

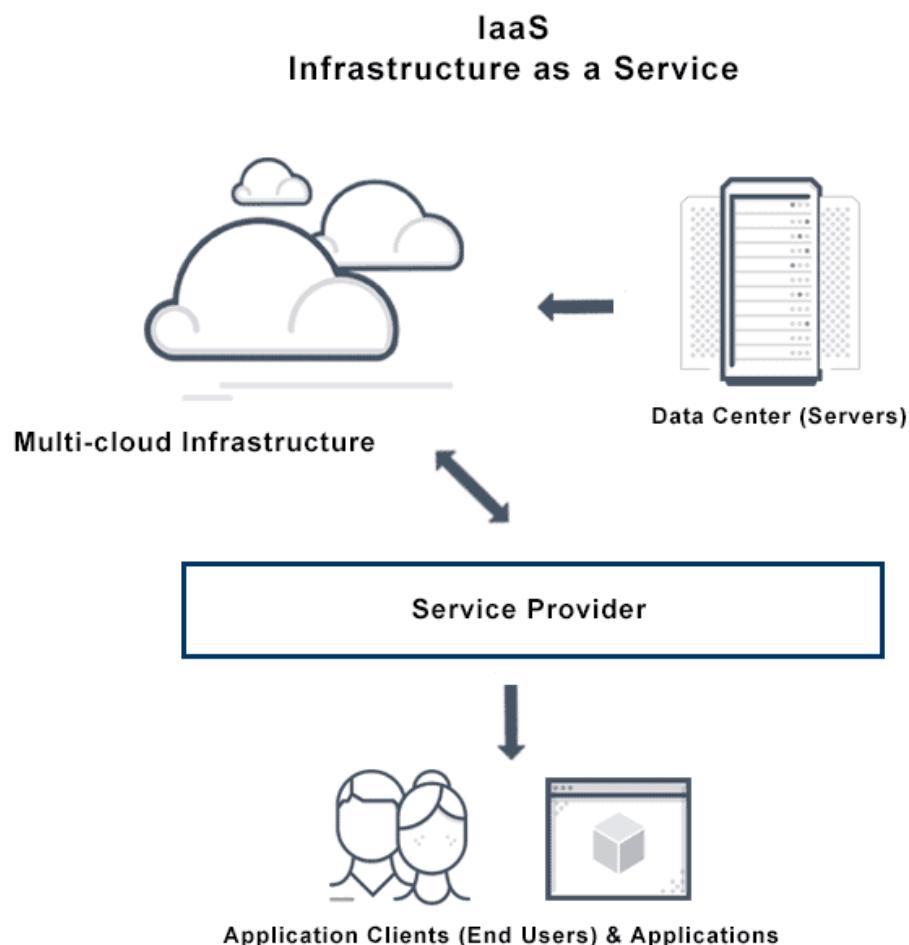
Practical 1

Aim: Study and implementation of Infrastructure as a Service.

Introduction of IAAS

IAAS stands for Infrastructure as a Service, which is a cloud computing model that provides virtualized computing resources over the internet. With IAAS, businesses can rent IT infrastructure, including servers, storage, and networking, as a service rather than purchasing and maintaining physical hardware. This allows organizations to scale their infrastructure up or down based on their needs, pay only for the resources they use, and avoid the costs and complexities associated with managing physical hardware. IAAS providers handle the infrastructure maintenance, while users have control over the operating systems, applications, and development frameworks running on the infrastructure.

Infrastructure as a Service (IaaS) is a cloud computing service where enterprises rent or lease servers for compute and storage in the cloud. Users can run any operating system or applications on the rented servers without the maintenance and operating costs of those servers. Other advantages of Infrastructure as a Service include giving customers access to servers in geographic locations close to their end users. IaaS automatically scales, both up and down, depending on demand and provides guaranteed service-level agreement (SLA) both in terms of uptime and performance. It eliminates the need to manually provision and manage physical servers in data centres.



Features of IAAS

Infrastructure as a Service (IaaS) offers a range of features that allow users to access and manage computing resources in the cloud. Here are some key features of IaaS in detail:

1. **On-Demand Resource Provisioning:** With IaaS, users can request and provision computing resources such as virtual machines, storage, and networking on-demand. This means that resources can be quickly scaled up or down based on the user's needs, providing flexibility and cost-efficiency.
2. **Virtualization:** IaaS providers use virtualization technology to create virtual instances of servers, storage, and networking resources. This allows users to run multiple virtual machines on a single physical server, maximizing resource utilization and reducing hardware costs.
3. **Scalability:** IaaS offers the ability to scale resources up or down based on demand. Users can easily add or remove virtual machines, storage capacity, or network bandwidth to accommodate changing workload requirements. This scalability ensures that users have the necessary resources available when needed, without overprovisioning or underutilizing resources.
4. **Self-Service Management:** IaaS platforms typically provide a self-service portal or API that allows users to manage and control their resources. Users can provision, configure, and monitor virtual machines, storage, and networking resources without the need for manual intervention from the service provider.
5. **Pay-as-You-Go Pricing:** IaaS follows a pay-as-you-go pricing model, where users only pay for the resources they consume. This eliminates the need for upfront capital investments in hardware and allows users to align their costs with their actual resource usage. It also enables cost optimization by automatically scaling resources based on demand.
6. **Security and Compliance:** IaaS providers typically offer robust security measures to protect user data and infrastructure. This includes features such as data encryption, access controls, network firewalls, and intrusion detection systems. Additionally, IaaS providers often comply with industry standards and regulations to ensure data privacy and regulatory compliance.
7. **High Availability and Disaster Recovery:** IaaS platforms often include features for high availability and disaster recovery. Users can replicate their virtual machines and data across multiple data centers to ensure business continuity in the event of hardware failures or natural disasters. This redundancy minimizes downtime and ensures data integrity.
8. **Integration and Interoperability:** IaaS platforms are designed to integrate with other cloud services and on-premises infrastructure. Users can easily connect their IaaS resources with other cloud services, such as Platform as a Service (PaaS) or Software as a Service (SaaS), to build comprehensive cloud solutions. Additionally, IaaS platforms often support standard protocols and APIs, enabling interoperability with existing IT systems.

These are some of the key features of IaaS that provide users with the flexibility, scalability, and control they need to manage their computing resources in the cloud.

Advantages of IaaS

1. **Scalability:** Easily scale infrastructure up or down based on demand.
2. **Cost-effective:** Pay only for the resources used, reducing upfront costs.
3. **Flexibility:** Access to a wide range of computing resources and services.
4. **Reliability:** High availability and redundancy for improved reliability.
5. **Security:** Many IaaS providers offer robust security measures and compliance options.

Disadvantages of IaaS

1. **Technical expertise:** Requires knowledge of managing and configuring infrastructure.
2. **Connectivity reliance:** Dependent on internet connectivity for accessing resources.
3. **Potential vendor lock-in:** Difficult to migrate away from a specific IaaS provider once integrated.
4. **Security concerns:** Data security and compliance may require additional attention and resources.
5. **Performance variability:** Performance may be impacted by shared infrastructure in a multi-tenant environment.

Where is IAAS implemented?

The implementation can be in a public, private or hybrid cloud setting. Customers use a graphical interface to change the infrastructure as needed. The infrastructure can also be accessed through an API key — so new servers are brought online as part of an automation when needed.

Enterprises use IaaS to do the following more efficiently:

Test and development – Test and development environments are fast and easy to set up with IaaS. This allows for bringing applications to market quicker.

Backup and recover – IaaS solves for storage management and recovery issues. It handles unpredictable demand and storage needs without the enterprise having to dedicate staff to manage it.

Big data analysis – IaaS provides the processing power to economically mine large data sets.

Infrastructure as a Service (IaaS) can be implemented in various ways, including:

1. **Public cloud:** IaaS services offered by a third-party provider over the internet, allowing businesses to access and use infrastructure resources on a pay-as-you-go basis.
2. **Private cloud:** Organizations can build and manage their own IaaS environment within their data centres, providing greater control and security over infrastructure resources.
3. **Hybrid cloud:** Combines public and private cloud infrastructure, allowing businesses to leverage the scalability of public cloud while keeping sensitive data and workloads in a private cloud environment.

These implementations offer different levels of control, security, and flexibility, enabling organizations to choose the best fit for their specific needs and requirements.

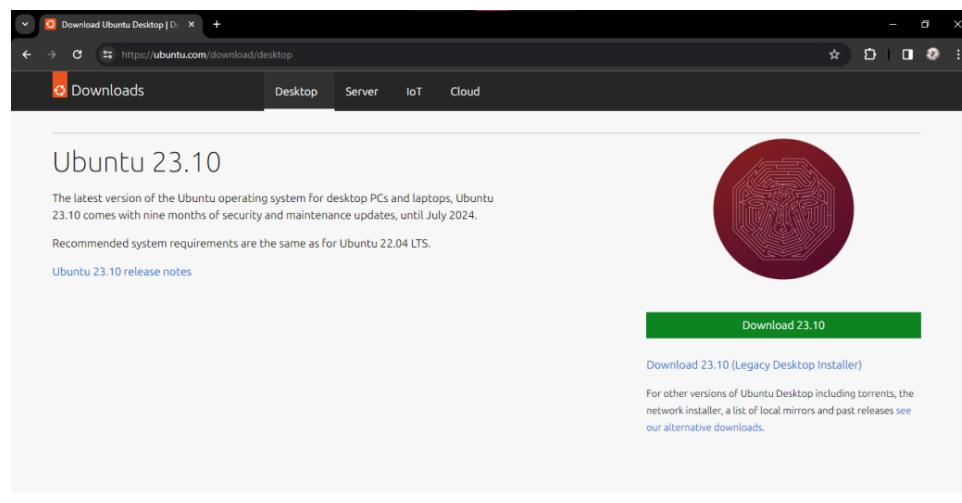
Practical 2

Aim: Installation and Configuration of virtualization using KVM.

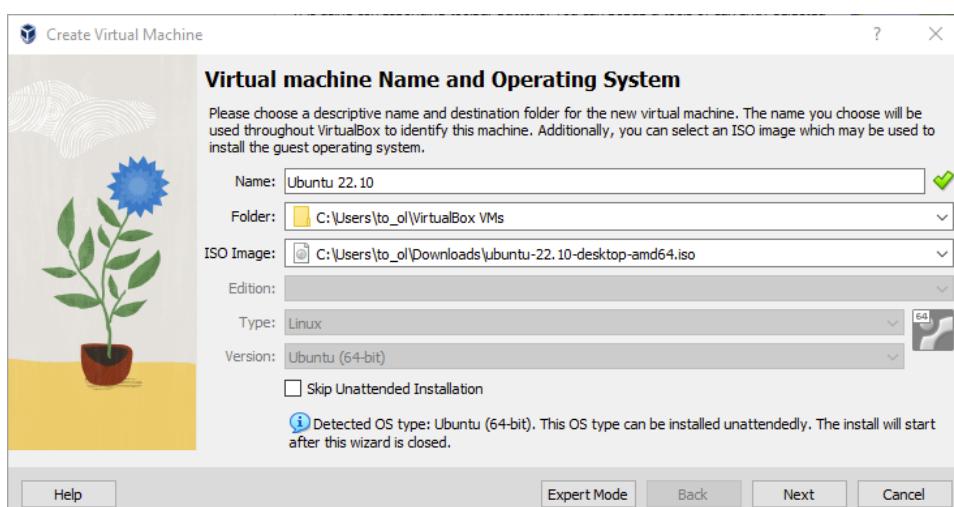
Step 1: Download the virtual box from its official website and install it with default configuration



Step 2: Now download the Ubuntu ISO file from its official website



Step 3: Now open the virtual box and create a new machine and select Ubuntu iso for it and start the machine

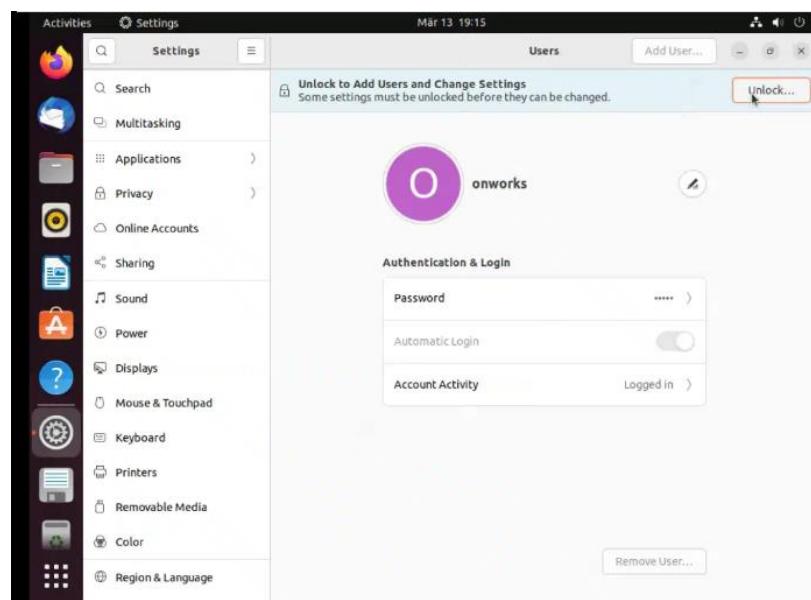


Step 4: Now get the current logged in user

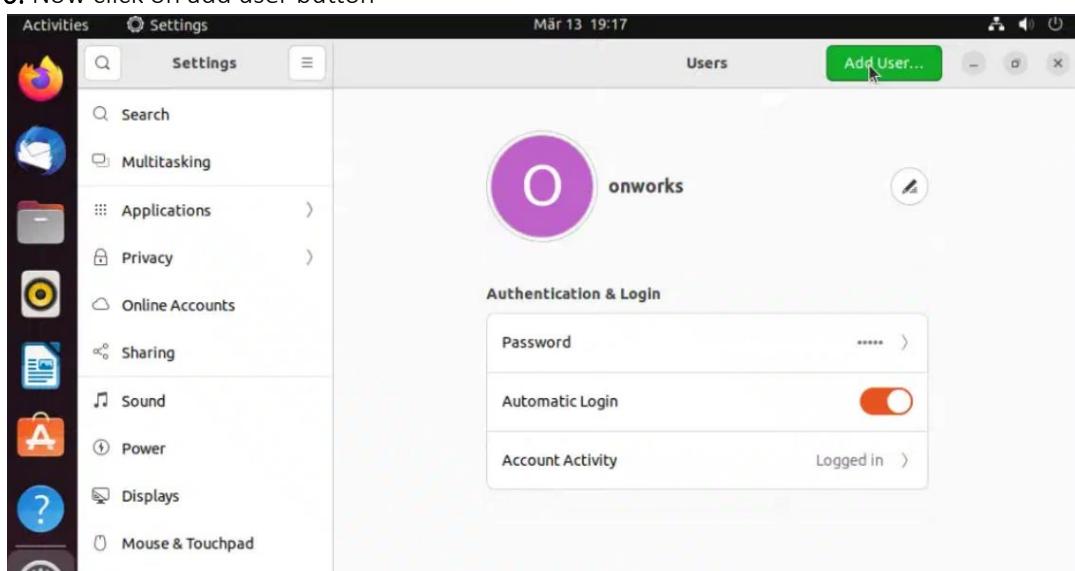


```
Activities Terminal Mär 13 18:31 onworks@TYCS35: ~$ who
onworks  tty2          2024-03-13 18:
          27 (tty2)
onworks@TYCS35: ~$ 
onworks@TYCS35: ~$ whoami
onworks
onworks@TYCS35: ~$
```

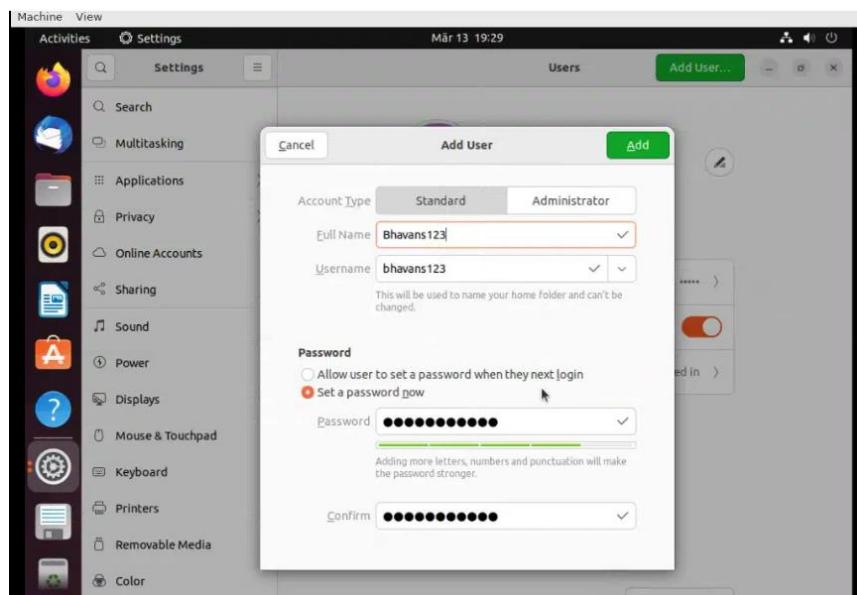
Step 5: Now go to settings-> Users and click on unlock button to add the users and enter your root credentials in pop up box.



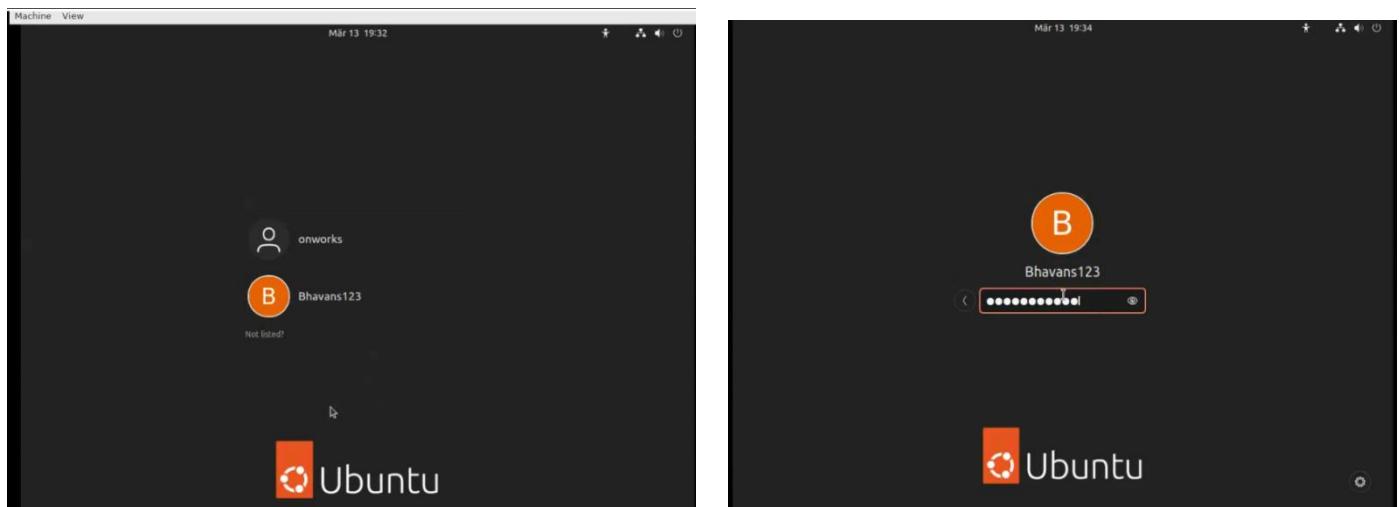
Step 6: Now click on add user button



Step 7: Enter the user details and create Standard account.



Step8: Now go to login screen and select the created user and enter the login credentials



Step 9: Now go to terminal and fire whoami command to verify whether user is logged in or not.

```
Machine View Activities Terminal Mär 13 19:47
bhavans123@TYCS35:~$ who
onworks  tty2          2024-03-13 19:37 (tty2)
bhavans123  tty3        2024-03-13 19:40 (tty3)
bhavans123@TYCS35:~$ whoami
bhavans123
bhavans123@TYCS35:~$
```

PRACTICAL 3

AIM: Study and implementation of Platform as a Service.

Case study:

Implementation:

Step-1: Go to google cloud Console-> New Project-> Dashboard.

The screenshot shows the Google Cloud Console dashboard. At the top, there's a banner offering '\$300 in free credits' with three bullet points: 'Access to Google Cloud products and services', '90 days to spend your credits', and 'No billing during trial'. Below the banner is a 'TRY FOR FREE' button. To the right, there are sections for 'TRY VERTEX AI' and 'GOOGLE CLOUD SETUP'. The main area is titled 'Select a resource' and shows a dropdown menu for 'NO ORGANIZATION'. A search bar is present, and below it, a table lists a single project: 'No organization' with ID '0'. The 'ALL' tab is selected in the table header. Below this, the 'New Project' section is shown. It includes a warning about quota (11 projects remaining) and a 'MANAGE QUOTAS' link. The 'Project name' field is filled with 'TYCS21-Prac3'. The 'Organization' field is set to 'bhavans.ac.in'. The 'Location' field shows 'bhavans.ac.in' with a 'BROWSE' button. At the bottom of the 'New Project' section are 'CREATE' and 'CANCEL' buttons.

The screenshot shows the Google Cloud Platform dashboard for project "TYCS21-Prac3". The left sidebar includes links for Project info, Resources (BigQuery, SQL), and IAM & Admin. The main area displays various metrics and status updates.

- Project info:** Project name: TYCS21-Prac3, Project number: 36076531632, Project ID: tycs21-prac3.
- API APIs:** Requests (requests/sec) chart from 2:15 to 3 PM, showing no data available for the selected time frame.
- Google Cloud Platform status:** Google Distributed Cloud Edge customers are experiencing issues with creating new Google Kubernetes Engine (GKE) clusters. Began at 2024-03-21 (09:29:25). All times are US/Pacific. Data provided by status.cloud.google.com.
- Resources:** BigQuery (Data warehouse/analytics) and SQL (Managed MySQL, PostgreSQL, SQL Server).
- Monitoring:** Create my dashboard, Set up alerting policies, Create uptime checks.

Step-2: For managing access of cloud platform give the access to registered users and roles to them. From the side navbar, go to IAM and admin-> IAM-> Click on “Grant Access”-> Give access to a user and save.

The screenshot shows the "Grant access to "TYCS21-Prac3"" dialog. The left sidebar lists IAM & Admin options like Identity & Organization, Policy Troubleshooter, and Workload Identity Federation.

Resource: TYCS21-Prac3

Add principals: New principals: faria.khan11@gmail.com

Assign roles: Role: Access Approval Viewer (selected), IAM condition (optional): Ability to view access approval requests and configuration. Buttons: SAVE, CANCEL.

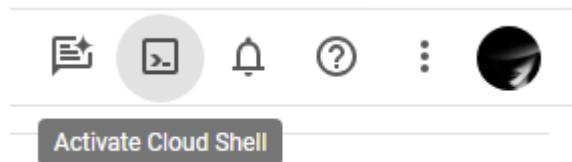
View by principals: faria.khan11@gmail.com

View by roles:

Type	Principal	Name	Role	Security insights
✉️	faria.khan11@gmail.com	Faria Khan	Access Approval Viewer	edit
✉️	fariakhan21-24@bhavans.ac.in	TYCS21 FARIA KHAN	Owner	edit

GRANT ACCESS **REMOVE ACCESS**

Step-3: Now open the cloud Console for manipulation of files on Google cloud.



Information about the cloud platform:

uname-a

cat /etc/os-release

```

CLOUD SHELL Terminal (tycs21-prac3) + 
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to tycs21-prac3.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ uname -a
Linux cs-802515183828-default 6.1.75+ #1 SMP PREEMPT_DYNAMIC Fri Mar  8 15:32:05 UTC 2024 x86_64 GNU/Linux
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ cat /etc/os-release
PRETTY_NAME="Debian GNU/Linux 11 (bullseye)"
NAME="Debian GNU/Linux"
VERSION_ID="11"
VERSION="11 (bullseye)"
VERSION_CODENAME=bullseye
ID=debian
HOME_URL="https://www.debian.org/"
SUPPORT_URL="https://www.debian.org/support"
BUG_REPORT_URL="https://bugs.debian.org/"
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 

```

File creation:

```

fariakhan21_24@cloudshell:~ (tycs21-prac3)$ touch fkhan.txt
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ ls
fkhan.txt README-cloudshell.txt
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 

```

File editing:

The screenshot shows a terminal window with the command `nano fkhan.txt` running. The nano editor interface is visible, showing the text:

```

GNU nano 5.4                                     fkhan.txt
[ Read 0 lines ]
Hii There,
This is TYCS21 Faria Khan here.

Nice To Meet You!

```

The status bar at the bottom of the nano window includes various keyboard shortcuts for file operations like Help, Exit, Write Out, Read File, Cut, Paste, Execute, Justify, Location, Go To Line, Undo, Redo, Set Mark, To Bracket, Where Was, Copy, Where Was, Previous, and Next.

To save the file: **ctrl + X** -> **Y**-> **Enter**.

Save modified buffer?

Yes No Cancel

Reading the stored file:

```

fariakhan21_24@cloudshell:~ (tycs21-prac3)$ cat fkhan.txt
Hii There,
This is TYCS21 Faria Khan here.

Nice To Meet You!
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 

```

Deleting the stored file from cloud platform:

```

fariakhan21_24@cloudshell:~ (tycs21-prac3)$ rm fkhan.txt
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ ls
README-cloudshell.txt
fariakhan21_24@cloudshell:~ (tycs21-prac3)$ 

```

The file is successfully deleted.

Case Study:

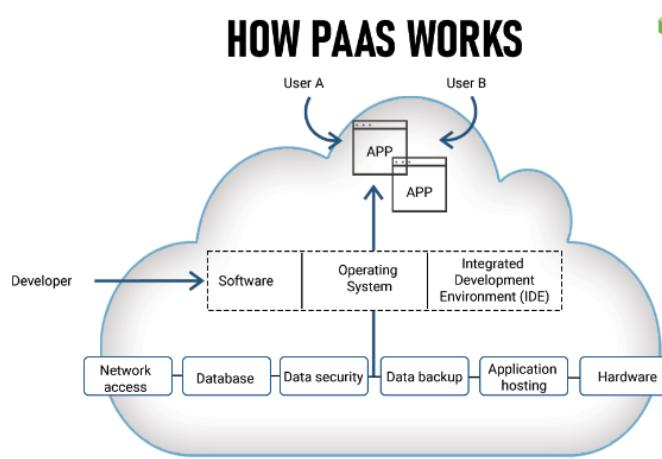
Platform as a Service | PaaS

Platform as a Service (PaaS) provides a runtime environment. It allows programmers to easily create, test, run, and deploy web applications. You can purchase these applications from a cloud service provider on a pay-as-per use basis and access them using the Internet connection. In PaaS, back end scalability is managed by the cloud service provider, so end-users do not need to worry about managing the infrastructure.

PaaS includes infrastructure (servers, storage, and networking) and platform (middleware, development tools, database management systems, business intelligence, and more) to support the web application life cycle.

Example: Google App Engine, Force.com, Joyent, Azure.

PaaS providers provide the Programming languages, Application frameworks, Databases, and Other tools:



Key Features of PaaS

PaaS is a valuable cloud computing model for organizations looking to streamline application development and deployment processes while offloading infrastructure management to a third-party provider. It promotes collaboration, reduces complexity, and often leads to faster and more cost-effective development and deployment of applications.

Now that we know how Platform as a Service (PaaS) works, let us understand what are the key features and advantages of PaaS in detail.

1. Development Tools: PaaS provides a range of development tools and services accessible through a cloud-based environment. These include programming languages, frameworks, and integrated development environments. Developers can write, test, and debug their applications within the PaaS environment, using these tools and services to streamline the development process.

2. Scalability: PaaS platforms are built to be horizontally scalable. This means that when your application experiences increased demand or traffic, you can easily add more computing resources (e.g., virtual machines) or scale out to accommodate the load. Likewise, during periods of lower demand, you can scale in or remove resources, helping you optimize costs.

3. Automatic Updates: PaaS providers handle the maintenance of the underlying infrastructure. This includes tasks like server maintenance, applying security updates, and managing software patches. The platform automatically ensures that the environment is secure and up-to-date, reducing the burden on developers and administrators.

4. Database Management: PaaS often offers managed database services. This means that the platform provides tools and services for creating, configuring, and maintaining databases. Developers can work

with databases through database management systems (DBMS) without having to handle the low-level tasks of database administration.

5. Multi-Tenancy: PaaS platforms support multi-tenancy, which means they can serve multiple users or organizations on the same infrastructure while keeping their environments isolated. This efficient resource utilization and isolation are achieved through features like virtualization, containerization, and user access controls.

Advantages of PaaS

There are the following advantages of PaaS -

1) Simplified Development

PaaS allows developers to focus on development and innovation without worrying about infrastructure management.

2) Lower risk

No need for up-front investment in hardware and software. Developers only need a PC and an internet connection to start building applications.

3) Prebuilt business functionality

Some PaaS vendors also provide already defined business functionality so that users can avoid building everything from very scratch and hence can directly start the projects only.

4) Instant community

PaaS vendors frequently provide online communities where the developer can get the ideas to share experiences and seek advice from others.

5) Scalability

Applications deployed can scale from one to thousands of users without any changes to the applications.

Disadvantages of PaaS cloud computing layer

1) Vendor lock-in

One has to write the applications according to the platform provided by the PaaS vendor, so the migration of an application to another PaaS vendor would be a problem.

2) Data Privacy

Corporate data, whether it can be critical or not, will be private, so if it is not located within the walls of the company, there can be a risk in terms of privacy of data.

3) Integration with the rest of the systems applications

It may happen that some applications are local, and some are in the cloud. So there will be chances of increased complexity when we want to use data which in the cloud with the local data.

Implementation:**1. SAP Cloud**

SAP offers cloud PaaS as an open business platform. The platform has been developed for the smooth and seamless deployment of applications. Besides, its PaaS service integrates [cloud and on-premise](#) apps and offers many supporting services. This includes a library of over 1,300 apps built on the same PaaS platform.

2. Microsoft Azure

Microsoft Azure is a development environment that harnesses the properties of PaaS. It supports the entire web app development lifecycle, from building to deploying and managing the app thereafter. Additionally, Azure is compatible with a wide range of languages, libraries, and frameworks. This allows developers to access multiple associated cloud computing services offered by Microsoft. Owing to the size of [Azure](#), it covers all three cloud models—SaaS, PaaS, and IaaS.

3. Salesforce Lightning

Lightning is Salesforce's next-generation PaaS platform. It is a component-based framework meant for app development. It provides a user-friendly user interface (UI) with advanced features that boost the experience of both business users and IT teams. The platform offers a rapid application development feature that includes the use of reusable building blocks.

4. AWS Lambda

AWS Lambda is a part of Amazon Cloud and supports the effective management of Amazon Web Services (AWS) resources. This implies that users can run code without provisioning the resources or managing the server. This PaaS environment is multi-code capable, and therefore, enables any kind of software development. The [serverless architecture](#) of the platform allows it to handle micro-service architecture quite easily and, as such, has garnered the attention of numerous enterprises worldwide.

5. Google App Engine

[Google App Engine](#) is a part of the Google Cloud ecosystem. It is a scalable serverless PaaS platform meant for rapid deployment. Google generally provides a set of highly capable servers that can cope with growing volumes of queries. Developers, however, have raised concerns regarding Google App Engine's services. Some of the prominent issues include lack of support in some language environments, inadequate development tools, and failure to plug-and-play some applications, besides many others.

wide offerings, users have raised concerns over the inadequacies of the control panel, high complexity, and increased time taken, for instance, provisioning.

PRACTICAL 4

Aim: Study and implementation of Storage as a Service.

CASE STUDY:**Introduction of SAAS**

Software as a Service (SaaS) delivers the applications through the web that a third-party vendor manages. Furthermore, its interface is accessible on the client's side. Through the SaaS platform, various tools and software are licensed on a subscription basis and are hosted centrally. SaaS provides a complete software solution that you purchase on a pay-as-you-go basis from a cloud service provider.

SaaS is also known as "hosted software" and "on-demand software". In addition, it is gaining more and more gravity, and for excellent reasons. Not only that, for both small and big enterprises, but web-based applications also present them a better and more transparent way to IT services for their Businesses.

SaaS is widely used across various industries, including customer relationship management (CRM), project management, collaboration, human resources, accounting, and more. Examples of popular SaaS applications include Salesforce for CRM, Google Workspace for productivity, Slack for communication, and QuickBooks Online for accounting.

Overall, SaaS offers numerous benefits, including cost-effectiveness, accessibility, automatic updates, scalability, and simplified management. It has transformed the software industry by providing businesses and users with efficient and convenient ways to access and utilize software applications.

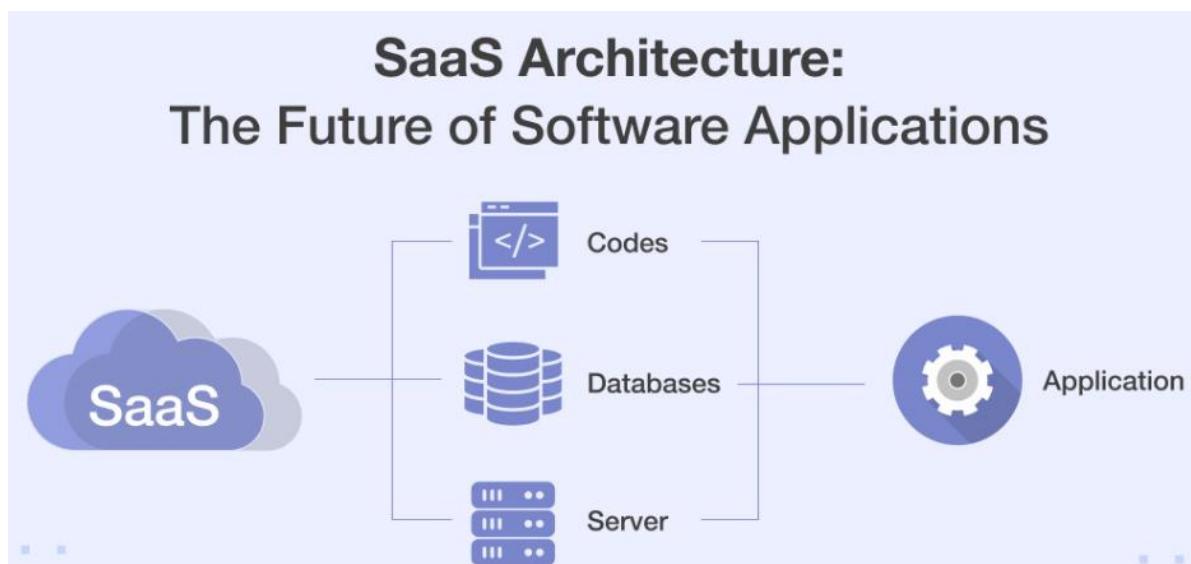
Software as a Service Cloud Computing has two main varieties-

1. Vertical Software as a Service

The software which answers the needs, industry-wise such as, getting software for agriculture, healthcare, finance industries, real estate.

2. Horizontal Software as a Service

The products that focus on a specific software category like sales, marketing, developer tools, HR but are industry agnostic.



Features of SAAS

Software as a Service (SaaS) offers a range of features that distinguish it from traditional software deployment models. Here are the key features of SaaS in detail:

1. Subscription-Based Pricing:

- SaaS applications are typically offered on a subscription basis, where users pay a recurring fee (monthly, annually, or based on usage) to access the software. This pricing model provides predictability in costs and allows users to scale their usage according to their needs.

2. Accessibility and Cross-Platform Compatibility:

- SaaS applications are accessed over the internet through web browsers or dedicated client applications. They are designed to be platform-independent, meaning users can access them from various devices and operating systems, including desktops, laptops, tablets, and smartphones.

3. Automatic Updates and Maintenance:

- SaaS providers manage software updates, patches, and maintenance tasks centrally. Users benefit from automatic updates, ensuring they always have access to the latest features, bug fixes, and security enhancements without manual intervention.

4. Scalability and Flexibility:

- SaaS solutions are designed to scale seamlessly based on user demand. Organizations can easily add or remove users, upgrade or downgrade subscription plans, and access additional features or resources as needed. This scalability and flexibility support business growth and agility.

Advantages of SAAS

- 1. Cost Reduction:** Cost benefits are one of the well-known and most obvious advantages of using software as a service for businesses. The expense of buying and installing the entire software and IT infrastructure in-house is negated when the software is rented from a third-party service provider.
- 2. Ease of Accessibility:** A software as a service application is easily accessible. A computer and a stable internet connection is all that is required to access and use the cloud-hosted software. Using this method, the application can be easily made available on any remote desktop or mobile phone and used at anytime from anywhere.
- 3. Effortless Scalability:** Whenever your business grows and you feel the need of adding new users, there is no need to buy additional software licenses or server space for the new users. All you have to do is to upgrade your existing plan or subscription for the SaaS application to accommodate the new users.
- 4. Trouble-free Upgradation:** It is a cumbersome task to upgrade your existing software and hardware to the newer versions. In many cases, businesses do not have the budget or the IT manpower to upgrade software every subsequent year.

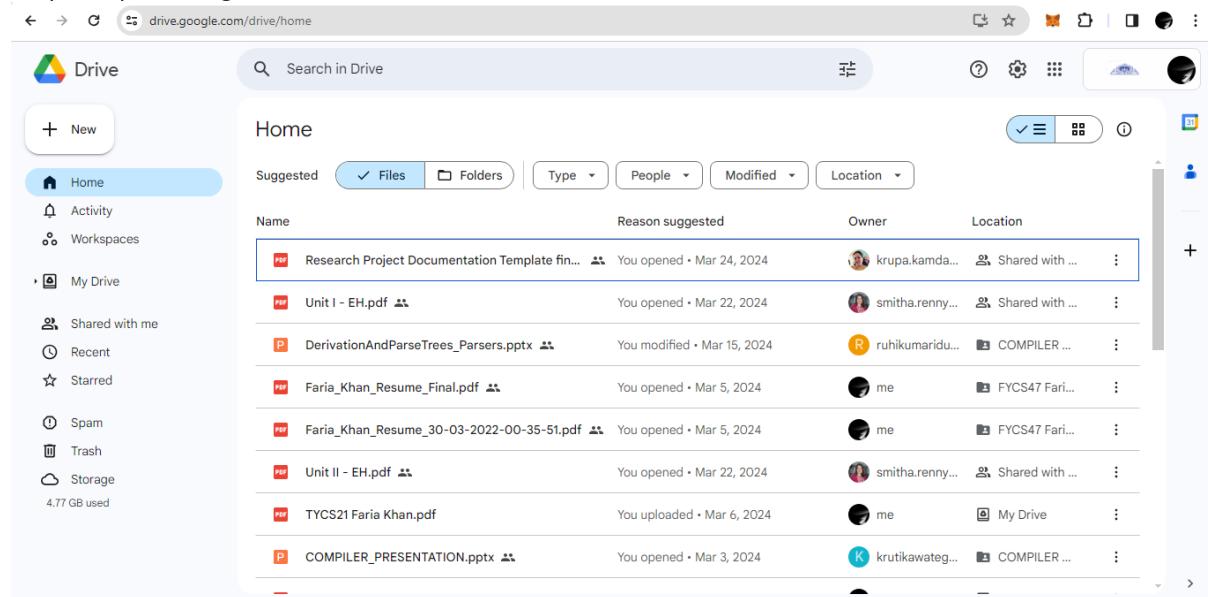
Disadvantages of SAAS

1. **Insufficient Data Security:** This is one of the top concerns for companies who are looking to opt for a SaaS-based application model. Issues such as identity and access management need to be addressed before trusting any third party service provider with your company's sensitive data.
2. **Difficulty with Regulations Compliance:** When your business critical data is stored in the service provider's data center, it is difficult to comply with the government's data protection regulations. Your company will need to learn which rules apply to your business, ask the right questions from your service provider, and address any kind of inconsistencies in the process.
3. **Cumbersome Data Mobility:** The software as service market is filled with startups, and many of them do not have enough experience to survive in a highly competitive atmosphere. In case of a failure or in an event where you want to change your service provider, it becomes a cumbersome task to transfer your company's critical data from one service provider to another. Therefore, you need to be prepared for such an event with a planned exit strategy.
4. **Low Performance:** A browser-based application running on a remote data center may lack in performance when compared to a similar application running from your employee's desktop. Companies therefore need to invest in a fast and reliable internet connection to negate this factor and also use tools for application performance management to know how their SaaS apps are performing over time.

Where is SAAS implemented?

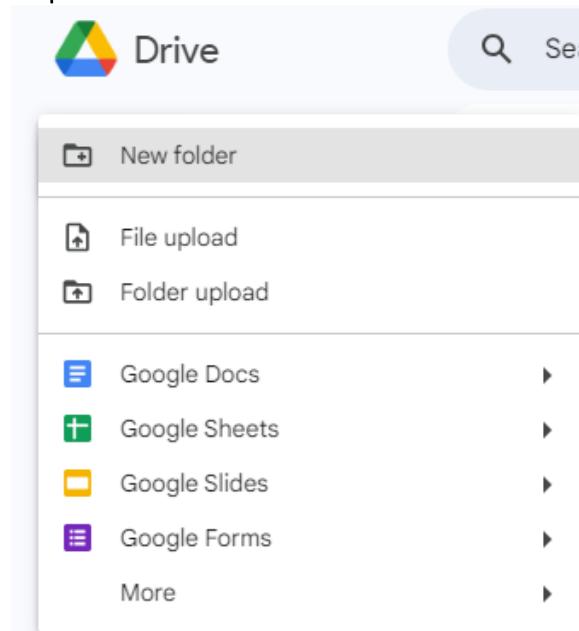
Software as a Service (SaaS) is implemented and used in various environments, catering to a wide range of industries and business needs. Here are the common implementation scenarios for SaaS:

1. **Enterprise Applications:**
 - SaaS is widely used for enterprise applications such as customer relationship management (CRM), enterprise resource planning (ERP), human resources management (HRM), accounting, project management, and collaboration tools. Examples of popular SaaS applications in this category include Salesforce (CRM), SAP SuccessFactors (HRM), Oracle NetSuite (ERP), and Microsoft Office 365 (productivity suite).
2. **Small and Medium-sized Businesses (SMBs):**
 - SMBs often leverage SaaS solutions due to their cost-effectiveness, scalability, and ease of use. SaaS applications cater to various SMB needs, including email marketing, online accounting, inventory management, document collaboration, and customer support. Examples include Mailchimp (email marketing), QuickBooks Online (accounting), Dropbox (file storage and collaboration), and Zendesk (customer support).
3. **Industry-Specific Solutions:**
 - Many industries utilize SaaS solutions tailored to their specific requirements. For example, healthcare organizations use SaaS platforms for electronic health records (EHR) and telemedicine, while educational institutions use SaaS learning management systems (LMS) for online education. Other examples include legal practice management software, construction project management tools, and retail analytics platforms.
4. **Startups and Entrepreneurial Ventures:**
 - Startups and entrepreneurial ventures often rely on SaaS applications to streamline operations, manage resources efficiently, and accelerate growth. SaaS offerings provide startups with access to essential tools and services without substantial upfront investments in infrastructure or software licenses. Examples include cloud-based development platforms, marketing automation tools, and customer engagement platforms.

IMPLEMENTATION:**Step 1: Open Google Drive**

The screenshot shows the Google Drive interface. On the left, there's a sidebar with navigation links like Home, Activity, Workspaces, My Drive, Shared with me, Recent, Starred, Spam, Trash, and Storage. The main area is titled 'Home' and shows a list of files and folders. One file, 'Research Project Documentation Template fin...', is selected. The list includes:

Name	Reason suggested	Owner	Location
Research Project Documentation Template fin...	You opened • Mar 24, 2024	krupa.kamda...	Shared with ...
Unit I - EH.pdf	You opened • Mar 22, 2024	smitha.renn...	Shared with ...
DerivationAndParseTrees_Parsers.pptx	You modified • Mar 15, 2024	ruhikumaridu...	COMPILER ...
Faria_Khan_Resume_Final.pdf	You opened • Mar 5, 2024	me	FYCS47 Fari...
Faria_Khan_Resume_30-03-2022-00-35-51.pdf	You opened • Mar 5, 2024	me	FYCS47 Fari...
Unit II - EH.pdf	You opened • Mar 22, 2024	smitha.renn...	Shared with ...
TYCS21 Faria Khan.pdf	You uploaded • Mar 6, 2024	me	My Drive
COMPILER_PRESENTATION.pptx	You opened • Mar 3, 2024	krutikawateg...	COMPILER ...

Step 2: Create a new folder

The screenshot shows the 'New folder' creation dialog. It has a search bar at the top. Below it, there are several options: 'New folder' (selected), 'File upload', 'Folder upload', 'Google Docs', 'Google Sheets', 'Google Slides', 'Google Forms', and 'More'. The 'New folder' option is highlighted with a blue background.

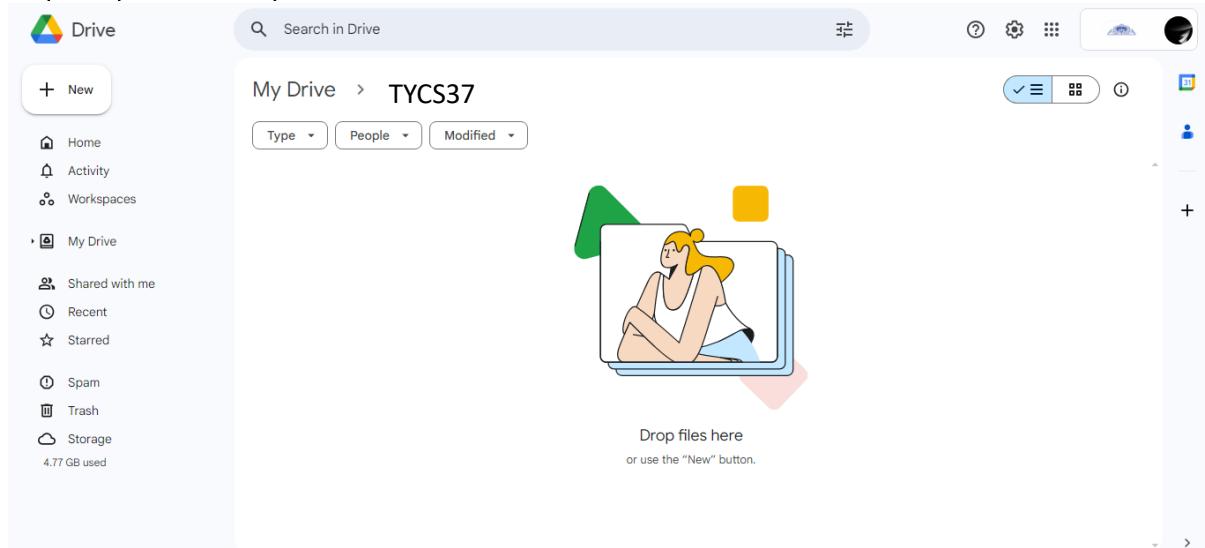
Step 3: Give a name to it and click on create.

New folder

TYCS37

Cancel Create

Step 4: Open the newly created folder



Step 5: Click on New Folder-> File Upload-> Select a file-> Open.

The screenshot shows the Google Drive interface again, with the 'File upload' option selected in the left sidebar. Below it, there's a placeholder for files with the text 'Drop files here or use the "New" button.' A large green arrow points upwards towards the 'File upload' button. In the foreground, a Windows 'Open' file dialog box is displayed over the drive interface. The dialog shows a list of files in the 'Data (D):' drive, specifically in the 'SEM 6 > CC' folder. The files listed are: cc_u3.pyq, CC_CIA2_TYCS21_TYCS28, cc_prac1, cc_prac1, cc_prac2, cc_prac2, cc_prac3, cc_prac3, cc_prac4, cc_prac4, cc_prac5, cc_prac5, cc_prac6, cc_prac6, cc_prac7, cc_prac7, pyq1, pyq2, Quota_TVCS21_TYCS28, and recording.conf. The file 'cc_prac5' is highlighted. At the bottom of the dialog, there are 'Open' and 'Cancel' buttons. A large yellow arrow points from the 'Open' button in the dialog to the 'Open' button in the Google Drive interface.

Step 6: File is uploaded successfully on the drive.

The screenshot shows the Google Drive interface. On the left, there's a sidebar with navigation links: Home, Activity, Workspaces, My Drive, Shared with me, Recent, Starred, Spam, Trash, and Storage. The main area shows a folder named "TYCS37". Inside this folder, a file named "cc_prac5.pdf" is listed. The file details are: Owner - me, Last modified - 4:28 PM, File size - 1.7 MB. A modal window at the bottom right indicates "1 upload complete" with a green checkmark next to "cc_prac5.pdf".

PRACTICAL 5

Aim: Practical on RSS Feed.

Step 1: Go to Google news and open article and copy the link of it.

The image consists of three vertically stacked screenshots of the Google News website.

- Top Stories:** Shows a large image of Prime Minister Narendra Modi. Below it, a story from Hindustan Times: "PM Modi in Kolkata today, to unveil 1st underwater Metro route, other projects". Other stories include "India Today" about the first underwater metro section and "The Times of India" about the 1st under-river Metro.
- Local News:** Features a weather widget for Maharashtra at 23°C. Stories include "The Times of India" about Turkish actress Hande Ercel's welcome in Mumbai and "NDTV" about a new comedy club in Andheri.
- Sports:** Shows a cricket player in action. Stories include "The Wire" about Ishan Kishan-Shreyas Iyer's BCCI exclusion, "The Times of India" about the Shreyas-Ishan controversy, and "India TV News" about India TV Poll results regarding their exclusion from the central contract.

Step 2: Go to <https://rss.app/> -> RSS Feeds -> Google News feed -> Paste the copied URL -> Click on "Generate" -> Save the feed -> click on Your Feed is ready

The screenshots illustrate the workflow for generating an RSS feed:

- Screenshot 1:** The homepage of RSS.app with the title "The #1 Source of RSS Feeds" and a call-to-action button "Get Started Now".
- Screenshot 2:** The "RSS Feeds" section of the site, featuring links to various feed types like YouTube RSS Feeds, Facebook Page, and Google News Feeds.
- Screenshot 3:** A search results page for "Google News RSS Feed" on the site, showing the URL <https://news.google.com> in the search bar and a "Generate" button.
- Screenshot 4:** The "Generating" screen, displaying a progress bar and a message: "We're working on generating your feed. Hold tight, it might take up to 20 seconds."

Screenshot 1: RSS.app - Create RSS Feeds from almost any webpage

The screenshot shows the main interface of RSS.app. At the top, there's a navigation bar with links for 'RSS Generator', 'RSS Feeds', 'RSS Widget', 'Bots', 'Blog', 'LOG IN', and 'SIGN UP'. Below the navigation is a large orange header with the text 'Create RSS Feeds from almost any webpage'. Underneath this, there are two buttons: 'RSS Generator' (highlighted in blue) and 'RSS Builder'. A search bar contains the URL 'https://news.google.com/topics/CAAqKggKlIRDQkFTRIFvSuwyMHZNRFp1ZEdvU0jXvNVMVWRD...'. To the right of the search bar is an orange 'Generate' button. Below the search bar are three cards: 'Webpage to RSS Feed' (with a globe icon), 'Instagram RSS Feed' (with an Instagram icon), and 'Twitter RSS Feed' (with a Twitter icon). On the left side, there's a sidebar with categories like 'Top 20', 'Beauty', and 'Business'. The main content area has a heading 'Select which RSS feed you would like to create' and a search bar.

Screenshot 2: RSS.app - Google News - Sports - Latest

This screenshot shows the 'Overview' tab for the 'Google News - Sports - Latest' feed. The left sidebar shows 'Starred' feeds. The main area displays the feed's URL ('https://news.google.com/topics/CAAqKggKlIRDQkFTRIFvSuwyMHZNRFp1ZEdvU0jXvNVMVWRD...'), a preview image of a woman shouting, and the headline 'Shabnim Ismail bowls fastest ball in women's cricket history in DC vs MI WPL 2024 match'. There are buttons for 'Add to my feeds', 'Save Feed', 'Settings', and 'Edit'.

Screenshot 3: RSS.app - Google News - Sports - Latest

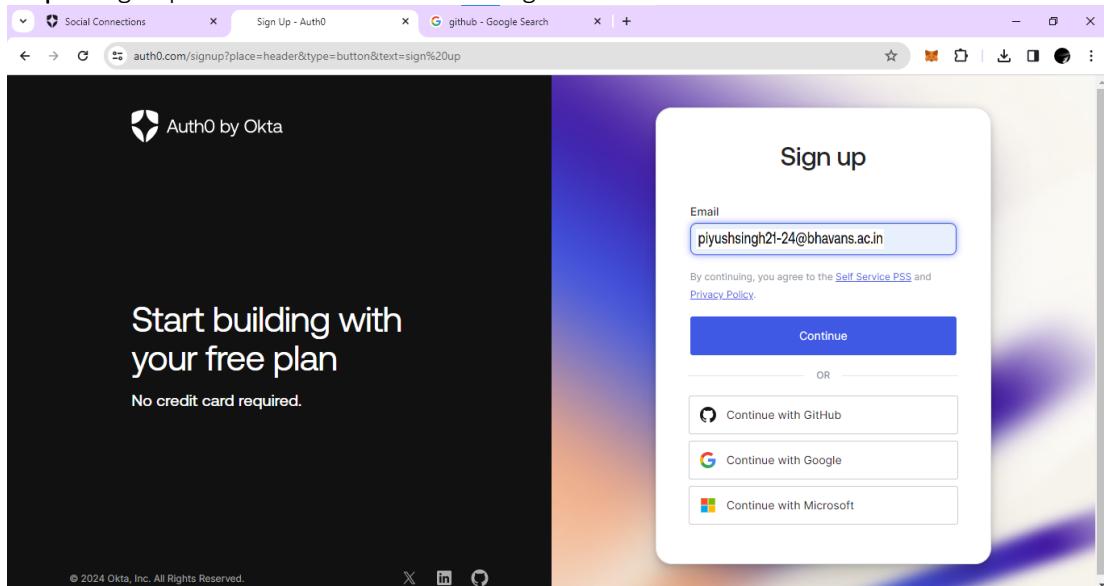
This screenshot shows the 'Preview Feed' tab for the same feed. It displays the generated XML feed URL ('https://rss.app/feeds/q9GXP9uvCTGz6WWs.xml') and a preview of the feed content, which includes the same article about Shabnim Ismail.

Step 3: Copy the generated RSS feed URL and paste in browser.

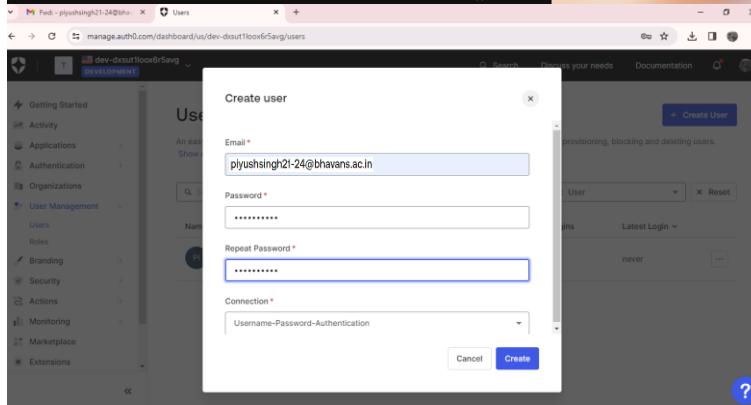
The screenshot shows a browser window with multiple tabs open. The active tab displays an RSS feed from RSS.app for the URL <https://rss.app/feeds/q9GXP9uvCTGz6WWs.xml>. The feed content includes a news item about Shabnim Ismail's fastest ball, a thumbnail image of her, and a sidebar titled "Generate Feeds with RSS.app" listing various news sources. A message at the bottom encourages users to try RSS.app.

Open the link in new tab

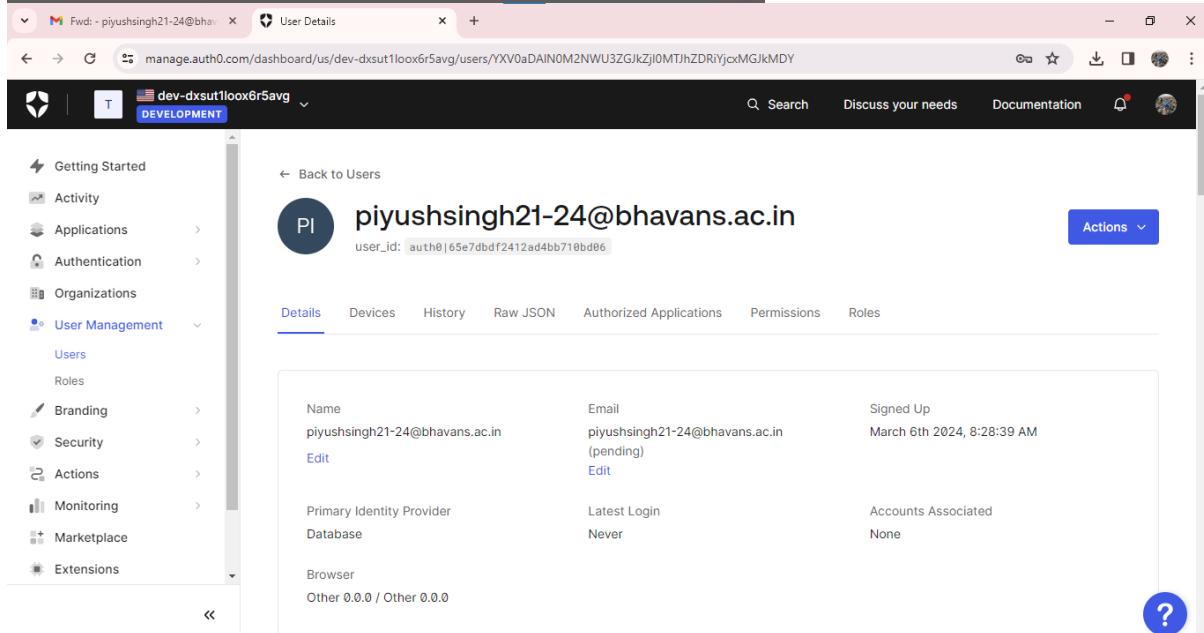
The screenshot shows a browser window displaying the XML code of the RSS feed. The URL in the address bar is <https://rss.app/feeds/q9GXP9uvCTGz6WWs.xml>. The XML code is extensive, detailing the channel information, items, and their descriptions, including the image of Shabnim Ismail and the link to the original news article.

PRACTICAL 6**AIM: Practical on single sign-on.****Step-1: Sign up on auth0-> Go to user management-> Users-> Add users.**

The screenshot shows the Auth0 sign-up interface. A purple header bar at the top has tabs for "Social Connections", "Sign Up - Auth0", and "github - Google Search". Below the header is a URL bar with "auth0.com/signup?place=header&type=button&text=sign%20up". The main content area has a dark background with the text "Start building with your free plan" and "No credit card required.". On the right, a white "Sign up" form is displayed with an "Email" field containing "piyushsingh21-24@bhavans.ac.in". Below the email field is a note: "By continuing, you agree to the [Self Service PSS](#) and [Privacy Policy](#)". There are three "Continue" buttons: "Continue" (blue), "Continue with GitHub" (light blue), "Continue with Google" (light blue), and "Continue with Microsoft" (light blue). At the bottom left of the sign-up form is a "Cancel" button and a "Create" button.



The screenshot shows the "Create user" dialog box from the Auth0 dashboard. It contains fields for "Email" (piyushsingh21-24@bhavans.ac.in), "Password", "Repeat Password", and "Connection" (Username-Password-Authentication). At the bottom are "Cancel" and "Create" buttons.



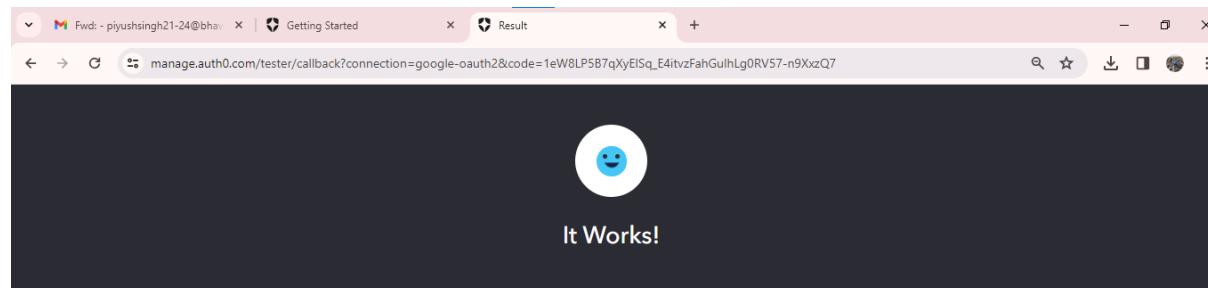
The screenshot shows the "User Details" page for the user "piyushsingh21-24@bhavans.ac.in". The user ID is "auth0|65e7dbdf2412ad4bb710bd86". The "Details" tab is selected, displaying the following information:

Name	Email	Signed Up
piyushsingh21-24@bhavans.ac.in	piyushsingh21-24@bhavans.ac.in (pending)	March 6th 2024, 8:28:39 AM
Primary Identity Provider	Latest Login	Accounts Associated
Database	Never	None
Browser		
Other 0.0 / Other 0.0		

Step-2: Go to Get Started-> Try your Login Box-> Try it out-> Enter your Username and password-> Get connected-> Take me to dashboard.

The screenshot shows the Auth0 Management Dashboard under the 'DEVELOPMENT' tab. The left sidebar lists various management options like Getting Started, Activity, Applications, Authentication, Organizations, User Management, Branding, Security, Actions, Monitoring, Marketplace, Extensions, Settings, and Get support. The main area displays three cards: 'Invite your team members', 'Try your Login box', and 'Add a social login provider'. Each card has a brief description and a 'Try it out' or 'Customize' button.

This screenshot shows a custom login interface. At the top is a logo and the word 'Welcome'. Below it is a message: 'Log in to dev-dxsut1loox6r5avg to continue to All Applications.' There are two input fields: 'Email address' containing 'piyushsingh21-24@bhavans.ac.in' and 'Password' with masked input. Below the fields are links for 'Forgot password?' and 'Continue'. At the bottom, it says 'Don't have an account? [Sign up](#)'.



If you can see this page, it means that your connection works.
This is the user profile the application will receive:

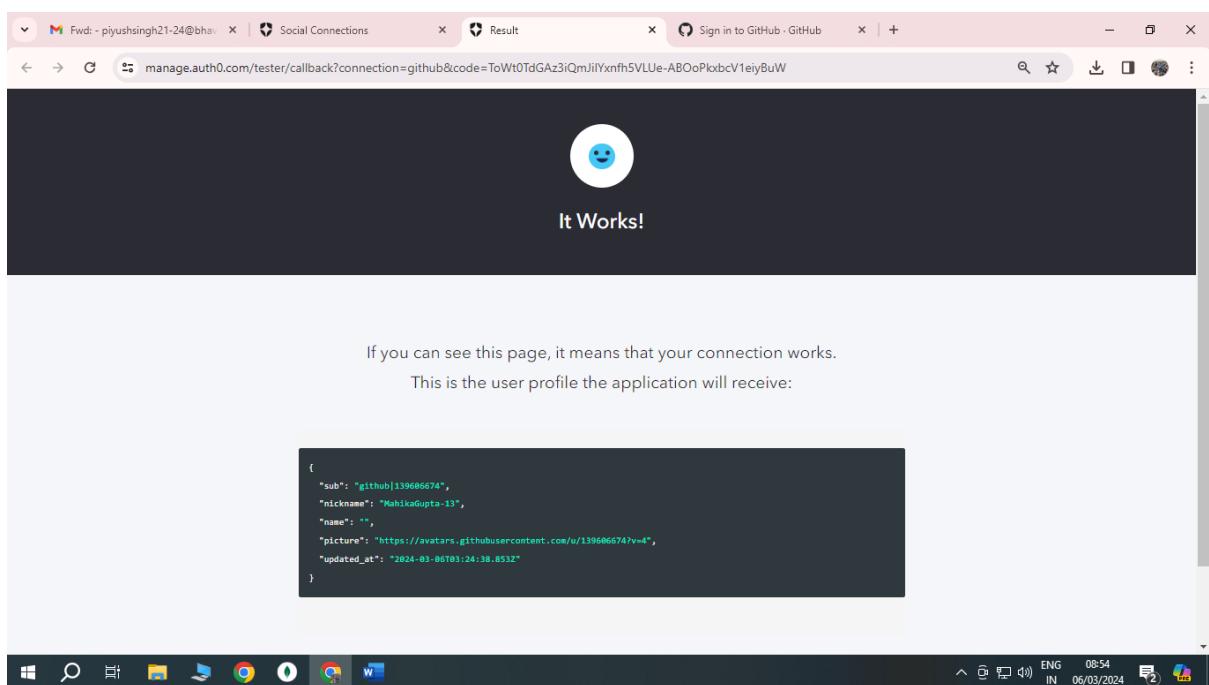
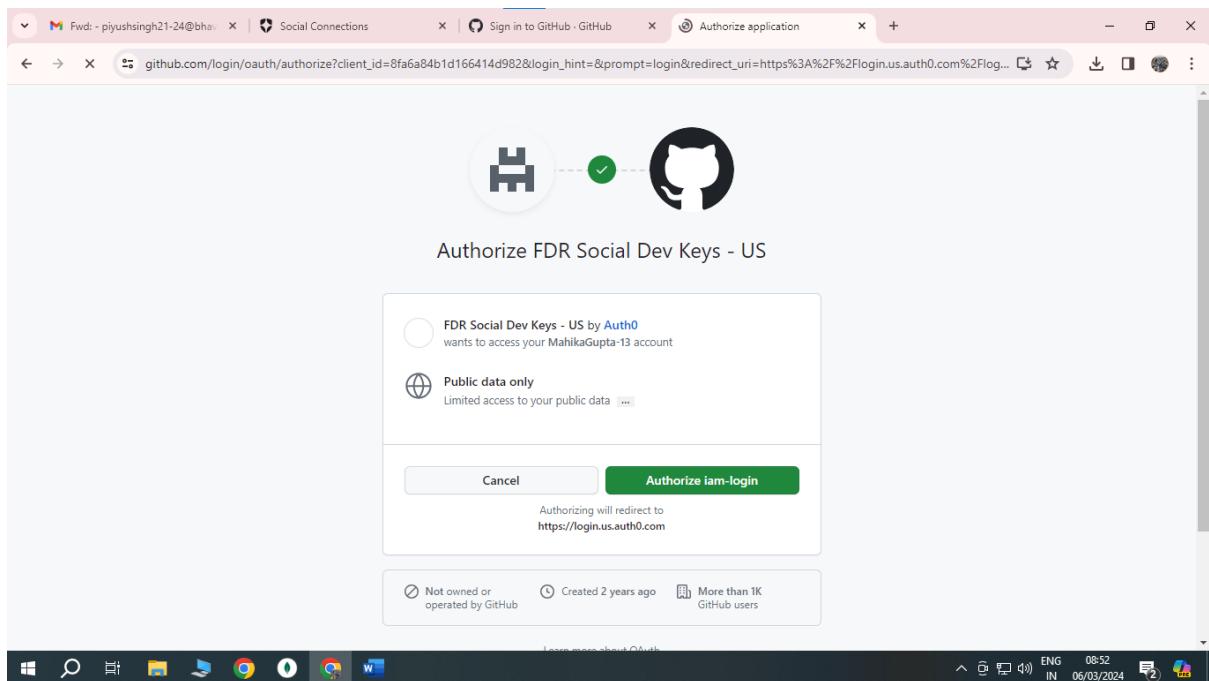
```
{
  "sub": "auth0|65e7dc4866efach5e65770b",
  "nickname": "mahikagupta21-24",
  "name": "mahikagupta21-24@bhavans.ac.in",
  "picture": "https://s.gravatar.com/avatar/fc3d09b9aee885ae785c3dec81573a1b?s=400&r=pg&d=https%3A%2F%2Fcdn.auth0.com%2Fcontent%2Fplaceholder%2Fimage.png",
  "updated_at": "2024-03-06T03:49:34.143Z"
}
```

Step-3: Go to Authentication → Social → Create Connection → GitHub → Continue → Just leave the next page as is, scroll down and click on Create → Toggle on Default App.

The screenshot shows two screenshots of the Auth0 dashboard. The top screenshot shows the 'Social Connections' page with a list of available connections: 'github' (No Applications enabled) and 'google-oauth2' (1 Application enabled). The bottom screenshot shows the detailed configuration for the 'github' connection, specifically the 'Applications' tab where the 'Default App' toggle switch is turned on.

Step-4: Now click on Try Connection and enter the credentials for the same and authorize GitHub → Take me to dashboard.

The screenshot shows a browser window with three tabs: 'Fwd: - piyushsingh21-24@bhavans.ac.in', 'Social Connections', and 'Sign in to GitHub - GitHub'. The main content area displays a GitHub sign-in form for the 'FDR Social Dev Keys - US' application. The user has entered their email ('piyushsingh21-24@bhavans.ac.in') and password, and the 'Sign in' button is highlighted in green.



Step-5: To create an application, click on Applications-> Create Application-> Regular web application-> Choose node.js in technology-> I want to integrate my app-> Scroll down, Save setting and continue-> Now, download the sample app (to the right).

The screenshot shows the Auth0 dashboard with the URL <https://manage.auth0.com/dashboard/us/dev-mosx3bl737x0hms6/applications>. On the left, there's a sidebar with various options like Getting Started, Activity, Applications (which is selected), APIs, SSO Integrations, Authentication, Organizations, User Management, Branding, Security, Actions, Monitoring, Marketplace, Extensions, and Settings. The main area is titled 'Applications' with a sub-instruction: 'Setup a mobile, web or IoT application to use Auth0 for Authentication. Show more >'. It shows a large blue icon of two overlapping documents. Below it says 'No items have been added to this section.' and has a blue 'Create Application' button.

Create application

Name * You can change the application name later in the application settings.

Choose an application type

Native Mobile, desktop, CLI and smart device apps running natively. e.g.: iOS, Electron, Apple	Single Page Web Applications A JavaScript front-end app that uses an API. e.g.: Angular, React, Vue	Regular Web Applications Traditional web app using redirects. e.g.: Node.js Express.	Machine to Machine Applications CLIs, daemons or services running on your backend. e.g.: Shell script

Cancel **Create**

The screenshot shows the 'Application Details' page for 'TYCS37_Test_App'. The URL is <https://manage.auth0.com/dashboard/us/dev-shzhfhiuk3p86udn/applications/22bfcc5xvdtbyh11wouqj1t9vfkxclg/quickstart/list>. The page title is 'TYCS37_Test_App' and it's identified as a 'Regular Web Application'. It shows a sidebar with icons for Quickstart, Settings, Credentials, Addons, Connections, and Organizations. The main content area is titled 'REGULAR WEB APP' and asks 'What technology are you using for your project?'. It features a search bar 'Search by technology name' and a grid of icons for various technologies: Apache, ASP.NET (OWIN), ASP.NET Core v2.1, ASP.NET Core, Django, Next.js, and a question mark icon.

The screenshot shows the Auth0 dashboard for the application 'TYCS37_Test_App'. The 'Quickstart' tab is selected. The main heading is 'Choose your path'. There are two main options: 'I want to integrate with my app' (represented by a code icon) and 'I want to explore a sample app' (represented by a download icon). Below each option is a brief description and a button: 'Integrate Now' for the first and 'Explore Sample App' for the second. A 'View on Github' link is also present under the sample app section. On the far right, there is a blue circular 'Help' icon.

The screenshot shows the 'Configure Auth0' step in the Auth0 dashboard. The 'Node.js (Express)' technology is selected. The 'Allowed Callback URL' field contains 'http://localhost:3000/callback'. To the right, there is a list of steps: 'Configure Auth0', 'Integrate the SDK', 'Test your login', 'Get the user profile', and 'Next Steps'. A 'Having trouble?' section with links to download a sample app and view its code is also visible. A blue circular 'Help' icon is on the right.

Allowed Logout URLs

A URL in your application that Auth0 can return to after the user has been logged out of the authorization server. This is specified in the `returnTo` query parameter.

`http://localhost:3000`

Specify multiple valid URLs by comma-separating them. Query strings and hash information are not taken into account when validating these URLs. [Learn more](#)

[Save And Download App](#)

Start the sample application

Execute the following commands in the sample's directory:

```
npm install
npm start
```

[Next Steps](#)

Recent download history

01-login.zip
38.1 KB • Done

Application Details

DEVELOPMENT

Node.js (Express)

You're all set!

Your application **TYCS16_Test_App** is now secured with Auth0

Go To Application Settings

Having trouble?

- Download a sample app
- View the sample app code
- Read the documentation
- Ask the community
- Give us feedback

What's next?

- Require auth for specific routes
- Route customization
- Obtaining access tokens for external APIs
- Obtaining and using refresh tokens

Step-6: Now extract the app-> Open it and on terminal and type npm i and then npm start-? Click on the link-> Login-> Accept-> View your profile.

01-login

Name	Date modified	Type	Size
routes	25-03-2024 21:24	File folder	
views	25-03-2024 21:24	File folder	
.env	25-03-2024 21:24	ENV File	1 KB
package	25-03-2024 21:24	JSON Source File	1 KB
package-lock	25-03-2024 21:24	JSON Source File	101 KB
README	25-03-2024 21:24	Markdown Source ...	3 KB
server	25-03-2024 21:24	JavaScript Source ...	2 KB


```

npm start
Microsoft Windows [Version 10.0.22621.3296]
(c) Microsoft Corporation. All rights reserved.

C:\Users\YASH\OneDrive\Desktop\TYCS16\SEM 6\CLOUD COMPUTINNG\01-login\01-login>npm i
added 148 packages, and audited 149 packages in 4s
18 packages are looking for funding
  run 'npm fund' for details
1 moderate severity vulnerability

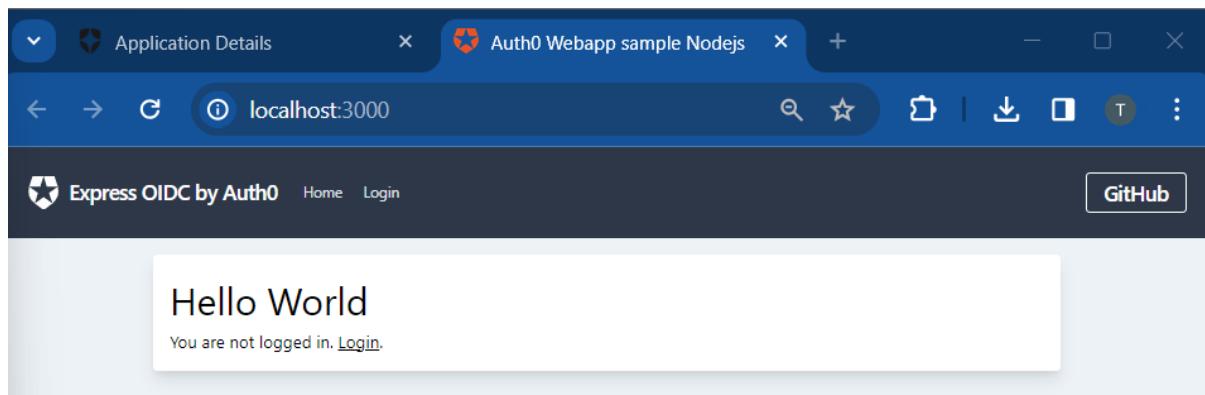
To address all issues, run:
  npm audit fix

Run 'npm audit' for details.
npm notice New minor version of npm available! 10.1.0 -> 10.5.0
npm notice Changelog: https://github.com/npm/cli/releases/tag/v10.5.0
npm notice Run npm install -g npm@10.5.0 to update!
npm notice

C:\Users\YASH\OneDrive\Desktop\TYCS16\SEM 6\CLOUD COMPUTINNG\01-login\01-login>npm run

C:\Users\YASH\OneDrive\Desktop\TYCS16\SEM 6\CLOUD COMPUTINNG\01-login\01>Login>npm start
> start
> node server.js

Using 'form_post' for response_mode may cause issues for you logging in over http, see https://github.com/auth0/express-openid-connect/blob/master/FAQ.md
[listening on http://localhost:3008]
```





Welcome

Log in to dev-shzfhiukp3p86udn to continue to
TYCS37_Test_App.

Email address

piyushsingh21-24@bhavans.ac.in

Password

.....



[Forgot password?](#)

[Continue](#)

Don't have an account? [Sign up](#)

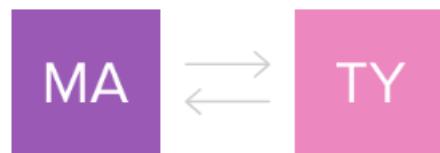
OR



[Continue with Google](#)



Authorize App



Hi mahikagupta21-24@bhavans.ac.in,

TYCS16_Test_App is requesting access to your dev-shzfhiukp3p86udn account.

- **Profile:** access to your profile and email

Decline

Accept

A screenshot of a web browser window. The address bar shows 'localhost:3000'. The main content area displays the 'Hello World' message from the application, along with the text 'You are logged in. [View your profile](#)'. The browser interface includes standard navigation buttons (back, forward, search, etc.) and a header with the Auth0 logo and links for Home, Profile, and Logout.

Welcome piyushsingh21-24@bhavans.ac.in

This is the content of req.user.

Note: _raw and _json properties have been omitted.

```
{
  "sid": "kYvvdznM6r-IrVcwBL62Qip-8YQ6F8br",
  "nickname": "mahikagupta21-24",
  "name": "mahikagupta21-24@bhavans.ac.in",
  "picture": "https://s.gravatar.com/avatar/fc3d09b9aee085ae785c3dec81573a1b?s=480&r=pg&d=https%3A%2F%2F",
  "updated_at": "2024-03-25T16:10:15.822Z",
  "email": "mahikagupta21-24@bhavans.ac.in",
  "email_verified": false,
  "sub": "auth0|6601a1e77e87f7a8c0a8978a"
}
```

Step-7: Now, go to Auth0 dashboard-> Activity and check the total users, applications, connections, logins and new sign-ups.

Total Users	Applications	APIs	Connections
1	2	0	0

Daily Active Users (0)

Last 30 Days

Feb 26 Mar 4 Mar 15 Mar 22 Mar 25



Step-8: For customization, go to Branding-> Universal login and change the front end as per your need. Put the favicon link on the company logo, select the colours and Save.

The screenshot shows the Auth0 dashboard with the URL `manage.auth0.com/dashboard/us/dev-shzfhliukp3p86udn/universal-login/customizations-new`. The left sidebar has a 'Branding' section selected. The main area is titled 'Universal Login' and contains a 'Quick Start' configuration panel. It includes fields for 'Company Logo' (with a placeholder 'Your logo URL'), 'Primary Color' (set to #635dff), and 'Page Background Color' (set to #000000). To the right, there is a preview window showing a login form with a red star icon and the specified colors. A success message at the bottom says 'Universal Login settings have been saved'.

Step-9: Now check the frontend. Go to terminal-> npm start-> Click on link-> Logout and login again-> view profile.

Welcome piyushsingh21-24@bhavans.ac.in

This is the content of `req.user`.
Note: `_raw` and `_json` properties have been omitted.

```
{
  "sid": "4Q58001K99YN28ugZh20TwTD884TspU0",
  "nickname": "mahikagupta21-24",
  "name": "mahikagupta21-24@bhavans.ac.in",
  "picture": "https://s.gravatar.com/avatar/fc3d09b9aee085ae785c3dec81573a1b?s=480&r=pg&d=https%3A%2F%2F
  "updated_at": "2024-03-25T16:22:11.530Z",
  "email": "mahikagupta21-24@bhavans.ac.in",
  "email_verified": false,
  "sub": "auth0|6001ale77e87f7a8c0a8978a"
}
```

Step-10: Close the server connection (CTRL+C in terminal) and check the Users Page.

```
C:\Windows\System32\cmd.exe + v
Microsoft Windows [Version 10.0.22621.3296]
(c) Microsoft Corporation. All rights reserved.

C:\Users\YASH\OneDrive\Desktop\TYCS16\SEM 6\CLOUD COMPUTINNG\01-login\01-login>npm start

> start
> node server.js

Using 'form_post' for response_mode may cause issues for you logging in over http, see https://github.com/auth0/express-openid-connect/blob/master/FAQ.md
Listening on http://localhost:3000
GET / 304 25.774 ms -
GET /profile 304 6.646 ms -
GET /logout 302 653.350 ms - 318
GET / 200 7.784 ms - 2504
GET /Login 302 6.337 ms - 754
POST /callback 302 721.631 ms - 86
GET / 200 3.795 ms - 2672
GET /profile 200 4.930 ms - 3631
^C^CTerminate batch job (Y/N)? y

C:\Users\YASH\OneDrive\Desktop\TYCS16\SEM 6\CLOUD COMPUTINNG\01-login\01-login>
```

Users

An easy to use UI to help administrators manage user identities including password resets, creating and provisioning, blocking and deleting users.
[Show more >](#)

Name	Connection	Logins	Latest Login	...
 mahikagupta21-24@bhavans.ac.in mahikagupta21-24@bhavans.ac.in	Username-Password-Authenti...	2	2 minutes ago	[...]

PRACTICAL 7**Aim:** User Management in Cloud.**Step-1:** Login in to <https://manage.auth0.com/>-> Applications-> APIs-> Create an API.

Go to its settings and toggle what's shown in the below screenshot-> Save.

The screenshot shows the Auth0 dashboard under the 'DEVELOPMENT' tab. On the left, there's a sidebar with various icons. In the center, there's a list of existing APIs, with one named 'Auth0 Managem...' visible. A large blue button at the top right says '+ Create API'. Below it, a modal window is open for creating a new API. The modal has fields for 'Name *' (containing 'TYCS21_API'), 'Identifier *' (containing 'http://localhost:3000'), and 'Signing Algorithm *' (set to 'RS256'). At the bottom of the modal are 'Cancel' and 'Create' buttons.

The screenshot shows the Auth0 API Management dashboard. At the top, there's a navigation bar with links for 'API Details', 'manage.auth0.com', 'dashboard', 'us/dev-j85wnfvrlsxlry/apis/6601a728875d42f76c3a343b/quicksart', 'Search', 'Discuss your needs', 'Documentation', and a user icon.

Quickstart Tab:

- 1. Choose a JWT library:** As your API will be parsing JWT formatted access tokens, you will need to setup these capabilities on your API. You can navigate to [jwt.io](#) and choose from there. Remember to pick a library that support your selected signing algorithm.
- 2. Configuring your API to accept RS256 signed tokens:** Configure the library that will validate the `access_tokens` in your API. Validating a token means that you are certain you can trust its contents.

Code snippets for C#, Node.js, and PHP are provided for configuration:

```

public class Startup
{
    public void ConfigureServices(IServiceCollection services)
    {
        services.AddMvc();

        // 1. Add Authentication Services
        services.AddAuthentication(options =>
        {
            options.DefaultAuthenticateScheme = JwtBearerDefaults.AuthenticationScheme;
            options.DefaultChallengeScheme = JwtBearerDefaults.DefaultChallengeScheme;
        });
    }
}

```

Settings Tab:

General Settings:

- Id:** 6601a728875d42f76c3a343b
- Name ***: TYCS37_Test_App
- Identifier:** http://localhost:3000

RBAC Settings:

- Enable RBAC:**
- If this setting is enabled, RBAC authorization policies will be enforced for this API. [Role](#) and permission assignments will be evaluated during the login transaction.
- Add Permissions in the Access Token:**
- If this setting is enabled, the Permissions claim will be added to the access token. Only available if RBAC is enabled for this API.

Step-2: Now give permission to the API. Go to the permissions tab under this newly created API-> Create a permission and add it.

TYCS37 Test App

Custom API Identifier <http://localhost:3000>

Permissions

Add a Permission

Define the permissions (scopes) that this API uses.

Permission *	Description *
Manage	The user can manage the data of this API

+ Add

List of Permissions

These are all the permissions that this API uses.

Permission	Description
Manage	The user can manage the data of this API

List of Permissions

These are all the permissions that this API uses.

Permission	Description
Manage	The user can manage the data of this API

Step-3: At the left Navbar, go to User Management-> Users-> Create a new user.

Users

An easy to use UI to help administrators manage user identities including password resets, creating and provisioning, blocking and deleting users. [Show more >](#)



You don't have any users yet.

All of your users will be found here, regardless of the authentication method they use to access your applications.

+ Create User

Step-4: For creation of user, click on create and fill the credentials for new user.

Create user

Email *

Password *

Repeat Password *

Connection *

Username-Password-Authentication

[Cancel](#) [Create](#)

The screenshot shows the Okta User Management interface. A user named "piyushsingh21-24@bhavans.ac.in" has been created. The "Details" tab is selected, displaying the user's name, email (pending), signed up date (March 25th 2024, 10:09:59 PM), primary identity provider (Database), latest login (Never), and accounts associated (None). The "Passkeys" section indicates that no passkeys have been created. The "Actions" dropdown menu is visible on the right.

Step-5: For viewing and assigning permissions to user, click on permission tab. Now, for assigning permission click on “Assign Permissions” and then enter the permission for selected user-> Add permission.

The screenshot shows the Okta User Management interface with the "Permissions" tab selected for the same user. The "Assign Permissions" button is highlighted. Below it, a table lists the user's current permissions, which are currently empty. The sidebar on the left shows various management options like Getting Started, Activity, Applications, Authentication, Organizations, and User Management.

Add Permissions

Select permissions from existing APIs

Select an API...

TYCS21_API
http://localhost:3000

Add Permissions

Select permissions from existing APIs

TYCS37_Test_App

Permissions Select: All | None Filter Permissions

Manage

Add Permissions

Getting Started Activity Applications Authentication Organizations User Management Users Roles Branding Security Actions Monitoring Marketplace

Back to Users piyushsingh21-24@bhavans.ac.in user_id: auth0|6601a8df7e87f7a8c0a8a975

Actions

Details Devices History Raw JSON Authorized Applications Permissions Roles

List of permissions this user has.

Name	Description	API	Assignment
Manage	The user can manage the data of this API	TYCS16_Test_App	Direct

Assign Permissions

Step-6: To create role, go to User Management-> Roles-> Create a new role-> Save.

Getting Started Activity Applications Authentication Organizations User Management Users Roles Branding Security Actions Monitoring Marketplace Extensions Settings

Back to Users piyushsingh21-24@bhavans.ac.in user_id: auth0|6601a8df7e87f7a8c0a8a975

Actions

Details Devices History Raw JSON Authorized Applications Permissions Roles

All Roles assigned to this User.

Name	Description	Assignment
There are no roles assigned to this user yet		

Assign Roles

New Role

Name *

Description *

CancelCreate

The screenshot shows a software application window titled "New Role". At the top right is a close button (X). Below it, there are two input fields: "Name *" containing "Project Manager" and "Description *" containing "Manages the project!". At the bottom are "Cancel" and "Create" buttons. The background shows a sidebar with sections like "Getting Started", "Activity", "Applications", "Authentication", "Organizations", "User Management" (selected), "Roles", "Branding", "Security", "Actions", "Monitoring", "Marketplace", and "Extensions". The main panel title is "Project Manager" with a "Role ID" of "ro1_g3VXJ82wTmBcQSHz". It has tabs for "Settings" (selected), "Permissions", and "Users". The "Settings" tab contains the same "Name" and "Description" fields as the modal. A "Save" button is at the bottom.

Step-7: Now for assigning the roles, go to your User Management-> Users-> Click on a particular user-> Come under the roles tab and assign role.

The screenshot shows the Auth0 dashboard with the URL manage.auth0.com/dashboard/us/dev-j85wnfvirsixry/users. On the left sidebar, under 'User Management', the 'Roles' option is selected. The main 'Users' page lists a single user named 'mahika@gmail.com'. Below the user list, a modal window titled 'Assign Roles' is open, prompting the user to 'Select roles to assign to this user. You may assign up to 50 roles per user.' A search bar shows the result 'Project Manager' with the description 'Manages the project'.

The screenshot shows the 'User Details' page for the user 'piyushsingh21-24@bhavans.ac.in'. The 'Actions' dropdown menu is open, displaying options: 'Send Verification Email', 'Change Email', 'Change Password', 'Block', and 'Delete'. The 'Delete' option is highlighted with a red border.

Step-8: For deletion or to block the user, click on actions tab and select the desired option.

This screenshot is identical to the previous one, showing the 'User Details' page for the user 'piyushsingh21-24@bhavans.ac.in'. The 'Actions' dropdown menu is open, and the 'Delete' option is clearly highlighted with a red border.

The user is successfully deleted.

Practical 8**Case study on Amazon EC2/Microsoft Azure/Google Cloud Platform****Abstract:**

Cloud computing has transformed the way organizations deploy, manage, and scale their IT infrastructure. This case study explores the adoption and implementation of cloud services provided by Amazon Web Services (AWS) Elastic Compute Cloud (EC2), Microsoft Azure, and Google Cloud Platform (GCP). Through a detailed analysis of their features, benefits, challenges, and real-world examples, this study illustrates the impact of cloud computing on modern businesses.

Introduction:

Amazon EC2, Microsoft Azure, and Google Cloud Platform (GCP) are leading providers of cloud computing services, offering a comprehensive suite of infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS) solutions. These cloud platforms enable organizations to access on-demand compute, storage, networking, and other resources, empowering them to innovate faster, reduce costs, and scale dynamically to meet evolving business needs.

Overview of Amazon EC2, Microsoft Azure, and Google Cloud Platform:

Amazon EC2: Amazon EC2 is a core component of AWS, offering resizable compute capacity in the cloud. EC2 instances enable users to launch virtual servers with various configurations, operating systems, and pricing options. AWS provides a wide range of instance types optimized for different workloads, along with additional services such as auto-scaling, load balancing, and virtual private cloud (VPC) for enhanced flexibility and scalability.

Microsoft Azure: Microsoft Azure is a comprehensive cloud computing platform that provides a diverse set of services, including compute, storage, databases, AI, and IoT. Azure Virtual Machines (VMs) offer scalable compute resources with support for Windows and Linux operating systems. Azure's integrated development tools, AI capabilities, and hybrid cloud solutions make it a popular choice for enterprise customers seeking to modernize their IT infrastructure and drive digital transformation initiatives.

Google Cloud Platform (GCP): Google Cloud Platform (GCP) offers a broad portfolio of cloud services, including compute, storage, databases, machine learning, and analytics. GCP's Compute Engine provides virtual machine instances with customizable configurations, advanced networking features, and integrated security.

controls. GCP's global infrastructure, innovative technologies, and commitment to sustainability attract organizations looking to leverage the power of the cloud for their business needs.

Case Study: Adoption of Cloud Computing at XYZ Corporation

XYZ Corporation, a global technology company, embarked on a journey to modernize its IT infrastructure and transition to the cloud to support its rapidly expanding business operations. Facing challenges with legacy on-premises infrastructure, limited scalability, and high operational costs, XYZ Corporation evaluated cloud offerings from Amazon EC2, Microsoft Azure, and Google Cloud Platform to address its requirements.

Objectives:

Enhance scalability and flexibility to support dynamic business growth.

Improve agility and accelerate time-to-market for new products and services.

Optimize operational efficiency and reduce infrastructure costs.

Strengthen security and compliance posture to protect sensitive data.

Solution:

After careful evaluation and comparative analysis, XYZ Corporation decided to adopt a multi-cloud strategy, leveraging services from Amazon EC2, Microsoft Azure, and Google Cloud Platform to achieve its objectives effectively.

Implementation Steps:

Assessment and Planning: XYZ Corporation conducted a comprehensive assessment of its existing infrastructure, applications, and workloads to identify migration priorities and dependencies. A detailed migration plan was developed, outlining the sequence of migrations, resource requirements, and risk mitigation strategies.

Migration and Deployment: The migration process involved lifting and shifting on-premises workloads to virtual machines on Amazon EC2, Microsoft Azure, and Google Cloud Platform. XYZ Corporation utilized migration tools, such as AWS Server Migration Service, Azure Migrate, and GCP's Migration Service, to streamline the migration process and minimize downtime.

Optimization and Governance: Post-migration, XYZ Corporation optimized its cloud environment by right-sizing instances, implementing cost management strategies, and optimizing resource utilization. Cloud governance policies and controls were established to govern access, security, and compliance across all cloud platforms.

Integration and Automation: XYZ Corporation integrated cloud services with its existing systems and workflows using APIs, SDKs, and automation tools. DevOps practices were adopted to automate provisioning, configuration management, and deployment processes, enabling continuous delivery and infrastructure as code (IaC).

Results:

Scalability and Flexibility: By leveraging cloud resources from Amazon EC2, Microsoft Azure, and Google Cloud Platform, XYZ Corporation achieved enhanced scalability and flexibility to meet fluctuating demand and support business growth initiatives.

Agility and Innovation: Cloud adoption enabled XYZ Corporation to accelerate innovation and shorten development cycles by providing developers with self-service access to scalable compute, storage, and development tools.

Cost Optimization: Through proactive cost management and optimization strategies, XYZ Corporation realized significant cost savings by optimizing resource usage, leveraging cost-effective pricing models, and eliminating upfront capital expenditures.

Enhanced Security and Compliance: By leveraging built-in security features and compliance certifications offered by Amazon EC2, Microsoft Azure, and Google Cloud Platform, XYZ Corporation strengthened its security posture and achieved regulatory compliance across its cloud environments.

Conclusion:

The adoption of cloud computing services from Amazon EC2, Microsoft Azure, and Google Cloud Platform has empowered organizations like XYZ Corporation to unlock new opportunities, drive innovation, and achieve operational excellence. By embracing a multi-cloud strategy and leveraging the unique capabilities of each cloud platform, organizations can effectively address their business requirements while mitigating risks and maximizing the benefits of cloud computing. As cloud technologies continue to evolve, organizations must remain agile and adaptable to capitalize on emerging trends and opportunities in the ever-changing landscape of cloud computing.

TYCS37

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