Session 2015-2016

‘Boot’ For Computer

Best of Outstanding Technology

Department of Computer Science & Engineering
Institute of Engineering and Science
IPS Academy, Indore

2015-16

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Principal Message

Technical Education is the most potential instrument for socio-economic change. Presently, the engineer is seen as a high-tech player in the global market. Distinct separation is visible in our education between concepts and applications. Most areas of technology now change so rapidly that there is a need for professional institutes to update the knowledge and competence.

Institute of Engineering and Science, IPS Academy is a leading, premium institution devoted to imparting quality engineering education since 1999. The sustained growth with constant academic brilliance achieved by IES is due to a greater commitment from management, dynamic leadership of the president, academically distinctive and experienced faculty, disciplined students and service oriented supporting staff.

The Institute is playing a key role in creating and ambiance for the creation of novel ideas, knowledge, and graduates who will be the leaders of tomorrow. The Institute is convinced that in order to achieve this objective, we will need to pursue a strategy that fosters creativity, supports interdisciplinary research and education. This will also provide the students with an understanding and appreciation not only of the process of knowledge creation, but also of the process by which technology and knowledge may be used to create wealth as well as achieve social economic goals.

I am delighted to note that the engineering graduates of this institute have been able to demonstrate their capable identities in different spheres of life and occupied prestigious position within the country and abroad. The excellence of any institute is a measure of achievements made by the students and faculty.

Dr. Archana Keerti Chowdhary
Principal

HOD Message

Today we find that information technology has become overwhelmingly pervasive, while its parent, computing science, has become correspondingly hard to find. While many CS educational institutions have shifted focus from core CS. This is the single most important attribute of the education offered here. Our department has remained true to the vision on which it was founded.

There are several ways to present the canonical core of computer science. Over the years we have developed a distinct style and method that bridges the theory - practice divide while remaining grounded in the core. Technology changes rapidly, especially in the field of computing, whereas the science, if it changes at all, does so much more gradually.

Our Department has produced hundreds of professionals and has established a name for itself in the country and abroad. They have consistently excelled in the highly competitive industrial environment, Best Employer/ awards in top-ranking companies. Learning is a continuous process and does not end with the acquisition of a degree, especially because steady and rapid advances in computing technologies shorten the life of tools and techniques prevalent today. Therefore we do not aim to make our students walking manuals of any language or package. Instead, they are given a strong foundation in computer science and problem-solving techniques, and are made adaptable to changes.

We believe that this approach to teaching-learning, coupled with practical experience gained during Industrial Training in reputed organizations, equips our students to handle the challenges posed by the software industry.

Dr. Namrata Tapaswi

Professor & Head CSE Department

Session 2015-16

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To the Readers

*In continuation of our endeavors to inform, educate as well as provide an opportunity to deserving people. This edition of Magazine '**Boot for Computer'** is the premier chronicler of computing technologies, covering the latest discoveries, innovations, and research that inspire and influence the field. Every year, we bring readers in-depth stories of emerging areas of computer science, new trends in IT, and practical research applications. Faculty and students choose this to debate technology implications, public policies, engineering challenges, and market trends.*

Besides that it doesn't forget its primary objective that is to promote computer science & engineering from its grass root levels. We hope that this edition would be enjoyable as well as informative.

Editors...

1. 4 CES surprises already teased for Android lovers

Raksha Chhirolya (0808CS121079)

As the end of December approaches, visions of sugar plums are dancing in Android fans' heads as they await the big event.

Not Christmas—we're talking about CES 2017. While there are more rumors than you can shake a stocking at, several companies have already begun to promote their upcoming announcements.

Also, T-Mobile has announced that its first Uncarrier event of 2017 (the 13th such announcement) will be held on the first day of CES this year.

In a short teaser video, CEO John Legere simply says, "You're going to love what's next," after dodging a barrage of customers seeking info. Previous Uncarrier events have brought free music and video streaming, carryover data, and, most recently, a stock ownership referral program.

Also on tap at CES is a slew of new phones from LG. While the company is still being tight-lipped about the follow-up to its flagship G5, it has already announced it will be bringing 4 new K-series handsets and the next-generation of its Stylo phablet to the big show.

And while HTC will certainly have some goodies to show off at CES, it's also planning a major announcement after the show. In a cryptic invitation to an event on Jan. 12, the company simply says it will be unveiling something "For U."

Set against a blue, cloud-swirled background, the white U mirrors the C in HTC's logo, which is turned on its side.

Why this matters: CES doesn't always deliver when it comes to products you can actually buy, but it's hard to not get wrapped up in the hype.

HTC's is particularly interesting in that it's coming after the event, but we'll be watching T-Mobile to see what goodies are in store for Android phones. And a new Tango phone is pretty exciting, too.

This story, "4 CES surprises already teased for Android lovers" was originally published by Greenbot.

2. Encrypted messaging app Signal uses Google to bypass censorship

Kartik Budholiya (0808CS121056)

Developers of the popular Signal secure messaging app have started to use Google's domain as a front to hide traffic to their service and to sidestep blocking attempts.

Bypassing online censorship in countries where internet access is controlled by the government can be very hard for users. It typically requires the use of virtual private networking (VPN) services or complex solutions like Tor, which can be banned too.

Open Whisper Systems, the company that develops Signal—a free, open-source app—faced this problem recently when access to its service started being censored in Egypt and the United Arab Emirates. Some users reported that VPNs, Apple's FaceTime and other voice-over-IP apps were also being blocked.

The solution from Signal's developers was to implement a censorship circumvention technique known as domain fronting that was described in a 2015 paper by researchers from University of California, Berkeley, the Brave New Software project and Psiphon.

The technique involves sending requests to a "front domain" and using the HTTP Host header to trigger a redirect to a different domain. If done over HTTPS, such redirection would be invisible to someone monitoring the traffic, because the HTTP Host header is sent after the HTTPS connection is negotiated and is therefore part of the encrypted traffic.

"In an HTTPS request, the destination domain name appears in three relevant places: in the DNS query, in the TLS Server Name Indication (SNI) extension and in the HTTP Host header," the researchers said in their paper. "Ordinarily, the same domain name appears in all three places. In a domain-fronted request, however, the DNS query and SNI carry one name (the "front domain"), while the HTTP Host header, hidden from the censor by HTTPS encryption, carries another (the covert, forbidden destination)."

Their research revealed that many cloud service providers and content delivery networks allow HTTP host header redirection, including Google, Amazon Cloudfront, Amazon S3, Azure, CloudFlare, Fastly and Akamai.

However, most of them only allow it for domains that belong to their customers,

so one must become a customer in order to use this technique.

Google, for example, allows redirection through the HTTP host header from google.com to appspot.com. This domain is used by Google App Engine, a service that allows users to create and host web applications on Google's cloud platform.

This means that someone can create a simple reflector script, host it on Google App Engine and then use the HTTP host header trick to hide its location from censors.

Someone monitoring user traffic will only see HTTPS requests going to www.google.com, but those requests will reach the reflector script on Google App Engine and will be forwarded to a hidden destination.

"With today's release, domain fronting is enabled for Signal users who have a phone number with a country code from Egypt or the UAE," Open Whisper Systems founder Moxie Marlinspike said Wednesday in a blog post. "When those users send a Signal message, it will look like a normal HTTPS request to www.google.com. To block Signal messages, these countries would also have to block all of google.com."

Even if the censors decide to ban Google, the domain fronting implementation can be expanded to use other large-scale services as domain fronts.

If this happens, enforcing a ban on Signal would be the equivalent of blocking a very large portion of the internet.

The anti-censorship feature is currently present in the latest version of Signal for Android. It's also included in a beta version of the app for iOS that will be released in production soon.

The developers also plan future improvements that will allow the app to detect censorship automatically and switch to domain fronting even if the user has a phone number from a country where censorship is not normally present.

This is intended to cover those cases where users travel to other countries where the app is blocked. Signal is considered by security experts as one of the most secure messaging services around.

It's open-source end-to-end encryption protocol has also been adopted by other popular chat apps like Facebook Messenger and WhatsApp.

While the communication between users is encrypted end-to-end, the Signal app uses servers for contact discovery and these can be blocked by censors to prevent users from using the app.

3. It's about time! Google to release a pair of Android Wear smartwatches in 2017

Samipya Nanavati (0808CS121087)

Major manufacturers like Moto and Huawei may be rethinking their wearable strategies, but Google isn't biding its time while they figure it out. In an exclusive interview with The Verge, Android Wear product manager Jeff Chang revealed that the company will release a pair of new flagship smartwatches in the new year, designed to take full advantage of Android Wear 2.0's new features.

Rumors have swirled for several months about a Pixel-branded smart watch, but these devices won't bear Google's name.

Like the Nexus phones of years past, the company that manufactures them gets the branding, though Chang declined to name the partner. He said the two companies worked closely together on production of the devices, but didn't reveal any specifics about the size or design of the two models.

Google plans to release a fifth and final developer preview of the OS in January, which will reportedly bring support for two main features, Android Pay and Google Assistant.

The fourth version of the preview landed last week, adding a single-click Google sign-in and a new system for on-device in-app purchases.

"This is a marathon, not a sprint.... This category of product is here with us to stay." — Android Wear product manager Jeff Chang

Since its unveiling at Google I/O in May, Android Wear 2.0 has seen delays that have pushed its release into 2017.

While most major manufacturers opted to hold off on the release of new watches this year, Chang revealed numerous models that are primed to receive the new update, including:

- Asus ZenWatch 2
- Asus ZenWatch 3
- Casio Smart Outdoor Watch
- Fossil Q Marshal
- Fossil Q Wander
- Huawei Watch
- Huawei Watch Ladies
- LG G Watch R
- LG Watch Urbane
- LG Watch Urbane 2nd Edition LTE
- Michael Kors Access Bradshaw
- Michael Kors Access Dylan
- Moto 360 Gen 2
- Moto 360 Sport
- Nixon Mission
- Polar M600
- Tag Heuer Connected

Chang told The Verge that Google remains "quite optimistic" about the future of Android Wear and said that other partners will be releasing new watches in the coming months. "This is a marathon, not a sprint," he said. "This category of product is here with us to stay."

Why this matters: With delays to Android Wear and no new flagship releases to speak of in 2016, it was starting to seem like Google was going to cede to Samsung and Apple in the smartwatch race.

However, Chang's comments inject a little excitement back into the Android wearables scene, and now we have something solid to look forward to in the new year.

This story, "It's about time! Google to release a pair of Android Wear smartwatches in 2017" was originally published by Greenbot.

4. No, AMD loyalists aren't abandoning Radeon graphics cards in droves

Tanu Jain (0808CS121109)

There's a reason why every news story you read at PCWorld includes a "Why this matters" or "The impact on you" paragraph: Context is important. Without proper context, news and numbers are just characters on a screen—and raw information without a wider look at what it *actually means* often results in misinterpretation and FUD.

Case in point: A recent post by Parsec, a cloud game streaming company, titled "The Loyalty To AMD's GPU Product Among AMD CPU Buyers Is Decreasing." Parsec pulls an abundance of data from PCPartPicker builds to show that AMD CPU sales have declined precipitously over the past six months, and the number of AMD CPU buyers who also bought Radeon graphics cards dropped as well.

Go ahead and read Parsec's post if you want to see the raw numbers. But you don't really need to, because while the raw numbers *may* suggest AMD loyalty is on the decline, crucial context that's lacking whatsoever from Parsec's article reveals that the supposed truth isn't quite so crystal clear.

Why this matters: You've been reading this, right?

Making numbers dance

First things first, because it needs to be mentioned: While PCPartPicker is a stellar resource for enthusiasts—the first suggestion in my How to avoid common PC building mistakes tutorial is "Use

PCPartPicker"—there's no proof that the builds created by its users result in actual sales, as Ben Funk pointed out to me on Twitter. Likewise, there's no evidence that PCPartPicker builds reflect actual PC sales trends. Anecdotally, I've found that many enthusiasts create PCPartPicker builds to plan out and share aspirational computers, the sort of fire-breathing beasts that spark fun conversations online but few people actually buy.

So the data Parsec's using is *far* from scientific.

That said, I'm totally OK with the methodology! Diving into PCPartPicker builds for hardware data is an intriguing idea…as long as you mention those caveats in your findings (which Parsec doesn't) and use the data as a rough guideline bolstered by additional information and context, rather than trying to identify hard truths from it (again, which Parsec doesn't do). But forget about all that boring number stuff (at least until I use Parsec's own data at the end to completely dismiss the premise of its article). Two phrases that you'll see endlessly repeated among the AMD faithful provide far more insight into the situation than all of Parsec's data: "Wait for Zen" and "Wait for Vega." Those names don't appear in Parsec's article even once.

Context! AMD shows how Zen—now renamed Ryzen—is its best chip family in a decade

Zen (now Ryzen) and Vega are major next-gen overhauls for AMD's processors and enthusiast-class graphics cards, respectively—the sort of releases that AMD loyalists would wait for, rather than pulling the trigger early and building a PC now. AMD's current CPU lineup is *years* old and doesn't really hang with Intel's Core processors. Ryzen's due in the first quarter of 2017. No wonder AMD CPU sales have plunged! While FX chips can still game, they're not chips that the people that buy graphics cards are planning around right now.

5. HyperX Cloud Stinger review: Solid entry-level audio is cheaper than ever

Lokesh Mandloi (0808CS121060)

HyperX first made a name for itself back in 2014 with the release of its Cloud headset. Featuring clean audio and an incredible level of comfort for a street price of $80, we've been recommending the Cloud ever since. It's an excellent entry-level headset, with superb craftsmanship that you wouldn't expect given its low price.

But a new contender has appeared to vie for its position as the top affordable headset—and the surprising part is that this one's also made by HyperX.

A cheaper Cloud

With a list price of $50, the Cloud Stinger is one of the most budget-friendly gaming headsets you're liable to find—at least as far as reputable, name-brand companies are concerned. (If you didn't already know, HyperX is run by Kingston.)

Of course, that price tag does mean some cut corners. Build quality is where you'll feel it most: The chassis is constructed almost entirely from cheap-feeling plastic, though a strip of metal still runs through the headband. Overall, this headset feels durable enough to survive normal use—e.g., tossed into a backpack, dropped onto a desk, and all the usual battle scars headsets sustain—but you won't pick up the Cloud Stinger and mistake it for anything more than a budget headset.

HyperX does a good job emulating the *look* of a higher-end device, though. In jet black with the trademark red logo on each earcup, the Cloud Stinger doesn't look much different than its pricier siblings.

Nor does it sacrifice HyperX's reputation for comfort. Most budget headsets sit on the head with all the grace of a falling anvil, but not the Cloud Stinger. It can be a bit tight on the jaw, especially straight out of the box, but tends to loosen up after a few days of use and eventually hits that "I forgot it was on my head" stage. Both the headband and earcups are padded generously, and the faux-leather covering breathes a surprising amount. Only rarely did I find myself with the dreaded Sweaty Ears Syndrome.

Best of all: A volume slider comes embedded on the bottom of the right earcup. The lack of competent in-line or on-headset controls has been one of my major complaints with HyperX's offerings up to now, but the Cloud Stinger finally takes the leap into modern convenience. The slider doesn't have much range—I'd prefer a wheel, personally—but it's a start. (Now if only we could get it retroactively added to the original Cloud design.)

The microphone controls also get an upgrade, ditching the finicky in-line controls for a simple flip-to-mute. Microphone's up? You're muted. Down, and you're ready to talk. It's the same system you'll find on the $300 Astro A50, though the downside is that the Cloud Stinger's microphone is firmly attached to the left side. Previous HyperX headsets all came with detachable microphones and could potentially double as flashy black-and-red headphones if necessary, but this a *gaming headset*.

Bronze medal for audio

Of course, the most important question is how much *sound* can you get for $50?

The Cloud Stinger ain't half bad. Sure, it's a budget headset. Don't expect to get the same audio from the Cloud Stinger as Logitech's G933, the aforementioned A50, or a high-end pair of headphones.

The Cloud Stinger does a decent job, though. Most of its punch comes from the midrange, so maybe 80 percent of any given game (or film or music) comes through sounding clear and clean. And for a headset of this size, you get a surprising amount of stereo width. With music playing, you can easily pinpoint where each instrument resides in the mix—something you can't do with most budget headsets. You get a similar positive experience in games when it comes to pinpointing enemies or the direction of incoming gunshots.

It's that 20 percent that might bother more discerning listeners. While most gaming headsets lean on the low end to cover up imperfections, the Cloud Stinger doesn't pack much bass at all. At quieter volumes the mix sounds okay, like a flat-response set of studio headphones, but at higher volumes there's just no *oomph* to anything. Explosions sound somewhat neutered, as does the rumble of a passing tank, a growling monster, or what have you.

The same is true of the extreme treble range—maybe that top 10 percent. Cymbal crashes get drowned out, gunshots lose some of their sharp *crack*, and you miss some of the subtler textures. If you test the Cloud Stinger and think it feels a bit lifeless compared to other headsets/headphones, the lack of bass and treble is probably why.

However, these are audiophile complaints about a $50 headset. If you're only willing to spend $50 on a headset, the Cloud Stinger is a damn fine option. It's better than any similarly priced competitor I've tested, and compares favorably to $50 headphones—with a microphone thrown in, to boot.

6. Advanced 3D NAND is ready to dominate SSDs, kill off traditional flash chips

Sumit Bhonsle (0808CS121106)

Three dimensional NAND (3D NAND) is expected to dominate the solid-state drive (SSD) industry beginning next year, as suppliers reduce their shipments of flash storage based on traditional 2D or planar NAND, according to a new report.

According to DRAMeXchange's latest forecast, NAND flash manufacturers are focusing their efforts on converting fabrication plants to 3D NAND, which is

denser, faster and less expensive to produce than traditional 2D NAND. DRAMeXchange forecasts that the market supply of 2D NAND flash will begin to fall sharply in the first quarter. By the third quarter of 2017, the share of 2D NAND in the industry's total bit shipments will be under 50%.

"Since the second quarter of 2016, suppliers have sped up their respective 3D NAND development process," Sean Yang, research director of DRAMeXchange, said in a statement. "By the end of this year, 3D NAND is estimated to represent about 30% of the total flash bit shipments."

However, the NAND flash industry's wafer capacity is projected to increase by a marginal annual rate of 6% in 2017. That's because as the pace of the industry-wide transition to 3D NAND architecture accelerates, supply of 2D NAND memory will drop sharply, leading to shortages next year, Yang noted.

Because of the dearth of NAND flash wafers, DRAMeXchange expects prices to rise next year. At the same time, SSD demand worldwide is projected to soar by 60% in 2017 compared to 2016, DRAMeXchange stated, even as many flash memory suppliers are still getting mass production of 3D NAND memory up to speed. Many flash manufacturers are focusing on next-generation, 64-layer 3D NAND.

"Until the industry in general is able to apply 64-layer 3D NAND solutions to [SSD] storage products, the market supply for 3D NAND memory will remain tight," DRAMeXchange's report stated. "In the meantime, NAND flash prices will continue to go up and boost suppliers' revenues."

For example, Western Digital (WD) has begun manufacturing the third generation of its 3D NAND flash chips, which increases the number of layers from 48 to 64 and will allow it to double capacity.

Pilot production of the new 64-layer chips has already started in WD's Yokkaichi, Japan joint venture fabrication plant. Initial shipments are expected in the fourth quarter of this year with "meaningful commercial volumes" beginning in the first half of 2017.

In 2015, SanDisk and technology partner Toshiba announced they were manufacturing the world's first 48-layer 3D NAND product using BiCS (Bit-Cost Scalable) technology. That BiCS NAND flash chip offered 256Gbit (32GB) of capacity and stored 3-bits-per-cell (transistor). The latest iteration of the technology is called BiCS3. According to Toshiba, the new 64-layer 3D NAND flash chips have 40% more potential capacity over the previous BiCS2 technology.

7. Honda hopes to collaborate with Google's Waymo on self-driving cars

Aditi Mantri

Honda Motor's research and development subsidiary is in talks to integrate Waymo's self-driving technology with its vehicles, suggesting that working with car makers as a technology partner is key on the agenda of Alphabet's autonomous car unit.

Collaboration between the two companies will focus on the integration of Waymo's fully self-driving sensors, software and computing platform into Honda vehicles, the car maker said Wednesday. The Waymo tie-up will "allow Honda R&D to explore a different technological approach to bring fully self-driving technology to market," alongside its own ongoing efforts.

"I think these kind of deals between tech and auto giants like Waymo and Honda make sense given the sheer investment required to effectively deliver a fully autonomous car," said Patrick Moorhead, president and principal analyst at Moor Insights & Strategy. "I would expect Apple to participate in a similar manner where they're not delivering the entire car, but the electronics."

Alphabet spun out its self-driving car project into a separate business earlier this month with a mission "to make it safe and easy for people and things to move around."

Honda, which aims to put production vehicles with automated driving capabilities on highways sometime around 2020, said that if there is an agreement between the two companies, Honda R&D engineers in Silicon Valley, California, and Tochigi, Japan, would work closely with Waymo engineers based in Mountain View, California, and Novi, Michigan.

Honda could also start its collaboration by initially supplying to Waymo some of its vehicles that are modified for integration of the self-driving technology from the Alphabet unit. These vehicles would join Waymo's existing fleet, which are currently being tested in four U.S. cities, Honda said.

Fiat Chrysler Automobiles announced recently that it had produced 100 Chrysler Pacifica Hybrid minivans that are currently being outfitted with Waymo's fully self-driving technology, including a purpose-built computer and a suite of sensors, telematics and other systems.

The minivans will join Waymo's self-driving test fleet in early 2017. The

companies had announced the deal in May but it isn't clear yet whether FCA will integrate Waymo technologies into its vehicles for sale in the long term, though it could be an offshoot of the collaboration. Google did not immediately comment on the discussions with Honda.

8. 4 easy Linux projects for newbies and intermediate users

Vartika Srivastava (0808CS121112)

It's nearing the end of the year, and most people are busy finishing up the last week's worth of work, and students are finishing up finals. For me, the last week and a half of December is usually a time to catch up on sleep, and take it easy. But an endless flow of cookies and Netflix can get tiresome.

Even if the end of the year is full of family commitments, dinners, and last-minute oh-geez-what-do-I-buy-my-brother-in-law shopping, a small project that doesn't take too long can be rewarding, and may yield future benefits. Here are a few ideas that shouldn't take more than a few hours.

1. Try a new Linux distro

A lot of Linux users love the OS because of the level of customization it allows. Once everything is set up just right, workflows can be quicker, and computing can be more personal and enjoyable. But sometimes it's good to step out of your comfort zone.

Trying a new distribution might be trivial to some, but to others it might be like trying sushi when your favorite food is pizza. It can feel strange. You might not like it, but who knows? Maybe you'll fall in love all over again.

If you've never tried running a Linux operating system, this is a great time to dip your toes in the water. Total novices might want to try Fedora 25 because of the ease of writing the image to a USB stick. Canonical's Ubuntu 16.04 is also a good toe-dipper. Both operating systems can run "live" on a USB drive (meaning you don't have to go full-bore and nuke Windows if you're just looking to test drive).

For users who have been running Fedora or a flavor of Ubuntu for a while and feel like they have it down, playing with Gentoo or Arch Linux will present a bit more challenge when it comes to setup, but will offer a great learning experience.

2. Create an OpenPGP keypair

Creating an OpenPGP keypair is a great way to learn how public-key encryption tools work. Some Linux distributions come with GnuPG (called **gpg**)

preinstalled, since the OS needs it to verify the signatures of packages.

Creating a keypair in Linux is pretty easy, and can be accomplished by running **gpg —gen-key** in a terminal window. The Fedora Wiki has a great tutorial on creating keys in KDE, GNOME, and through the command line. If you're using Windows, you can use GPG4Win to create keys.

While OpenPGP is far from perfect—most people don't want to encrypt stuff from the command line, and a lot of desktop applications feel clunky—it's still worth learning. For now, OpenPGP is one of the strongest encryption tools out there.

If you're going to create keys for messing around, a key with the default depth of 2,048 bits is just fine. I prefer 4,096-bit keys for my real-world keypair. It's also a good idea to create a revocation certificate (to tell the world if your keys are obsolete or stolen), and to have a safe backup (as in not on your PC or phone) of your private key. And finally, always try to create keys on your PC instead of a phone or tablet.

3. Create a backup scheme

Like saving for retirement, the best time to start backing up is yesterday. The second-best time to start backing up is now. I speak from personal experience: I once had to pay about $1,000 to recover a hard drive full of photographs that spanned eight years.

Some backup services can back up your files automatically, but you can make local backups using Linux programs like **rsync**. Rsync is a bit like a smarter copy command, in that it only copies over files that have changed. If you couple **rsync** with compression via **tar** and schedule it using the **crontab**, you can have automatic backups sent to your network attached storage (NAS) or remote server through SSH.

A new hard drive (used just for backups) or a cloud service might feel a bit pricey, but weigh that cost against your grief should the 3-year-old hard drive you've got your life on fails.

4. Build a NAS

Speaking of network storage, I'm a firm believer that everyone should have a NAS. You can think of your NAS as your own private cloud for your home. The thing is, NAS devices can be expensive, but not everyone needs an eight-drive hulking machine humming away in the closet. Luckily, it's easy to make one out of an old PC and a new hard drive or two.

The FreeBSD-based FreeNAS is a popular choice for home NAS machines. FreeNAS is pretty easy to set up, and can be run from a USB thumb drive so that the PC's hard drives can be used for storage only.

A popular Linux-based option is OpenMediaVault. Like FreeNAS, OMV has a plugin system that allows you to install different software

applications like the Emby media server. You can also install the containerization plugin Docker on an OMV server. Used in conjunction with the personal cloud software Nextcloud, Docker would make it possible to access your files remotely as easily as you would with Dropbox or Google Drive.

If you're feeling up to the task, you can try doing all this yourself by setting up an Ubuntu or Fedora server, and using Docker to install the applications (like Nextcloud) that you need.

None of these projects should take very long, and they'll have some benefit down the road. If you've got a spare evening, it's worth taking some time to learn something new about Linux.

9. Despite big data, Alibaba's Taobao back in US blacklist

Suyash Heda (0808CS121108)

Alibaba's Taobao.com marketplace is in the eye of a storm after the U.S. Trade Representative included the vastly popular online Chinese marketplace in the list of 'Notorious Markets' for 2016, after a long break.

The list identifies markets that are allegedly "engaging in and facilitating substantial copyright piracy and trademark counterfeiting." The listing carries no penalties but will likely be an embarrassment for Alibaba, which has been trying to burnish its image in international markets.

The move by the USTR comes even as the company claims to have used "big data" technologies to zero in, for example, on 13 factories and shops that were selling knockoff RAM modules under Kingston and Samsung brands, according to Alibaba's news hub Alizila.

Its counterfeit goods monitoring and identification algorithm, for example, monitors about 100 dimensional characteristics, ranging from price to the online shops decorations, transaction records, product-release pattern and consumer complaints. Merchants and goods are rated on a 0 to 100 scale, with 80 usually treated as a red flag.

Another system scrutinizes accounts, products and transactions for 600 different indicators, focusing on seller behavior, product information, consumer reviews and user reports, according to Alizila. The company also uses optical character recognition and the scanning and analysis of images and logos for suspicious listings.

The USTR charges that right holders in the U.S. and internationally "continue to report serious challenges to reducing high levels of counterfeit and pirated goods on Taobao." Initial attempts to report intellectual property rights infringement are refused inconsistently and refusals of take-down requests contain little to no justification or guidance on how the right holder can amend its notification to get results. Small businesses do not benefit from a program extended to larger right holders.

The right holders have also complained that error messages stall or prevent use of IP complaint systems and relevant communications to the right holders are not translated from Chinese. Right holders are prevented from directly communicating with Taobao resellers by broken hyperlinks, according to the USTR report.

As a result, one large motor vehicle manufacturer, for example, reported that at least 95 percent of the merchandise with the company's brand names and trademarks on Alibaba platforms is suspected to be counterfeit.

The Chinese giant has given the development a political twist, with Alibaba Group President Michael Evans claiming that the USTR's decision leads the company "to question whether the USTR acted based on the actual facts or was influenced by the current political climate."

Evans claims that in 2016 alone, Alibaba doubled over 2015 the number of infringing product listings it proactively removed from its site. "It is therefore unreasonable for the USTR to have concluded that Alibaba is less effective in anti-counterfeiting than when it reviewed our efforts in 2015 and when it removed us from its list four years ago," he said in a statement Wednesday.

10. ADUPS Android Malware Infects Barnes & Noble

Farhan Khan (0808CS121040)

ADUPS is an Android "firmware provisioning" company based out of Shanghai, China. The software specializes both in Big Data collection of Android usage, and hostile app installation and/or firmware control. Google has blacklisted the ADUPS agent in its Android Compatibility Test Suite (CTS).

ADUPS recently compromised many BLU-phone models and was found to be directly transmitting call logs, SMS, contacts, location info, nd more from handsets within the US to Chinese servers using DES (weak) encryption.

The latest tablet from Barnes & Noble, the newly-released $49 BNTV450, has been found to include ADUPS. In the aftermath of the BLU data theft, ADUPS hostile data collection and control over Android may (or may not) be temporarily quelled, but harmful capability remains with the ADUPS agent.

Devices running ADUPS should be considered under malicious control, and they should not be used with sensitive data of any kind.

ADUPS APK

The extent of the ADUPS BLU data theft was discovered and documented by Kryptowire, who learned that the ADUPS agent was capable of:

- SMS Recording
- SMS Transmission
- IMEI Exfilration
- IMSI (Transmission)
- Call Log Transmission
- Call Contact Information Transmission
- Location Collection and Transmission
- Command Injection
- Remote User Application Update
- Remote User Application Install
- Transmit List of Installed Applications
- Transmit order of application execution
- Programmatic Firmware Update
- Remote Execution and Privilege Escalation (without user notification or request)
- IP Address (Transmission)
- Name (*for contacts)

Significant subsets of this capability were exercised on individuals within the Unitied States, which was escalated to the Department of Homeland Security.

A class action lawsuit investigation was launched against BLU by The Rosen Law Firm of New York, which is collecting class members and information for a damages assessment.

11. Permabit Technology Corporation's Albireo VDO for Ubuntu Server

Shreyas Duraphe(0808cs121098)

In perfect alignment with its self-described identity as "the data reduction expert", Permabit Technology Corporation recently announced availability of its Albireo Virtual Data Optimizer (VDO) 6 for Canonical's Ubuntu Server. VDO data reduction enables enterprise hybrid cloud data centers and cloud service providers to reduce their storage footprint, increase data density and avoid costly data-center expansions, resulting in "massive savings on data-center investment".

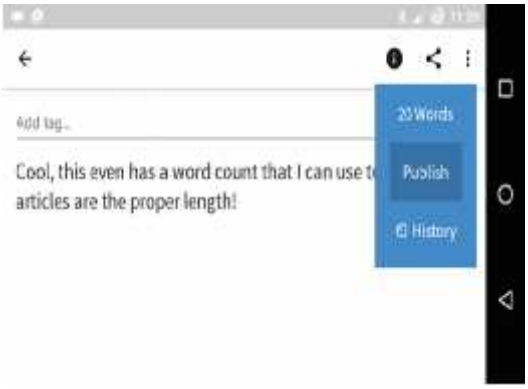
Permabit says its move to Ubuntu Server 14.04 LTS—and imminently 16.04 LTS, as well—is the only modular data reduction solution available for the Linux block storage stack. The move occurred due to Ubuntu's place in the forefront of large cloud infrastructure deployments and its deep involvement in the OpenStack project. VDO leverages Permabit's patented deduplication, HIOPS Compression and thin provisioning technologies.

12. Android Candy: Teach an Android to Take Notes

Yash Raghuvanshi (0808CS121120)

A few months ago I tried out the recently open-sourced Simplenote application from the folks at Automattic. One of the other fairly new additions to their cross-platform note-syncing platform is that an Android app is available for free in the Google Play Store.

The Android app does pretty much all the same things the desktop or web-based app does, and it syncs between devices automatically. With many "syncing" apps, I find it frustrating that the syncing isn't reliable or consistent. I have to admit, this one seems pretty solid. Perhaps it's because it does text and only text—I'm not sure.



To be completely honest, Simplenote doesn't do nearly as many things as Evernote does; however, that seems to be by design. It is a "simple note" program, and it handles simple notes extremely well. Along with syncing to other devices, it also allows you to publish notes publicly on the web so others can see them (here's an example). On top of that, it allows you to share notes between a group of users simply by tagging the note with their email addresses.

Simplenote may not be as robust as Evernote, but what it does with text is amazing. From my limited experience with it, it's also fairly reliable. If you're not using Simplenote for taking simple notes, you should give it a try. Just search for Simplenote in the Google Play Store. It's from the folks at Automattic, the same company responsible for WordPress.

13. Transitioning to Python 3

Mansi Jaiswal (0808CS12065)

The Python language, which is not new but continues to gain momentum and users as if it were, has changed remarkably little since it first was released. I don't mean to say that Python hasn't changed; it has grown, gaining functionality and speed, and it's now a hot language in a variety of domains, from data science to test automation to education. But, those who last used Python 15 or 20 years ago would feel that the latest versions of the language are a natural extension and evolution of what they already know.

At the same time, changes to the language—and particularly changes made in Python 3.x—mean that Python 2 programs won't run unmodified in Python 3. This is a known issue, and it was part of the process that Python's BDFL (Benevolent Dictator for Life)

Guido van Rossum announced back when the "Python 3000" project was launched years ago. Guido expected it would take time for organizations to move from Python 2 to Python 3, but he also felt that the improvements to the language were necessary.

The good news is that Python 3, which at the time of this writing exists in version 3.5, is indeed better than Python 2. The bad news is that there still are a lot of companies (including many of my training and consulting clients) that still use Python 2.

Why don't they just upgrade? For the most part, it's because the time and effort needed to do so aren't seen as a worthwhile investment of developer resources. Most differences between Python 2 and 3 are easily expressed and understood by people, but the upgrades aren't completely automatic. Moving a large code base from Python 2 to 3 might take days, but it also might take weeks or months.

That said, companies will soon be forced to upgrade, because as of the year 2020, there will be no more support for Python 2. That's a risk many companies aren't going to want to take.

If you have to upgrade, but can't upgrade, that puts you in a terrible spot. However, there is another option: upgrade incrementally, modifying just 1–2 files each week so that they work with both Python 2 and 3. After a number of months of such incremental changes, you'll be able to switch completely to Python 3 with relatively little investment.

How can you make your code compatible with both? In this article, I provide a number of suggestions on how to do this, using both an understanding of Python 3's changes and the tools that have been developed to make this transition easier. Don't wait until 2019 to start making these changes; if you're a Python developer, you already (in mid-2016) should be thinking about how to change your code to be Python 3-compatible.

What Has Changed?

The first thing to ask is this: what exactly changed in Python 3? And, how easily can you move from Python 2 to Python 3? Or, how can you modify your Python 2 programs so they'll continue to work in Python 2, but then also work unmodified in Python 3? This last question is probably the most important one for my clients, and possibly for your business as well, during this transition period.

On the face of things, not very much actually changed in Python 3. It's a cleaner, more efficient and modern language that works like more modern Python developers want and expect. Things that Python developers were doing for years, but that weren't defaults in the language, are now indeed defaults. Sure, there are things I'm still getting used to after years of bad habits, such as failing to use parentheses around the

arguments passed to print, but on the whole, the language has stayed the same.

However, this doesn't mean that nothing has changed or that you can get away with not changing your code.

For example, you almost certainly never wanted to use Python 2's input built-in function to get user input. Rather, you wanted to use the raw input built-in function. So in Python 3, there is no equivalent to Python 2's input; the Python 3 input function is the same as Python 2's raw input.

A more profound change is the switch in the behavior of strings. No longer do strings contain bytes; now they contain Unicode characters, encoded using UTF-8. If 100% of your work uses ASCII, you're in luck; nothing in your programs will really need to change. But if you use non-ASCII characters, and if you do so in the same program as you work with the contents of binary files, you'll have to make some adjustments. Python 2's str class is now a bytes class, and Python 2's Unicode class is now the stir class.

14. Red Hat Open Stack Platform

Shruti Sharma

The adoption of OpenStack in production environments has burgeoned, necessitating increased requirements for enhanced management and seamlessly integrated enterprise capabilities.

Numerous enterprises worldwide rely on Red Hat's offerings in the OpenStack space—that is, Red Hat OpenStack Platform, a highly scalable, open Infrastructure-as-a-Service (IaaS) platform designed to deploy, scale and manage private cloud, public cloud and Network Functions Virtualization (NFV) environments.

The updated Red Hat OpenStack Platform 9, based on the "Mitaka" release from the upstream OpenStack community, brings technical updates across the board, encompassing nearly all of the major OpenStack projects, and features integrated management for OpenStack through Red Hat CloudForms. Red Hat OpenStack Platform 9 builds on the proven, trusted foundation of Red Hat Enterprise Linux to provide critical dependencies needed in production OpenStack environments centered on service functionality, third-party drivers, and system performance and security.

Programme Education Objectives

The educational objectives of the Computer Science & Engineering programs are as follows:

1. To prepare students for successful careers in software industry that meet the needs of Indian and multinational companies.
2. To develop the skills among students to analyze real world problem & implement with computer engineering solution and in multidisciplinary projects
3. To provide students with solid foundation in mathematical, scientific and engineering fundamentals to solve engineering problems and required also to pursue higher studies.
4. To develop the ability to work with the core competence of computer science & engineering i.e. software engineering, hardware structure & networking concepts so that one can find feasible solution to real world problems
5. To inseminate in students professional and ethical attitude, effective communication skills, team work skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context.
6. To motivate students perseverance for lifelong learning and to introduce them to professional ethics and codes of professional practice

Programme Outcomes

An engineering program defines a set of specific program outcomes that relate to its educational objectives, including the items a-k listed below. We regularly review the courses in our curriculum to make sure that all these items are covered, and try to measure whether our students are successfully attaining the following goals:

a. Graduates will demonstrate knowledge of mathematics, science and allied engineering in computer science & engineering.

b. Graduates will demonstrate ability to analysis, design and implement the problems as per user requirements and specification.

c. Graduates will possess strong fundamental concepts on database technologies, operating system, compiler design, networking, data structure, software engineering.

d. Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

e. Graduates will demonstrate and ability to visualize and work on laboratory and multidisciplinary tasks.

f. Graduates will demonstrate skills to use modern engineering tools, softwares and equipment to analyze problems.

g. Graduates will posses leadership and management skills with best professional ethical practices.

h. Graduates will be able to communicate effectively in both verbal and written form.

i. Graduates will have the confidence to apply computer science and engineering solution for the welfare of human being.

j. Graduates will enhance their self confidence and capable of being a kaizen.

k. Graduates can participate and succeed in competition examination like GATE, GRE, IES etc.

Departmental Information

Name and address of the department:

Department of Computer Science & Engineering
Institute of Engineering and Science, IPS Academy
Knowledge Village
Rajendra Nagar, A.B.Road, Indore (M.P) PIN-452012

Head of the Department

Dr. Namrata Tapaswi
HOD, Computer Science & Engineering
Phone: 0731- 4014853
e-mail: hod.compsc@ipsacademy.org

History of the department:

The Department of Computer Science & Engineering was established in the year 1999 offering Bachelor of Engineering (BE) with intake 60, it was increased to 120 in year 2012 and again intake was increased to 180 in year 2014. The programme is intended to educate students on the applications of scientific knowledge for practical purposes involving activities like modeling, analysis, design and other associated fields of core courses in Computer Science & Engineering education. It intends to equip graduates with profound theoretical knowledge and rich hands on experience.

Vision & Mission of the Department

Vision

Attaining global recognition in computer science and engineering education, research and training to meet the growing needs of the industry and society

Mission

Provide quality undergraduate and postgraduate education, in both the theoretical and applied foundations of computer science, and train students to effectively apply this education to solve real-world problems, thus amplifying their potential for lifelong high-quality careers.

Department Faculty Details

 Dr. Namrata Tapaswi HOD & Professor	 Mr. Jayesh Gangarade Associate Professor	 Mr. Arvind Upadhyay Associate Professor	 Mr.Neeraj Shrivastava Associate Professor
 Mr. Sunil Nimawat Assistant Professor	 Mr. Deepak Shukla Assistant Professor	 Ms. Nisha Bhalse Assistant Professor	 Mr. Yagyapal Yadav Assistant Professor
 Mr. Neeraj Mehta Assistant Professor	 Mr. Anil Panwar Assistant Professor	 Ms. Barkha Sahu Assistant Professor	 Mr. Sourabh Jain Assistant Professor
 Ms. Shruti Sharma Assistant Professor	 Ms. Shweta Gangrade Assistant Professor	 Mr.Vijay Choudhary Assistant Professor	 Mr.Ved K Gupta Assistant Professor

 Ms.Anjali Verma Assistant Professor	 Ms.Vaishali Gupta Assistant Professor	 Ms. Nitu Mathuriya Assistant Professor	 Mr. Ankur Ratmele Assistant Professor
 Mr.Sudhir K Patidar Assistant Professor	 Mr.Pratik Jain Assistant Professor	 Mr. Pankaj Pateriya Assistant Professor	 Mr. Prateek Nahar Assistant Professor
 Ms. Purnima Pandey Assistant Professor	 Ms. Priyanka Vijayvargiya Assistant Professor	 Ms. Ritu maheshwari Assistant Professor	 Ms.Shaba P Khan Assistant Professor
 Mr. Abhaydeep Seth Assistant Professor	 Ms. Neha yadav Research Associate	 Mr. Dharmendra Choukse Sr. Programmer	

Department Event

Four faculty development programs were organized in which two days program on Advanced JAVA technology in the month of July 2015, two days program on Hybrid Technology in the month of July 2015, one day program on Cloud Computing Technology in the month of July 2015 & one week program on Android Application Development in the month of March 2016.

One day Seminar on Cyber Security & Ethical Hacking in the month of March 2016.

20 different Workshops were organized on different topics covering Cyber Security, JAVA, C/C++, LINUX, Microsoft Azure Camp, MS Office, Python, Cloud Computing & Security, Basic Computer Skills, Netbeans, Android, Introduction to design of algorithm.

Four expert lectures were organized in which one day program on Research Methodology by Ms. Ruchi Vijayvergiya in the month of August 2015, one day program on Core JAVA by Mr. Ankit Tiwari, NIIT Indore in the month of September 2015, one day program on JAVA Technologies by Mr. Vibhor Patidar in the month of February 2016, one day program on Games Development by Mr. Abhishek Jain in the month of September 2014.

One Industrial Visit program was organized by Live Projects Demostration in the month of August 2016.

17 Training programs were organized Advanced JAVA , Hybrid Technology, PhpMySql, C & CPP, Firefox, Scilab, Advance C, Ubuntu, JAVA, Advance CPP, Libre Office, Latex.

2 Other Events were organized in which one day program on Cloud Computing Technology in the month of July 2015, eight days program on UMANG 2015in the month of August 2015.

Department Membership

Department of Computer science & engineering is having the membership of Computer society of India (CSI). Three programs were organized under the banner of CSI in which one week program on Android Application Development by Mr. Shivanand Gautam, Director & Sr. Programmer "Concept Solutions" Indore in the month of March 2016, one week program on Python by Mr. Shivanand Gautam, Director & Sr. Programmer "Concept Solutions" Indore in the month of March 2016, one day program on Technical quiz by Department Level in the month of August 2015.

Placements

Students were placed in top companies in the year 2015. 17 Students got placed in Tata Consultancy Services(TCS), 2 students in Canopus Info Systems P.Ltd., 2 students in Borm Bruckmeire, 2 students in Hotwax Media, 2 students in Yash Technologies and one student each in Xoriant Solutions Pvt. Ltd., XL Dynamics India Pvt.Ltd., Systango, HSBC.

Sports Activities

Students had received winner & runner up awards in different sports activities (IPSA Level) were Cricket Competition(Boys), Basketball(Boys), Volleyball(Girls), Shotput(Boys & Girls), Table Tennis(Boys), Chess(Boys & Girls), Carrom(Boys & Girls).

Social Activities

World Literacy Day

Department of Computer Science & Engineering, IES IPS Academy Indore celebrated "World Computer Literacy Day" on 02nd December 2015. On this occasion department organized one day awareness camp and Basic Computer Skills training under the banner of Spoken Tutrial IIT Bombay for the students of Jeevan Jyoti Higher Secondary School, Shramik Colony Rau, Indore.

Number of students who actively participated in the above event were 62.

Glimpses of the event are:

Faculty Members Achievements

In the department, Papers published in Journals were nine in numbers. Journals are International Journal of Advance Research In Science And Engineering, International Journal of Software & Hardware Research in engineering, IJRCEE, International Research journal of engineering and technology, Springer, International journal of engineering science and management, IJSET, IJSER, IJERGS, IJTRA, IJARCCE, IJECS, IJCSIT, IJCEM, International journal of emerging trends in science and technology, by the faculty was 18, Paper Presented in Seminar/Conference organized by Conference on social ethics of technology & business in entrepreneurship management, 15th International business horizon-INBUSH ERA 2015 International conference on futuristic trends in computational analysis and knowledge management, Eleventh IRF International Conference, IEEE international conference computer communication centre MGI indore, ACM, IEEE Xplore.

Five seminars/conferences were conducted on different areas under Conference on social ethics of technology & business in entrepreneurship management, 15th International business horizon-INBUSH ERA 2015 International conference on futuristic trends in computational analysis and knowledge management, Eleventh IRF International Conference, IEEE international conference computer communication centre MGI indore, IEEE international conference computer communication centre MGI indore, ACM & IEEE.

Highlighed topics were Women empowerment and entrepreneurship through decision making, Design and development of rule based inflectional and derivational Urdu stemmer"Usal", Identifying the problem & solution of false positive, An Enhanced framework of genomics using big data computing, Supervised Classification of dermoscopic images using optimized fuzzy clustering based multi layer feed forward neural network, Analysis and performance improvement of k-means clustering in Big data environment, Optimization of C5.0 classifier using Bayesian Theory IC4 2015 & POS Tagger for under using stochastic approaches.

Eleven Expert Lectures were delivered by Faculties in Seminars and Workshop on Basic Computer Skills, Women Entrepreneurship, IPR, Cloud Computing & Security, Power Point, MS Word, MS Excel, Computer Fundamentals, MS Office.

Ten Seminars & Workshops were attended by the faculty members on different topics like Cyber Security, Cloud Computing & Security, Programming Fundamentals, Introduction to design of algorithm, Impact of cloud technology in education, MATLAB & simulink for engineering education, Introduction to robotics, Wiley Research Connect, Power Point, MS Word, MS Excel.

Eleven SDPs/FDPs were attended by the faculty member on the topic Netbeans, JAVA, Introduction to research methodology, Cloud Competency Centre, Entrepreneurship, Android, Android Application Development, Cloud Computing Technology, Advanced JAVA, Hybrid Technology.

Student Achievements

Nine different Academic Awards: winner & runner up awards in events like Paper Presentation, “UDAAN2015” Minor Competition Cum Exhibition, “UDAAN2015” Major Project Competition Cum Exhibition, Technical Quiz, Texas Instruments India Analog Campaign 2015.

Papers published in Journals were nineteen in numbers. Journals are International Journal of Software & Hardware Research in engineering, International Research journal of engineering and technology, International journal of engineering science and management, IJRCEE, IJDACR, IJERGS, IJTRA, IJSER, IJARCCE, IJECS, IJCSIT, IRCEE, Global Journal of Computer Science & Technology, IJCEM, International journal of emerging trends in science and technology.

Five Paper were presented in Seminar like Identifying the problem & solution of false positive, An Enhanced framework of genomics using big data computing, Optimization of C5.0 classifier using Bayesian Theory IC4 2015, Analysis and performance improvement of k-means clustering in Big data environment, Social network comment classification using fuzzy based classifier techniques.

Fifty Three Workshops/Seminars were attended on topic like Microsoft Azure, Core JAVA, Live Projects Demonstration, Research Methodology, Hybrid Technology, Cloud Computing Technology, Netbeans, Android, Cloud Infrastructure Services, ISM, Programming Fundamentals, Cloud Computing & Security, LINUX, Data Communication, JAVA, Introduction to research methodology, Database Fundamentals, HADOOP, Cloud Computing, Cyber Security, Advanced JAVA & Android, Advanced JAVA, Cloud Computing Technology, Research Methodology, Live Projects Demonstration, Games Development, JAVA Technologies, Microsoft Azure Camp, Cyber Security & Ethical Hacking, Python, Android Application Development, PhpMySql, C & CPP, FireFox, Scilab, Advance C, Ubuntu, Advance CPP, Libre Office, Latex.