EMERGING TECHNOLOGY OF NETWORK AND TELECOMMUNICATIONS MANAGEMENT

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Fall ISM4220C

Introduction

The world of technology advances quickly. As it does, the importance of managing networks and telecommunications also increases. The fields of network management and telecommunications management may seem alike in their goals. Network management is centered around maintaining the running of data systems while telecommunications management focuses more on the transmission of voice and data. In this essay we will delve into the variances between the realms of network and telecommunication management, talk about how IT departments are set up, discuss the mechanics of monitoring, and assess the effects of performance evaluations. Furthermore, we will explore the impact of technologies such, as cloud computing, in shaping the environment.

Different Kinds of Monitoring and Devices

In order to ensure that operations run smoothly, it is crucial to conduct monitoring activities by utilizing two differing approaches. These approaches are active and passive monitoring. Active monitoring entails assessing system performance by transmitting signals such as pings to identify any disturbances that may arise. In contrast to this approach is monitoring, which involves examining existing network traffic to identify issues based on real time data analysis.

The equipment that needs monitoring includes routers and firewalls which're components of any IT system along with servers and switches (Clemm et al., 2020). Monitoring tools like NetFlow and SNMP are utilized to monitor data flow and pinpoint any issues or bottlenecks to ensure smooth operation (Clemm et al., 2020). In case of an issue detection, IT teams lead to prompt action in order to prevent complications.

Network and Telecommunications Management

So, what are the main distinctions between network management and telecommunications management? The key difference lies in their areas of control and supervision; Network management primarily deals with data handling tasks such as maintaining the speed and stability of internet connections and overseeing data transfer between devices. On the hand, telecommunications management is centered around voice and internet communication activities, like managing phone calls, video conferences and other forms of voice data transmission (Pitt & Levine, 1996).

As technology advances and new innovations like generation (5G) networks and cloud-based services emerge, the traditional boundaries between network management and telecommunications are starting to fade away—resulting in an integrated approach to managing data and voice systems together within organizations (Cristofoli et al., 2019).

Organizational IT Structure in Telecommunications Integration

When considering how IT departments are or should be structured, many organizations' structures will widely vary. The integration of network and telecommunications management into one division is preferred by some companies as it can enhance efficiency with the advancements in VoIP and cloud services that simplify voice and data management together.

Many businesses continue to operate departments due to the skills needed for each one; managing networks requires proficiency, in routing and switching, whereas telecommunications

experts concentrate on phone systems and communication networks (Vithayathil, 2018). The advent of cloud computing complicates this setup further as more telecommunications functions are outsourced to cloud providers while internal IT teams handle the rest of the infrastructure.

In the study by Vithayathil (2018), it is highlighted that when organizations transition to using cloud based services they often reorganize their IT departments to prioritize the management of cloud resources over maintaining infrastructure. This shift involves a change in the roles of IT departments from server and hardware management to a combined focus on managing networks as well as coordinating external cloud services. For instance, in these setups IT teams may be responsible for overseeing cloud-based communication systems such as VoIP along with their network management duties. These systems are often hosted off site, by cloud service providers. This setup enables companies to streamline their operations and lower costs associated with on-site hardware, all while boosting flexibility and scalability using cloud services.

The change highlights the need for today's IT departments to manage both network and telecommunications effectively in the evolving centric landscape.

Technical Debt and Performance Measurements

Let's delve into the concept of technical debt. Technical debt is a situation that arises when organizations opt for fixes to address issues but end up facing long term consequences instead of lasting solutions. This is akin to using tape to patch a leak rather than fixing the

underlying pipe problem directly (Dahal, 2022). Over time the temporary measures prove ineffective. A small patch to an underlying big issue may result in larger challenges down the road by hampering system efficiency and complicating future enhancements.

That's why it's crucial to measure performance in IT settings! Metrics such as uptime and latency are monitored closely to gauge system performance and identify any issues. These issues could be error rates that may arise along the way. Both active and passive monitoring techniques are employed to gather this data accurately. Furthermore, Service Level Agreements (SLAs) are established to define performance standards, including downtime thresholds (Vithayathil, 2018; Clemm et al., 2020). By monitoring such key metrics organizations can prevent the accumulation of technical debt and maintain the efficient operation of their systems.

Adaptive Network Services and Evolving Technologies

With the rise of cutting-edge technologies, there comes the need for evolution in network management practices to keep pace with the changes at hand. The landscape of networking has been reshaped by advancements such as cloud computing, the Internet of Things (IoT) and 5G connectivity prompting a demand for network services that're agile and responsive. For instance, in the event of a data flood in network traffic, dynamic services have the ability to automatically redirect or boost capacity as needed.

Cloud computing has revolutionized the industry by allowing companies to scale their networks on demand without investing in hardware (Vithayathil, 2018). The emergence of 5G technology and its enhanced speed and capacity for connecting devices simultaneously is pushing IT departments to adapt and think outside the box to remain competitive (Clemm et al., 2020).

Conclusion

In summary, although network and telecommunication management may appear similar initially, they have differing purposes. Networks handle data, while telecommunications deal with voice and communication technologies. However, with the advancement of technology these domains are becoming more interconnected. IT departments need to determine whether to merge these functionalities or maintain their separation according to the organization's requirements. Monitoring systems, addressing debts and evaluating performance metrics are essential for ensuring operations. In the paced world of technology, advancements today and in the future to come it is crucial to implement strategies that guarantee our network and communication systems are ready to tackle upcoming challenges effectively.

FSCJ Peer-Reviewed References

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