Optical networking innovations and platforms are helping operators across the world in addressing the growing demand for dynamic and high-capacity services, while keeping the cost per bit at the lowest possible level. These solutions lend operators the network capacity, efficiency and flexibility to support services that can be deployed and reconfigured on demand. In an interview with tele.net, Sam Bucci, senior vice-president and general manager, optical networking business unit, Nokia, talks about the role of optics in Nokia's growth strategy, and recent innovations and key trends in the optical networking space across the globe…

What are Nokia's key focus areas in the optical space?

Over the last decade, the optical space has experienced a bit of a transformation. It has been largely driven by the ever-increasing demand for bandwidth, especially with the evolution of 3G and 4G, residential broadband, cloud services, and the pervasiveness of video. At the same time, we have seen the emergence of webscale and hyperscale companies that have added a new and different dimension to optical networking.

Our investments are currently focused on a few key areas:

• Lowering the total cost of ownership: To this end, we continue to invest in new high capacity, high speed silicon designed to lower cost and power consumption. An example of this is our recently announced Photonic Service Engine (PSE)-3 chipset, which is an evolution over the first chip that supported 100 gigs back in 2010, and can support 1.2 TB of capacity on a single chip with the ultimate in flexibility around modulation.

• Flexibility of solutions: We have added switching at Layer 0/1/2 to give customers a choice in most efficiently delivering a bit end to end. We have pioneered the ability to send wavelengths from one point to another in any direction without contention, known as CDCF. This provides customers with the ability to direct big data flows at the most economical layer, namely layer 0, avoiding electrical switching as much as possible.

• Simplification and automation: Reducing the complexity of managing networks reduces the total cost of ownership. We are focusing on making networks less complicated in order to simplify initial deployment and ongoing operations. Therefore, software which simplifies is a big focus area for us.

• Increase the utilisation of optical network: Networks are not utilised 100 per cent of the time at 100 per cent capacity. To this end, we are pioneering network slicing and other concepts which we call virtual infrastructure that allow customers to increase network utilisation through both more efficient use for their internal networking needs, and the ability to publish available connection paths for utilisation by partners and new customers, creating new value.

Our customers on the enterprise side are increasingly looking at paying only for what they consume on a need basis as opposed to building their own networks. Although moving to cloud is essential, on-demand bandwidth requirement for storage networking is becoming increasingly important.

The industry has been talking about internet protocol (IP) and optics convergence. What has been the progress on this front?

We sort of pioneered that concept. Nokia is one of the few companies in the world uniquely positioned to offer IP and optical, as well as integrate the two, wherever required. For example, for network management, we have a product called Network Services Platform, which can manage both IP and optical. It makes a lot of sense to have integrated optics in metro areas for certain applications.

That said, the level of integration is being dictated by our customers. With time, there will be more integration as optics is miniaturised and switching becomes denser.

What kind of demand have you seen in the Indian market?

The Indian market is outpacing most global markets in terms of growth and demand for bandwidth is sky rocketing. This growth can be attributed to many factors, not the least of which

is the Digital India initiative and of course 4G. We are witnessing significant demand from operators to build very high capacity, high performance and reliable networks at the lowest possible cost.

We are also seeing greater uptake in the residential broadband space. It is important to keep investing and innovating in this space because technology evolution is not going to stop. The Indian industry is at the first stage of residential broadband and fiberisation. Soon, 5G will come and disrupt this space.

What opportunities are being presented by the Smart Cities Mission?

From an optical perspective, smart cities have some requirements. Thus, it is important to have solutions that can be customised. The industry needs to devise plug-and-use solutions that can be easily used by different service providers. We have been building such custom solutions for hyperscale companies; but for smart cities, the software has to be less complicated. Also, it is important to note that solutions for smart cities would have to be open and cannot be proprietary. Starting this year, all our solutions have become open and can be deployed at not just the optical layer but also the upper layers through open interfaces, and through software-defined networking control.

That said, the movement in the smart cities space has been slower than anticipated. Lots of initiatives have been announced but the pace of activity is a little slower than we had expected. It will pick up over the next few years.

What has been operators' response to open networking?

We have seen that there is willingness and enthusiasm about embracing open networking but most operators are approaching it cautiously as of now, for very good reason. This is mostly because they still have to maintain high performance and reliability, and continue offering services at low costs. Typically, when you introduce open networking, it may cost more in the short term and the cost benefits flow in only later.

We are believers of open networking. We are cautiously trying to bring out applications and infrastructure for our customers that will allow them to deploy new technologies without losing out what they have today.

What kind of opportunities is Nokia looking at in the 5G space?

Nokia is a leader in mobility networks, and naturally, our focus on delivering best in class 5G solutions is well known. In the network context, slicing is a key component in 5G deployment. Our customers can benefit from network slicing, which will allow them to use different parts of the network for different applications; ensuring 100 per cent use of the network all the time. For us, opportunity lies in enabling our customers to do that.

As a leading technology provider, what kind of challenges do you face globally?

The constant need to reduce the cost of our solutions is a challenge. It is pertinent to note that most of the low hanging fruits have already been taken.

Second, ensuring that our solutions are always relevant to our customers is a challenge. We want to partner with them and build solutions that fit into their businesses practically. Since our customers are located across the globe, we want to build solutions that can be quickly modified and customised for various geographies and customer situations.

The third challenge is automation and simplification of these solutions. We need different approaches as, going forward, it will not just be humans who will access the networks or technologies. In the future, systems are going to be a lot more automated.

What are the three technology trends that will shape the future of optics?

One key technology trend is 5G, the other two trends are digitalisation as well as virtualisation.

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