

Runbook: Python 3.12 FastAPI Application on AWS EC2

This runbook describes the standard, production-ready procedure to install, configure, and operate a Python 3.12 FastAPI application on an Amazon Linux EC2 instance, including virtual environment setup and dependency installation.

1. Prerequisites

- Amazon Linux 2023 EC2 instance
- IAM role attached to EC2 with SSM read permissions
- Security Group allows SSH (22) and application port (e.g., 8000)

2. System Setup

- `sudo dnf update -y`
- `sudo dnf install -y git python3.12 python3.12-pip python3.12-devel`

3. Application Source Setup

- Clone the FastAPI application repository from GitHub
- `cd` into the application directory

4. Python Virtual Environment Setup

- Create a Python 3.12 virtual environment: `python3.12 -m venv venv`
- Activate the virtual environment: `source venv/bin/activate`
- Upgrade pip inside the virtual environment

5. Dependency Installation

- Install application dependencies: `pip install -r requirements.txt`
- Verify installed packages if needed using `pip list`

6. Running the FastAPI Application

- Run FastAPI with Uvicorn binding to 0.0.0.0
- Example: `uvicorn main:app --host 0.0.0.0 --port 8000`

7. Running as a systemd Service

- Create a systemd service pointing to the virtual environment Python interpreter
- Enable auto-start and restart on failure using `systemctl`

8. Validation & Health Checks

- `systemctl status fastapi`
- `journalctl -u fastapi -f`
- Access <http://:8000/docs>

9. Troubleshooting

- Ensure virtual environment is activated when running manually
- Verify requirements.txt compatibility with Python 3.12
- Confirm IAM role attachment if using AWS services