

Iwan Downs Presentation

by Iwan CostelloDowns

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TIME SUBMITTED	07-JAN-2020 03:42PM (UTC+0000)	WORD COUNT	356
SUBMISSION ID	117545770	CHARACTER COUNT	664

Remote Monitoring and Control of a Process Rig

Problem to solve: Update the existing process rig to IoT and industry 4.0 using web technologies.

- Enable the remote control & monitoring of the process rig system using PLC tags in http program.
- Use PLC web server for data access.
- Send and retrieve parameters from the PLC to any IP device using wireless protocols.

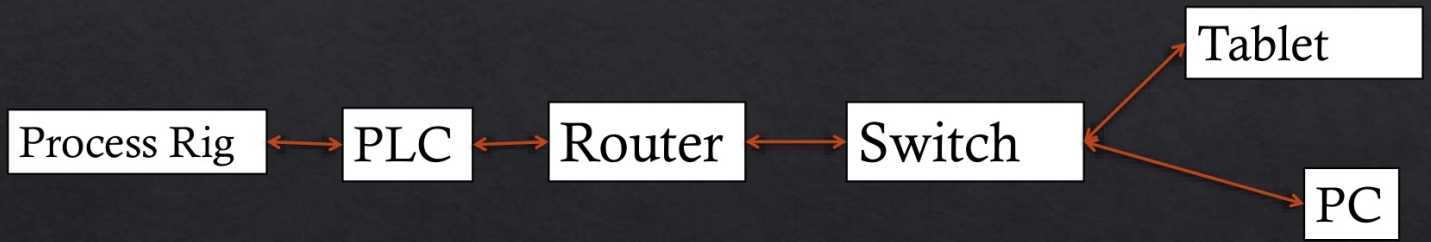


Possible Solutions

- ◇ PLC:
- ◇ Uses IP addressing set by software by the admin.
- ◇ Built in web server with open source software.

- ◇ Scada:
- ◇ Requires Licences
- ◇ Overkill for this system

Block Diagram



Hardware

24 port switch



S7 1200 PLC

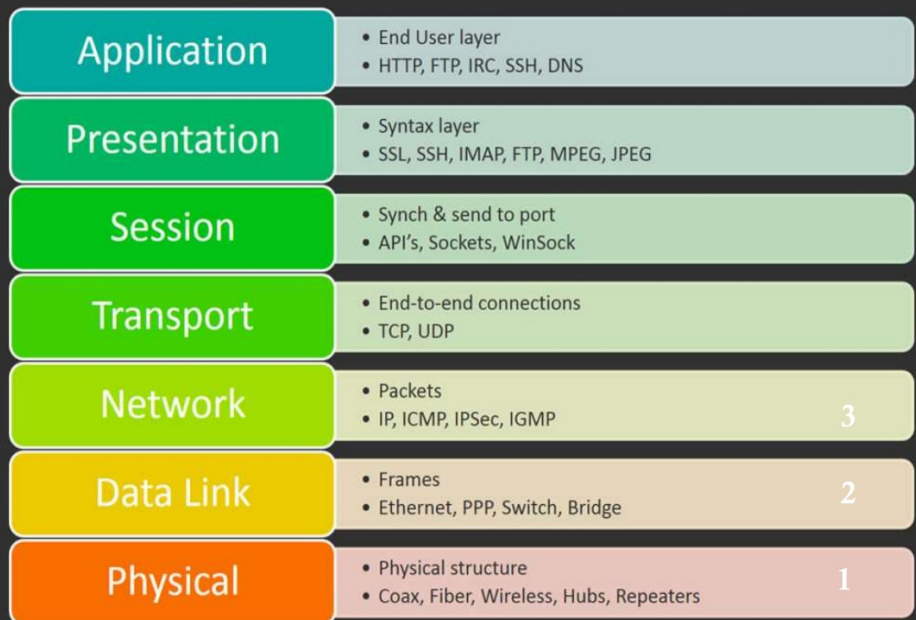


Router with ethernet port and serial ports



- The PLC is the Ethernet device with NIC card with MAC Address This is a layer 1 device
- The PC for writing the program for the PLC has a NIC card and MAC Address. This is layer 1 device
- The Cisco switch which communicates using only Mac Addresses is a layer 2 device.
- The Cisco router which communicates using ip addresses. This is a layer 3 device.

7 Layers of the OSI Model



Software

- ◇ TIA Portal
- ◇ HTML Open Source
- ◇ AJAX Open Source
- ◇ HTTP Protocol

Configuration and programming

- ◆ Industry uses VLAN networks for system separation and security. This system will use the same principle.
- ◆ VLAN will be configured using the Cisco switch and router.
- ◆ The PLC will be programmed and configured using the TIA Portal development environment.
- ◆ The Web comms will be achieved using a specific web program which will be downloaded to the PLC.
- ◆ The Web page and wireless adapter will enable remote monitoring and control using AWP commands.

Feasibility and Limitations

- ◇ There is a range of addressing schemes that can be used, but sometimes the limits are set by the network devices such as routers (e.g. BT routers have addresses from 192.168.2.1 – 192.168.2.170). There will be network limitations to consider.
- ◇ Only one Flow or Temperature will be done so project can be completed on time.

Any Questions?

Iwan Downs Presentation

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

61 /100

Instructor

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GRADING FORM: CSG-RUBIC

IWAN COSTELLODOWNS

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RESEARCH-INFORMED LITERATURE

 Background research included relevant detail with a reasonable explanation. 6/10 The depth of research was appropriate for the project at this stage with an understanding of the solutions considered.6/10 **12/20**

KNOWLEDGE AND UNDERSTANDING

 The problem was defined clearly. 3.5/5 Relevant constraints and codes of practice have been identified and the requirements have been planned as part of the project.3/5 Environmental and sustainability issues were discussed and more detail on this needs to go into the project.2.5/5 A clear understanding of functional requirements has been demonstrated with good use of a block diagram.3.5/5 Good response to questioning with full knowledge of the project requirements. 6.5/10 **19/30**

ANALYSIS

 A breakdown of the problem was delivered and key areas identified.3/5 Functional design requirements was discussed thoroughly and a clear understanding was shown.6/10 Justification of final solution was clear but a more detail on the competitive alternative would have been better for comparison.3/5 **12/20**

PRACTICAL APPLICATION AND DEP.

 Design specification was clear with a good explanation.3/5 Reasons for final solution was logical and a reasonable comparison carried out to justify the choice. 6/10 Project planning has been very well thought out .3/5 **12/20**

SKILLS FOR PROFESSIONAL PRAC.

 Quality of the slides was good and clear to read. 3/5 The presentation delivery was clear but could have had more detail included. 3/5 **6/10**