**Automation**

* Types of automation
  + manual
    - like a command line tool (still needs a user to input specific info for the automation processes and to hit ENTER key)
  + scheduled
    - occurs at a specific time
  + event
    - automation reacts and starts running once a certain event occurs
  + self-service
    - front-ended by a website
* Orchestration
  + describes the arranging and coordinating of automated tasks
  + benefits:
    - centralized management
    - auditing
    - enhanced workflow
    - self-portal service
* Runbooks
  + can have as many steps as you want
  + normally scoped to perform a specific process or procedure
* Pipelines
  + used to manage and release automation
  + used to automate the release of software applications
  + **source code**
    - stored in a source control repository
    - when changes to the source code are made it triggers a build
  + **Build**
    - responsible for assembling and putting together the automation
    - combines any dependencies is responsible for outputting an artifact that can distributed
  + **Tests**
    - once the artifact is created, **tests** should be run to ensure that the automation runs properly and that no bugs were introduced with the changes that were made
  + **Release**
    - responsible for deploying the new artifact and any actions necessary to make it operational on its intended targets

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* Types of orchestration
  + OS task scheduler
  + runbook orchestration
  + cloud-base automation
  + configuration management
  + continuous integration
  + continuous deployment
* Orchestration communication methods
  + locally
  + remoting protocols
  + agent
  + service
* OS Task Schedulers
  + a built-in service that allows you to perform automated tasks on a chosen computer
  + defining a **Trigger**
    - triggers are scheduled at a specific time or interval
      * hourly, daily, weekly, monthly
    - events
  + **Action** (trigger kicks off the actions)
    - runs a specific program, script, or automation
  + **Communication method**
    - locally
* Runbook Orchestration
  + a workflow management system that allows you to coordinate, deploy, and monitor automation
  + runbook orchestration **requires** additional infrastructure
    - management server
    - runbook runners (executing automation)
    - database
  + **web portal or graphical interface**
    - creating, edit, monitoring and auditing workflows and runbooks
  + **Communication method**
    - agent
      * agents are installed on every server that you want to be a runbook runner
* Cloud-based Automation
  + provides an end-to-end automation workflow that coordinates with lower-level automation through an API and/or a web port for cloud resources
  + **provided as a service**
    - API
    - web portal
  + **managers and coordinates**
    - cloud runbook
    - cloud workflows
    - lower-level automation tasks
    - cloud resources
  + **communication method**
    - cloud service
* Configuration Management Tools
  + provides the ability to manage system state changes and provisioning of infrastructure through automation
  + **Requires**
    - central/management server
    - agents or remote protocol
  + **declarative infrastructure** 
    - process of managing and provisioning infrastructure through machine-readable files or code
    - DSL (domain specific language)
  + **communication method**
    - agent or remoting protocol
* Continuous Integration Tools
  + automates software development build processes that are triggered by code changes to central code repositories
  + **requires**
    - CI server
    - database
    - build agents
  + **provides automation**
    - software build process
    - testing
  + **communication method**
    - agent
* Continuous Deployment Tools
  + designed for automating the deployment of software releases
  + **requires**
    - CD server(s)
    - database
    - agents
  + **provides automation**
    - deployment of software across different environments
  + **communication method**
    - agent