

自动化

基于虚拟局域网的变电站综合数据流分析与通信网络仿真

张志丹,曹一家,黄小庆,何杰,杨漾

湖南大学 电气与信息工程学院, 湖南省 长沙市 410082

摘要:

根据IEC61850标准, 归纳分析了数字化变电站内的各种典型数据流, 运用明确的数学模型对其进行了详细描述, 最终得出各类报文的数据包生成图。以IEC 61850-5规定的D2-1典型变电站为例, 对其中存在的各种数据流及其流量大小进行了详细说明; 利用OPNET仿真软件, 应用优先级标签技术, 对基于虚拟局域网(virtual local area network, VLAN)的集成型变电站综合通信网络进行了仿真分析, 进一步研究了变电站通信网络中VLAN的配置方法和原则, 对有无VLAN的星型网络进行了对比研究。结果表明, VLAN技术可以较好地解决变电站中的网络资源竞争以及部分安全性问题。

关键词: 数字化变电站 IEC 61850 数据流分析 OPNET仿真 虚拟局域网

Comprehensive Data Flow Analysis and Communication Network Simulation for Virtual Local Area Network-Based Substation

ZHANG Zhidan ,CAO Yijia ,HUANG Xiaoqing ,HE Jie ,YANG Yang

College of Electrical & Information Engineering, Hunan University, Changsha 410082, Hunan Province, China

Abstract:

Based on IEC61850 standard, various typical data flows of digital substation are analyzed and generalized; by use of unambiguous mathematical model the data flows are described in detail; finally the data packet generation diagram of various messages is obtained. Taking thypical substation D2-1 specified by IEC 61850-5 for example, the detailed description of various data flows in it and their flow volumes are given; using OPNET software and applying priority based tag technology, the simulation analysis of integrated communication network for integrated substation based on virtual local area network (VLAN) is performed to further research the configuration method and the principle of VLAN in substation communication network, and the comparative study on star network with and without VLAN is carried out. Research results show that the network resource competition in substation and some security problems can be well solved by VLAN.

Keywords: digital substation IEC 61850 data flow analysis OPNET simulation virtual local area network (VLAN)

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通讯作者: 黄小庆

作者简介:

作者Email: misshuang504@126.com

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