Describe architectures and services

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AZURE FUNDAMENTALS

Introduction to Cloud technologies
& AZ-900 certification preparation

Describe Azure architecture and services

Steven VINCENT - Burgundy School of Business -
Feb. 2023 -

Chapter study guide

Describe Azure architecture and services (35–40%)

Describe the core architectural components of Azure

- Describe Azure regions, region pairs, and sovereign regions
- Describe availability zones
- Describe Azure datacenters
- Describe Azure resources and resource groups
- Describe subscriptions
- Describe management groups
- Describe the hierarchy of resource groups, subscriptions, and management groups

Describe Azure compute and networking services

- Compare compute types, including container instances, virtual machines (VMs), and functions
- Describe VM options, including Azure Virtual Machines, Azure Virtual Machine Scale Sets, availability sets, and Azure Virtual Desktop
- Describe resources required for virtual machines
- Describe application hosting options, including the Web Apps feature of Azure App Service, containers, and virtual machines
- Describe virtual networking, including the purpose of Azure Virtual Networks, Azure virtual subnets, peering, Azure DNS, Azure VPN Gateway, and Azure ExpressRoute
- Define public and private endpoints

Describe the core architectural components of Azure

Azure geographies

5 geographies

- Americas
- Europe
- Asia Pacific
- Middle East
- Africa

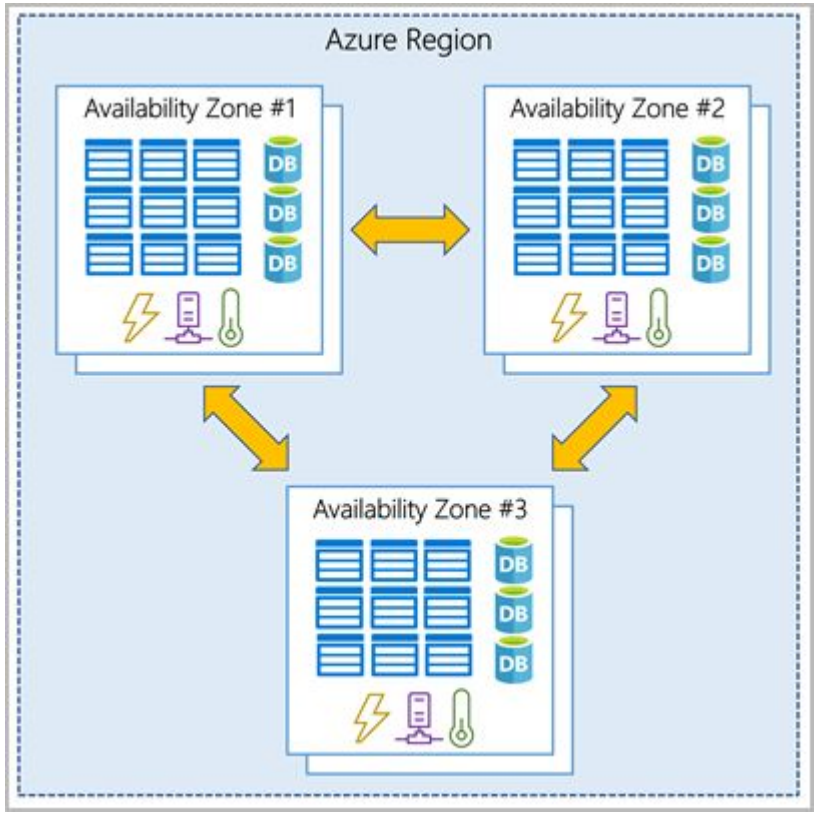
Region & Availability Zones

A region is a geographical area on the planet that contains at least one, but potentially multiple datacenters that are nearby and networked together with a low-latency network. Availability zones are physically separate data centers within an Azure region.

Made up of one or more data centers with independent power, cooling, and networking

Connected through high-speed, private fiber-optic networks.

Set up to be an isolation boundary

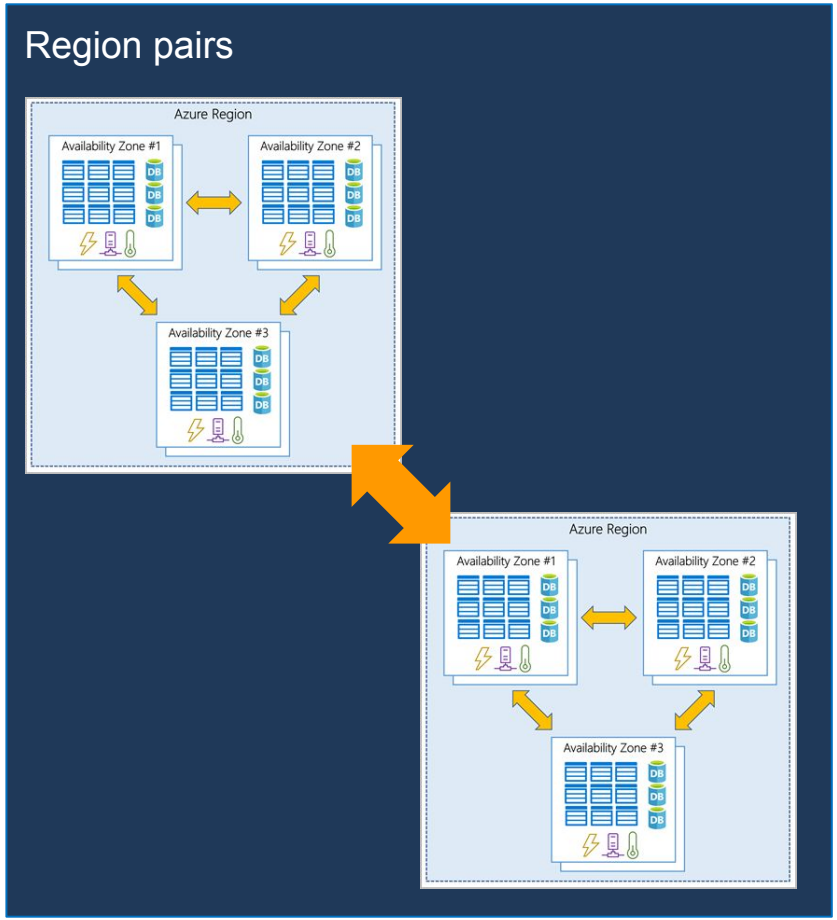


Region pairs

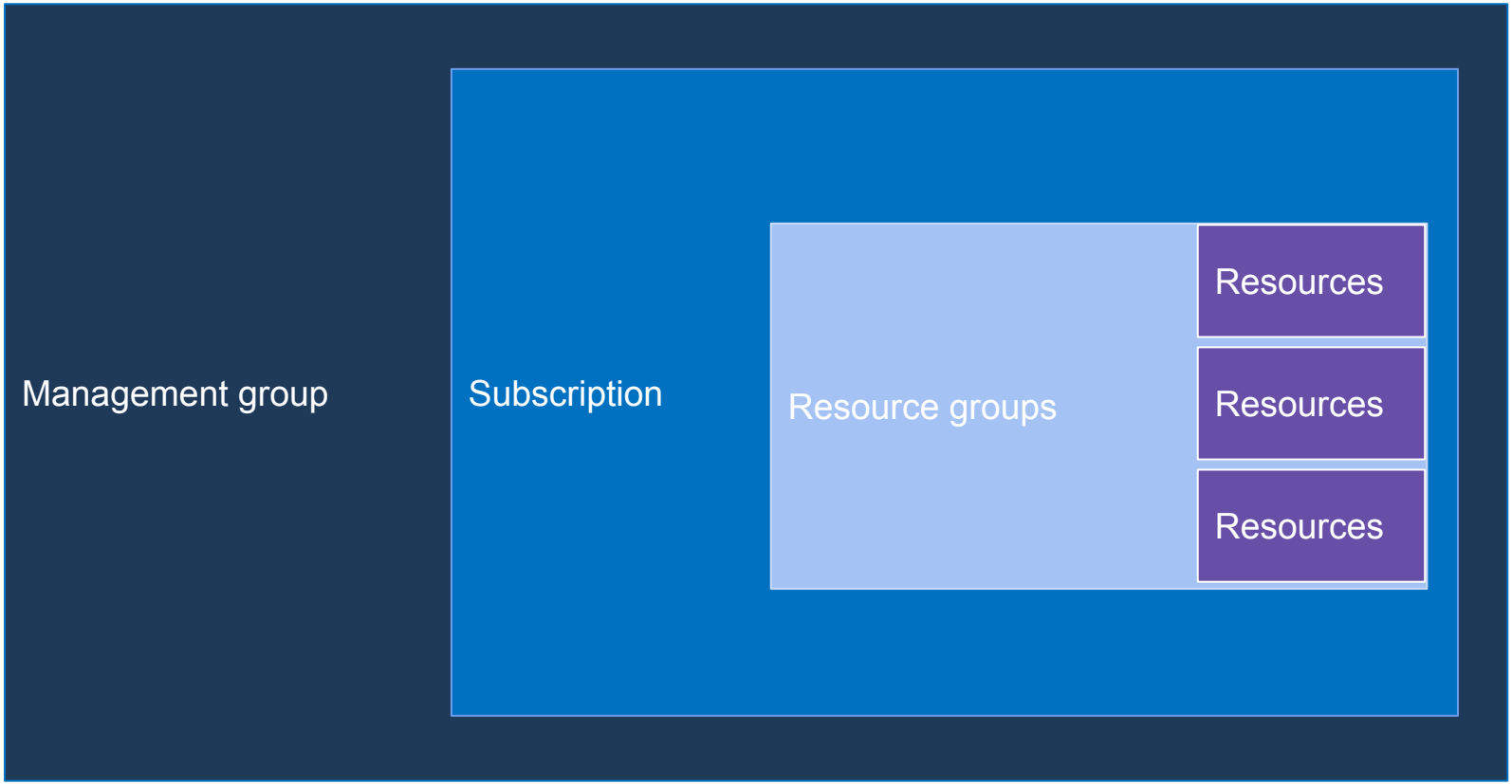
An Azure Region Pair is a relationship between 2 Azure Regions within the same geographic region for disaster recovery purposes. If one of the regions were to experience a disaster or failure, then the services in that region will automatically failover to that regions secondary region in the pair.

For extensive outage, one region of every pair is prioritized to be restored for application hosted in that region pair.

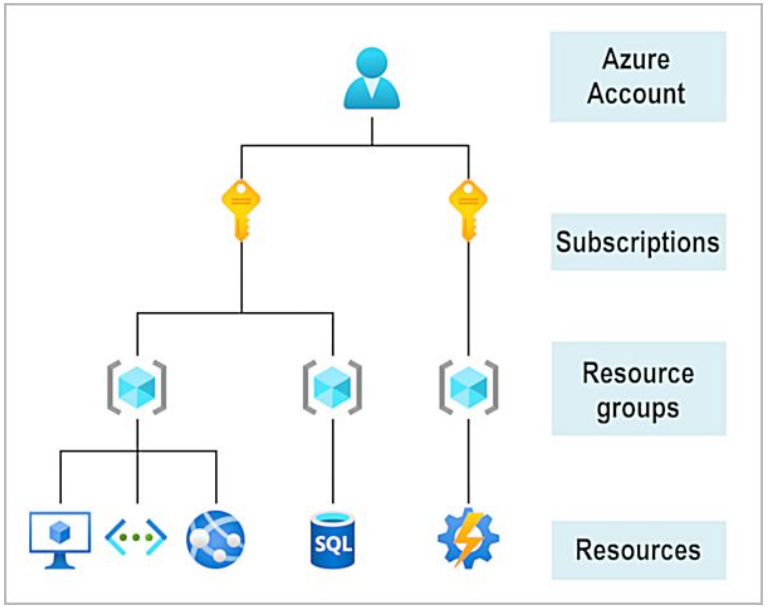
Updates are rolled out to one region to minimize downtime & risk outage

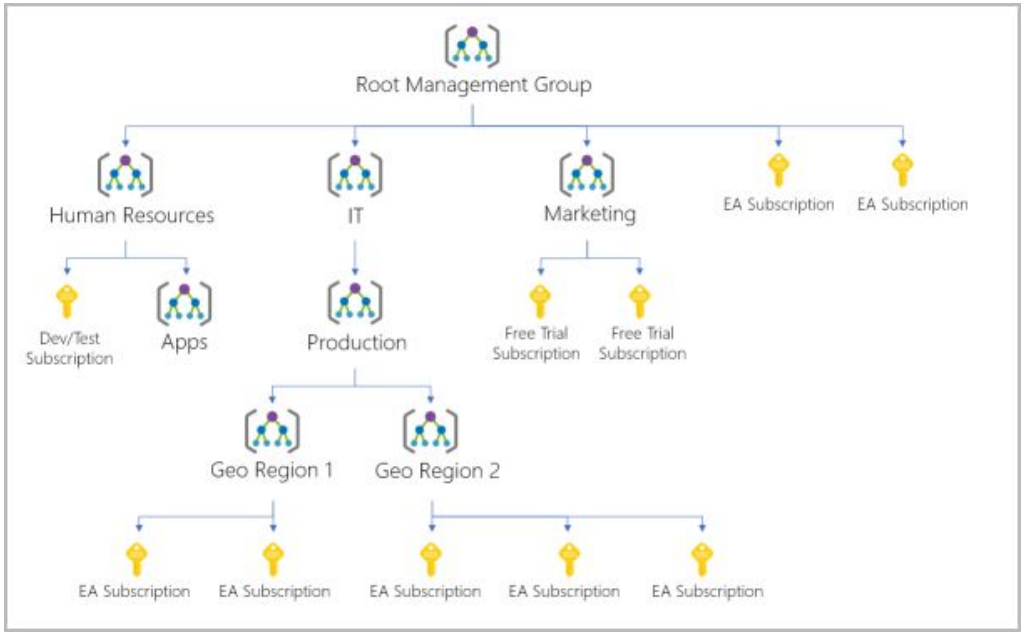


Azure account architecture



Azure account & management group





Describe Azure compute and networking services

Compute type

IaaS	PaaS	PaaS	PaaS
 Virtual machines	 Container Apps	 Function App	 App Services
Emulate hardware	Use host OS & emulate OS	Serverless	Multiple web hosting features
Total control & separation of environments	Lightweights	Function as a service	Enterprise grade web app service
Can run any app/scénario	Respond quicker to demand changes	Designed for micro/nano-services	Multiple programming languages & containers
+ ***VM Scale Sets*** *Auto-scaled workloads for VMs*	+ ***Kubernetes Service*** *Scalable container hosting platform*	+ ***Logic app*** *GUI to define the actions and how they relate to one another.*	

Azure Networking Services

Virtual networks

Network security groups

Load balancers

Front Door and CDN profiles

Emulate physical network	Filter network traffic between resources in Vnet	Even traffic distribution I.O	Content Delivery Network (web content to users)
Isolation, communication, filtering, routing	Contain security rules	Support In/Out scenarios & external/internal traffic	Offload web apps & reduce latency
One or more subnet segmentation	For each rule specify src / dest, port & protocol	High-availability & scalability scenarios	Points of presence locations (caching)

+ ***VNet Peering***

Connect privately multiple vnet

+ ***VPN Gateway***

On-premise to azure & cross regional communication of vnet

+ ***Application security groups***

Configure network security extension of an application's structure

+ ***Application gateways***

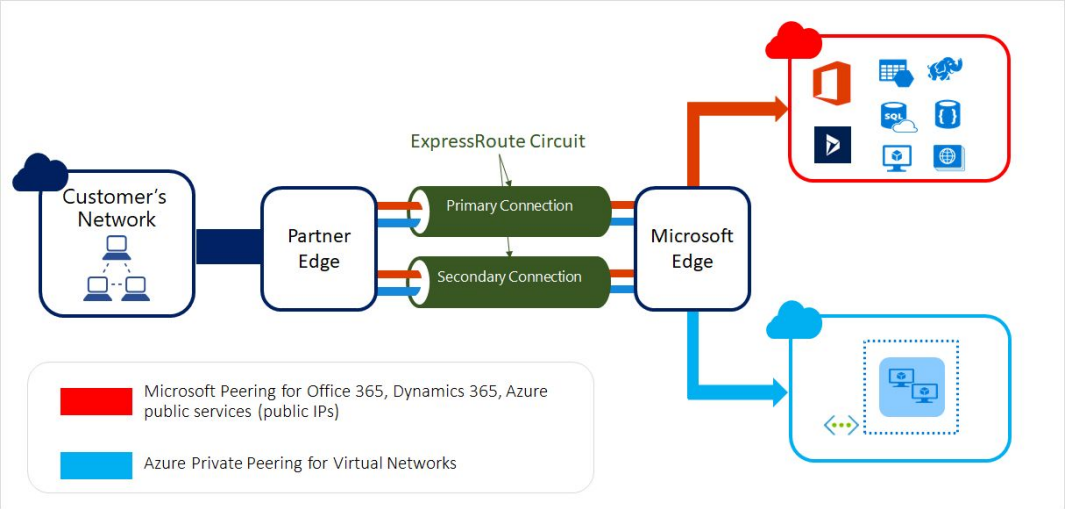
Even traffic distribution for HTTP web traffic

VPNs & Azure ExpressRoute - Hybride networking

Azure ExpressRoute

Point to Site VPN

Site to Site VPN



+ ***Cloud Exchange Co-location***
+ ***Point-to-point Ethernet Connection***
+ ***Any-to-any (IPVPN) Connection***
+ ***ExpressRoute Direct***

Private vs Public endpoints & DNS

Endpoints

Private	Public
Private IP address from your virtual network	Public IP address (Public internet facing)
Connect privately and securely to a service through Azure Private Link.	Enables data access from outside the virtual network
Bringing a service to a virtual network (your own service or Azure storage services)	Pass through an IP public address. The source can be a Private IP or Public IP

DNS

Resides behind a company firewall and maintains records of internal websites	Maintains a publicly available domain names list available. (available to anyone)

Quizz Session

https://forms.office.com/Pages/ResponsePage.aspx?id=DMCNU7rZFEirl1hLiiuqx0ASCt0R_U9Ai6VCg4wpuQFUQ1dBVFFQRVo5UkNKVTVHUTVTV1hTWVJRSSQlQCN0PWcu

Describe architecture & services

INTRODUCTION TO GIT

GIT Overview

Git is a tool that's used to manage multiple versions of source code edits that are then transferred to files in a Git repository.

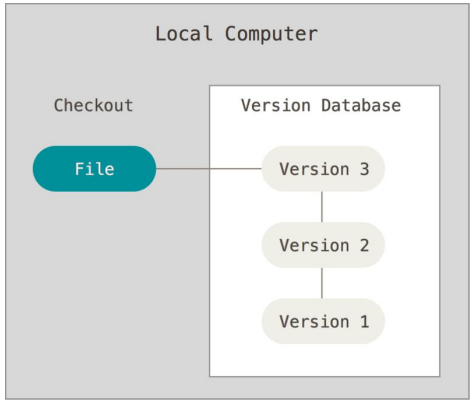
GitHub

Bitbucket

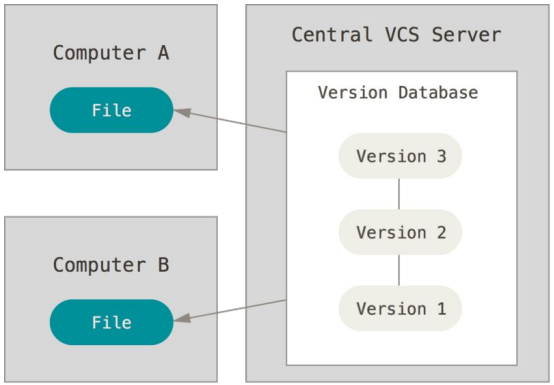
Version Control

Version Control is a system that records changes to a file or set of files over time so that you can recall specific versions later.

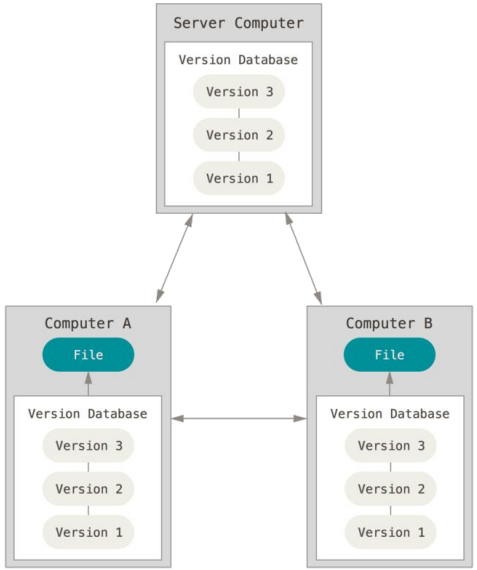
Local Version Control Systems



Centralized Version Control Systems

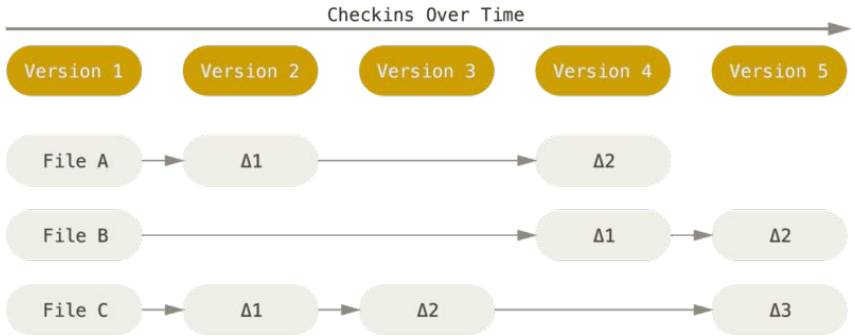


Distributed Version Control Systems

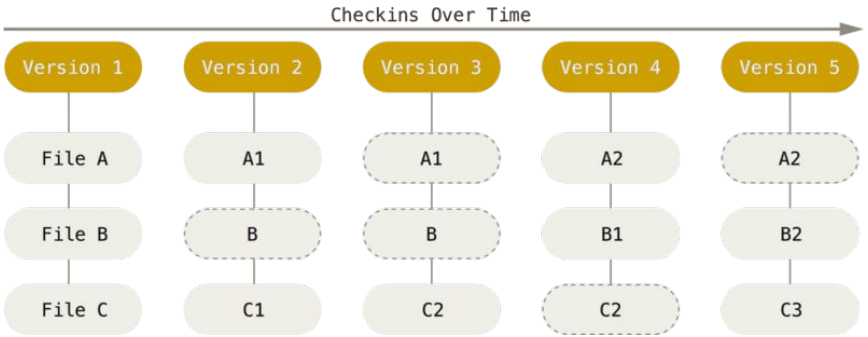


GIT Data Storage

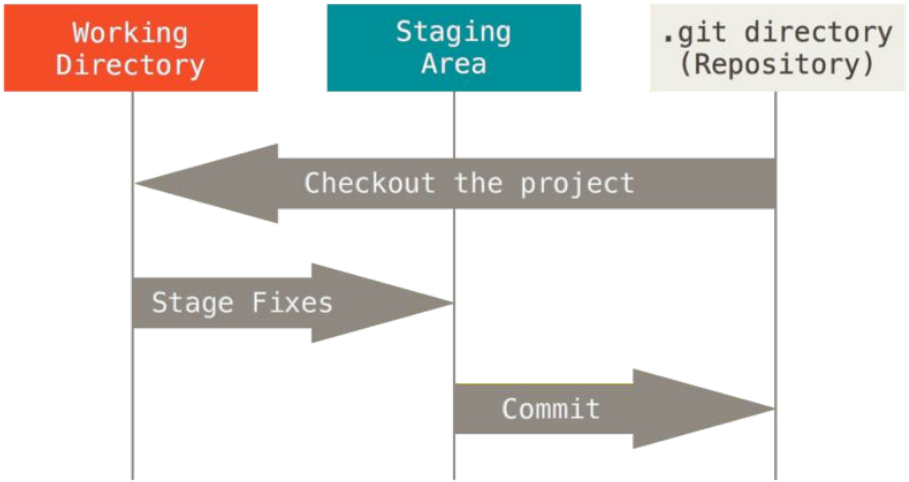
Storing data as changes to a base version of each file



Storing data as snapshots of the project over time



GIT States



Modified means that you have changed the file but have not committed it to your database yet.

Staged means that you have marked a modified file in its current version to go into your next commit snapshot.

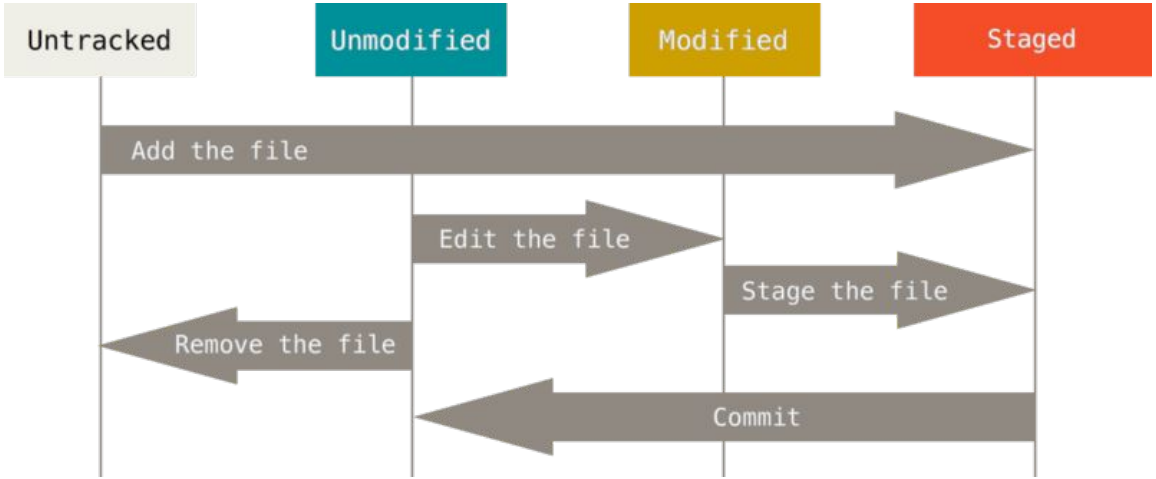
Committed means that the data is safely stored in your local database.

Lifecycle of the status of a file

Tracked files are files that were in the last snapshot, as well as any newly staged files. They are files that Git knows about.

Untracked files are any files in your working directory that were not in your last snapshot and are not in your staging area.

Files have 4 status: untracked, unmodified, modified, or staged



Git Basics

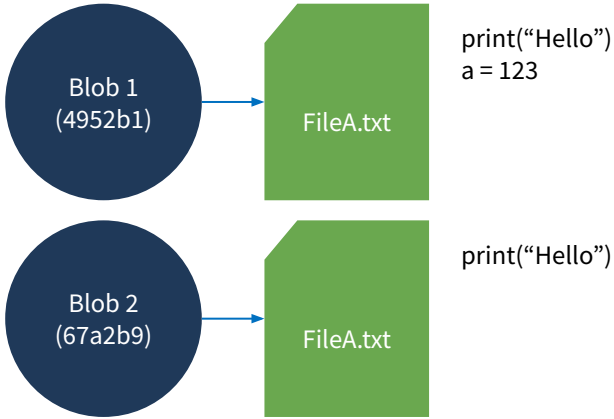
Hash

‘Hello World’

0a4d55a8d778e5022fab701977c5d840bbc486d0

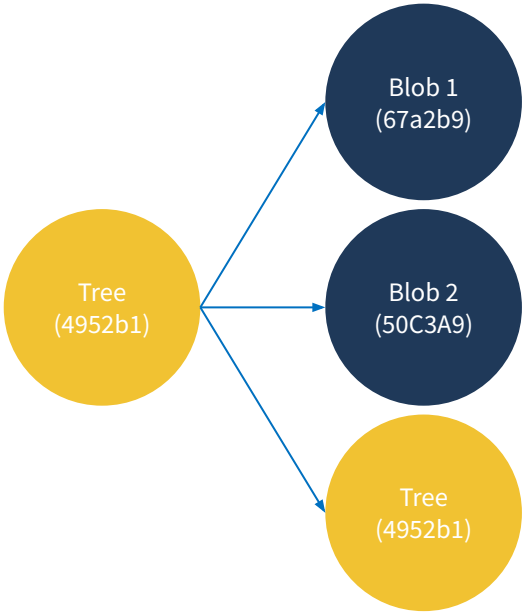
← 40 characters →

Blob

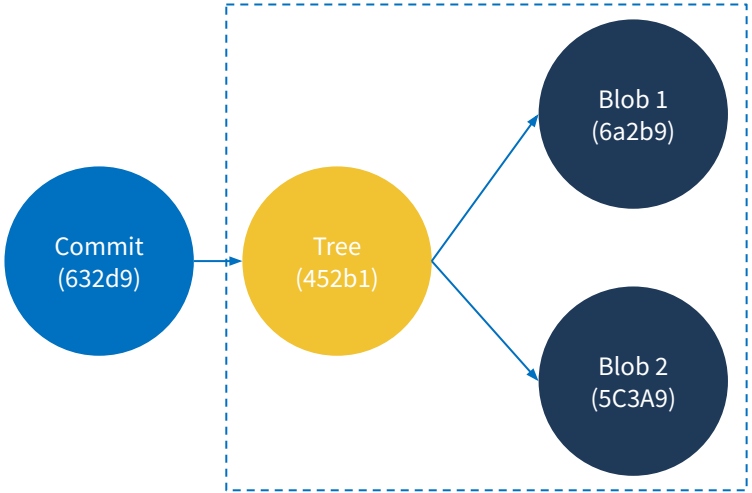


Git Basics

Tree

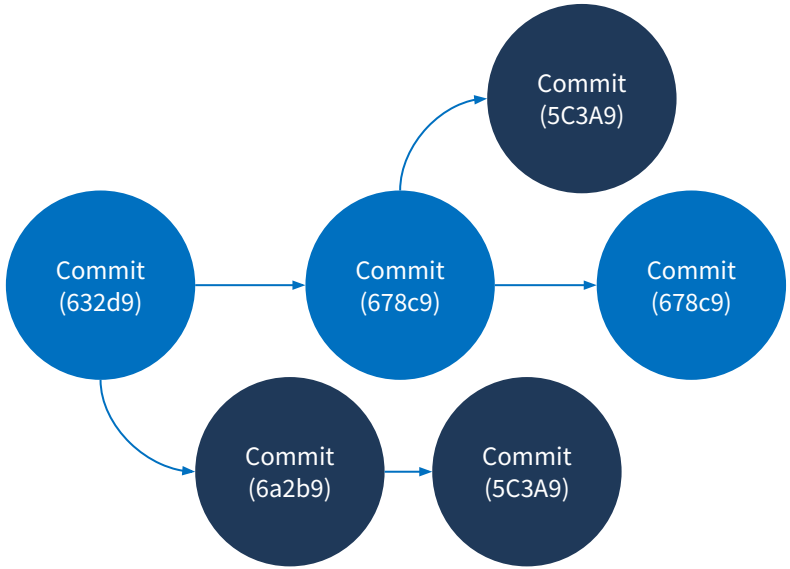


Commit

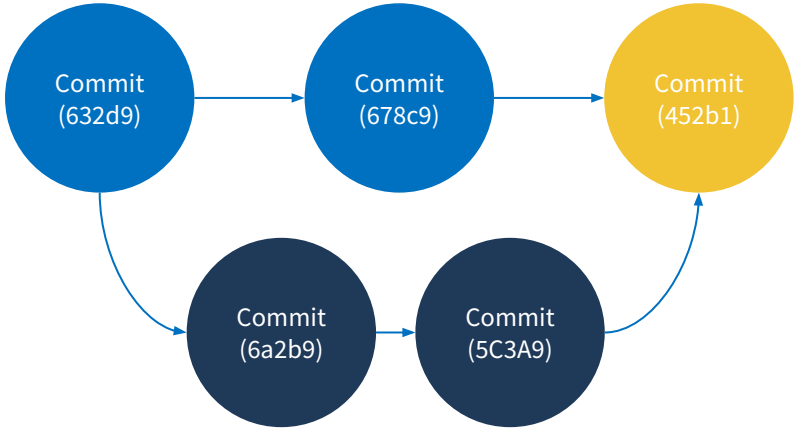


Git Basics

Branch



Merge



GIT operations