

WEEK 1

1. Discuss success and failure stories

Discuss success stories of software engineering

1. Carerix: providing state-of-art software for corporate and personnel intermediaries

- Carerix is a Netherlands-based market leader in the field of staffing and recruitment software solutions.
- The company was recently acquired by European workforce management solutions provider PIXID.Carerix supplies innovative Customer Relationship Management (CRM) and Applicant Tracking Systems to more than 700 enterprise and mid-level businesses worldwide.
- Their smart web-based software features all the necessary functionality for vacancy posting, candidate sourcing, matching, and invoicing. Daxx has worked with Carerix since 2012, contributing to its enterprise software development, UX design, and QA activities.
- During that time, the company's monthly recurring revenue has more than doubled along with the number of subscribers to the Carerix service. Currently, Carerix software serves more than 650 customers and 10,000 users on a day to day basis.

2. HVR: enabling real-time data integration for the enterprise

- HVR Software is a U.S.-based company specializing in real-time data integration. HVR is a solution that helps companies move large volumes of data in their complex environments fast and efficiently for real-time information.
- The solution integrates data between on-premise and cloud systems, often into a data lake or data warehouse.HVR is uniquely designed for moving

data within cloud environments as it has a flexible, distributed architecture that simplifies cloud adoption.

- Our company Daxx had a chance to cooperate with HVR on a number of software development activities for their solution.
- What's special about the company's solution is its unique ability integrate data to and from traditional storage and management systems such as Oracle, SQLServer, etc. into their cloud systems such as AWS, Apache Kafka®, Microsoft Azure.

3. Broadleaf: improving the efficiency of multi-channel retailing

- Broadleaf Commerce is an Inc 5000 enterprise eCommerce solution provider with headquarters in Dallas, Texas
- The company's mission is to provide businesses with all the necessary functionality for online transactions while helping them significantly reduce costs and improve efficiency. Broadleaf was one of the first companies to develop an open-source, enterprise-ready eCommerce platform for online retailers based on Spring Framework.
- This flexible and extensible framework is widely used for building enterprise-class Java applications and is easily customizable for various business needs. Daxx had the opportunity to help Broadleaf reach their business goals by creating a cross-functional development team that covers support and system integration for European clients.
- Broadleaf B2B and B2C eCommerce platform solutions facilitate multi-channel retailing by handling more than 10,000 concurrent site visitors, processing 200 transactions per second, and managing more than 1,000,000 products in one system

4. Qualtrics: powering customer and employee experiences

- Qualtrics is an experience management company with co-headquarters across the US.
- The company provides enterprise software for collecting and analyzing data for market research, customer satisfaction and loyalty surveys, product and concept testing, employee evaluation and website

feedback. Qualtrics serves industries such as automotive, travel, hospitality, financial services, government, media, and aviation.

- Its core product is an Experience Management (XM) platform which helps brands continually assess the quality of their customers, employees, products, and brands. It is the first experience management platform measuring employee experiences via key metrics powered by predictive intelligence.
- With Qualtrics XM, enterprises can predict which changes will resonate most with all of their stakeholders

5. Auth0: securing and managing the authentication process

- Auth0 is a US-based startup specializing in Identity-as-a-Service (IDaaS) for the enterprise.
- The company's key product is a Universal Identity Platform for web, mobile, IoT, and internal applications. It authenticates and secures around 42 million logins per day.
- Auth0 provides 24/7 customer support and makes sure its platform is resilient to failures and the users never experience any downtime. The company's applications have built-in rate limiting and automated blocking features to mitigate authentication attacks.

Discuss Failures Stories of software Engineering

Heathrow Airport Disruption

- In February of this year, more than 100 flights in and out of London's Heathrow airport were cancelled, delayed, or otherwise disrupted after technical issues compromised the departure boards and check-in systems.
- As a result passengers were left without the critical information they needed about their flights. On top of that, there was limited functionality for electronic tickets (which have become quite common in recent years).

- While a Heathrow spokesperson issued a statement and said they couldn't share any more details about what caused the systems to be affected and/or which systems were impacted, they did promise to continue closely monitoring their systems.

Deadly Flaw in Medical Infusion Pumps

- The company CareFusion designs and manufactures advanced medical equipment for some of the top hospitals around the world. Unfortunately, they also have their fair share of recalls.
- And some of them are direr than others. In 2015, the CareFusion Alaris Pump, which is designed to automatically deliver fluids and medicine to hospital patients, had a software error that caused the pump to delay infusion.
- Thankfully the issue was caught very early on, but the consequences could have been dire – potentially leading to accidental overdosing. But that's not all.

F-35 Fighter Plane Glitch

- A couple of years ago, a software glitch in an F-35 Joint Strike Fighter jet was identified to have a bug.
- The bug actually caused planes to incorrectly detect and lock in on the wrong targets when flying in formation. As the company explained, each of the planes flying in formation must detect a target from varying angles.
- But the software was unable to differentiate between one target and multiple targets. In essence, the F-35s were seeing double. (And that's not something you want when flying in formation at high speeds and high altitudes.)

Uber Software Bug Catches “Cheater”

- Okay, let's take a temporary break from the serious ones. Here's one that's pretty funny (unless you're the main character of the story, that is.) In France, a bug within the Uber app actually revealed a man's affair with another woman to his wife.
- It ultimately led to a divorce and got Uber slapped with a \$45 million lawsuit.
- The bug, which causes Uber notifications to be pushed to a device even after you log out of the account on a specific device, actually sent several notifications to the Frenchman's wife – clearly outlining his rendezvous to his mistress' flat.

Software Bug Aids in Bank Heist

- In 2016, a group of advanced hackers/thieves hijacked the Bangladesh Bank System and successfully transferred out over \$81 million in four different transactions.
- They had another \$870 million lined up, but a spelling error tipped off the bank and caused these additional transfers to be canceled.
- But here's where it gets interesting. According to a release by the Bangladesh Bank authorities, there's a printer set up to automatically print read-outs of all transactions made.
- But there just so happened to be a glitch in the system (which could have been caused by the thieves, I supposed) that interrupted this printing process.
- So it wasn't until several delays later that the transfer receipts were tracked down.

TSB Bank Outage Locks Clients Out

- When you store your money in a bank, you expect to be able to access it whenever and wherever you want. But, alas, technology doesn't always afford this freedom.

- And while you've probably experienced a minor glitch in online banking in the past, I bet you've never had to go through one like this.
- In April 2018, millions of TSB Bank customers were locked out of their accounts after a “simple” upgrade to the software led to a massive banking outage.
- The system upgrade was planned, but apparently not well enough. Immediately after TSB turned on the new system, customers began experiencing issues logging in. Others were shown details of other people's accounts.

Hospital Computer Failure

- Also in 2018, Wales National Health Service (NHS) experienced a widespread computer failure that led to issues accessing patient files.
- In many hospitals and facilities, doctors were unable to see patient files. This meant they couldn't access X-ray results or bloodwork.
- It also led to a backlog in appointments, since patients couldn't be seen and the system didn't allow for cancellations.

3. Enact the importance of ethical practices

Ethics provide the moral compass by which we live our lives and make decisions – 'doing the right thing' because it's the right thing to do.

The way we make decisions is important for organization's because the wrong decisions can have a significant impact on people's lives and the reputation of organizations. So, when we make decisions based on good principles, and live by good values, we can improve the lives of others and the experiences they have at work.

Ethical practice standards

Each standard progresses through four levels of impact;

(1) Foundation level

At this level you will:

- Take responsibility for your actions
- Act consistently with relevant regulation and law
- Handle personal data and information in a professional manner
- Demonstrate honesty in dealings with others

(2) Associate level

At this level you will:

- Make responsible choices about your work, applying professional principles and values
- Consider the purpose and implications of actions, decisions and people practices for all stakeholders
- Provide explanations and reasons for the choices you make and the advice you provide
- Demonstrate professionalism and consistency in what you say and do in order to build trust

(3) Chartered Member level

At this level you will:

- Make responsible decisions by considering different ethical perspectives, and finding the best possible way forward for all stakeholders
- Coach and influence managers and leaders to consider the implications of their decisions on stakeholders
- Challenge decisions and actions which are not ethical, explaining the organization risks
- Encourage transparency in decision-making and communication where possible

(4) Chartered Fellow level

At this level you will:

- Make responsible decisions by balancing different ethical perspectives, and shape how ethics inform wider decision-making and governance
- Coach and influence senior leaders to consider the ethical impact of their decisions in the short and long-term
- Take a visible lead in solving ethical dilemmas, considering how they will play out beyond the organization
- Surface the unsaid in leadership discussions to enable transparency and improved decision-making

WEEK 2

1. Case study to understand the SDLC

- ❖ Choose any model of the SDLC and analyze the tasks at each stage as described below.
- Write at least one full paragraph for each stage of the SDLC including what it consists of and how you would apply that stage to the Case Study as described below.
- Apply the Systems Development Life Cycle to the case described below. Choose any model of the Systems Development Life Cycle and analyze the tasks you would need to accomplish at each stage of the Systems Development Life Cycle for that model.
- You may use any of the SDLC models I gave you in the Lessons area in the Week 1 or Week 2 Lessons, or any other model of your own choice. However, be sure to state which model you are using and provide a URL to the resource(s) you consulted on that model so that I can compare your analysis of the case study against the specific Systems Development Life Cycle model that you chose for your analysis.
- You will have to identify the appropriate questions to ask yourself and to answer for each stage of your Systems Development Life Cycle, similar to what I have done for the Systems Initiation phase above. Part of this assignment is for you to understand and explain to me what needs to be accomplished in each phase and how that would specifically look for the Case Study below.
- You must use your own general knowledge about organizations to make reasonable assumptions appropriate to the case study, since you will not be given every possible detail of the case

2. Include details like specific questions and examples as indicated below.

- Be as detailed as possible in your analysis. For example, if you are discussing how you would conduct a feasibility study, give a couple examples of specific questions you would ask. Your paper should contain at least 2-3 pages and up to 1-2 pages of diagrams as indicated below.
- Your paper should contain at least 2-3 pages of writing and you are encouraged to also provide up to another 1-2 pages of diagrams

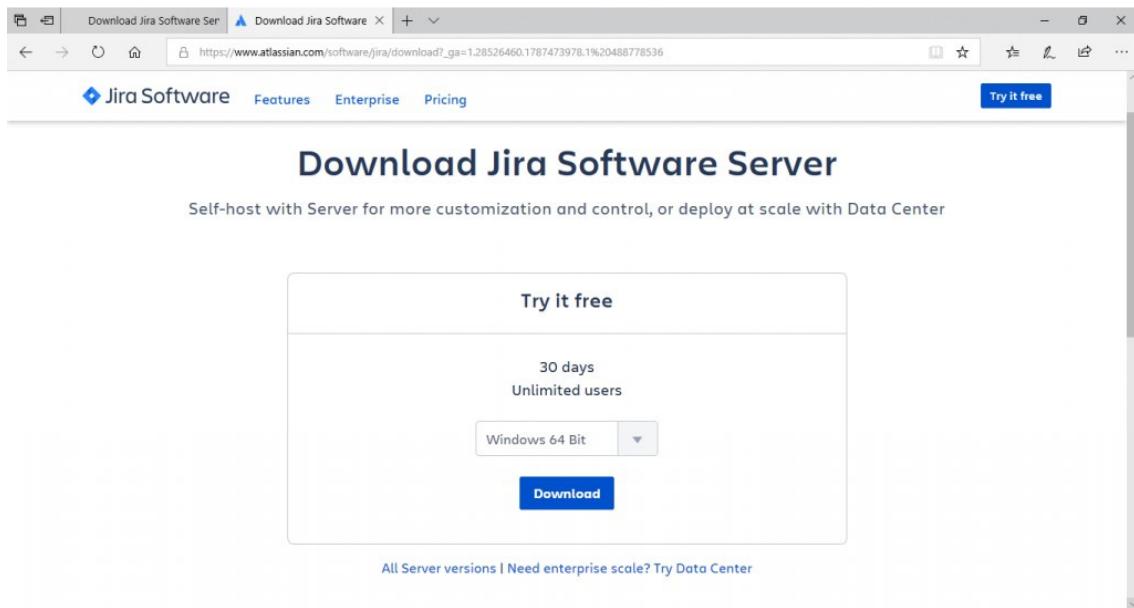
Case Study

- You are leading a team of software developers at a university. The university's President has approached you about developing a new information system for tracking student course registrations.
- The system will need to contain information about students, faculty, and courses.
- Students should be able to use the system to browse course descriptions and the schedule of classes for each semester, add classes to their schedule, and drop classes from their schedule.

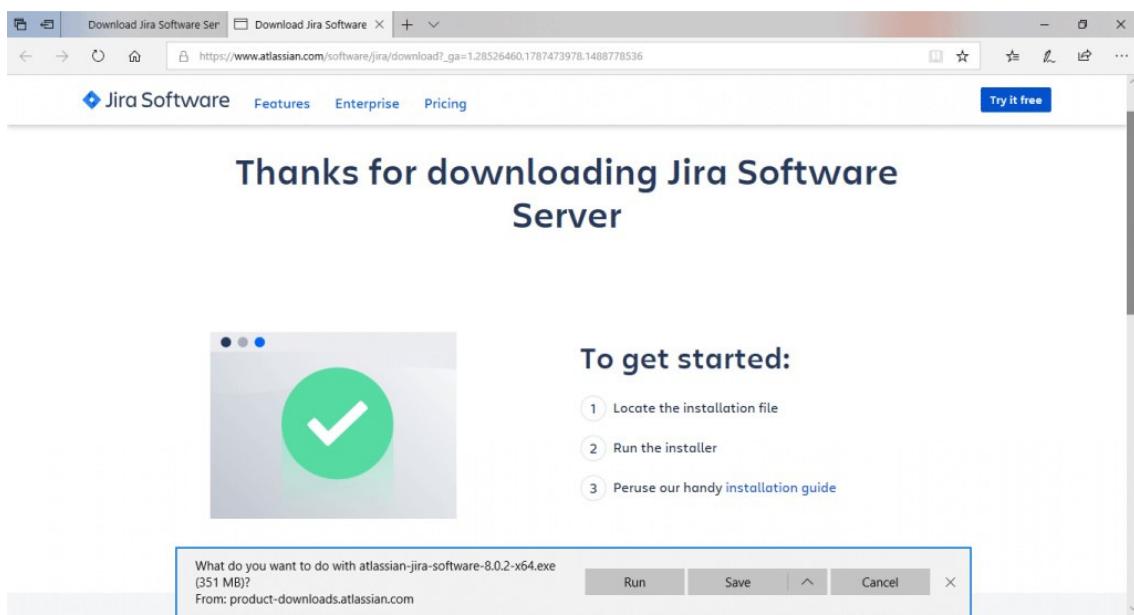
3. Create JIRA (similar tool) account and learn interface

Step 1 – To download and install Jira visit the official website of Atlassian. The link to the website is https://www.atlassian.com/software/jira/download?_ga=1.28526460.1787473978.1488778536

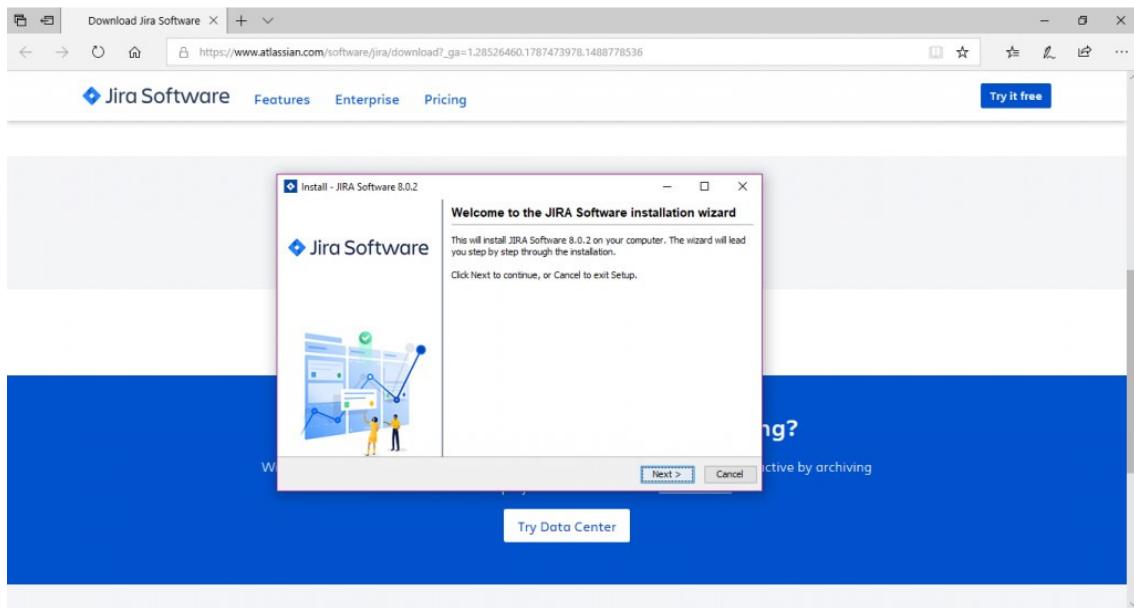
Step 2 – After selecting the type of Operating System in which you want to install Jira, look for the Download option and click on it. You can change the operating system type by clicking on the dropdown.



Step 3 – Once Jira is downloaded, click on the .exe file. After this, you will see that the Run confirmation pop-up is displayed, click on RUN to proceed. You can refer to the screenshot below.

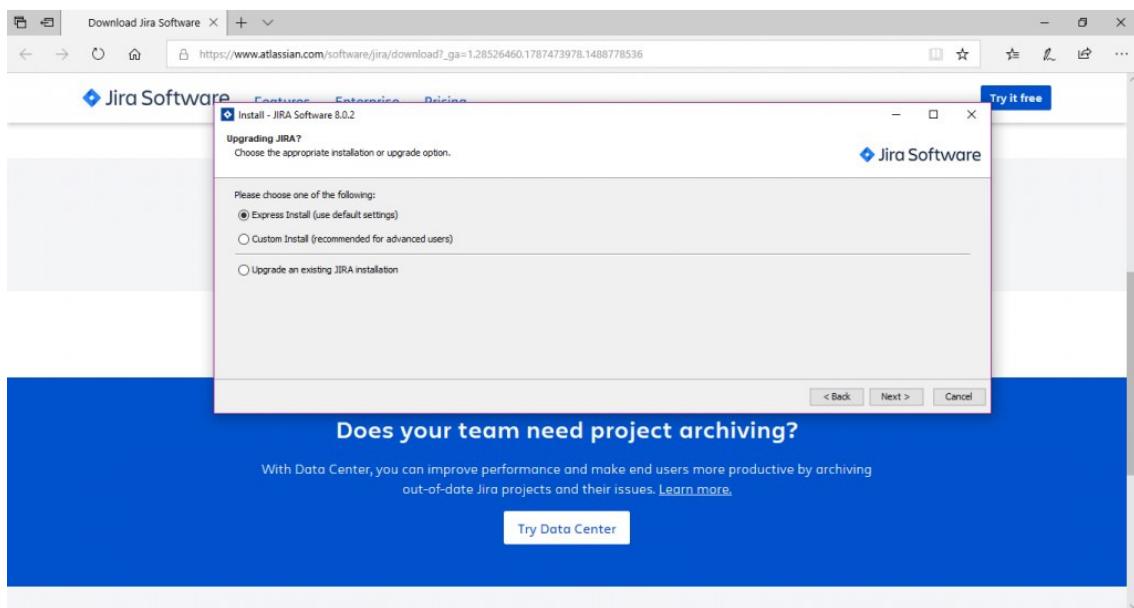


Step 4 – Notice that the JIRA installation wizard would be displayed. If so, click on Next

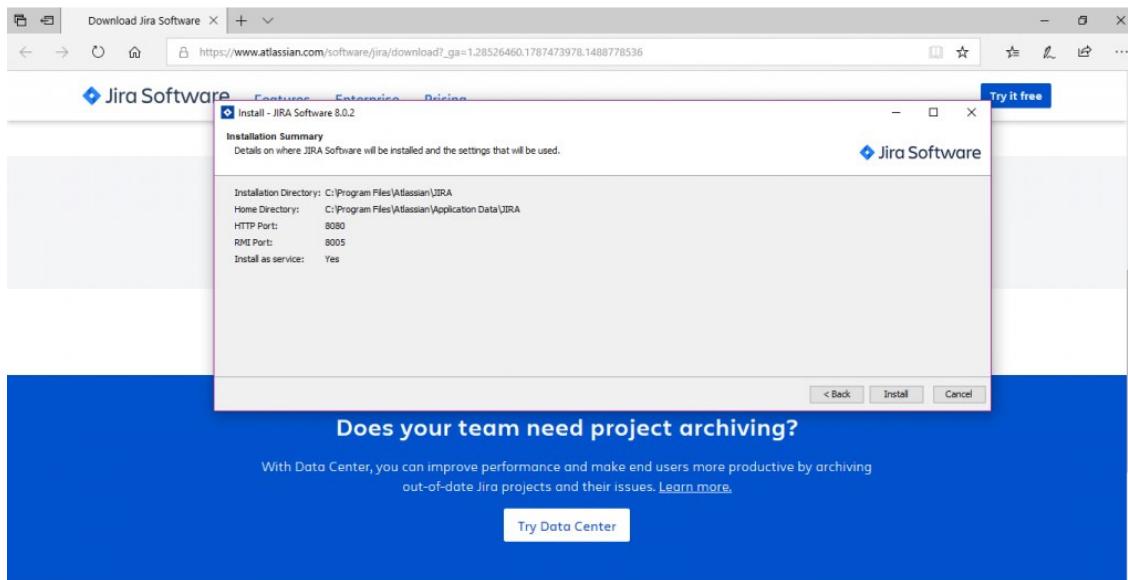


Step 5 – Choose the desired installation option and then click on Next again.

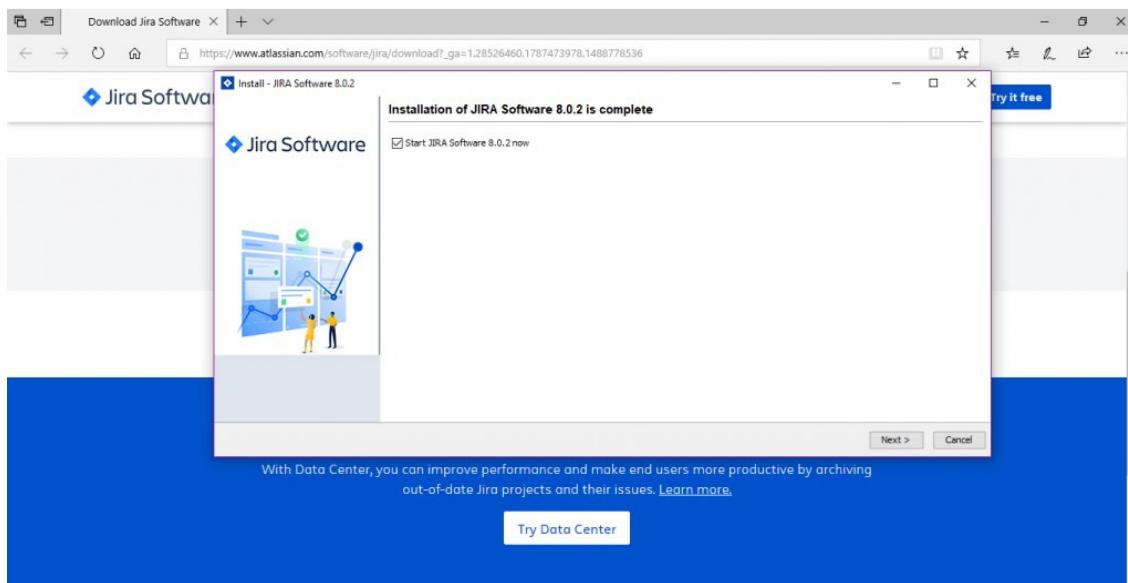
The installation summary would be displayed with the Destination Directory, Home Directory, RMI Port, HTTP Port etc. The screenshots for the same are attached below for your reference.



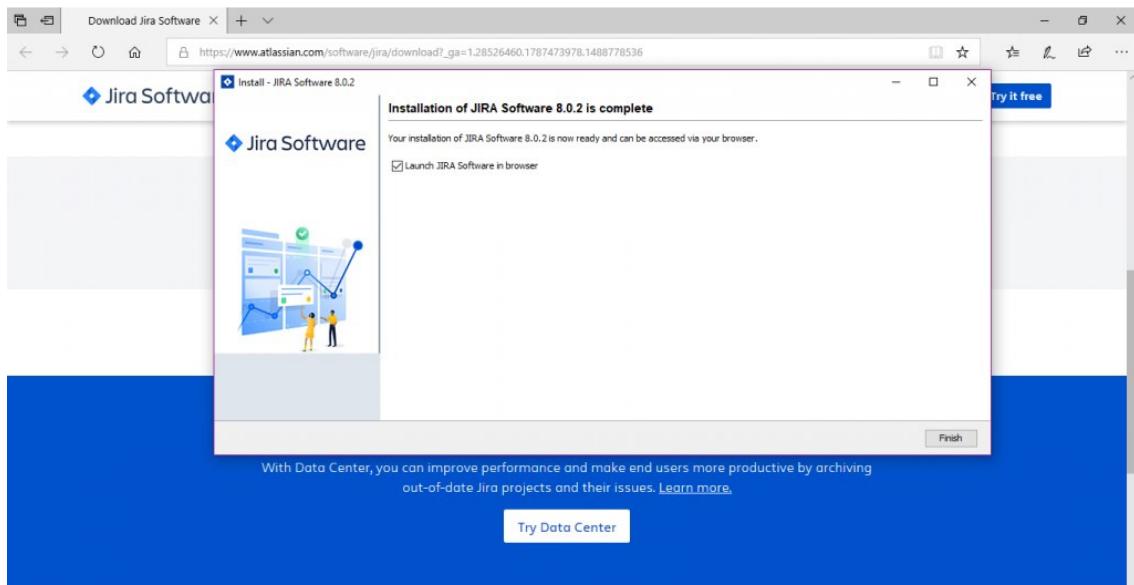
Step 6 – Click on Install. JIRA will start installing. It would take a few minutes for the installation to finish.



Step 7 – Please make sure that the “Start JIRA Software 8.0.2 now” checkbox is checked in order to start Jira automatically. After that click on Next, if not, it can be accessed using the Windows Start Menu shortcut.



Step 8 – Click the Finish button.



i

How to use Jira software

The screenshot shows the Jira Software interface with the 'Scrum: Teams in S...' project selected. The left sidebar includes options like Roadmap, Backlog, Active sprints (which is currently selected), Reports, Issues, Components, Releases, Project pages, Add item, and Project settings. The main area displays a Kanban board with four columns: TO DO, IN PROGRESS, CODE REVIEW, and DONE. Each column contains several tasks, each with a status icon (green checkmark, red X, yellow warning), an assignee, and a due date. The tasks are categorized by team: SPACE TRAVEL PARTNERS, LOCAL MARS OFFICE, and LARGE TEAM SUPPORT.

To Create a project

- In the top-left corner, click the Jira home icon
- In the top-right corner, select Create project.

To Pick a template

The Jira template library houses dozens of templates across a variety of different categories, and is designed to get your team started quickly and successfully. You can choose a template from all the Jira products you own (Jira Software, Jira Service Management, and Jira Work Management). Today, Jira Software offers three templates

To Set up your columns

- Navigate to your team's board by selecting Active sprints (for Scrum projects) or Kanban board (for Kanban projects) in the project menu on the left
- Select more (•••) > Board settings in the top-right corner.
- Select Columns.
- Select Add column to add a column for each step in your team's process.

Create an issue

- In the project menu, select **Roadmap**
- Start typing, then hit enter to create your first epic.

Invite your team

- In the project menu on the left, select Project settings.
- Select People.
- In the top-right corner, select Add people.
- Search for your team member's email address, and select Add

WEEK 3

1. Play and act agile ceremonies
2. Play different agile roles

Agile ceremonies



The four scrum ceremonies are:

- Sprint Planning
- Daily Scrum
- Sprint Review
- Sprint Retrospective

Sprint planning: is an event in scrum that kicks off the sprint. The purpose of sprint planning is to define what can be delivered in the sprint and how that work will be achieved.

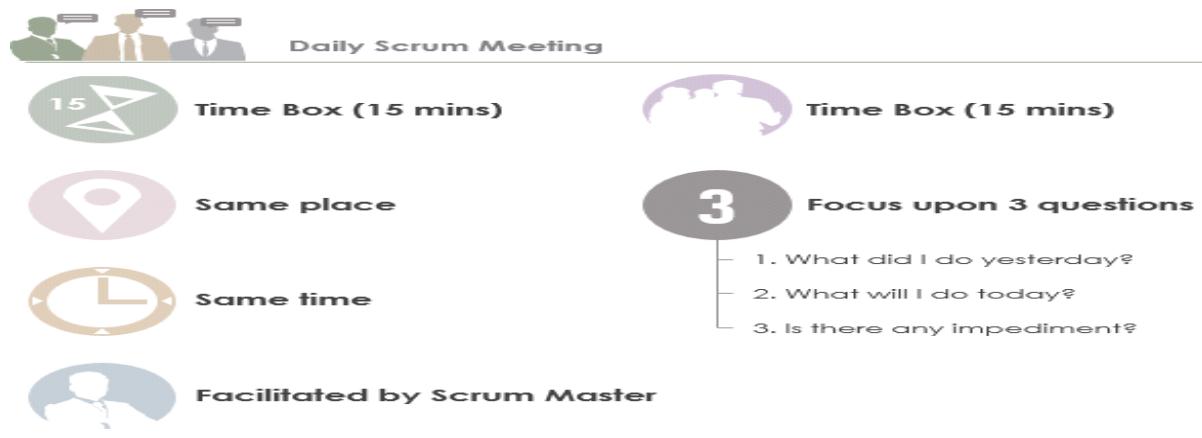
Sprint planning is done in collaboration with the whole scrum team.



- Sprint Planning is used to determine what the team will accomplish in the upcoming Sprint. The event itself has two parts.

Daily Scrum : sometimes referred to as the Daily Standup, has a time-box for 15 minutes or less, and is specifically for the benefit of the development team.

- The goal of this event is for the team to get in sync on a daily basis, allowing for better collaboration and transparency.
- The Daily Scrum should be held at the same time each day and should not include anyone outside of the Scrum Team.



- The Daily Standup meetings are usually time-boxed to **between 5 and 15 minutes**.

Sprint Review: is when the team presents their work from the Sprint to the project's stakeholders.

- It should cover not only the work they accomplished, but also open discussions around the work they were not able to complete.



A Sprint Review includes the following events:

- Attendees include the Scrum Team and key stakeholders if invited by the Product Owner;
- The Product Owner discusses the ‘done’ and ‘what has not been done’ items of the Product Backlog,
- The Development team elaborates the ‘done’ work, and justifies the Increment,
- The Product Owner discusses the Product Backlog. He or she projects likely target and delivery dates based on progress to date (if needed)

Sprint Retrospective: is the primary event in which the Scrum Team can inspect and adapt their approaches based on their experiences from the previous sprints.

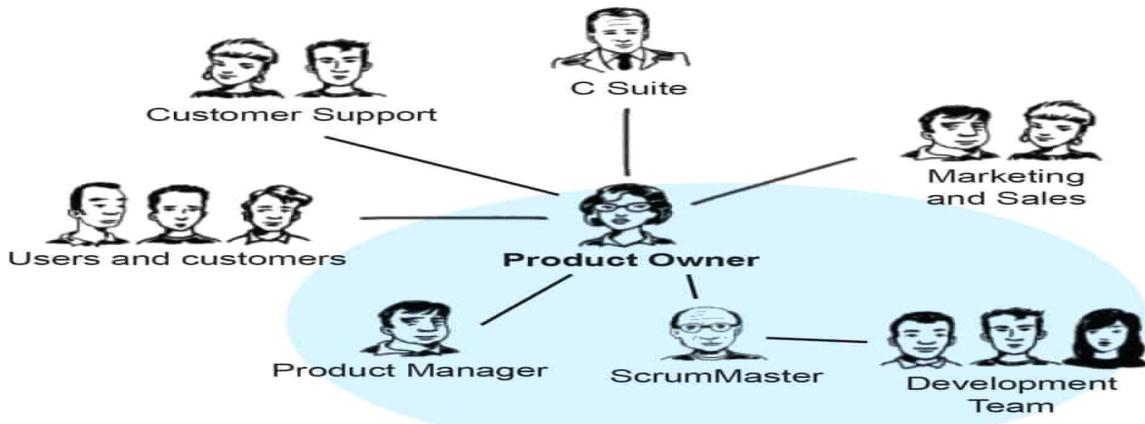
The sprint retrospective is usually held as the last activity of the sprint. It is a good idea to repeat the sprint retrospective on the same day time and place.



- When you're performing a sprint retrospective you want to capture any good ideas that come up which can then be applied to future sprints

Roles and Responsibilities of Agile

- Product Owner** – Often an executive or key stakeholder, the Product Owner has a vision for the end product and a sense of how it will fit into the company's long-term goals.
- This person will need to direct communication efforts, alerting the team to major developments and stepping in to course-correct and implement high-level changes as necessary.



The product owner is a role on a product development team responsible for managing the product backlog in order to achieve the desired outcome that a product development team seeks to accomplish. Key activities to accomplish this include:

- Clearly identify and describe product backlog items in order to build a shared understanding of the problem and solution with the product development team
- Make decisions regarding the priority of product backlog items in order to deliver maximum outcome with minimum output
- Determine whether a product backlog item was satisfactorily delivered
- Ensure transparency into the upcoming work of the product development team.

Scrum Master – The Scrum Master is most akin to a project manager. They are guardians of process, givers of feedback, and mentors to junior team members.

- They oversee day-to-day functions, maintain the Scrum board, check in with team members, and make sure tasks are being completed on target



- The methodology is highly collaborative and requires efficient processes, and the results of the process depend upon the expertise of the Scrum Master.
- Agile methodologies may have started in tech companies, but Scrum Master jobs can be found in all kinds of industries and for all kinds of companies around the globe

Team Member – Team members are the makers: front- and back-end engineers, copywriters, designers, videographers, you name it.

- Team members have varied roles and skills but all are responsible for getting stuff done on time and in excellent quality.
- Every organization requires its employees to work together as a team to achieve its goals. It is possible to have different individuals working together in a group.
- But they must be team-oriented because effective teamwork depends on the character traits of a good team member.



What are the qualities of a good team member?

1. Having an identity.
2. Being committed.
3. Being flexible..
4. You are humble.
5. An effective communicator.
6. A consistent performer.
7. Being objective.



**SOFTWARE
ENGINEERING
DAILY**



SOFTWARE ENGINEERING

WEEK 4

1. case study to understand the importance of risk management and mitigation of risk

Tornado IPT Case Study

1. Working with Tornado IPT

- The Tornado Integrated Project Team (Tornado IPT) is part of the UK Ministry of Defence's (MOD's),
- Defence Equipment and Support (DE&S) organization.
- It is responsible for the provision of logistical support and capability development for the RAF Tornado F3 (Air Defence Variant) and the GR4 (Ground Reconnaissance) fleet until 2025,
- The requirement to drive down defence costs whilst maintaining outputs to the end customer has led the IPT instigating a transformation program which has resulted in the development of a series of availability-based contracting solutions with industry.

2. The Challenge

- The management of Safety-related risk has always been paramount within the Tornado IPT and it was recognized that a similar rigours needed to be introduced to manage the risks and issues potentially impacting on all areas of IPT business.
- In partnership with MOD's Risk Process Owner (Through Life Procurement Management Support Group) a formalized project risk management process was developed for the Tornado IPT.
- Key to the successful implementation of this program would be the selection and deployment of a powerful risk management and analysis tool.

3. The Solution

- After a comprehensive evaluation and assessment phase, Tornado IPT selected Predict! Risk Controller as best meeting its requirement.
- The intuitive nature of operation and integration with Predict! Risk Analyzer were key points identified.
- Feedback sought from other DE&S IPT's who already operated the tool were also positive which reinforced the selection processes.
- Risk Decisions have worked closely with Tornado IPT to configure Predict! And develop custom templates for management reporting.
- They also provided a comprehensive training program to ensure that users were able to get up to speed quickly and realize the benefits from Predict! Risk Controller and Risk Analyzer.

4. The Benefits

- Risk Management is now co-ordinate across the IPT with regular monthly business and project reviews being conducted.
- The decision-making process is now risk-based, with clearly defined escalation processes in place, ensuring risk is managed at the level where it can be influenced.

LEND LEASE CORPORATION CASE STUDY

Lend Lease Corporation Limited is an Australian-based multinational company that specializes in project management and construction, property investment management and property development.

The company has over 11,485 employees operating in more than 40 countries around the world where the Bovis Lend Lease division constructs and manages large building projects.

The Challenge:

- Lend Lease is leading a development team that includes Bovis Lend Lease as a project and construction manager for the residential development and infrastructure for Phase One of the Stratford City project.
- This involves the construction of up to 3000 residential dwellings and related accommodation that are due for completion in late 2011.
- As the preferred development partner for Zones 2-7 of the Stratford City regeneration scheme, the company needed to implement the latest risk management technologies and model of proposed developments processes to help ensure the successful delivery of this key project on budget and within tight timescales.

The Solution:

- Was selected after a rigorous ITT process which included a detailed analysis of all potential solutions.
 - Risk Decisions was one of the only suppliers able to demonstrate a track record of successful implementations and delivery of high levels of support to organizations of a similar scale working on large complex projects.
-
- Prior to installation on Lend Lease's servers based in Atlanta, USA, Risk Decisions conducted a master_class to introduce the concept of risk management at the highest level and a series of workshops with different stakeholder groups to determine configuration requirements.
 - The company has also provided additional consultancy support to assist with stakeholder mapping and setting a framework to enable risk management to be rolled out and embedded as a core process and procedure.
-
- Lend Lease has deployed Predict!, the latest enterprise version of Risk Decisions' powerful suite of risk management and analysis software which includes Predict! Risk Controller and Predict! Risk Analyzer.
 - It also intends to implement Predict! Risk Controller Lite, a unique solution that uses familiar spreadsheets to enable infrequent and remote users to provide regular updates on risks.
 - This module will also be a key change management tool to assist in the embedding of risk management across the organization and will be deployed early in 2009.

2. How to use tools to manage and mitigate risks

WEEK 5

1. Conduct warmup activities to Ignite Design Thinking

Conduct Warm up activity to ignite Design thinking.

<1.So what are warm-ups?

>Warm-ups can be described as exercises one normally runs right before the main proceedings to help participants relax and ease people into a group activity or learning situation. Warm-ups go very well with design thinking because they support many of its attributes, such as being curious and having an open mindset as well as being mindful of and collaborating with other people.

>Consequently, a well-chosen warm-up can add real value to a design thinking workshop or project, but then, a poorly chosen warm-up can also have the opposite effect, making people feel nervous, uncomfortable and confused. So, when choosing your warm-up, choose it purposefully! Here are some pointers to bare in mind:

-
- Firstly, warm-ups are not per se part of design thinking, they just have proven to be a useful way of promoting team work and supporting certain work attitudes.
 - Warm-ups as well as other methods and exercises should generally be selected to suit the team, so you should know your audience and the people you are working with.
 - While it's important to be mindful of the people, it is also vital to read the current mood and situation and select the warm-up accordingly — it should fit to the given circumstances.
 - Let the participants understand that you don't just want to do a 'warm-up' with them now. Communicate the goal and reflect on it afterwards if necessary. Especially when using an 'educative' warm-up, e.g. 'Marshmallow Challenge' before prototyping, you should debrief it — active reflection increases the likelihood of understanding and learning.
 - For the conduct of the warm-up, give clear instructions and know when a short demo might be necessary for your audience to better understand the activity.
 - Lastly, I would like to add that you as a facilitator should love and understand the warm-up you're choosing and get excited when using it. Only then will the spark be transmitted to the participants.

>Below, you find some examples of what for and when you can use a warm-up:

- Create a positive group atmosphere
- Help people to get to know one another (better)
- Break down social barriers

-
- Reduce pressure
 - Energize
 - Distract the group temporarily to better focus afterwards
 - Prepare the team for a certain mode of working / phase / mindset.

WEEK 6

1. Organize role play for requirement activities

What is role play?

Role-play or role-paying is the changing of one's behavior to assume a role, either unconsciously to fill a social role, or consciously to act out an adapted.

Role play objectives

- Be very clear about what you want people to get out of the role playing experience.
- Clear thinking and role play preparation result in clear outcomes.
- Are you assessing skills or are you developing them? If you are assessing people, they need to know the competency.
- People also need to trust that the role play will have the same level of challenge for them and their peers.
- Are you giving everyone the same level of challenge, or are you flexing according to the level of skill

Role playing placement - where in the agenda?

-
- In skills development programmer, trainers and facilitators often schedule a role play exercise at the end of a course
 - People become more comfortable with the idea of 'performing' in public; and, it more fairly shows role
 - Hey get feedback in the form of notes from the director, which they will immediately apply to the work in hand.
 - Be realistic in your ambitions for the role play. For instance, if you are teaching a complex.
 - If you don't have time to eventually get the participants doing the whole thing properly, in depth, with plenty of rehearsal and revisiting, then just do a part of it.

Role play briefing

- Allow the other participants to observe the role play and give their comments afterwards.
- Explain clearly what you want them to look out for.
- It is important though that the (non-professional role player) person or persons involved in the role play go first.

Role play development

- Play allows children to use their creativity, developing their imagination, dexterity, and physical, cognitive, and emotional strength.
- Play is important to healthy brain development.

Types of Role Play

- Illiterate
- Semi-Literate
- Literate
- Advanced Literate

4. Draw UML diagram for given use case

What is a use case diagram?

In the Unified Modelling Language (UML), a use case diagram can summarize the details of your system's users (also known as actors) and their interactions with the system. To build one, you'll use a set of specialized symbols and connectors. An effective use case diagram can help your team discuss and represent:

- Scenarios in which your system or application interacts with people, organizations, or external systems

Goals that your system or application helps those entities (known as actors) achieve

- The scope of your system

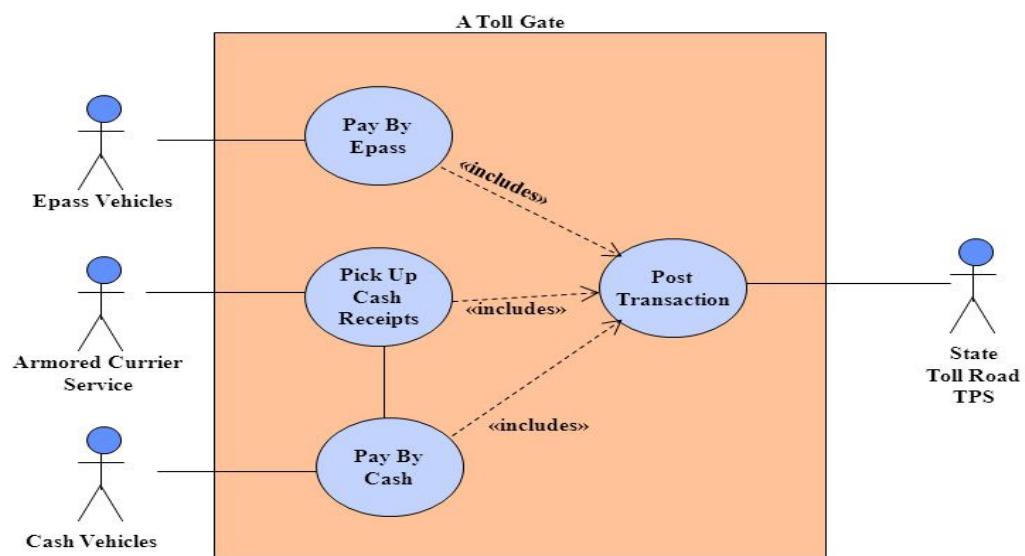
When to apply use case diagrams

- Representing the goals of system-user interactions.
- Defining and organizing functional requirements in a system.
- Specifying the context and requirements of a system.
- Modelling the basic flow of events in a use case.

E -Toll System

- **Electronic toll collection (ETC)** is a wireless system.
- Automatically collect the usage fee or toll charged to vehicles using toll roads, HOV lanes, toll bridges, and toll tunnels.
- It is a faster alternative which is replacing toll booths, where vehicles must stop and the driver manually pays the toll with cash or a card.
- In most systems, vehicles using the system are equipped with an automated radio transponder device.
- A major advantage is the driver does not have to stop, reducing traffic delays.

Use Case Diagram



Use case of toll system

- (1) first, the Internet access is ubiquitous and reliable.

-
- (2) Strict vehicle registration policy is actively in place to ensure maximum compliance.
 - (3) Lastly, an efficient legal provision is in force to handle cases of toll fee evasions and outright violation of traffic laws.

The system design was implemented in five modules.

- 1. Database design
- 2. Web service (cloud component)
- 3. Android application (mobile client)
- 4. Administrative web application (web client); and
- 5. XBee-driven WSN component.

WEEK 7

1. Create detailed user stories for the above identified problem

1. Create detailed user stories for the above identified problem

- Title: E-Toll System
- Description: Traffic congestion at Toll Plazas is creating huge economical loss in terms of fuel wastage apart from adding to environmental pollution. An application may be developed to have QR equipped Payment Receipt for long distance vehicles which can be scanned at the QR readers installed at unmanned toll lanes for passing through the toll gates
- Nature: Baseline/ Complex/ Very Complex
- Category: Software/ Hardware+ Software
- Technology Bucket: (e.g. Software – Web development, Software- Mobile App development)

User story of E-toll

Vehicles using the expressway passing through the Chandimandir toll plaza at Panchkula in Haryana no longer need to stop to pay the toll. On April 19, the plaza will unveil the country's first electronic toll collection (ETC) system based on radio-frequency identification (RFID) technology.

When a vehicle bearing an RFID tag passes through the toll plaza, the reader at the plaza identifies the unique ID of the tag and transmits the information to the central clearing house. The toll is instantly debited from the ID account and the same is transferred to the toll operator concerned through the bank at the end of the shift or day.

"The system works just like the cards carried by the users of the Delhi Metro," Union Minister for Road Transport and Highways, C.P.Joshi told *Business Today*.

An expert committee headed by Unique ID Authority chairman Nandan Nilekani favoured the ETC system on an RFID platform.

"This is the first pilot project we are implementing, and we hope to bring the entire national highway network under the ETC mode in the next two years," Joshi said.

The new system, once unveiled across India, will significantly reduce the congestion on expressways and travel time, he added.

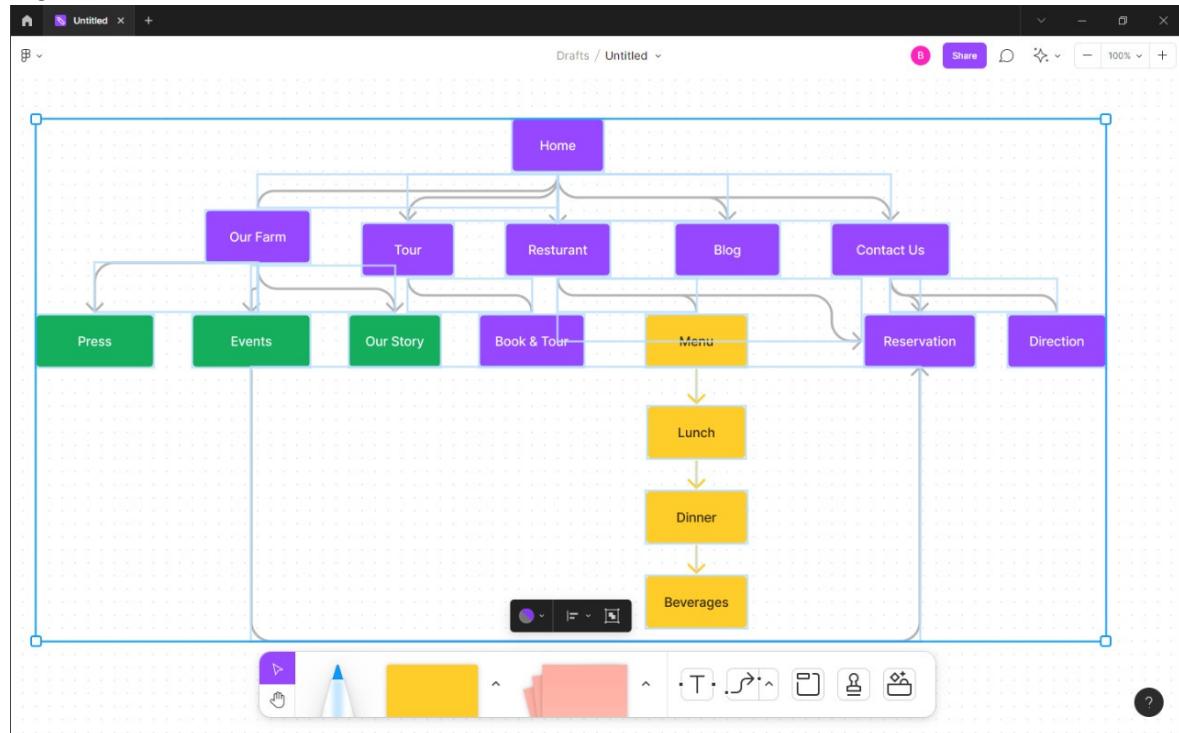
A road user needs to register with the agency manning the plaza by giving details such as his name, address, vehicle type, registration etc, when requesting the RFID tag. A central database will store the information along with the user's tag code.

Those registered for the ETC system can also get online statements of toll payment details.

WEEK 8

1.Create sitemap and wireframe for above created user stories

Create Sitemap wireframe for above created user stories. (Tools such as sketch, Adobe XD, Figma, etc. can be used.



NOTE: Download any of the tool mentioned in the Title.

Step-1: Download the Figma Application Through Any browser,

Step-2: Now install the application in the desktop

Step-3: Open the application and create an account using Google account

Step-4: Now again Login into Figma application and create a new page using new figjam ,

Step-5: Using Clipboard, click on ellipse and choose it as square,

Step-6: Make some clips by pulling blocks from ellipse,

Step-7: arrange the blocks as shown in the above diagram.

WEEK 9

1. Create Git (similar tool) account and configure repository

Steps to publish Git artifacts

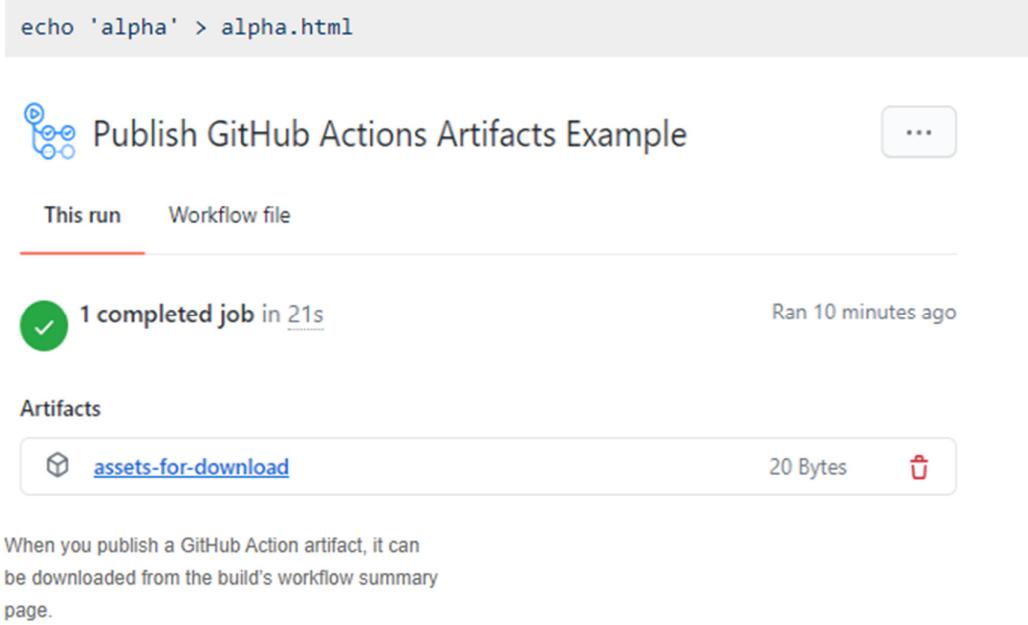
A developer should follow these five steps to publish GitHub Actions artifacts for download:

1. Perform Git Actions build steps
2. Create a temporary folder in the container being used
3. Copy all artifacts of interest into that temporary folder
4. Use GitHub's upload-artifact action
 1. Provide a meaningful name for the artifact download link
 2. Specify the path to the folder containing your GitHub Action artifacts
5. Run the GitHub Actions workflow and find the published artifacts on the workflow's build page
6. The easiest way to demonstrate how GitHub's artifact upload action works is to add a step to a simple workflow that creates a temporary directory. Then, use the touch and echo commands to create a few simple files. Once a developer completes this action, the files will publish as artifacts.

Published artifacts in GitHub

If a developer isn't familiar with the echo and output switch, the following command will create a file on the local filesystem named alpha.html with the text 'alpha' contained within it:

```
echo 'alpha' > alpha.html
```

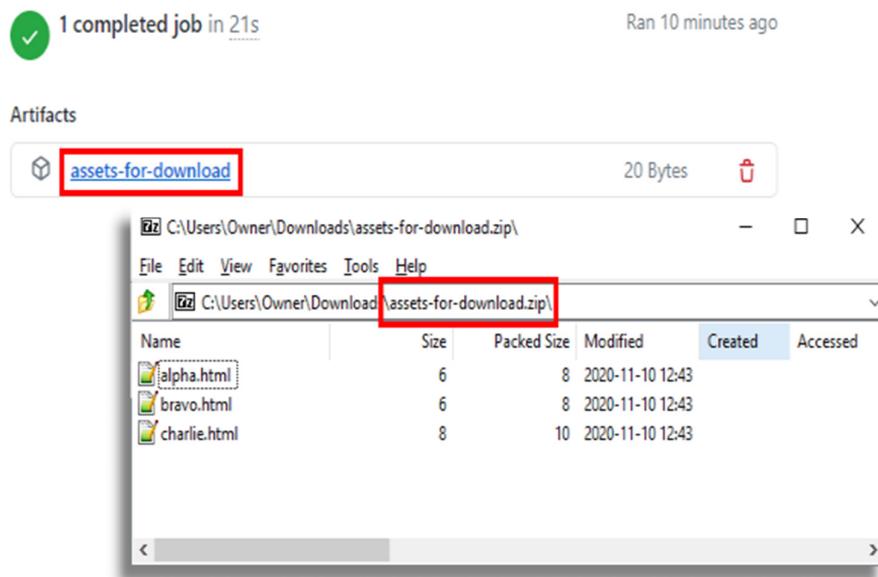


The screenshot shows a GitHub Actions workflow run titled "Publish GitHub Actions Artifacts Example". It has two tabs: "This run" (selected) and "Workflow file". A green checkmark icon indicates "1 completed job in 21s". The job ran 10 minutes ago. Under the "Artifacts" section, there is a single artifact named "assets-for-download" with a size of 20 Bytes and a delete icon.

When you publish a GitHub Action artifact, it can be downloaded from the build's workflow summary page.

Workflow artifact downloads

- When this build runs, the status page of the workflow will include a link to download a file named assets-for-download.
- zip, which will contain the three files named alpha.html, bravo.html and charlie.html.
- This proves that the script works and makes the GitHub Action artifacts available for download.



The zip file downloaded as a GitHub Action artifact contains all of the selected build files.

Learn version control and configuration management with GIT:

Step 1: On your computer, you need to install Git first. The process will depend on your operating system: please follow the instructions below by clicking the relevant button.

Linux

Windows

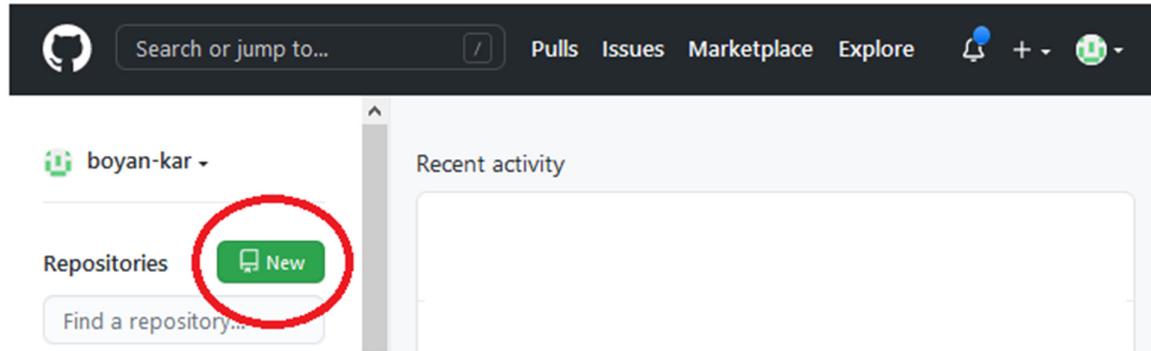
macOS

What is a repository?

You can think of a repository (*aka* a repo) as a “main folder”, everything associated with a specific project should be kept in a repo for that project. Repos can have folders within them, or just be separate files.

2. Create your own repository and project folder structure

To make a repository, go to **Repositories/New repository** - choose a concise and informative name that has no spaces or funky characters in it.



Step 3: Let's create a new private repository. You can call it whatever you like if the name is available.

Create a new repository

Repository template
Start your repository with a template repository's contents.

No template ▾

Owner * **Repository name ***

boyan-kar / my-first-repository ✓

Great repository names are short and memorable. Need inspiration? How about [symmetrical-couscous](#)?

Description (optional)

Public
Anyone on the internet can see this repository. You choose who can commit.

Private
You choose who can see and commit to this repository.

Step 4: Click on Initialise repo with a README.md file. It's common practice for each repository to have a `README.md` file,

Step 5: We will also create a .gitignore file. This file lets Git know what kind of files should not be included in the repository.

Once you are ready, click on **Create repository**.



Public

Anyone on the internet can see this repository. You choose who can commit.



Private

You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

Add a README file

This is where you can write a long description for your project. [Learn more.](#)



Add .gitignore

Choose which files not to track from a list of templates. [Learn more.](#)



.gitignore template: R ▾

Choose a license

A license tells others what they can and can't do with your code. [Learn more.](#)

This will set **main** as the default branch. Change the default name in your [settings](#).

Create repository

Here is how the repository should look:

Click on the repository name to go back to its main directory.

Code Issues Pull requests Actions Projects Security Insights Settings

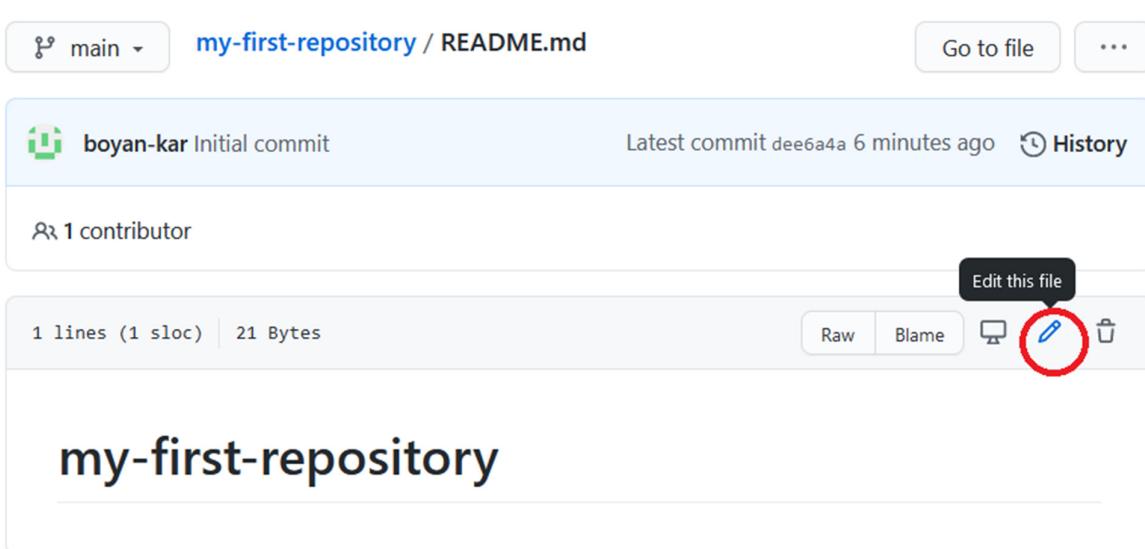
main 1 branch 0 tags Go to file Add file Code

boyan-kar Initial commit	691a5b4 now	1 commit
.gitignore	Initial commit	now
README.md	Initial commit	now

README.md GitHub automatically shows the README.md file of the current directory. View your commit history here.

my-first-repository

You can directly edit your README.md file on Github by clicking on the file and then selecting Edit this file.



Configuration management with GIT:

Using GIT for Configuration Management

Step 1: Initialization on a new deployment

Step 2: Updating any configuration, including the default configuration:

Step 3: Resolving Git merge conflicts

1. Check out the `site` branch. You may already be on that branch; if so, git will tell you that and the command will leave you there.

```
git checkout site
```

2. Edit the YAML file or files that contain the configuration you want to change.

3. Commit the changes to the `site` branch.

```
git add -A
git commit -m "your commit message goes here in quotes"
```

If you want to add a single file to your git repository, you can use the command below, as opposed to using `git add -A`.

```
git add PATH_TO_FILE
```

For example, if you made a change to your `servers.yml` file and wanted to only commit that change, you would use this command:

```
git add ~/openstack/my_cloud/definition/data/servers.yml
```

4. To produce the required configuration processor output from those changes. Review the output files manually if required, run the configuration processor:

```
cd ~/openstack/ardana/ansible
ansible-playbook -i hosts/localhost config-processor-run.yml
```

5. Ready the deployment area

```
ansible-playbook -i hosts/localhost ready-deployment.yml
```

6. Run the deployment playbooks from the resulting scratch directory.

```
cd ~/scratch/ansible/next/ardana/ansible
ansible-playbook -i hosts/verb_hosts site.yml
```

Step 4: Identifying the occurrence of a merge conflict:

```
Auto-merging ardana/ansible/roles/nova-compute-esx/defaults/main.yml
Auto-merging ardana/ansible/roles/nova-common/templates/nova.conf.j2
CONFLICT (content): Merge conflict in ardana/ansible/roles/nova-common/templates/nova.conf.j2
Auto-merging ardana/ansible/roles/nova-cli/tasks/availability_zones.yml
Auto-merging ardana/ansible/roles/nova-api/templates/api-paste.ini.j2
```

Step	5:	Examining	Conflicts
------	----	-----------	-----------

Step 6: Examining differences between your current version and the previous upstream version

- The previous "upstream" version on the ardana branch.
Your current version on the site branch.

He new "upstream" version on the ardana branch.

Step 7: Using stage markers to view clean versions of files (without conflict markers)

Step 8: Resolving the conflict

There are two approaches to resolving the conflict:

- Edit the merged file containing the conflict markers, keeping the change you want to preserve and removing the conflict markers and any changes you want to discard.
- Take the new upstream version of the file and re-apply any changes you would like to keep from your current version.

Step 9: Resolving the conflict - editing the file containing the conflict markers

Step 10: Resolving the conflict - re-applying your changes to new upstream version

Step 11: Completing the merge procedure

Step 12: Recovering from Errors

WEEK 10

1. Install and configure Jenkins

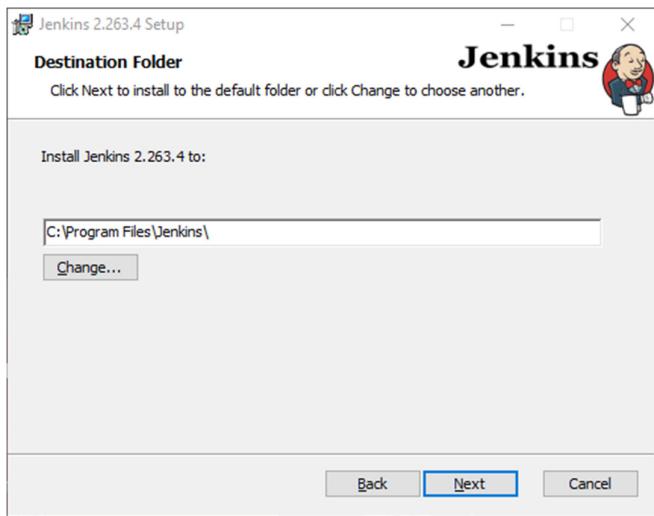
Step 1: Setup wizard

On opening the Windows Installer, an **Installation Setup Wizard** appears, Click **Next** on the Setup Wizard to start your installation.



Step 2: Select destination folder

Select the destination folder to store your Jenkins Installation and click **Next** to continue.



Step 3: Service logon credentials

When Installing Jenkins, it is recommended to install and run Jenkins as an independent windows service using a **local or domain user** as it is much safer than running Jenkins using **LocalSystem(Windows equivalent of root)** which will grant Jenkins full access to your machine and services.

To run Jenkins service using a **local or domain user**, specify the domain user name and password with which you want to run Jenkins, click on **Test Credentials** to test your domain credentials and click on **Next**.

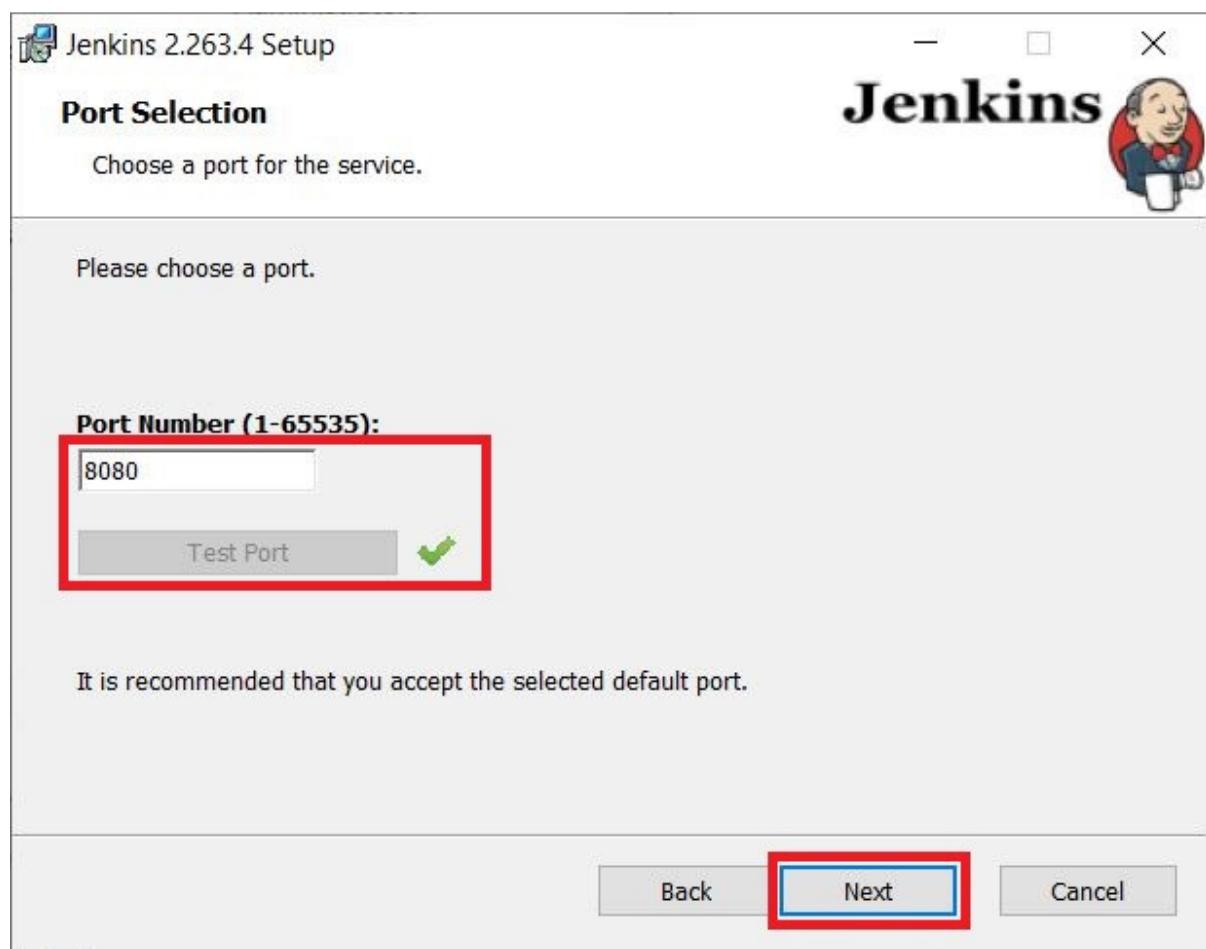
S



If you get **Invalid Logon** Error pop-up while trying to test your credentials, follow the steps explained [here](#) to resolve it.

Step 4: Port selection

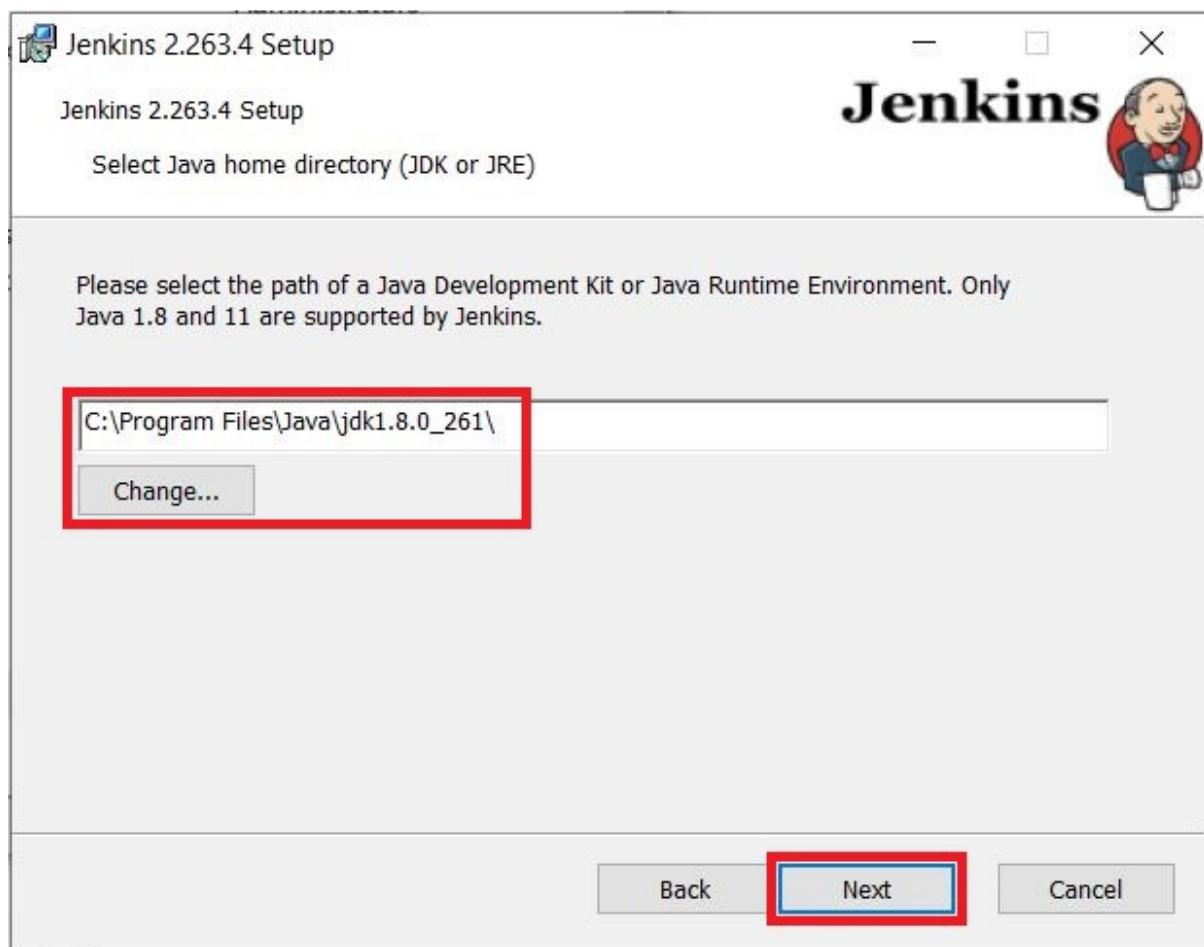
Specify the port on which Jenkins will be running, **Test Port** button to validate whether the specified port is free on your machine or not. Consequently, if the port is free, it will show a green tick mark as shown below, then click on **Next**.



Step 5: Select Java home directory

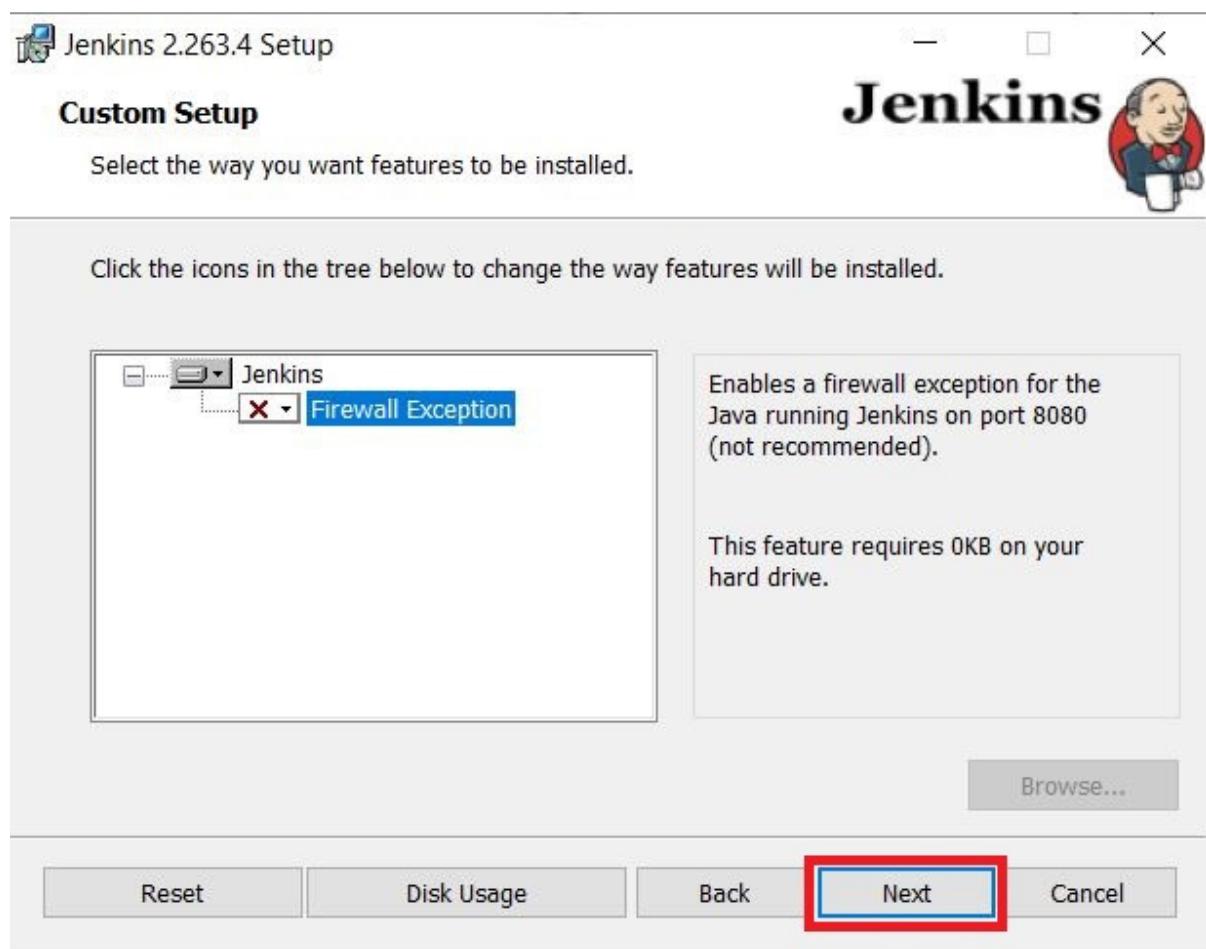
The installation process checks for Java on your machine and prefills the dialog with the Java home directory. If the needed Java version is not installed on your machine, you will be prompted to install it.

Once your Java home directory has been selected, click on **Next** to continue.



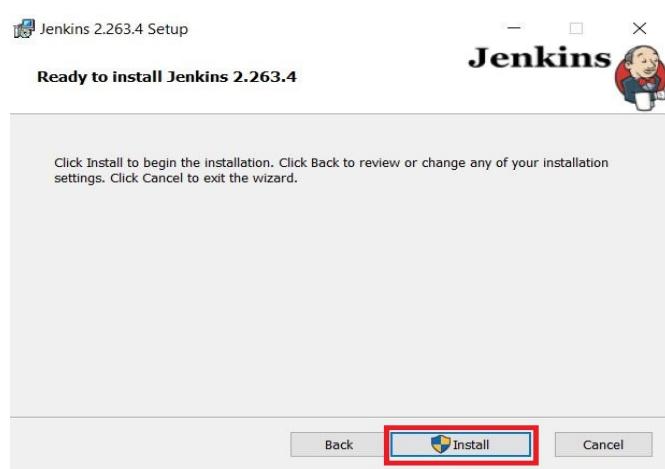
Step 6: Custom setup

Select other services that need to be installed with Jenkins and click on **Next**.



Step 7: Install Jenkins

Click on the **Install** button to start the installation of Jenkins.



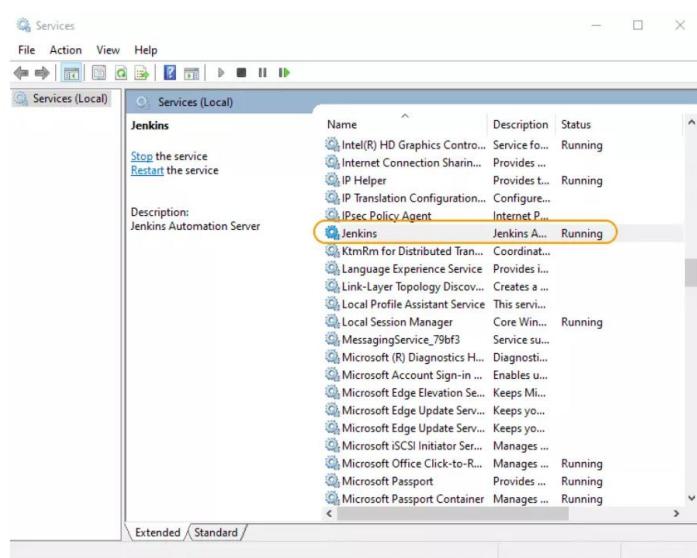
Additionally, clicking on the **Install** button will show the progress bar of installation, as shown below:



Step 8: Finish Jenkins installation

Once the installation completes, click on **Finish** to complete the installation.

Jenkins will be installed as a **Windows Service**. You can validate this by browsing the **services** section, as shown below:



See the [upgrade steps](#) when you upgrade to a new release.

Post-installation setup wizard

After downloading, installing and running Jenkins, the post-installation setup wizard begins.

This setup wizard takes you through a few quick "one-off" steps to unlock Jenkins, customize it with plugins and create the first administrator user through which you can continue accessing Jenkins.

Unlocking Jenkins

When you first access a new Jenkins instance, you are asked to unlock it using an automatically-generated password.

Step 1

Browse to <http://localhost:8080> (or whichever port you configured for Jenkins when installing it) and wait until the **Unlock Jenkins** page appears.

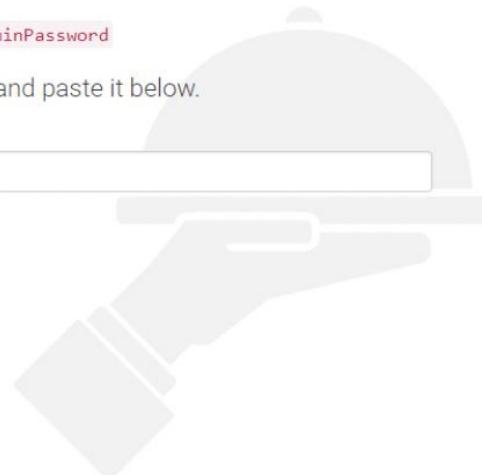
Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

C:\Program Files (x86)\Jenkins\secrets\initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password



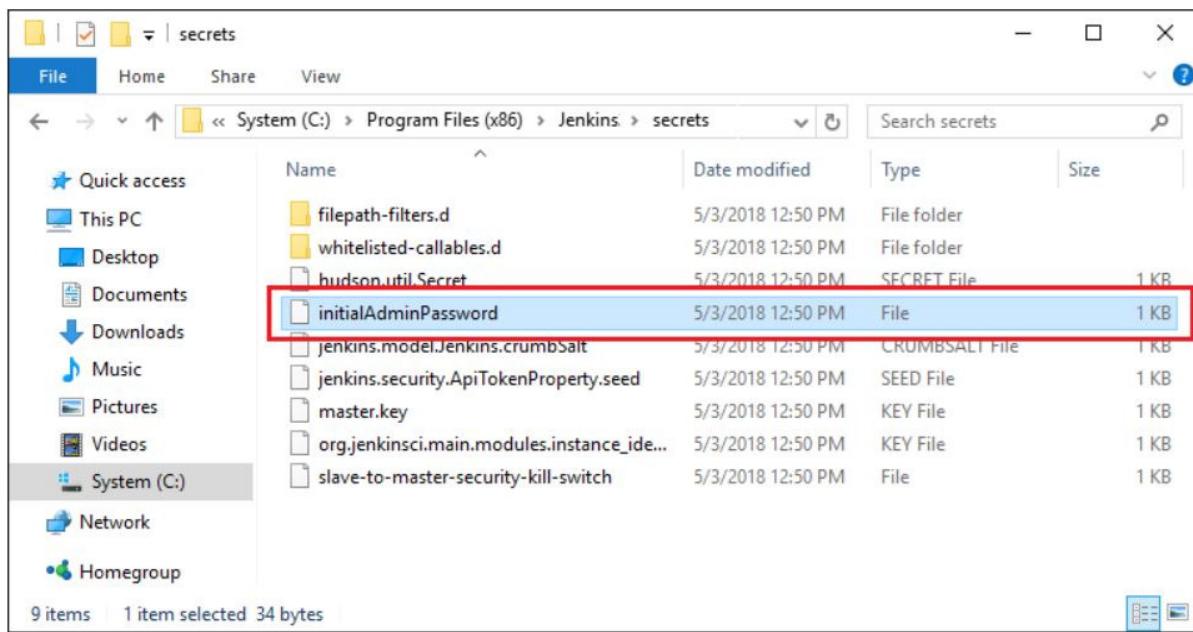
Continue

Step 2

The initial Administrator password should be found under the Jenkins installation path (set at Step 2 in Jenkins Installation).

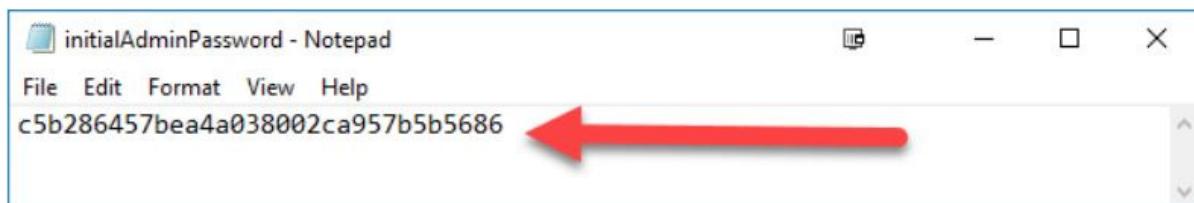
For default installation location to C:\Program Files\Jenkins, a file called **initialAdminPassword** can be found under C:\Program Files\Jenkins\secrets.

However, If a custom path for Jenkins installation was selected, then you should check that location for **initialAdminPassword** file.



Step 3

Open the highlighted file and copy the content of the **initialAdminPassword** file.

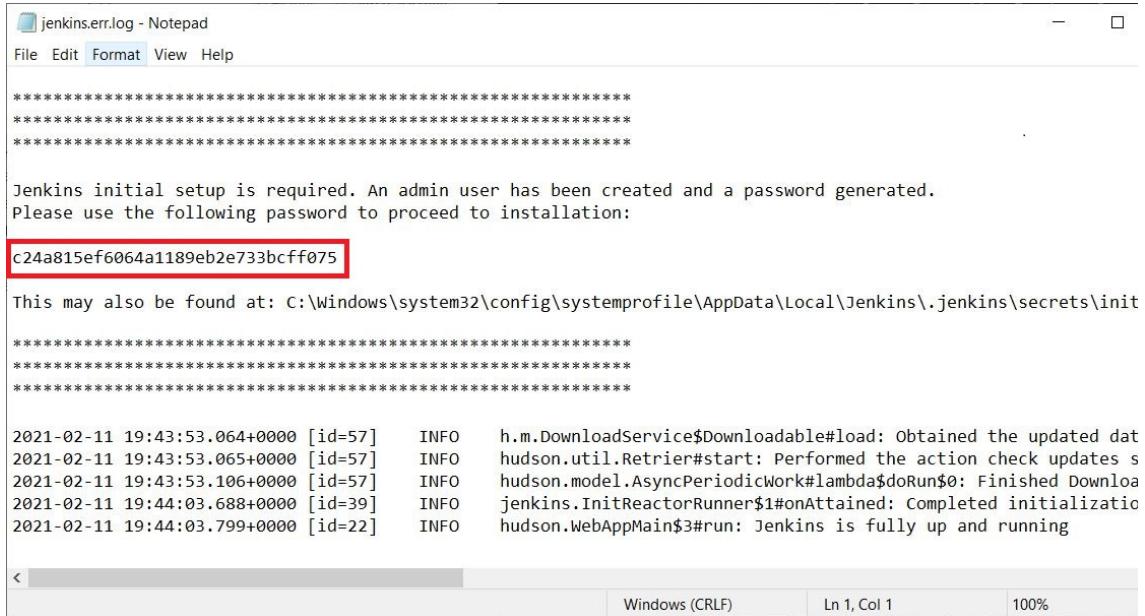


Step 4

On the **Unlock Jenkins** page, paste this password into the **Administrator password** field and click **Continue**.

Notes:

- You can also access Jenkins logs in the **jenkins.err.log** file in your Jenkins directory specified during the installation.
- The Jenkins log file is another location (in the Jenkins home directory) where the initial password can also be obtained.



```
*****
***** Jenkins initial setup is required. An admin user has been created and a password generated.
***** Please use the following password to proceed to installation:
***** c24a815ef6064a1189eb2e733bcff075
***** This may also be found at: C:\Windows\system32\config\systemprofile\AppData\Local\Jenkins\.jenkins\secrets\init
***** 2021-02-11 19:43:53.064+0000 [id=57] INFO h.m.DownloadService$Downloadable#load: Obtained the updated dat
***** 2021-02-11 19:43:53.065+0000 [id=57] INFO hudson.util.Retriger#start: Performed the action check updates s
***** 2021-02-11 19:43:53.106+0000 [id=57] INFO hudson.model.AsyncPeriodicWork#lambda$doRun$0: Finished Downloa
***** 2021-02-11 19:44:03.688+0000 [id=39] INFO jenkins.InitReactorRunner$1#onAttained: Completed initializatio
***** 2021-02-11 19:44:03.799+0000 [id=22] INFO hudson.WebAppMain$3#run: Jenkins is fully up and running
```

This password must be entered in the setup wizard on new Jenkins installations before you can access Jenkins's main UI. This password also serves as the default administrator account's password (with username "admin") if you happen to skip the subsequent user-creation step in the setup wizard.

Customizing Jenkins with plugins

After unlocking Jenkins, the **Customize Jenkins** page appears. Here you can install any number of useful plugins as part of your initial setup.

Click one of the two options shown:

- **Install suggested plugins** - to install the recommended set of plugins, which are based on most common use cases.
- **Select plugins to install** - to choose which set of plugins to initially install. When you first access the plugin selection page, the suggested plugins are selected by default.

If you are not sure what plugins you need, choose **Install suggested plugins**. You can install (or remove) additional Jenkins plugins at a later point in time via the **Manage Jenkins > Manage Plugins** page in Jenkins.

The setup wizard shows the progression of Jenkins being configured and your chosen set of Jenkins plugins being installed. This process may take a few minutes.

Creating the first administrator user

Finally, after customizing Jenkins with plugins, Jenkins asks you to create your first administrator user.

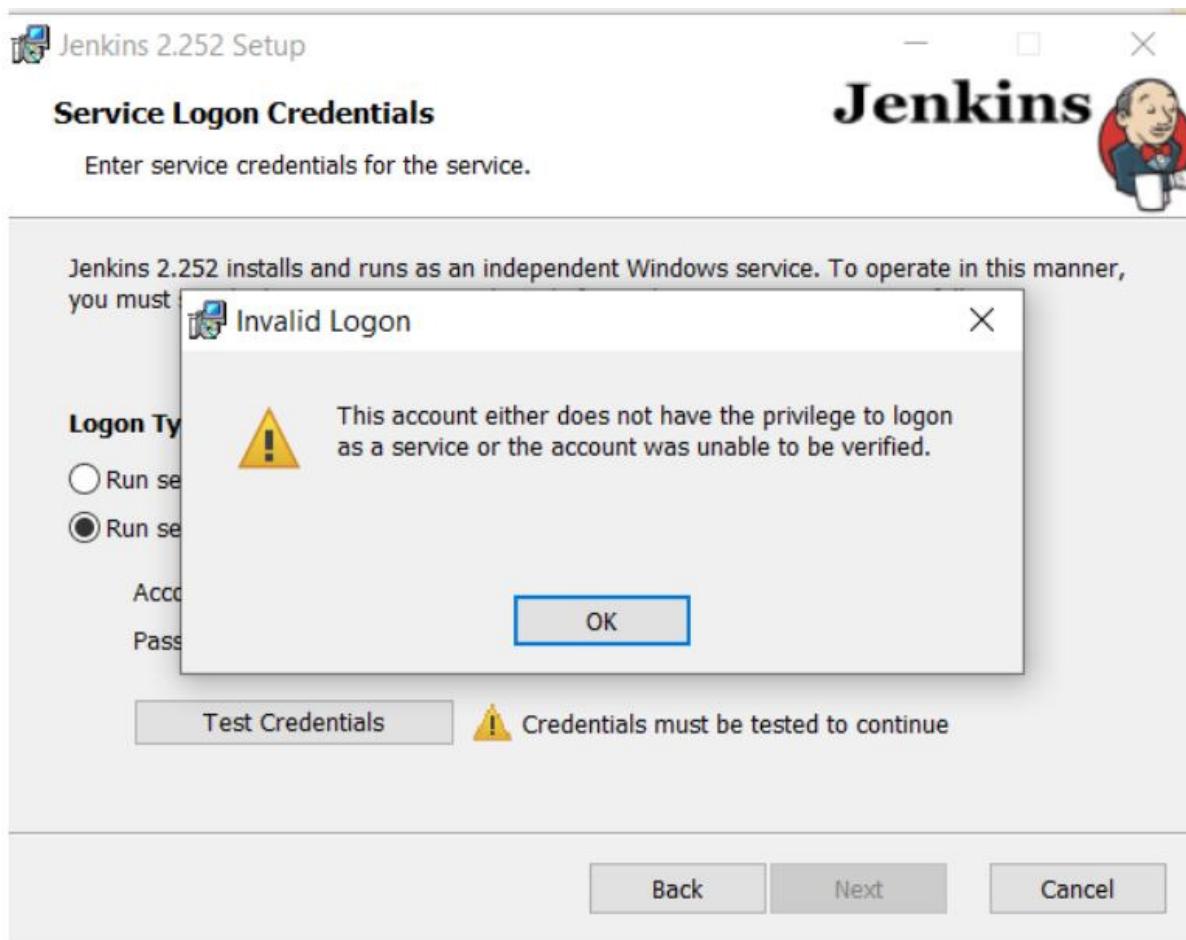
1. When the **Create First Admin User** page appears, specify the details for your administrator user in the respective fields and click **Save and Finish**.
2. When the **Jenkins is ready** page appears, click **Start using Jenkins**.

Notes:

- This page may indicate **Jenkins is almost ready!** instead and if so, click **Restart**.
 - If the page does not automatically refresh after a minute, use your web browser to refresh the page manually.
3. If required, log in to Jenkins with the credentials of the user you just created and you are ready to start using Jenkins!

Troubleshooting Windows installation

Invalid service logon credentials



When installing a service to run under a domain user account, the account must have the right to logon as a service. This logon permission applies strictly to the local computer and must be granted in the Local Security Policy.

Perform the following steps below to edit the Local Security Policy of the computer you want to define the 'logon as a service' permission:

1. Logon to the computer with administrative privileges.
2. Open the **Administrative Tools** and open the **Local Security Policy**
3. Expand **Local Policy** and click on **User Rights Assignment**
4. In the right pane, right-click **Log on as a service** and select properties.

-
5. Click on the **Add User or Group...** button to add the new user.
 6. In the **Select Users or Groups** dialogue, find the user you wish to enter and click **OK**
 7. Click **OK** in the **Log on as a service Properties** to save changes.

After completing the steps above, try logging in again with the added user.

2. Create a container image for Hello world project

Create a container image for Hello world project And Setup build for container image using Jenkins (Hello world application)

How to Create a New Build Job in Jenkins

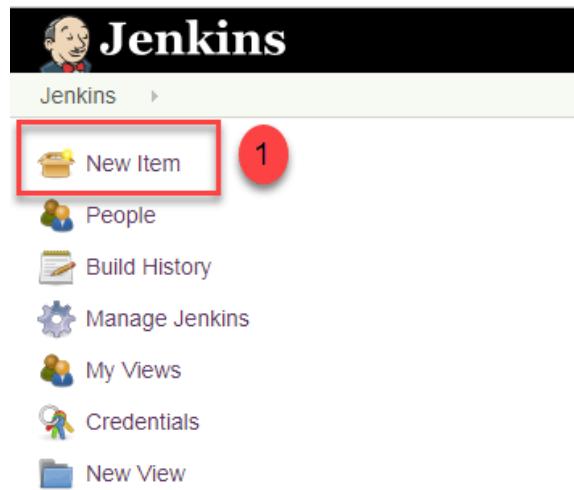
The freestyle build job is a highly flexible and easy-to-use option. You can use it for any type of project; it is easy to set up, and many of its options appear in other build jobs. Below is a step by step process to create job in Jenkin.

Step 1) Login to Jenkins

To create a Jenkins freestyle job, log on to your Jenkins dashboard by visiting your Jenkins installation path. Usually, it will be hosted on localhost at <http://localhost:8080> If you have installed Jenkins in another path, use the appropriate URL to access your dashboard as shown in the below Jenkins job creation example.

Step 2) Create New Item

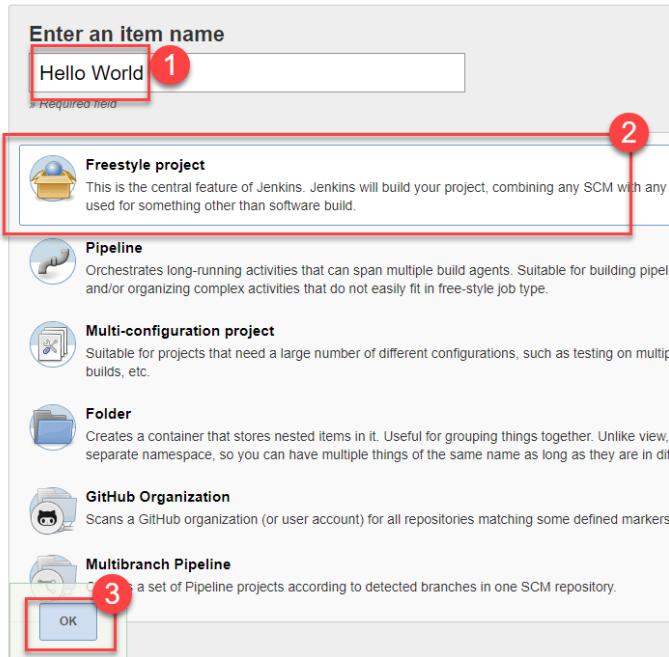
Click on “New Item” at the top left-hand side of your dashboard.



Step 3) Enter Item details

In the next screen,

-
1. Enter the name of the item you want to create. We shall use the “Hello world” for this demo.
 2. Select Freestyle project
 3. Click Okay



Step 4) Enter Project details

Enter the details of the project you want to test.

The screenshot shows the Jenkins General configuration page. The 'Description' field is highlighted with a red box and contains the text 'Hello world java test program'. Below the description, there are several configuration options: 'Discard old builds', 'GitHub project', 'This project is parameterized', 'Throttle builds', 'Disable this project', and 'Execute concurrent builds if necessary'. At the bottom right, there is an 'Advanced...' button.

Step 5) Enter repository URL

Under Source Code Management, Enter your repository URL. We have a test repository located at <https://github.com/kriru/firstJava.git>

The screenshot shows the 'Source Code Management' section of a Jenkins job configuration. The 'Git' option is selected. Under 'Repositories', there is one entry with a red box around it: 'Repository URL: https://github.com/kiru/firstJava.git'. Below it, 'Credentials' are set to '- none -'. There are 'Advanced...' and 'Add Repository' buttons. In the 'Branches to build' section, there is one entry with a red box around it: 'Branch Specifier (blank for 'any'): */master'. Below it is an 'Add Branch' button.

It is also possible for you to use a local repository.

If your GitHub repository is private, Jenkins will first validate your login credentials with GitHub and only then pull the source code from your GitHub repository.

Step 6) Tweak the settings

Now that you have provided all the details, it's time to build the code. Tweak the settings under the **build** section to build the code at the time you want. You can even schedule the build to happen periodically, at set times.

Under **build**,

1. Click on “**Add build step**”
2. Click on “**Execute Windows batch command**” and add the commands you want to execute during the build process.

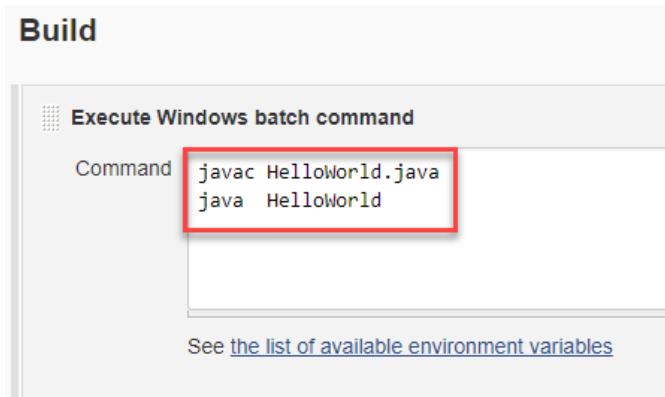
The screenshot shows the 'Build Environment' configuration menu. A red box labeled '1' points to the 'Add build step ▾' dropdown. A red box labeled '2' points to the 'Execute Windows batch command' option in the list, which is highlighted with a blue background.

Here, I have added the java commands to compile the java code.

I have added the following windows commands:

```
javac HelloWorld.java
```

```
java HelloWorld
```



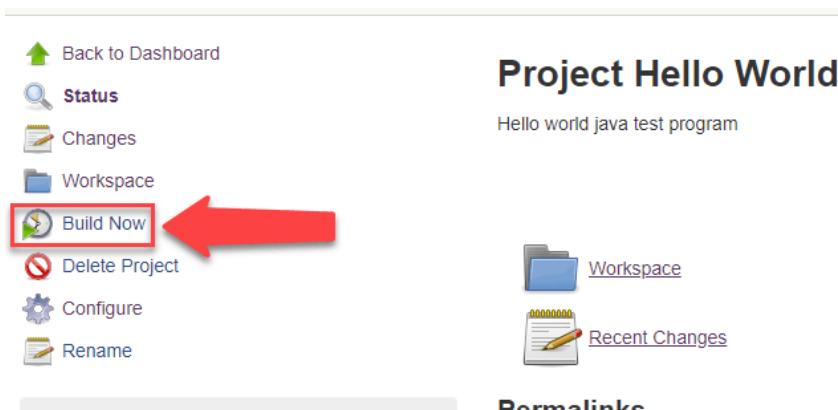
Step 7) Save the project

When you have entered all the data,

1. Click **Apply**
2. **Save** the project.

Step 8) Build Source code

Now, in the main screen, Click the **Build Now** button on the left-hand side to build the source code.



Step 9) Check the status

After clicking on **Build now**, you can see the status of the build you run under **Build History**.

[Back to Dashboard](#)

[Status](#)

[Changes](#)

[Workspace](#)

[Build Now](#)

[Delete Project](#)

[Configure](#)

[Rename](#)

Project Hello World

Hello world java test program

[Workspace](#)

[Recent Changes](#)

Build History

#1 Sep 3, 2018 5:45 PM

RSS for all RSS for failures

Permalinks

Step 10) See the console output

Click on the **build number** and then Click on **console output** to see the status of the build you run. It should show you a success message, provided you have followed the setup properly as shown in the below Jenkins create new job example.

Jenkins > Hello World > #1

[Back to Project](#)

[Status](#)

[Changes](#)

Console Output

[View as plain text](#)

[Edit Build Information](#)

[Delete Build](#)

[Next Build](#)

Console Output

Started by user [The_Guru99](#)
Building in workspace C:\Program Files (x86)\Jenkins\workspace\Hello World
Cloning the remote Git repository
Cloning repository <https://github.com/kriru/firstJava.git>
> git.exe init C:\Program Files (x86)\Jenkins\workspace\Hello World # timeout=10
Fetching upstream changes from <https://github.com/kriru/firstJava.git>
> git.exe --version # timeout=10
> git.exe fetch --tags --progress <https://github.com/kriru/firstJava.git> +refs:
> git.exe config remote.origin.url <https://github.com/kriru/firstJava.git> # t:
> git.exe config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/
> git.exe config remote.origin.url <https://github.com/kriru/firstJava.git> # t:
Fetching upstream changes from <https://github.com/kriru/firstJava.git>
> git.exe fetch --tags --progress <https://github.com/kriru/firstJava.git> +refs:
> git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
> git.exe rev-parse "refs/remotes/origin/origin/master^{commit}" # timeout=10
> git.exe rev-parse "origin/master^{commit}" # timeout=10
C:\Program Files (x86)\Jenkins\workspace\Hello World>javac HelloWorld.java

C:\Program Files (x86)\Jenkins\workspace\Hello World>java HelloWorld
Hello World

Finished: SUCCESS

In sum, we have executed a HelloWorld program hosted on GitHub. Jenkin pulls the code from the remote repository and builds continuously at a frequency you define.

WEEK 12

2. Use SonarQube to capture code quality metrics

➤ What is SonarQube ?

SonarQube is an open-source platform developed by SonarSource for continuous inspection of code quality. Sonar does static code analysis, which provides a detailed report of bugs, code smells, vulnerabilities, code duplications.

➤ **Features:**

- Can perform automatic reviews with static code analysis for many problems that affect code quality.
- Helps maintain quality and reliability of code projects over its life-span using advanced quality test metrics and graphs.
- Integrates seamlessly with other tools like Jenkins, Atlassian, MSBuild, etc, which helps productive workflow.
- Supports most popular programming languages like Java, Python, JavaScript, etc (along with framework support).

➤ **ADVANTAGES FOR SONARQUBE TOOL**

1. Architecture and Design
2. Unit tests
3. Duplicated code
4. Potential bugs
5. Complex code
6. Coding standards
7. Comments

➤ **SonarQube For Metrics**

- Complexity.
- Duplications.
- Issues.
- Maintainability.
- Reliability.

-
- Security.
 - Size.
 - Tests.

➤ **How to Use SonarQube Tool For Code Quality:**

Step 1: Download and Unzip SonarQube

Step 2: Run the SonarQube local server

Step 3: Start a new SonarQube project

Step 4: Setup Project properties and SonarScanner

Step 5: View your analysis report on Sonar Dashboard

➤ **What is SonarQube and why it is used?**

SonarQube (formerly Sonar) is an open-source platform developed by SonarSource for continuous inspection of code quality to perform automatic reviews with static analysis of code to detect bugs, code smells on 17 programming languages.

➤ **INSTALLATION PROCESS FOR SONAR QUBE**

Step 1:In the browser search download sonar qube 8.9lts

Step 2:Click download sonar qube

Step 3:Scroll down and click on the sonar qube 8.9(community edition)

Step 4:In the computer file open sonar qube application

Step 5:In the solar qube application open bin

Step 6:IN the bin application select window –x86-64,select start sonar.bat

Step 7:Open start sonar.bat copy the application in CP(command prompt)coppied application press enter

Step 8:END

WEEK 13

1. Organize Roleplay to understand the roles and responsibilities of QA and QC team.

Roles and Responsibilities of Quality Assurance(QA)

Strategic roles and responsibilities of a Quality Assurance Manager

In addition to their day-to-day duties as quality assurance managers, they may be asked to assume other strategic positions such as:

- Managing the overall performance of the quality department;
- Ensuring compliance with government regulations;
- Support the development of new products;
- Developing policies for the quality management system;
- Providing technical support to customers;
- Serving on committees responsible for developing and implementing strategies;
- Evaluating the effectiveness of existing programs;
- Monitoring changes in market conditions;
- Preparing reports about current trends and future plans;
- Conducting research into emerging technologies;
- Working with outside consultants; and
- Help develop marketing strategies designed to increase sales.
- Other tasks assigned by senior executives.

Typical Skills of a Quality Assurance Manager

- The following skills may be found helpful in this position:
- Communication: The ability to communicate effectively both orally and in writing.
- Organization: A good sense of orderliness and time management.
- Problem-solving – An aptitude for analyzing situations and formulating solutions.
- Teamwork – Ability to get along well with others.
- Leadership – Leadership qualities such as initiative, self-confidence, assertiveness, decisiveness, and diplomacy.
- Creativity – Creative thinking abilities including imagination, originality, resourcefulness, flexibility, adaptability, and inventiveness.
- Judgment – Judgmental capabilities include discrimination, discernment, foresight, objectivity, and sound judgment.
- Analytical Thinking – The ability to think logically and critically about issues and solve problems.
- Inquiry – Curiosity and interest in learning new things.
- Decision-Making – Decision-making skills that involve choosing alternatives and evaluating their relative merits.
- Planning – Planning skills that enable one to anticipate future needs and devise appropriate courses of action.
- Time Management – Time management skills that allow you to organize your activities efficiently and keep on schedule.

-
- Self Control – Self-control refers to the capacity to delay gratification and resist impulses.
 - Adaptability – Adaptability involves the ability to adjust behaviour to suit changing circumstances.
 - Attention To Detail – Attention to detail can mean paying close attention to small details while performing routine tasks.
 - Technical Skills - Technical skills and experience related to the industry.

Roles and Responsibilities of Quality Control(QC)

Responsibilities for Quality Control Inspector

- Inspect products to ensure that they meet quality standards
- Create tests for quality control of products
- Disassemble product parts to inspect them individually
- Monitor production operations to ensure conformance to company specifications
- Direct assembly adjustments to ensure operations reflect quality standards
- Ensure products meet customer expectations based on company objectives
- Communicate the results of inspections and put forward corrective suggestions
- Write reports to document deficiencies and errors of products
- Carry out quality assessment measures of all the products ready to be shipped and incoming raw materials
- Take a thorough look at the plans, specifications, and blueprints to understand the product requirements
- Reject all the incoming raw materials fail to meet quality expectations and report the issue to the concerned department at the earliest
- Resolving quality-related issues adhering to deadlines
- Providing training to the quality assurance team
- Design an efficient design protocol which can be used across all domain
- Prepare documentation of the inspection process, which includes detailed reports and performance records
- Recommend improvement measures to the production process to ensure quality control standards are met
- Guide the production team about the quality control issues to enhance the quality of the product
- Monitor customer satisfaction levels
- Monitor the production phase at various levels

2.Audit the artifacts produced in previous sessions

Auditing session activity

In addition to providing information about current and completed sessions in the Systems Manager console, Session Manager provides you with the ability to audit session activity in your AWS account using AWS CloudTrail.

CloudTrail captures session API calls through the Systems Manager console, the AWS Command Line Interface (AWS CLI), and the Systems Manager SDK. You can view the information on the CloudTrail console or store it in a specified Amazon Simple Storage Service (Amazon S3) bucket. One Amazon S3 bucket is used for all CloudTrail logs for your account. For more information, see [Logging AWS Systems Manager API calls with AWS CloudTrail](#).

Monitoring session activity using Amazon EventBridge (console)

With EventBridge, you can set up rules to detect when changes happen to AWS resources. You can create a rule to detect when a user in your organization starts or ends a session, and then, for example, receive a notification through Amazon SNS about the event.

EventBridge support for Session Manager relies on records of API operations that were recorded by CloudTrail. (You can use CloudTrail integration with EventBridge to respond to most AWS Systems Manager events.) Actions that take place within a session, such as an exit command, that don't make an API call aren't detected by EventBridge.

The following steps outline how to initiate notifications through Amazon Simple Notification Service (Amazon SNS) when a Session Manager API event occurs, such as **StartSession**.

To monitor session activity using Amazon EventBridge (console)

1. Create an Amazon SNS topic to use for sending notifications when the Session Manager event occurs that you want to track.

For more information, see [Create a Topic](#) in the *Amazon Simple Notification Service Developer Guide*.

2. Create an EventBridge rule to invoke the Amazon SNS target for the type of Session Manager event you want to track.

For information about how to create the rule, see [Creating an EventBridge Rule That Triggers on an Event from an AWS Resource](#) in the *Amazon EventBridge User Guide*.

As you follow the steps to create the rule, make the following selections:

- For **Service Name**, choose **Systems Manager**.
- For **Event Type**, choose **AWS API Call through CloudTrail**.
- Choose **Specific operation(s)**, and then enter the Session Manager command or commands (one at a time) you want to receive notifications for. You can choose **StartSession**, **ResumeSession**, and **TerminateSession**. (EventBridge doesn't support Get*, List*, and Describe* commands.)
- For **Targets**, choose **SNS topic**. For **Topic**, choose the name of the Amazon SNS topic you created in Step 1.