there? The biggest challenges are perhaps history and skill set. Most large carriers have a lifetime of experience and investments in voice termination and over that time have developed systems and processes (and internal skills) that have supported the business as it evolved over the years.

So by nature, carriers operate highly complex systems that have been tailor made to fit with their specific processes. Change is not easy in this environment and many internal players believe their position of power depends on the skills they have developed in making those solutions work. In addition, if they have deployed integrated network elements from vendors, they also know who to call (and perhaps blame) if things go wrong.

A virtualized environment conveys a completely different reality. Firstly, it brings in multiple players to the wholesale equation. Some of the virtual stakeholders include cloud providers, the software vendors supplying cloud management environments, transport providers (perhaps) providing connectivity to the cloud and the switching or SBC software vendors.

Added to that, the routing and rating environment needs to be integrated to provide real-time routing control and ensure both quality and margin targets are maintained or exceeded.

So if calls are failing – who is responsible for resolving the outage? Troubleshooting in this environment depends on skills that might not exist in carriers and could be expensive to acquire. It also requires considerable teamwork and cooperation among the various stakeholders to agree on the root cause and resolve it.

> “VIRTUALIZATION CREATES A COMPLEX **MULTI-PLAYER ENVIRONMENT**

A strong integration partner **is vital**

Due to added complexity brought on by the virtualization of the ecosystem, a key step in making a move to a virtualized environment is to form a solid partnership with a trusted systems integration (SI) team who has the necessary experience in managing the transition to the new platform model.

Help in choosing appropriate vendors with experience in integrating them seamlessly within your existing reality is key. A good SI company can save heartache and money in the long term and is a vital here.

Starting with a clear plan, that includes the recruitment and training of suitable in-house expertise is the first step. Then establishing, in cooperation with your SI partner, a clear lab testing environment that is able to assess the interoperability of these solutions, without them impacting the live network is key. Finally, having a clear workable plan for migrating service step by step to the new environment as quickly, and also as safely, as possible is the final piece of the puzzle.

The benefits are clear, but history will favor those that partner with the best in breed vendors to bring the benefits to reality.

the author

Steve has a lifetime of experience in designing, engineering and operating networks, both domestic and international.

With leadership experience in small technology start-ups through to global service providers, he has deep experience in a wide range of products, technologies and geographies.

He has the rare skill of being able to explain complex technical issues in easily understood concepts and uses that extensively in his consulting work with HOT TELECOM.

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Odine Solutions is a leading provider of next generation virtualized solutions for the telecoms industry. Our continued evolution has kept us at the forefront of cutting-edge software & virtualization technologies, where we have been an integral part of network and digital transformation at over 170 operators and carriers in 35 countries.

As we strive forward to be the market leading technology enabler for Wholesale voice carriers, our solutions empower CSPs with an advanced and continually evolving application suite for the end to end management of their wholesale operations, accessible from any device, any location, any time globally.

Odine Solutions' ability to deliver enhanced levels of efficiency, automation, optimization, and business intelligence through our global infrastructure providing the highest levels of performance and scalability on-demand to all customers, empowering them to never miss an opportunity.

To find out how we can help you, contact us at **info@odinesolutions.com**

or visit: **www.odinesolutions.com**

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