

Department of  
**Electronics and Communication  
Engineering**



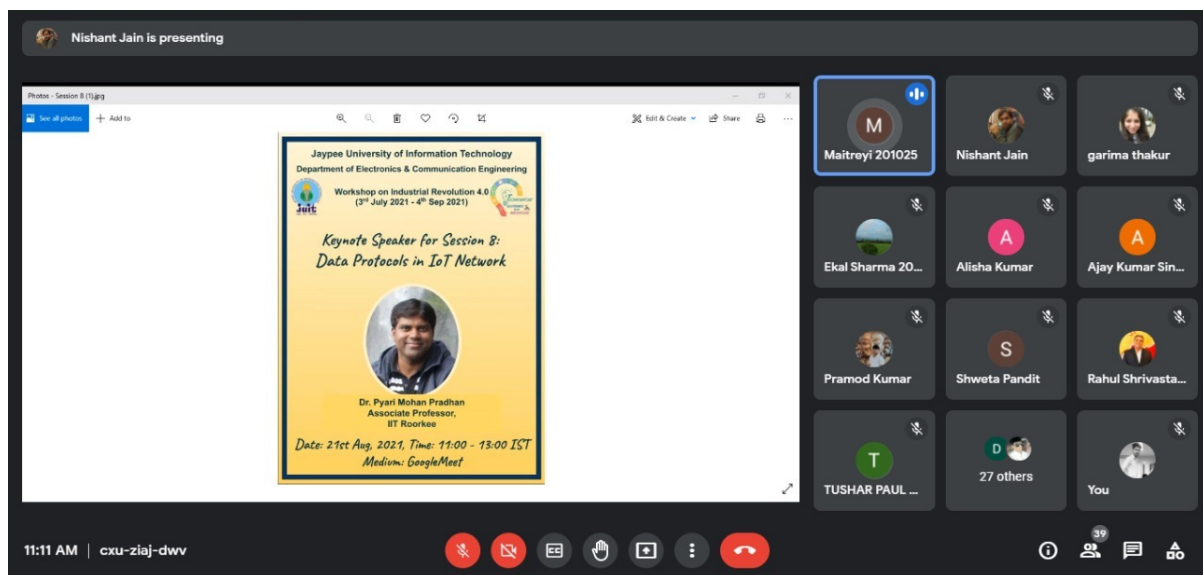
## Jaypee University of Information Technology Waknaghat

### WORKSHOP ON INDUSTRIAL REVOLUTION 4.0

#### Event Report: Session-8

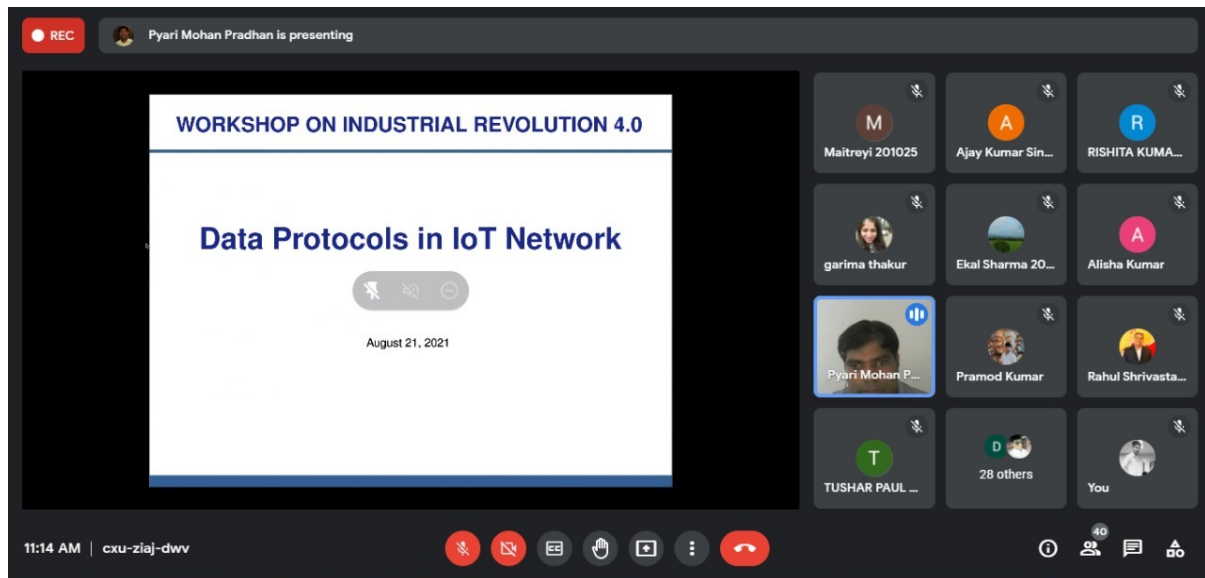
21<sup>st</sup> August, 2021

Department of Electronics and Communication Engineering of Jaypee University of Information Technology, Solan organized an amazing eighth session of “**Workshop on Industrial Revolution 4.0**” on 21<sup>st</sup> August, 2021. The topic of the session was “**Data Protocols in IoT Network**” delivered by an honourable speaker **Dr. Pyari Mohan Pradhan Associate Professor, IIT Roorkee**.

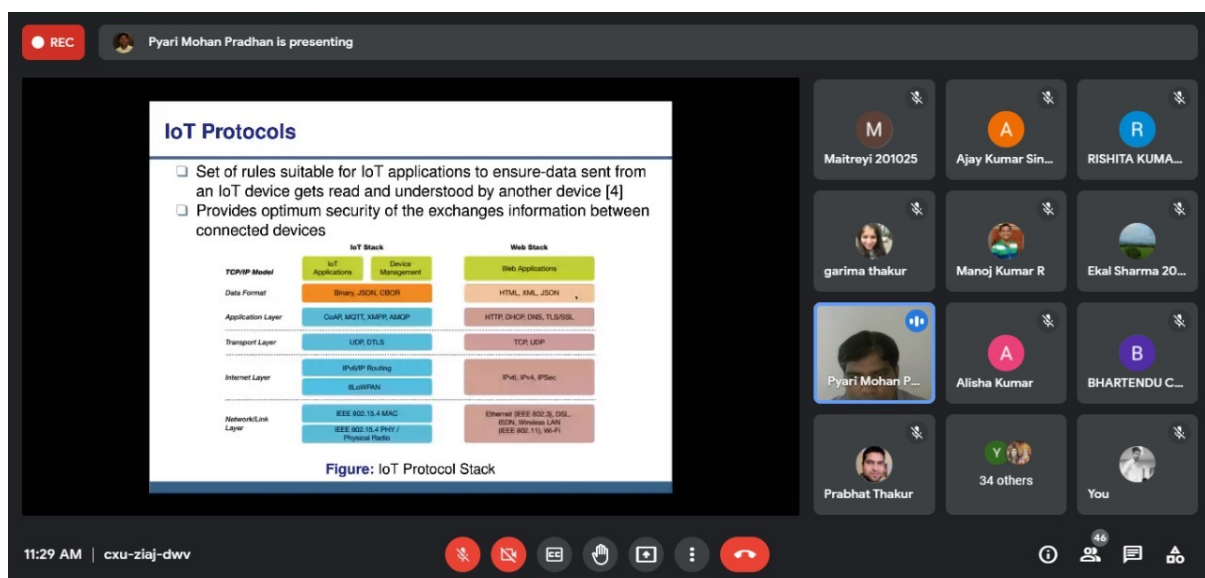


Our eminent speaker invited by Dr. Vikas Baghel, Assistant Professor, Department of Electronics and Communication Engineering served as an inspiration to several faculty

members and students of Electronics and Communication Engineering by delivering his motivation towards the domain of IOT and his immense great work in various fields including IoT, Protocols, Wireless Networks and its applications.



He explained that IoT data protocols are used to connect low-power IoT devices. They provide communication with hardware on the user side – without the need for any internet connection. Without IoT protocols and standards, hardware would be deemed useless. This is because IoT protocols enable hardware to exchange data. And, out of these transferred pieces of data, useful information can be extracted by the end-user.



REC Pyari Mohan Pradhan is presenting

### IoT Protocols: Architecture

11:38 AM | cxu-zlaj-dwv

When talking about the Internet of Things, we always think about communication. Interaction between sensors, devices, gateways, servers, and user applications is the essential characteristic that makes the Internet of Things what it is. But what enable all this smart stuff to talk and interact are the **IoT protocols** which can be seen as languages that the IoT gear uses in order to communicate.

REC Pyari Mohan Pradhan is presenting

### IoT and Industry 4.0

IoT & Standards based protocols are helping IT and OT converge and drive new economic value streams  
The Convergence of IoT and OT

- Information Technology (IT) supports connections to the internet along with related data and technology systems and is focused on the secure flow of data across and organization
- Operational Technology (OT) monitors and controls devices and processes on physical operational systems (assembly lines, utility distribution networks, production facilities, roadway systems etc.)
- Typically, IT does not get involved with the production and logistics of OT environments

11:27 AM | cxu-zlaj-dwv

REC Pyari Mohan Pradhan is presenting

### MQTT

- Message Queuing Telemetry Transport [5, 6, 7]
- ISO standard - ISO/IEC PRF 20922
- Introduced by IBM in 1999, Standardized by OASIS in 2013 - OASIS standard (v3.1.1)
- Lightweight publish-subscribe based protocol
- Message broker controls the publish-subscribe messaging pattern
- Designed for:
  - Remote connections
  - Limited bandwidth
  - Small-code footprint
- Suited for:
  - Transport
  - Telemetry data
  - Sensor data

11:39 AM | cxu-ziaj-dwv

The two-hour long workshop was appreciated by the participants and helped them gain a good amount of knowledge in the domain of data protocols in IoT network.

REC Pyari Mohan Pradhan is presenting

### MQTT: Topics

- Topics for publish and subscribe
  - hierarchical
  - wildcards (# and +)
- Example:** building1/+/room1, building1/floor1/room1/#

11:49 AM | cxu-ziaj-dwv

REC Pyari Mohan Pradhan is presenting

### MQTT: QoS Level 0

- At most once delivery
- Messages delivered according to delivery guarantee of underlying network
- A response is not expected and no retry semantics are defined
- Least level of Quality of Service
- From a performance perspective, adds value as it's the fastest way to send a message
- Message can get lost if the subscriber unexpectedly disconnects or if the broker fails
- Example:** Regularly published temperature data

Figure: QoS Level 0

12:10 PM | cxu-zlaj-dwv

Pyari Mohan Pradhan

RISHITA KUMARI 201010

M 45 others

You

In-call messages

Messages can only be seen by people in the call and are deleted when the call ends.

google meet 11:53 AM  
Participants can put their questions in this chat box, Questions will be answered at the end of the session

Send a message to everyone

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### CoAP: Architecture

Figure: CoAP Protocol

12:28 PM | cxu-zlaj-dwv

Pyari Mohan Pradhan

RISHITA KUMARI 201010

M 48 others

You

In-call messages

google meet 11:53 AM  
Participants can put their questions in this chat box, Questions will be answered at the end of the session

Parsaa Azam 12:15 PM  
hello everyone.. good morning

Jayanthiswari S 19BM015 12:19 PM  
Nice session sir

Nishant Jain 12:19 PM  
Are there any security concerns with respect to MQTT protocols?

Nishant Jain 12:28 PM  
Thanks I got the answer from your slides

Send a message to everyone

REC Pyari Mohan Pradhan is presenting

### Conclusion

1. Protocol choice depends on scenario
2. Some protocols have more features than others
3. A complex use more Protocols like shown in figure

Pyari Mohan Pradhan

RISHITA KUMARI 201010

52 others

You

#### In-call messages

Thanks I got the answer from your slides

DR. GAURAV VIJAY 12:29 PM  
Very nice

Jayanthiswari S 19BM015 12:37 PM  
Feedback link sir

google meet 12:39 PM  
It will be shared at the end

Jayanthiswari S 19BM015 12:40 PM  
Thank you sir, Session timing please

Nishant Jain 12:40 PM  
Which programming language is best for implementing Data Protocols like MQTT for research point of view?

Send a message to everyone

12:43 PM | cxu-ziaj-dwv

At last the several queries raised by the participants were answered and developed immense interest in various fields and applications.