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Index

"It's still magic even if you know how it's done."

Supplementary Downlink (SDL)

ASI/T Ravin Kumar

Mobile broadband is now rapidly becoming more important as users demand Internet-based services on the move as well as at home and in the office. Mobile data traffic is predicted to increase exponentially over the coming years with a particular evolution towards asymmetrical traffic. Their number is projected to grow significantly in near future amplifying asymmetric mobile data traffic and the increase in mobile multimedia consumption.

What is SDL

SDL or supplemental downlink allows the bonding of unpaired spectrum with FDD mobile broadband bands, to significantly enhance networks downlink capacity and users experience. It uses unpaired spectrum to enhance the downlink capability of mobile broadband networks by enabling significantly faster downloads and supporting a much greater number of users with mobile devices. This provides an efficient way of using pectrum because consumption of rich content and other data heavy applications is asymmetric. There is much more traffic on the downlink than on the uplink over mobile broadband networks. Supplemental downlink and carrier aggregation have now been enabled in the HSPA+ Release 9 (and beyond) and LTE Release 10 (and beyond). The technology represents a significant step forward in traditional spectrum aggregation systems that are already used for HSPA+ and LTE networks by the 3GPP standardization group. Supplemental downlink technology can now be used in the L-Band and could also be considered in other frequency bands. In Release 9, the SDL feature allowed a single carrier in an unpaired band to be used along with the serving cell's paired spectrum. Release 10 provided for up to three supplemental carriers in the unpaired band to be used along with the serving carriers in the paired band. This feature was demonstrated at MWC 2011 by Ericsson using unpaired spectrum from the L-band (1452-1492 MHz) with paired spectrum in the 2.1 GHz band.
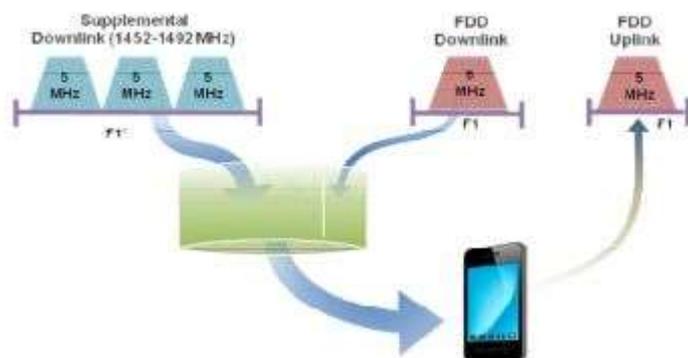
Benefits of SDL

The two principal benefits of SDL at 1.4 GHz:

Reduced costs: Deployment leads to avoided costs of investment in additional base station and backhaul infrastructure. Once mobile broadband demand exceeds network capacity, networks can be expanded by deploying a 1.4 GHz SDL on existing base station sites rather than building new base station sites and this leads to cost effectiveness. The scale of this benefit depends primarily how soon other spectrum is made available for mobile broadband use and how quickly demand for mobile broadband grows in each country

Better service quality: Deployment leads to improved services – in particular better in- building coverage, higher downlink speeds and ability to support a greater number of users. The 1.4 GHz SDL when paired with low frequency spectrum behaves like sub-1 GHz 3 spectrum in terms of propagation characteristics. So a 1.4 GHz SDL offers better in-building coverage than spectrum allocated for mobile broadband use at 2.1 or 2.6 GHz The use of 1452-1492 MHz for a supplemental downlink for mobile broadband could generate economic benefits to the society at large and the availability of broadband and the development of e-health services such as telemedicine and mobile healthcare systems should deliver substantial benefits which include improved services and response times, cost savings and better health care.

SDL provides:
Increased peak rate
Improved capacity
Effective use of existing spectrum
Supplemental Downlink (SDL) is poised to boost the downlink:
By aggregating unpaired spectrum with typically paired spectrum L-Band standardized as band 32 in 3GPP and harmonized in Europe o Band 29 in the US This new technology will allow network operators to manage the ever-increasing demand for data service on wireless networks and provide improved performance for end users. The following figure, according to simulations carried out by Qualcomm, shows that the downlink data burst rate capacity approximately doubles for fixed number of users with use of SDL. Conversely, the number of data subscribers supported at given bit rate becomes approximately.

Functioning of SDL
A cell typically consists of two component carriers: uplink and downlink. Supplementary downlink only cells are an exception where there is only a downlink component carrier. This feature allows a carrier aggregation capable UE to use the supplementary downlink only cell as a secondary component carrier. For HSPA+, since the SDL carrier is not paired with an uplink, it cannot support UEs configured in pre-Release 9 modes (legacy UEs). It can only be used as the secondary serving cell (carrier) by Release 9, or later, UEs. The SDL operation is different from traditional Release 8 DC- HSDPA. In traditional Release 8 DC-HSDPA, both the carriers can support SC UEs as well as DC-HSDPA UEs. Hence, the Radio Network Controller (RNC) can assign an SC UE to either of the two carriers. In contrast, the SDL carrier cannot support single carrier (pre-Release 9) operation. For LTE Release 10 onwards, the Supplementary Downlink for Carrier Aggregation feature makes it possible to add and unlock an FDD E-UTRAN Cell with a downlink carrier only, no uplink carrier, for example: Band 29. This downlink only cell is utilized as a downlink secondary cell by the Carrier Aggregation feature. When a cell is configured as downlink only, it is barred and incomingS1 and X2 handover are rejected. The Dynamic Cell Selection and Supplementary Downlink for Carrier Aggregation features can operate together.

HackRF One Bundle

ASI/T Dheeraj Kushwaha

HackRF one is hardware tool works like SDR (software Define Radio). It enables fast and accurate transmission of radio signals. The frequency range of this software is 1Mhz to 6Ghz. It can be programmed and managed as stand-alone device and system.

Today in modern technique every device become smaller and most of the devices works remotely. Further every home appliance can control by remotely. so the basic concept of working of these devices is frequency. We are surrounded by radio waves. Most of high tech equipment consist Bluetooth,wifi,GPS etc. these feature works on radio waves itself.

HackRF One is a Software-Defined Radio that can interact with any of these features. The majority of wireless systems in the digital age could easily be transceived by HackRF One. The vision behind it is to bring an open source peripheral that could assist modern day engineers and researchers for improving next generation communication systems.

HackRF One processes Digital Signals to Radio waveforms allowing integration of large-scale communication networks. It is designed to test, develop, improvise and modify the contemporary Radio Frequency systems.

HackRF One is an open source platform so it allows progressive innovation by almost anyone in the Software domain. The device is actually made and designed for analysis with a wide frequency range for analysing radio signals.

We can use this device as a spectrum analyser. By using this device, we can check the analysis which frequency strength is available in our range. And if we want then we can intercept the frequency (if it is not encoded). Most of the wireless devices can be open through it by analysing the frequency range of that wireless device.

गांव से गुजरेगा आत्मनिर्भर भारत का रास्ता

HC/RO Sunil Kumar Singh

गांव हर कामकाजी व्यक्ति के लिए संबल का प्रतीक हैं। बड़े-बड़े शहरों या विदेशों में काम करने वाले भारतीय जब भी थोड़े उदास होते हैं, किसी परेशानी में फंसते हैं, किसी त्योहार में अकेले पड़ जाते हैं या वहां प्रदूषण आदि जब बढ़ जाता है तो अचानक से गांव की याद आती है। मैंने कई लोगों को कहते सुना है और सुनता आ रहा हूं, 'ज्यादा दिक्कत होगी तो गांव चला जाऊंगा, वहीं अपने घर में रहूंगा और खेती-बारी करूंगा। भले कोई सुख सुविधा न मिले पर वहां सुकून तो मिलेगा। ' ऊपर की ये बातें अधिकांश भारतीयों के जीवन में लागू होती हैं, चूंकि भारत को गांवों का देश भी कहा जाता है। वर्ष 2011 की जनगणना के आंकड़े भी कहते हैं कि भले ही शहर बढ़ रहे हों, लेकिन गांवों की आबादी में भी इजाफा हुआ है।

गांव हमेशा से प्रासंगिक रहे हैं लेकिन एक वैश्विक महामारी कोरोना वायरस ने गांव की महत्ता को आज और बढ़ा दिया है। चूंकि इस वायरस का फिलहाल कोई इलाज नहीं है इसलिए सरकार ने इसका प्रसार न हो इसके लिए लगभग दो महीने से ज्यादा का लॉकडाउन घोषित किया।

इस लॉकडाउन के दौरान अचानक तेजी से चल रहा देश थम गया और जो जहां था वहीं फंस गया। इतने समय के दौरान शायद ही ऐसा कोई आदमी हो जिसे अपने गांव की याद न आई हो। हमारे देश का श्रमिक वर्ग जो विभिन्न राज्यों में अपनी श्रम शक्ति/कौशल का इस्तेमाल कर देश की अर्थव्यवथा को गति दे रहा है वह अपने-अपने गांव आने के लिए आतुर दिखा। श्रमिक सब छोड़-छाड़ कर पहले अपने गांव लौटना चाहते थे, इसकी तसदीक रोज टीवी और समाचार पत्र कर रहे थे। इस दौरान कई दुर्भाग्यपूर्ण हादसे भी हुए फिर भी कई लोग दिखे जो साइकिल, पैदल, खुले ट्रकों में, ट्रेन से जैसे भी हो गांव लौटने पर अड़े दिखे।

विभिन्न राज्यों में रह रहे लाखों श्रमिकों मे से फिलहाल काफी लोग अपने-अपने प्रदेश लौट चुके हैं और लौटने का क्रम लगातार जारी है। कोरोना के भय और लॉकडाउन की दिक्कतों के कारण वापस लौटे श्रमिकों में से अधिकांश का कहना है कि अगले कुछ महीनों तक वे अपने गांव में ही रहेंगे। इतने बड़े पैमाने पर गांव में मानव संपदा लौटने से किसी भी प्रदेश की दशा और दिशा में बदलाव आ सकता है और वह आत्मनिर्भर बनने की दिशा में आगे बढ़ सकता है।

प्रधानमंत्री श्री नरेंद्र मोदी ने भारत को आत्मनिर्भर बनाने का आह्वान किया है। उन्होंने हाल ही में एक विशेष आर्थिक पैकेज का भी ऐलान किया है जिसकी मदद से इस लक्ष्य को पाया जा सकता है। गांव कैसे सशक्त हों, हर हाथ को काम मिले, किसानों को आर्थिक समस्या न हो और उत्पादों का भी उचित मूल्य मिले इससे जुड़ी हर बात का ध्यान रखा गया है।

केंद्र सरकार ने मनरेगा में औसत मजदूरी दर 182 से बढ़ाकर 202 रुपये कर दिया है साथ ही बारिश के दिनों में काम मिलने में दिक्कत न हो इसके लिए मनरेगा में काम के दायरे को बढ़ाया गया है। केंद्र सरकार 40 हजार करोड़ रुपये का अतिरिक्त आवंटन भी कर रही है इससे 300 करोड़ मानव दिवस रोजगार पैदा करने में आसानी होगी। जल संरक्षण से संबंधित कार्य और पशु शेड के निर्माण से हर हाथ को काम देने में सक्षम होंगे।

झारखंड में जल संरक्षण के लिए पिछले साल डोभा निर्माण (एक प्रकार का खड्डु जहां पानी जमा होता है) बड़े पैमाने पर मनरेगा के तहत किए गए थे जिसका लाभ गर्मी के मौसम में किसानों को खेतों की नमी बरकरार रखने में मिला था, पैदावार में भी बढ़ोत्तरी हुई थी। झारखंड की भौगोलिक संरचना के हिसाब से जल संरक्षण करना आवश्यक है और इससे सबंधित कार्यों को मनरेगा में जोड़े जाने से यहां रोजगार के अवसर पैदा होंगे।

सही मायनों में देखा जाए तो किसान और श्रमिकों की खुशहाली ही देश की आर्थिक तरक्की की नींव हैं। लॉकडाउन की अवधि में पीएम किसान निधि से मिली सहायता ने किसानों को साहूकार और महाजनों से मुक्ति दिलाई है। केंद्र सरकार ने 18,700 करोड़ रुपये डीबीटी (डायरेक्ट बेनीफिट ट्रांसफर) के माध्यम से किसानों के खाते में ट्रांसफर किए हैं। तीन महीनों तक उन्हें यह राशि दी जानी है। फसलों की बिक्री भी किसान अब ऑनलाइन कर सकते हैं।

झारखंड के कई किसानों ने लॉकडाउन की अवधि में गेहूं, तरबूज आदि की बिक्री ई-नाम पोर्टल पर की है जिससे उन्हें बाजार में अपने उत्पाद भी नहीं ले जाने पड़ते हैं, खेतों से ही बिक्री संभव हो जाती है। इसके लिए जरूरत है जागरुकता की ताकि अन्य किसानों को भी इसका लाभ मिल सके। छोटे किसान भी समूह बनाकर अपने उत्पादों की बिक्री इसके माध्यम से कर सकते हैं। न्यूनतम समर्थन मूल्य देकर किसानों से सरकारें अनाज की खरीद कर रही हैं। इससे उन्हें औने-पौने दाम में साहूकारों को अनाज बेचने से मुक्ति मिली है।

गावों के लिए पशुधन का बड़ा महत्व है। देश में शायद ही ऐसा कोई गांव हो जहां पशुपालन नहीं होता है। इनकी जरूरत खेती-किसानी के साथ-साथ आहार के लिए भी होती है। वन संपदा और हरे-भरे क्षेत्रों से परिपूर्ण होने के कारण झारखंड में बड़े पैमाने पर पशुपालन होता है। प्रधानमंत्री श्री नरेंद्र मोदी ने विशेष आर्थिक पैकेज में 15 हजार करोड़ रुपये का एक पशु पालन आधारभूत ढांचा विकाष कोष स्थापित करने का ऐलान किया है। इसी तरह से जड़ी-बूटी की खेती को प्रोत्साहन देने के लिए चार हजार करोड़ रुपये का ऐलान किया गया है।

झारखंड खनिज संसाधनों से भरा-पूरा क्षेत्र है। झारखंड में देश का एक तिहाई कोयला पाया जाता है। प्रदेश के लाखों श्रमिकों को इससे रोजगार मिल रहा है। कोयला खनन के क्षेत्र में केंद्र सरकार नीतिगत सुधार करेगी ताकि कोयला उत्पादन में आत्मनिर्भरता बढ़ सके। रुपये प्रति टन की निर्धारित व्यवस्था की बजाय राजस्व साझेदारी की व्यवस्था बनाने की योजना है। इससे पहले केवल अंतिम उपयोग संबंधी स्वामित्व के साथ स्व उपयोग करने वाले उपभोक्ता ही बोली लगा सकते थे पर नए बदलावों से कोई भी पार्टी किसी भी कोयला ब्लॉक के लिए बोली लगा सकती है और खुले बाजार में बेच सकती है। इससे संबंधित 50 ब्लॉकों की पेशकश तुरंत की जानी है। इसका झारखंड को सीधा फायदा होगा। रोजगार के नए साधन तो सृजित होंगे ही साथ ही साथ श्रमिकों को तत्काल काम मिलेगा।

ऐसा प्राय: देखा गया है कि संकट की घड़ी में कोई भी परिवार एकजुट होता है, आज हम एक अदृश्य दुश्मन का मुकाबला कर रहे हैं। इस समय हम और पूरा देश एकजुटता से ही इसे परास्त कर सकते हैं। ऐसे में हमारा दायित्व बनता है कि हम हर उस व्यक्ति को संबल दें, हर हाथ को काम मिले उस रास्ते को बताने का प्रयास करें जिससे भारत एक बार फिर सोने की चिड़िया बनने की ओर अग्रसर हो।

A Conceptual Understanding of Communication Engineering

HC/RO Ravi Babu Chilikuri

Communication requirement #1

There must be some characteristic of the receiver's environment that can be changed. Here the key phrase is "can be changed", this is more than having some characteristic that varies, it implies controllability – a change in the receiver's environment that is deliberate versus a change that is random

Requirement #2

That change must be observable by the receiver, first, the receiver must have a sensor or "detector" of the appropriate kind. This might be a radio receiver, or an optical sensor, or an infrared detector, etc. Secondly, some types of detector might need to be tuned to the correct frequency or otherwise optimized in some way, Third, the detector must be sensitive enough to measure the change, this starts a discussion of power levels, etc. More on this when we discuss and mention about errors

Humans have 5 senses that we consider to be our normal means of communicating with our environment. If we are going to communicate with another person, we are probably going to use the sensors that have the greatest information rates – arguably our sight, then perhaps our hearing for most situations. Our sensors have developed from years of living in our particular environment and they are not easily changed – but we can increase their sensitivity with things like telescopes or listening devices. We are sensitive to many things at sufficient power levels. Most of us would not consider using heat to communicate with a person – but recently developed non-lethal crowd-control mechanisms can use focused energy beams over a distance of a few hundred meters to make a person very hot – communicating the message to "stay back". Properly adjusted and modulated this could be a communication channel for humans, for example. But it would not be very efficient compared to many other available techniques. We can equip machines with a variety of sensors and that allows flexibility in the design of the communication system. Translation layers can be used to convert to and from other forms of communication.

Requirement #3

It must be possible for the sender at its location to create the observable change at the receiver's location, a channel must exist between the sender and the receiver, the sender uses some energy to create a local change (i.e., at the sender's location) that propagates through the channel and eventually creates the observable change at the receiver's location, the receiver does not directly measure the signals created at the sender; the receiver measures the signals after they have passed through the channel, unfortunately the channel is **lossy, when t**he receiver may be unable to capture all of the energy used by the sender, some channels use **unguided** media such as the atmosphere or even the vacuum of space. Energy from a point source (an **isotropic antenna**) radiates in all directions and only a small fraction impinges on the receiver antenna (**free-space path loss**),the channel may absorb (convert to heat) or scatter or even radiate the energy from the sender rather than delivering it to the receiver, this can be true of **guided** or unguided media. Guided media describes things like wire or fibre optic cable or waveguides where the physical characteristics of the media are designed to prevent the energy from going in all directions. Wires, fibreoptic cables, waveguides, and so on are guided media. In unguided media any control of the direction of energy propagation must be done prior to putting the energy into the medium. For example, we might collimate a beam of light (e.g. the reflector in your flashlight) or we might use an antenna that has directional characteristics (called **gain**).

Requirement #4

The meaning of the observations must be coordinated between sender and receiver The observable changes have no meaning by themselves; there is some signal encoding that gives those observations meaning, for example: green light to signal a 1, red light to signal a 0, the code must be known to both the sender and the receiver. Even two humans talking to each other are using a code – our common language. Babies are physically capable of making most of the same sounds as adults –

but they have not yet learned the code we call language. To see this point from another direction – we could reverse the meaning of the two colours above. The signal characteristics would be the same, but sending the same sequence of colours would result in an inverted set of bits communicated through the channel.

Requirement #5

The timing between the sender and the receiver must be coordinated, If we measure the same conditions at the receiver during two separate observations

a) Is it the same signal observed twice or is it two separate signals that have the same content?

b) We can assign serial numbers to messages to reduce this problem but what about individual signals?

Imagine that I see you on two different days and each day I tell you "Rani got married." We would use our understanding of human society to guess that you simply forgot that you told me this information yesterday – because we believe it unlikely that Susan has had another wedding since yesterday. Now imagine a computer increments the marriage counter for Susan every time it receives this message as a new message. To determine if this is a new message, we might need to have the sender place a message ID in the sent messages and have the receiver keep a list of received message IDs to compare against each received message. The receiver only "knows" the following:

i)*The observed measurements*

ii)*The rules that have been agreed to with the sender prior to communication*

I see a red light from you for 10 seconds and then a green light for 10 seconds, Was that 00000000001111111111 (1 signal per second) or was that 01 (1 signal per 10 seconds), If the receiver knows the senders "rule" for sending a new signal every second then it would use the first interpretation, The sender generally knows more than the receiver. The sender knows when it sent something – the receiver must deduce this information, and even if we interpret the signals correctly – we might still need some way to indicate the start of a frame, Some bits might be needed for timing coordination rather than conveying user data. In general there may be multiple timing structures that must either be known or observed by the receiver to properly communicate We may need to encode the clock as part of the communication channel, lets discuss it further.

Requirement #6

To avoid errors the intent of the sender must be unambiguous in spite of other changes caused by other actors, the receiver does not "know" what signal was sent by sender; it must use the rules it knows and its measurements to make a "best guess" at what the sender sent, the receiver knows a list of possible signal values sent but will not know which one from the list has been sent the measurements are confused by many factors

1) The lossy channel **attenuates** (reduces the power of) the signal.
2) The channel often has characteristics that are frequency dependent – which produces **distortion** (a change in the "shape" of a signal as a function of time)
3) The measurements may include intentional or unintentional man-made **interference**
4) The measurements may include **noise Shot noise; thermal noise;** etc.

Because of the relationship between the **time domain** and the **frequency domain** representations for the same signal we can think of distortion in two ways. Distortion is a change in the value of the signal as a function of time (its shape when plotted against time) or equivalently it is a change in the **spectrum** (the relative power of the frequency components) of the signal.

In some sense interference and noise are equivalent because they represent measured energy that does not represent energy sent by the sender. But we often distinguish noise as being random and interference as having some structure. Noise can sometimes be reduced through simple averaging of multiple measurements. Interference is more difficult to eliminate because it may be more correlated across multiple measurements.

The receiver measures the signal that has been modified by the channel plus the interference plus the noise, The signal injected into the channel by the sender must be designed (power level, encoding, etc.) so that what the receiver measures has enough **signal-to-noise ratio (SNR)** that the receiver guesses correctly, If the receiver guesses incorrectly then we have a communication error, For example in a simple encoding scheme we might measure the voltage output of the detector. Perhaps

the sender uses +1 volt to signal a 1 and -1 volt to signal a 0. It uses 0 volts to indicate an idle channel perhaps. This kind of signalling is called **baseband** signalling (because there is no **modulation**). In that case we might use the following rule at the receiver: a measurement greater than 0.25 volts we will "guess" to have resulted from the sender sending a 1, a measurement less than -0.25 volts we will declare to be a 0, and anything in between we will declare as idle. This would allow for some attenuation and some noise.

Requirement #7

The observation of the change must be possible in spite of imprecision in the timing, while the receiver may know the nominal frequency of the senders clock the actual frequency of the sender and receiver clocks may vary slightly, A crystal clock with an oven to control temperature might have an accuracy of 1×10^{-9}, A 1 MHz clock with this accuracy will deviate by one clock tick every 1000 seconds (the resulting errors are called **bit slip**), even if the sender's clock frequency could be exactly reproduced at the receiver there would still be uncertainty about the phase , The phase of the clock tick at the receiver and the phase at the sender will vary based on their relative distance and the propagation velocity between them.

Even if these were constant there are other variable delays between the sender and receiver that make it impossible for the receiver to know apriori the correct phase to use. The sender cannot make instantaneous changes occur at the receiver. Electronic circuits and some types of media have characteristics (**impedance**) that essentially require infinite energy to create a change in zero time. Due to the inverse relationship between time and frequency it takes increasingly greater bandwidth in our media and circuitry to achieve shorter and shorter pulses. The channel characteristic manipulated by the sender will therefore spend some of its time transitioning between values and those times are not suitable for measurement by the receiver

Adding clock to our example

To make our red and green light channel work we might modify the signalling as follows, A one is a green light for ½ second followed by ½ second of no light, a zero is a red light for ½ second followed by ½ second of no light ,we are guaranteed two transitions every second , the receiver can use a **phase lock loop (PLL)** to lock onto the sender's clock and sample the channel at the best time. This is an example of a line encoding that includes the clock, by forcing transitions into the signal we are making the sender's clock details available at the receiver and including the various phase delays of the channel.

Summary

- A sender creates signals that are sent through a channel to the receiver
- The receiver measures a distorted and attenuated version of that signal as well as noise and interference
- Using rules about timing, possible signal values at the sender, and the channel characteristics the receiver guesses which signal when sent would have been most likely to cause the measured value at the receiver
- Once the receiver has guessed at the sent signal it knows the meaning of that signal based on the rules it shares with the sender. If the guess was correct then the meaning intended by the sender will be known and communication has occurred. If the signal guessed by the receiver does not match what the sender sent then an error has occurred.

Technical Quiz

1. India's First No-Permission No-Takeoff compliant drone flight on the A200 Remotely Piloted Aircraft System has been completed successfully in which state?
   [A] Punjab
   [B] Karnataka
   [C] Bihar
   [D] Uttar Pradesh

2. What is the name of India's first social media app named launched by Vice President Venkiah Naidu?

   [A] Milap
   [B] Chatmat
   [C] Connect
   [D] Elyments

3. Which institute has developed a virtual classroom aid, 'Mobile Masterjee'?

   [A] The Indian Institute of Technology, Kanpur

   [B] The Indian Institute of Technology, Bhubaneswar

   [C] The Indian Institute of Technology, Mandi

   [D] The Indian Institute of Science

4. AIIMS doctor along with a team of IIT-Delhi students have developed which app which enables users to track willing plasma donors who have recovered from Covid-19?

   [A] COPAL-19
   [B] COVIL-19
   [C] COPLA-19
   [D] PLACO-19

5. Which of the following has partnered will UNESCO to adopt technology in classrooms?
   [A] Samsung
   [B] Lenovo
   [C] Toshiba
   [D] DELL

6. Which of the following launched India's First Service Audio Service 'Suno'?

   [A] Netflix

   [B] Audible

   [C] Google

   [D] Facebook

7. FSSAI to develop app to prevent food wastage in partnership with which company?

   [A] Google
   [B] Nasscom Foundation
   [C] Infosys
   [D] TCS

8 Which of the following app brings fingerprint authentication for the users?

   [A] Google Drive
   [B] TikTok
   [C] Instagram
   [D] WhatsApp

9. Name the driving license app, that is introduced by the government recently.

   [A] G-Yatra
   [B] Sarathi
   [C] Spotify
   [D] m-Parivahan

10. The Centre is demanding _____ for fingerprinting of messages to trace the origin of all content shared through it.
   A] Twitter
   [B] WhatsApp
   [C] Instagram
   [D] TikTok

Technical Terms

Cloud

A technology that allows us to access our files and/or services through the internet from anywhere in the world. Technically speaking, it's a collection of computers with large storage capabilities that remotely serve requests.

Domain

A group of computers, printers and devices that are interconnected and governed as a whole. For example, your computer is usually part of a domain at your workplace.

Exploit

A malicious application or script that can be used to take advantage of a computer's vulnerability.

Breach

The moment a hacker successfully exploits a vulnerability in a computer or device, and gains access to its files and network.

Malware "the bad guy"

An umbrella term that describes all forms of malicious software designed to wreak havoc on a computer. Common forms include: viruses, trojans, worms and ransomware.

Bot/Botnet

A type of software application or script that performs tasks on command, allowing an attacker to take complete control remotely of an affected computer. A collection of these infected computers is known as a "botnet" and is controlled by the hacker or "bot-herder".

DDoS

n acronym that stands for distributed denial of service – a form of cyber attack. This attack aims to make a service such as a website unusable by "flooding" it with malicious traffic or data from multiple sources (often botnets).

BYOD (Bring Your Own Device)

Refers to a company security policy that allows for employees' personal devices to be used in business. A BYOD policy sets limitations and restrictions on whether or not a personal phone or laptop can be connected over the corporate network.

Acknowledgement

We are highly thankful for reading out this compilation and hope it will be useful for you in our day to day professional and personal life. We would like to hear your interest areas, suggestions from you to make this newsletter more informative and interesting. Your views will definitely help us to create this newsletter as an effective medium to reach you with latest development in the fields of communication and technology.
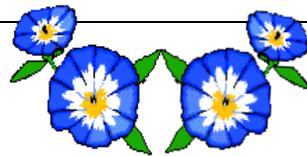
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Answers to the Quiz

1	2	3	4	5	6	7	8	9	10
B	D	A	A	D	A	B	D	B	B