

NAME COLLEGE OF TECHNOLOGY, BHOPAL

DEPARTMENT OF INFORMATION TECHNOLOGY

LAB MANUAL

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Prepared By:

Approved By:

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List of Experiments

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2.	Service deployment & Usage over cloud.	
3.	Management of cloud resources.	
4.	Using existing cloud characteristics & Service models .	
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List of Experiments

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1.	Working of Goggle Drive to make spreadsheet and notes.	
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Experiment No. 1

Objective: Working of Goggle Drive to make spreadsheet and notes.

Requirement: Google account, Internet Connection.

THEORY:

Google Docs is a free cloud-based suite of tools for creating documents, spreadsheets, presentations, and more. This tutorial will cover the **Spreadsheets** application in Google Docs, in addition to showing you how to access and store your Docs from **Google Drive**.

Google Docs, Sheets, and Slides are productivity apps that let you create different kinds of online documents, work on them in real time with other people, and store them in your Google Drive online — all for free. You can access the documents, spreadsheets, and presentations you create from any computer, anywhere in the world. (There's even some work you can do without an Internet connection!) This guide will give you a quick overview of the many things that you can do with Google Docs, Sheets, and Slides.

Google Docs

Google Docs is an online word processor that lets you create and format text documents and collaborate with other people in real time. Here's what you can do with Google Docs:

- Upload a Word document and convert it to a Google document
- Add flair and formatting to your documents by adjusting margins, spacing, fonts, and colors — all that fun stuff
- Invite other people to collaborate on a document with you, giving them edit, comment or view access
- Collaborate online in real time and chat with other collaborators — right from inside the document
- View your document's revision history and roll back to any previous version
- Download a Google document to your desktop as a Word, OpenOffice, RTF, PDF, HTML or zip file
- Translate a document to a different language
- Email your documents to other people as attachments

Google Sheets

Google Sheets is an online spreadsheet app that lets you create and format spreadsheets and simultaneously work with other people. Here's what you can do with Google Sheets:

- Import and convert Excel, .csv, .txt and .ods formatted data to a Google spreadsheet
- Export Excel, .csv, .txt and .ods formatted data, as well as PDF and HTML files
- Use formula editing to perform calculations on your data, and use formatting make it look the way you'd like
- Chat in real time with others who are editing your spreadsheet
- Create charts with your data
- Embed a spreadsheet — or individual sheets of your spreadsheet — on your blog or website

Google Slides

Google Slides is an online presentations app that allows you to show off your work in a visual way. Here's what you can do with Google Slides:

- Create and edit presentations
- Edit a presentation with friends or coworkers, and share it with others effortlessly
- Import .pptx and .pps files and convert them to Google presentations
- Download your presentations as a PDF, a PPT, or a .txt file
- Insert images and videos into your presentation
- Publish and embed your presentations in a website

Create, name or delete a Google document

Create a Google document

To create a new document, go to your Drive, click the **Create** button, and select **Document**.

A window with a new Google document will open, and you'll be able to edit the document, share it with other people, and collaborate on it in real-time. Google Docs saves your document automatically, and you can always access it from your Drive.

Name a document

When you create a new document, Google Docs will name it **Untitled** by default.

To choose a name other than **Untitled**, click the **File** menu, and select **Rename**. From here you can choose and confirm your document's title. You can also edit the name by clicking the title displayed at the top of the page, and making your changes in the dialog that appears. Titles can be up to 255 characters long.

Delete a document

Delete an item that you own from your Drive

1. From your Drive, select the item(s) you want to delete.
2. From the **More** menu, choose **Move to trash**.
3. If you're deleting a shared document that you own, you'll see an option to change the ownership of the document.
4. The item will be moved to the **Trash**.
5. To purge individual items from Trash, select them and choose **Delete forever**. To purge all your items click **Empty Trash** in the upper left.

Create and save a document

There are different ways of getting started using Google documents: you can create a new online document, you can upload an existing one, or you can use a template from our templates gallery.

To create a new document, go to your Drive, click the red **Create** button, and select **Document** from the drop-down menu.

As soon as you name the document or start typing, Google Docs will automatically save your work every few seconds. At the top of the document, you'll see text that indicates when your document was last saved. You can access your document at any time by opening your Drive at <http://drive.google.com>.

To save a copy of a document to your computer, you can download it. In your document, go to the **File** menu and point your mouse to the **Download as** option. Select one of the following file types: HTML (zipped), RTF, Word, Open Office, PDF, and plain text. Your document will download to your computer.

Upload a document

You can upload existing documents to Google documents at any time. When you're uploading, you can either keep your document in its original file type or convert it to Google Docs format. Converting your document to Google Docs format allows you to edit and collaborate online from any computer.

Note: When uploaded, images within a document are left as images (rather than being converted to text by Optical Character Recognition technology).

You can upload the following file types:

- .html
- .txt
- .odt
- .rtf
- .doc and .docx
- .pdf

Follow these steps to upload a document:

1. Click the **Upload** icon in the top left of your Documents List.
2. Click **Files...**, and select the document you'd like to upload.
3. Click **Open**.
4. Check the box next to 'Convert documents, presentations, spreadsheets, and drawings to the corresponding Google Docs format' if you'd like to be able to edit and collaborate on the document online. Uploaded document files that are converted to Google documents format can't be larger than 1 MB.
5. Click **Start upload**. The uploaded file will appear in your Documents List.

Experiment No. 2

Objective: Installation and Configuration of Justcloud.

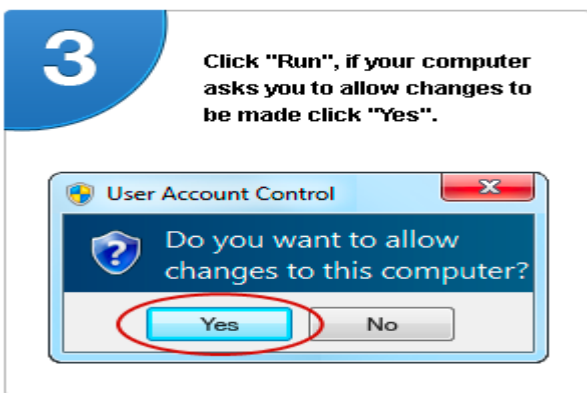
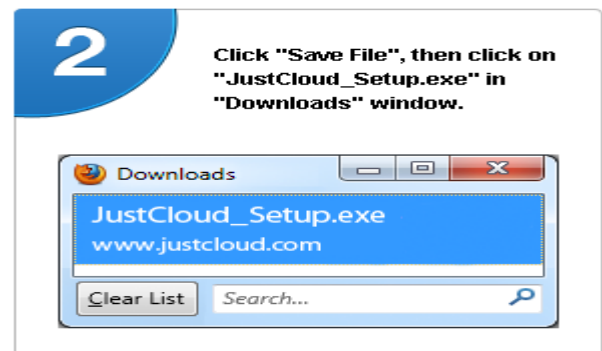
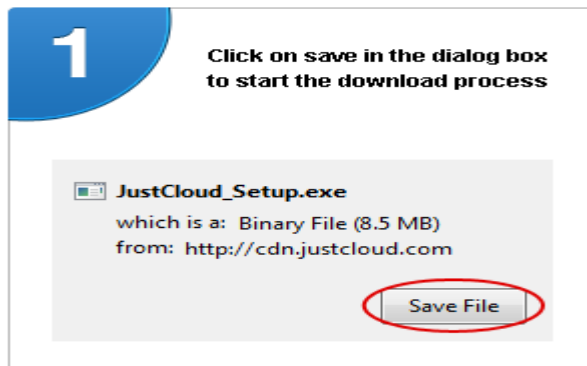
Requirement: Justcloud exe File

THEORY:

Professional Cloud Storage from JustCloud is Simple, Fast and Secure. Just Cloud will automatically backup the documents, photos, music and videos stored on your computer, to the cloud so you are never without files again.

Installation :

1. Download Software this link
<http://www.justcloud.com/download/>



2. By following these steps you will download and install the JustCloud software application on this computer. This software will automatically start backing up files from your computer and saving them securely in an online cloud user account. Your free account gives you 15MB storage space or 50 files for 14 days. Once installed a sync folder will be added to your desktop for you to easily drag and drop files you wish to backup.

Experiment No. 3

Objective: Working in Cloud9 to demonstrate different language.

Requirement: Login account in Cloud9

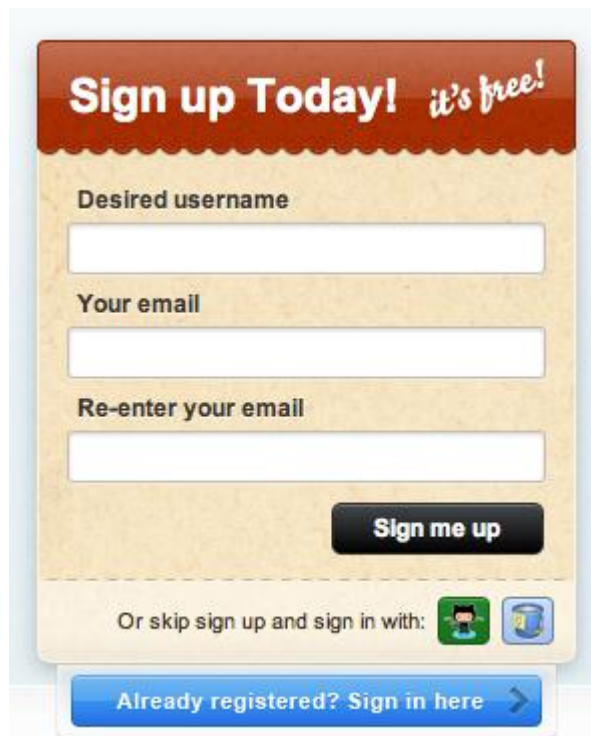
THEORY:

Cloud9 IDE is an online development environment for JavaScript and Node.js applications as well as HTML, CSS, PHP, Java, Ruby and 23 other languages. Anyone looking for a modern and secure IDE. With your code online and accessible from anywhere, you can work more efficiently than before.

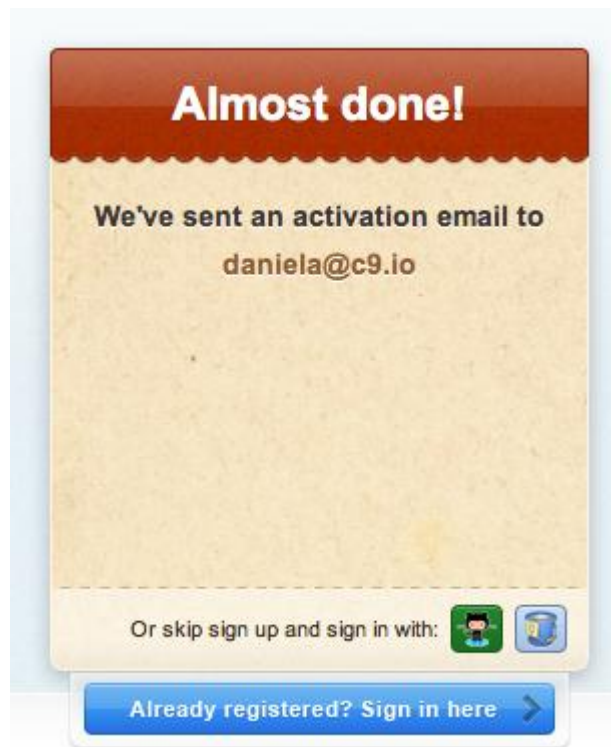
Creating a new account

Creating an account for the Cloud 9 IDE can be done in a few simple steps:

1. First, sign up for an account on the Cloud9 homepage, by filling in your desired username and email address and pressing the **Sign me up** button:

A screenshot of the Cloud9 sign-up form. At the top, a red banner with a scalloped edge contains the text "Sign up Today! it's free!". Below this, the form has three input fields: "Desired username", "Your email", and "Re-enter your email". A black button with white text "Sign me up" is positioned to the right of the email fields. Below the input fields, there is a link that says "Or skip sign up and sign in with:" followed by two small icons: a green one with a person and a blue one with a cloud. At the bottom, a blue button with white text "Already registered? Sign in here" and a right-pointing arrow is displayed.

You will then see a message indicating that we have sent you an email to the address you provided with activation instructions:



2. Check your email now. You will receive an email from us with a link to activate the account. Click on the link. You will now be asked to set a password for your new Cloud9 account:

3. Click on **Activate**.

Congratulations! You are now the proud owner of a Cloud9 account. Now, go ahead and create your first project.

Create a new project

The first step for creating a new project is to click on the "+" next to **My Projects** in the Projects tab:



At this point, you will encounter two choices: **Create a new project** and **Clone from url**. We will explore both paths.

After clicking on **Create a new project**, you will be presented with the screen shown below:

A screenshot of the 'Create a new project' dialog box. The dialog has a title bar 'Create a new project'. Below the title bar, there's a 'Project name:' field with the placeholder text 'Make sure it's awesome!'. Below the name field, there's a section 'Who will have access to this project?' with two radio buttons: 'Anyone' (selected) and 'Only the people I specify (Premium feature)'. Below this, there's a 'Project type:' section with four radio buttons: 'Git' (selected), 'Mercurial', 'FTP' (marked with a red 'beta' badge), and 'Dropbox' (marked with '* coming soon'). Below the project type section, there are two main options: 'Shared Development Server' and 'Your Dedicated Dev Server'. The 'Shared Development Server' option has a description: 'Run your hosted environment on one of our powerful and flexible shared servers. Free of charge!'. The 'Your Dedicated Dev Server' option has a description: 'Get your own Private Run Environment with full shell access and no security restrictions' and a dropdown menu labeled 'Select server type'. At the bottom right of the dialog, there are two buttons: 'CANCEL' and 'CREATE'.

Enter a project name. You will now have three choices for the type of project you wish to create:

- Git project: will allow you to run *git* commands from the console and push your changes to Github
- Mercurial: will allow you to run *hg* commands form the console and push your changes to Bitbucket.
- FTP: will allow you to upload your files directly to an FTP server you have access to.

Make a choice for the type of project and press **Create**. That is all! You will now see your new project in the dashboard:



Now, just click **Start Editing** to get started!

Let's start with a simple "Hello Cloud9" example.

1. From your dashboard, click 'create new workspace' and then select 'create new workspace'.
2. Enter a catchy workspace name, visibility: open (proud to share your creations), hosting: hosted and choose a 'custom' workspace type. Click 'create'.
3. The workspace is being prepared and when done, select the project in the dashboard and click 'start editing'.
4. The workspace is opened, right click the project tree and select 'new file'. Name it 'helloCloud9.cc'.
5. Open the file by double clicking it in the file tree. Copy / paste the following code in the file:

```
int main() {  
  
    cout << "Hello world\n";  
  
}
```

6. Compile the code using:

```
g++ helloCloud9.cc -o helloCloud9
```

7. Run the file by typing:

```
./helloWorld
```

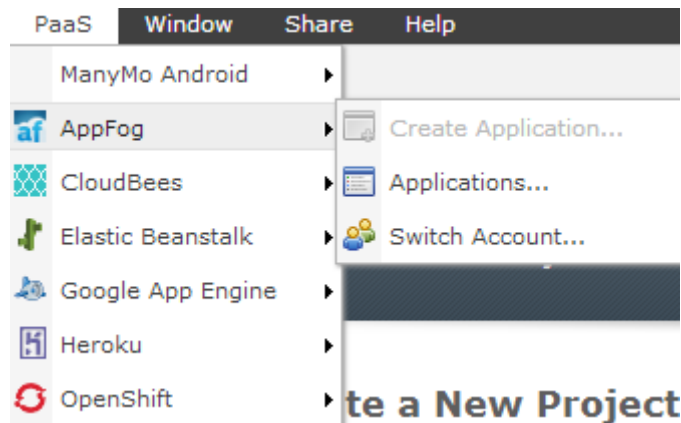
Experiment No. 4

Objective: Working in Codenvy to demonstrate Provisioning and Scaling of a website.

Requirement: Login account in Codenvy, Cloud Bees.

THEORY:

PaaS Overview



One of the advantages of coding in the cloud with Codenvy is deploying to a PaaS of choice once the app has been built, run and tested in Codenvy. Users do not need to install any plugins or administer their workspaces in any way. Codenvy talks to API of most popular PaaS providers. Currently, the following PaaS are supported:

- AppFog
- CloudBees
- AWS Elastic Beanstalk
- Google App Engine
- Heroku
- Openshift
- ManyMo (to run Android apps)









The mechanism of deploying, updating and configuring apps slightly differs depending on the chosen PaaS provider. To be able to deploy to a PaaS authentication is required (**Login** or **Switch Account** in PaaS menus). Codenvy will handle connection to a PaaS account, retrieving information on existing apps and providing tools to manage them.

Some providers will require deploy of SSH keys and git operations to update the apps (Heroku, OpenShift), while others (GAE, AWS) make it possible to update apps in one click.

When deploying an application, it is created in Codenvy and then deployed to a PaaS. OpenShift is an exception from this rule – the application is created there and then pulled to a Codenvy workspace.

It is possible to import existing apps deployed to some PaaS (Heroku) or overwrite existing applications (Google App Engine).

You can find detailed how-to guides on how to get started with PaaS in Codenvy in a PaaS menu on the left sidebar. Check out PaaS support chart:

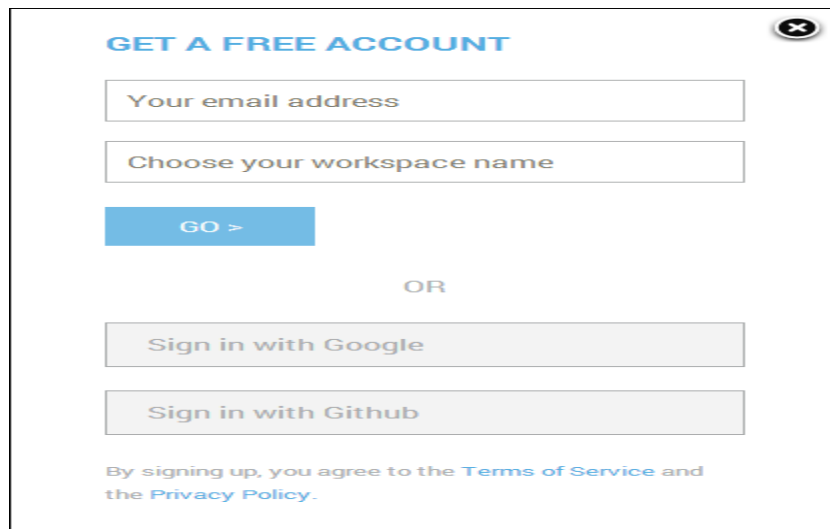
PaaS	Languages	Features	Cloud SDK Run
	Java	Application management EC2 and S3 console	Yes
	Java, PHP, Python, Ruby	Manage applications	No
	Java, Ruby	Manage applications	Yes - Micro Cloud Foundry
	Java	Manage applications	No
	Java Python PHP (app IDs need to be whitelisted at GAE)	Application management, Logs, Indexes, Pagespeed, Queues, DoS, Resource Limits, Crons, Backends	Yes
	Ruby	Manage applications	No
	Java, PHP, Ruby, Python, Node.js	Manage applications	No
	Java, Ruby	Manage applications	

Registration and Login

There are several registration options available in Codenvy:

- The fastest and the easiest way is to register using your **Google** or **GitHub** account. Click Sign in with Google or GitHub and follow the registration process. Your Codenvy workspace name will be identical to your Google or GitHub ID. Note that you will need a verified email associated with your GitHub account.

- If you do not have accounts with Gmail or GitHub or just want to choose a domain name by yourself, enter your email and the desired domain name, and press *Go*.



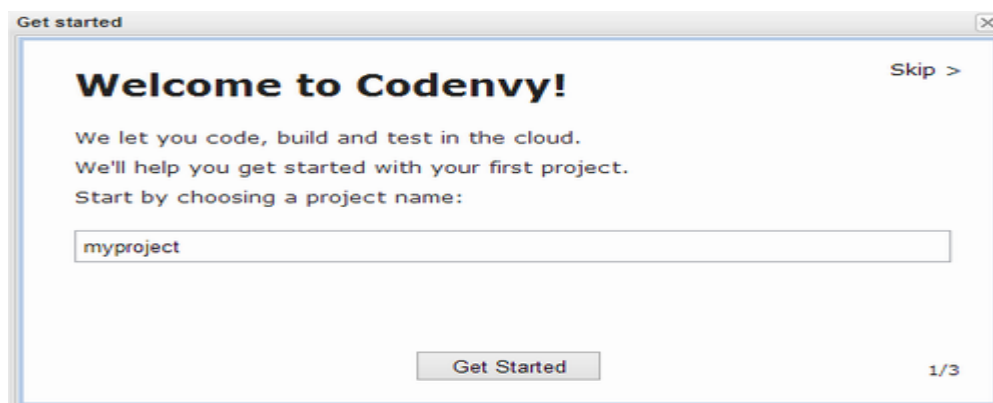
The screenshot shows a web form titled "GET A FREE ACCOUNT" with a close button in the top right corner. The form contains two input fields: "Your email address" and "Choose your workspace name". Below these fields is a blue button labeled "GO >". Underneath the button is the word "OR". Below "OR" are two buttons: "Sign in with Google" and "Sign in with Github". At the bottom of the form, there is a line of text: "By signing up, you agree to the [Terms of Service](#) and the [Privacy Policy](#)."

Getting Started Using Codenvy Factories

You can find Codenvy Factory buttons at his site, Codenvy.com or anywhere on the net. If you click on a Factory button, we will create a temporary workspace for you with the project of your choice. After a fruitful coding session in a temporary workspace you can create a permanent account with Codenvy by pressing Create Account button in the top right corner of a temporary workspace.

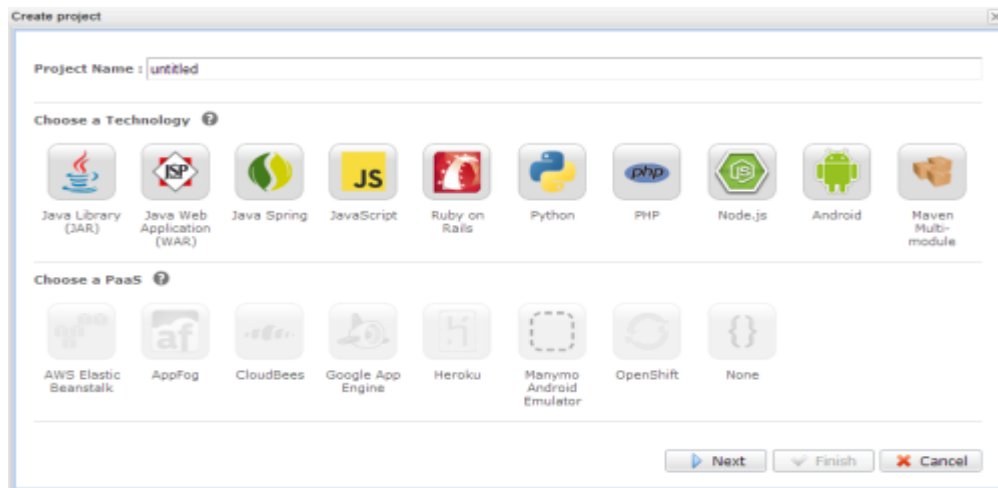
Create a Project from Scratch

Once logged in to Codenvy, the **Welcome Screen** and **Get Started Wizard** will help you make your first steps. If this is your first visit to Codenvy and you do not have any created projects, you will see the below window. Creation of a new project will barely take 1-2 minutes, and the wizard will guide your through each step (entering project name, choosing a technology and PaaS).



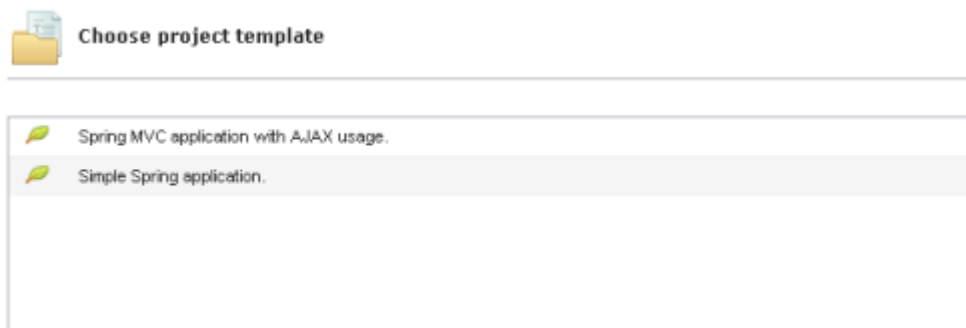
The screenshot shows a window titled "Get started" with a close button in the top right corner. The main heading is "Welcome to Codenvy!". Below the heading is a "Skip >" link. The text reads: "We let you code, build and test in the cloud. We'll help you get started with your first project. Start by choosing a project name:". Below this text is an input field containing the text "myproject". At the bottom center is a button labeled "Get Started". In the bottom right corner, it says "1/3".

You can also create a new project from the **Welcome Screen - Create a New Project From Scratch**



A Smart Wizard will guide you through the process of creating your project. You need to choose a **Technology** and the supported **PaaS** in case you want to deploy your application. Each technology is tied up with the supported PaaS, thus, making your choice error-free.

- To complete a project creation procedure, choose a **Template** (there are several templates to choose from, depending on the chosen technology and PaaS).



The next stages depend on whether or not you want to deploy your application to PaaS right way, and what PaaS you have chosen.

Please, have a quick look at the video demonstrating a new user friendly Create a Project Wizard.

Import GitHub Projects

Importing a project from GitHub will create a new project and by clone the content of a GitHub repository. You will find a GitHub import option on the Welcome Screen



Import from GitHub

Enter your GitHub account name to import your projects.

- Click **OK** to go to a GitHub authorization page.
- authorize the app

Authorize cloud-ide.int?

The app **cloud-ide.int** will be able to:

- Read your public information.
- Update your user profile.
- Update your public **and private** repositories (Commits, Issues, etc).

Authorize app **Deny**

- Choose the repository you want to import (check Git Read-Only if necessary) and click **Finish**

Load project

Import from GitHub
Import your project from GitHub to Codenvy

gae4younew	
gaegwt	
gaetest	
gitapp	null
github	git appfog
googlerepo	
jrebel1	

Name





☒ Git Read-Only

Cancel **Finish**


Device Support

Codenvy currently supports all desktop and laptop devices. We currently provide touch device support through the use of the Puffin Web Browser which virtualizes double clicks and right clicks. We have not yet created a native touch UI design.


Browser Support

Browser	Version
Chrome 	21+
Firefox 	15+
Safari 	5.1+
Puffin Browser 	2.4+

Web Server Support

Web Server	Version
Apache Tomcat 	7.0.39

Build Environment Support

Build System	Version
	3.0.4








Version Control System Support


Version Control System	Version
	1.6

Git Hosting Provider Support

Provider	Homepage	Tutorial Link
Assembla	https://www.assembla.com/	Assembla
Beanstalk	http://beanstalkapp.com/	Beanstalk
BitBucket	https://bitbucket.org/	BitBucket
CloudForge	http://www.cloudforge.com/	CloudForge
Codebase	http://www.codebasehq.com/	Codebase
Codeplane	https://codeplane.com/	Codeplane
Codespaces	http://www.codespaces.com/	Codespaces
Deveo	https://deveo.com/	Deveo
GitEnterprise	http://www.gitenterprise.com/	GitEnterprise
GitHub	https://github.com/	GitHub
GitLab	http://gitlab.com/	GitLab
Gitorious	https://gitorious.org/	Gitorious
PHPCloud	http://www.phpcloud.com/	PHPCloud
PikaCode	https://pikacode.com/	PikaCode
Planio	https://plan.io/	Planio
ProjectLocker	http://projectlocker.com/	ProjectLocker
Unfuddle	https://unfuddle.com/	Unfuddle

Language Support

Language	Version	Syntax coloring	Code outline	Code assistant	Error detection	Cloud local run	Debug mode
 CSS	2.0	Yes	No	Yes	No	Preview	-----
 HTML	4.1	Yes	Yes	Yes	Yes	Preview	-----
 Java	1.6 (runner and autocomplete)	Yes	Yes	Yes	Yes	Yes	Yes
JavaScript  JS	Standard ECMA-262	Yes	Yes	Yes	Yes	No	No
 php	5.3	Yes	Yes	No	No	Yes	No
python 	2.7 (for runner only)	Yes	No	No	No	Yes	No
 Ruby	1.9.2	Yes	Yes	Yes	No	No	No

Language	Version	Syntax coloring	Code outline	Code assistant	Error detection	Cloud local run	Debug mode
	1.0	Yes	Yes	Yes	Yes	----	----

Framework Support

Framework Version Access

Templates



Project 1) Simple Android application



2.1

Project

- 1) Google App Engine Java project that uses the Search API
- 2) Java Web project
- 3) A demonstration of accessing Amazon S3 buckets and objects using the AWS Java SDK



0.4.12

Project 1) Simple Node.js project



1.8

Project

- 1) Simple Ruby on Rails application. v1.9
- 2) Simple Ruby on Rails application. v1.8 (Heroku compatible)











All versions

Project

- 1) Simple Spring application
- 2) Spring MVC application with AJAX usage

PaaS Support

PaaS	Languages	Features	Cloud SDK Run
	Java	Application management EC2 and S3 console	Yes
	Java, PHP, Python, Ruby	Manage applications	No
	Java, Ruby	Manage applications	Yes - Micro Cloud Foundry
	Java	Manage applications	No
	Java Python PHP (app IDs need to be whitelisted at GAE)	Application management, Logs, Indexes, Pagespeed, Queues, DoS, Resource Limits, Crons, Backends	Yes
	Ruby	Manage applications	No

PaaS	Languages	Features	Cloud SDK Run
	Java, PHP, Ruby, Python, Node.js	Manage applications	No
	Java, Ruby	Manage applications	

URL Format for Workspaces, Projects and Files

Every Codenvy user has a domain, also called a workspace.

```
https://codenvy.com/ide/[workspace name]
```

Each workspace contains projects that also have their urls:

```
https://codenvy.com/ide/[workspace name]/[project name]
```

While projects have their files:

```
https://codenvy.com/ide/[workspace name]/[project name]/[file name]
```

However, these URL are not displayed in a browser's address bar. In other words, even if you go to

```
codenvy.com/ide/workspace/project/file
codenvy.com/ide/workspace/
```

although the target file will be opened. The same concerns project URL.

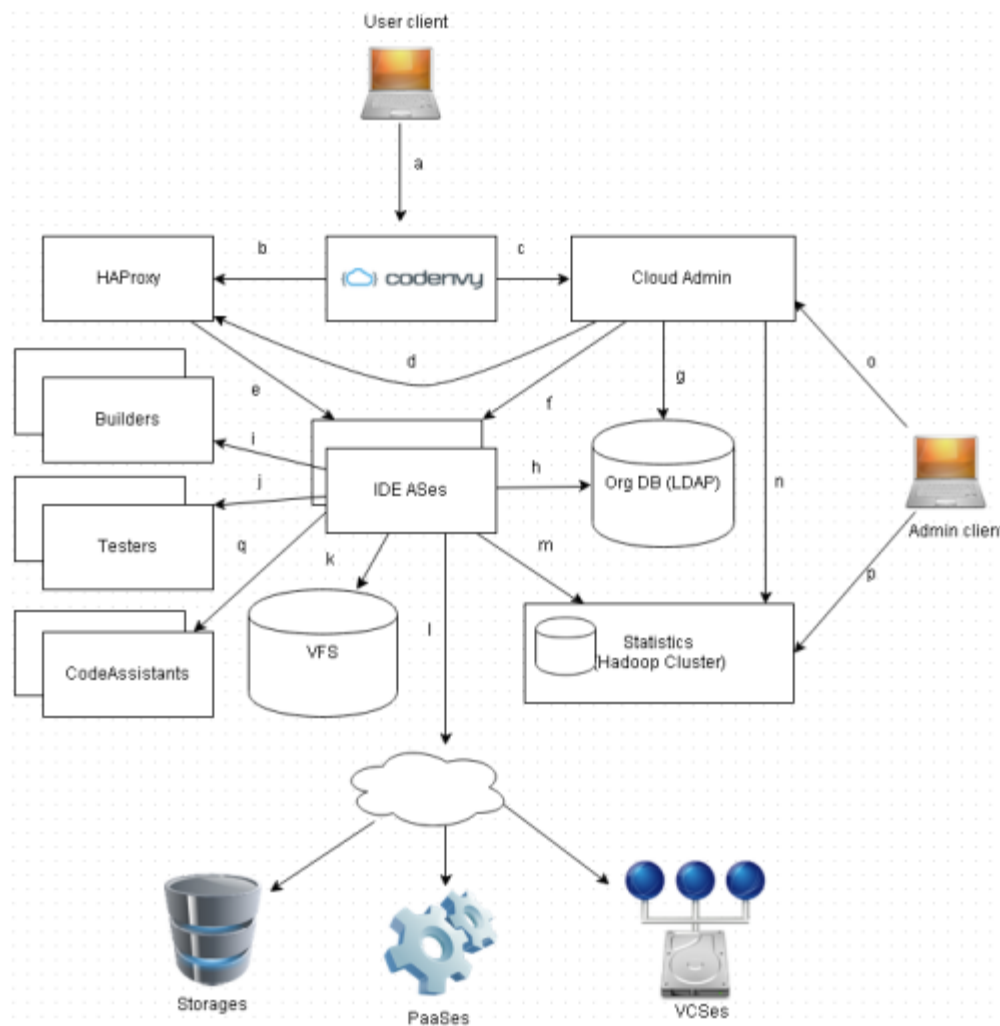
Before July 9, 2013, domain names were added as subdomains to codenvy.com, e.g.

```
https://johnsmith.codenvy.com
```

Such an address will be automatically redirected to

```
https://codenvy.com/ide/johnsmith
```

Architecture



Index

Explanation

- a The client's browser loads Codenvy site and makes a request. There are two basic types of client requests: regular (business logic) and meta
- b The request is recognized as a regular and load balancer (HAProxy) routes it accordingly
- c Request is recognized as meta, so Cloud Admin performs some special actions like tenant creating/removing
- d While performing meta request Cloud Admin may change the configuration of HAProxy
- e Business request is routed to the IDE Application dynamically deployed on one of the Application Servers
- f While performing meta request Cloud Admin may use internal REST request to the Cloud Agent located on one of the Application Servers with IDE Application or create/remove AS according to scalability rules
- g Some kinds of meta requests, such as Authentication, call Organization DB located on LDAP server and containing information about Users, Workspaces and other business entities

Index	Explanation
h	IDE calls Organization DB
i	IDE calls internal services - Builder (for Java apps)
j	IDE calls internal services - Testers (Debuggers) (for Java apps)
k	IDE uses a Distributed Storage (GlusterFS) via Virtual File System interface
l	IDE calls external PaaSes/Storages and VCSes REST API
m	Statistics storage retrieves logs from the applications for further analysis
n	Request to the Cloud Admin impacts service's statistical information stored in Hadoop Cluster
o	Administrative client manages Cloud Admin
p	Manager requests Statistical storage for service metrics through a dedicated Administrative client
q	IDE calls internal services - Code Assistants

Experiment No. 5

Objective: Installation and Configuration of Hadoop/Eucalyptus.

Requirement: . Java 1.6, Eclipse Europa 3.3.2, Cygwin.

THEORY:

Hadoop is a powerful framework for automatic parallelization of computing tasks. Unfortunately programming for it poses certain challenges. It is really hard to understand and debug Hadoop programs. One way to make it a little easier is to have a simplified version of the Hadoop cluster that runs locally on the developer's machine. This tutorial describes how to set up such a cluster on a computer running Microsoft Windows. It also describes how to integrate this cluster with Eclipse, a prime Java development environment.

Prerequisites

Before we begin, make sure the following components are installed on your workstation:

- Java 1.6
- Eclipse Europa 3.3.2

This tutorial has been written for and tested with Hadoop version **0.19.1**. If you are using another version, some things may not work.

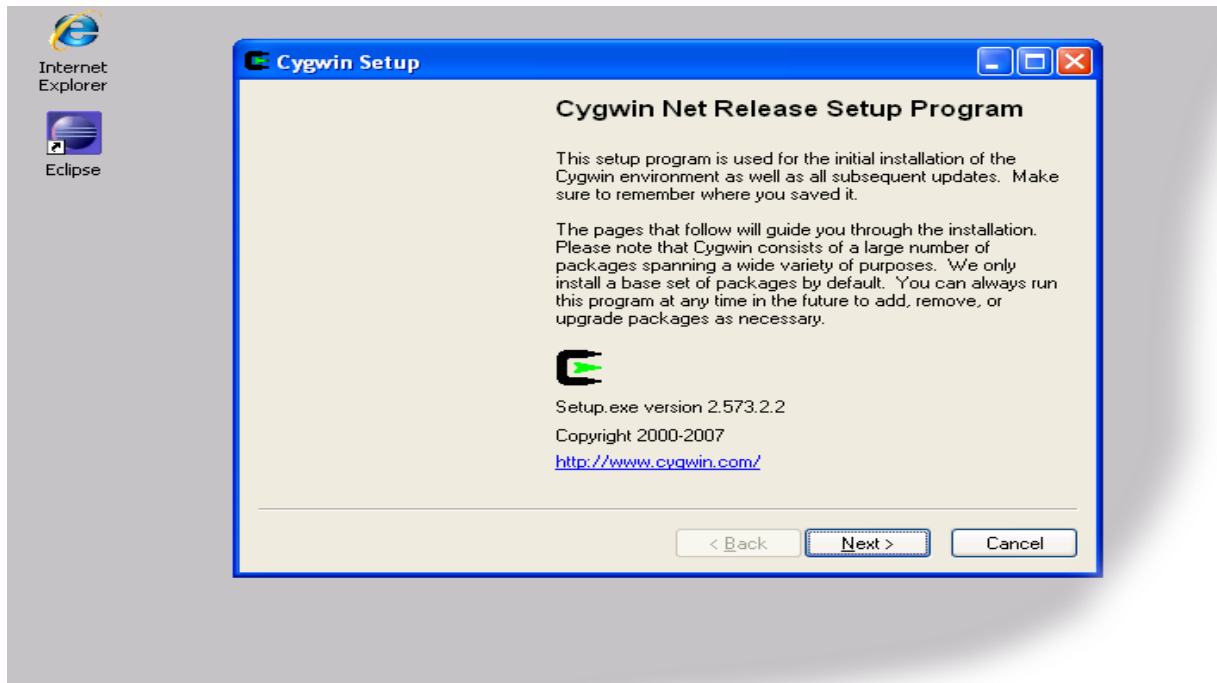
Make sure you have exactly the same versions of the software as shown above. Hadoop will not work with versions of Java earlier than 1.6 and versions of Eclipse later than 3.3.2 due to plug-in API incompatibility.

Installing Cygwin

After installing the prerequisite software, the next step is to install the Cygwin environment. Cygwin is a set of Unix packages ported to Microsoft Windows. It is needed to run the scripts supplied with Hadoop because they are all written for the Unix platform.

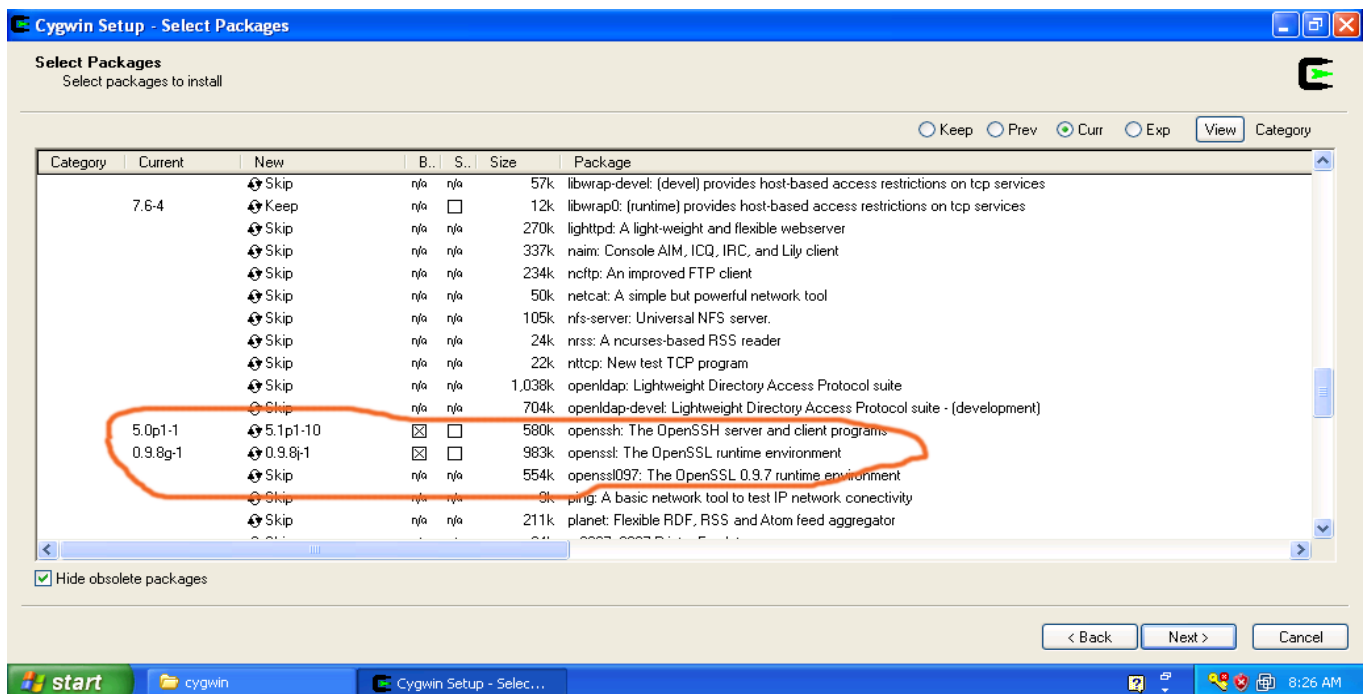
To install the cygwin environment follow these steps:

1. Download cygwin installer from <http://www.cygwin.com>.
2. Run the downloaded file. You will see the window shown on the screenshots below.



Cygwin Installer

- When you see the above screenshot, keep pressing the 'Next' button until you see the package selection screen shown below. Make sure you select 'openssh'. This package is required for the correct functioning of the Hadoop cluster and Eclipse plug-in.



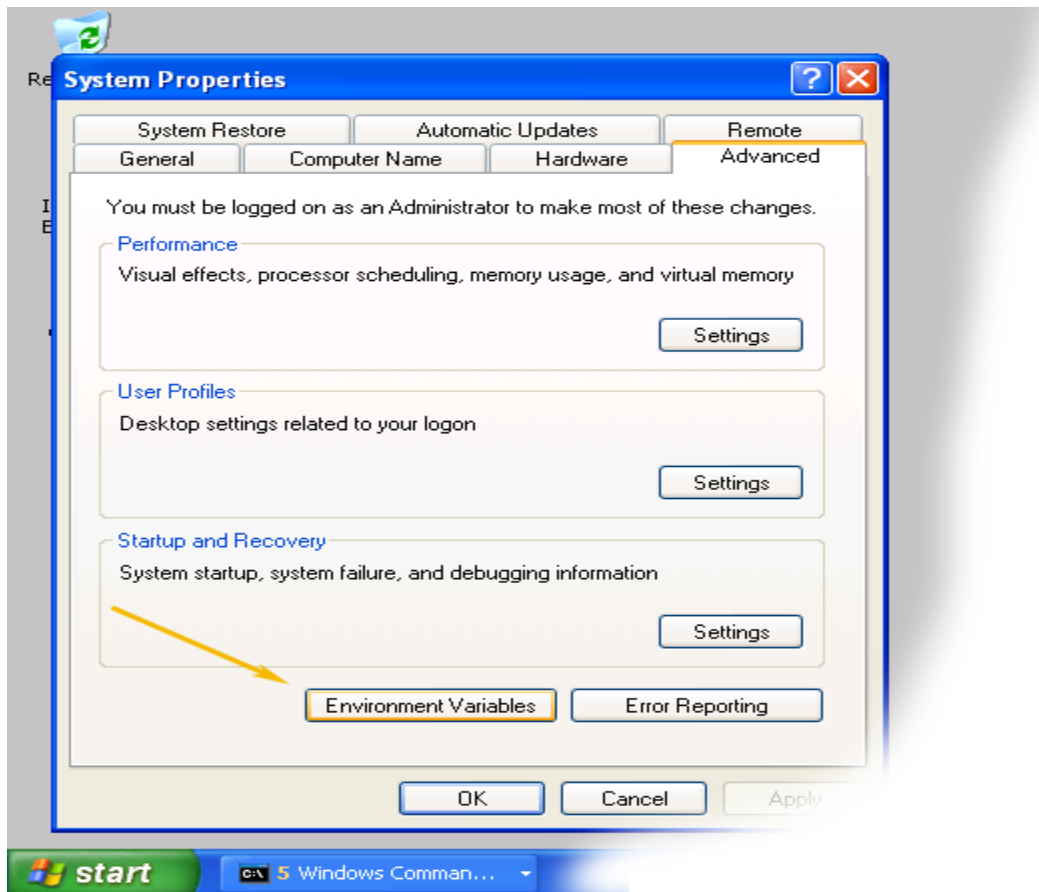
- After you selected these packages press the 'Next' button to complete the installation.

Set Environment Variables

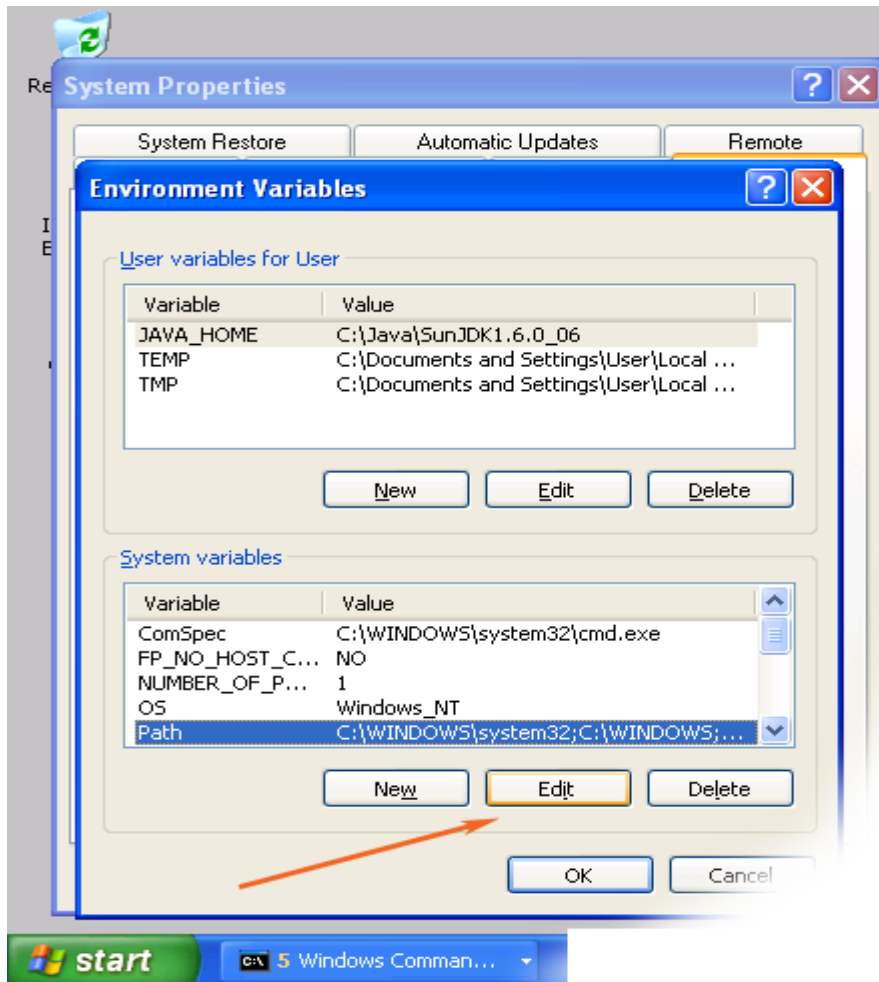
The next step is to set up the PATH environment variable so that Eclipse IDE can access Cygwin commands here

To set environment variables follow these steps:

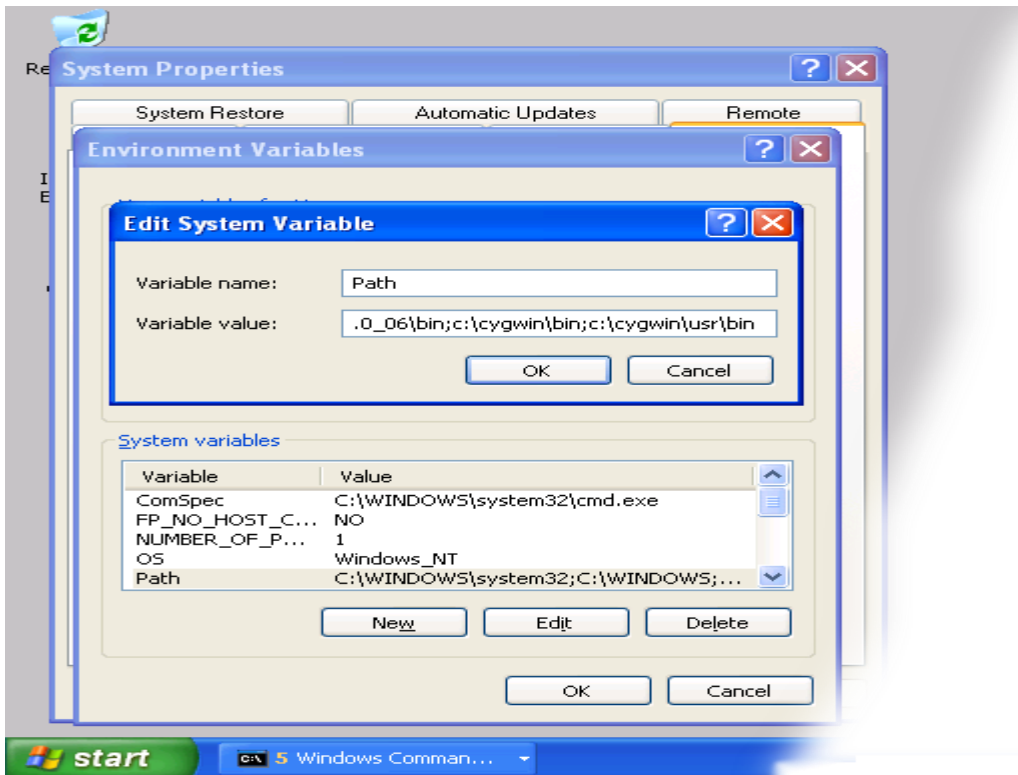
1. Find "My Computer" icon either on the desktop or in the start menu, right-click on it and select *Properties* item from the menu.
2. When you see the Properties dialog box, click on the *Environment Variables* button as shown below



3. When *Environment Variables* dialog shows up, click on the *Path* variable located in the *System Variables* box and then click the *Edit* button.



4. When *Edit* dialog appears append the following text to the end of the *Variable value* field:
`;c:\cygwin\bin;c:\cygwin\usr\bin`



Note: If you installed cygwin in the non-standard location, correct the above value accordingly.

5. Close all three dialog boxes by pressing OK button of each dialog box.

Setup SSH daemon

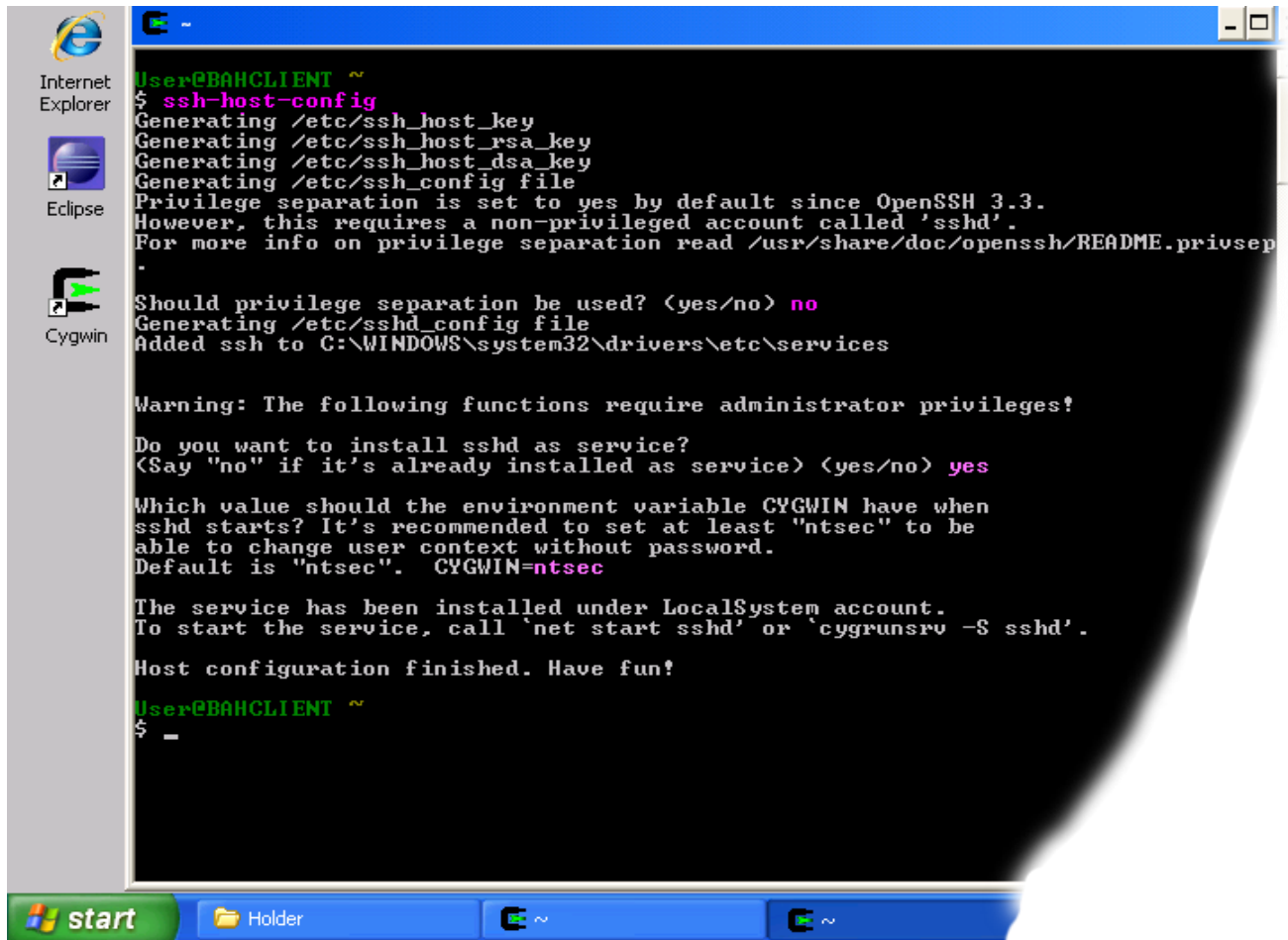
Both Hadoop scripts and Eclipse plug-in need password-less SSH to operate. This section describes how to set it up in the Cygwin environment.

Configure ssh daemon

1. Open the Cygwin command prompt.
2. Execute the following command:

```
ssh-host-config
```

3. When asked if privilege separation should be used, answer **no**.
4. When asked if sshd should be installed as a service, answer **yes**.
5. When asked about the value of CYGWIN environment variable, enter **ntsec**.
6. Here is an example session of this command. Note that the input typed by the user is shown in pink and output from the system is shown in gray.



```
User@BAHCLIENT ~
$ ssh-host-config
Generating /etc/ssh_host_key
Generating /etc/ssh_host_rsa_key
Generating /etc/ssh_host_dsa_key
Generating /etc/ssh_config file
Privilege separation is set to yes by default since OpenSSH 3.3.
However, this requires a non-privileged account called 'sshd'.
For more info on privilege separation read /usr/share/doc/openssh/README.privsep
.
Should privilege separation be used? <yes/no> no
Generating /etc/sshd_config file
Added ssh to C:\WINDOWS\system32\drivers\etc\services

Warning: The following functions require administrator privileges!

Do you want to install sshd as service?
<Say "no" if it's already installed as service> <yes/no> yes

Which value should the environment variable CYGWIN have when
sshd starts? It's recommended to set at least "ntsec" to be
able to change user context without password.
Default is "ntsec". CYGWIN=ntsec

The service has been installed under LocalSystem account.
To start the service, call 'net start sshd' or 'cygrunsrv -S sshd'.

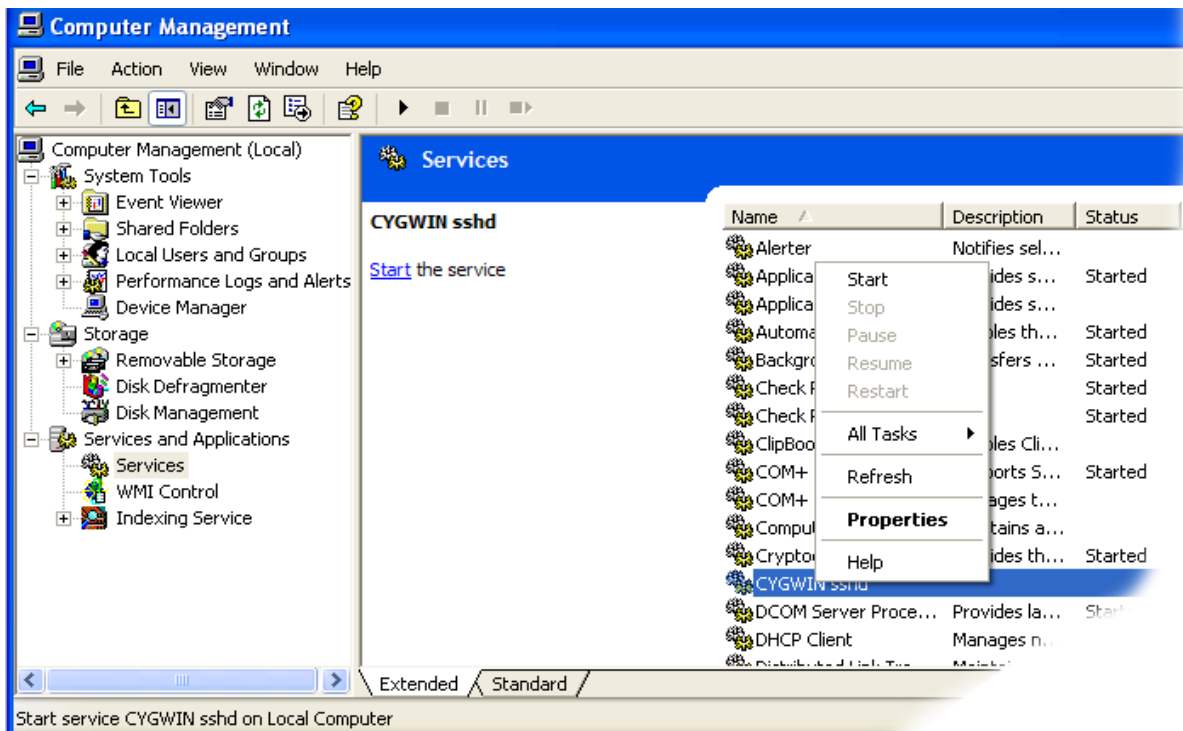
Host configuration finished. Have fun!

User@BAHCLIENT ~
$
```

Example of using ssh-host-config

Start SSH daemon

1. Find *My Computer* icon either on your desktop or in the start-up menu, right-click on it and select **Manage** from the context menu.
2. Open **Services and Applications** in the left-hand panel then select the *Services* item.
3. Find the **CYGWIN sshd** item in the main section and right-click on it.
4. Select **Start** from the context menu.



Start SSHD service

- A small window should pop-up indicating the progress of the service start-up. After that window disappears the status of CYGWIN sshd service should change to **Started**.

Setup authorization keys

Eclipse plug-in and Hadoop scripts require ssh authentication to be performed through authorization keys rather than passwords. The following steps describe how authorization keys are set up.

1. Open cygwin command prompt
2. Execute the following command to generate keys

```
ssh-keygen
```

3. When prompted for filenames and pass phrases press ENTER to accept default values.
4. After the command has finished generating keys, enter the following command to change into your .ssh directory:

```
cd ~/.ssh
```

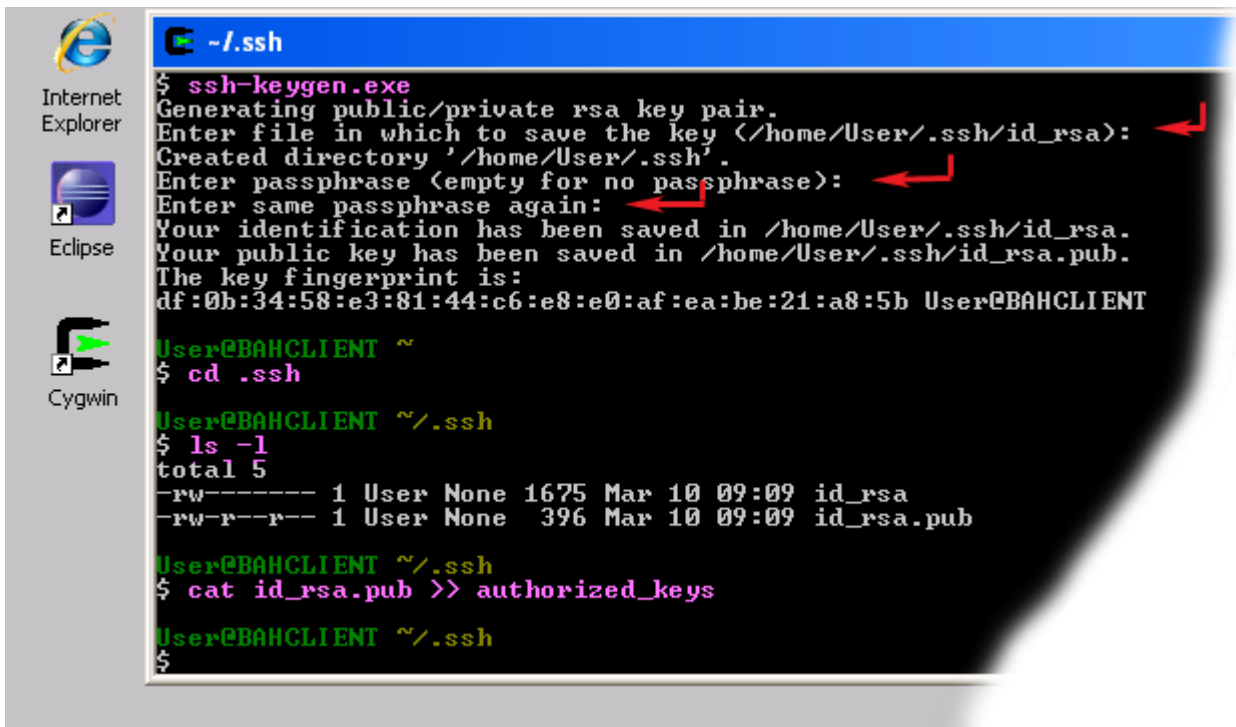
5. Check if the keys were indeed generated by executing the following command:

```
ls -l
```

You should see two files *id_rsa.pub* and *id_rsa* with recent creation dates. These files contain authorization keys.

6. To register the new authorization keys enter the following command (note the sharply-angled double brackets -- they are very important):

cat id_rsa.pub >> authorized_keys



```
~/.ssh
$ ssh-keygen.exe
Generating public/private rsa key pair.
Enter file in which to save the key (/home/User/.ssh/id_rsa):
Created directory '/home/User/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/User/.ssh/id_rsa.
Your public key has been saved in /home/User/.ssh/id_rsa.pub.
The key fingerprint is:
df:0b:34:58:e3:81:44:c6:e8:e0:af:ea:be:21:a8:5b User@BAHCLIENT
User@BAHCLIENT ~
$ cd ~/.ssh
User@BAHCLIENT ~/.ssh
$ ls -l
total 5
-rw----- 1 User None 1675 Mar 10 09:09 id_rsa
-rw-r--r-- 1 User None 396 Mar 10 09:09 id_rsa.pub
User@BAHCLIENT ~/.ssh
$ cat id_rsa.pub >> authorized_keys
User@BAHCLIENT ~/.ssh
$
```

Setting up authorization keys

7. Now check if the keys were set up correctly by executing the following command:

ssh localhost

Since it is a new ssh installation, you will be warned that authenticity of the host could not be established and will be asked whether you really want to connect. Answer *yes* and press ENTER. You should see the Cygwin prompt again, which means that you have successfully connected.

8. Now execute the command again:

ssh localhost

This time you should not be prompted for anything.

Download, Copy and Unpack Hadoop

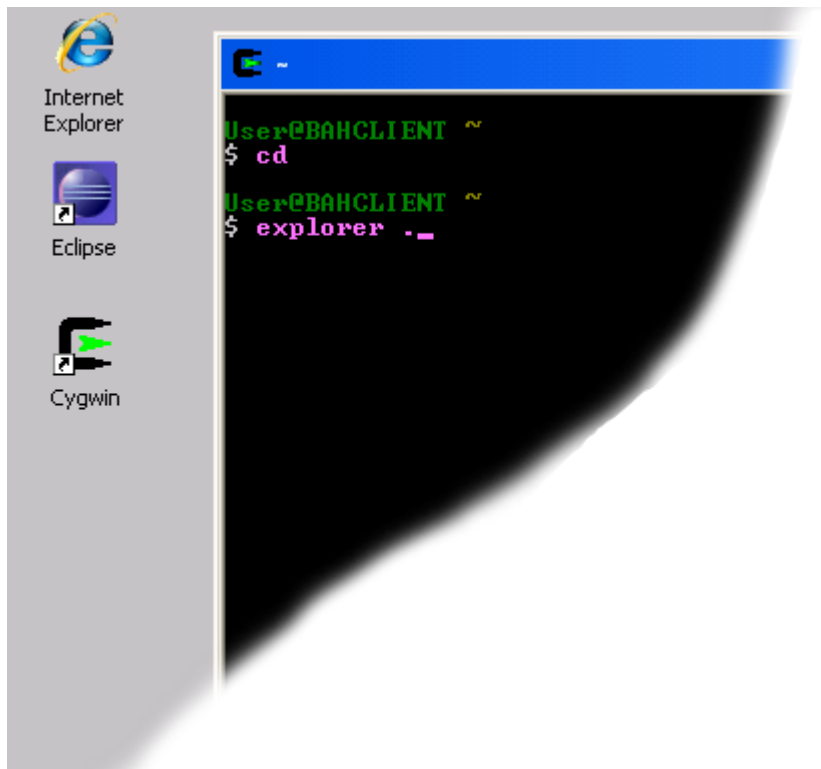
The next step is to download and copy the Hadoop distribution.

1. Download hadoop 0.19.1 and place in some folder on your computer such as *C:\Java*.
2. Open Cygwin command prompt.
3. Execute the following command:

```
cd
```

4. Execute the following command to enable your home directory folder to be shown in the Windows Explorer window:

```
explorer .
```



5. Open another Explorer window and navigate to the folder that contains the downloaded Hadoop archive.
6. Copy the Hadoop archive into your home directory folder.

Unpack Hadoop Installation

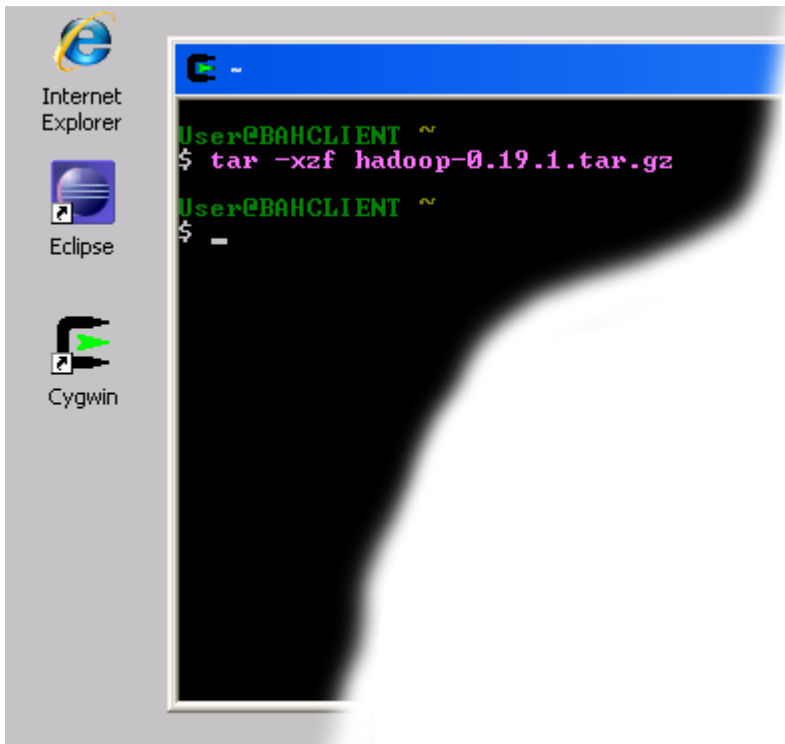
The next step is to unpack the downloaded and copied package.

To unpack the package follow these steps:

1. Open a new Cygwin window.
2. After the new Cygwin window appears, execute the following command:

```
tar -xzf hadoop-0.19.1.tar.gz
```

This will start unpacking the Hadoop distribution. After several minutes you should see a new Cygwin prompt again as shown in the screenshot below:



3. When you see the new prompt, execute the following command:

```
ls -l
```

This command will list the contents of your home directory. You should see a newly created directory called *hadoop-0.19.1*

4. Next execute the following commands:

```
cd hadoop-0.19.1  
ls -l
```

If you get output similar to the following, everything was unpacked correctly and you can go to the next step.

```
total 4145

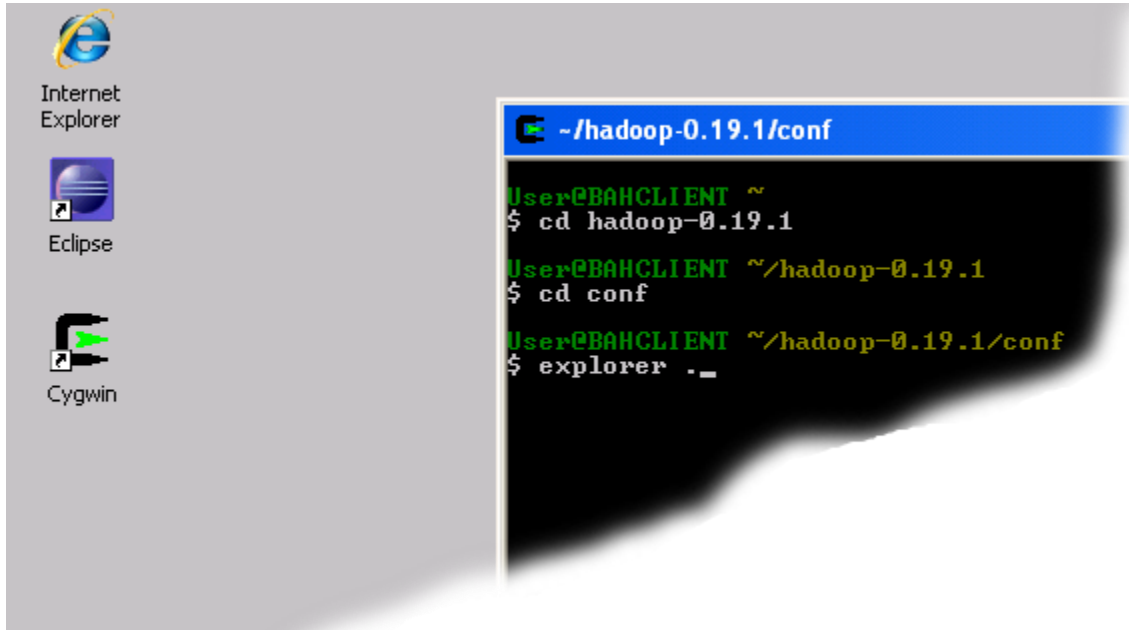
-rw-r--r--  1 vlad None  295315 Feb 19 19:13 CHANGES.txt
-rw-r--r--  1 vlad None   11358 Feb 19 19:13 LICENSE.txt
-rw-r--r--  1 vlad None    101 Feb 19 19:13 NOTICE.txt
-rw-r--r--  1 vlad None   1366 Feb 19 19:13 README.txt
drwxr-xr-x+  2 vlad None      0 Feb 26 05:41 bin
-rw-r--r--  1 vlad None  58440 Feb 19 19:13 build.xml
drwxr-xr-x+  4 vlad None      0 Feb 19 19:18 c++
drwxr-xr-x+  2 vlad None      0 Mar 10 13:46 conf
drwxr-xr-x+ 12 vlad None      0 Feb 19 19:12 contrib
drwxr-xr-x+  7 vlad None      0 Feb 26 05:41 docs
-rw-r--r--  1 vlad None   6839 Feb 19 19:12 hadoop-0.19.1-ant.jar
-rw-r--r--  1 vlad None 2384306 Feb 19 19:18 hadoop-0.19.1-core.jar
-rw-r--r--  1 vlad None  134119 Feb 19 19:12 hadoop-0.19.1-examples.jar
-rw-r--r--  1 vlad None 1276792 Feb 19 19:18 hadoop-0.19.1-test.jar
-rw-r--r--  1 vlad None   52295 Feb 19 19:12 hadoop-0.19.1-tools.jar
drwxr-xr-x+  4 vlad None      0 Feb 26 05:41 lib
drwxr-xr-x+  3 vlad None      0 Feb 26 05:41 libhdfs
drwxr-xr-x+  2 vlad None      0 Feb 26 05:41 librecordio
drwxr-xr-x+  4 vlad None      0 Mar 10 13:46 logs
drwxr-xr-x+ 15 vlad None      0 Feb 26 05:41 src
-rwxr-xr-x  1 vlad None   1079 Mar  1 16:41 testProj.jar
drwxr-xr-x+  8 vlad None      0 Feb 19 19:12 webapps
```

Configure Hadoop

Now that Hadoop has been unpacked, we are ready to configure it.

1. Open a new Cygwin window and execute the following commands:

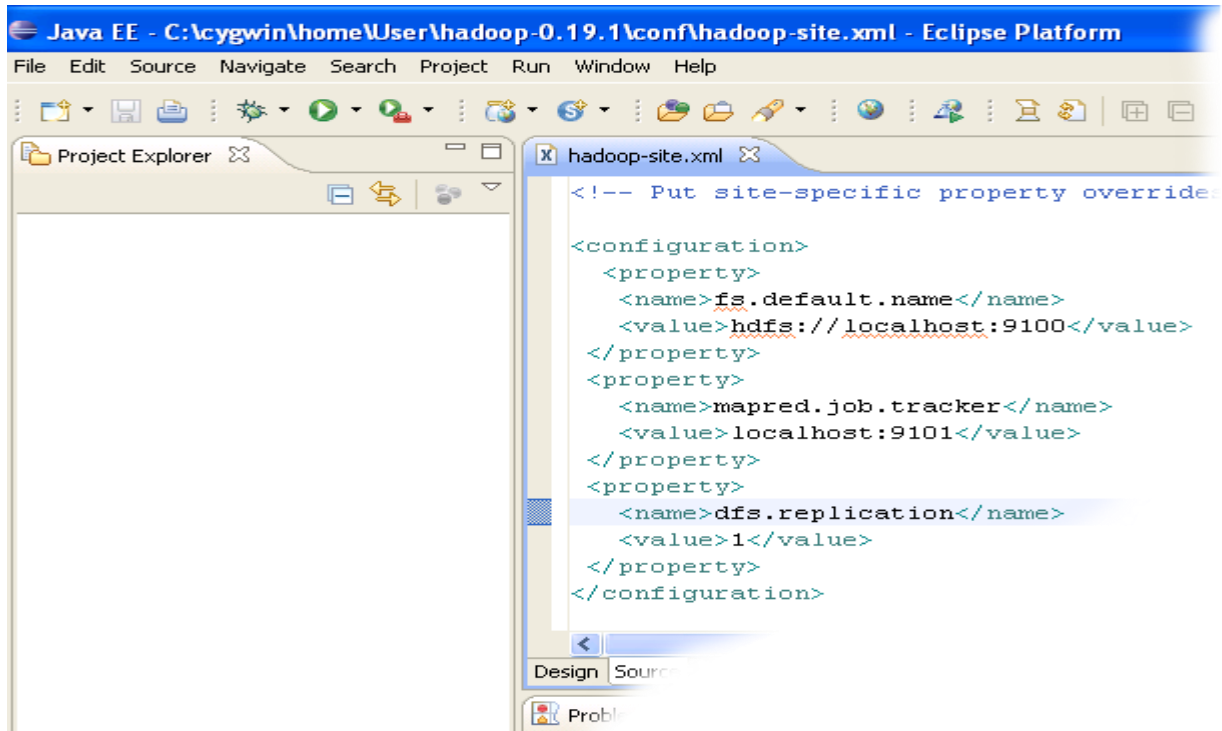
```
cd hadoop-0.19.1
cd conf
explorer .
```



Bringing up explorer window

1. The last command will cause the Explorer window for the '**conf**' directory to pop up. Minimize it for now or move it to the side.
2. Launch Eclipse.
3. Bring up the '**conf**' Explorer window opened in Step 2 and drag the file **hadoop-site** to the Eclipse main window.
4. Insert the following lines between **<configuration>** and **</configuration>** tags.
5. `<property>`
6. `<name>fs.default.name</name>`
7. `<value>hdfs://localhost:9100</value>`
8. `</property>`
9. `<property>`
10. `<name>mapred.job.tracker</name>`
11. `<value>localhost:9101</value>`
12. `</property>`
13. `<property>`

14. `<name>dfs.replication</name>`
15. `<value>1</value>`
16. `</property>`



Editing site configuration file

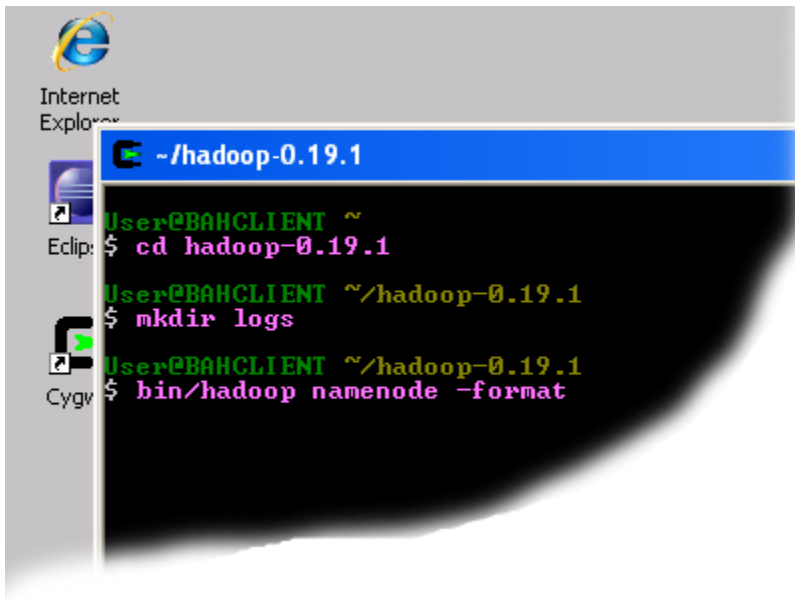
17. Close the Eclipse, Cygwin command and Explorer windows.

Format the namenode

Next step is to format the Namenode to create a Hadoop Distributed File System (HDFS).

1. Open a new Cygwin window.
2. Execute the following commands:

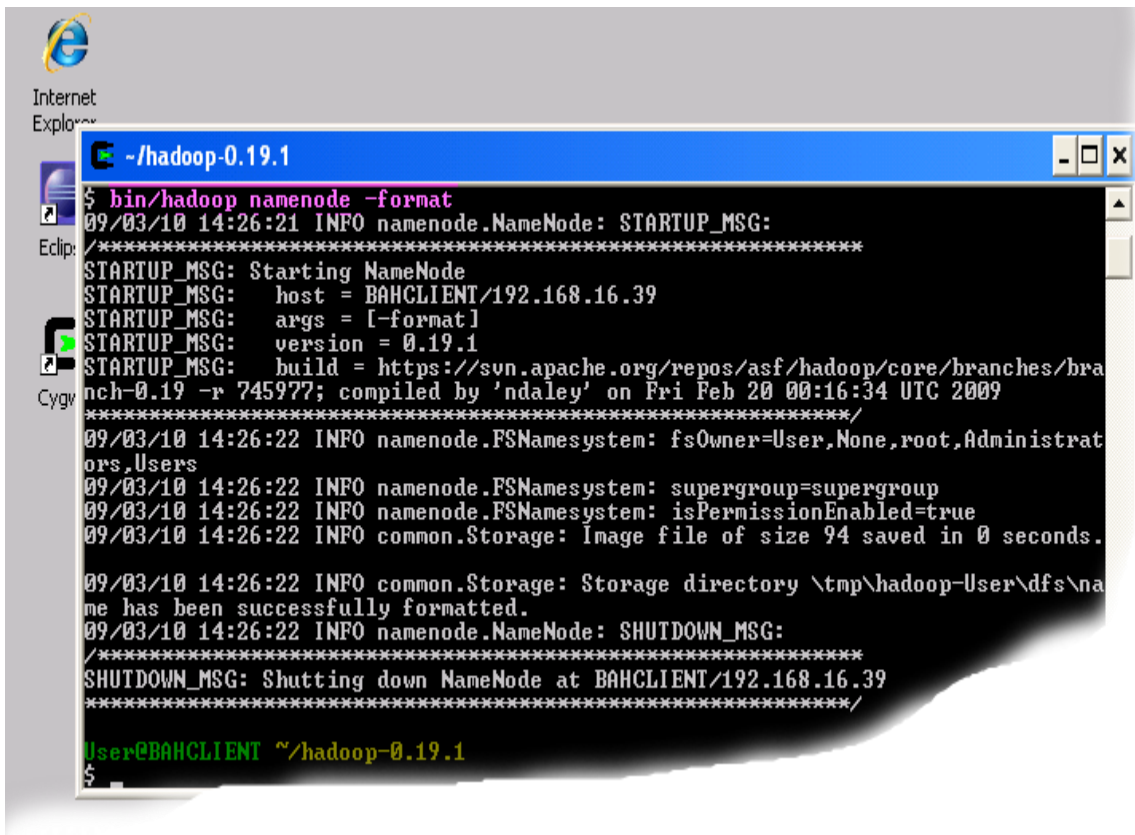
```
cd hadoop-0.19.1
mkdir logs
bin/hadoop namenode -format
```

A screenshot of a Windows desktop environment. In the background, there are icons for Internet Explorer, Eclipse, and Cygwin. A terminal window titled "-/hadoop-0.19.1" is in the foreground. The terminal shows the following commands and output:

```
User@BAHCLIENT ~  
$ cd hadoop-0.19.1  
User@BAHCLIENT ~/hadoop-0.19.1  
$ mkdir logs  
User@BAHCLIENT ~/hadoop-0.19.1  
$ bin/hadoop namenode -format
```

Format the namenode

3. The last command will run for some time and produce output similar to that shown below:

A screenshot of a Windows desktop environment, similar to the first one. The terminal window titled "-/hadoop-0.19.1" shows the output of the command `bin/hadoop namenode -format`. The output includes startup and shutdown messages for the NameNode, indicating that the distributed file system has been successfully formatted.

```
$ bin/hadoop namenode -format  
09/03/10 14:26:21 INFO namenode.NameNode: STARTUP_MSG:  
/*****  
STARTUP_MSG: Starting NameNode  
STARTUP_MSG: host = BAHCLIENT/192.168.16.39  
STARTUP_MSG: args = [-format]  
STARTUP_MSG: version = 0.19.1  
STARTUP_MSG: build = https://svn.apache.org/repos/asf/hadoop/core/branches/branch-0.19 -r 745977; compiled by 'ndaley' on Fri Feb 20 00:16:34 UTC 2009  
*****/  
09/03/10 14:26:22 INFO namenode.FSNamesystem: fsOwner=User, None, root, Administrators, Users  
09/03/10 14:26:22 INFO namenode.FSNamesystem: supergroup=supergroup  
09/03/10 14:26:22 INFO namenode.FSNamesystem: isPermissionEnabled=true  
09/03/10 14:26:22 INFO common.Storage: Image file of size 94 saved in 0 seconds.  
  
09/03/10 14:26:22 INFO common.Storage: Storage directory \tmp\hadoop-User\dfs\namenode has been successfully formatted.  
09/03/10 14:26:22 INFO namenode.NameNode: SHUTDOWN_MSG:  
/*****  
SHUTDOWN_MSG: Shutting down NameNode at BAHCLIENT/192.168.16.39  
*****/  
User@BAHCLIENT ~/hadoop-0.19.1  
$
```

Hadoop Distributed File System created.

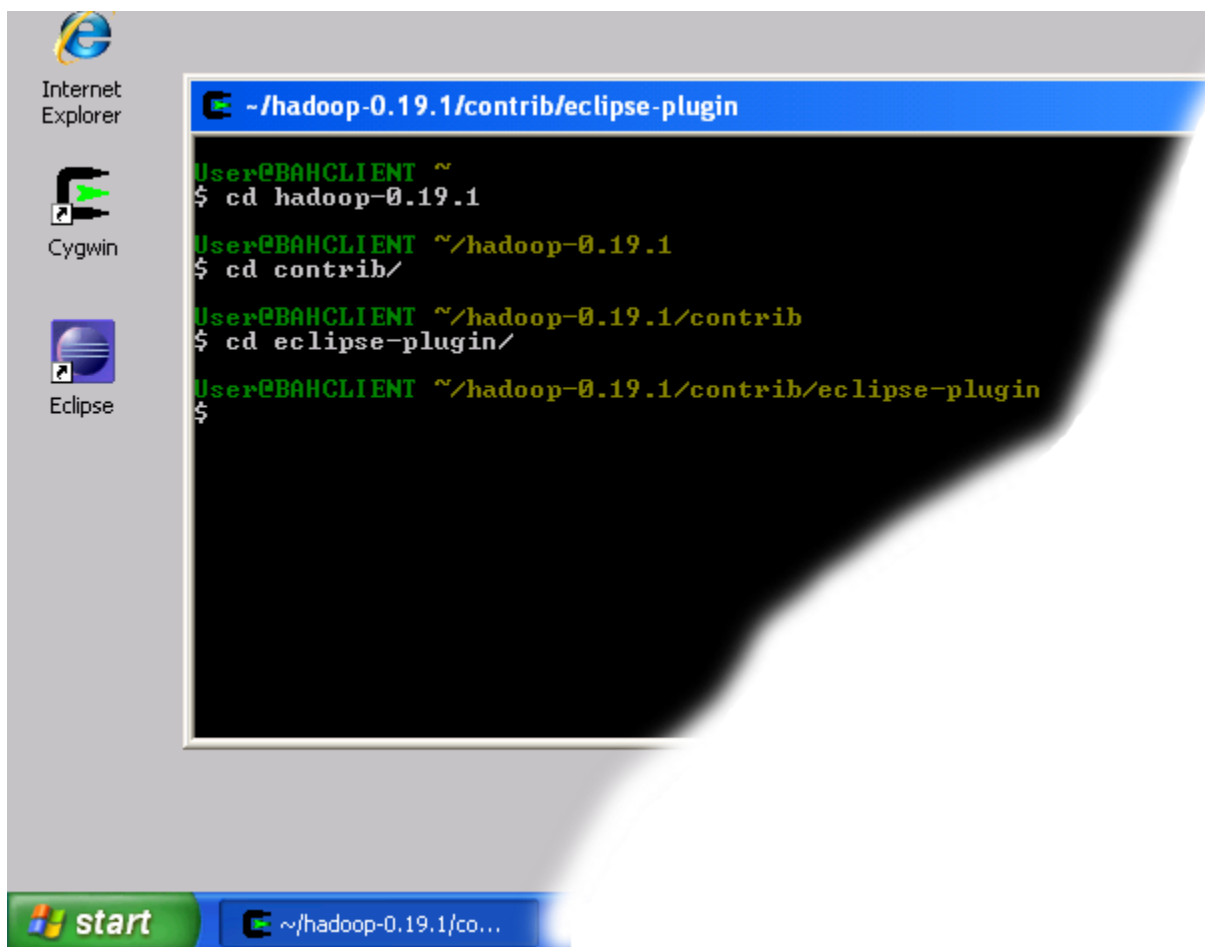
Now that the filesystem has been created you can proceed to the next step.

Install Hadoop plug-in

The next step is to install and check the Hadoop plug-in for Eclipse.

1. Open a new Cygwin window and execute the following commands:

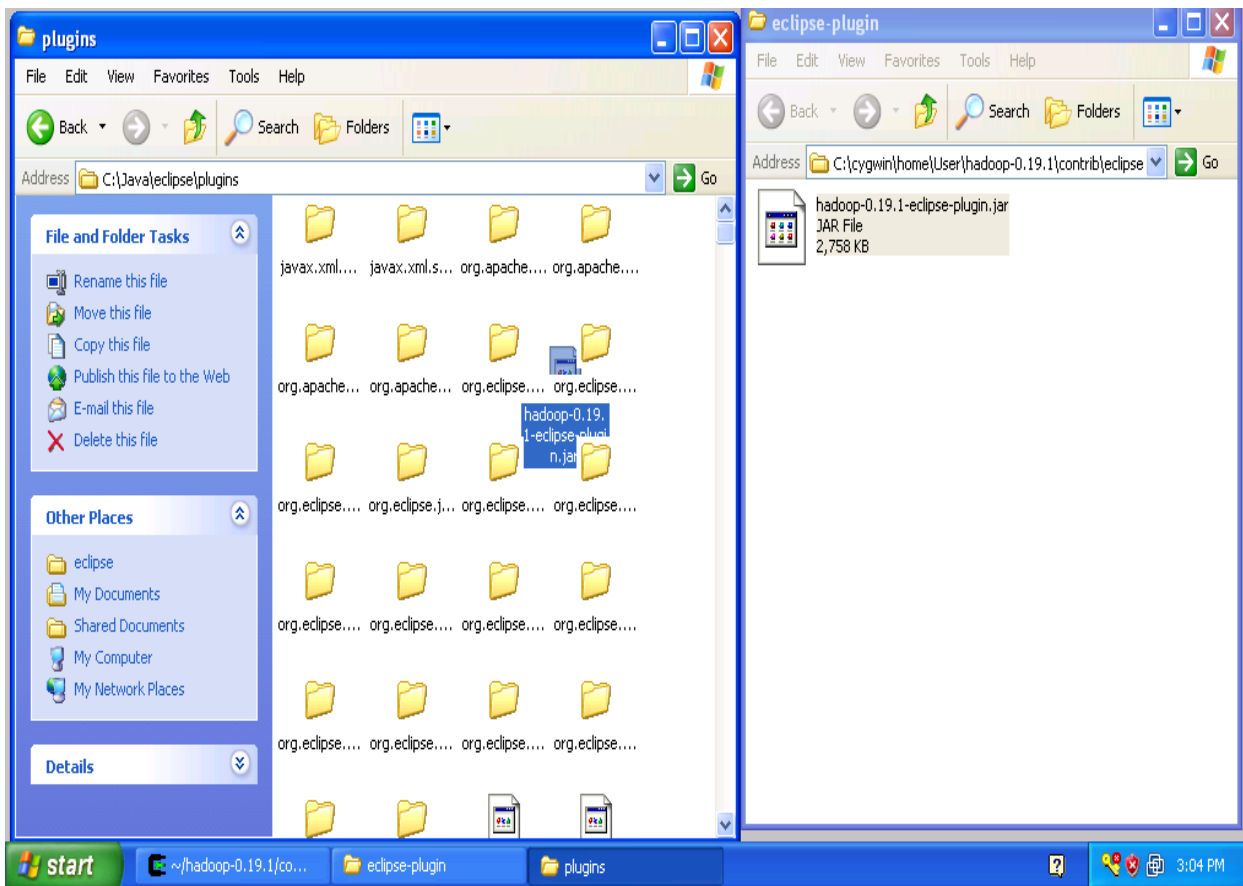
```
cd hadoop-0.19.1
cd contrib
cd eclipse-plugin
explorer .
```



Navigate to Hadoop eclipse plugin folder

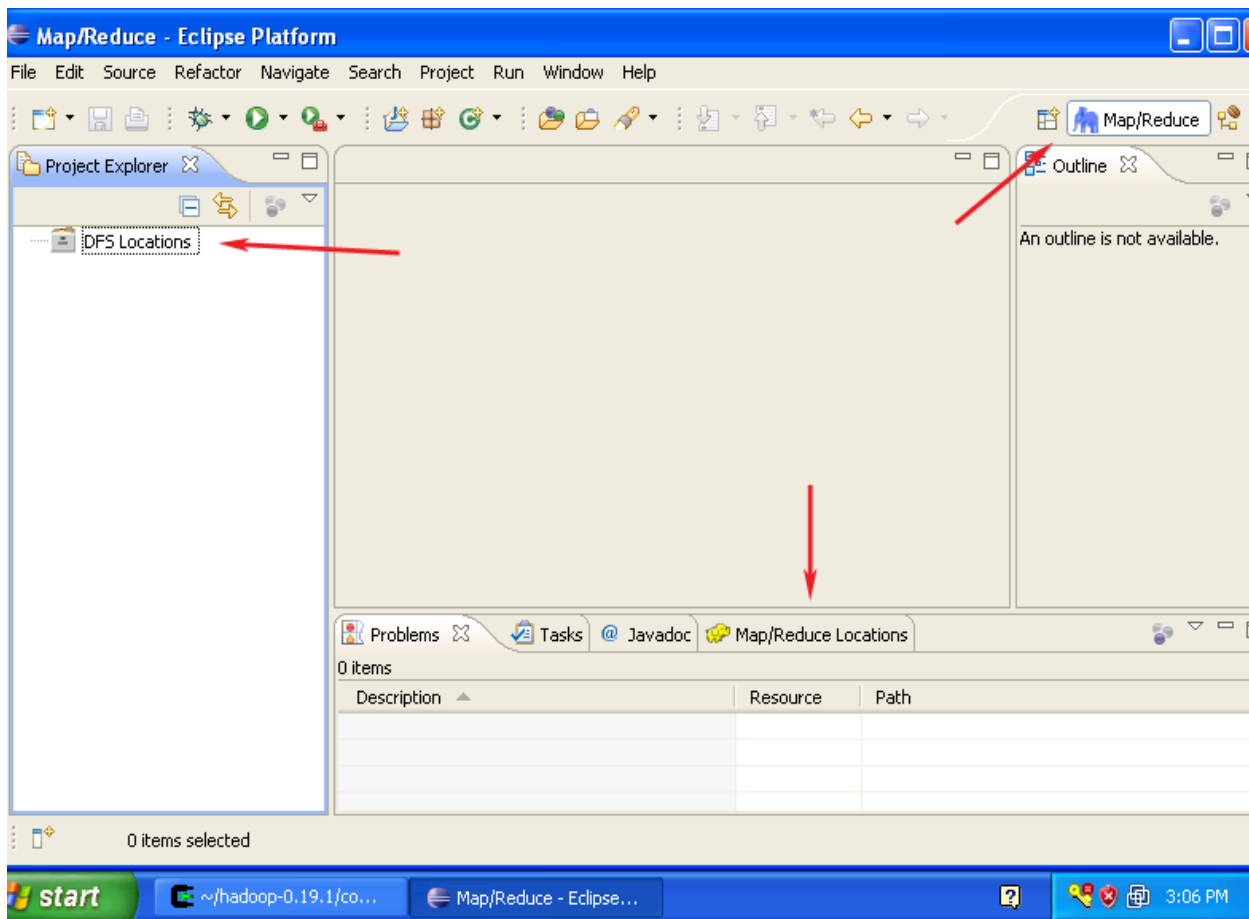
2. Shrink the newly popped window and move it to the right of the screen.
3. Open another Explorer window either through "My Computer" icon or by using the "**Start -> Run**" menu. Navigate to the **Eclipse** installation and open the "plugins" folder.

- Copy the file "hadoop-0.19.1-eclipse-plugin.jar" from the Hadoop **eclipse-plugin** folder to the **Eclipse** plugins folder as shown in the figure below.



Copy Hadoop Eclipse Plugin

- Close both explorer windows
- Start Eclipse
- Click on the open perspective icon, which is usually located in the upper-right corner the eclipse application. Then select **Other** from the menu.
- Select **Map/Reduce** from the list of perspectives and press "OK" button.
- As a result your IDE should open a new perspective that looks similar to the image below.



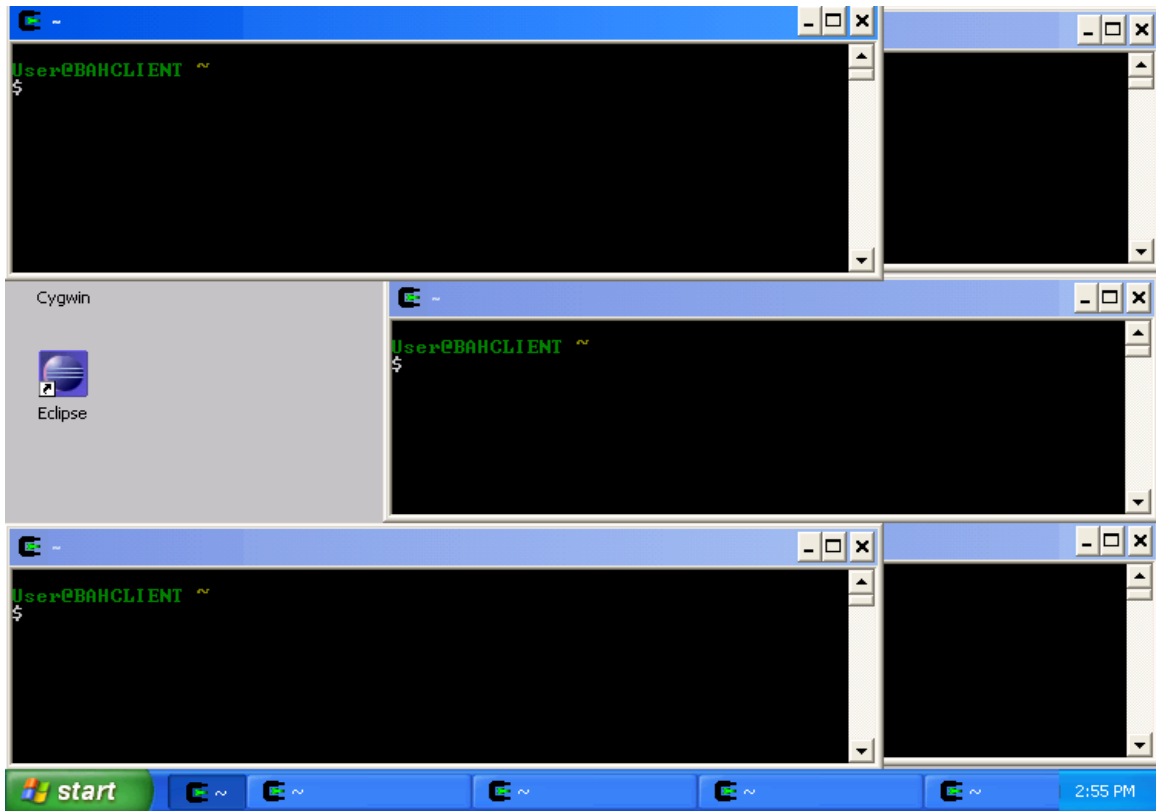
Eclipse Map/Reduce Perspective

Now that we have installed and configured the Hadoop cluster and Eclipse plugin, it's time to test the setup by running a simple project.

Start the local Hadoop cluster

Next step is to launch the newly configured cluster.

1. Close all the windows on the desktop, open five Cygwin windows and arrange them as shown below.



2. Start the **namenode** in the first window by executing:

```
cd hadoop-0.19.1  
bin/hadoop namenode
```

3. Start the **secondary namenode** in the second window by executing:

```
cd hadoop-0.19.1  
bin/hadoop secondarynamenode
```

4. Start the **job tracker** the third window by executing:

```
cd hadoop-0.19.1  
bin/hadoop jobtracker
```

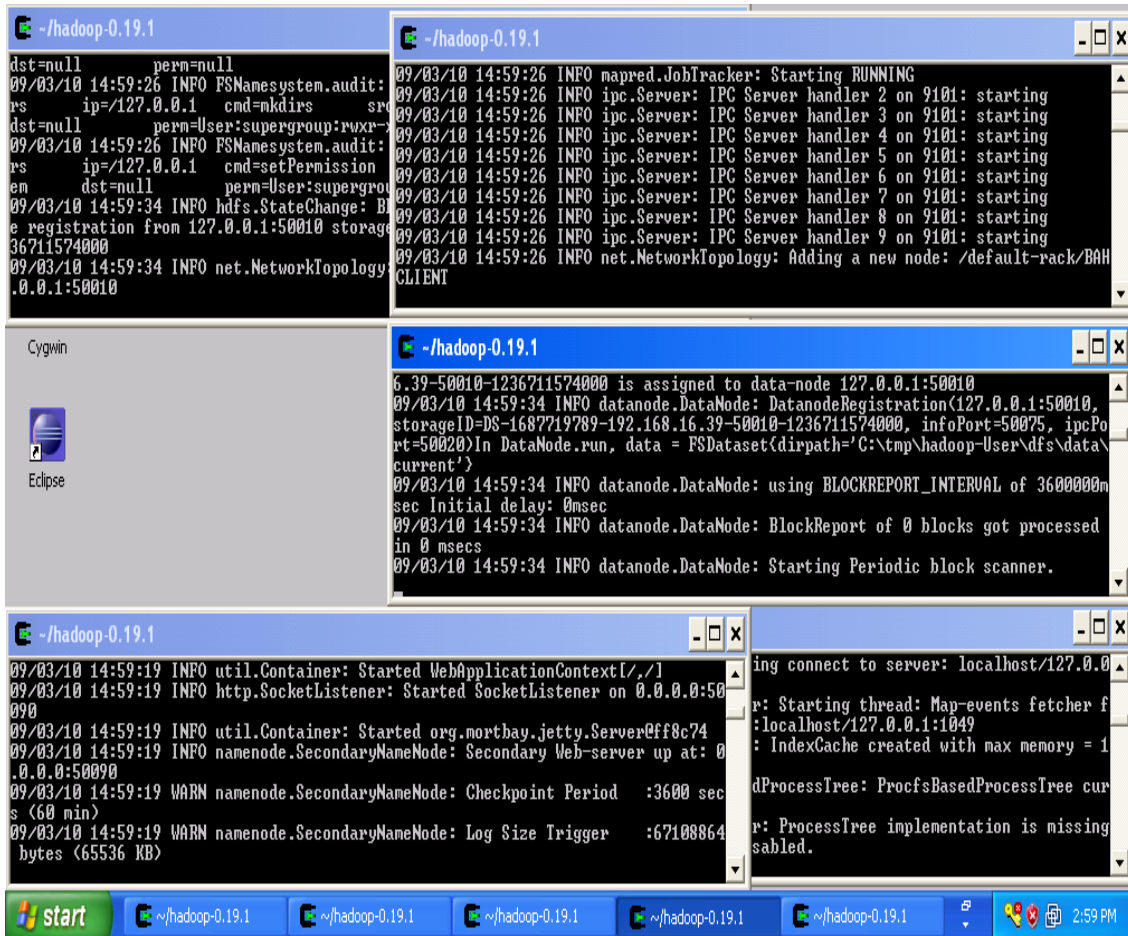
5. Start the **data node** the fourth window by executing:

```
cd hadoop-0.19.1  
bin/hadoop datanode
```

6. Start the **task tracker** the fifth window by executing:

```
cd hadoop-0.19.1  
bin/hadoop tasktracker
```

- Now you should have an operational hadoop cluster. If everything went fine your screen should look like the image below:



```
-/hadoop-0.19.1
dst=null perm=null
09/03/10 14:59:26 INFO FSNamesystem.audit:
rs ip=127.0.0.1 cmd=nkdirs sr
dst=null perm=User:supergroup:rwxr-
09/03/10 14:59:26 INFO FSNamesystem.audit:
rs ip=127.0.0.1 cmd=setPermission
em dst=null perm=User:supergro
09/03/10 14:59:34 INFO hdfs.StateChange: B
e registration from 127.0.0.1:50010 storag
36711574000
09/03/10 14:59:34 INFO net.NetworkTopology
.0.0.1:50010

-/hadoop-0.19.1
09/03/10 14:59:26 INFO mapred.JobTracker: Starting RUNNING
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 2 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 3 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 4 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 5 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 6 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 7 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 8 on 9101: starting
09/03/10 14:59:26 INFO ipc.Server: IPC Server handler 9 on 9101: starting
09/03/10 14:59:26 INFO net.NetworkTopology: Adding a new node: /default-rack/BAH
CLIENT

Cygwin
Eclipse

-/hadoop-0.19.1
6.39-50010-1236711574000 is assigned to data-node 127.0.0.1:50010
09/03/10 14:59:34 INFO datanode.DataNode: DatanodeRegistration(127.0.0.1:50010,
storageID=D$-1687719789-192.168.16.39-50010-1236711574000, infoPort=50075, ipcPo
rt=50020)In DataNode.run, data = FSDataset(dirpath='C:\tmp\hadoop-user\dfs\data\
current')
09/03/10 14:59:34 INFO datanode.DataNode: using BLOCKREPORT_INTERVAL of 3600000m
sec Initial delay: 0msec
09/03/10 14:59:34 INFO datanode.DataNode: BlockReport of 0 blocks got processed
in 0 msec
09/03/10 14:59:34 INFO datanode.DataNode: Starting Periodic block scanner.


-/hadoop-0.19.1
09/03/10 14:59:19 INFO util.Container: Started WebApplicationContext[/,/]
09/03/10 14:59:19 INFO http.SocketListener: Started SocketListener on 0.0.0.0:50
090
09/03/10 14:59:19 INFO util.Container: Started org.mortbay.jetty.Server@ff8c74
09/03/10 14:59:19 INFO namenode.SecondaryNameNode: Secondary Web-server up at: 0
.0.0.0:50090
09/03/10 14:59:19 WARN namenode.SecondaryNameNode: Checkpoint Period :3600 sec
s (60 min)
09/03/10 14:59:19 WARN namenode.SecondaryNameNode: Log Size Trigger :67108864
bytes (65536 KB)

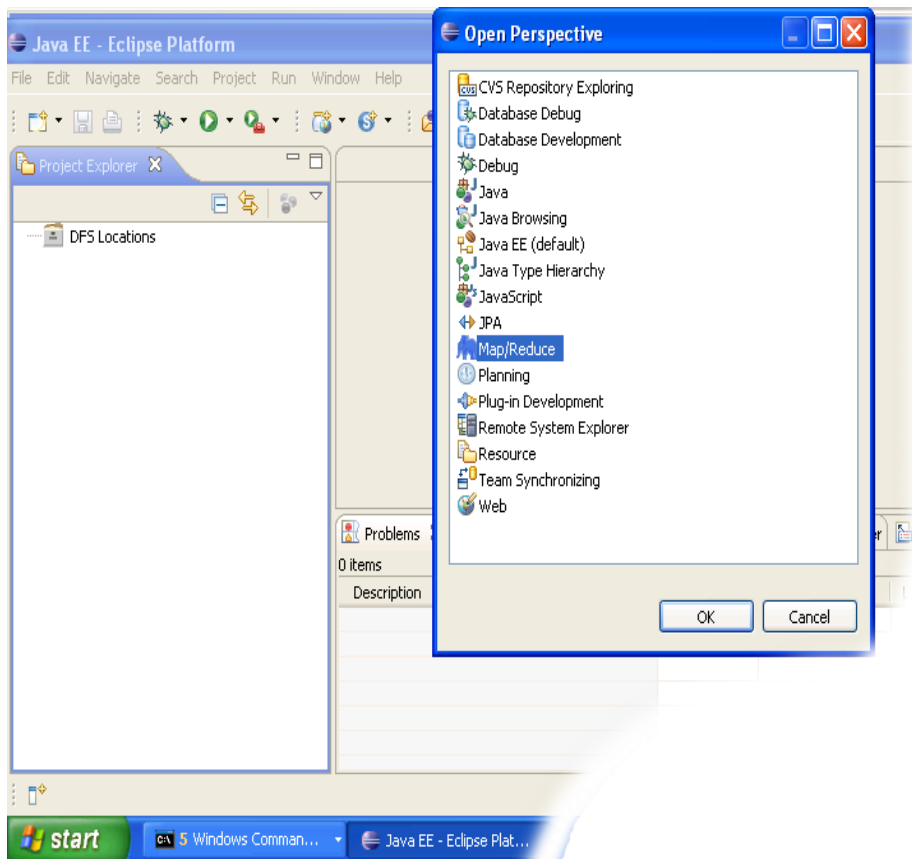
ing connect to server: localhost/127.0.0.1:1049
r: Starting thread: Map-events fetcher f
:localhost/127.0.0.1:1049
: IndexCache created with max memory = 1
dProcessTree: ProcsfsBasedProcessTree cur
r: ProcessTree implementation is missing
sabled.
```

At this point the cluster is running and you can proceed to the next step.

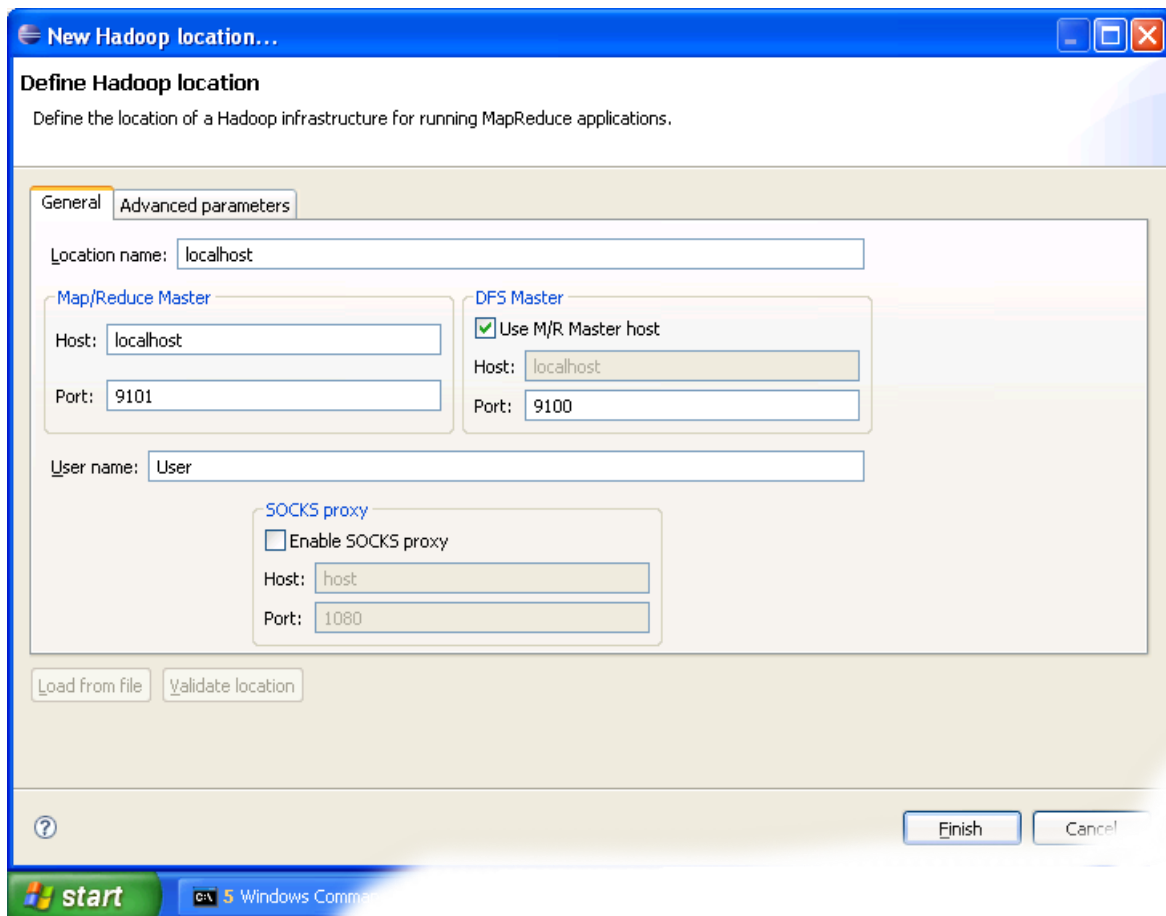
Setup Hadoop Location in Eclipse

Next step is to configure Hadoop location in the Eclipse environment.

- Launch the **Eclipse** environment.
- Open Map/Reduce perspective by clicking on the open perspective icon (), select "Other" from the menu, and then select "**Map/Reduce**" from the list of perspectives.



3. After switching to the *Map/Reduce* perspective, select the **Map/Reduce Locations** tab located at the bottom of the Eclipse environment. Then right click on the blank space in that tab and select "**New Hadoop location....**" from the context menu. You should see a dialog box similar to the one shown below.

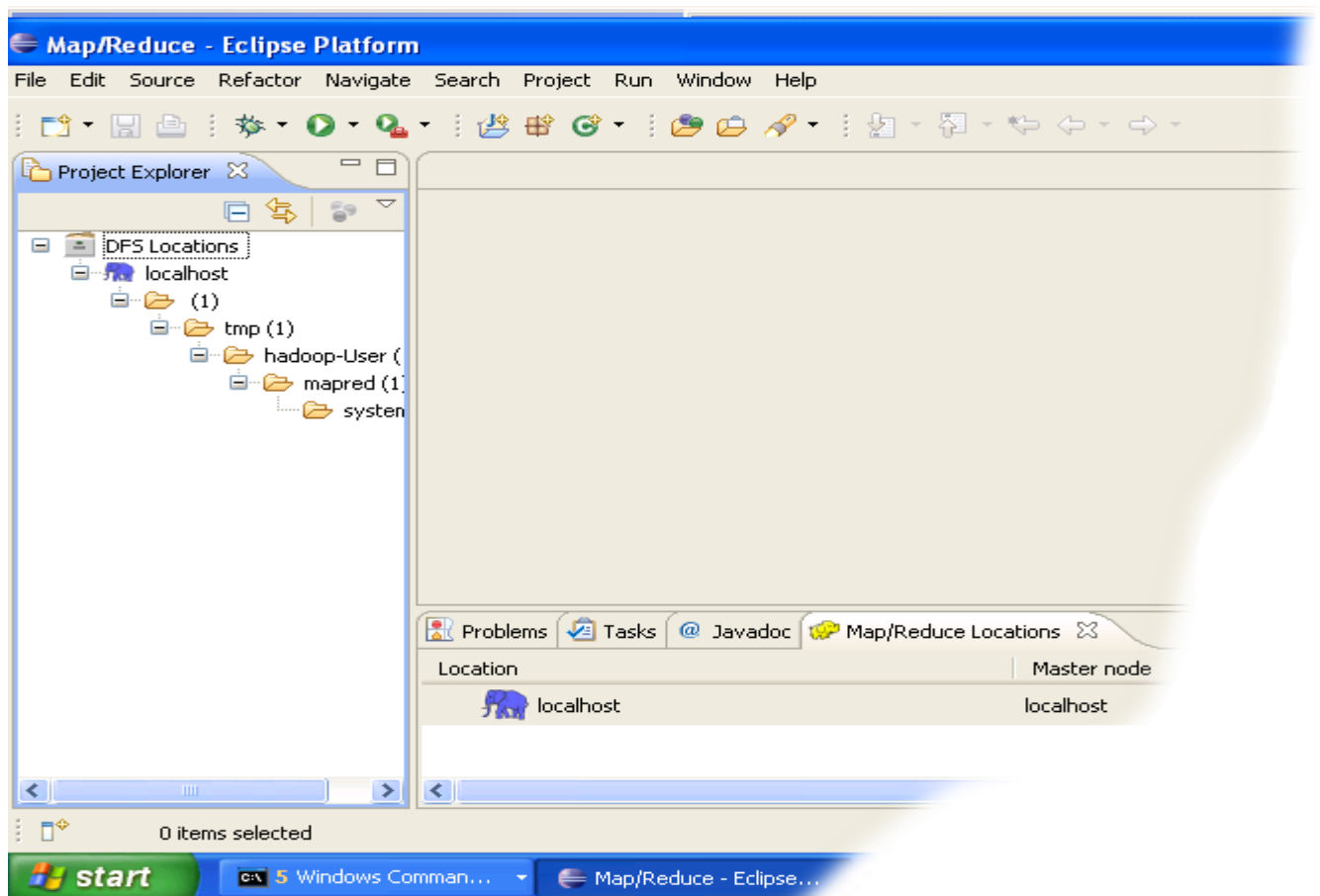


Setting up new Map/Reduce location

4. Fill in the following items, as shown on the figure above.
 - Location Name -- **localhost**
 - Map/Reduce Master
 - Host -- **localhost**
 - Port -- **9101**
 - DFS Master
 - Check "Use M/R Master Host"
 - Port -- **9100**
 - User name -- **User**

Then press the **Finish** button.

5. After closing the Hadoop location settings dialog you should see a new location in the "**Map/Reduce Locations**" tab.
6. In the **Project Explorer** tab on the left hand side of the Eclipse window, find the **DFS Locations** item. Open it using the "+" icon on its left. Inside, you should see the **localhost** location reference with the blue elephant icon. Keep opening the items below it until you see something like the image below.



7. Browsing HDFS location

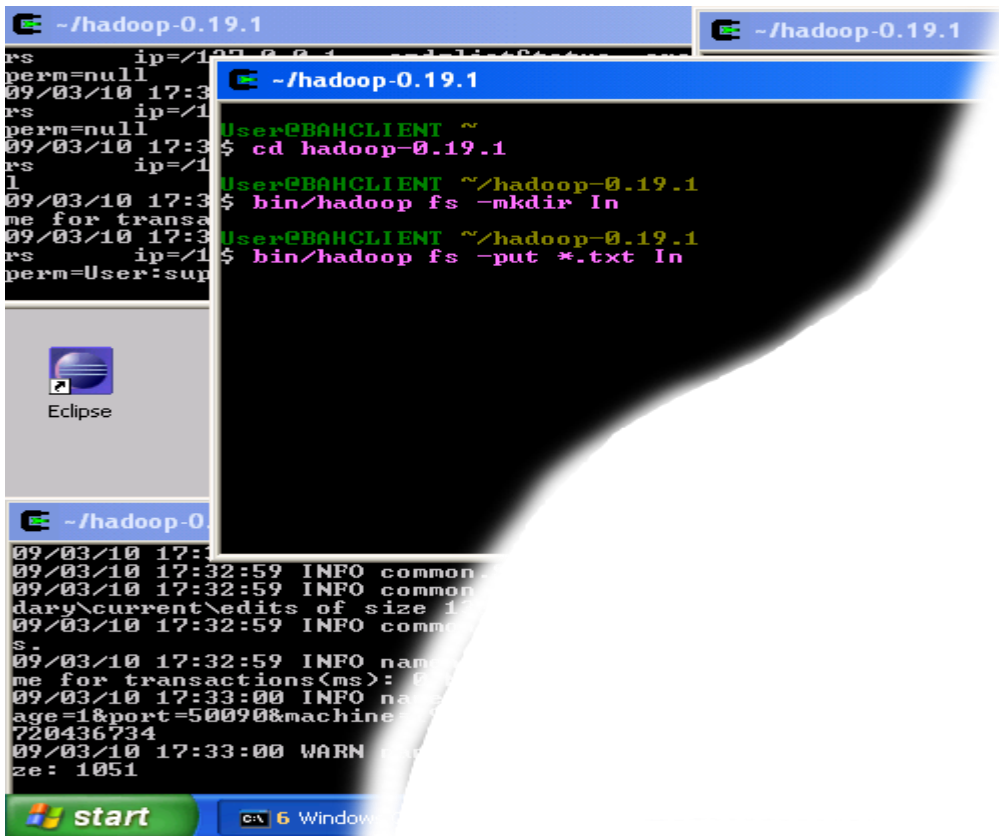
You can now move on to the next step.

Upload data to HDFS

We are now ready to run the first Map/Reduce project but data is still missing. This section explains how to upload data to the Hadoop Distributed File System (HDFS).

Upload Files To HDFS

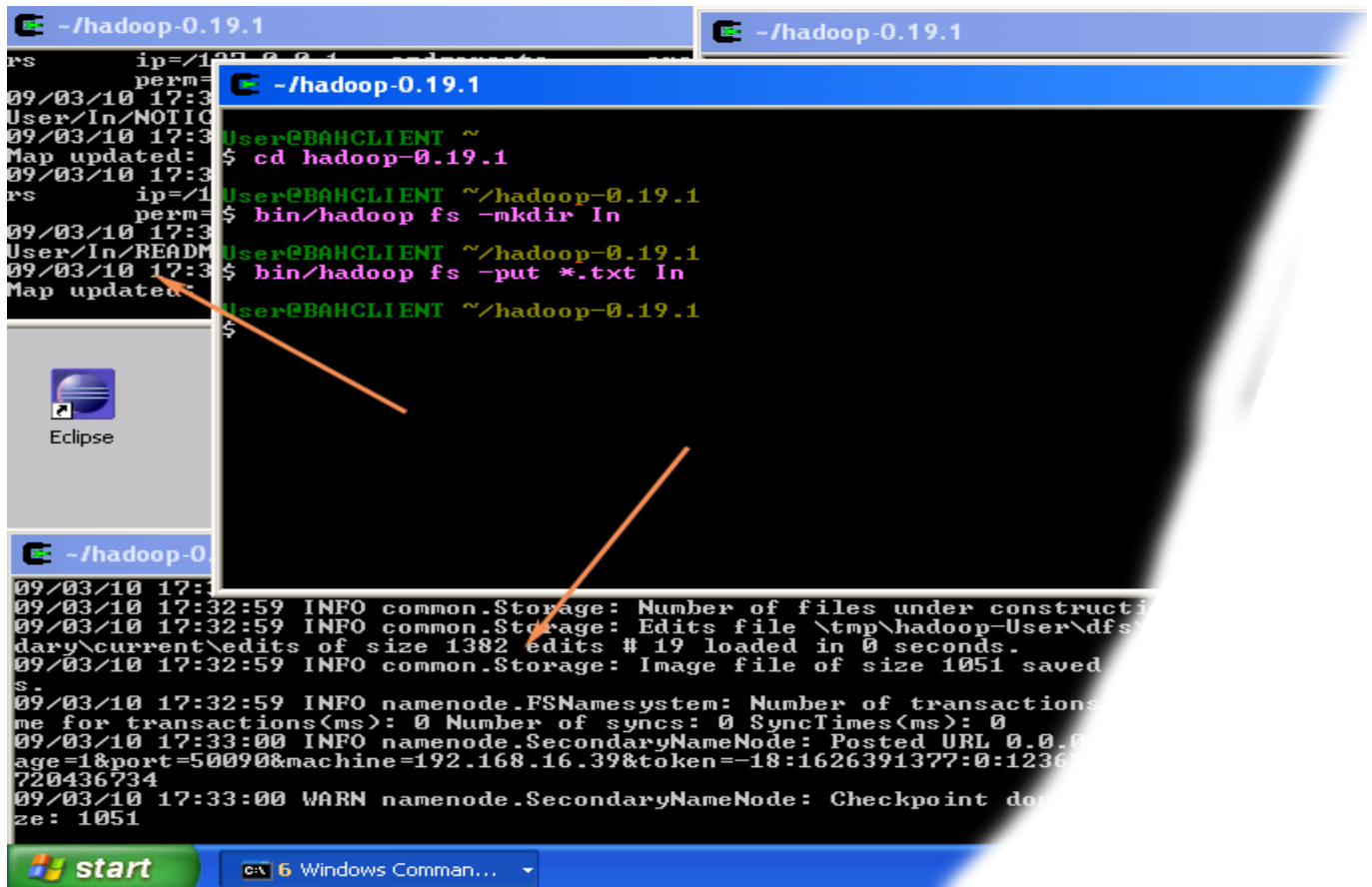
1. Open a new CYGWIN command window.



2. Execute the following commands in the new CYGWIN window as shown on the image above.

```
cd /hadoop-0.19.1
bin/hadoop fs -mkdir In
bin/hadoop fs -put *.txt In
```

When the last of the above commands starts executing, you should see some activity in other Hadoop windows as shown in the image below.



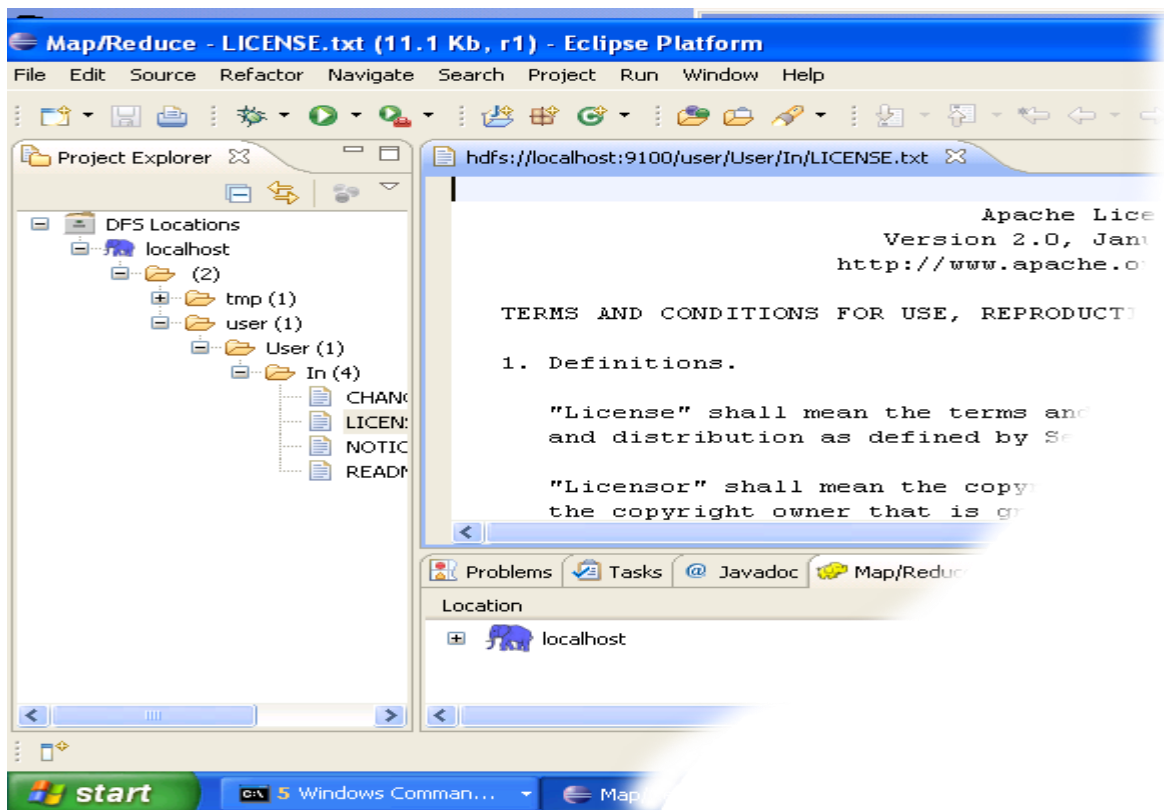
The result of these commands is a newly created directory -- named **In** -- in the HDFS which contains a set of text files that comes with the Hadoop distribution.

3. Close the Cygwin Window.

Verify if the files were uploaded correctly

In this section we will check if the files were uploaded correctly.

1. Open the Eclipse environment.
2. Open **DFS locations** folder which is located in the Project Explorer tab of **Map/Reduce** perspective.
3. Open **localhost** folder in **DFS locations** folder.
4. Keep opening HDFS folders until you navigate to the newly created **In** directory, as shown in the image below.



Verifying that the data was uploaded correctly

5. When you get to the **In** directory, double-click on the file **LICENCE.txt** to open it.
6. If you see something similar to the image above then the data was uploaded correctly and you can proceed to your first Hadoop project.

Now move on to the next step.

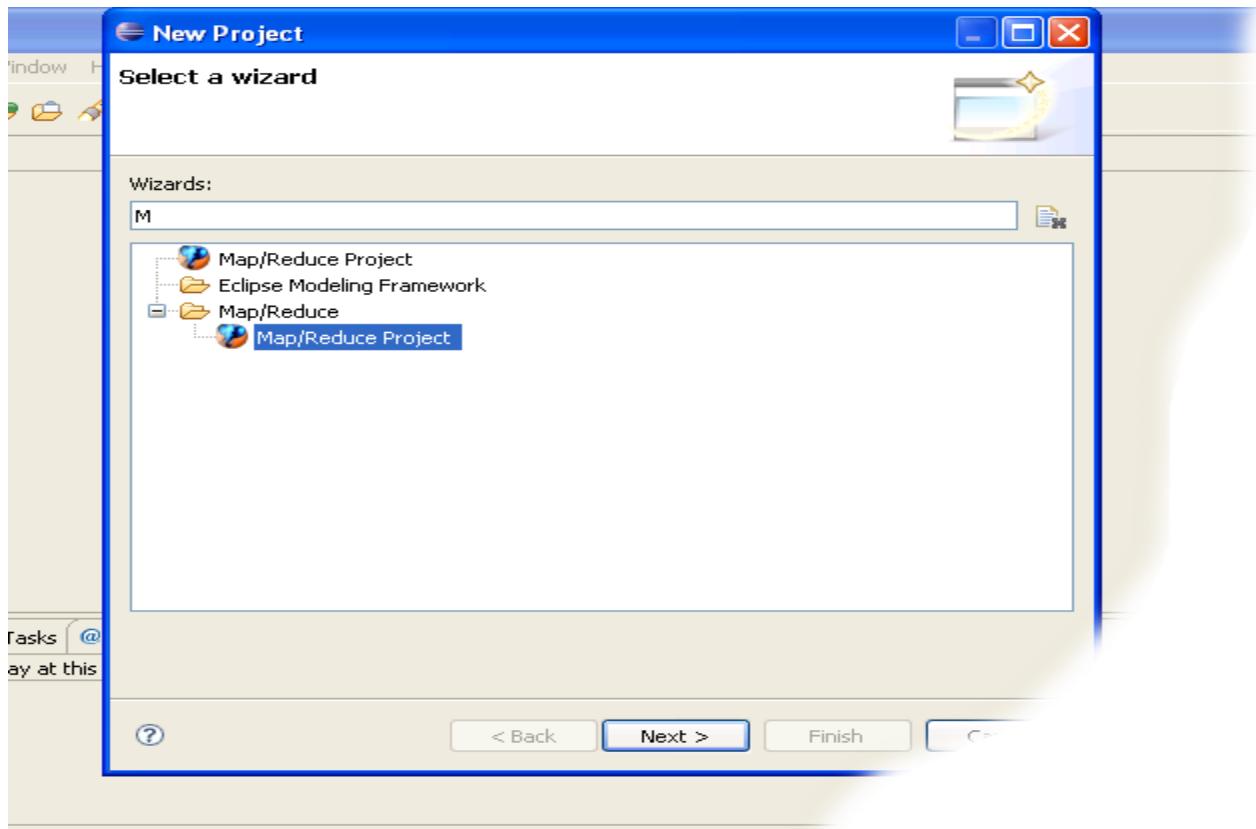
Create and run Hadoop project

Now we are ready to create and run out first Hadoop project.

Creating and configuring Hadoop eclipse project.

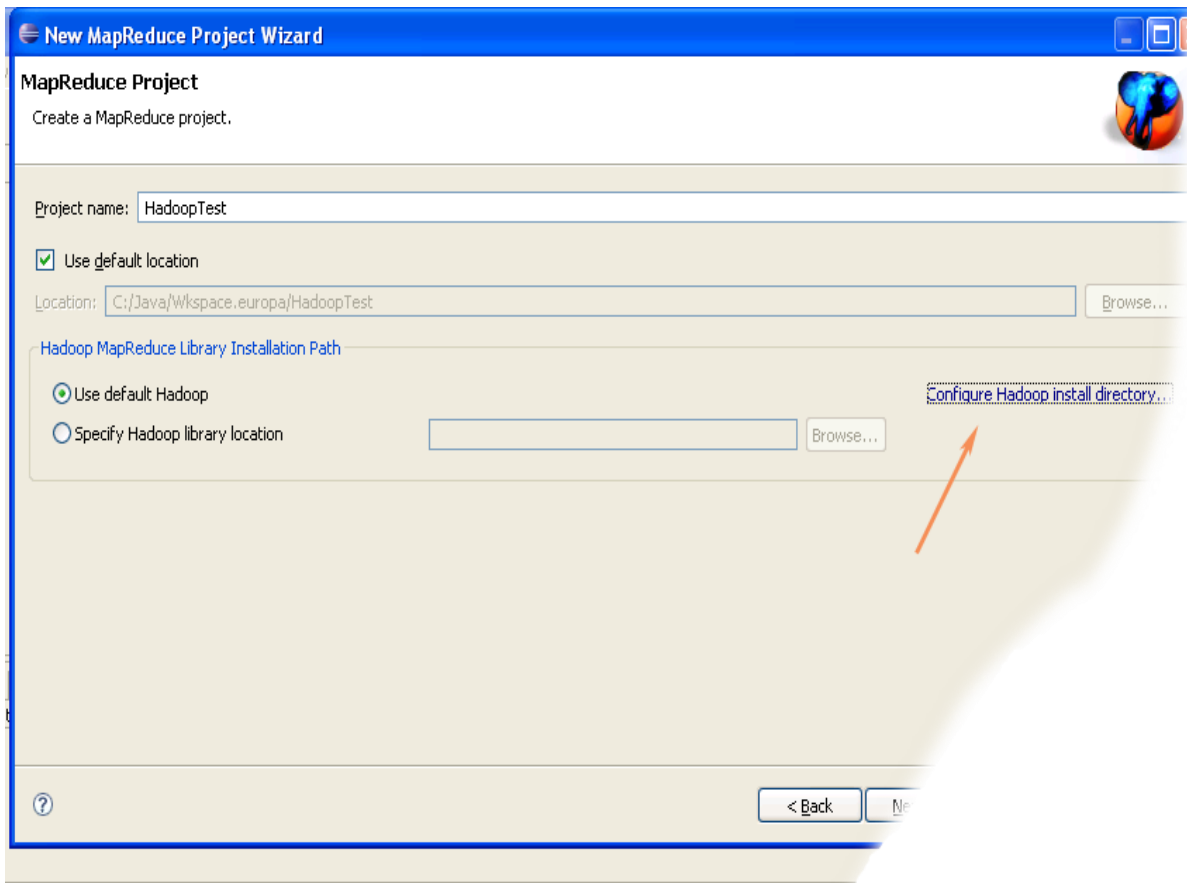
1. Launch Eclipse.
2. Right-click on the blank space in the **Project Explorer** window and select **New -> Project..** to create a new project.

3. Select **Map/Reduce Project** from the list of project types as shown in the image below.



4. Press the **Next** button.

5. You will see the project properties window similar to the one shown below



6. Fill in the project name and click on **Configure Hadoop Installation** link on the right hand side of the project configuration window. This will bring up the project **Preferences** window shown in the image below.



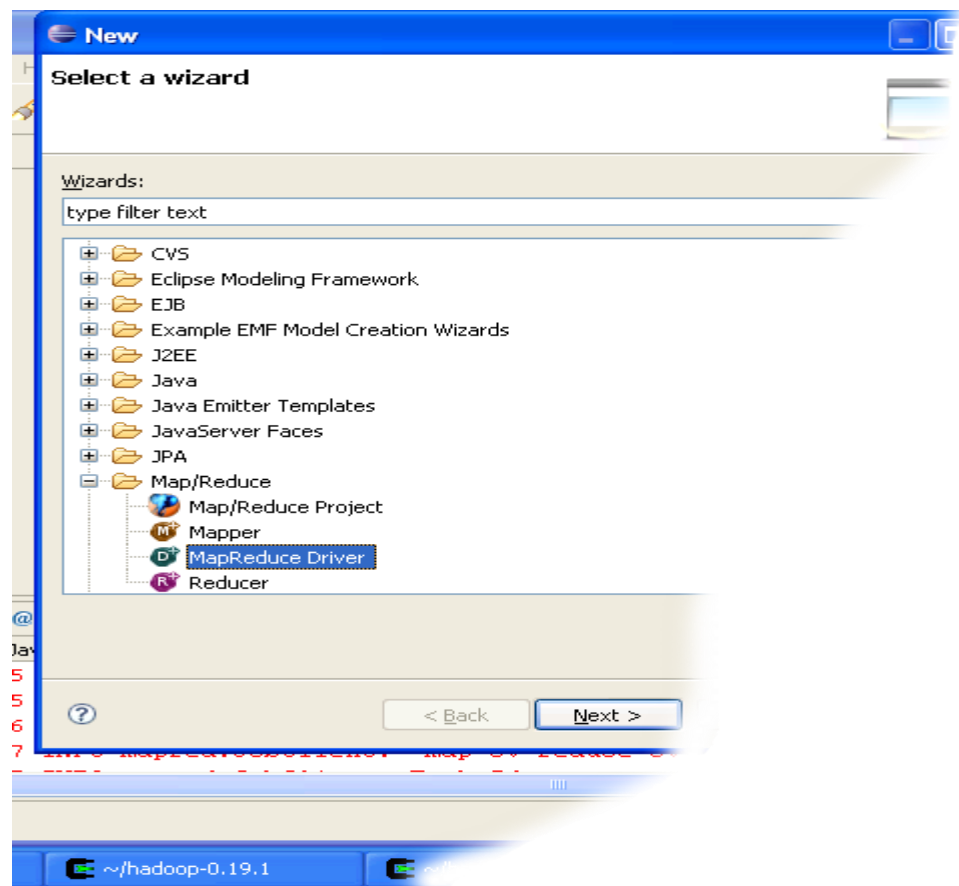
7. In the project **Preferences** window enter the location of the Hadoop directory in the **Hadoop installation directory** field as shown above.

If you are not sure of the location of the Hadoop home directory, refer to Step 1 of this section. Hadoop home directory is one level up from the **conf** directory.

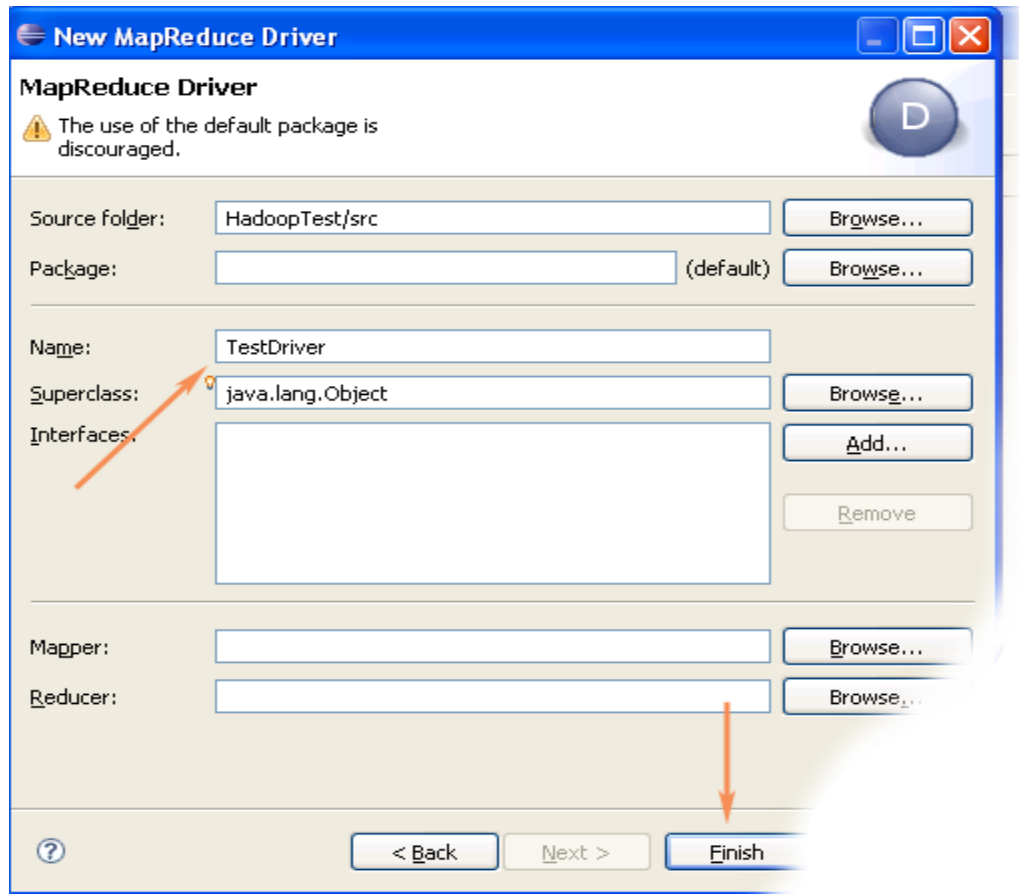
8. After entering the location close the **Preferences** window by pressing the **OK** button. Then close the **Project** window with the **Finish** button.
9. You have now created your first Hadoop Eclipse project. You should see its name in the **Project Explorer** tab.

Creating Map/Reduce driver class

1. Right-click on the newly created Hadoop project in the **Project Explorer** tab and select **New -> Other** from the context menu.
2. Go to the **Map/Reduce** folder, select **MapReduceDriver**, then press the **Next** button as shown in the image below.



3. When the **MapReduce Driver** wizard appears, enter **TestDriver** in the **Name** field and press the **Finish** button. This will create the skeleton code for the **MapReduce Driver**.



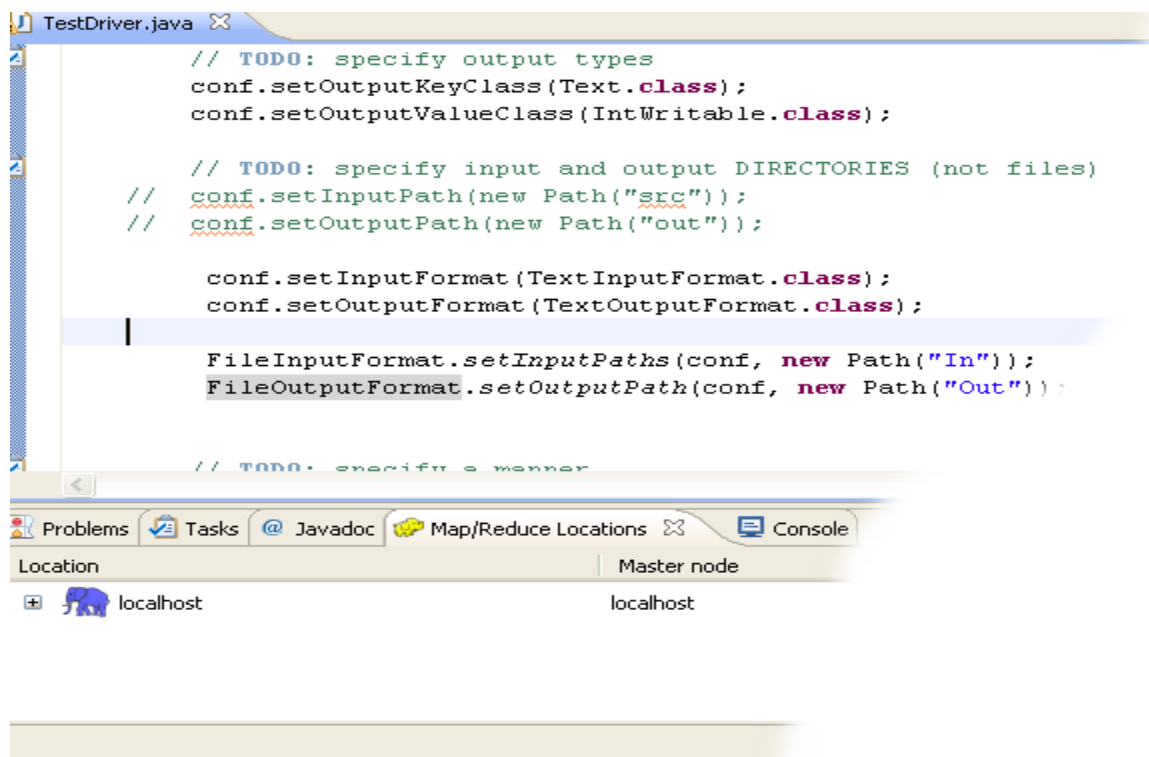
4. Unfortunately the Hadoop plug-in for Eclipse is slightly out of step with the recent Hadoop API, so we need to edit the driver code a bit.

Find the following two lines in the source code and comment them out:

```
conf.setInputPath(new Path("src"));  
conf.setOutputPath(new Path("out"));
```

Enter the following code immediately after the two lines you just commented out (see image below):

```
conf.setInputFormat(TextInputFormat.class);  
conf.setOutputFormat(TextOutputFormat.class);  
  
FileInputFormat.setInputPaths(conf, new Path("In"));  
FileOutputFormat.setOutputPath(conf, new Path("Out"));
```



5. After you have changed the code, you will see the new lines marked as incorrect by Eclipse. Click on the error icon for each line and select Eclipse's suggestion to import the missing class.

You need to import the following classes: *TextInputFormat*, *TextOutputFormat*, *FileInputFormat*, *FileOutputFormat*.

6. After the missing classes are imported you are ready to run the project.

Running Hadoop Project

1. Right-click on the **TestDriver** class in the **Project Explorer** tab and select **Run As --> Run on Hadoop**. This will bring up a window like the one shown below.

Experiment No. 6

Objective: Working and installation of Google App Engine.

Requirement: Login account codenvy.

THEORY:

Deploying a New Application GAE

With Codenvy you can deploy Java, Python and PHP apps to Google App Engine.

- create a new project from scratch and choose either Java web application or Python and Google App Engine as PaaS (if you have already created a project, then open it and go to **PaaS > Google App Engine > Create Application**)
- enter project name and choose a **Template**
- check **Use existing GAE ID** if you want to overwrite an existing app
- click **Create** button
- if you deploy your first app to GAE from Codenvy you need to authenticate
- allow access to proceed
- enter required information at the GAE webpage (*Application Title is optional*)

The screenshot shows the 'Create an Application' interface. At the top, it says 'You have 4 applications remaining.' Below this, the 'Application Identifier' section has a text input field containing 'gaeapplication82', a '.appspot.com' domain, and a 'Check Availability' button. To the right, a message states 'Yes, "gaeapplication82" is available!'. A small disclaimer follows: 'All Google account names and certain offensive or trademarked names may not be used as Application Identifiers. You can map this application to your own domain later. [Learn more](#).' The 'Application Title' section has a text input field with 'Text search demo' and a note 'Displayed when users access your application.' Below this is a yellow box for 'Authentication Options (Advanced):' with a 'Learn more' link. It explains that Google App Engine provides an API for authenticating users. Three options are listed: 1. 'Open to all Google Accounts users (default)' with a radio button and a note that anyone with a valid Google Account can sign in. 2. 'Restricted to the following Google Apps domain:' with a radio button, a text input field, and a note that only members of the specified domain can sign in. 3. '(Experimentally) Open to all users with an OpenID Provider' with a radio button and a note that anyone with an OpenID account can sign in. At the bottom are 'Create Application' and 'Cancel' buttons.

Click to see a full sized image

- once you click **Create Application**, the browser's tab will be automatically closed in a few seconds
- when you are back to your Codenvy workspace, click **Deploy** to push the app to GAE

The process may take several minutes, and you will see a confirmation message in the Output panel with the application url - *yourappname.appspot.com*

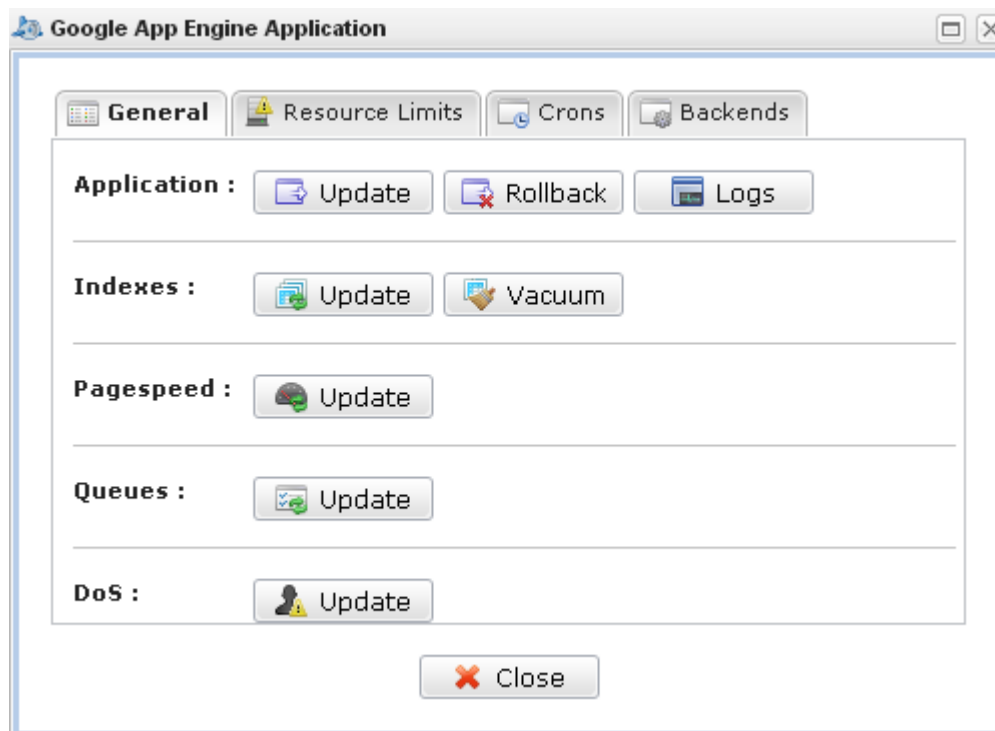
Make sure you use the same Google ID to log in to Codenvy and Google App Engine. Using different accounts may cause 401 or 404 errors. 401 error can be fixed by logging out, and then logging in Google App Engine at **PaaS > Google App Engine > Logout/Login**

Watch the entire process of deploying an app to GAE in the below video

Updating an Existing Application GAE

Having deployed your application to GAE, you can make some changes to the code and easily update it.

- The application is updated at **Project > PaaS > Google App Engine**
- The project is re-built and re-deployed once you press **Application Update** button. An alternative way to update your GAE app is to go to **PaaS > Google App Engine > Update Application**.



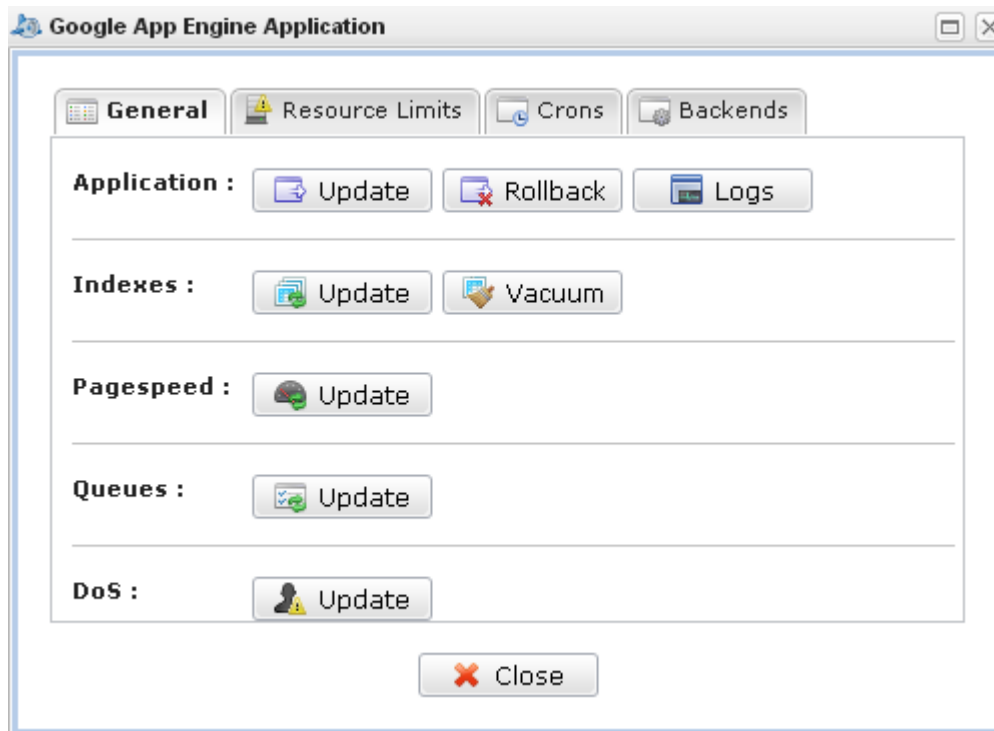
Three messages (project build, start and end of deployment) appear in the Output panel one by one. Once done, changes are implemented in the application hosted on appspot.com.

Have a look at this short video demonstrating how you can update your GAE apps directly from Codenvy:

Managing GAE Applications

You can manage your GAE application at **Project >PaaS > Google App Engine**.

It's possible to modify and vacuum Indexes, PageSpeed, Queues, DoS as well as have a look at resource limits, cron jobs and backends.



Import an Existing GAE Application

If you have a GAE application which you need to import to Codenvy, here's a workaround (this is not a direct import of source code, so it will take a few minutes or so):

- download source code of your app (of course, this step can be omitted if you have in on GitHub and sync it regularly). You can download source code of your Java and Python apps using SDK command line (check out GAE documentation).
- push this code to GitHub or whatever remote repository you use
- clone your GitHub project to Codenvy
- open *appengine-web.xml* file and edit application ID, if necessary, for example `<application>javagae112</application>` (enter the app ID you need to update on GAE)
- if you want to create a new version of the same app, you can change it as well, for example `<version>2</version>`

```
<appengine-web-app xmlns="http://appengine.google.com/ns/1.0">  
  <application>javall12</application>  
  <version>1</version>
```

- update application at **Project > PaaS > Google App Engine**.

Once the app is updated, you can change and update it anytime directly from Codenvy.

Since Codenvy uses Maven as a build manager, the projects you clone should also be built with Maven, i.e. contain pom.xml file in the root project folder.

You may have a look at this short video demonstrating the procedure of importing an existing GAE app to Codenvy using GitHub.

Device Support

Codenvy currently supports all desktop and laptop devices. We currently provide touch device support through the use of the Puffin Web Browser which virtualizes double clicks and right clicks. We have not yet created a native touch UI design. Vote for this feature at our [Userveice](#) page.

Experiment No. 7

Objective: Working and installation of Microsoft Azure.

Requirement: Account on Microsoft Azure

THEORY:

Introduction:

In this article we are going to see how to create a new database stored procedure using the new Azure portal instead of using the SQL Server Management Studio.

Overview:

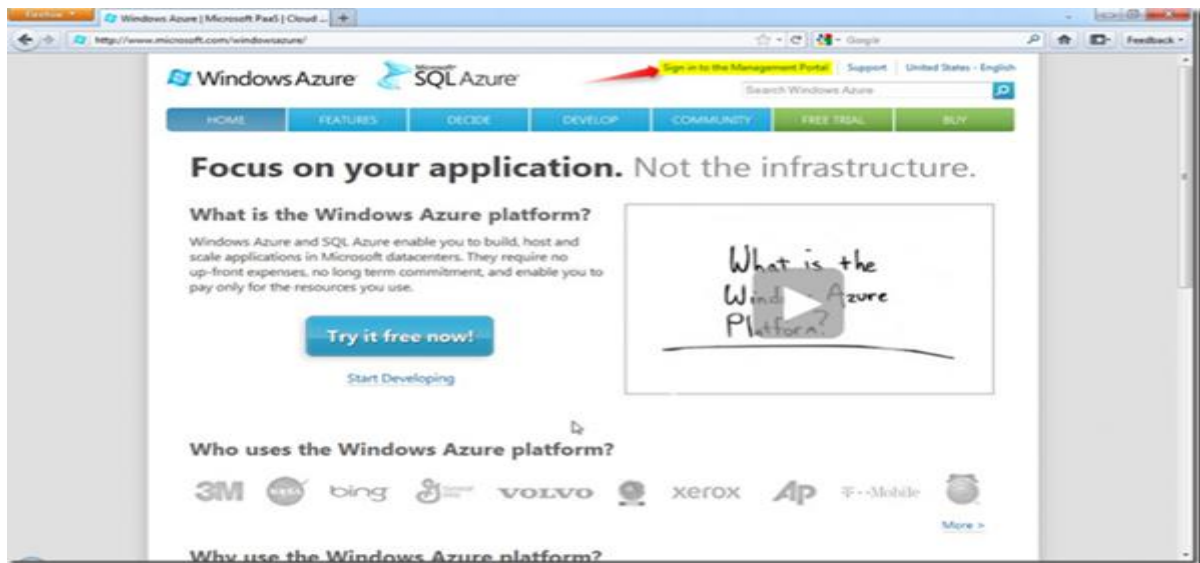
Stored procedures are created normally using the SQL Server management studio, with the latest version of SQL Azure we have option to create a user stored procedure directly online without need to have a local interface. This way we have some control of using it anywhere anytime to do some updates regularly.

Let us see how to create the Stored procedure in Azure portal step by step.

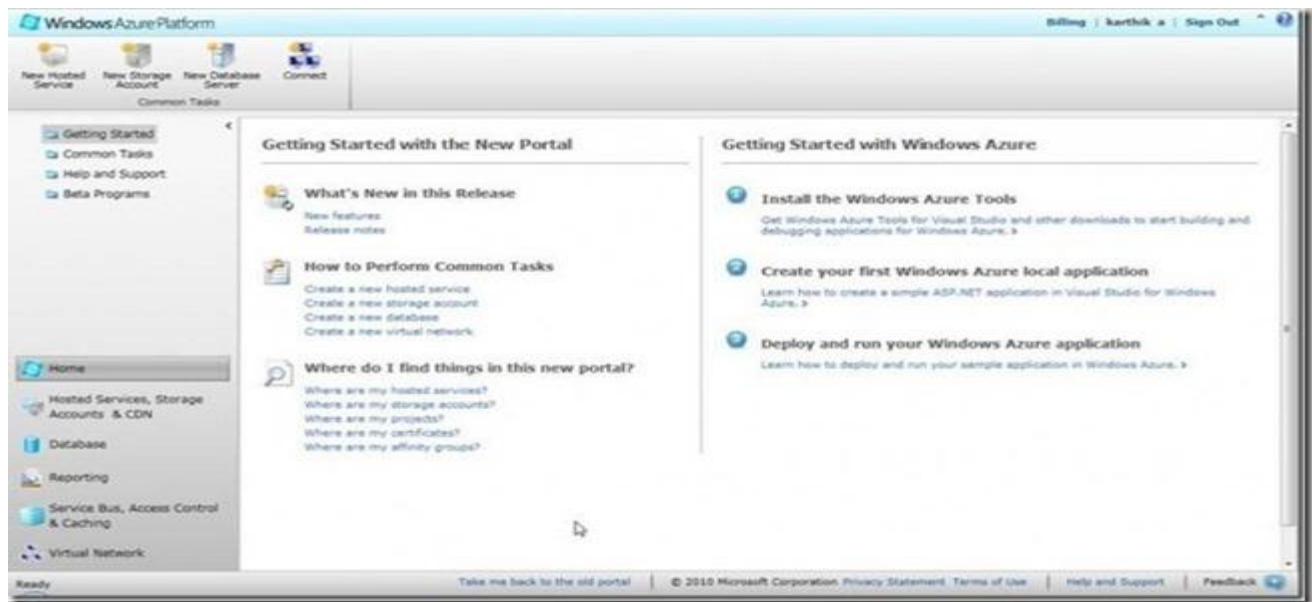
Steps:

Log in to the Azure portal using the below link. You can see the screen look similar to below

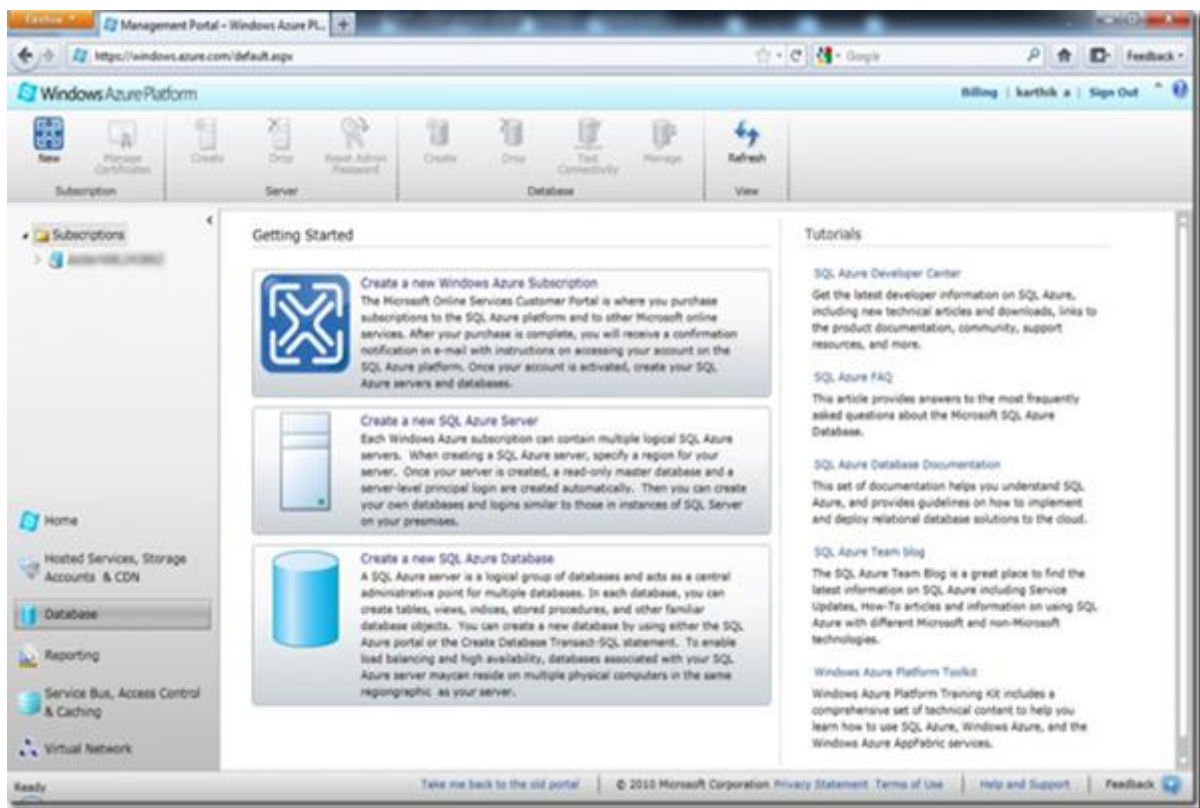
<http://www.microsoft.com/windowsazure/>



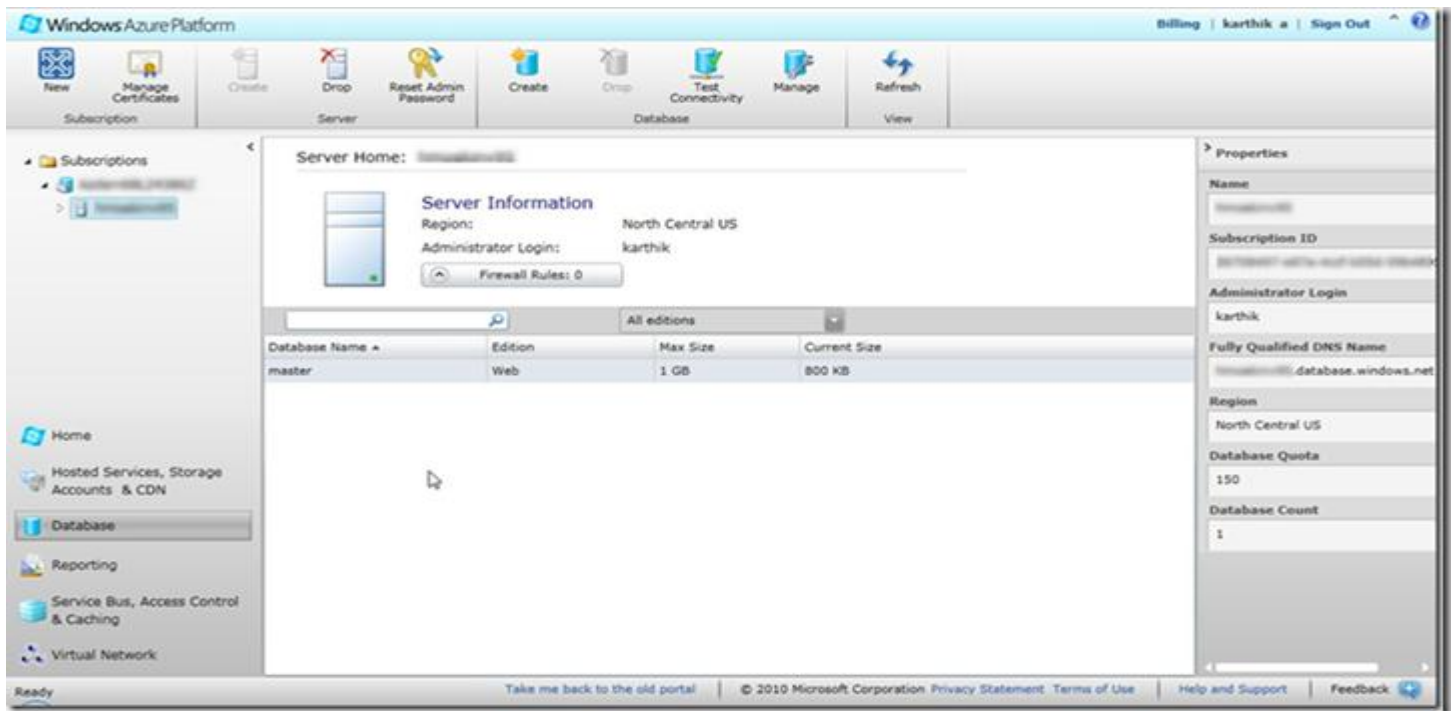
Login to the portal using your Microsoft Windows Live credentials with Azure credentials to the management portal and you will see the screen as shown in the screen below



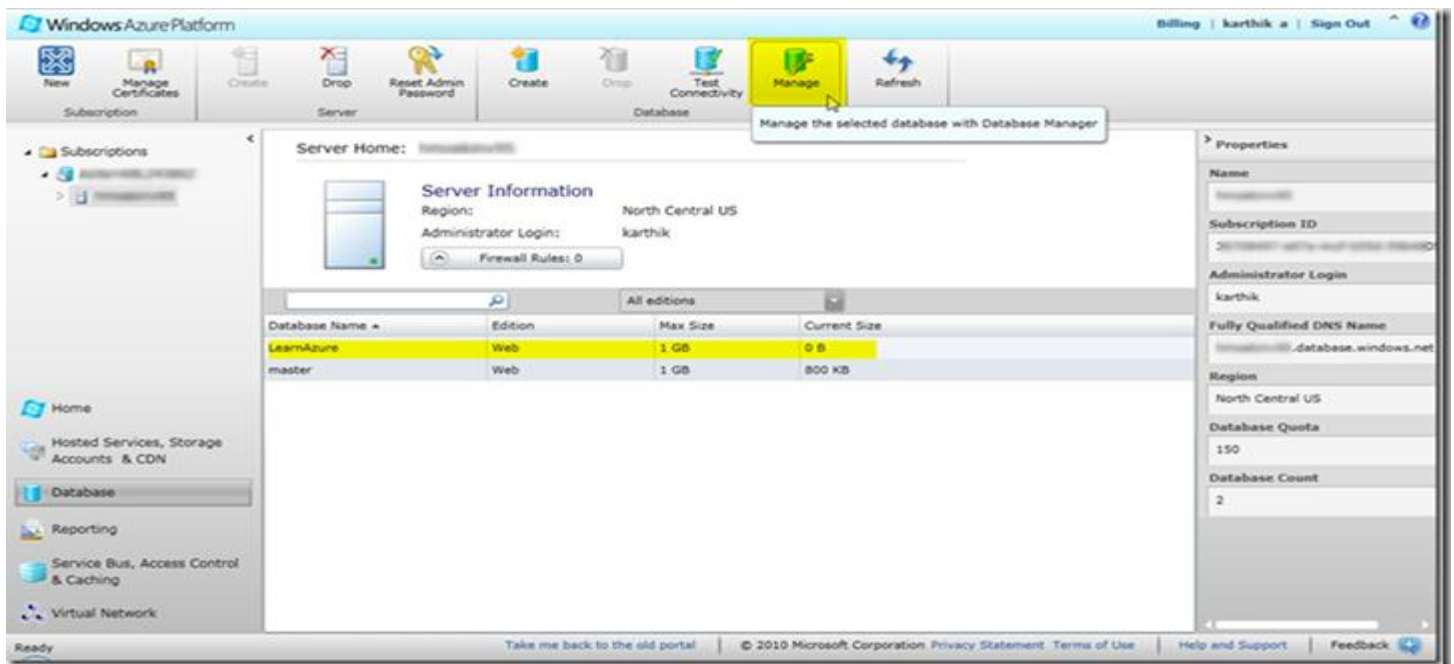
Now we can see the Database Menu at the bottom left, Click on that will go to the Database Subscription window as shown in the screen below



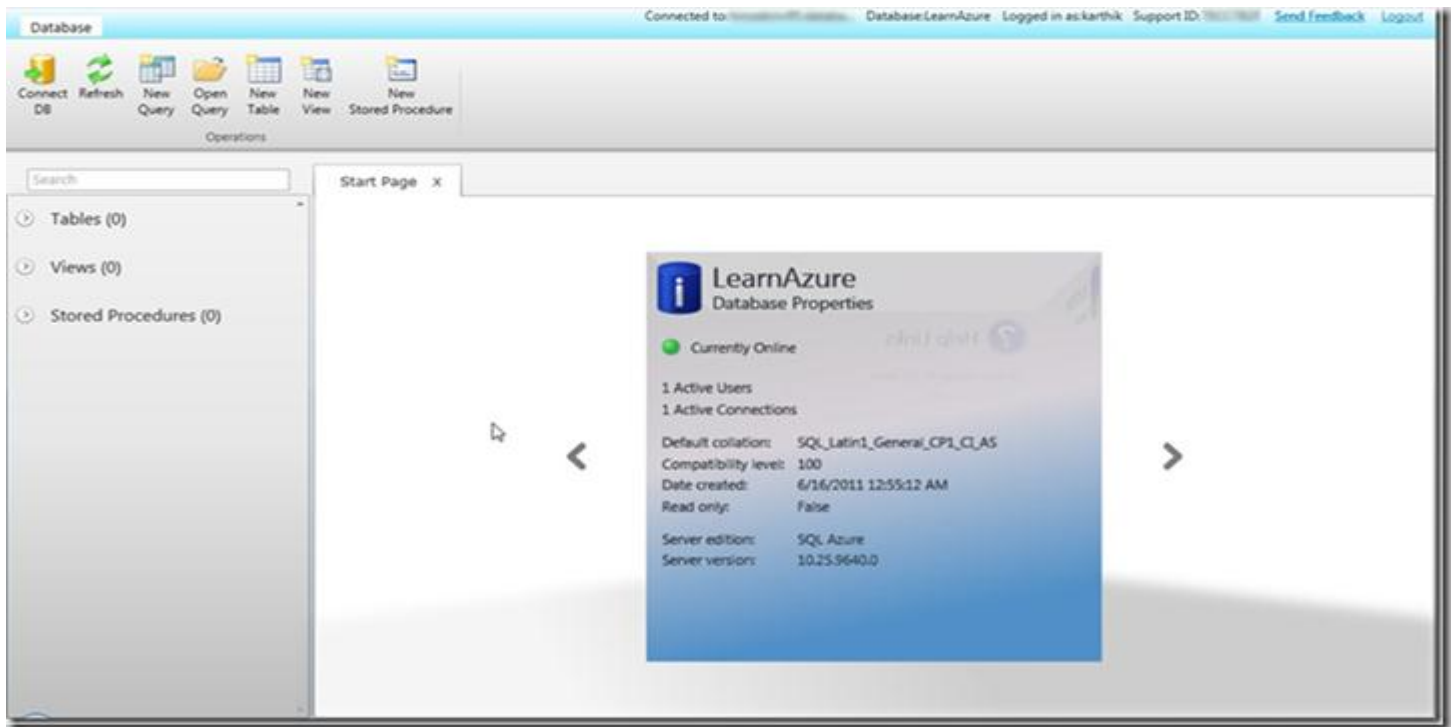
Clicking on the subscription name will provide the complete details of the server created and the new database created as shown in the screen below



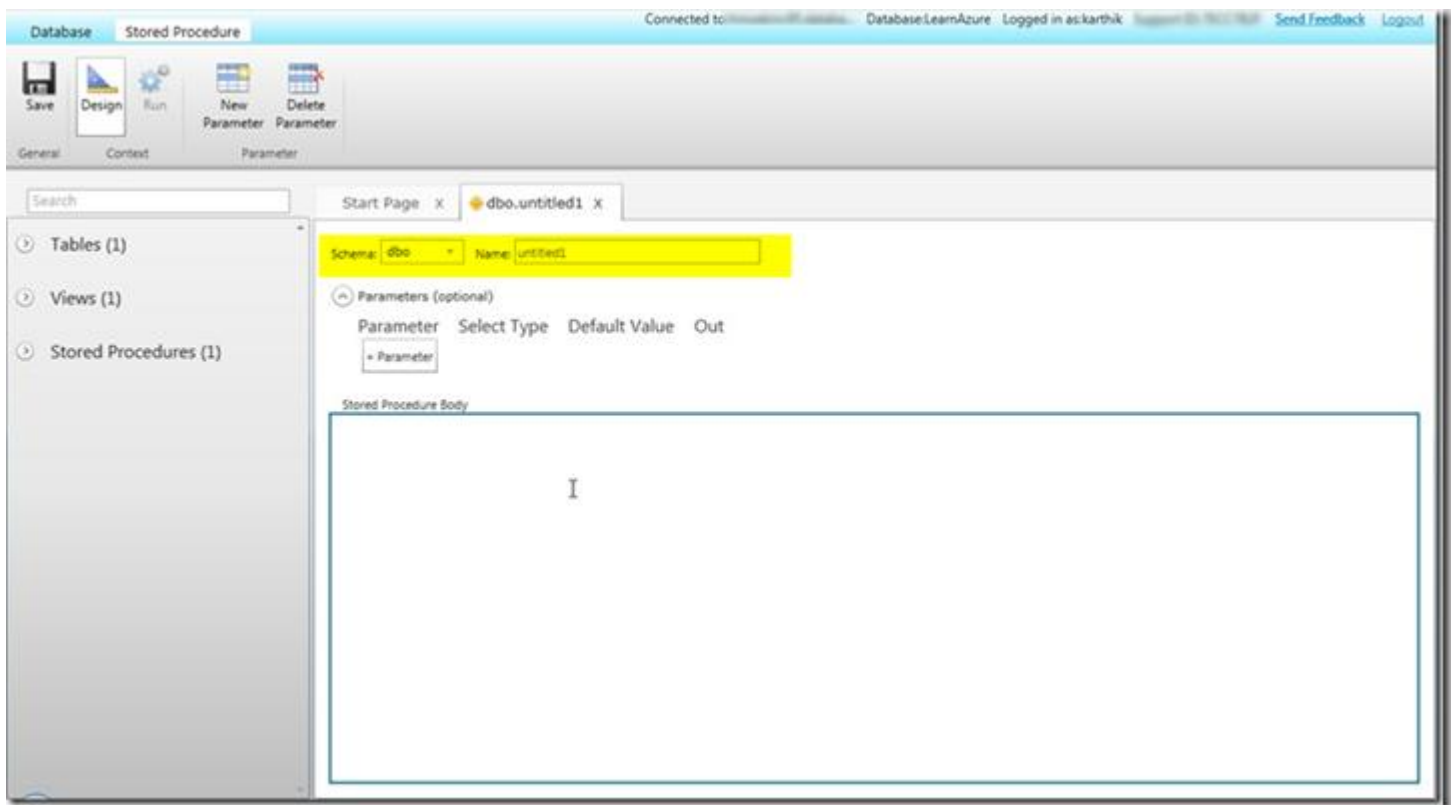
Now we have a database created(LearnAzure) with a Max size of 1GB and ready to use it for the application based on the requirement. To create a new Stored Procedure click on Manage at the top menu tool bar as shown in the screen below



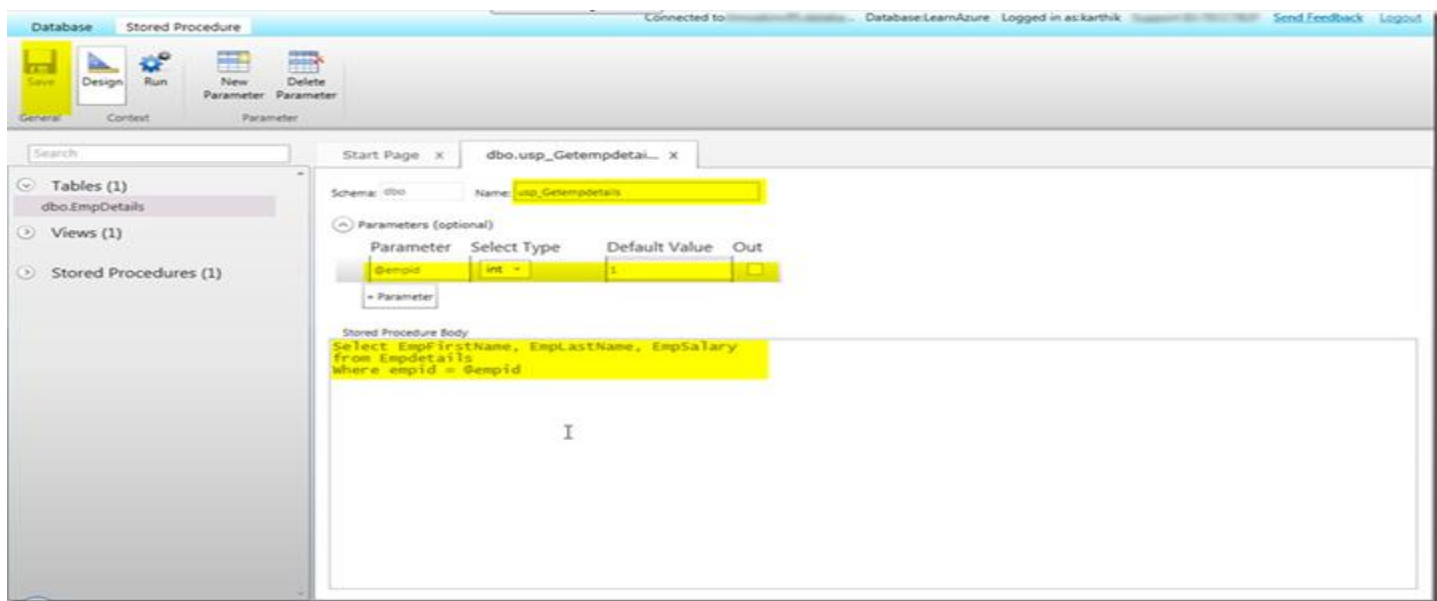
Check my previous article on how to connect to the manage portal using the credentials and the firewall using the link. Once logged in you screen will look like below



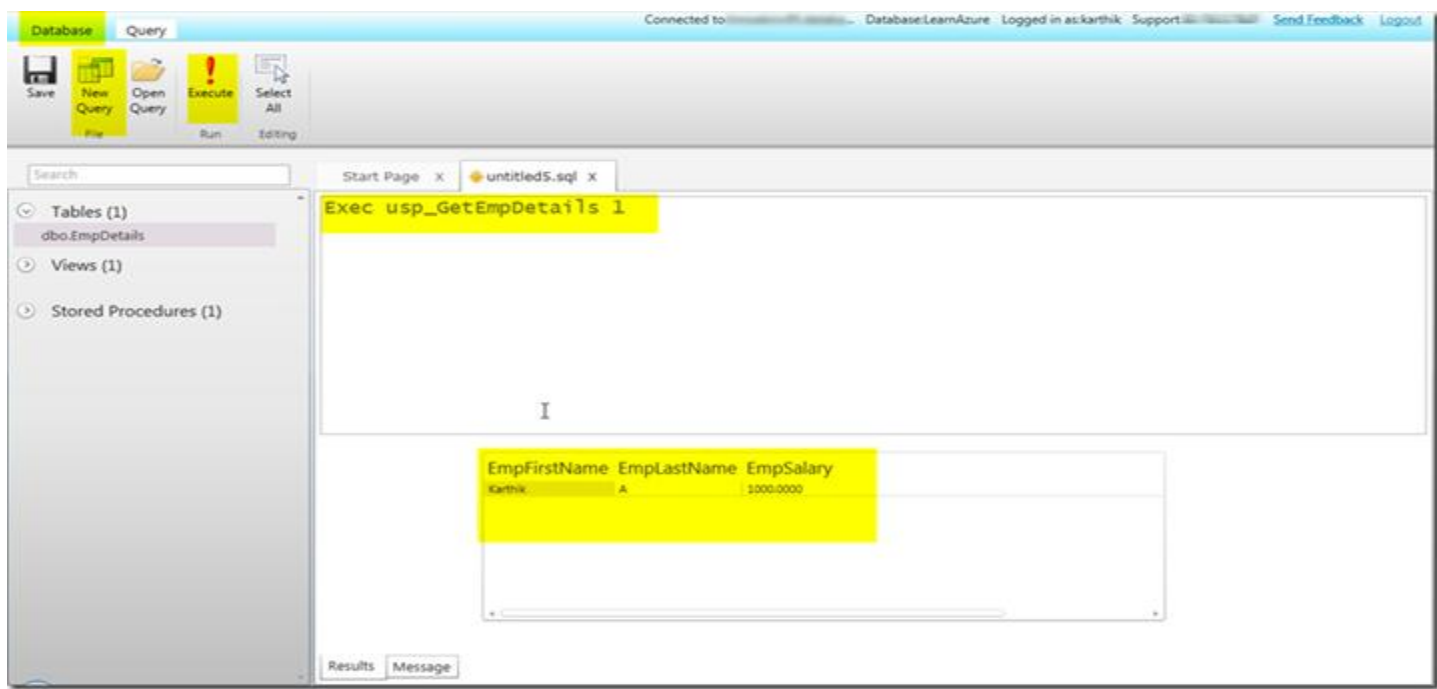
To create a new stored procedure click on New Stored procedure menu at the top and we will see a script window as shown in the screen below



Now we will write our customized stored procedure for the EmpDetails table which we created in our earlier tutorial(Check my previous article for table creation) as shown in the screen below



Once we create the structure for the stored procedure as shown in the above screen we need to save it. Once save we can use the stored procedure to execute the same as shown in the screen below. We need to navigate to the new query window in the Database section and write a execute command as shown below.



We can create n Number of stored procedure as per the requirement and use it across the process which we normally do with the traditional SQL Server locally.

Experiment No. 8

Objective: Working with Mangrasoft Aneka Software.

Requirement: ECMA Runtime Environment, Database

THEORY:

Aneka is a Cloud Application Development Platform (CAP) for developing and running compute and data intensive applications. As a platform it provides users with both a runtime environment for executing applications developed using any of the three supported programming models, and a set of APIs and tools that allow you to build new applications or run existing legacy code. The purpose of this document is to help you through the process of installing and setting up an Aneka Cloud environment. This document will cover everything from helping you to understand your existing infrastructure, different deployment options, installing the Management Studio, configuring Aneka Daemons and Containers, and finally running some of the samples to test your environment.

An Aneka Cloud is composed of a collection of services deployed on top of an infrastructure. This infrastructure can include both physical and virtual machines located in your local area network or Data Centre. Aneka services are hosted on Aneka Containers which are managed by Aneka Daemons. An Aneka Daemon is a background service that runs on a machine and helps you to install, start, stop, update and reconfigure Containers.

A key component of the Aneka platform is the Aneka Management Studio, a portal for managing your infrastructure and clouds. Administrators use the Aneka Management Studio to define their infrastructure, deploy Aneka Daemons, and install and configure Aneka Containers. The figure below shows a high-level representation of an Aneka Cloud, composed of a Master Container that is responsible for scheduling jobs to Workers, and a group of Worker Containers that execute the jobs. Each machine is typically configured with a single instance of the Aneka Daemon and a single instance of the Aneka Container.

Installation

This section assumes that you have a copy of the Aneka distribution with you. If you do not have a copy already, you can download the latest version from Manjrasoft's Website.

Installing Aneka Cloud Management Studio

Aneka installation begins with installing Aneka Cloud Management Studio. The Cloud Management Studio is your portal for creating, configuring and managing Aneka Clouds. Installing Aneka using the distributed Microsoft Installer Package (MSI) is a quick process involving three steps as described below.

Step 1 – Run the installer package to start the Setup Wizard

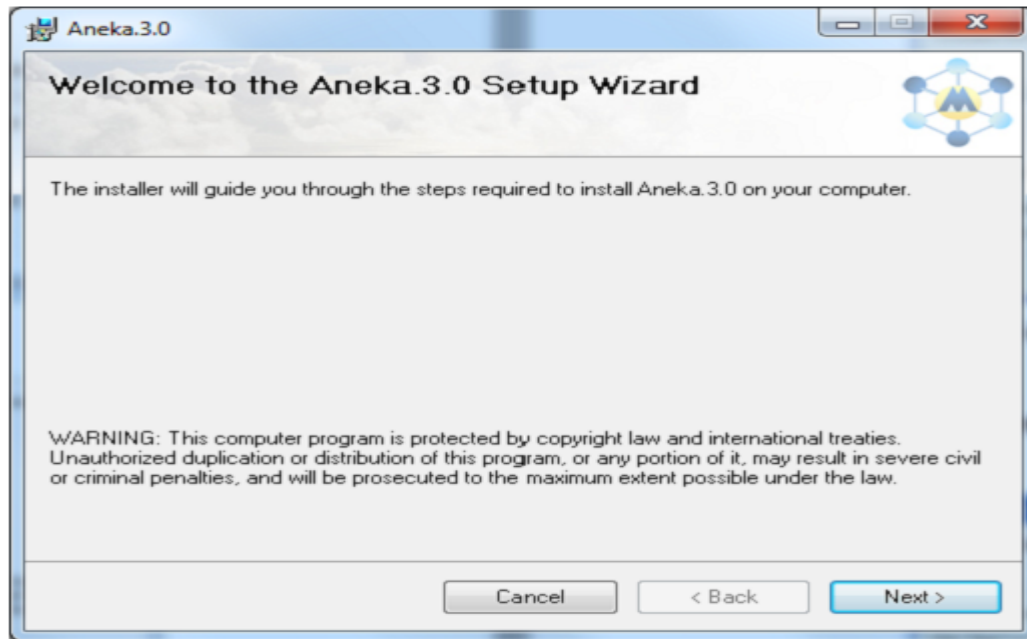


Figure - Welcome Page

The Welcome Page is self-explanatory and you can proceed by clicking next.

Step 2 – Specifying the installation folder

In Step 2 you specify the installation folder. By default Aneka is installed in C:\Program Files\Manjrasoft\Aneka.3.0.

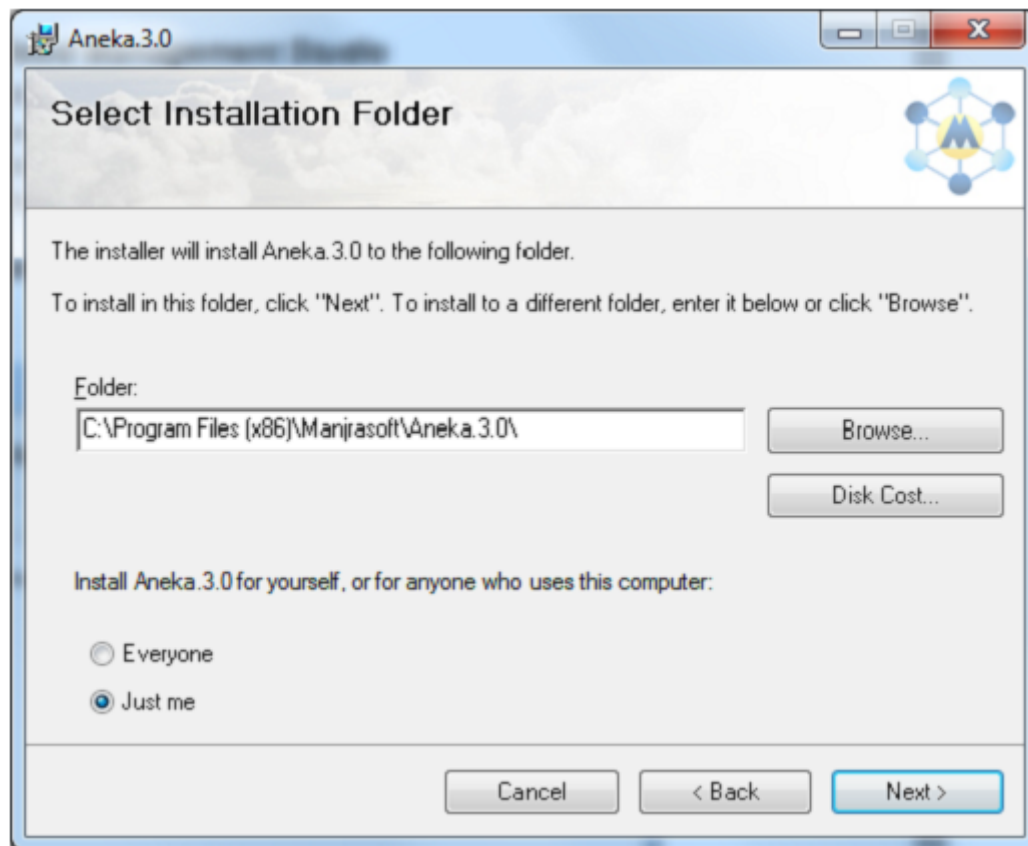


Figure - Specifying the installation folder

Step 3 – Confirm and start the installation

At this point you are ready to begin the installation. Click “Next” to start the installation or “Back” to change your installation folder.

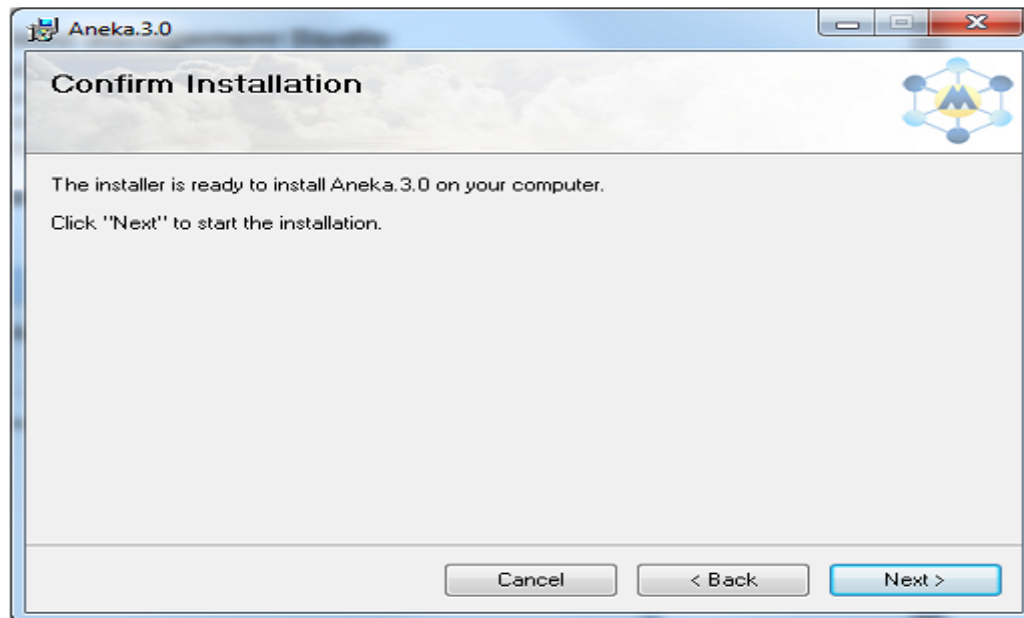


Figure - Confirm Installation

Once the installation is complete, close the wizard and launch Aneka Management Studio from the start menu.

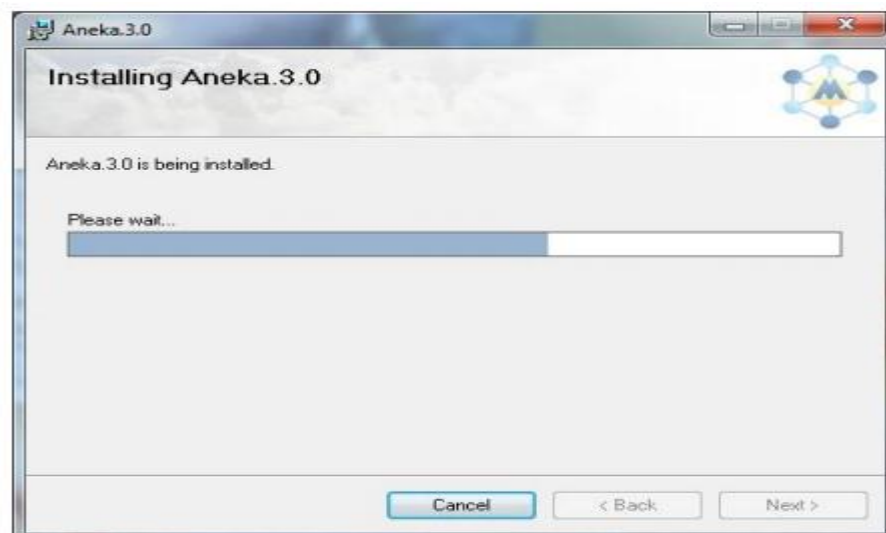


Figure - Installation Progress

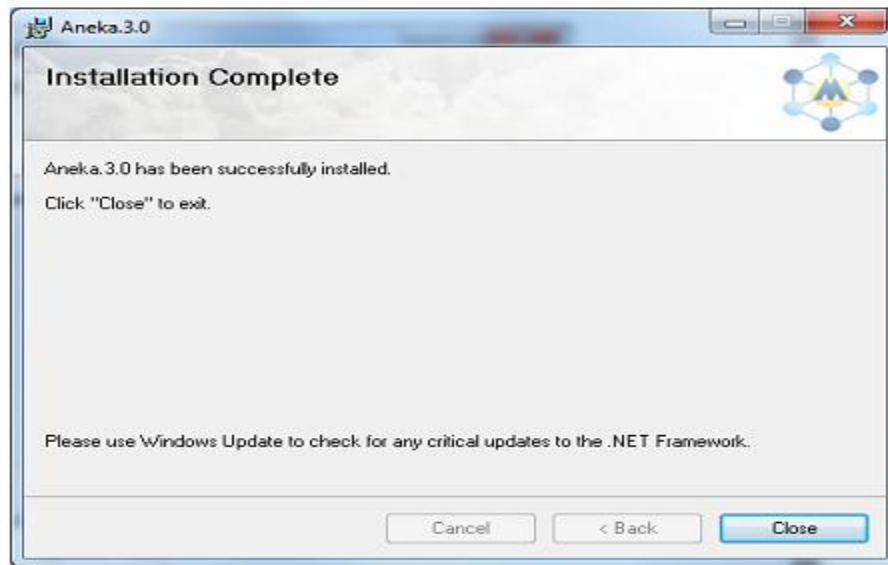


Figure - Installation Complete

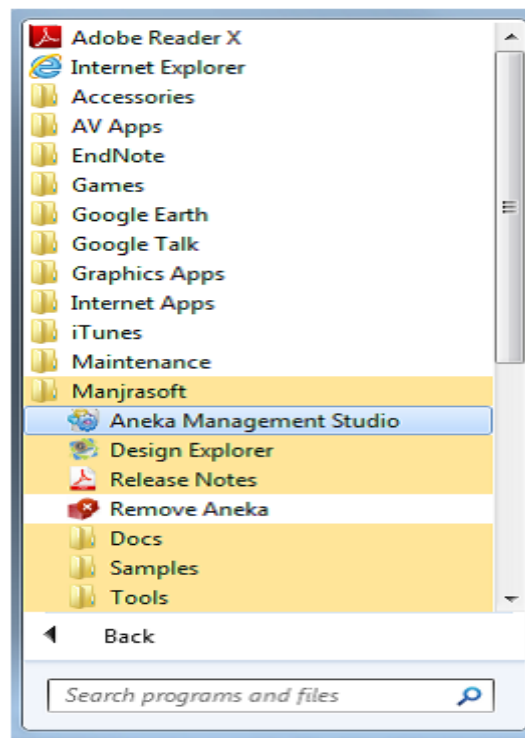


Figure - Start Menu

Aneka Cloud Management Studio

The Aneka Cloud Management Studio is your portal for managing your infrastructure and clouds. It provides facilities for defining your underlying cloud infrastructure and creating one or more Aneka Clouds on top. It lets you create and manage Aneka user accounts, monitor the overall performance of your Cloud,

obtain detailed reporting information on resource usage, data transfers, billing and application (job) execution. It also provides facilities for troubleshooting your deployments by allowing you to access and examine remote logs.

Starting up Management Studio

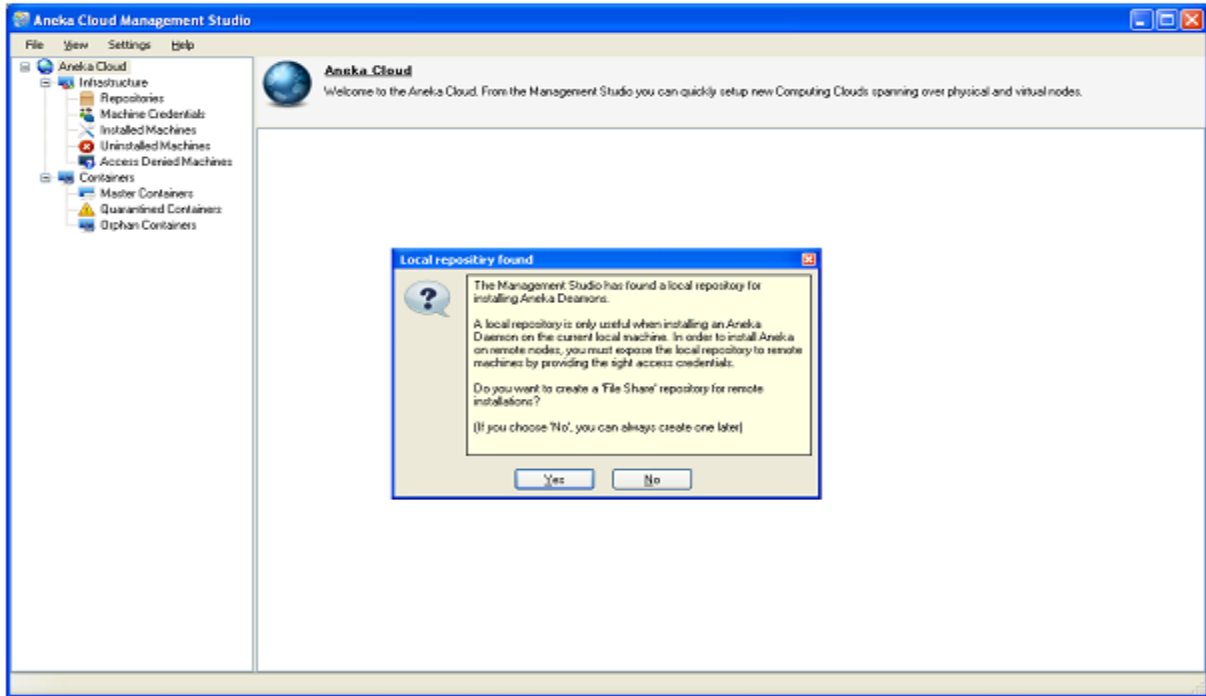


Figure - Starting Aneka Cloud Management Studio for the first time.

When Aneka Cloud Management Studio is started up for the first time you'll be asked to create a Remote Repository for performing remote installations. Setting up a Remote Repository requires selecting a suitable repository type and supplying valid credentials which remote machines can use to connect and download required files. You may however choose to create this repository at a late time before making remote installations. If no repository is defined, you will be restricted to making local installations only.

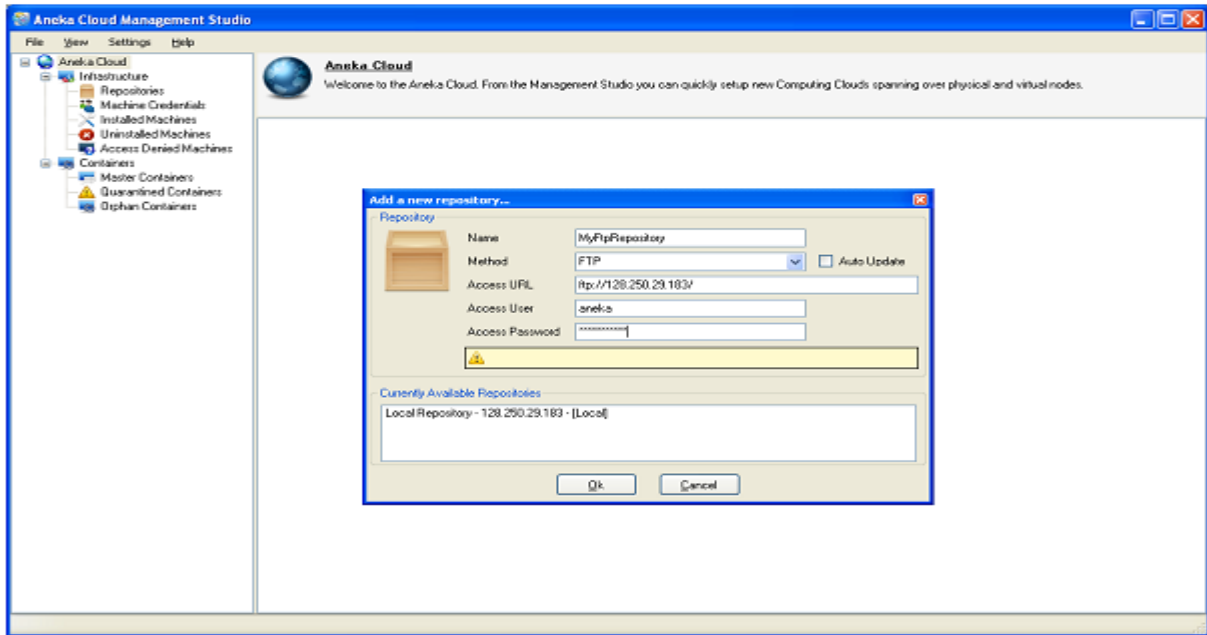


Figure - Creating a repository for remote installations

Shutting down Aneka Management Studio

When attempting to shut down Aneka Management Studio, you will be given the choice of saving all configuration data from the current session. It is highly recommended that you save this information and restore it the next time you start using the Management Studio.

The Configuration File

The configuration file, ManagementStudio.config, contains all information that describes your infrastructure, your Clouds, the machine credentials, repositories and authentication keys (see section on installing the Master Container) that you defined when using Aneka Management Studio. It is recommended that you save this information when you exit Management Studio so that you can restore it at a later session, and get up-to-speed with your Cloud management without having to redefine all settings again. Some configuration information, such as authentication keys, must be maintained safely if you are to add new Containers to your existing Cloud. Losing an authentication key however, is not detrimental as you will be able to reconfigure your clouds with a new key.

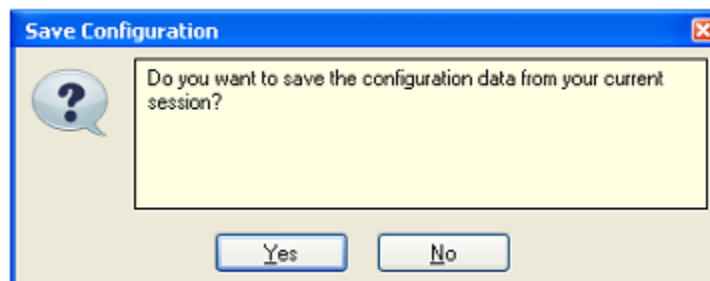


Figure - Request to save configuration data when closing Management Studio

The configuration file is always encrypted before being written to disk for security reasons. When saving configuration data you will be required to specify a password as show in Figure.

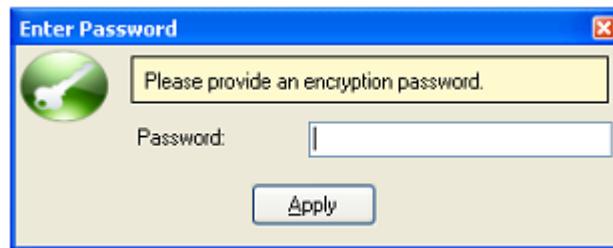


Figure - Password to encrypt configuration data

When starting up Aneka Management Studio at a later session, you will be given the choice of restoring your configuration data. If you choose to do so, you must re-enter the same password you used when saving.

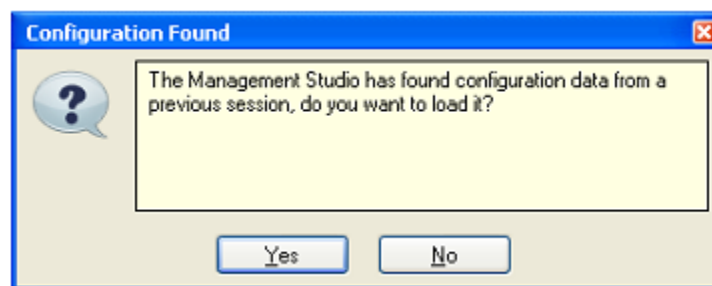


Figure - Request to restore configuration data

Viva Questions

Ques1: How does cloud computing provides on-demand functionality?

Ans: Cloud computing is a metaphor used for internet. It provides on-demand access to virtualized IT resources that can be shared by others or subscribed by you. It provides an easy way to provide configurable resources by taking it from a shared pool. The pool consists of networks, servers, storage, applications and services.

Ques2: What is the difference between scalability and elasticity?

Ans: Scalability is a characteristic of cloud computing through which increasing workload can be handled by increasing in proportion the amount of resource capacity. It allows the architecture to provide on demand resources if the requirement is being raised by the traffic. Whereas, elasticity is being one of the characteristic provide the concept of commissioning and decommissioning of large amount of resource capacity dynamically. It is measured by the speed by which the resources are coming on demand and the usage of the resources.

Ques3: What are the different layers of cloud computing?

Ans: Cloud computing consists of 3 layers in the hierarchy and these are as follows:

- 1. Infrastructure as a Service (IaaS)** provides cloud infrastructure in terms of hardware like memory, processor speed etc.
- 2. Platform as a Service (PaaS)** provides cloud application platform for the developers.
- 3. Software as a Service (SaaS)** provides cloud applications which are used by the user directly without installing anything on the system. The application remains on the cloud and it can be saved and edited in there only.

Ques4: What resources are provided by infrastructure as a service?

Ans: Infrastructure as a Service provides physical and virtual resources that are used to build a cloud. Infrastructure deals with the complexities of maintaining and deploying of the services provided by this layer. The infrastructure here is the servers, storage and other hardware systems.

Ques5: How important is platform as a service?

Ans: Platform as a Service is an important layer in cloud architecture. It is built on the infrastructure model, which provides resources like computers, storage and network. This layer includes organizing and operate the resources provided by the below layer. It is also responsible to provide complete virtualization of the infrastructure layer to make it look like a single server and keep it hidden from the outside world.

Ques6: What does software as a service provide?

Ans: Software as Service is another layer of cloud computing, which provides cloud applications like Google is doing, it is providing Google docs for the user to save their documents on the cloud and create as well. It provides the applications to be created on fly without adding or installing any extra software component. It provides built in software to create wide varieties of applications and documents and share it with other people online.

Ques7: What are the different deployment models?

Ans: Cloud computing supports many deployment models and they are as follows:

- Private Cloud

Organizations choose to build their private cloud as to keep the strategic, operation and other reasons to themselves and they feel more secure to do it. It is a complete platform which is fully functional and can be owned, operated and restricted to only an organization or an industry. More organizations have moved to private clouds due to security concerns. Virtual private cloud is being used that operate by a hosting company.

- Public Cloud

these are the platforms which are public means open to the people for use and deployment. For example, Google, Amazon etc. They focus on a few layers like cloud application, infrastructure providing and providing platform markets.

- Hybrid Clouds

It is the combination of public and private cloud. It is the most robust approach to implement cloud architecture as it includes the functionalities and features of both the worlds. It allows organizations to create their own cloud and allow them to give the control over to someone else as well.

Ques8: What are the different datacenters deployed for this?

Ans: Cloud computing is made up of various datacenters put together in a grid form. It consists of different datacenters like:

- Containerized Datacenters

These are the traditional datacenters that allow high level of customization with servers, mainframe and other resources. It requires planning, cooling, networking and power to access and work.

- Low-Density Datacenters

These datacenters are optimized to give high performance. In these datacenters the space constraint is being removed and there is an increased density. It has a drawback that with high density the heat issue also creeps in. These datacenters are very much suitable to develop the cloud infrastructure.

Ques9: What are the different modes of software as a service?

Ans: Software as a Service provides cloud application platform on which user can create application with the tools provided. The modes of software as a service is defined as:

1. Simple multi-tenancy: in this each user has its own resources that are different from other users. It is an inefficient mode where the user has to put more time and money to add more infrastructure if the demand rises in less time to deliver.

2. Fine grain multi-tenancy: in this the functionality remains the same that the resources can be shared too many. But it is more efficient as the resources are shared not the data and permission within an application.

Ques10: What is the security aspects provided with cloud?

Ans: Security is one of the major aspects which come with any application and service used by the user.

Companies or organizations remain much more concerned with the security provided with the cloud. There are many levels of security which has to be provided within cloud environment such as:

- Identity management: it authorizes the application service or hardware component to be used by authorized users.

- Access control: permissions has to be provided to the users so that they can control the access of other users who are entering the in the cloud environment.

- Authorization and authentication: provision should be made to allow the authorized and authenticated people only to access and change the applications and data.

Ques11: What is the difference between traditional datacenters and cloud?

Ans: Cloud computing uses the concept of datacenter as it is the datacenter is based on the tradition one so the difference between them are as follows:

- Cost of the traditional datacenter is higher, due to heating issues and other hardware/software related issues but this is not the case with the cloud computing infrastructure.
- It gets scaled when the demand increases. Most of the cost is being spent on the maintenance being performed on the datacenters, whereas cloud platform requires minimum maintenance and not very expert hand to handle them.

Ques12: What are the three cost factors involves in cloud data center?

Ans: Cloud data center doesn't require experts to operate it, but it requires skilled people to see the maintenance, maintain the workloads and to keep the track of the traffic. The labor cost is 6% of the total cost to operate the cloud data center. Power distribution and cooling of the datacenter cost 20% of the total cost. Computing cost is at the end and is the highest as it is where lots of resources and installation has to be done. It costs the maximum left percentage.

Ques13: How the cloud services are measured?

Ans: Cloud computing provides the services to the organizations so they can run their applications and install them on the cloud. Virtualization is used to deploy the cloud computing models as it provides a hidden layer between the user and the physical layer of the system. The cloud services are measured in terms of use. Pay as much as you use that can be on the basis of hours or months or years. Cloud services allow users to pay for only what they use and according to the demand the charges or the prices gets increased.

Ques14: What are the optimizing strategies used in cloud?

Ans: To optimize the cost and other resources there is a concept of three-data-center which provides backups in cases of disaster recovery and allows you to keep all the data intact in the case of any failure within the system. System management can be done more efficiently by carrying out pre-emptive tasks on the services and the processes which are running for the job. Security can be more advanced to allow only the limited users to access the services

Ques15: What are different data types used in cloud computing?

Ans: Cloud computing is going all together for a different look as it now includes different data types like emails, contracts, images, blogs, etc. The amount of data increasing day by day and cloud computing is requiring new and efficient data types to store them. For example if you want to save video then you need a data type to save that. Latency requirements are increasing as the demand is increasing. Companies are going for lower latency for many applications.

Ques16: What are the security laws which take care of the data in the cloud?

Ans: The security laws which are implements to secure data in the cloud are as follows: Input validation: controls the input data which is being to any system. Processing: control that the data is being processed correctly and completely in an application. File: control the data being manipulated in any type of file. Output reconciliation: control the data that has to be reconciled from input to output. Backup and recovery: control the security breaches logs and the problems which has occurred while creating the back.

Ques17: How to secure your data for transport in cloud?

Ans: Cloud computing provides very good and easy to use feature to an organization, but at the same time it brings lots of question that how secure is the data, which has to be transported from one place to another in cloud. So, to make sure it remains secure when it moves from point A to point B in cloud, check that there is no data leak with the encryption key implemented with the data you sending.

Ques18: What do you understand from VPN?

Ans: VPN stands for virtual private network; it is a private cloud which manages the security of the data during the transport in the cloud environment. VPN allows an organization to make a public network as private network and use it to transfer files and other resources on a network.

Ques19: What does a VPN consists of?

Ans: VPN is known as virtual private network and it consists of two important things:

1. Firewall: it acts as a barrier between the public network and any private network. It filters the messages that are getting exchanged between the networks. It also protects from any malicious activity being done on the network.

2. Encryption: it is used to protect the sensitive data from professional hackers and other spammers who are usually remain active to get the data. With a message always there will be a key with which you can match the key provided to you.

Ques20: Name few platforms which are used for large scale cloud computing.

Ans: There are many platforms available for cloud computing but to model the large scale distributed computing the platforms are as follows:

1. Map Reduce: is software that is being built by Google to support distributed computing. It is a framework that works on large set of data. It utilizes the cloud resources and distributes the data to several other computers known as clusters. It has the capability to deal with both structured and non-structured data.

2. Apache Hadoop: is an open source distributed computing platform. It is being written in Java. It creates a pool of computer each with hadoop file system. It then clusters the data elements and applies the hash algorithms that are similar. Then it creates copy of the files that already exist.

Ques21: What are some examples of large cloud providers and their databases?

Ans: Cloud computing has many providers and it is supported on the large scale. The providers with their databases are as follows:

- **Google big table:** it is a hybrid cloud that consists of a big table that is spilt into tables and rows. Map Reduce is used for modifying and generating the data.

- **Amazon SimpleDB:** is a web service that is used for indexing and querying the data. It allows the storing, processing and creating query on the data set within the cloud platform. It has a system that automatically indexes the data.

- **Cloud based SQL:** is introduced by Microsoft and it is based on SQL database. it provides data storage by the usage of relational model in the cloud. The data can be accessed from the cloud using the client application.

Ques22: What are some open source cloud computing platform databases?

Ans: Cloud computing platform has various databases that are in support. The open source databases that are developed to support it is as follows:

1. MongoDB: is an open source database system which is schema free and document oriented database. It is written in C++ and provides tables and high storage space.

2. CouchDB: is an open source database system based on Apache server and used to store the data efficiently

3. LucidDB: is the database made in Java/C++ for data warehousing. It provides features and functionalities to maintain data warehouse.

Ques23: What are some open source cloud computing platforms for PaaS?

Ans:

- Cloud Bees
- Cod envy
- Cloud9
- I9

Ques24: What essential things a user should know before going for cloud computing platform?

Ans: A user should know some parameters by which he can go for the cloud computing services. The parameters are as follows:

- 1. User should know the data integrity in cloud computing:** It is a measure to ensure integrity like the data is accurate, complete and reasonable.
- 2. Compliance:** user should make sure that proper rules and regulations are followed while implementing the structure.
- 3. Loss of data:** user should know about the provisions that are provided in case of loss of data so that backup and recovery can be possible.
- 4. Business continuity plans:** user should think about does the cloud services provide him uninterrupted data resources.
- 5. Uptime:** user should know about the uptime the cloud computing platform provides and how helpful it is for the business.
- 6. Data storage costs:** user should find out about the cost which you have to pay before you go for cloud computing.

Ques25: What are system integrators?

Ans: Systems integrators are the important part of cloud computing platform. It provides the strategy of the complicated process used to design a cloud platform. It includes well defined architecture to find the resources and the characteristics which have to be included for cloud computing. Integrators plan the users cloud strategy implementation. Integrators have knowledge about data center creation and also allow more accurate private and hybrid cloud creation.

Ques26: What is the requirement of virtualization platforms in implementing cloud?

Ans: Virtualization is the basis of the cloud computing and there are many platforms that are available like VMware is a technology that provides the provision to create private cloud and provide a bridge to connect external cloud with private cloud. There are three key features that have to be identified to make a private cloud that is:

- Cloud operating system.
- Manage the Service level policies
- Virtualization keeps the user level and the backend level concepts different from each other so that a seamless environment can be created between both.

Ques27: What is the use of eucalyptus in cloud computing environment?

Ans: Eucalyptus stands for Elastic Utility Computing Architecture for Linking Your Programs to Useful Systems and provides an open source software infrastructure to implement clusters in cloud computing platform. It is used to build private, public and hybrid clouds. It can also produce your own datacenter into a

private cloud and allow you to extend the functionality to many other organizations. Eucalyptus provides APIs to be used with the web services to cope up with the demand of resources used in the private clouds.

Ques28: Explain different layers which define cloud architecture?

Ans: Cloud computing architecture consists of many layers which help it to be more organized and can be managed from one place. The layers are as follows:

1. Cloud controller or CLC is the top most level in the hierarchy which is used to manage the virtualized resources like servers, network and storage with the user APIs.
2. Walrus is used for the storage and act as a storage controller to manage the demands of the users. It maintains a scalable approach to control the virtual machine images and user data.
3. Cluster Controller or CC is used to control all the virtual machines for executions the virtual machines are stored on the nodes and manages the virtual networking between Virtual machines and external users.
4. Storage Controller or SC provides a storage area in block form that are dynamically attached by Virtual machines.
5. Node Controller or NC is at the lowest level and provides the functionality of a hypervisor that controls the VMs activities, which includes execution, management and termination of many instances.

Ques29: How user will gain from utility computing?

Ans: Utility computing allow the user to pay per use means whatever they are using only for that they have to pay. It is a plug in that needs to be managed by the organizations on deciding what type of services has to be deployed from the cloud. Utility computing allows the user to think and implement the services according to them. Most organizations go for hybrid strategy that combines internal delivered services that are hosted or outsourced services.

Ques30: Is there any difference in cloud computing and computing for mobiles?

Ans: Mobile cloud computing uses the same concept but it just adds a device of mobile. Cloud computing comes in action when a task or a data get kept on the internet rather than individual devices. It provides users on demand access to the data which they have to retrieve. Applications run on the remote server, and then given to the user to be able to, store and manage it from the mobile platform.

Ques31: What do you understand by Map Reduce?

Ans: Map Reduce is a software framework that was created by Google. It's prime focus was to aid in distributed computing, specifically large sets of data on a group of many computers. The frameworks took its inspiration from the map and reduce functions from functional programming.

Ques32: Explain how map reduce works?

Ans: The processing can occur on data which are in a file system (unstructured) or in a database (structured). The map reduce framework primarily works on two steps:

- 1. Map step:** During this step the master node accepts an input (problem) and splits it into smaller problems. Now the node distributes the small sub problems to the worker node so that they can solve the problem.
- 2. Reduce step:** Once the sub problem is solved by the worker node, the node returns a solution to the master node which accepts all the solutions of the worker node and re-compiles them into a solution. This solution is for the input that was provided to the master node.

Ques33: What is an input reader in reference to map reduce?

Ans: The input reader as the name suggests primarily has two functions:

1. Reading the Input

2. Splitting it into sub-parts

The input reader accepts a user entered problem and then it divides/splits the problem into parts which then each are assigned a map function. Also an input reader will always read data from a stable storage source only to avoid problems.

Ques34: How is map reduce related to cloud computing?

Ans: The map reduce framework contains most of the key architecture principles of cloud computing such as:

- **Scale:** The framework is able to expand itself in direct proportion to the number of machines available.
- **Reliable:** The framework is able to compensate for a lost node and restart the task on a different node.
- **Affordable:** A user can start small and over time can add more hardware.

Due to the above features the map reduce framework has become the platform of choice for the development of cloud applications.

Ques35: How does fault tolerance work in map reduce?

Ans: In a map reduce job the master pings each worker periodically. In case a worker does not respond to that system then the system is marked as failed. Even completed tasks are rescheduled because the output was stored in a in a local disk of a worker which failed. Hence map reduce is able to handle large-scale failures easily by simply restarting a task. The master node always saves itself at checkpoints and in case of any failure it simply restarts from that checkpoint.

Ques36: What is Hypervisor in Cloud Computing and its types?

Ans: The hypervisor is a virtual machine monitor (VMM) that manages resources for virtual machines. The name hypervisor is suggested as it is a supervisory tool for the virtual machines. There are mainly two types of hypervisors :

- > **Type-1:** the guest Vm runs directly over the host hardware, e.g. Xen, Hyper-V, VMware ESXi
- > **Type-2:** the guest Vm runs over hardware through a host OS, e.g. Kvm, Oracle virtual box

Ques37: Are Type-1 Hypervisors better in performance than Type-2 Hypervisors and Why?

Ans: Yes the Type-1 Hypervisors are better in performance as compared to Type-2 hypervisors because Type-1 hypervisors does not run through a host OS, they utilize all resources directly from Host hardware. In cloud implementation Type-1 hypervisors are used rather than Type-2 because Cloud servers need to run multiple OS images and it should be noted that if OS images are run on host a OS as in case of Type-2, the resources will get wasted.

Ques38: What is the function of Amazon Elastic Compute Cloud?

Ans: Amazon Elastic compute cloud is also known as Amazon EC2 is an Amazon web service that provides scalable resources and makes the computing easier for developers. The main functions of Amazon EC2 are:

- It provides easy configurable options and allow user to configure the capacity.
- It provides the complete control of computing resources and let the user run the computing environment according to his requirements.
- It provides a fast way to run the instances and quickly book the system hence reducing the overall time.
- It provides scalability to the resources and changes its environment according to the requirement of the user.
- It provides varieties of tools to the developers to build failure resilient applications.

Ques39: What are the advantages of cloud architecture?

Ans: Cloud architecture uses simple APIs to provide easily accessible services to the user through the internet medium. It provides scale on demand feature to increase the industrial strength. It provides the transparency between the machines so that users don't have to worry about their data. Users can just perform the functionality without even knowing the complex logics implemented in cloud architecture. It provides highest optimization and utilization in the cloud platform

Ques40: What are the different components required by cloud architecture?

Ans: There are 5 major components of cloud architecture.

1. Cloud Ingress:

Provides a mean to communicate with the outside world. This can be done with the help of communication methods such as:

- Queue based communications
- HTTP communications
- REST/SOAP
- Service Bus

2. Processor Speed:

Processor speed is the major section on which the whole cloud architecture is based. It provides on demand resources that can be dynamically allocated to the user. It saves lots of cost and has many benefits of virtualization.

3. Cloud storage services:

Cloud services provide means to store data to user's applications. It is used to provide services for different types of storages like: table data, files.

4. Cloud provided services:

Additional services are provided by the cloud, like data services, payment processing services, and search or web functionality services.

5. Intra-Cloud communications:

It provides a way to communicate with other systems that are using cloud architecture. Providers usually provide services so that one user can communicate easily with another user by being on cloud.

Ques41: What is the relationship between SOA and cloud architecture?

Ans: Service oriented architecture (SOA) is an architectural style that supports service oriented methodology that is being added in the cloud architecture as a mandatory component. Cloud architecture support the use of on-demand access to resources and it provides lots of other facilities that are being found in SOA as well. SOA makes these requirements optional to use. But, to get the full functionality and more performance based efficiency there is a requirement for the mixture of SOA and cloud architecture.

Ques42: What does private cloud offer in building an infrastructure?

Ans: Private cloud offers complete set of development tools and easy to configure panel where you can customize and deploy prototype applications.

- It keeps the private sensitive application separate and hidden from the world.
- It provides the provision to create high performance applications and include the concept of elasticity.
- It uses a firewall and keeps all the resources in a pool that separates them with other resources that are made public.

Ques43: What is cloud computing?

Ans: The cloud computing is the computing which is completely based on the Internet. It can also be defined as the next stage in the evolution of the Internet. The cloud computing uses the cloud (Internet) that provides the way to deliver the services whenever and wherever the user of the cloud needs. Companies use the cloud computing to fulfill the needs of their customers, partners, and providers. The cloud computing includes vendors, partners, and business leaders as the three major contributors. The vendors are the one who provide applications and their related technology, infrastructure, hardware, and integration. The partners are those who offer cloud services demand and provide support service to the customers. The business leaders are the ones who use or evaluate the cloud service provided by the partners. The cloud computing enables the companies to treat their resources as a pool and not as independent resources.

Ques44: What is a cloud?

Ans: A **cloud** is a combination of hardware, networks, storage, services, and interfaces that helps in delivering computing as a service. It has broadly three users which are end user, business management user, and cloud service provider. The end user is the one who uses the services provided by the cloud. The business management user in the cloud takes the responsibility of the data and the services provided by the cloud. The cloud service provider is the one who takes care or is responsible for the maintenance of the IT assets of the cloud. The cloud acts as a common center for its users to fulfill their computing needs.

Ques45: What are the basic characteristics of cloud computing?

Ans: The four basic characteristics of cloud computing are given as follows:

- Elasticity and scalability.
- Self-service provisioning and automatic de-provisioning.
- Standardized interfaces.
- Billing self-service based usage model.

Ques46: How many types of deployment models are used in cloud?

Ans: There are 4 types of deployment models used in cloud:

1. Public cloud
2. Private cloud
3. Community cloud
4. Hybrid cloud

Ques47: Which services are provided by Window Azure operating system?

Ans: Windows Azure provides three core services which are given as follows:

- Compute
- Storage
- Management

Ques48: What are the advantages of cloud services?

Ans: Some of the advantages of cloud service are given as follows:

- Helps in the utilization of investment in the corporate sector; and therefore, is cost saving.
- Helps in the developing scalable and robust applications. Previously, the scaling took months, but now, scaling takes less time.
- Helps in saving time in terms of deployment and maintenance.

Ques49: What is Web Service?

Ans: Web Services can convert your applications into Web-applications. Web Services are published, found, and used through the Web. The basic Web services platform is XML + HTTP.

XML provides a language which can be used between different platforms and programming languages and still express complex messages and functions.

The HTTP protocol is the most used Internet protocol.

Web services platform elements:

- SOAP (Simple Object Access Protocol)
- UDDI (Universal Description, Discovery and Integration)
- WSDL (Web Services Description Language)

Ques50: What is UDDI?

Ans: UDDI is an XML-based standard for describing, publishing, and finding Web services.

- UDDI stands for Universal Description, Discovery and Integration.
- UDDI is a specification for a distributed registry of Web services.
- UDDI is platform independent, open framework.
- UDDI can communicate via SOAP, CORBA, Java RMI Protocol.
- UDDI uses WSDL to describe interfaces to web services.
- UDDI is seen with SOAP and WSDL as one of the three foundation standards of web services.
- UDDI is an open industry initiative enabling businesses to discover each other and define how they interact over the Internet.

UDDI has two parts:

- A registry of all a web service's metadata including a pointer to the WSDL description of a service
- A set of WSDL port type definitions for manipulating and searching that registry

Grading Sheet Format



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Grading Sheet

Branch/Semester : IT/VII
Subject : CLOUD COMPUTING

Subject Code : IT-703

S.No.	Name of Student	Enrollment No.	Date of Experiment	Grade	Date of Experiment	Grade	Date of Experiment	Grade
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