Ericsson Wi-Fi Essentials – Live Virtual

Description
This course is intended for anyone, from Technicians to Engineers, who wishes to undertake a primer on the basics of Wi-Fi. This course explores all the standards and protocols that govern Wi-Fi networks. This Instructor-Led Training is an aggregation of the Web-Based Learning fundamentals. This course is a pre-requisite for all other Wi-Fi curriculum paths.

Learning Objectives
On completion of this course, the participants will be able to:

1. Explain what Wi-Fi is.
   1.1 Describe the features of Wi-Fi solution.
   1.2 Explain the added value of using Wi-Fi.

2. Describe the standards that govern Wi-Fi.
   2.1 Identify where Wi-Fi frequencies fit in the Radiation Spectrum.
   2.2 List the IEEE standards that specify Wi-Fi frequencies.
   2.3 Describe the capacity and capabilities of each Wi-Fi frequency.
   2.4 List which IEEE standards are used to govern Wi-Fi networks.

3. Explain the call flow related to Associating and Authenticating a network.
   3.1 Define key terms related to 802.11 frames and Association to the network.
   3.2 Explain where 802.11 frames fit into the OSI model.
   3.3 Identify the three main frame types and list examples.
   3.4 Explain the importance of a Beacon.
   3.5 Describe the call flow for Associating and Authenticating a network.
   3.6 Explain how Passpoint is used in a network.
   3.7 Explain Power Save functionality.
   3.8 Describe the Disassociation and De-authentication processes.
   3.9 Summarize the general downlink prioritization.

4. Describe the modulation techniques used in Wi-Fi.
   4.1 Describe wave characteristics.
   4.2 Explain Modulation and Demodulation.
   4.3 List the types of Modulations.
   4.4 Describe the Quadrature Amplitude Modulation.
   4.5 Explain the encoding techniques used in Wi-Fi.
   4.6 Identify the modulation rates and data rates for each 802.11 amendment.
   4.7 Explain the 802.11ac MCS versus Spatial streams.
5 List the modulation rates according to the 802.11 standard.
5.1 Describe the modulation types and associated data rates.
5.2 Explain the relationship between modulation rates and distance.
5.3 Define the term Signal to Noise Ratio (SNR) and its effect on modulation rates.
5.4 Describe the relationship between the coverage area and the modulation rate.
5.5 Explain the Air Time Fairness principle.
5.6 Describe the protection scheme.
6 Explain how Carrier Sense Multiple Access with Collision Avoidance is used in a Wi-Fi network.
6.1 Explain how Carrier Sense Multiple Access with Collision Avoidance is used in a Wi-Fi network.
6.2 Describe how Distributed Coordination Function is used as an access method.
6.3 Explain how RTS/CTS works.
6.4 Describe the situation where CTS-to-Self is needed.
6.5 Explain how modulation rate adaptation works.
7 Explain Radio Frequency propagation and its effects.
7.1 Define what propagation is and what affects it.
7.2 Describe how the environment influences propagation.
7.3 Explain what types of reaction an RF wave has when it interacts with an object.
7.4 Describe how signal loss occurs over a distance.
7.5 Explain what the Fresnel Zone is.
7.6 Define what a Breaking Point is.
8 Describe the types of antennas and their radiation.
8.1 Explain Transmission Power Measurements.
8.2 Describe an Isotropic Radiator.
8.3 Define the radiation patterns of antennas.
8.4 Explain Antenna Polarization.
8.5 List available AP antennas.
8.6 Describe the MIMO usage.
8.7 Explain how Beamforming works.
9 Explain the Link Budgeting process and the attenuations that need to be considered.
9.1 Describe the building penetration effects and material attenuation.
9.2 Explain the Link Budget principle.
9.3 Define Effective Reach.
9.4 Describe the Fade Margin.
9.5 Calculate a Link Budget for uplink, downlink, and backhaul.
10 Describe the components of a Wi-Fi network.
10.1 Describe the components of a Wi-Fi network.
10.2 Explain the different topologies for Wi-Fi backhaul networks.
11 Explain the 3GPP/Wi-Fi Interoperability.
11.1 Explain Band Steering.
11.2 Describe the Traffic Steering feature.
12 Describe the Ericsson Access Point portfolio.
12.1 List the common features of Access Points.
12.2 Describe each Access Points feature.
12.3 Explain the Mounting Options.
13 Describe the Ericsson Wi-Fi Controllers.
13.1 Explain what a Wi-Fi Controller is.
13.2 List the supported features of Wi-Fi Controllers.
13.3 Identify the layer in the network where the Controller is located.
13.4 Explain to a colleague what CAPWAP is.
13.5 Define what CGCM is.
13.6 Explain the use of a Data collector and locate where it resides.
14 Identify the Management Applications used with the Ericsson Wi-Fi technology.
14.1 Explain purpose of the Management Applications.
14.2 List the Element Management layer entities.
14.3 Describe the Web Interface for both the Controller and the AP.
14.4 Explain the CLI Interface for the Access Point.
14.5 Describe the Wi-Fi Manager Interface.
14.6 Explain the Wi-Fi Business Analyzer.

Target Audience
The target audience for this course comprise:

Prerequisites
None

Duration and Class Size
The length of the course is twelve (12) hours spread over four (4) sessions, with a maximum number of twelve (12) participants.

Learning Situation
This course is based on interactive theoretical instructor-led lessons delivered through a live virtual classroom environment.

Time Schedule
Learning time always depends on the knowledge of the attending participants. The time schedule provided below is indicative only and can be used as an estimate.
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<td>Wi-Fi Standards and Frequencies</td>
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<td>1</td>
<td>Call Flow and MAC Architecture</td>
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<td>Modulation and Encoding Techniques</td>
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