

Monitoring & Observability Guide

Monitoring & Observability Stack [🔗](#)



Prometheus + Grafana Setup [🔗](#)

Helm Installation [🔗](#)

```
1 helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
2 helm upgrade --install prometheus prometheus-community/kube-prometheus-stack \
3   --namespace monitoring \
4   --set grafana.adminPassword="${GRAFANA_ADMIN_PASSWORD}"
```

Key Metrics Collected [🔗](#)

- **Kubernetes:** Node/pod metrics, resource usage
- **GitLab:** Repository stats, CI/CD metrics
- **Keycloak:** Authentication events, session data
- **Custom:** Homelab-specific alerts

Default Dashboards [🔗](#)

- Kubernetes cluster overview
- Node exporter metrics
- GitLab performance
- Application-specific dashboards



AlertManager Configuration [🔗](#)

Critical Alerts [🔗](#)

```
1 groups:
2 - name: homelab-critical
3   rules:
4   - alert: NodeDown
5     expr: up{job="node-exporter"} == 0
6     for: 5m
7     annotations:
8       summary: "Node {{ $labels.instance }} is down"
9
10  - alert: GitLabDown
11    expr: probe_success{instance="https://gitlab.homelab.local"} == 0
12    for: 2m
13    annotations:
14      summary: "GitLab is unreachable"
15
16  - alert: KeycloakDown
17    expr: up{job="keycloak"} == 0
18    for: 2m
19    annotations:
20      summary: "Keycloak SSO is down"
```

Notification Channels [🔗](#)

- Email alerts for critical issues
- Slack integration (optional)
- PagerDuty for production incidents

Custom Dashboards [🔗](#)

Homelab Overview Dashboard [🔗](#)

```
1 {
2   "dashboard": {
3     "title": "Homelab Overview",
4     "panels": [
5       {
6         "title": "Service Health",
7         "type": "stat",
8         "targets": [
9           {
10            "expr": "up{job=~\"gitlab|keycloak|grafana\"}"
11          }
12        ]
13      },
14      {
15        "title": "Resource Usage",
16        "type": "graph",
17        "targets": [
18          {
19            "expr": "100 - (avg by (instance) (rate(node_cpu_seconds_total{mode=\"idle\"}[5m])) * 100)"
20          }
21        ]
22      }
23    ]
24  }
25 }
```

Log Aggregation with Loki [🔗](#)

Loki Stack Deployment [🔗](#)

```
1 helm repo add grafana https://grafana.github.io/helm-charts
2 helm upgrade --install loki grafana/loki-stack \
3   --namespace monitoring \
4   --set fluent-bit.enabled=true \
5   --set promtail.enabled=true
```

Log Sources [🔗](#)

- K3s system logs
- GitLab application logs
- Keycloak authentication logs
- Application container logs

Log Queries [🔗](#)

```
1 # GitLab errors
```

```
2 {job="gitlab"} |= "ERROR"
3
4 # Failed authentication attempts
5 {job="keycloak"} |= "LOGIN_ERROR"
6
7 # Pod restart events
8 {job="kubernetes"} |= "pod" |= "restart"
```

Key Performance Indicators [🔗](#)

Infrastructure KPIs [🔗](#)

- **Uptime:** >99.5% for critical services
- **Response Time:** <200ms for web interfaces
- **Resource Usage:** <80% CPU/Memory utilization
- **Error Rate:** <1% for authentication flows

GitLab Metrics [🔗](#)

- Repository clone/push rates
- CI/CD pipeline success rates
- User activity levels
- Storage utilization

Security Metrics [🔗](#)

- Failed authentication attempts
- Network policy violations
- Certificate expiration warnings
- Vulnerability scan results