Analyst Insight

Mavenir: The tale of a rising US telecom network champion

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How Mavenir became an end-to-end telecom network vendor from its voice and messaging roots

For the second year in a row, I made the trip to cowboy nation to attend Mavenir's one-day analyst event in Dallas, Texas—and it was worth the trip. Last year at the same event, Mavenir exposed its virtual RAN (vRAN) strategy to a select group of respected telecom analysts, most of them veterans, and guess what? Despite the soundness of its vRAN baseband unit (BBU) architecture (Mavenir does not do remote radio units (RRUs), preferring to solely focus on software), no one believed the story—even less so when the rhetoric centered around taking on the big guys (e.g., Ericsson, Huawei, and Nokia). Well, what a difference a year makes!

2018 geopolitics changed the RAN vendor market dynamic forever

In case you don't remember the extraordinary circumstances that, although indirectly related, helped pave the way for Mavenir's vRAN journey:

- 1H18 was marked by a severe $1B fine that ZTE had to pay to US authorities as a penalty for breaking a settlement resolving sanctions-busting sales to Iran and North Korea. The fine ended a three-month ban from purchasing components from American suppliers that temporarily shut down the company's operations, costing it business around the world and turning it into a bargaining chip in US-China trade negotiations

- 2H18 saw the beginning of an escalating war against Huawei that led to a ban in 1H19, preventing the Chinese giant from buying key US components

Stuck with foreign vendors such as Ericsson, Nokia, and Samsung, the US government has been looking at potential homegrown alternatives, at least for RAN and mobile core networks. Cisco, Ciena, and Juniper Networks were the three major suspects and showed some potential, but the emerging vRAN vendors led by Altiostar, Affirmed Networks, Mavenir, and Parallel Wireless really stood out with their 21st century approach to what a telecom network should be.

Then came the idea of creating a new US champion by putting a few vendors together. After a closer look, it became clear that Cisco was getting more serious about RAN and reinforcing its grip on Altiostar (started in 2011 by the founders of mobile packet core vendor Starent Networks and sold to Cisco in 2009). Mavenir's long history of voice and messaging products and services, which still make up the bulk of its revenue, along with its foray into virtual packet core and its October 2019 vRAN commercial launch, could make the two competing vendors good prospects.

Mavenir is now in the right place at the right time

Although it was hard a year ago to envision how Mavenir could benefit from those developments and build vRAN momentum to expand its scope beyond voice communication products and services, the execution of the vRAN plan outlined last year and a series of recent events have substantially changed Mavenir's fortunes for the better:

- **The O-RAN Alliance's unabated momentum:** Founded in February 2018 by AT&T, China Mobile, Deutsche Telekom, NTT DOCOMO, and Orange, the O-RAN Alliance was established as a German entity in August 2018 through the merging of the xRAN Forum and the C-RAN Alliance. As of end of October 2019, the O-RAN Alliance counts 22 service provider members, including the world's 10 largest operators ranked by revenue, and a plethora of vendors engaged in various network elements (e.g., access, transport, core, subscriber management, OSS/BSS) of telecom networks. Of course, vRAN chargers Altiostar—backed by Cisco, Rakuten, and Telefónica—and Mavenir are members.

- **Huawei's awkward vRAN position:** At its global analyst industry event held in Shenzhen in April this year, Huawei pushed the need for open design and resource sharing to simplify base station installation and reduce site costs but took a very different path than the open networking group O-RAN Alliance. Huawei does not believe in what the O-RAN Alliance is trying to achieve, arguing it is counterproductive and will increase the total cost of ownership of cellular sites. Huawei believes the group's concept of open interfaces separates components in a way that will raise costs in the longer term.

- **Rip and replace in rural America:** In July 2019, the US Senate passed a bill that considers federal subsidization of replacing Huawei equipment already installed in the US. Several rural and regional carriers use Huawei kit. According to the bill, grant funding will come from the Supply Chain Security Trust Fund or will be borrowed interest free from the US Department of Treasury. Grants may be used only to "replace communications equipment and services obtained from Huawei or ZTE or another entity posing a national security risk." The funding can only go for equipment purchased on or after 14 August 2018 and is available to service providers with fewer than 6 million customers. Consequently, this bill opened the door for a flurry of greenfield rural network vRAN, vEPC, and vIMS buildouts, putting Altiostar, Affirmed Networks, and Mavenir in the driver's seat.

- **Rakuten Mobile's aggressive virtual telecom network:** The world is watching Rakuten's prowess in deploying the world's first virtual mobile networks using Altiostar for vRAN (BBUs) and Nokia for radios. Altiostar's BBU can be split into virtualized distributed units (vDUs) and virtualized central units (vCUs); Altiostar is deploying vDUs at the 4,000 edge compute sites supplied and installed by Cisco and vCUs at two sites. Other vendors include Altiostar's off-the-shelf server partner Quanta Cloud Technology (QCT), Ciena, Cisco for vEPC, Fujitsu, Intel, InnoEye Technologies, Netcracker for vOSS/BSS, Mavenir for NFV-based RCS, NEC, Red Hat, Sercomm, Tech Mahindra, and Viavi.

- **Vodafone's RAN opening warning call:** Despite its reluctance to become a member of the O-RAN Alliance, Vodafone has been looking at vRAN for some time. It's worth noting that Huawei's geopolitical issues have shaken Europe's Big 5 (e.g., Deutsche Telekom, Orange, Telecom Italia, Telefónica, and Vodafone) and sent a message of urgency to open up the RAN interfaces—not only in case they need to attach new RRHs/RRUs to Huawei's installed BBUs but also to move away from the vendor lock-in that has been the norm since the start of the telecom industry. Vodafone, which has Ericsson and Huawei in its mobile 4G and 5G network in the UK, has been working closely on OpenRAN through the Facebook's TIP initiative and in October 2019 added Mavenir and Parallel Wireless as vRAN vendors in a trial.

- **Telefónica's investment in Altiostar:** Through its startup incubator Wayra and its Telefónica Innovation Ventures entities, Telefónica is known for making investments in promising and/or early-stage startups. However, the 17 October 2019 announcement of an investment in Altiostar was not particularly well received by a few service providers that were testing Altiostar and are now turning to Mavenir. Meanwhile, this did not prevent Telefónica from selecting Mavenir as a vRAN supplier.

Mavenir's momentum could not have been possible without a sound vRAN product

Our analyst meeting in Dallas took place two weeks after the official commercial launch of Mavenir's OpenRAN platform, which already counts Telefónica and Vodafone as customers. Mavenir's OpenRAN technology enables any RRUs to interface via Ethernet fronthaul with its BBU design built on commercial off-the-shelf equipment including x86 servers with open software running on top. The interface is made possible with open source O-RAN software that rides over the fiber connecting the RRUs with the BBU.

As highlighted during a one-hour presentation, Mavenir's software supports the O-RAN 7.2 Radio Architecture with Open Interfaces specification. The O-RAN 7.2 spec provides an open alternative to the Common Public Radio Interface (CPRI), which the wireless industry has traditionally used to carry traffic between RRUs and BBUs in centralized RAN architectures.

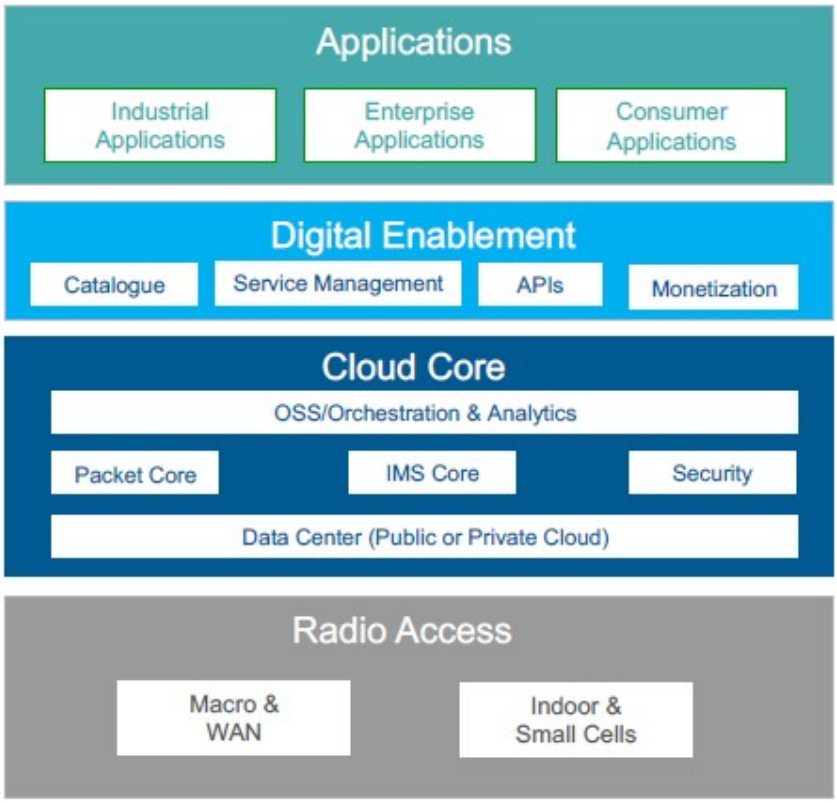
And finally, Mavenir showed a wide ecosystem of RRU suppliers and partners that will come in handy for greenfield and rural network buildout opportunities.

Mavenir's brand new product proposition goes beyond vIMS, vEPC, and vRAN

In fact, by just having vIMS, vEPC, and newly added vRAN, we can already argue that Mavenir is getting close to becoming a new end-to-end telecom network supplier in a fiercely competitive field dominated by Ericson, Huawei, and Nokia at the tier 1 level, followed by Samsung and ZTE at the tier 2 level. Where does this put Mavenir?

As the meeting progressed, we had a fresh overview on packet core and a rapid refresh on IMS and RCS, which again account for 90% of the company's total revenue. Then, we moved on to Mavenir's 5G new core, cloud core, and Mavenir Digital Enablement and discovered that the company is a de facto end-to-end software telecom provider covering all network functions that matter the most, as illustrated in Exhibit 1.

Exhibit 1 Mavenir's new product proposition



Source: Mavenir

Exhibit 1 illustrates how far Mavenir is going in its end-to-end software journey, starting from applications and going all the way down to radio access networks. Starting from its IMS voice and messaging legacy, it built a complete cloud core platform that features key elements of security learned from widespread telephony fraud and cyberattacks. Yet again, Mavenir's expertise and leadership in the voice and messaging business, along with the 2014 Stoke acquisition, has helped the company build a sound security service suite that includes anti-fraud, IoT security, and DDoS modules. In 5G, the company's security features are built by design, and its portfolio will continue to protect existing legacy interfaces.

From an operational system management perspective, Mavenir has built an OSS/orchestration and analytics platform that runs its cloud core engine. The next logical step was to move to the revenue management architecture layer without reinventing the wheel; there was no willingness whatsoever to become an Amdocs or Netcracker. In doing so, Mavenir remained focused on its own environment and identified the four key functions deemed indispensable in constructing an end-to-end proposition: catalogue, service management, APIs, and monetization. And naturally, Mavenir's application layer is sitting on top of the whole stack.

Not shown in Exhibit 1 is Mavenir's 5G new core built on 3GPP's service-based architecture that features all functions but AF, the application function that fulfills the role of an application server that interacts with the 3GPP core network to provide services, and LMF, the location management function.

Bottom line: A new US telecom network champion is born

Although Mavenir has been around since 2005, it's its sudden reincarnation coming from the 2017 three-way merger of Xura, Ranzure, and Mitel that reset the course, with great software ambitions based on a solid voice and messaging foundation that paved the way for vIMS and vEPC—which also triggered the willingness to take a crack at the untouchable domain: RAN. But with a tweak, add a "v" for virtual in front of it and stay away from the heavy-duty hardware business of producing radios. Put another way, let's focus on what you do best: software.

Mavenir's accomplishments over the past two years are remarkable, particularly the vRAN traction the company has gained with the world's tier 1 service providers within a year. Right after the creation of the new Mavenir in 2017, the company acquired Argyle Data, bringing big data and a machine learning security platform that delivers real-time anomaly detection and predictive analytics for mobile operators and IoT networks. This acquisition and its vRAN ambition marked the beginning of a new era: the creation of a new generation of US telecom network software supplier.

I can't wait to see what 2020 brings for Mavenir. After all, in French Mavenir is a neologism between *mon* and *avenir*, which together in English mean "my future."

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