

# readme.md for @serve.zone/spark

“ A powerful Deno-powered server management tool for the modern infrastructure

Spark is a comprehensive tool for maintaining and configuring servers at the OS level, with deep Docker integration and advanced task scheduling capabilities. Built for the serve.zone infrastructure, Spark serves as the backbone for [@serve.zone/cloudly](#) cluster management, handling everything from daemon orchestration to container lifecycle management.

## ▣ Features

- **▣ Standalone Binary** - No runtime dependencies, just download and run
- **▣ Docker Integration** - Native support for Docker services, stacks, secrets, and networks
- **⚙️ Daemon Management** - Systemd integration for reliable service operation
- **▣ Task Scheduling** - Cron-like task scheduling for automation
- **▣ Auto-Updates** - Self-updating capabilities for zero-downtime deployments
- **▣ Secure Secrets** - Docker secrets management for sensitive data
- **▣ Comprehensive Logging** - Built-in logging with multiple severity levels
- **▣ Mode Support** - Cloudly and CoreFlow node operation modes

## ▣ Installation

### Quick Install (Recommended)

Install the latest version via our installation script:

```
curl -sSL https://code.foss.global/serve.zone/spark/raw/branch/master/install.sh | sudo bash
```

# npm Install

Install via npm (automatically downloads the correct binary for your platform):

```
npm install -g @serve.zone/spark
```

## Specific Version




```
curl -sSL https://code.foss.global/serve.zone/spark/raw/branch/master/install.sh | sudo bash -  
s -- --version v1.2.4
```

## Manual Installation

Download the binary for your platform from the [releases page](#) and make it executable:

```
# Example for Linux x64  
wget https://code.foss.global/serve.zone/spark/releases/download/v1.2.4/spark-linux-x64  
chmod +x spark-linux-x64  
sudo mv spark-linux-x64 /usr/local/bin/spark
```

## Supported Platforms

-  Linux (x86\_64, ARM64)
-  macOS (Intel, Apple Silicon)
-  Windows (x86\_64)

## Quick Start

## Install as System Daemon

Set up Spark to run as a systemd service:

```
sudo spark installdaemon
```

This command:

- Creates a systemd service unit
- Enables automatic startup on boot
- Starts the Spark daemon immediately

## Configure Operation Mode

Spark supports different operation modes for various use cases:

```
# For Cloudly cluster management
sudo spark asdaemon --mode cloudly

# For CoreFlow node management
sudo spark asdaemon --mode coreflow-node
```

## View Logs

Monitor Spark daemon activity in real-time:

```
sudo spark logs
```

## ☐ CLI Reference

### Core Commands

```
spark installdaemon
```

Installs Spark as a system daemon service. This sets up a systemd unit that automatically starts on boot.

```
sudo spark installdaemon
```

```
spark updatedaemon
```

Updates the daemon service configuration to the current Spark version.

```
sudo spark updatedaemon
```

```
spark asdaemon [--mode MODE]
```

Runs Spark in daemon mode. Requires a mode to be specified (either via `--mode` flag or from saved configuration).

```
sudo spark asdaemon --mode cloudly
```

#### Available modes:

- `cloudly` - Manages Cloudly services
- `coreflow-node` - Manages CoreFlow node services

### spark logs

Displays real-time logs from the Spark daemon service.

```
sudo spark logs
```

### spark prune

Performs a complete cleanup of Docker resources and restarts services. Use with caution!

```
sudo spark prune
```

This command:

1. Stops the Spark daemon
2. Removes all Docker stacks
3. Removes all Docker services
4. Removes all Docker secrets
5. Removes specified Docker networks
6. Prunes the Docker system
7. Restarts Docker
8. Restarts the Spark daemon

## Advanced Usage

### Check Version

```
spark --version
```

### Get Help

```
spark help
```

# Programmatic Usage

While Spark is primarily designed as a CLI tool and daemon, you can also use it as a library in your Deno projects.

## Import from Deno

```
import { Spark } from 'https://code.foss.global/serve.zone/spark/raw/branch/master/mod.ts';
```

## Basic Usage

```
import { Spark } from './mod.ts';

// Create a Spark instance
const spark = new Spark();

// Start the daemon programmatically
await spark.daemonStart();
```

## Task Scheduling

Schedule automated tasks using the built-in task manager:

```
import { Spark } from './mod.ts';

const spark = new Spark();

// Define a custom task
const backupTask = {
  name: 'daily-backup',
  taskFunction: async () => {
    console.log('Running backup...');
    // Your backup logic here
  },
};
```

```
// Schedule it to run daily at 2 AM
spark.sparkTaskManager.taskmanager.addAndScheduleTask(
  backupTask,
  '0 2 * * *'
);
```

## Service Management

Manage Docker services programmatically:

```
import { Spark } from './mod.ts';

const spark = new Spark();

// Add a service to manage
spark.sparkUpdateManager.services.push({
  name: 'my-app',
  image: 'code.foss.global/myorg/myapp',
  url: 'myapp',
  environment: 'production',
  port: '3000',
  secretJson: {
    API_KEY: 'secret-value',
    DATABASE_URL: 'postgresql://...',
  },
});

// Start managing services
await spark.sparkUpdateManager.start();
```

## Configuration Management

Access and modify Spark's configuration:

```
import { Spark } from './mod.ts';

const spark = new Spark();
```

```
// Write configuration
await spark.sparkConfig.kvStore.writeKey('mode', 'cloudly');

// Read configuration
const mode = await spark.sparkConfig.kvStore.readKey('mode');
console.log(`Current mode: ${mode}`);
```

## Logging

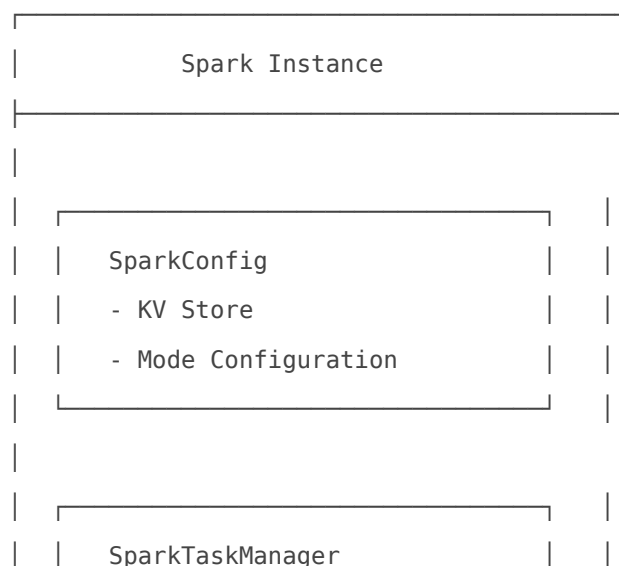
Use Spark's built-in logger for consistent logging:

```
import { logger } from './ts/spark.logging.ts';

// Log at different levels
logger.log('info', 'Application starting...');
logger.log('ok', 'Service deployed successfully');
logger.log('warn', 'High memory usage detected');
logger.log('error', 'Failed to connect to database');
logger.log('success', 'Backup completed');
```

## Architecture

### Core Components



- Cron Scheduling

- Task Execution

SparkServicesManager

- Docker Integration

- Service Updates

- Secret Management

SmartDaemon

- Systemd Integration

- Service Lifecycle

## Key Classes

- **Spark** - Main orchestrator class that coordinates all components
- **SparkConfig** - Handles configuration storage and retrieval
- **SparkTaskManager** - Manages scheduled tasks and automation
- **SparkServicesManager** - Manages Docker services and updates
- **SparkInfo** - Provides project and version information

## Update Management

Spark includes self-updating capabilities:

```
import { Spark } from './mod.ts';

const spark = new Spark();

// Check for and apply updates
await spark.sparkUpdateManager.updateServices();
```

The update manager:

- Pulls latest Docker images
- Manages service rollouts
- Handles zero-downtime deployments
- Manages Docker secrets securely

## ☐ Docker Integration

### Service Definition

```
const serviceDefinition = {
  name: 'api-server',
  image: 'code.foss.global/myorg/api',
  url: 'api',
  environment: 'production',
  port: '8080',
  secretJson: {
    JWT_SECRET: 'your-jwt-secret',
    DB_PASSWORD: 'your-db-password',
  },
};

spark.sparkUpdateManager.services.push(serviceDefinition);
```

## Stack Management

Spark manages Docker stacks for complex multi-service deployments:

```
# View running stacks
docker stack ls

# Spark manages these automatically
```

## ☐ Development

# Prerequisites

- [Deno](#) v2.x or later

## Running from Source

```
# Clone the repository
git clone https://code.foss.global/serve.zone/spark.git
cd spark

# Run directly
deno run --allow-all mod.ts

# Run tests
deno test --allow-all test/

# Type check
deno check mod.ts

# Format code
deno fmt

# Lint
deno lint
```

## Building Binaries

Compile for all supported platforms:

```
bash scripts/compile-all.sh
```

Binaries will be output to `dist/binaries/`.

## Compile for Specific Platform

```
# Linux x64
deno compile --allow-all --output spark-linux-x64 --target x86_64-unknown-linux-gnu mod.ts

# macOS ARM64
deno compile --allow-all --output spark-macos-arm64 --target aarch64-apple-darwin mod.ts
```

# ☐ Security

## Permissions

Spark requires the following Deno permissions:

- `--allow-net` - API communication, Docker socket access
- `--allow-read` - Configuration files, project files
- `--allow-write` - Logs, configuration updates
- `--allow-run` - `systemctl`, Docker commands
- `--allow-env` - Environment variables
- `--allow-sys` - System information

## Secrets Management

Always use Docker secrets for sensitive data:

```
const serviceWithSecrets = {
  name: 'secure-app',
  image: 'myapp:latest',
  secretJson: {
    API_KEY: Deno.env.get('API_KEY')!,
    DB_PASSWORD: Deno.env.get('DB_PASSWORD')!,
  },
};
```

# ☐ Troubleshooting

## Service Won't Start

Check the daemon status:

```
sudo systemctl status smartdaemon_spark
```

View recent logs:

```
sudo journalctl -u smartdaemon_spark -n 100
```

## Docker Issues

Verify Docker is running:

```
sudo systemctl status docker
```

Check Docker socket permissions:

```
sudo ls -la /var/run/docker.sock
```

## Configuration Issues

Check current mode:

```
# Run spark programmatically
deno run --allow-all -e "
import { Spark } from './mod.ts';
const s = new Spark();
const mode = await s.sparkConfig.kvStore.readKey('mode');
console.log('Mode:', mode);
"
```

## Examples

### Automated System Maintenance

```
import { Spark } from './mod.ts';
```

```
const spark = new Spark();

// Schedule weekly system updates
const updateTask = {
  name: 'system-update',
  taskFunction: async () => {
    const shell = new Deno.Command('bash', {
      args: ['-c', 'apt-get update && apt-get upgrade -y'],
    });
    await shell.output();
  },
};

// Every Sunday at 3 AM
spark.sparkTaskManager.taskmanager.addAndScheduleTask(
  updateTask,
  '0 3 * * 0'
);

await spark.daemonStart();
```

## Multi-Service Deployment

```
import { Spark } from './mod.ts';

const spark = new Spark();

// Add multiple services
const services = [
  {
    name: 'frontend',
    image: 'code.foss.global/myorg/frontend',
    url: 'frontend',
    port: '80',
    environment: 'production',
  },
  {
    name: 'backend',
```

```
image: 'code.foss.global/myorg/backend',
url: 'backend',
port: '3000',
environment: 'production',
secretJson: {
  DATABASE_URL: Deno.env.get('DATABASE_URL')!,
},
},
{
  name: 'worker',
  image: 'code.foss.global/myorg/worker',
  url: 'worker',
  environment: 'production',
},
];

services.forEach(svc => spark.sparkUpdateManager.services.push(svc));

await spark.daemonStart();
```

## Support

For issues, questions, or contributions:

- [Report Issues](#)
- [View Source](#)

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