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Wireless connectivity solution for Brownfield WiBro

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Virtual Review

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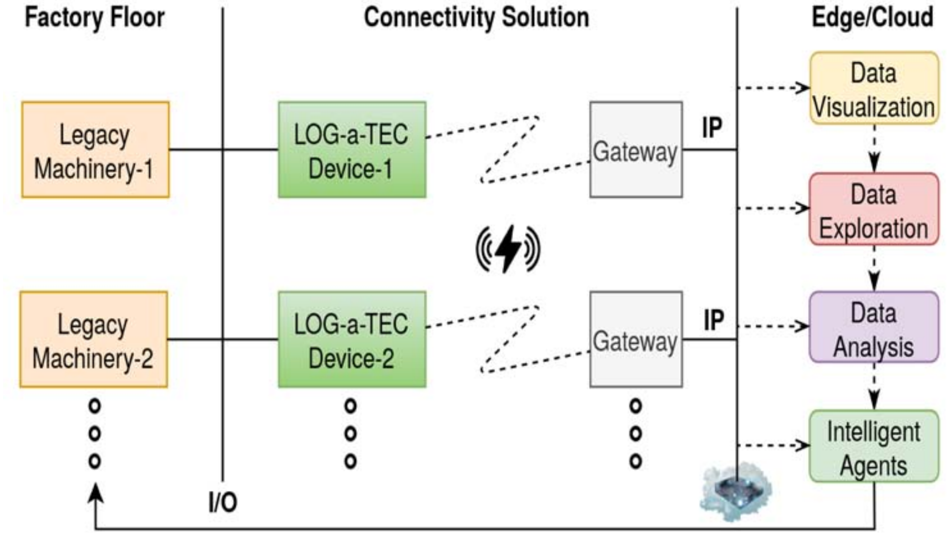


Brownfield retrofit

- **Experiment description (max. 4 slides)**
  - Concept and objectives
  - Background and motivation
  - Experiment set-up
- **Project results (max. 3 slides)**
  - Measurements
  - Lessons learned
- **Business impact (min. 4 slides)**
  - Impact on your business, .. how did Fed4FIRE helped you ?
  - Value perceived, .. why did you come to Fed4FIRE ?
- **Feedback (min. 4 slides)**
  - Used resources and tools
  - Added value of Fed4FIRE

Concept & Objectives

Assess the feasibility and estimate the costs of connecting existing machines in a brownfield factory floor.

- Efficiently retrofit WiFi capability into legacy assets/machinery

- Estimate the capital and operational costs of such a solution

Background & Motivation

Greenfield factories typically support automated data collection.

Legacy brownfield ones need retrofitting as all or part of a data collection methodology includes manual operations.

Improving and streamlining business processes, reduce loss, increase control → achieved using Big Data platforms.

Tested the feasibility of WiFi for retrofitting using the LOG-a-TEC plug and play nodes.

Experiment set-up

Set up 2 access points and 10 different node positions in a brownfield factory to measure connectivity parameters.

2-3 hours to set up 12 devices.

Results

Measurements

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5
Tx Rate [Mbps]	1.04	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.05	1.05
Jitter [ms]	6.829	6.939	6.092	6.716	6.608	4.506	3.372	2.298	4.086	2.2
Packet loss [%]	0	0	0	0	0	0	0	0	0	0

Figure 3. Tx Rate, jitter and packet loss ratio measurements for ten locations/production lines.

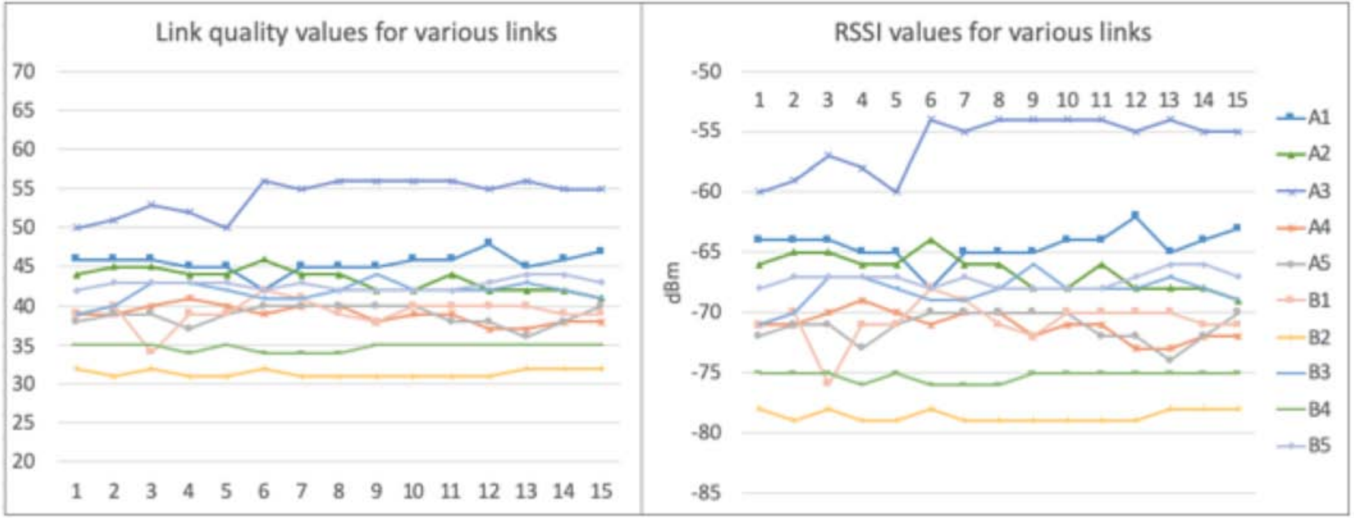


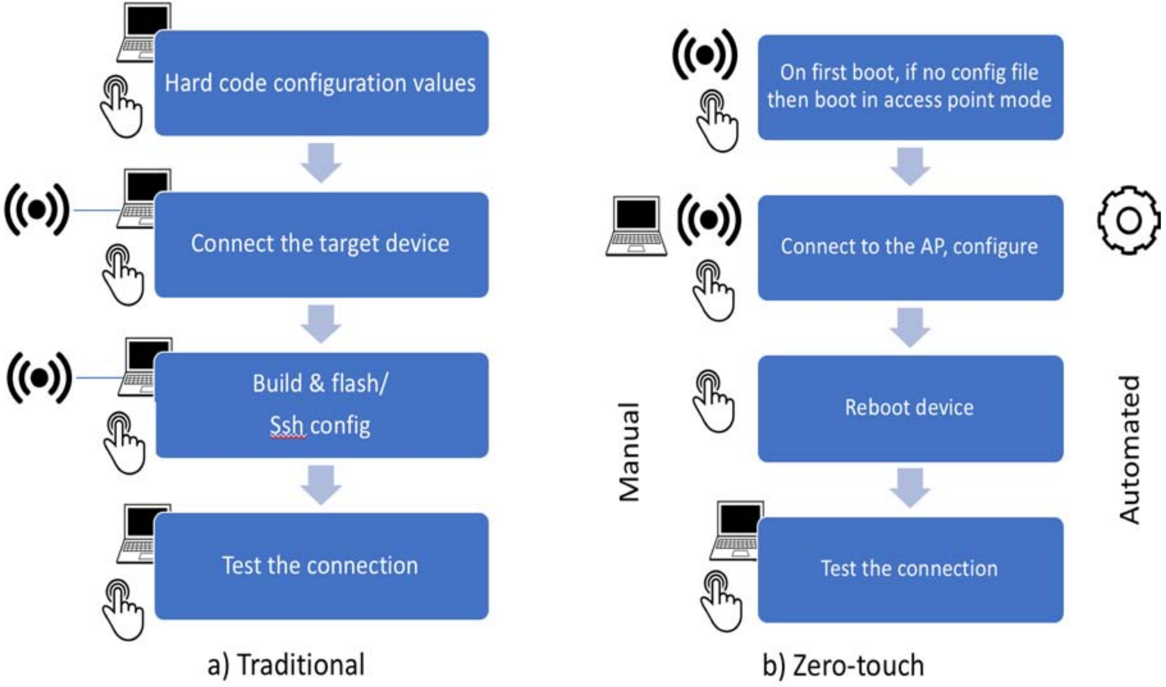
Figure 4. Link quality indicator and RSSI measurements.

Zero-touch provisioning

Initial deployment and configuration can be time consuming and error prone.

Zero-touch provisioning reduces the time, but increased automation is needed for deploying larger number of devices.

- Potential to cu down to by by 4x to 30 mins?



Lessons learnt

Connectivity is feasible according to performance measurements.

Increased deployment automation for a cost-effective commercial solutions.

Assessment of improvement in operational efficiency using DevOps tools requires longer running experiments.

Business Impact

Aimed impact

This project would enable the company to assess whether developing new integrated connectivity solutions is feasible and understand where cost savings enabled by DevOps and SysOps practices lie.

Identified available off the shelf ethernet to WiFi adapters and their costs.

Zero-touch can speed up deployment costs by > 4x

Added value

For our particular case, the main added value was:

- Availability of funding
- Availability of cutting edge know-how in the host institution supporting the testbed and experiment

Feedback

Documentation

- Technology and research infrastructures evolve fast

- Testbeds cannot be compared to commercial services in terms of documentation

- Verbal discussion with the patron is invaluable

Portability

- We encountered no difficulties with respect to the portability of the infrastructure nodes

- Infrastructure nodes are accessed and controlled through a management system to which any new node can be added by implementing the API

- The federation tools seemed less useful for most of the proposed remote and portable work of the experiment

FED4FIRE

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Co-funded by the Swiss Confederation

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