iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** V **Month of publication:** May 2023

DOI: https://doi.org/10.22214/ijraset.2023.53506

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue V May 2023- Available at www.ijraset.com

Backup for MS Teams using Graph API

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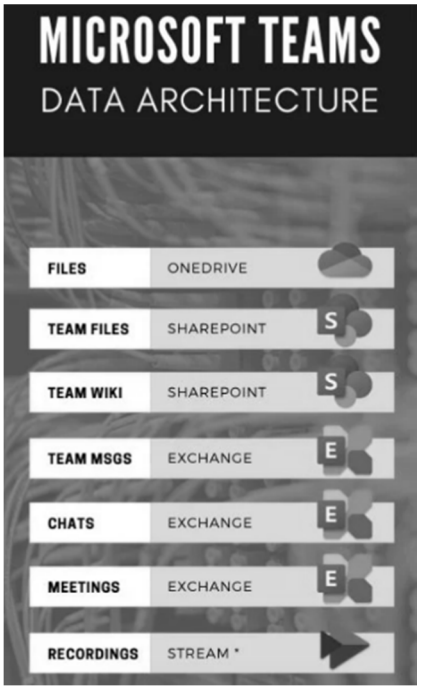
Abstract: ***The use of Microsoft Teams has significantly increased. It is a setting with lots of info. The data of the team can manage everything, including chat messages, photos, recordings in files, voicemails, and contacts. Like any other programme, Teams data needs to be regularly backed up to provide security and guard against data loss.***
The fact that Team's data is dispersed broadly across the Microsoft 365 cloud makes backup for Team challenging as well. Teams keeps track of calendar information, discussion history, and chat data in Exchange. It keeps channel files and wikis in SharePoint and chat files in OneDrive. This implies that backing up Exchange, SharePoint, and OneDrive all at once is the only method to backup all of your Teams data. There are typically other steps that you must perform in order to get the restored data back into MS Team.
We studied and collected information from various research papers, blogs and sites about how this data is stored and can be retrieved for backup and storage. We also studied about Graph APIs provided by Microsoft to work on this vast amount of data collection. You can access Microsoft Cloud with the RESTful Microsoft Graph API. resources as well as rich, people centric data.



I. INTRODUCTION

Usage of Microsoft Teams and collaboration on Teams components is rapidly growing. We store more and more data inside Microsoft Teams. How to backup data in Teams?
Millions of people are using Microsoft Teams on daily basis and storing a massive volume of data in Teams. You can imagine that sooner or later Teams in your organization or institution will store sensitive data that require some kind of backup solution.
The complex data architecture of Microsoft Teams does not make the backup process any easier. If a business need arises to implement a Microsoft Teams backup solution, one need to prepare themselves to:

1) Understand quite a complex way of storing data in Microsoft Teams.
2) Review available out-of-the-box options to secure data, including retention policies.
3) Analyse third party backup tools that could deliver backup option for Microsoft Teams.

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Due to the fact that Microsoft Teams' data is dispersed broadly across the Microsoft 365 cloud, various data sources are included in its data architecture, making MS Teams backup challenging.

You need to understand where Microsoft Teams stores data to decide which components need to backup. When thinking about "Where's my data" you have multiple resources where your data will land including SharePoint, OneDrive and Exchange.

A. Microsoft Teams Data Backup

Microsoft 365 by design offers some options to restore deleted data for most of the Office 365 applications, but the time to restore data is limited without the possibility to extend it. In case a business requires backup providing solution with a longer time to restore the data, it will need to use compliance retention policies or purchase a professional backup solution for Microsoft Teams.

Data deleted in MS Teams will be retained for some time before it is permanently removed. After permanent deletion of data, it is not possible to restore without additional backup or copy of data. Retention of data just delays the point of permanent removal of data.

Data retention based on recycling bin functionality is offered by OneDrive for business and SharePoint Online. You can retrieve deleted data up to 90 days (30+60) after deletion using the two levels of the recycle bin. Data is permanently erased after this period. In accordance with the service request, you filed to the Microsoft Service Team, you have an additional 14 days to restore deleted files. Exchange, on the other hand, provides 14 days of data retention time limit. This time limit for Exchange data retention can be extended by organizations for up to 30 days. Hence, data retention feature in Microsoft Teams is very useful but is limited when compared with a "real backup solution".

Backup plans guarantee that your data can be restored quickly and efficiently. Also, the backup systems allow to retain and secure files/data for longer periods of time which is critical for organizations. One such way of implementing a backup solution is by using Graph API which is provided by Microsoft, this Data from all Microsoft cloud services is unified under a single endpoint called Microsoft Graph API. under one single point.

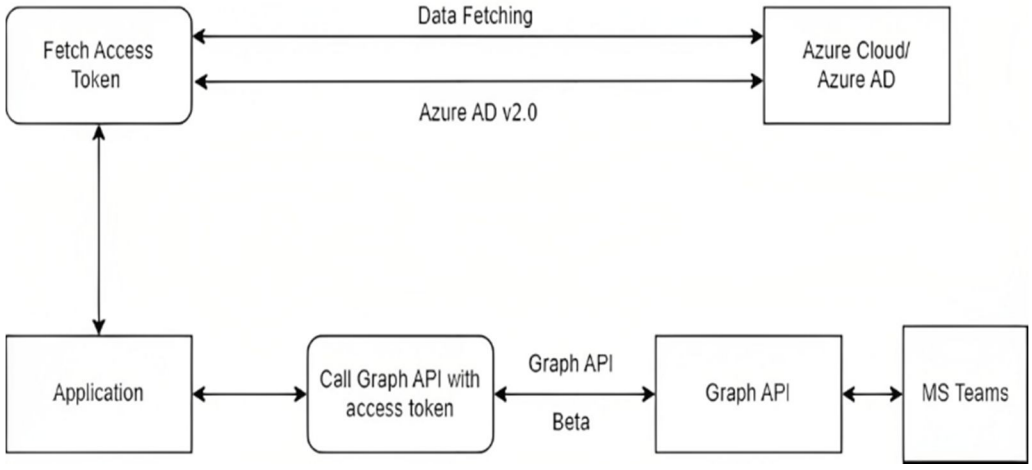

Fig: System Architecture

Azure is a cloud computing platform and web portal that enables you to access and manage Microsoft's cloud services and resources. Azure also includes Azure Active Directory. Depending on your needs, these services and resources may store and alter your data. All you need is an active internet connection and the ability to logon to the Azure portal in order to access these resources and services

You may access Microsoft Cloud service resources via the Microsoft Graph API, which is a RESTful web API. You can send requests to the Microsoft Graph API once your app has been registered and you have obtained authentication tokens for a user or service.

REST APIs and client libraries are made available by Microsoft Graph to access data on the following Microsoft cloud services:

Delve, Excel, Microsoft Bookings, Microsoft Teams, OneDrive, OneNote, Outlook/Exchange, Planner, and SharePoint are all Microsoft 365 services. Enterprise Mobility and Security services are: Services for Windows 10's Advanced Threat Analytics, Advanced Threat Protection, Azure Active Directory, Identity Manager, and Intune devices, activities, and notifications

365 Business Central for Dynamics.

Versions

The Microsoft Graph API is presently available in the following versions:

Beta variation the https://graph.microsoft.com/beta endpoint provides access to APIs that are presently in the beta version. Consult the Microsoft Graph beta endpoint reference to begin utilising the experimental APIs.

Version 1.0 The APIs in the v1.0 version are usually accessible and prepared for usage in production. The endpoint for the v1.0 version is https://graph.microsoft.com/v1.0. Consult the Microsoft Graph REST API v1.0 reference to begin utilising the v1.0 APIs.

Microsoft Teams is the best messaging software for businesses. It offers a space for real-time meetings, collaboration, file and app sharing, and even the occasional emoji. Everything is centralised, visible, and open to everybody.

II. RELATED WORK

Backup and recovery refers to the act of creating and keeping copies of data that can be used to safeguard businesses against data loss due to a natural disaster, a human error, or a system failure. [1] As the era of big data applications comes to an end, data backups and storage are becoming more and more crucial. The authors of this work investigate several backup and recovery methods, such as data backup and recovery, system backup and recovery, application backup and recovery, mirror backup functionality, etc. According to claims, the mirror backup option is the most effective. [1]. The mirror backup system makes advantage of a dual system hot backup to provide high availability. The backup center's mirror server can immediately take over and provide services in the event of a failure.

Their [1] study focuses on a two-stage backup architecture for data storage that includes an offline tape backup in addition to a network storage backup as the primary backup. All business process management data is transferred to the primary backup server of the backup centre, and some infrequently used or secure communications data is copied to tapes for longer storage on the backup server.

In [2], the authors look into and offer information on a user-friendly data sharing method that utilises Microsoft OneDrive. In this article, the authors describe HTCondor, a high-throughput distributed computing manager that will handle users' requests for credential acquisition and renewal. Additionally, the credentials provided with jobs have a limited lifespan, adding yet another level of defence against unreliable resources. Furthermore, the writer gives information about how to access OneDrive data from Azure cloud, stating the workflow of HTCondor, OAuth and Microsoft Graph APIs.

The author also describes how to use the HTCondor, OAuth, and Microsoft Graph APIs to access OneDrive data from the Azure cloud.

We may better comprehend the issue with Microsoft Teams' data storage at several places and the challenges associated with backing up data from various sources by referring to [11]. The comprehensive procedure of Microsoft's already existing data retention function, which allows users to store their data in SharePoint, Exchange, and OneDrive, is also described by (Szyman Bochniak) [11].

The limits and lack of available backup options for Teams backup are discussed by (Alan Mann) in [12]. Additionally, he talks about the different types of data that Microsoft Teams contains and the best native and third-party Teams backup options. MS Teams data include Messages, shared files, Web pages, OneNote, Group mailbox messages, calendars, etc. Third party tools discussed here are Afi, AvePoint, Veeam, SkyKick, etc. Among these AvePoint, Veeam and SkyKick are the most complete tools.

Microsoft has comprehensive documentation on the Microsoft Graph API in [13]. Endpoint names, URLs, and methods for calling APIs are all included in this. For calling APIs and testing them, utilise Microsoft Graph Explorer.

By leveraging Facebook's Graph API, the author of this page [3] demonstrates numerous methods for importing JSON data. The Facebook Graph API uses an OAuth token to authenticate and authorise data access, similar to the Microsoft Graph API. The user then demonstrates three different ways of obtaining data from the Facebook Graph API. Framework of REST APIs is the topic of a survey article by the authors of [4]. This paper consists information about RESTFUL APIs key elements such as resources, verbs for requests, headers for requests, bodies for requests and responses, and status codes etc. Further the writer gives an overview of HMAC (Hash-based Message Authorization Code) type of authorization and detailed description of OAuth(2.0) and its working.

The goal of this thesis [5] was to leverage the Microsoft Graph API interface to develop a user authentication system for their online application ("OPENTUNTI"). For their implementation, the authors of this work make use of the Microsoft web API and the OAuth 2.0 authorisation mechanism. Additionally, they offer code samples and a thorough explanation of the procedure for creating authorization codes, as well as refresh and access tokens needed to access user data via Microsoft Graph APIs. The end result was a working authentication system that simplified, made safer, and made the authentication procedure (i.e., generating access token) easier for the user.

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III. IMPLEMENTATION PROCEDURE

Firstly, Admin needs to login to the application using correct credentials. The login credentials are verified on Azure AD. Then after Admin can view the accounts using view accounts option. Further Admin can choose the account for Data backup or recovery. Admin can select the Data that has to be Back up or recover. In this application Microsoft Cloud plays the role of authorization, data fetching, Backup and Recovering the data.

A. Procedure

1) The Admin of the particular organization needs to register on the application in order to access the data.
2) The admin is verified and then given access the access token to fetch the data from the Microsoft cloud.
3) The admin is provided with the Tenant ID, Channel ID and the Client ID.
4) With the provided Data the admin can view all the groups, channels and users in the organization.
5) The admin can then choose to download the data of the users or groups that contains the description of the particular group or user and the details that include User ID along with the corresponding Group ID and Channel ID.
6) The admin can also download the data of the meetings conducted by the organization which provides the duration and other details.
7) The admin can view and download all the chats within the groups and user-to-user.
8) The data is downloaded on the local device, it is downloaded in the JSON format which can be we formatted to view details.

B. Module Description

The system contains following modules:

1) *Admin:* Among the available Teams admin positions are those for Teams administrator, Teams communications administrator, Teams communications support specialist, Teams communications support engineer, and Teams device administrator. To learn what each job is capable of doing and which PowerShell and Microsoft Teams admin tools the admin may utilise, look at the following table. Using Azure Active Directory (Azure AD), you can choose administrators who need different degrees of access to manage Microsoft Teams. Administrators can oversee all of Teams' tasks or be given specific permissions for managing your company's telephone requirements or troubleshooting call quality issues.
2) *Graph API:* A single request can interact with numerous nodes using the Graph API, which models data in terms of nodes and edges. You can access Microsoft Cloud service resources via the Microsoft Graph RESTful web API. You can send requests to the Microsoft Graph API once your app has been registered and you have obtained authentication tokens for a user or service. For MS Teams data backup, we use the Graph API. The main method of bringing data into and out of a platform is through the Graph API. The Graph API is an HTTP-based API that models the data in terms of nodes and edges and enables the client to communicate with several nodes at once. You can access Microsoft Cloud service resources via the Microsoft Graph RESTful web API. You can send requests to the Microsoft Graph API once your app has been registered and you have obtained authentication tokens for a user or service. The main method of bringing data into and out of a platform is through the use of Graph API for MS Teams data backup. Apps can utilise this HTTP-based API to programmatically query data. programmatically query data using applications.

IV. RESULT

(Landing Page)

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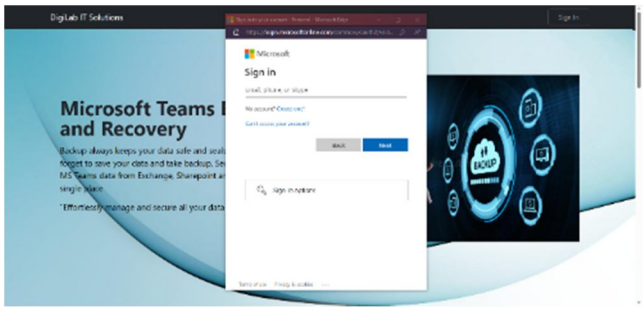
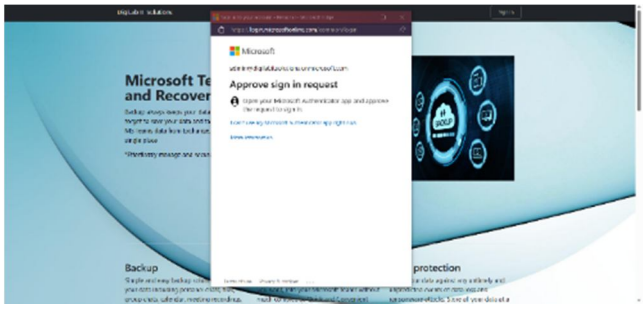
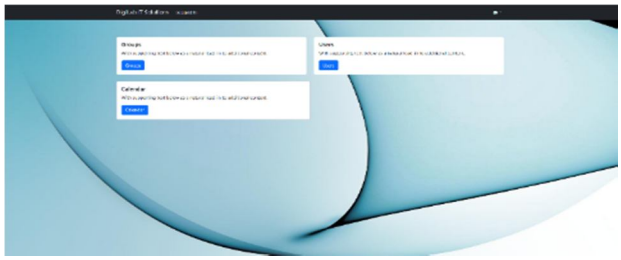


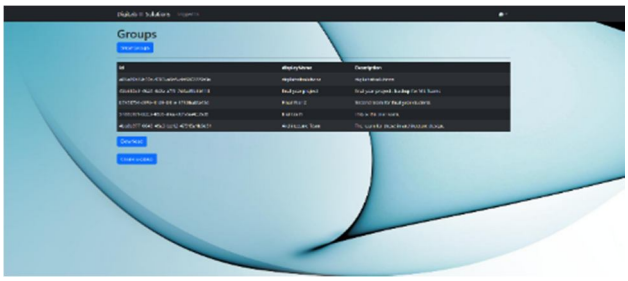
(Login)



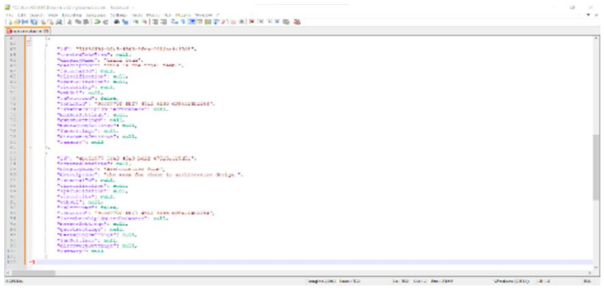
(Authenticate)



(Logged In)



(Groups Data)



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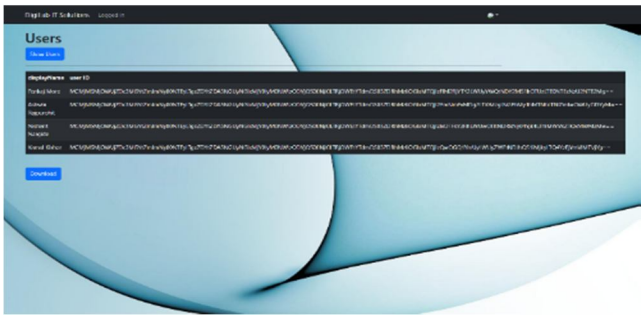
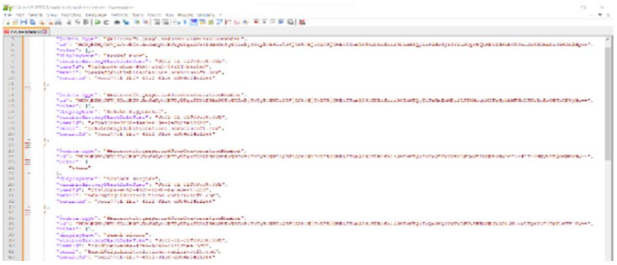


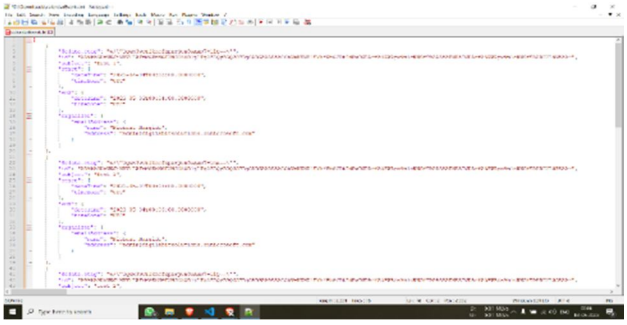
(Users Data)



(User Data Downloaded)

(Scheduled Meetings)

(Create Meeting)



(Calendar Evens/ Meetings Data Downloaded)

V. CONCLUSION

Thus, in this project, we have concluded that being famous communication and data sharing platform MS Teams need to introduce the options for backup and recovery of data at one place. In our project (Backup of MS Teams data using Microsoft Graph API) we tried to overcome the problem of MS Teams storing separate data like chats, files, meeting recordings, calendar, etc at separate places like SharePoint, OneDrive and Exchange by creating an application which allows to store and recover user data at a single place. We use Microsoft Graph API to access MS Teams data for backup and recovery.

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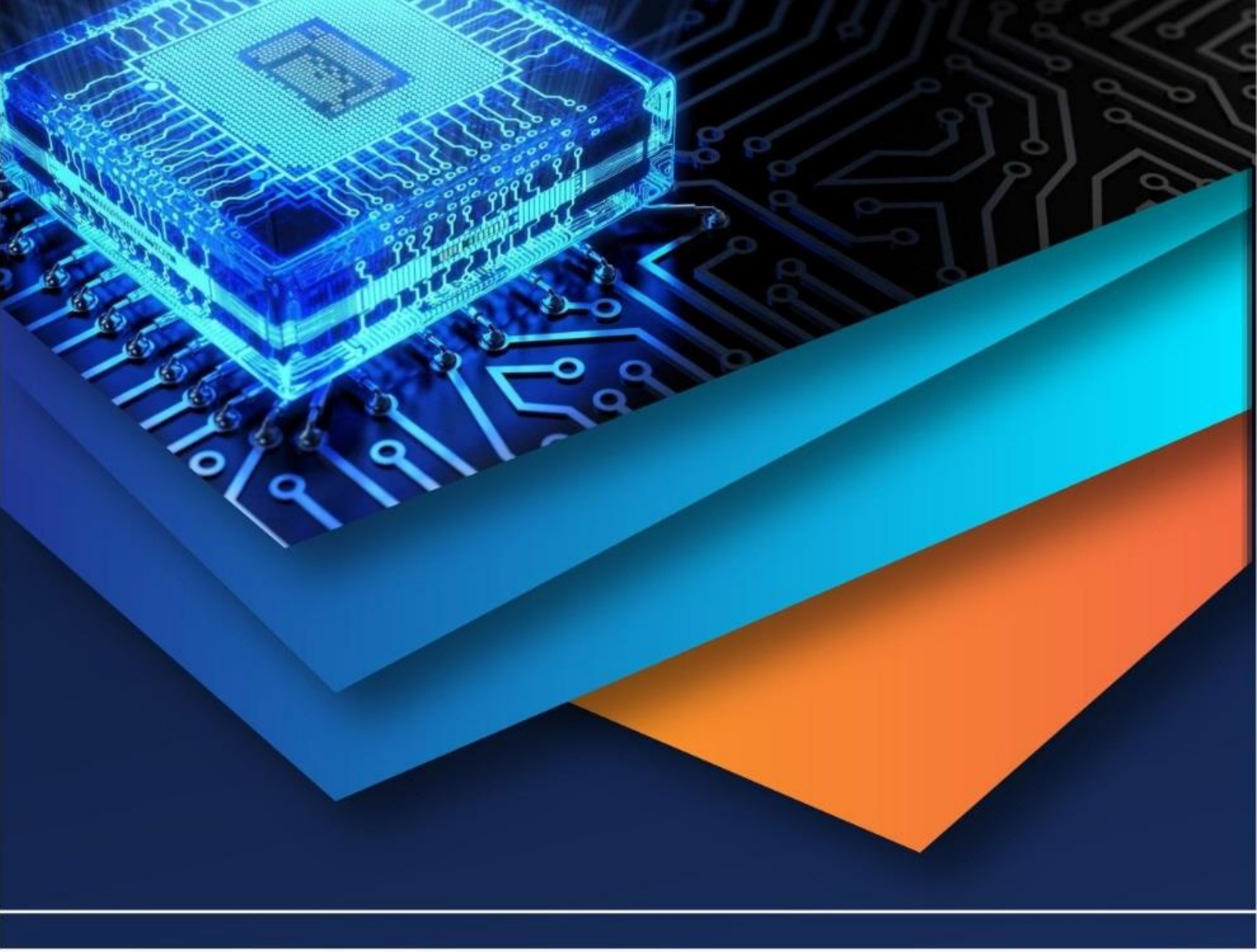

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