Open DC Grid Working Group

open-dc-grid.org Kickoff Meeting

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Agenda

- Introductions
- Review/refine objectives
- Compare/contrast with existing standards
- Deliverables
- Organization
- Feedback / introductions 2

Introductions

* Jim Gula
  * Retired engineer with technical background in communications software – managed hardware, software, mechanical at Intel, Western Digital, etc.
  * Got interested off-grid in connection with emergency preparedness, lead author IEEE P2030.10
* Martin Jäger
  * Founder of Libre Solar project, developing open source hardware for energy access
  * Background of several years in automotive battery development, incl. 48V systems

Working Group?
Why not IEEE, ISO, IEC etc?

* Open source model
  * Technical knowledge can be for everyone – it's not property
  * Private individuals trying to make a difference
  * No hidden or commercial agenda
* Particularly important for developing world
  * Highly fragmented market
  * Small companies with limited resources
  * Encourage entrepreneurship on a shoestring
* Parallel development and definition
  * Standardize what works – not our biases
  * "Standard" is not done until working systems demonstrated
  * Starting platform for businesses – making money is OK

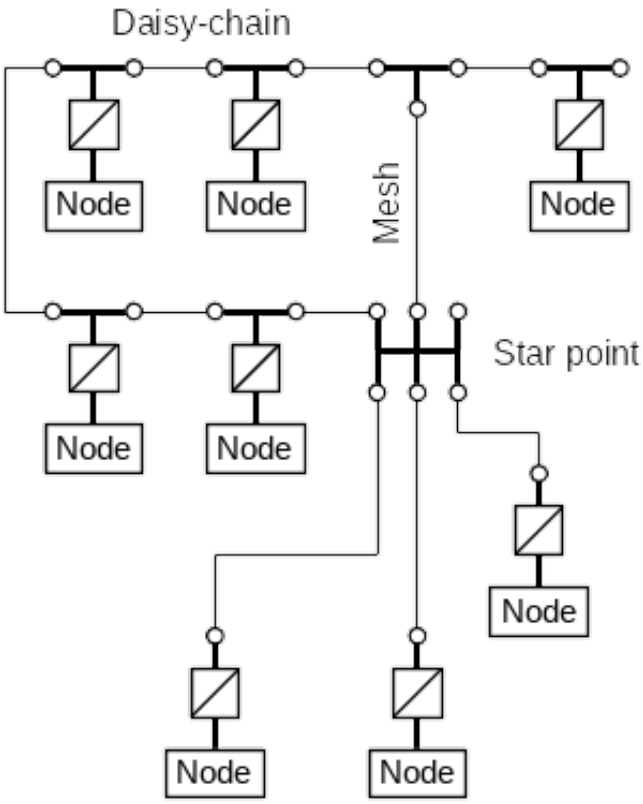
High Level Objectives
Improving Lives with Electricity

* Reduce costs of off-grid / weak-grid electricity
* Improve flexibility / extendibility of SHS's
* Simplify implementation and use of off-grid power

Non-Objectives

* Replace AC with DC
* Universal DC plug
* Complete, sellable SHS
* Grids > 10kW

Objectives – Target Architecture



Power Line
DC Bus
Nanogrid Port
Voltage Converter

Node can be SHS, battery, Appliance, PV module, grid connection, etc.

Technical Objectives
Interoperable Devices

* Electrical
  * Define voltage, current, power quality etc – 48V? ISO 21780?
  * Characterize stability criteria for DC-DC converters
  * Safety limits and requirements
* Functional
  * Droop curves for power sharing
  * Protocols for power arbitrage
  * Protocols for monitoring, operations and maintenance
  * Low level protocols to support PAYGO – not UI
* Communications
  * Inexpensive, reliable, simple physical layer / layers
  * Mapping to existing Internet protocols

Compare / Contrast Existing Standards

* IEEE P2030.X, 1547
* IEC Seg 6 microgrids, Seg 4 LVDC, 62898
* ISO 21780
* USB / Ethernet
* Efficiency for Access Roadmap

Deliverables
All Open Source

* Formal version-controlled standard for interoperability
  * Freely available online and printable
  * Licensed under Creative Commons license
* Hardware schematics for key components
  * Assembled prototype boards available for testing
* Embedded software for communications and control
* Demo software for remote management
* Interoperability test procedures

Organization - TBD

* Based on typical open-source software project
  * Contributors submit content via GitHub pull requests
* Potentially – non profit corporation with board
* Use of trademark licensing to assure compatibility

Feedback – Introductions 2

* Name / Organization
  * Feel free to just say self as your affiliation
* Is this project of interest?
* What could we do to make it more interesting?

Next Meeting

- Next Meeting:
  - 11 February 2020
  - FreeConferenceCall.com meeting ID: jlgula
- Sharing Portals
  - Web site: https://open-dc-grid.org/
  - GitHub: https://github.com/open-dc-grid