Complete Lab Setup Requirements: Grafana, Prometheus, ELK, Docker, Kubernetes, Jenkins

# 1. Minimum System Requirements

For setting up a complete monitoring and CI/CD lab environment on Ubuntu Linux:

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| --- | --- | --- |
| Component | Minimum | Recommended |
| CPU | 4 cores | 8 cores |
| RAM | 8 GB | 16 GB or more |
| Storage | 100 GB SSD | 200+ GB SSD/NVMe |
| Network | Stable internet, bridged adapter | Same + static IP preferred |

# 2. Operating System

- Ubuntu 20.04 LTS or 22.04 LTS  
- Clean install, updated packages  
- Use `sudo apt update && sudo apt upgrade -y`

# 3. Required Software Components

Core Tools & Dependencies:  
- curl, wget, git, unzip, vim/nano  
- apt-transport-https, ca-certificates, software-properties-common  
- Docker Engine + Docker Compose  
- OpenJDK 11 or later (for Jenkins, Elasticsearch)  
- Node.js (optional, for Kibana plugin or frontend testing)

# 4. Stack & Services Setup

A. Monitoring & Logging

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| --- | --- |
| Tool | Purpose |
| Prometheus | Metric collection and alerting |
| Grafana | Dashboards & visualizations |
| Node Exporter | Host system metrics collection |
| Elasticsearch | Log storage & search |
| Logstash | Parsing logs & routing |
| Kibana | Visualizing logs from Elastic |
| Filebeat | Shipping logs to Logstash |

B. Containerization & Orchestration

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| --- | --- |
| Tool | Purpose |
| Docker | Container platform |
| Docker Compose | Multi-container management |
| Kubernetes (Minikube or kubeadm) | Container orchestration |

C. CI/CD Pipeline

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| --- | --- |
| Tool | Purpose |
| Jenkins | Build and deployment automation |
| GitHub/GitLab | Source repo integration (optional) |

# 5. Networking & Ports

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| --- | --- |
| Tool | Port |
| Prometheus | 9090 |
| Grafana | 3000 |
| Jenkins | 8080 |
| Elasticsearch | 9200 |
| Kibana | 5601 |
| Logstash | 5044 |
| Kubernetes API | 6443 |

# 6. Optional Enhancements

- Nginx/Apache: Reverse proxy and SSL termination  
- Vault: Secret management  
- Ansible: Configuration automation  
- Helm: Kubernetes package manager