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Ansible

What is Ansible?

Ansible is an open-source IT automation engine that simplifies complex tasks like configuration management, application deployment, and orchestration across servers and devices using simple, human-readable scripts (playbooks) written in YAML, without needing agents on managed nodes, making IT infrastructure management easier and more consistent.

It uses a control node to push instruction to manage to nodes, automating repetitive IT processes and ensuring consistency.

Key Concepts & Features:

- **Agentless:** Connects to managed machines via SSH (Linux/Unix) or WinRM (Windows), requiring no special software (agents) installed on them.
- **Playbooks:** These are YAML files that define desired states, tasks, and workflows, making automation code version-controllable, like software.
- **Modules:** Small programs that perform specific actions (e.g., installing software, managing users, patching) on hosts, written in Python.
- **Infrastructure as code (IaC):** Treats infrastructure management like software development, ensuring repeatable, self-documenting, and reliable setups.
- **Declarative:** You define *what* you want (e.g., "this service should be running"), and Ansible figures out *how* to get there.

What it's used for:

- **Configuration Management:** Ensuring servers have consistent settings, patches, and software.
- **Application Deployment:** Automating the release of new applications or updates.
- **Orchestration:** Managing complex, multi-step workflows across different systems.
- **Cloud Provisioning:** Setting up virtual machines, network components, and cloud resources.
- **Security & Compliance:** Enforcing security policies and patching vulnerabilities across fleets.

ad-hoc command:

An Ansible ad-hoc command is a single-line command executed from the command line of the Ansible control node to automate a quick, one-time task on one or more managed nodes. They are designed for simple, immediate operations and are not saved for repeated use, unlike playbooks which are reusable, structured files written in YAML.

Key Characteristics

- **One-Time Use:** Designed for immediate, specific actions, not complex automation workflows.
- **One-Liner:** Executed directly from the command line with a simple syntax: ansible [hosts] -m [module] -a "[arguments]".
- **Module-Based:** Uses built-in Ansible modules (like command, file, copy) to perform tasks.
- **Idempotent:** Checks the current state before acting, ensuring tasks only run if needed.
- **Parallel Execution:** Runs across multiple hosts simultaneously by default for speed