

--	--	--

SDN & IBN Assignment

CMIT 495: Current Trends and Projects in Computer Networks and Security

Professor Dodoo

By:

Michael Lambinicio

--	--	--

--	--	--

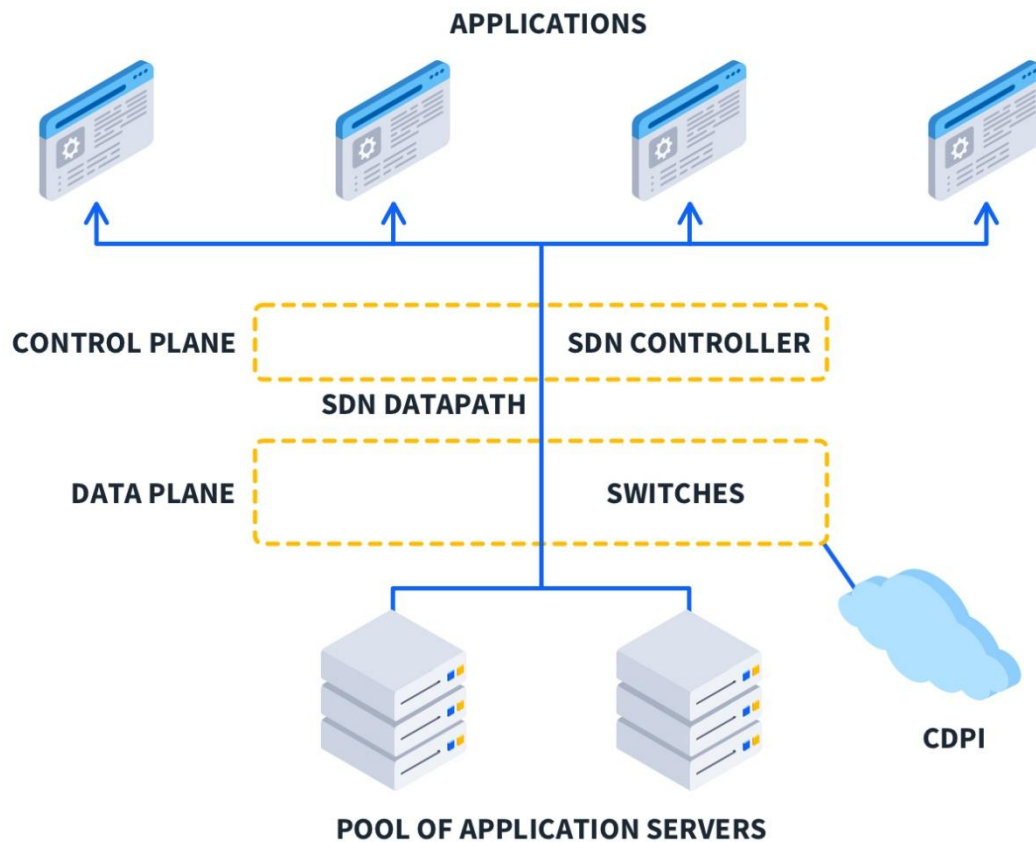
Long gone are the days when networking was fully manual based and IT professionals configuring everything and monitoring every single piece of software and hardware. Modern technology and networks today have adopted new ways to increase productivity without using so much manpower and wasted resources. We are going to dive into it below.

Software-defined Networking:

One of the modern networking infrastructures today is software-defined networking. To summarize, it is a way to build and manage networks using software, making them more flexible and easier to adapt to new requirements (Smoot, 2024). It is a layered process to how a network infrastructure using SDN would work. You would have your hardware devices such as your routers, switches and other devices that transfer the data through the network. You then have an SDN controller which acts like the “brain” for those devices, instructing them what to do. Then you have the application which is the foundation on which the controller is going to get its guidance from to send out to the hardware devices to execute. The ultimate goal of this structure is to have a centralized center of the network utilizing programmed applications to get processes in the network executed correctly. Below is an example of this:

--	--	--

--	--	--



(Smoot, 2024)

One of the key advantages of having a software defined networking structure is it helps organizations manage and safeguard their internet traffic for critical digital communications, especially for equipment installed in remote locations (Pleasant, 2023). To add, compared to the traditional network where all devices were managed individually, it would be impossible if you had over one thousand devices. Using an SDN would allow you to easily manage as it is centralized to reach all devices. This would also reduce any downtime if there was ever a disaster and you needed to reroute your network.

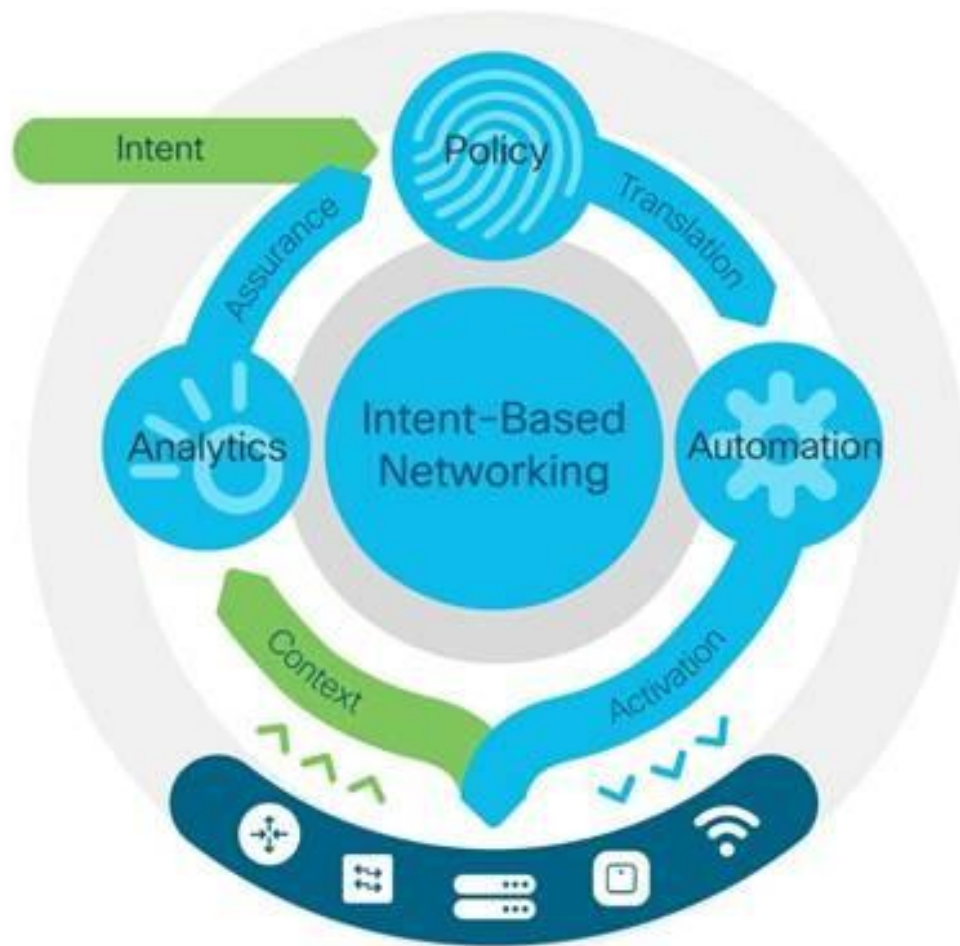
Intent-based Networking:

Now we are going to talk about Intent-based networking. To give a general idea, it uses machine learning algorithms to support the network administrator (Climer, 2018). The idea is that giving your network some

--	--	--

--	--	--

automation will increase productivity without losing any workflow and knowing that all tasks are intent.



Networks can be given instructions to execute policies through IBN. If it is intended to have a network adapt to any changes and automatically adjust as needed to keep the workflow going, then that is IBN. Unlike SDN, where you can control multiple devices over a network through single software, adding IBN can have automated execution of policies, redistributing manpower to more pressing priorities. It takes networking strategy to a higher level by combining automation with intelligence (Reshma, 2019).

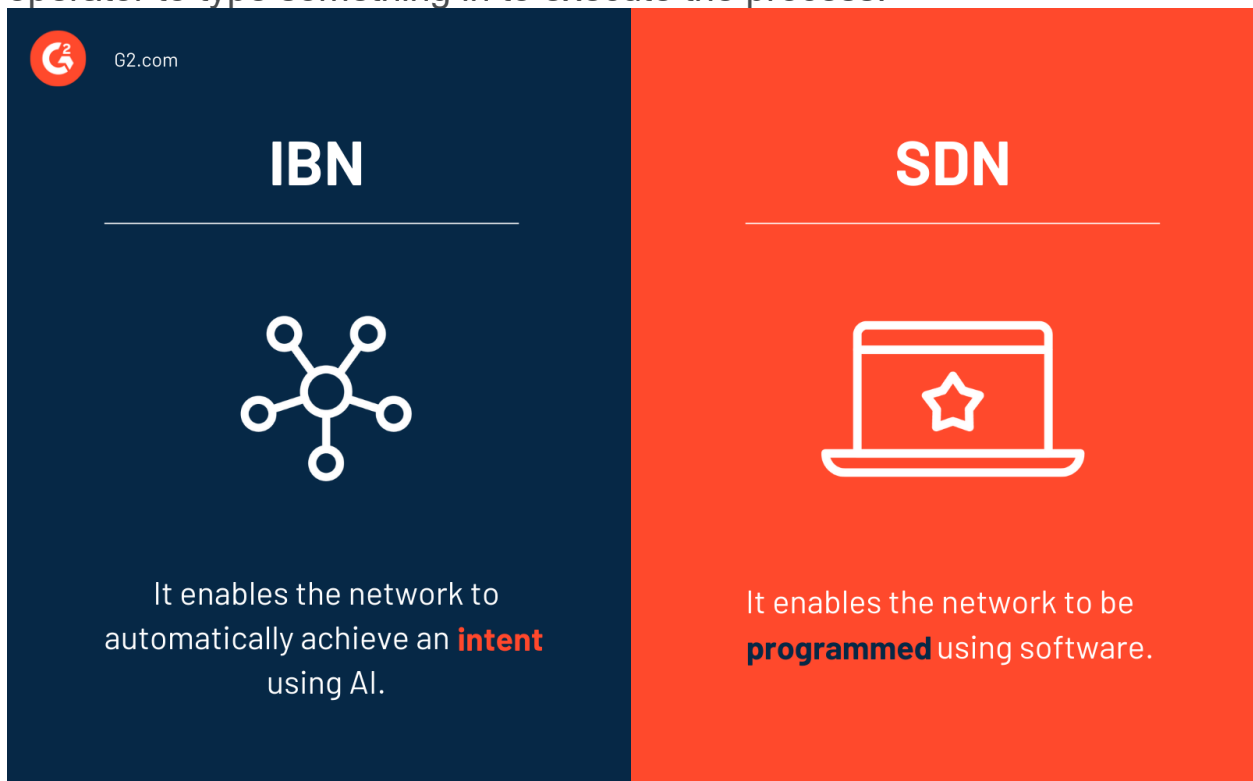
There has been a major shift in how organizations run their infrastructure when it comes to networks. It used to be having your own building that would house all your equipment so you can host your own servers to run an operation or advertise your business. Employees would

--	--	--

--	--	--

have to manually monitor them every day to ensure no vulnerabilities are open to any threats. Today, it has moved to providers managing the server and datacenter aspect of networks and simplifying it for the consumer to just pay for it and any other services they may need. For example, back-end infrastructures are the physical pieces in a physical location that a provider will set up and the consumer just has to “rent” out how much of it they need. Virtualization is utilizing those resources through software setup and images to set the consumer up with the resources needed to run their operation. This is how they would complement each other; one needs the other to run. They both provide a “service” to the customer with scalability in the end so it’s important to ensure these services are monitored and working efficiently every day.

Software-defined networking and Intent-based networking relate to each other because they are the brain/controller to the physical systems within a network. With SDN, you can instruct your devices on what to do. With IBN, it adds sophistication to the process by creating automation and adapting to any changes that happen, lessening the need for a human operator to type something in to execute the process.



(Rangan, 2021)

--	--	--

--	--	--

References;

- Smoot, C. (2024, April 9). *What is software-defined networking (SDN)?*. CBT Nuggets.
<https://www.cbtnuggets.com/blog/technology/networking/software-defined-networking>
- Pleasant, N. (2023, February 27). *Software defined networking (SDN): Why your organization needs it*. Digi International.
<https://www.digi.com/blog/post/software-defined-networking>
- Climer, S. (2018, September 14). *What is intent-based networking? the business-it bridge*. Mindsight. <https://gomindsight.com/insights/blog/intent-based-networking-cisco-dna-ar2018/>
- Reshma, P. M. (2019, November 21). *Everything you need to know about intent based networking (IBN)*. Thinkpalm Technologies.
<https://thinkpalm.com/blogs/know-about-intent-based-networking/>
- Rangan, K. (2021, August 25). *How intent-based networking helps Build Autonomous Networks*. <https://www.g2.com/articles/intent-based-networking>

--	--	--