# **Prometheus, Grafana, Node Exporter, and cAdvisor with Alerts**

Today I successfully set up a monitoring and alerting system using Prometheus, Grafana, Node Exporter, and cAdvisor on an Ubuntu server. The purpose was to collect system and container metrics, visualize them, and configure alerts that notify via email.  
  
The process began with the installation of Prometheus, which acts as the core monitoring system. I created the configuration file prometheus.yml to scrape metrics from Prometheus itself, Node Exporter, and cAdvisor. System services were configured so Prometheus runs persistently.  
  
Next, I deployed Node Exporter to collect system-level metrics such as CPU, memory, and disk usage. I also set up cAdvisor in a Docker container to provide container-level metrics. Both were integrated into Prometheus through the configuration file, and I verified they were correctly being scraped.  
  
I then installed Grafana, which serves as the visualization and alerting platform. Prometheus was added as a data source in Grafana. For email notifications, I configured the SMTP settings in grafana.ini using Gmail with an App Password. In Grafana, I created an email contact point and linked it through a notification policy to ensure alerts would be sent to my inbox.  
  
Finally, I created several alert rules to detect critical situations. These include:  
- Low Memory Alert when available memory falls below 20%.  
- High CPU Alert when CPU usage exceeds 70%.  
- Container Not Running Alert if a container has not been seen for over one minute.  
  
The system was tested by simulating conditions such as stopping a container and generating CPU load. Alerts were successfully delivered to the configured email address, confirming the setup works as expected.  
  
This setup provides a reliable monitoring and alerting solution, combining Prometheus for data collection, Grafana for visualization and notifications, and exporters like Node Exporter and cAdvisor for system and container insights.