



Connected Grid Design Suite-Substation Workbench Release 1.0: Frequently Asked Questions (FAQ)

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Introduction

This document answers frequently asked questions (FAQs) about the Connected Grid Design Suite – Substation Workbench Release 1.0.

General Overview

Q. What is the Connected Grid Design Suite (CGDS) – Substation Workbench, and why is it needed?

A- In today's global energy industry, utilities require cost-effective, time-efficient rollout of substation and operational communications networks. With growing investment in grid modernization, new solutions are needed to help engineers implement communication capabilities, assure compliance with rapidly changing regulatory standards, and plan for future needs.

Cisco® has created the Connected Grid Design Suite (CGDS) to support electrical and operational engineers as they develop, model, and test distributed communications networks capable of enabling next-generation use cases today. The CGDS Design Suite helps utilities to both implement new automated substations and maintain and retrofit existing facilities.

Utilities gain:

- Acceleration of grid modernization initiatives
- Improved reliability, security, and compliance
- Less training required for field personnel
- Lower deployment and ongoing maintenance costs
- Faster project execution

Q. What are some of the challenges of automating communications for operational networks?

A. Today's utilities are witnessing an explosion of IP-enabled devices within the substation. These facilitate large-scale automation projects. The use of IP provides scale, security, and manageability at a reduced cost, replacing a variety of application-centric networks and labor-intensive proprietary solutions. At the same time, deploying smart grid communications networks requires a new skill set, and utility operations teams rarely have IT experts on staff.

Substations generally encompass a variety of equipment and intelligent electronic devices (IEDs) from numerous vendors. Although each vendor solution provides software for managing its own devices, there has not been a good solution for managing configuration and design across a wide range of IEDs and IP-enabled devices, such as switches and routers. As a result, these proprietary solutions require time and effort to manage and frequently more customization than standards-based solutions. This can lead to reduced reliability and increased risk. The utility must remain compliant with both current and emerging regulatory, security, and corporate requirements.

A critical challenge for engineers is that it can be difficult to visualize the communications network in relation to the automated substation, to assure that IEDs remain connected and communicating with each other securely and as expected. Engineers are also challenged to identify where IP-enabled devices connect to the substation network, to understand how these devices may impact network reliability and throughput, and to identify their purpose.

Q. How does the Connected Grid Design Suite solution help utilities reduce the complexity of integrating new technologies?

For years, substation engineers and control center engineers have had to deal with the lack of a harmonized and standardized information model to support substation design, modeling, and visualization. Control center systems and substation systems have followed different standards for a long time:

- Control center Energy Management Systems (EMS) and Distribution Management Systems (DMS) follow IEC 61970, which is the CIM Model.
- Smart substations follow the IEC 61850 standard.

Using different standards has created confusion and some obstacles to exchanging information in a unified fashion.

Realizing that this bifurcation of model standards has had a negative impact on grid modernization projects as well as standards adoption, IEC working groups have made harmonizing IEC 61850 and IEC 61970 a key focus. With harmonization:

- Substation primary devices will follow the harmonized IEC61970/61960 CIM model
- Protection and control systems will have built-in association from the IEC61850 Model
- A network communication model will facilitate data exchange.

Together these form what Cisco calls the “integrated system model” for the smart substation. This model contains all information to be used by the control center EMS/DMS, Substation Design and Engineering solution, and network management system for substation design and configuration. This model harmonizes substation one-line diagrams and substation configuration, feeding IED information into the CIM model, etc.

The extension of the CIM model also describes the communication channel between substations and control centers, the communication channel profile, and its communication protocol. The CGDS - Substation Workbench provides patented visualization of this harmonized system model, greatly simplifying visualization, modeling and design, configuration, and testing and operations.

Technical Overview

Q. Does the CGDS require the use of IEC 61850 within the substation?

A. Release 1.0 of the CGDS Substation Workbench leverages the capabilities of 61850 to build the integrated system model internally and is most adept at modeling for 61850 substations. Additional protocols, such as DNP, are on the roadmap and planned for 2H CY2013.

Environment and Qualifications

Q. In what environment does the CGDS Substation Workbench operate?

A. The CGDS - Substation Workbench Release 1.0 operates in a substation, test bed, or laboratory environment.

Q. Does the CGDS require the use of Cisco routers and switches?

A. The CGDS solution uses a vendor-agnostic, standards-based approach to modeling, telecommunications design, and configuration. As a result, the CGDS builds standards-based XML configuration templates that can be pushed to any router or switch. As long as the router or switch manufacturer offers an interface capable of accepting the standardized XML template, the CGDS can provide configuration assistance.

Q. On what hardware platforms has the Connected Grid Design Suite (CGDS) been validated?

A. To date, Cisco has certified two server appliance platforms for use with the CGDS - Substation Workbench. One of these is a hardened substation platform (IEC 61850 and IEEE 1613 compliant), the other is a non-hardened platform that is optimized for running multiple applications as a co-tenant to the CGDS software.

Other customer selected platforms may also be viable options should they meet the minimum server specifications. Appliances can also be built manually for limited deployments and proofs-of-concept. For more details, contact the CGDS product management group at ask-cgds@cisco.com.

Ordering

Q. When will Cisco Connected Grid Design Suite (CGDS) be available?

A. The first software module of the Cisco Connected Grid Design Suite (CGDS), the Substation Workbench, will be available for order in March 2013. Find more detail about the Substation Workbench at <http://www.youtube.com/watch?v=Te26gTaNukQ>

Q. What are the part numbers for Cisco Connected Grid Design Suite (CGDS) – Substation Workbench?

A. For ordering information, please refer to the Cisco Connected Grid Design Suite (CGDS) Substation Workbench data sheet, or contact the CGDS product management group at ask-cgds@cisco.com.

Related Information:

Check these resources for more information about Cisco Connected Grid Design Suite (CGDS) – Substation Workbench:

1. Visit http://www.cisco.com/web/strategy/energy/substation_automation.html
2. View the whitepaper found at:
http://www.cisco.com/web/strategy/docs/energy/connected_grid_design_suite_overview.pdf
3. Read the case study at: http://www.cisco.com/web/strategy/docs/energy/state_grid_china_cs.pdf
4. Watch the CGDS Overview video at
<http://www.youtube.com/watch?v=49NuGMzNMUA&feature=youtu.be>
5. Watch the Substation Workbench Detailed Video at:
<http://www.youtube.com/watch?v=Te26gTaNUkQ>
6. Contact the CGDS product management group at ask-cgds@cisco.com.

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