Remote PHY Rollouts

By Sara Waddington, Managing Editor, Broadband Journal

Dave Hering, Sr. Product Line Manager, VIAVI Solutions, explains how Remote PHY technology can lower OPEX/CAPEX, whilst increasing capacity and robustness in the networks.

Dave Hering, Sr. Product Line Manager, VIAVI Solutions

Traditional node splits have been the answer to increase network speed and capacity until recently, but cost and hub space/power issues are now breaking this model. Distributed access architectures (DAA), such as Remote PHY, are the consensus solution but their implementation will not come without new challenges.

Broadband Journal asked Dave Hering, Sr. Product Line Manager, VIAVI, for his thoughts on network evolution as Remote PHY technology develops and gains more traction, with the promise of lowering operational and capital costs while increasing capacity and robustness in the networks.

BBJ: What do cable operators tell you is keeping them up at night on their forthcoming R-PHY rollouts? Which trends do you see developing?

DH: The biggest trend that we see is the migration from lab trials to field trials of Remote PHY. Operators on all continents seem to be embracing this. They are looking at how to move the technology into a production setting. However, figuring out how to provide regular maintenance on Remote PHY plant is now a concern for operators. With the Remote PHY, you no longer have the ability to look at the RF in the hub sites. You have to look at it on the Remote PHY node itself and it's a much more challenging environment for testing.

The other trend we are seeing is that actual installation for Remote PHY looks a lot more like business services. You have to put your fibre in place, you have internet services

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running out to the Remote PHY node and then, after that, it looks like traditional RF plant. Very often, it requires multiple work groups or even contractors to deploy and test equipment to turn on Remote PHY. This is keeping operators up at night, trying to figure out how to maintain and deliver R-PHY in a production setting.

We often hear that operators are going to go ahead and change their upstream frequency range in conjunction with DOCSIS 3.1 OFDMA deployment. However, this adds an additional level of complexity to the operation.

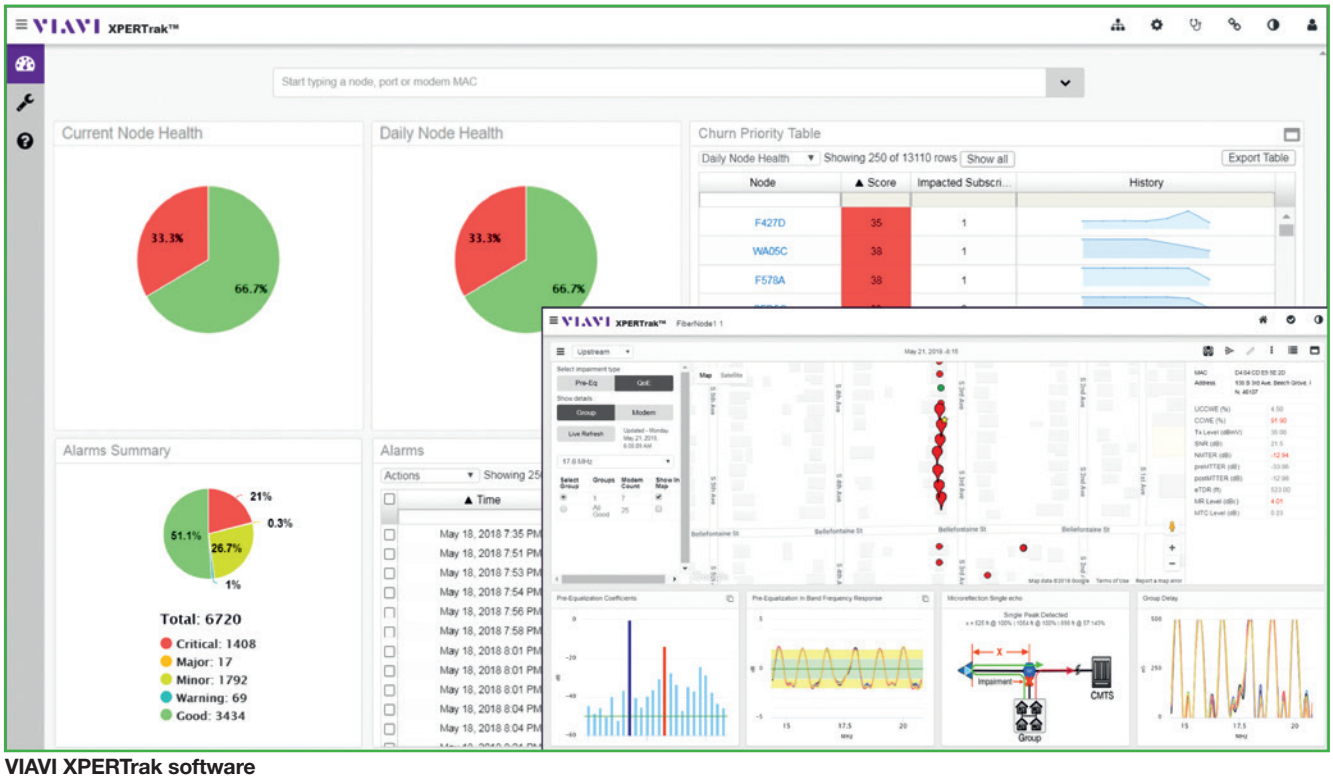
Many operators are simply out of space in the hubs and cannot do traditional node splits. Remote PHY gets rid of the analogue fibre going out to the node, so the link is more robust and easier to maintain. Operators can service the higher modulation schemes available with OFDM,

ONX with return sweep

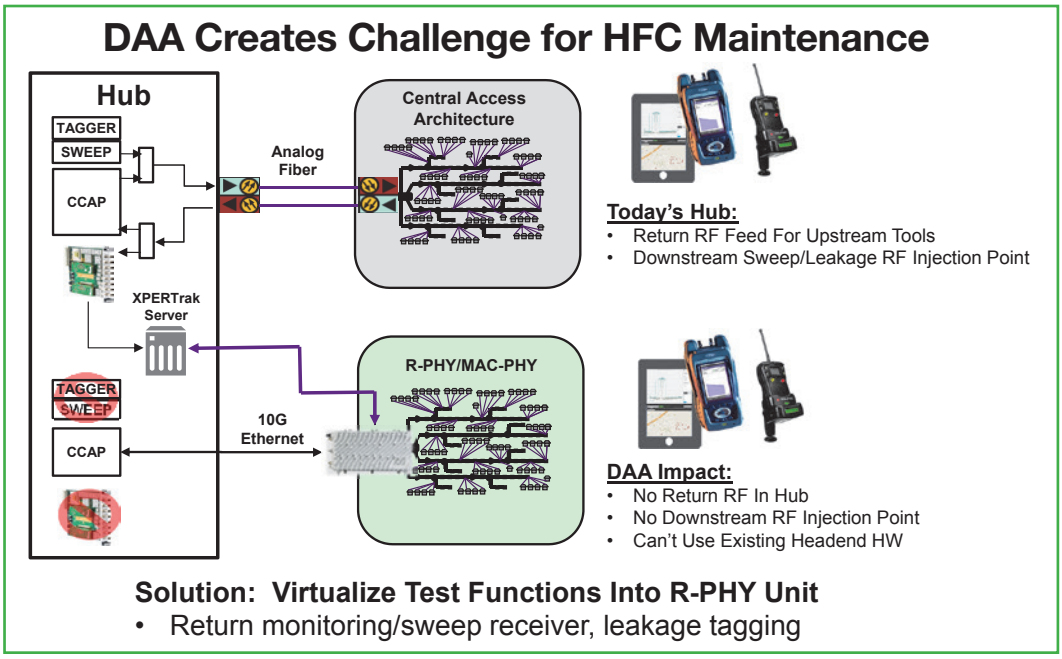
so you can see more coupling between DOCSIS 3.1 and Remote PHY for that reason.

BBJ: Change seems to be the only constant for cable operators. What is different or more challenging about implementing R-PHY vs DOCSIS3.1 or other recent changes?

DH: The biggest difference is the accessibility of test data. The traditional techniques of putting probes in the hub sites to help with spectrum, ingress suppression, sweep, tagging carriers for leakage detection etc. all have to change in a Remote PHY environment, because they do not go through traditional probes. As soon as you talk about taking data from a Remote PHY device and integrating that with field tests, essentially it means that you have to put software agents in place which can work with technicians in the field.



VIAVI XPERTrak software



Vendor proliferation is another change. The big draw for Remote PHY is that the CCAP and the Remote PHY device can be from different vendors. You therefore see stand-alone Remote PHY device vendors and new entrants in the CCAP space. If you look at the technology itself, there is Remote PHY and Remote MAC PHY etc. Even within Remote PHY, different vendors have different capabilities and excel in different areas (i.e better deployment to the MDU etc.). All of this leads to an increase in the number of vendors in the space, which adds complexity but also more flexibility for cable operators to select best-in-class vendor devices and to negotiate prices, which are strong drivers.

BBJ: What are some of the challenges that MSOs are asking the test community to help them solve?

DH: The test community is trying to help operators to reduce churn and lower OPEX costs. The traditional tools for sweep, ingress suppression and leakage detection are still required by operators. Remote PHY is like a combination of enterprise/business services (10Gb and even 100Gb fibre transport networks) with traditional HFC maintenance. Very often it involves laying fibre, because it is being done in conjunction with node splits and involves multiple work forces. The ability to coordinate and keep track of these work forces is something that MSOs are looking to build upon.

In view of this, we have been working on cloud-based software that essentially manages all our instruments and instrument data. This gives MSOs visibility of their own work forces and contractor groups. It is easy for them to run reports and to check progress and compliance with the Remote PHY systems build-out. Our StrataSync software is geared towards managing the workforces involved in R-PHY deployment.

We will be showing our XPERTrak software at the ANGA COM exhibition this June, designed to incorporate physical and virtual data sources (probes, modems, CMTSs and R-PHY units). We are adding a Remote PHY CCAP interface agent which enables communication between the person using the software/instrument and the Remote PHY. We have been very early to market with this.

BBJ: The industry worked hard to get ahead of the curve with R-PHY via early release of specs, interoperability events etc. Why are there still so many implementation challenges?

DH: I think this is just natural progression and evolution in the lifecycle. Standards at the last SCTE:ISBE Expo exhibition, for example, enabled interoperability and were all about the basics of providing data and video services. This is where the focus has been.

When you are in lab trials which involve MSO engineering groups, and you are moving technology from the labs to the field, that's when everyone sits back and says: "How are we going to do this?" As you go through and start moving into production, that is when the issues really start to come out. After all, this is a new deployment model moving into

the operational space. It won't happen overnight, it will be a gradual evolution. I would guess it will be five plus years to see this move into common operation.

BBJ: R-PHY is approaching rapidly while many are still early in DOCSIS 3.1 rollouts - we can already hear the footsteps of FDX approaching. What can an operator do to plan for and manage this level of continuous change in their operations?

DH: The answer is threefold: to recognise that the industry is in a high state of change (Remote PHY, DOCSIS 3.1, multiplexing etc.); to invest in future-proof, virtualised systems and modular instruments and to work with vendors who can communicate with other eco-system players/manufacturers. This is very different from working with vendors in a niche, stand-alone environment.

Operators need to put processes in place to ensure that the system can be correctly maintained after roll-out. It can take one to two years in a laboratory to develop a Remote PHY network and then perhaps a year afterwards to roll it out into the field.

BBJ: There have been some questions on whether test is still needed or whether it's need will be greatly reduced after migration to R-PHY. What are your thoughts on this?

DH: That's a good question. A lot of operators are looking at initial Remote PHY deployment as the final step to node plus zero, which inherently means less testing and no amplifiers. However, most operators still have amplifiers in their networks – it is very rare that an operator has only node plus zero.

If you step back from that, Remote PHY still has all the testing challenges of an existing deployment with one very notable exception; there is no testing on the analogue fibre. However, you still have to consider test around turning up the fibre in the first place - tests such as 10G and 100G Ethernet testing as well as network timing measurements of the IEEE 1588v2 PTP protocol.

With Remote PHY, a lot of people want to take the CCAP further back into the network and have it in the head-end or the data centre, rather than in the hub. That is the direction in which Remote PHY is going, which may require more timing tests.

Complete DAA-ready portfolio

BBJ: Where do you see the greatest challenges and opportunities?

DH: We are in the midst of an incredible amount of change. The real challenge here is to provide continuity for the MSO is the middle of all this change, but it is also a great opportunity. Being able to participate in all this means keeping up with standards bodies, as well as with the network manufacturers and the ecosystem overall. So, it is more complicated and requires diligence and greater levels of support than before.

The ultimate aim is to provide systems which make the transition seamless for operators and ensure that the technician's experience is consistent as he/she moves from centralised architecture to Remote PHY.

BBJ: Thank you for your time.

CONTACT

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