IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 7, July 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 7, July 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0907015 |

Working of Intent Based Networking

[1]Arunima Jaiswal, [2]Dr. Mohan Aradhya,

[1]Student, Department of Master of Computer Applications, RV College of Engineering®, Bengaluru, India

[2]Assistant Professor, Department of Master of Computer Applications, RV College of Engineering®, Bengaluru, India

ABSTRACT: Intent-Based Networking (IBN) is a new technology idea that promises to bring a higher level of intelligence and understanding into intended state to networking. These insights should, in theory, replace the manual processes of creating networks and responding to network problems. Simply put, administrators can submit a request to the network specifying the desired consequence (their intent)instead of having to manually code and execute individual activities The goal is to employ machine learning and cognitive computing to automate networking and reduce the amount of time spent on manual configuration and management. They sell software that translates user intent into network configuration. The purpose of this paper is to explain why IBN exists, what it is, and how it can be used, as well as the technology's technical implications, advantages and weaknesses, future prospects, implementation suggestions, and sociological considerations related to its acceptability.

KEYWORDS: Software Define network,Manual Task, Automated Testing.

I.INTRODUCTION

Intent-based systems work at a higher level in the application to provide genuine automation, and they are a novel networking capability. While the goals of intent-based networking are similar to those of software-defined networking, it focuses less on virtualization and more on designing, implementing, and improving a network's agility and availability of the network. Translation and validation, automated implementation, awareness of network state, assurance, and dynamic optimization/remediation are the four fundamental characteristics that characterise IBN. These four critical features enable IBNs to collect input from end users, construct a network design based on the end user's intent, evaluate the design for accuracy, and deploy the appropriate networkparameters, and then check to see if the system's objective is being accomplished on a regular basis, making modifications as needed.

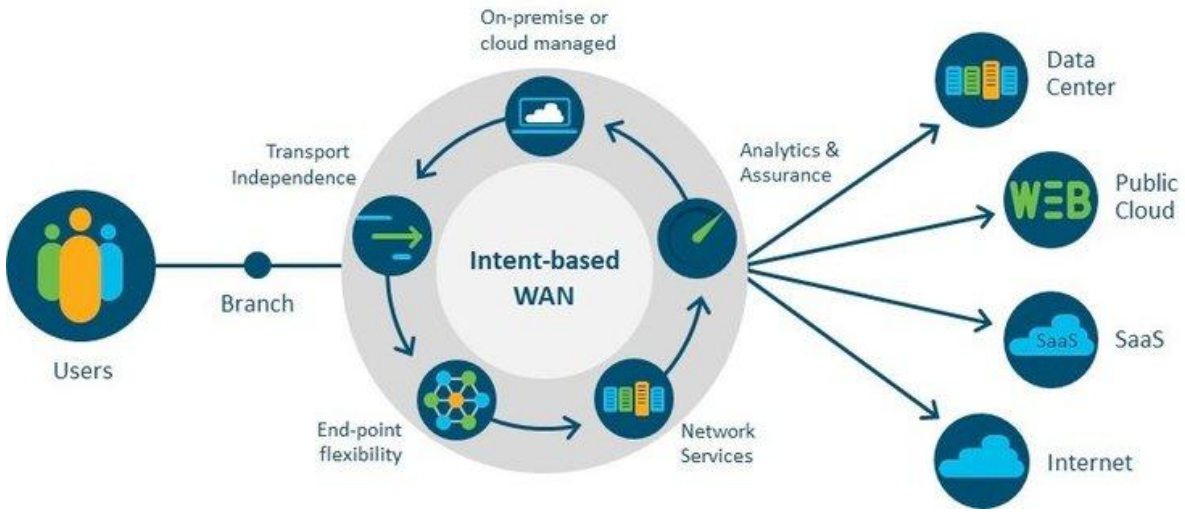

Fig 1. Architectural Diagram

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 7, July 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0907015 |

The automation of delivering business intent over a network via policies is known as intent-based technology. It's a never-ending loop of three main tasks: translating intent, automating intent configuration across physical and virtual networking devices, and monitoring. Using a graphical interface, network architects define the intent in clear language.The software manages the IBN cycle for the network administrator in order to ensure that the application does not go down in production. The size of the regression test suite in distributed agile teams often grows over time.The focus should be on risk-based testing for automated regression testing in high-risk areas. That purpose necessitates the use of automated testing. If there is a human, time-consuming phase in the distribution process, there is no possibility to automate delivery to users.Considerations for Networking Architecture Before incorporating IBN into the network architecture, analyse each networking project to see if intent-based networking may be added to it. SDN is vital to IBN since it eliminates the need to invest in new technology because IBN can be integrated into current SDN infrastructure.Security should be included into the network design, but it must also include the IBN components. Check to see if the security mechanism in place will keep the IBN component safe. Examine the network architecture's application programming interfaces (APIs) to see if they'll work with IBN.

II.LITERATURE SURVEY

Commands are translated into actions through an intent-based network. A network administrator is not required to setup a network to meet a new policy or business requirement. The network does the thinking, confirming that a configuration will work, recommending options to the administrator, and then modifying the configuration to match the desired configuration. In addition, the intent-based network can provision and repair**.**without the need for human involvement Performance issues are recognised quickly because intent-based networks constantly monitor themselves. The intent-based network also addresses these difficulties, employing machine learning to identify and apply the appropriate solutionAnother benefit of a network that is always monitoring and addressing errors is that it adheres to any policies established by the network administrator.

When network managers have a greater understanding of how their networks are working, they may make smarter decisions that lead to better business results. An intent-based network is continually collecting data about itself, which can be analysed in a variety of ways to provide useful information about network performance, security concerns, and other topics. The most important distinction between an intent-based and a non-intent-based strategy isThe difference between an intent-based network and a software-defined network is that an intent-based network converts high-level business goals into the best network configurations to serve those goals right away. A network administrator may quickly analyse and select among vetted configuration alternatives, saving hours of planning, testing, and manual configuration. Obtaining corporate objectives in a shorter period of time.

This platform develops the network configuration policy for the selected platform on its own. By smoothly applying the user's intention on the physical layer, the suggested solution avoids human mistake. IBN's industrial point of view It identifies various use cases in the context of industrial networks that could benefit from IBN in particular. Following that, we propose anDescribe the architecture of IBN and how it may be used to implement various use cases. It also includes a case study on the usage of intentions in conjunction with a commonly used framework. Although there are still certain obstacles to overcome along the route to IBN, when solved, IBN can reduce an organization's costs while also boosting its efficiency and reliability. Software-defined networking (SDN) and network-as-a-service (NAAS)The visualisation of network functions improves network flexibility and management agility, increasing network fragility and complexity. However, because the great majority of network parameters are set manually, configuration problems are unavoidable. Self-configuring, self-managing, and self-optimizing networks should be the norm in the future.The intent-driven network (IDN) is a self-driving network that automates application intents by detaching network control logic and closed-loop orchestration techniques. At this time, there is no single definition of IDN, and the research background and current state of IDN are unclear. In this article, we examine existing IDN applications and research in light of emerging applications and research.For IDN, clarify definitions and summarise features. We go over the IDN's basic architecture and essential technologies in detail.

This platform sets the policy for the network's configuration autonomously for the specified platform after receiving the user's input specification. By smoothly applying the user's intention on the physical layer, the suggested solution avoids human mistake. The Intent Management System also reduces the need for professional-level competence when it comes to network service provisioning.An Intent Management System for Network Service is presented in this research paper. The suggested method allows users to operate a network infrastructure by simply declaring their intents in the

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 7, July 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0907015 |

form of network architectural type and QoS value for each network slice. This platform sets the policy for the network's configuration authorization after receiving the user's input specificationindependently for the chosen platform.

III.TECHNOLOGICAL DEVELOPMENT

The Automated Regression Test is a type of testing that allows us to automate the majority of our testing efforts. On a fresh build, we run all of the previously conducted test cases. This indicates that we have a collection of test cases accessible, and that manually running these test cases is time-consuming. Because we know what to expect, automating these test cases saves time and is an effective regression test strategy.The amount of automation required is determined by the number of test cases that will continue to be applicable throughout time. If test cases change over time, the scope of the application expands, then automation of regression procedures becomes a waste of time. When there is a need to alter the code and we need to test it, we need to use regression testing.to see if the updated code has any effect on the rest of the software application Regression testing is also required when a new feature is added to a software application, as well as for bug and performance issues. Enhancements, error fixes, optimization, and deletion of existing functionalities are all part of software maintenance.

Challenges and issues are -:

Complex design - IBN system has a complex architecture due to the fact that it is a combination of multiple operating systems, environments, and network components.

Validation and Verification –To perform properly, the IBN system requires extensive verification and validation.

Success Rate –Because APIs control network access, IBN System's success rate is reliant on them.

Tools used are -:

IBN is made up of several components, each of which has its own set of advantages:

Management Dashboard -: To configure the system (state the intent) and monitor its operation, use the management dashboard. Despite the fact that IBN's goal is to administer the network without human interaction, human intervention will be required (and desirable) for some time.

Intent Translation-: The "what" is translated into the "how" by Intent Translation. Typical user interfaces are menus driven graphical more sophicaticated natural Languages.

Network Verification-: it verifies that the translated configuration will fulfil the intended objective without compromising security or dependability. This component use formal verification tools to rigorously evaluate and establish the configuration's correctness.

Remediation-: In real time, remediation reacts to changes (e.g. if a link fails, or a device goes offline). It uses Machine Learning (ML) to learn from historical incidents and network best practises, allowing it to perform corrective actions to a wide range of network issues. Although significant progress has been made, experts think that humans will continue to play a role in IBN development for some time.A remediation engine's suggested corrective activities will still need to be approved by humans.

Working-:

IBN is an automated technology that assists network engineers in the planning, design, and operation of networks in order to increase agility and availability. It enables the administrator to go from configuring their intended outcomes in arcane device-specific command lines to expressing their intent using natural language or a graphical interface.

They may, for example, want to block members of the engineering department from accessing sales data, or they may want to ensure that two distinct channels between servers are constantly available. IBN has become a feasible option

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 7, July 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0907015 |

for answering the question, "Is my network configured correctly?" because to recent improvements in formal verification techniques and modelling languages such as YANG.The continuous cycle of verification and remediation, which constantly ensures that the configuration fulfils the intent and makes real-time corrections, is the key to IBN.

IV.APPLICATIONS OF THE CONCEPT

Performance testing -: IBN systems can assist with application performance testing.

Security -:It can deliver excellent security to the application with the help of AI and machine learning techniques.

Web traffic filtering assistance - IBN systems also give a firewall to the web application, which can aid with Internet traffic while also improving security.

V.CONCLUSION

We reviewed the overall concept, the future, benefit implementation techniques, and the problems involved in this session. In recent improvements in intent-based networking, network management and orchestration have received a lot of attention. We begin with a thorough examination of existing frameworks and platforms before focusing on the most recent efforts in the field.domain of standardisation Finally, we talk about the problems and next steps in developing an intent-based networking system for telecommunication networks. Despite the fact that the notion of intent-based networking has been present for decades, no major modifications have been detected in recent years, according to our research. On the other hand, in addition to the emergentAI technologies used in the NLP and NLU sectors are expected to lead to significant advances in intent-based breakthroughs in networking and telecommunication. Market dynamics, customer habits, employee expectations, technological breakthroughs, and other factors are all changing at unprecedented rates in today's organisations.threats to security As technology supports new digital transformation projects and more corporate operations, business goals and modern networks are becoming increasingly intertwined. In terms of scalability, operational effectiveness, and security, IT experts must bridge the gap between what your business requires and what your network can provide. IBN assists in meeting those requirements.

REFERENCES

[1] Mojtaba Shahin; Muhammad Ali Babar; Liming Zhu, Continuous Integration, Delivery and Deployment: A Systematic Review on Approaches, Tools, Challenges and Practices, IEEE Access (Volume: 5), 2017

[2] S.A.I.B.S. Arachchi; Indika Perera, Continuous Integration and Continuous Delivery Pipeline Automation for Agile Software Project Management, IEEE Moratuwa Engineering Research Conference (MERCon), 2018

[3] Thorsten Rangnau; Remco v. Buijtenen; Frank Fransen; Fatih Turkmen, Continuous Security Testing: A Case Study on Integrating Dynamic Security Testing Tools in CI/CD Pipelines,IEEE 24th International Enterprise Distributed Object Computing Conference (EDOC), 2020

[4] Carmine Vassallo; Fiorella Zampetti; Daniele Romano, Continuous Delivery Practices in a Large Financial Organization, IEEE International Conference on Software Maintenance and Evolution (ICSME), 2016

[5] K. Sree Poornalinga; Dr. P. Rajkumar, Continuous Integration, Deployment and Delivery Automation in AWS Cloud Infrastructure, International Research Journal of Engineering and Technology (IRJET), Volume: 03 Issue: 05 | May-2016

[6] Sergejs Bobrovskis; Aleksejs Jurenoks, A Survey of Continuous Integration, Continuous Delivery and Continuous Deployment, Institute of Applied Computer Systems, Riga Technical University, Latvia

[7] Yasmine SKA; Janani P has mentioned in this paperA Study and Analysis of Continuous Delivery, Continuous Integration in Software Development Environment, JETIR, Volume 6, Issue 9, September 2019

[8] Jarosław Berłowskia, Patryk Chruściela, Marcin Kasprzyka, Iwona Konanieca, Marian Jureczkob, Highly Automated Agile Testing Process, **e-Informatica Software Engineering Journal** (**EISEJ**), Volume 10, Issue 1, 2016

[9] Pratibha Singh, Puja Patel, Impact of agile testing over traditional testing, Jaipur International Journal of Converging Technology and Management (IJCTM) Volume 1, issue 2, 2015

INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

Scan to save the contact details