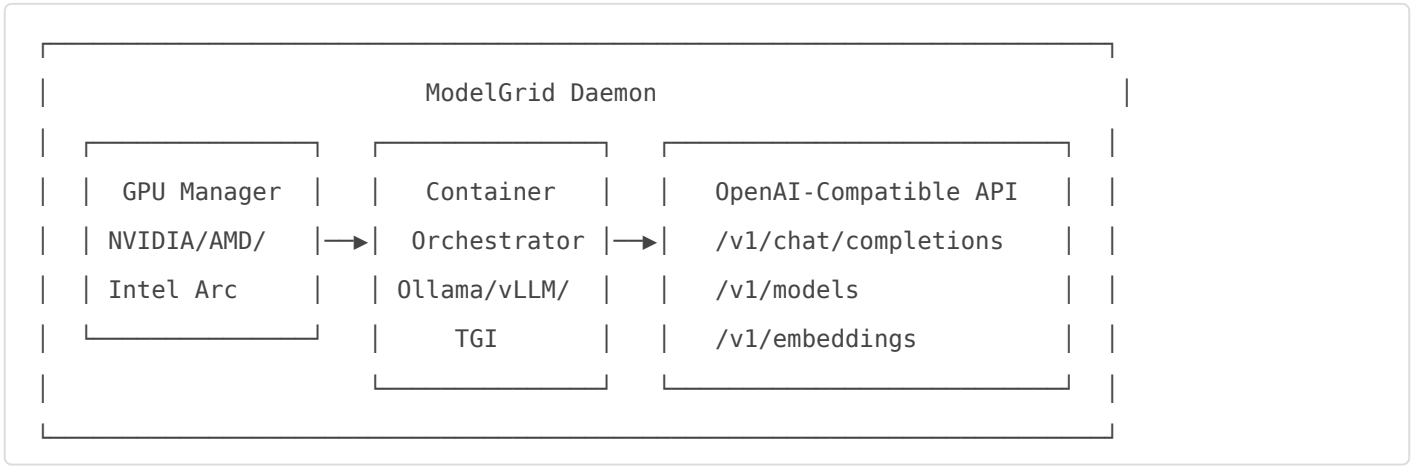
readme.md for @modelgrid.com/modelgrid

□□ ModelGrid

GPU infrastructure management daemon with OpenAI-compatible API for serving AI models in containers.

ModelGrid is a root-level daemon that transforms any GPU-equipped machine into a production-ready AI inference server. It manages Docker containers (Ollama, vLLM, TGI) across NVIDIA, AMD, and Intel GPUs, exposing a unified **OpenAI-compatible API** that works as a drop-in replacement for existing tools.



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□ Features

- □□ **OpenAI-Compatible API** — Drop-in replacement for OpenAI's API. Works with existing tools, SDKs, and applications
- □□ **Multi-GPU Support** — Auto-detect and manage NVIDIA (CUDA), AMD (ROCm), and Intel Arc (oneAPI) GPUs
- □□ **Container Orchestration** — Seamlessly manage Ollama, vLLM, and TGI containers with GPU passthrough
- □□ **Greenlit Models** — Controlled model auto-pulling with VRAM validation for secure deployments
- ⚡ **Streaming Support** — Real-time token streaming via Server-Sent Events
- □□ **Auto-Recovery** — Health monitoring with automatic container restart
- □□ **Docker Native** — Full Docker/Podman integration with isolated networking
- □□ **Prometheus Metrics** — Built-in `/metrics` endpoint for monitoring
- □□ **Cross-Platform** — Pre-compiled binaries for Linux, macOS, and Windows

□□ Installation

Via npm (Recommended)

```
npm install -g @modelgrid.com/modelgrid
```

Via Installer Script

```
curl -sSL https://code.foss.global/modelgrid.com/modelgrid/raw/branch/main/install.sh | sudo bash
```

Manual Binary Download

Download the appropriate binary for your platform from releases:

Platform	Binary
Linux x64	`modelgrid-linux-x64`
Linux ARM64	`modelgrid-linux-arm64`
macOS Intel	`modelgrid-macos-x64`

Platform	Binary
macOS Apple Silicon	`modelgrid-macos-arm64`
Windows x64	`modelgrid-windows-x64.exe`

```
chmod +x modelgrid-linux-x64
sudo mv modelgrid-linux-x64 /usr/local/bin/modelgrid
```

□□ Quick Start

```
# 1. Check your GPUs
sudo modelgrid gpu list

# 2. Initialize configuration
sudo modelgrid config init

# 3. Add an API key
sudo modelgrid config apikey add

# 4. Add a container (interactive)
sudo modelgrid container add

# 5. Enable and start the service
sudo modelgrid service enable
sudo modelgrid service start

# 6. Test the API
curl http://localhost:8080/v1/models \
  -H "Authorization: Bearer YOUR_API_KEY"
```

That's it! Your GPU server is now serving AI models with an OpenAI-compatible API. □□

□□ API Reference

ModelGrid exposes a fully OpenAI-compatible API on port `8080` (configurable).

Authentication

All API endpoints require Bearer token authentication:

```
curl -H "Authorization: Bearer YOUR_API_KEY" http://localhost:8080/v1/models
```

Chat Completions

```
POST /v1/chat/completions
```

```
curl -X POST http://localhost:8080/v1/chat/completions \
  -H "Authorization: Bearer YOUR_API_KEY" \
  -H "Content-Type: application/json" \
  -d '{
    "model": "llama3:8b",
    "messages": [
      {"role": "system", "content": "You are a helpful assistant."},
      {"role": "user", "content": "What is machine learning?"}
    ],
    "temperature": 0.7,
    "max_tokens": 1024,
    "stream": false
  }'
```

Streaming Response:

```
curl -X POST http://localhost:8080/v1/chat/completions \
  -H "Authorization: Bearer YOUR_API_KEY" \
  -H "Content-Type: application/json" \
  -d '{
    "model": "llama3:8b",
    "messages": [{"role": "user", "content": "Write a poem about AI"}],
    "stream": true
  }' --no-buffer
```

List Models

```
GET /v1/models
```

Returns all available models across all containers:

```
{
  "object": "list",
  "data": [
    {
      "id": "llama3:8b",
      "object": "model",
      "owned_by": "modelgrid",
      "created": 1706745600
    }
  ]
}
```

Embeddings

```
POST /v1/embeddings
```

```
curl -X POST http://localhost:8080/v1/embeddings \
  -H "Authorization: Bearer YOUR_API_KEY" \
  -H "Content-Type: application/json" \
  -d '{
    "model": "llama3:8b",
    "input": "Hello, world!"
  }'
```

Health Check (No Auth Required)

```
GET /health
```

```
{
  "status": "ok",
  "uptime": 3600,
  "containers": { "total": 2, "running": 2 },
  "models": 5,
```

```
  "gpus": 2
}
```

Prometheus Metrics (No Auth Required)

```
GET /metrics
```

```
# HELP modelgrid_uptime_seconds Server uptime in seconds
modelgrid_uptime_seconds 3600
# HELP modelgrid_containers_total Total configured containers
modelgrid_containers_total 2
# HELP modelgrid_containers_running Running containers
modelgrid_containers_running 2
```

□□ CLI Commands

Service Management

```
modelgrid service enable       # Install and enable systemd service
modelgrid service disable      # Stop and disable service
modelgrid service start        # Start the daemon
modelgrid service stop         # Stop the daemon
modelgrid service restart      # Restart the daemon
modelgrid service status       # Show service status with GPU/container info
modelgrid service logs         # Tail live service logs
```

GPU Management

```
modelgrid gpu list             # List all detected GPUs with VRAM info
modelgrid gpu status           # Show real-time GPU utilization
modelgrid gpu drivers          # Check driver status for all GPUs
modelgrid gpu install          # Install GPU drivers (interactive)
```

Example output:

```
GPU Devices (2):

┌──────────────┬──────────────────────────┬─────────┬────────────────┬──────────────┐
│ ID           │ Model                    │ VRAM    │ Driver         │ Status       │
├──────────────┼──────────────────────────┼─────────┼────────────────┼──────────────┤
│ nvidia-0     │ NVIDIA RTX 4090          │ 24 GB   │ 535.154.05     │ Ready        │
│ nvidia-1     │ NVIDIA RTX 4090          │ 24 GB   │ 535.154.05     │ In Use       │
└──────────────┴──────────────────────────┴─────────┴────────────────┴──────────────┘
```

Container Management

```
modelgrid container list       # List all configured containers
modelgrid container add        # Interactive container setup wizard
modelgrid container remove ID  # Remove a container
modelgrid container start [ID] # Start container(s)
modelgrid container stop [ID]  # Stop container(s)
modelgrid container logs ID    # Show container logs
```

Model Management

```
modelgrid model list           # List available/loaded models
modelgrid model pull NAME      # Pull a model (must be greenlit)
modelgrid model remove NAME    # Remove a model from container
modelgrid model status         # Show model recommendations with VRAM analysis
modelgrid model refresh        # Refresh greenlist cache
```

Configuration

```
modelgrid config show          # Display current configuration
modelgrid config init          # Initialize default configuration
modelgrid config apikey list   # List configured API keys
modelgrid config apikey add    # Generate and add new API key
modelgrid config apikey remove # Remove an API key
```

Global Options

```
--debug, -d    # Enable debug mode (verbose logging)
--version, -v  # Show version information
--help, -h     # Show help message
```

□□ Supported Containers

Ollama

Best for general-purpose model serving with easy model management.

```
# Add via CLI
sudo modelgrid container add
# Select: ollama

# Or configure directly
{
  "id": "ollama-1",
  "type": "ollama",
  "name": "Ollama Server",
  "gpuIds": ["nvidia-0"],
  "port": 11434
}
```

Supported models: llama3, mistral, codellama, phi, gemma, and 100+ more

vLLM

High-performance inference with PagedAttention and continuous batching.

```
{
  "id": "vllm-1",
  "type": "vllm",
  "name": "vLLM Server",
  "gpuIds": ["nvidia-0", "nvidia-1"],  # Tensor parallelism
  "port": 8000,
  "env": {
    "HF_TOKEN": "your-huggingface-token"  # For gated models
```

```
  }
}
```

Best for: Production workloads, high throughput, multi-GPU setups

TGI (Text Generation Inference)

HuggingFace's production-ready inference server with quantization support.

```
{
  "id": "tgi-1",
  "type": "tgi",
  "name": "TGI Server",
  "gpuIds": ["nvidia-0"],
  "port": 8080,
  "env": {
    "QUANTIZE": "gptq"  # Or: awq, bitsandbytes
  }
}
```

Best for: Quantized models, Flash Attention, HuggingFace ecosystem

□□ GPU Support

NVIDIA (CUDA)

Requirements:

- NVIDIA Driver 470+
- CUDA Toolkit 11.0+
- NVIDIA Container Toolkit (`nvidia-docker2`)

```
# Check status
modelgrid gpu drivers

# Install (Ubuntu/Debian)
sudo apt install nvidia-driver-535 nvidia-container-toolkit
sudo systemctl restart docker
```

AMD (ROCm)

Requirements:

- ROCm 5.0+
- AMD GPU with ROCm support (RX 6000+, MI series)

```
# Install ROCm
wget https://repo.radeon.com/amdgpu-install/latest/ubuntu/jammy/amdgpu-install_6.0.60000-1_all.deb
sudo apt install ./amdgpu-install_6.0.60000-1_all.deb
sudo amdgpu-install --usecase=rocm
```

Intel Arc (oneAPI)

Requirements:

- Intel oneAPI Base Toolkit
- Intel Arc A-series GPU (A770, A750, A380)

```
# Install oneAPI
wget -O- https://apt.repos.intel.com/intel-gpg-keys/GPG-PUB-KEY-INTEL-SW-PRODUCTS.PUB | sudo gpg --dearmor -o /usr/share/keyrings/intel-oneapi-archive-keyring.gpg
echo "deb [signed-by=/usr/share/keyrings/intel-oneapi-archive-keyring.gpg] https://apt.repos.intel.com/oneapi all main" | sudo tee /etc/apt/sources.list.d/intel-oneapi.list
sudo apt update && sudo apt install intel-basekit
```

⚙ Configuration

Configuration is stored at `/etc/modelgrid/config.json`:

```
{
  "version": "1.0",
  "api": {
    "port": 8080,
    "host": "0.0.0.0",
    "apiKeys": ["sk-your-api-key-here"],
```

```
    "cors": false,
    "corsOrigins": ["*"],
    "rateLimit": 60
  },
  "docker": {
    "networkName": "modelgrid",
    "runtime": "docker",
    "socketPath": "/var/run/docker.sock"
  },
  "gpus": {
    "autoDetect": true,
    "assignments": {}
  },
  "containers": [
    {
      "id": "ollama-1",
      "type": "ollama",
      "name": "Primary Ollama",
      "image": "ollama/ollama:latest",
      "gpuIds": ["nvidia-0"],
      "port": 11434,
      "models": [],
      "env": {},
      "volumes": []
    }
  ],
  "models": {
    "greenlistUrl":
"https://code.foss.global/modelgrid.com/model_lists/raw/branch/main/greenlit.json",
    "autoPull": true,
    "defaultContainer": "ollama",
    "autoLoad": ["llama3:8b"]
  },
  "checkInterval": 30000
}
```

Configuration Options

Option	Description	Default
`api.port`	API server port	`8080`
`api.host`	Bind address	`0.0.0.0`
`api.apiKeys`	Valid API keys	`[]`
`api.rateLimit`	Requests per minute	`60`
`docker.runtime`	Container runtime	`docker`
`gpus.autoDetect`	Auto-detect GPUs	`true`
`models.autoPull`	Auto-pull greenlit models	`true`
`models.autoLoad`	Models to preload on start	`[]`
`checkInterval`	Health check interval (ms)	`30000`

□□ Greenlit Models

ModelGrid uses a **greenlist system** for security. Only pre-approved models can be auto-pulled, preventing arbitrary downloads.

Default greenlist includes:

- `llama3.2:1b` (4GB VRAM)
- `llama3.2:3b` (6GB VRAM)
- `llama3:8b` (8GB VRAM)
- `mistral:7b` (8GB VRAM)
- `codellama:7b` (8GB VRAM)

Custom greenlist:

```
// greenlit.json
{
  "version": "1.0",
  "lastUpdated": "2026-01-30",
  "models": [
    { "name": "llama3:8b", "container": "ollama", "minVram": 8 },
    { "name": "llama3:70b", "container": "vllm", "minVram": 48 },
    { "name": "mistral:7b-instruct", "container": "ollama", "minVram": 8 }
  ]
}
```

Configure with:

```
{
  "models": {
    "greenlistUrl": "https://your-server.com/greenlit.json"
  }
}
```

□□ Development

Building from Source

```
# Clone repository
git clone https://code.foss.global/modelgrid.com/modelgrid.git
cd modelgrid

# Run directly with Deno
deno run --allow-all mod.ts help

# Run tests
deno task test

# Type check
deno task check

# Compile for current platform
deno compile --allow-all --output modelgrid mod.ts

# Compile for all platforms
deno task compile
```

Project Structure

```
modelgrid/
├── mod.ts                    # Deno entry point
├── ts/
│   ├── cli.ts                # CLI command routing
```

```
│   ├── modelgrid.ts          # Main coordinator class
│   ├── daemon.ts             # Background daemon process
│   ├── systemd.ts            # Systemd service integration
│   ├── constants.ts          # Configuration constants
│   ├── logger.ts             # Logging utilities
│   ├── interfaces/           # TypeScript interfaces
│   ├── hardware/             # GPU detection (NVIDIA/AMD/Intel)
│   ├── drivers/              # Driver management
│   ├── docker/               # Docker management
│   ├── containers/           # Container orchestration
│   │   ├── ollama.ts         # Ollama implementation
│   │   ├── vllm.ts           # vLLM implementation
│   │   └── tgi.ts            # TGI implementation
│   ├── api/                  # OpenAI-compatible API
│   │   ├── server.ts         # HTTP server
│   │   ├── router.ts         # Request routing
│   │   └── handlers/         # Endpoint handlers
│   ├── models/               # Model management
│   └── cli/                  # CLI handlers
├── test/                     # Test files
├── scripts/                  # Build scripts
└── bin/                      # npm wrapper
```

□□ Uninstallation

```
# Stop and remove service
sudo modelgrid service disable

# Uninstall via script
sudo modelgrid uninstall

# Or manual removal
sudo rm /usr/local/bin/modelgrid
sudo rm -rf /etc/modelgrid
sudo rm -rf /opt/modelgrid
sudo rm /etc/systemd/system/modelgrid.service
sudo systemctl daemon-reload
```

Resources

- **Repository:** https://code.foss.global/modelgrid.com/modelgrid
- **Issues:** https://community.foss.global/
- **Releases:** https://code.foss.global/modelgrid.com/modelgrid/releases

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