

# FOSS Chart Dependencies & Override System

## FOSS Chart Dependencies & Override System [↗](#)

### Supported FOSS Components [↗](#)

Component	Chart	Version	Purpose
Keycloak	bitnami/keycloak	16.0.0	SSO Authentication
Prometheus Stack	prometheus-community/kube-prometheus-stack	55.0.0	Monitoring & Alerting
JupyterHub	jupyterhub/jupyterhub	3.1.0	AI/ML Platform
Cert-Manager	jetstack/cert-manager	v1.13.0	Certificate Automation
Ingress-NGINX	ingress-nginx/ingress-nginx	4.8.0	Load Balancing
External Secrets	external-secrets/external-secrets	0.9.9	Secret Management
ArgoCD	argo/argo-cd	5.51.0	GitOps Deployment
Velero	vmware-tanzu/velero	5.1.0	Backup & Recovery

### Project Structure [↗](#)

```
1 homelab-iac/
2 |─ charts/                # Downloaded FOSS charts
3 | |─ Chart.yaml          # Dependency definitions
4 | |─ {chart-name}/       # Individual chart files
5 |─ overrides/            # Configuration layers
6 | |─ global/             # Environment configs
7 | | |─ config.yaml       # Global defaults
8 | | |─ production.yaml   # Production overrides
9 | | |─ staging.yaml       # Staging overrides
10 | |─ release/           # Chart-level configs
11 | | |─ chart-versions.yaml
12 | | |─ global-chart-config.yaml
13 | |─ service/           # Service-specific configs
14 | | |─ {service}/overrides.yaml
15 |─ manifests/           # Rendered Kubernetes manifests
16 | |─ base/              # Base Kustomize configs
17 | |─ environments/      # Environment overlays
18 |─ scripts/             # Automation scripts
19 | |─ deploy/            # Deployment scripts
20 | |─ update/            # Chart update tools
21 | |─ validate/          # Configuration validation
```

## 3-Tier Override System [↗](#)

### 1. Global Configuration ( `overrides/global/` ) [↗](#)

**Purpose:** Environment-wide settings applied to all services

```
1 global:
2   domain_name: "homelab.local"
3   certificates:
4     use_letsencrypt: false
5     acme_email: "admin@homelab.local"
6   resources:
7     default_profile: "medium"
8   monitoring:
9     retention: "30d"
10    storage_size: "50Gi"
```

### 2. Release Configuration ( `overrides/release/` ) [↗](#)

**Purpose:** Chart versions and global chart settings

```
1 releases:
2   keycloak:
3     chart_version: "16.0.0"
4     update_policy: "minor"
5   kube-prometheus-stack:
6     chart_version: "55.0.0"
7     update_policy: "patch"
```

### 3. Service Configuration ( `overrides/service/{service}/` ) [↗](#)

**Purpose:** Service-specific customizations

```
1 # overrides/service/keycloak/overrides.yaml
2 auth:
3   adminUser: admin
4 ingress:
5   enabled: true
6   hostname: keycloak.${global.domain_name}
7 postgresql:
8   enabled: true
```

## Setup & Deployment [↗](#)

### Initialize Project Structure [↗](#)

```
1 # Download and setup FOSS charts
2 bash scripts/setup-foss-dependencies.sh
3
4 # Validate configuration
5 bash scripts/validate/validate-overrides.sh
```

### Deploy to Environment [↗](#)

```
1 # Production deployment
2 bash scripts/deploy/deploy-stack.sh production
3
4 # Staging deployment
```

```
5 bash scripts/deploy/deploy-stack.sh staging
6
7 # Dry run
8 bash scripts/deploy/deploy-stack.sh production true
```

## Chart Management [↗](#)

```
1 # Check for updates
2 bash scripts/update/check-updates.sh
3
4 # Update dependencies
5 bash scripts/update/update-charts.sh
6
7 # Render manifests only
8 bash scripts/deploy/render-manifests.sh production
```

## Override Hierarchy [↗](#)

Configuration is applied in this order (later overrides earlier):

1. **Chart defaults** (from upstream FOSS charts)
2. **Global config** ( overrides/global/config.yaml )
3. **Environment config** ( overrides/global/{environment}.yaml )
4. **Release config** ( overrides/release/\*.yaml )
5. **Service config** ( overrides/service/{service}/overrides.yaml )

## Customization Examples [↗](#)

### Domain Configuration [↗](#)

```
1 # overrides/global/config.yaml
2 global:
3   domain_name: "mylab.local"
4
5 # Automatically applies to all services:
6 # - keycloak.mylab.local
7 # - grafana.mylab.local
8 # - jupyter.mylab.local
```

### Resource Scaling [↗](#)

```
1 # overrides/global/production.yaml
2 global:
3   resources:
4     default_profile: "large"
5
6 # overrides/service/keycloak/overrides.yaml
7 resources:
8   requests:
9     memory: 2Gi
10    cpu: 1000m
```

### Feature Toggles [↗](#)

```
1 # charts/values.yaml
2 keycloak:
```

```
3   enabled: true
4 monitoring:
5   enabled: true
6 ai-platform:
7   enabled: true
8 gitops:
9   enabled: false # Enable post-deployment
```

## Validation & Quality [🔗](#)

### Automated Validation [🔗](#)

- YAML syntax checking
- Required field validation
- Chart version compatibility
- Override structure validation

### Update Policies [🔗](#)

- **patch**: Only patch-level updates
- **minor**: Minor and patch updates
- **major**: All updates (requires manual approval)