HiPAS GridLAB-D

EPC-17-046 - Final Production Release

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Overview

Open-Source Distribution and Resources

- GitHub
- CI/CD
- Docker
- AWS Cloud
- Online documentation
- Tutorials

Packages, Services, and Utilities

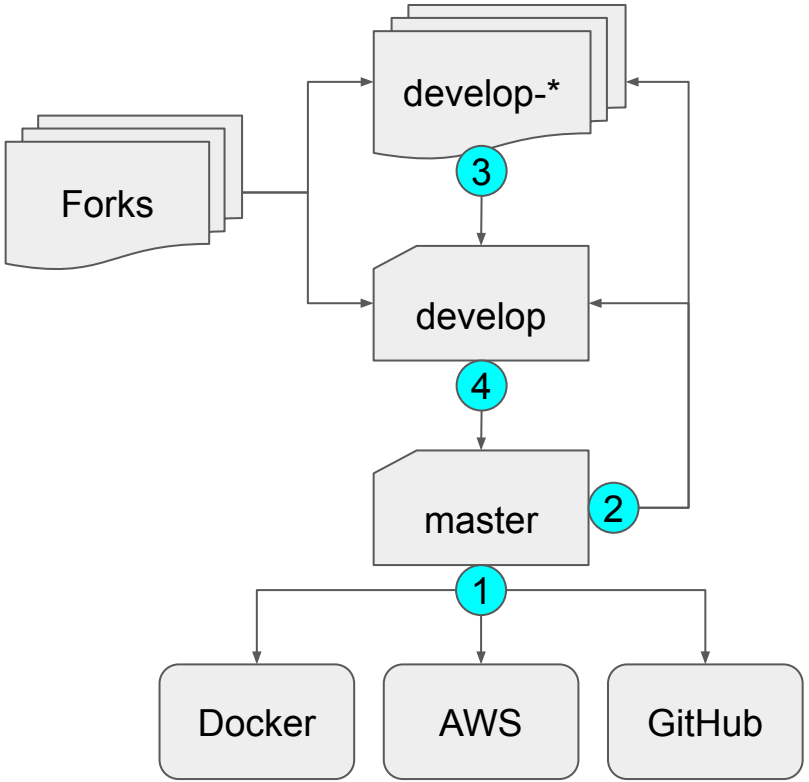
- Converters
- Geodata
- Modules
- Python
- Runtime
- Subcommands
- Tools

GitHub Repositories

arras/gridlabd	Source code and build system for simulation and support packages
arras/gridlabd-template	Analysis templates, e.g., for ICA, tariff design, electrification, and resilience analysis
arras/gridlabd-utilities	General purpose utilities for working with GridLAB-D models and data
arras/gridlabd-docker	Support infrastructure for creating and maintaining Docker base images
arras/gridlabd-project	Template for creating GridLAB-D projects in GitHub that use CI/CD automatically
arras/gridlabd-models	Sample models for use in GridLAB-D projects, validation testing, and tutorials
arras/gridlabd-library	Object libraries for distribution system assets, e.g., cables, transformers, regulators
arras/gridlabd-weather	Weather data repository
arras/gridlabd-examples	Example models and support code for various types of studies
arras/gridlabd-benchmarks	Benchmark models for GridLAB-D performance tests
arras/gridlabd-converters	Supplementary converter repository

Continuous Integration and Continuous Delivery

1. Master branch validated and deployed
2. Development branches updated
3. Development branches validated
4. Main development branch deployed



Docker

Primary docker organization "arras".

Image naming convention:

- arras/gridlabd:latest
- arras/gridlabd:develop
- arras/gridlabd:YYMMDD

AWS Cloud

Main AWS account is "arras" with IAM logins.

AMI naming convention:

arras-gridlabd-<VERSION>-<BRANCH>-<SYSTEM>-<ARCH>

<VERSION>, e.g., "4.3.1"

<BRANCH>, e.g., "master", "develop"

<SYSTEM>, e.g., "LINUX"

<ARCH>, e.g., "x86_64"

Online documentation

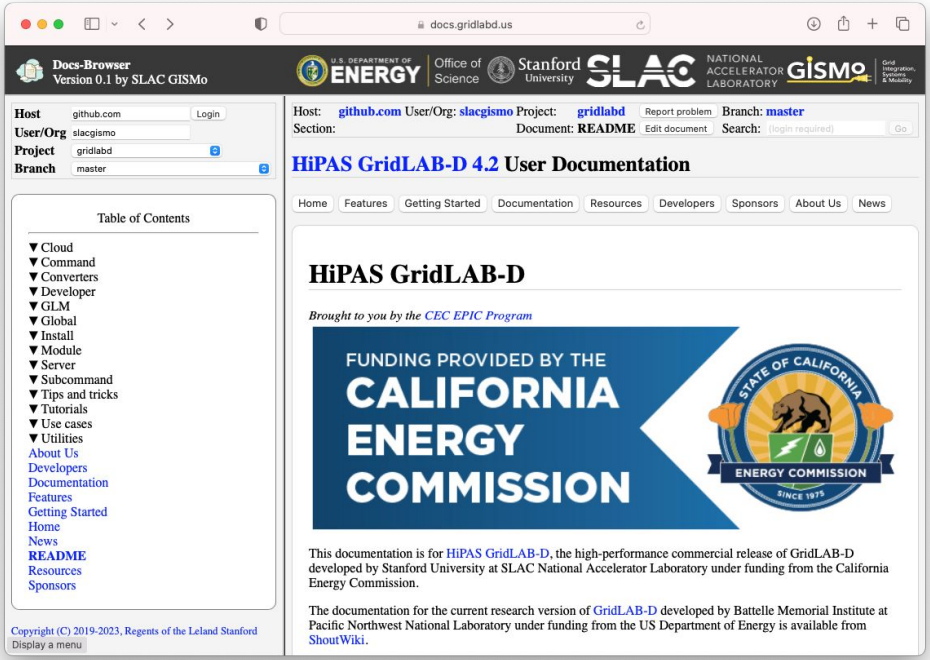
Delivered at https://docs.gridlabd.us/

Main page:

- About GridLAB-D
- Developers
- Documentation
- Features
- Getting Started
- Home
- News
- Resources
- Sponsors

Sections:

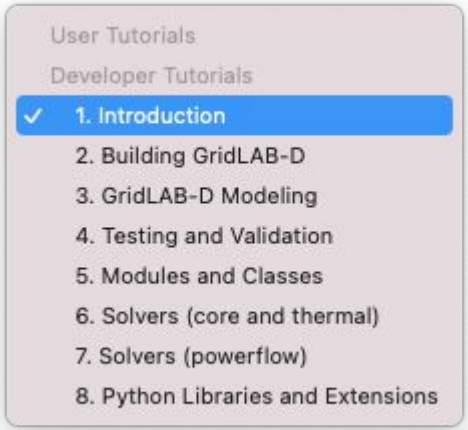
- Cloud
- Command
- Converters
- Developer
- GLM
- Global
- Install
- Module
- Server
- Subcommand
- Tips and Tricks
- Use Cases
- Utilities

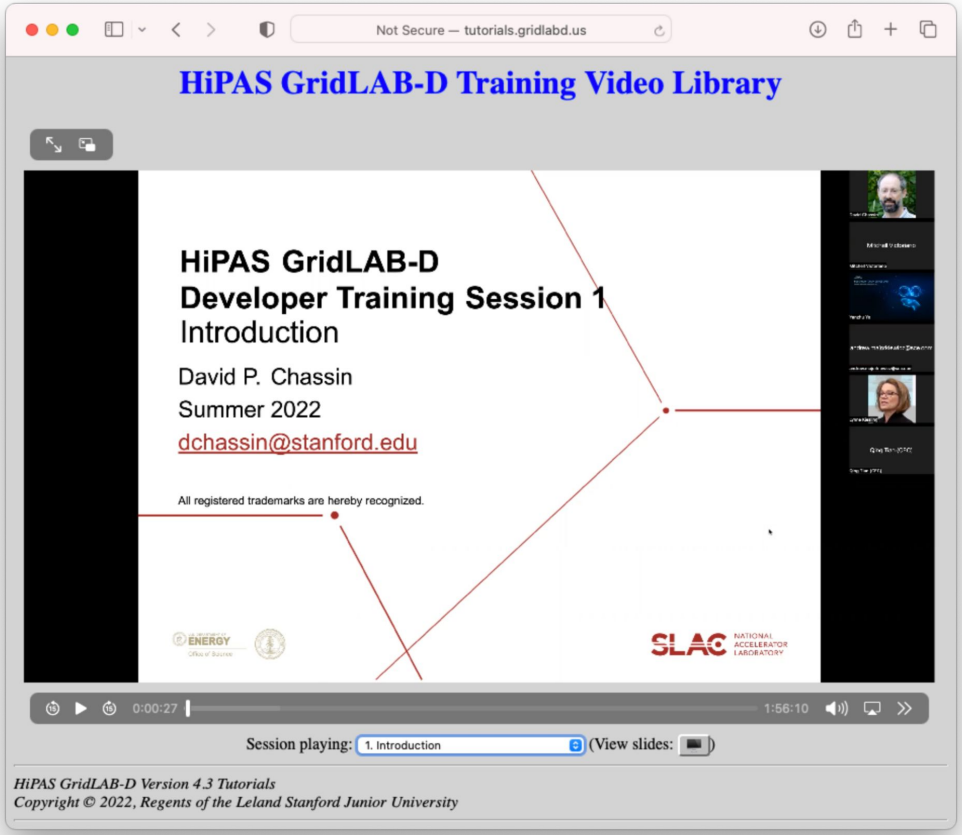


Tutorials

Online https://tutorials.gridlabd.us/

Topics:





Converters

Convert file formats and file semantics

Supported formats:

- CSV
- GLM
- GZ
- JSON
- MDB
- OMD
- PNG
- PY
- TXT
- XLS
- ZIP

Supported semantics:

- AMI
- SCADA
- Weather (NOAA, NSRDB, TMY)
- Cyme (CYMDIST)
- OMF (NRECA Open Model Framework)
- GridLAB-D (objects, classes, settings)
- Python (source code, data)
- Plots (voltage profiles, network graphs)
- Pole structure (SPIDACalc)
- File archives
- Compressed data files
- EMS log files (Schneider)

Geodata

Geographic datasets

- Address resolution
- Census tract geometry
- Distance calculations
- Ground elevation
- Powerline calculations
- Utility service territory
- Vegetation
- Weather

Modules

Integrated modeling and analysis modules

- commercial buildings
- generators and inverters
- industrial loads
- market models
- powerflow analysis
- reliability analysis
- residential buildings
- resilience analysis
- revenue analysis

Integrated data and support modules

- assert (data validation)
- climate data
- connection for co-simulation
- influxdb databases
- mysql databases
- optimizer (goal seeker)
- tape (play, collect, and record data)
- tariff database (NREL OpenEI)
- transactive energy system support

Python

Modules, packages, and libraries to use Python with GridLAB-D

- GridLAB-D package (pip installer)
  - Load, run, and interact with gridlabd simulations in python code
- GridLAB-D library (pip installer)
  - Modify gridlabd models in python code
  - Access subcommands, converters, geodata, and tools from python code
- GridLAB-D module (gridlabd installer)
  - Run python code in gridlabd simulations
  - Pre/post-process data in gridlabd simulations

Runtime resources

Runtime files support simulation while they are loading and running

- Timezone support
  - All known timezones worldwide since 1970
- Unit support
  - All SI units
  - Many widely recognized/commonly uses non-standard units
  - Some emerging/new/convenience units
- Server support
  - Icons for powerflow objects
  - Dynamic KML output
  - Live HTML support (javascript)

Subcommands

Manage simulation environment

- Assert (data validation)
- AWS (cloud manager)
- Check (model validation)
- Compare (model diff)
- Contributors (credit to authors)
- Convert (data converters)
- Geodata (GIS access)
- Git (version control)
- Help (access to subcommand/tool help)
- Job (multitasking control)
- Json-get (JSON data access)
- Library (manage object libraries)
- Lock (simulation lock manager)
- Manual (branch documentation manager)
- Matrix (linear algebra support)
- Openfido (OpenFIDO CLI)
- Pandas (panel data manager)
- Plot (plotting tools)
- Python (GridLAB-D python access)
- Require (GridLAB-D python manager)
- Requirements (GridLAB-D python info)
- Template (analysis template manager)
- Timezone (timezone resolution)
- Trace (exception traceback/debugger)
- Validation (GridLAB-D validation)
- Version (GridLAB-D version manager)
- Weather (weather data manager)

Tools

Manage GridLAB-D data and models

- Create filter (generate a GridLAB-D filter from CSV data)
- Create player (generate a player object from CSV data)
- Create poles (generate pole models for a network)
- EIA RECS data loader (access EIA residential load data)
- Fit filter (generate a GridLAB-D filter from AMI data)
- Insights (download GridLAB-D usage statistics)
- Market data (download market data from ISO)
- Market model (generate a wholesale market model from ISO data)
- MDB info (extract data from an MDB file, e.g., CYME)
- METAR to GLM (get real-time weather data from FAA)
- NOAA forecast (get a weather forecast from NOAA)
- NSRDB weather (get historical weather from NREL Solar Radiation Database)
- UCAR weather (get real-time weather data from UCAR)

Contact

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