Revitalization of SCADA system in DCV Elektro Primorska

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1. INTRODUCTION

Elektro Primorska is one out of 5 electric power distribution operators in Slovenia. From the geographical point of view, it is placed in the western part of the country supplying a little more than 123.000 buyers placed on the surface of 4335 square km with the electric energy. From the organizational point of view, it is divided into four business units: Gorica, Koper, Sežana and Tolmin. Elektro Primorska control system concept is of a centralized type having one dispatching centre placed in Gorica and interconnected with workstations in other business units.

The existing SCADA system of the power distribution network was put into operation in June, 2007. The integration of the Outage Management System (OMS) for processing of outages and planned works with the SCADA system was completed during 2008.

The upgrade of the existing SCADA system was initiated due to several reasons:

1. The server hardware manufacturer ceased to support the stated equipment in 2013 and the hardware had to be replaced following by the replacement of the software as well;
2. The SCADA application manufacturer ceased to support UNIX software platform in 2012; and
3. The SCADA software new functionalities were implemented and the existing ones were improved.

2. HW AND SW REVITALIZATION

Elektro Primorska was in charge of the purchase of new hardware. Coordinating activities with its IT Department, "Blade" version of Hewlett Packard manufacturing programme - HP BladeSystem c7000 was selected as the server solution including servers of the type HP BL460c G7. Figure 1 shows a new SCADA system block diagram.
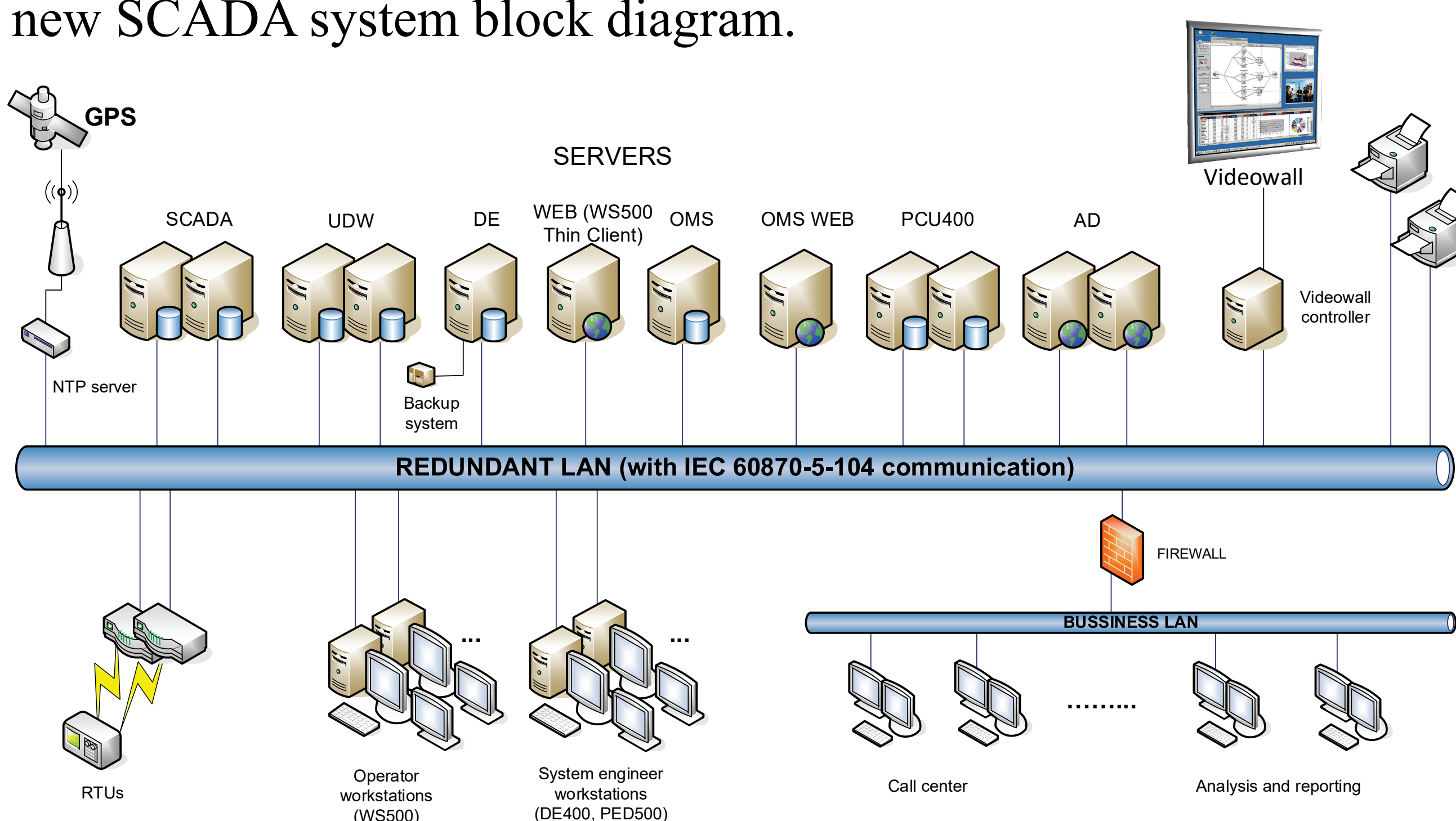

Figure 1 New Elektro Primorska SCADA system block diagram

New hardware components on which a part of the functionality of the new SCADA version software is distributed are the following ones:

- Active Directory (AD) servers – servers for the control of user accounts; and
- Process Communication Unit (PCU) 400 servers – communication so-called front-end servers.

Computer Operating Systems in the new SCADA System have been upgraded to new versions in accordance with Table I while the Data Engineering and Utility Data Warehouse databases are based on the most recent technology of Oracle Database.

Computers	OS (existing system)	OS (new system)
SCADA, UDW	True64 UNIX	Red Hat Enterprise Linux 5.6 64b
PCU400, Web, DE	Windows Server 2003	Windows Server 2008 R2 64b
Operating stations	Windows XP	Windows 7 64b Pro

Table 1 Existing and new SCADA system Operating Systems

The existing SCADA system software has been upgraded from version 2.3 to version 5.5 enabling the Employer to work with a whole range of new and enhanced functionalities:

- Colouring of events in the alarm list, as well as in the event list according to various criteria;
- Dynamic Contour Colouring (DCC) - dynamic colouring of contours in accordance with measuring levels;
- Advanced Real Time Calculation (ARTC) – a user oriented interface for defining of complex data based calculations in real time on the basis of MATLAB software package;
- Table presentations – a software module that enables users to define complex interfaces based on data in real time;
- Multilingualism,
- Significantly simplified operation with alarm and event lists (sorting, filtering, easier creation of user own lists, etc.);
- Numerous "smaller", but more important novelties (permissible manual entry without data collection blocking, possibility of configuration of alternative data sources for individual indications, etc.);
- The number of characters for EXTERNAL_IDENTITY parameter is set to 40, while it can be extended for IDENTIFICATION_TEXT up to 60.

3. COMMUNICATION CHANNELS SPLITTER

Končar developed a splitter – its in-house solution for splitting of communication channels that had the possibility of simultaneous serving both, the existing and the new SCADA systems with processing data not only for the needs of the migration (the transmission period of the simultaneous operation of the existing and the new SCADA system), but also to resolve problems in existing remote stations that did not have the possibility of simultaneous communication with more than one master centre.
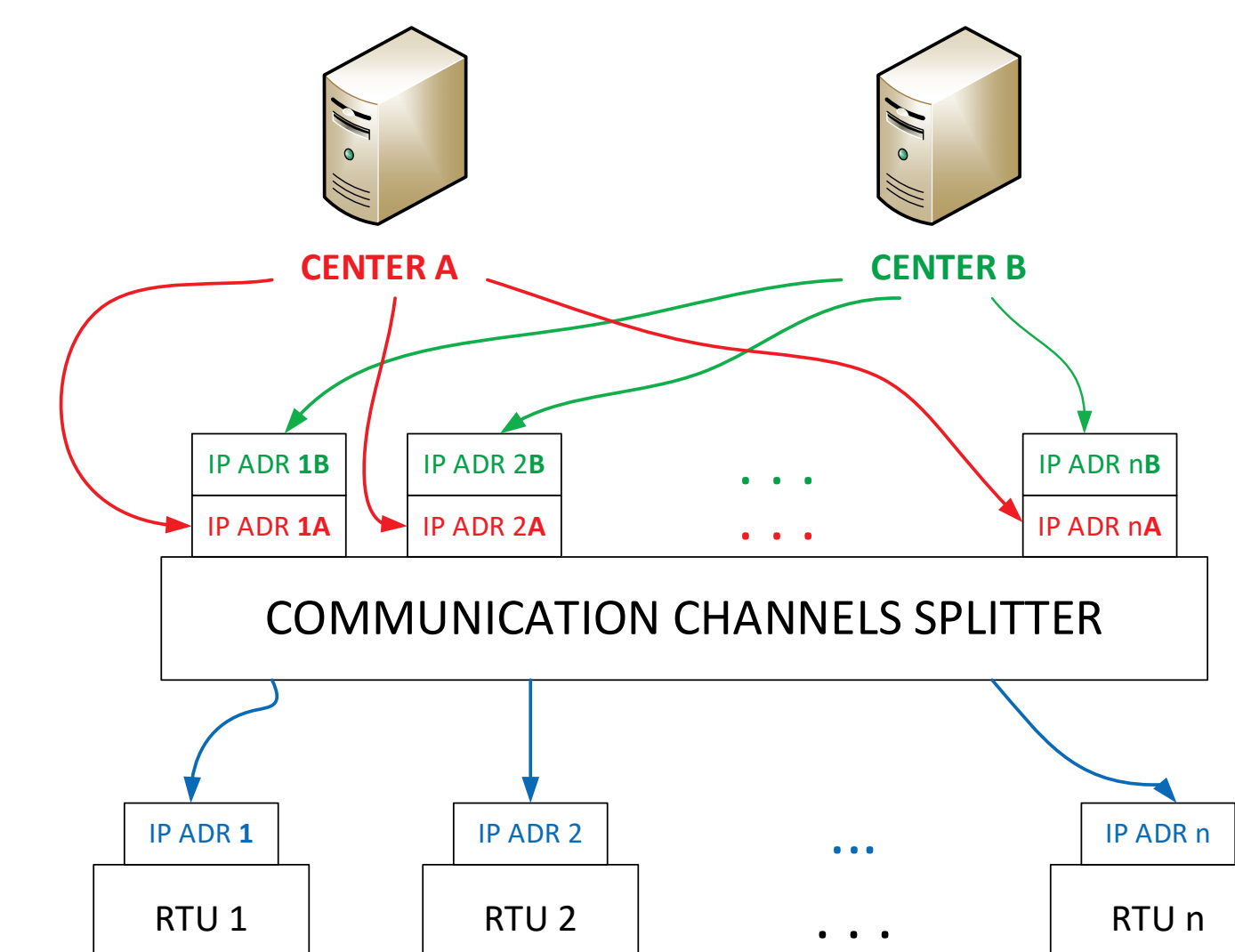

Figure 2 Communication DCs – RTUs over a splitter

4. CONCLUSION

The implemented SCADA system has resulted in an upgrade of the quality of every-day electric power network control in Elektro Primorska Distribution Area.