AITS/UIT Newsletter

Enjoy this brain teaser ☺

After a traumatic experience, Jackson opened his eyes in a hospital. He did not know who he was or what his name is. There were people there calling themselves his family but he did not recognize any of them. Although things were never the same for him he adjusted to a new life. He never remembered his life from before and never talked about it.

What had happened to Jackson?

HINT: *Jackson wasn't in an accident, didn't suffer from an injury, and did not have amnesia*

My Remarkable Groups
[Abraham John, Executive Director, AITS/UIT]

In this final newsletter of a challenging year, I want to draw attention to two remarkable groups at UNT that go about quietly fulfilling their respective roles within the organization and in doing so day in and day out add to the efforts of all the other Divisions and Departments in advancing our University's initiatives and goals to a successful conclusion.

I am referring to the Administrative Information Technology (AITS) and University Information Technology (UIT) groups. I have the unique privilege of having both these groups report to me. I am thankful for the blessing of being part of the work being done by some of the most wonderful staff anywhere!

From March 13, 2020 to the present time my groups have not let up in their efforts of fulfilling their role, finding new ways to deliver service in this challenging environment and providing service that empowers our students, faculty and staff.

When the mass retreat took place to meet the orders for remote work, my groups were among the few that needed to stay as physical and local as possible to address the very real need to address the needs of the physical environment. Our charge expanded to include all the preparation for remote work, continuing support for remote work, support of all the local needs by staff who were local and to adapt as our ranks were affected by what was raging around us while maintaining the level of service our students, faculty and staff have come to expect.

We stepped into the gaps as needed while continuing to discharge our normal support responsibilities. The help desk adjusted to meet the needs of our students, faculty, and staff. The testing center adjusted and evolved to support the academic integrity efforts of faculty by delivering live remote proctoring of tests and opening the Sage testing center when the fall semester resumed with face-to-face classes. Faculty testing and research services evolved to support the needs faculty and extended themselves into the testing arena to address shortfall in staff because of budget cuts. The divisional and departmental support achieved new heights in personalized support as staff moved to the new realm of mass remote work. This involved a significant mobilization of assets like laptops, tablets, support of home technology, virtual services, and secure access of on-campus assets from thousands of remote locations. This effort has not slowed since the start of the fall semester and will continue to increase. Staff within my groups also stepped into the breach as the university needed assistance in contacting students to check in to see how they were doing during this difficult time – not IT but definitely rooted in customer and community service.

Speaking or writing about the efforts of my groups and my staff does not do their efforts justice. Having been a first-hand observer and participant in these efforts, I can say that I am privileged to work with these remarkable staff members.

Individually efforts would fill pages and have been communicated to leadership. We in AITS and UIT are privileged to be part of a select group at UNT that stayed in the physical environment through the entirety of this crisis. This newsletter is also an example of the staff contributors from AITS and UIT who found the time, mental acuity, determination and grit to contribute an article while dealing with all the

challenges that come from an emergency environment at work and in their personal lives. In this as well, I look upon my staff with pride and humility.

Financial challenges abound within every organization and we are no exception. We lost our reserves entirely and our budgets were cut 20%. Both events would have left a less resilient staff reeling but my staff turned to face this challenge as the true professionals they are, and they rose to the challenge. We are also pushing towards incorporating our practices into the support delivered at ITSS and System as they experience staff loss through turnover and retirement. We have also picked up support responsibilities where our expertise eases the load and complements other IT groups. The contributions of the AITS/UIT staff have been invaluable to the Integrated Communications Project (ICP) and it is an AITS supported Division that is the entirety of the ICP pilot for UNT. Through this we hope to provide real use cases to our colleagues in the colleges.

This crisis has been a real case-study in how an experienced staff can meet new and unique challenges without falling apart. The other case-study is one of a group that grew and delivered during a crisis without engaging in dysfunctional activities.

UNT is richer for having a staff and groups such as mine. When the UNT leadership looks at the success of the organization, I hope they will remember the efforts of a quiet IT group that stepped up to address local needs during a frightening and difficult situation, never gave up, adapted, dropped nothing, always fulfilled their role, and always looked for ways to unite and not to divide!

One of the best praises I have ever received came from our CFO Bob Brown who, in one of our rare meetings, said that we are a team that gets things done. I found out that after the AVP who we reported to retired, there were two other AVP's under the CFO who actively sought to have us under their umbrella. I cannot think of a better testament about how we as a group are perceived. To be known as a group that get things done that further our University's mission means that we are engaged with our business units, we understand the goals and initiatives our various divisions and departments want to achieve and we work alongside our divisions and departments to achieve those goals and initiatives.

As you read the articles included in this issue of our newsletter, maybe get misty eyed by pieces like this one 😊, and take a swing at the brainteaser, we in Administrative Information Technology Services (AITS) and University Information Technology (UIT) wish you a happy and safe holiday season.

Wombat poop is cube-shaped.

Creating Training *Collections* and Uploading Custom Training for your Team or Class Using LinkedIn Learning
[Dr. Elizabeth Hinkle-Turner]

A "buttload" is a real measurement of weight.

IT leaders in UNT World have recently completed an exhaustive catalog of software applications utilized across its many campuses and entities. This data is being used to help guide decisions about administrative, teaching, and learning application resources. Preliminary research in connection with this work has revealed that UNT World has on offer several creative solutions to assist all system community members with their needs for online teaching, training, and learning particularly through instructional videos. Some solutions – like **Bridge** (untworldlearning.untsystem.edu) – are primarily geared towards staff (including student staff) and faculty personal and professional training needs. Other solutions – like **LinkedIn Learning** (it.unt.edu/LinkedInLearning) – are available to all students, faculty, and staff to be utilized in a variety of ways. These include accessing LinkedIn Learning courses for personal and professional growth, the utilization of the videos to give students in a particular class training in concepts or software related to the course, the achievement of certifications in different areas, and the enhancement of one's LinkedIn profile and accomplishments.

There is also a proliferation of training and orientation video content that is created by different schools, departments, and areas for use by their constituents. These can be freshman orientation features or instructional videos in how to use a certain lab or certain piece of equipment geared towards students in specific majors. These may be training videos to show staff in a particular area how to perform tasks related to their jobs. Often these "homegrown" videos are required viewing in addition to professionally-generated content from services such as LinkedIn Learning. For example, there may be a new employee in Printing Services who needs to learn how to use some of the actual production machinery while also having to know how to format and finalize Adobe Illustrator content for input to that machinery. The employee trainee might need to view videos made by their supervisor about a machine and also some Adobe Illustrator training provided by LinkedIn Learning. It would be great if there was a way to gather together all of this content in one place, assign the content, and track the progress of the new employee, wouldn't it?

This article is about one such solution we have readily available in UNT World – *Collections in LinkedIn Learning* – a solution that several faculty members and area supervisors are using already for their students and trainees. Here I will provide a step-by-step on how this is done. For the sake of not making this article a BOOK, I am just going to concentrate on how you make and assign a mixed-content Collection and run reports on your student/trainee completion rates. This is a lot of information to absorb so buckle in and let's go!

Before following the steps below in UNT's instance of LinkedIn Learning there are a few preliminary things that need to be completed:

- Activate your LinkedIn Learning account. All current UNT World community members have a LinkedIn Learning account but the account still needs to be made active by the user. In order to do this go to it.unt.edu/LinkedInLearning, click on the large Sign In button, sign in using your EUID and password, and follow any instructions to activate your account:

Here is the homepage for logging in to LinkedIn Learning at UNT

- Make sure that your target audience (the students in your class, the employees that you supervise) also activate their pre-made LinkedInLearning accounts. Note: if you or any of your target audience have difficulty doing this, please contact the UIT Helpdesk (see helpdesk.unt.edu for contact details) for assistance.
- If you are going to include original and custom video content that you have made please make sure that it is completed and has been saved in a format that LinkedIn Learning (LiL) accepts. LiL can currently support ASF, AVI, FLV, MPEG-1, MPEG-4, MKV, QuickTime, WebM, H264/AVC, MP4, VP8, VP9, WMV2, and WMV3 file types. I personally recommend MP4 because several of our other UNT World tools (Teams, Stream, Zoom) save video files automatically in this way. Make sure that any videos that you create also have a closed caption file. This caption file is usually saved separately automatically by Stream, Zoom etc when you select closed captioning while making your video or they can be generated after the fact by captioning software or a captioning service. The file format is often *.vtt* or *.srt*.
- If you are going to include non-video custom content, LiL supports Microsoft Word and Powerpoint documents and players and PDFs. Make sure that content is prepared properly and can be read accurately by a screen reader like JAWS.
- Ask to be given additional rights to LiL beyond your user status in order to add content and make playlists for others and assign these other users to view your content. The additional rights will also allow you to run reports and upload user assignment files. Please contact me – Elizabeth Hinkle-Turner at ehinkle@unt.edu – to request those rights. Another person you can contact if you are outside of UNT-Denton is Brandi Webster at Brandi.Webster@untsystem.edu. Once you receive those rights, you are – at last – ready to begin!

*Let's add the folks we want to view the Collection content that you will organize for them.

Step One – on your LiL homepage, go to the Admin dashboard to manage people and contents. On your homepage, you should have a Go To Admin option now since you have some administrator rights:

Step Two – Put your trainees/students in a custom group (they will need to have activated their accounts) so that you can easily assign content and recommend learning to them.

a. Under the People menu, select Groups, then click on the Create new group button:

b. Fill in the name of your group and add members. If a student's name does not pop up when you start typing in the Add Members box, it means they have not logged in and activated their account yet. You can add students later to an existing group as they get set up in LinkedInLearning:
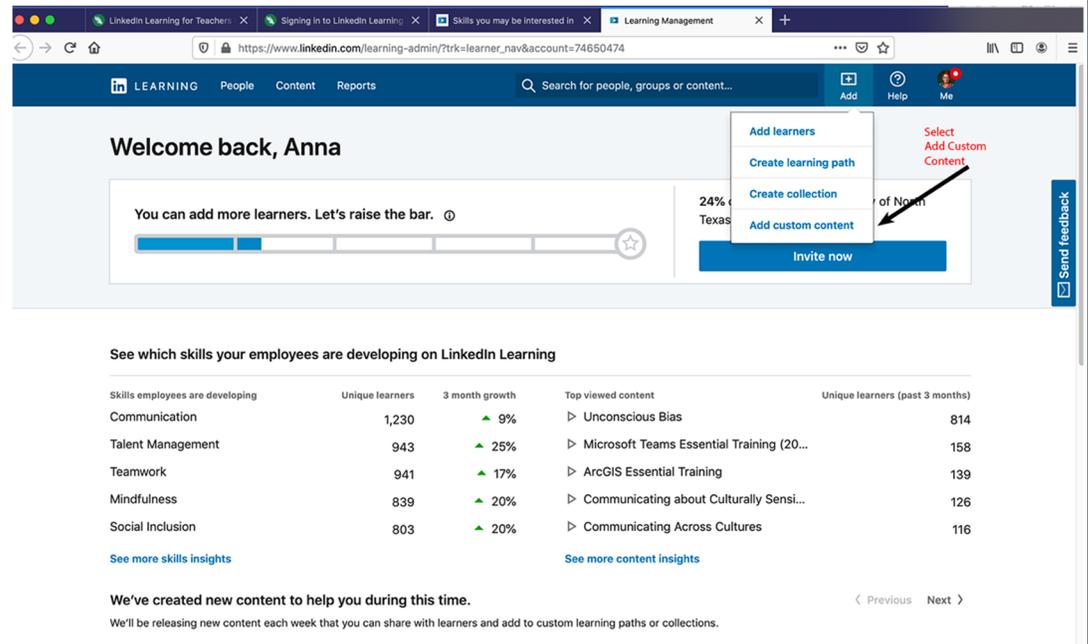
Now you have your group of learners – these steps are easy if you only have a dozen or so learners; if you have a group of hundreds, well, there is a way to do that too with a batch file…but that is another article…stay tuned…

*Let's add any custom content you have created and also ensure that it is **NOT** viewable by all LiL users all over the world (which is the default setting – **you have to limit it to ONLY your group**). If you want to add custom content (your Zoom class videos, archived Panopto lecture capture videos, MP4 videos you have made yourself) – follow these steps:

a. First choose Add Custom Content from the Add+ menu:

b. Choose Add → Upload Content using the +Add button:

A physics paper in 1975 was co-authored by a cat.

Baby puffins are called pufflings.

c. Select your content to upload (for this example, I am assuming an MP4 video) from your computer drive or a cloud resource:
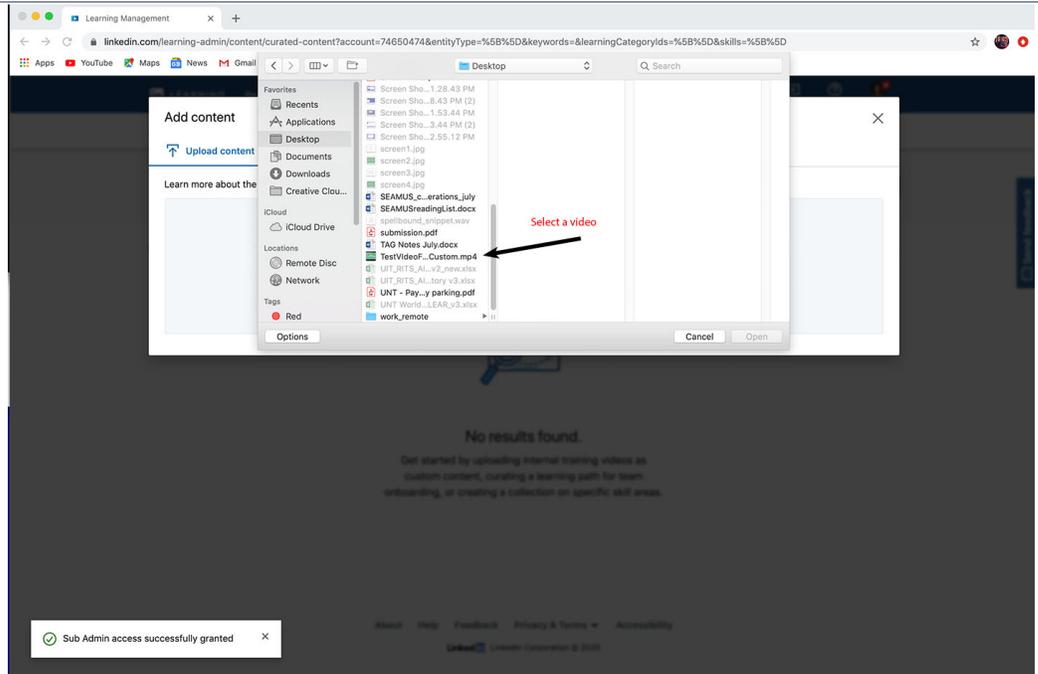
d. Set all of the parameters for your content and also (important!) make sure that your Group(s) that you created earlier are the ones who will see the content (which you will recommend to them):
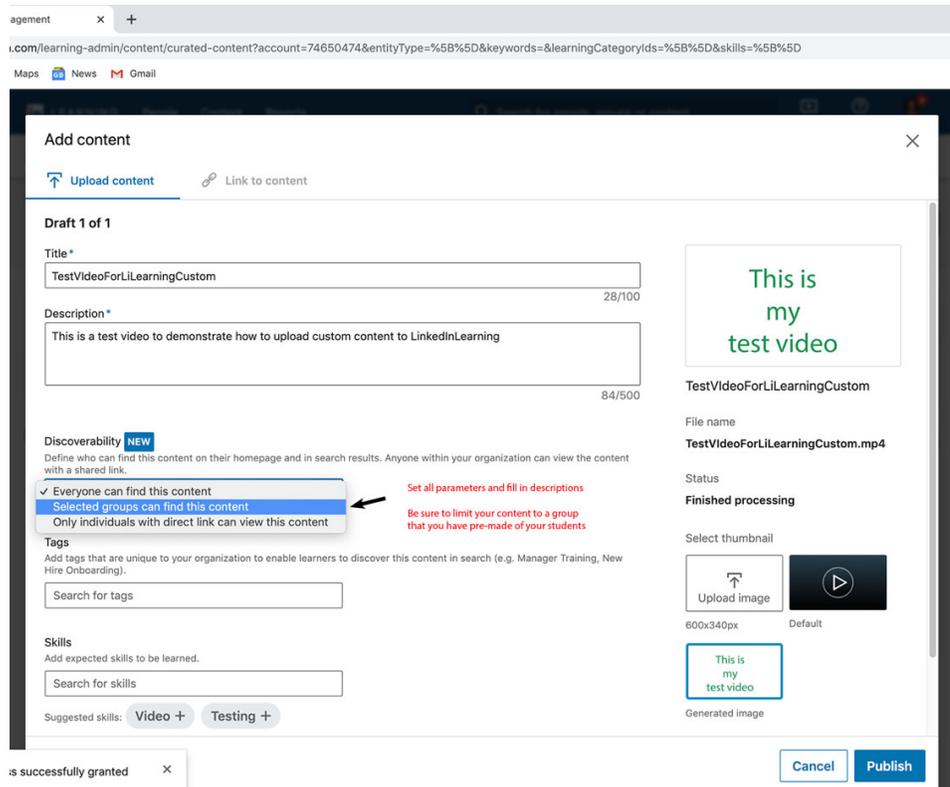
e. You should now see all your custom content:
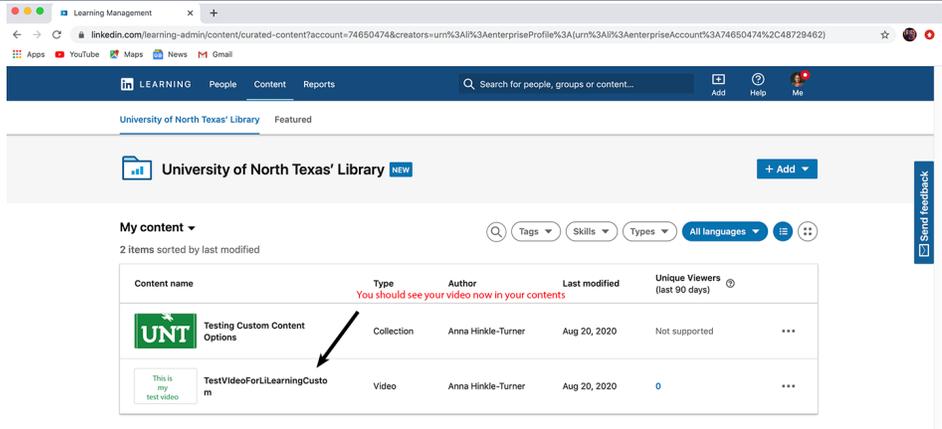
* Now you can put your custom content into either a Learning Path or Collection (it does not really matter which but on Learning Paths you can fine-tune the order of how things are viewed) For this example we are just going to create a Collection and put your custom items into it (Learning Paths will be discussed in a later article).

a. To create a collection choose Create collection from the Add menu:
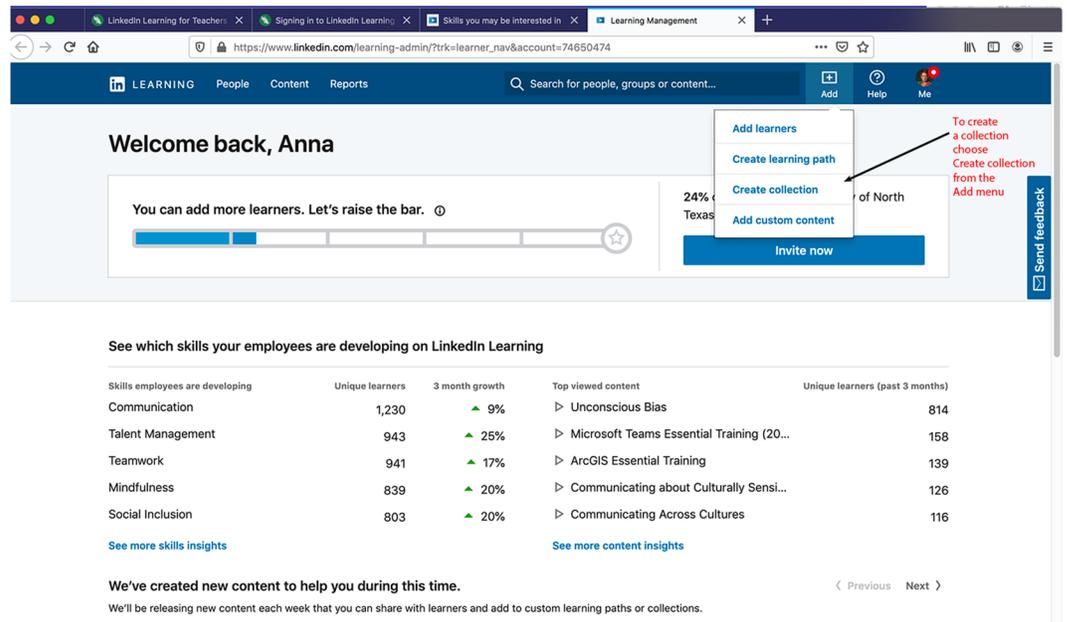
b. To add a video to a Collection just click on the 3 dots next to the video and select Add to Learning Path or Collection. (note: this is also the menu where you will Recommend the content to your students):

Here is where you add videos to your collection
Here is also where you recommend content so you can run reports on student activity

*Now go back to that menu again and **Recommend** the content to your students/trainees so that you can run reports and so that they know what they need to view when they log in to LiL.

    a. On this Recommend window, select your Group(s) for the recommendations and you can even add a due date:

*Finally, you can run reports to see how your students/trainees are doing!

    a. To run a report, on the Reports menu of your home admin dashboard select Recommendation history:

The original London bridge was taken apart in 1963, shipped overseas and reassembled piece by piece in Arizona.

b. Under Me – you should see your recommended content. Click on the three dots next to your content and choose Download Detail report:

Did you know that Volkswagen makes sausages?.

c. The report that downloads for you is a detailed spreadsheet of all your student in your group and their progress.:

* If you just want to add LinkedInLearning pre-created content to a Collection and recommend it and run a report, you can skip all of the custom content steps added above. All you need to do on the Admin homepage is Search for people, groups, or content (I am using Photoshop as an example here) and add it to your Collection that you have made for your class. Your collections can have a mixture of custom content and LinkedInLearning pre-made content:

    a.   Search for content:

    b.   Find the content you want to add:

Wow – this is a very long article! Congratulations for making it to the end. I will do follow-ups in the future about Playing Lists and editing captions but for now, this should get you started on creating Collections of learning for your students/trainees and even adding your own training materials to the great professional content available in LinkedIn Learning. Please direct any questions about this content or related topics to me at **ehinkle@unt.edu**.

Microsoft Built a Photo Realistic Earth Simulator That Happens to Have Airplanes
[Christopher Horiates]

When you think of Microsoft you probably associated the Windows OS with the company. The Windows OS has been out since 1985, but did you know that Microsoft has a longer running software product line?

Microsoft Flight Simulator (FS or MFS) debuted in 1982 and this year celebrated 38 years with the release of a new version.

In 1982 Flight Simulator 1.0 made its debut. All you had to fly was a Cessna 182 and four cities (Chicago, LA, New York and Seattle). It offered weather that could be changed as well as changing the time of day. For what it was and the hardware it had to run on it was cutting edge at the time and started off what would become the industry standard for at home flight sims.

FS 1.0 on
Final Approach to Chicago

I remember my first time playing, it was on my grandfather's PC after he showed me how. He was a WWII Pilot in the Army Air Corps and an aeronautical engineer. Back then it was the closest I was able to get to flying a real airplane. I can't tell you how many times I played but it always started with the screen to the left.

FS 2.0 Taking Off from Chicago

The main draw to a simulation like FS is the realism and the ability to truly experience what it would be like to fly and have the plane behave in every aspect as it would in real life. This would include temperature, wind, humidity, clouds, weather, mountains, mechanical failures, weight distribution, etc. Basically, every tiny aspect of getting a plane off the ground and the act of safely flying it. Since 1982 there have been 12 releases of the software title. Some were released close together with a small amount of time between while others went a few or more years between a release. With every release there we improvements over the previous. The level of graphic detail upgraded as machines became more powerful. Gameplay became more immersive and realistic. Additional airports and planes were introduced over years. Weather was able to be rendered in real time with an internet connection. You could play multiplayer with others. The goal was to replicate the real world into a video game.

MFS
95

(Released mid '96)   MFS X (Released 2006)

After the release of FSX in 2006 we thought we had finally reached the full potential of what a flight simulator could be. The physics and graphics were amazing, and you could finally start to identify landmarks of the world. Weather became much more realistic. Game size was two DVD's and it was awesome. It seemed that the future was bright for the franchise and we only dreamed of what would come in the next release. Well it seemed that our dreams flew off into the sunset. There seemed to be no movement to release an update. 2014 rolled around the all we go was a

Your ear has the smallest bone in your body.

downloadable copy of the game in Steam with minor tweaks, nothing to get excited about. Was this it? Was this the end of MSF?

On June 9, 2019 Microsoft dropped an unexpected announcement. MSF was coming back, to be released in 2020, 14 years after the last major update. While this alone was big news, what the MSF enthusiasts could not believe was what Microsoft was about to pull off. With the power of Microsoft Azure, Satellite Images and Bing Maps; Microsoft had mapped the entire planet and put it into a video game with 4K resolution. It is 2 Petabytes in size……. This will not install on your computer, rather it streams from Microsoft servers as you play the game. Microsoft claims you can take off, from one of the 37,000 manually edited airports or one of

Remaining 3 photos are MFS 2020

the 40 high detail hand crafted airports from around the world, fly to your home and you will see your home. Just be sure you have a plane that can make it and have

the time. If it's an 8-hour flight, it will take 8 hours to get there. Day or night you can fly anytime. I've seen reviews where actual pilots say they are using MSF to prepare for night fights and such by using real landmarks with such precision when they fly the route for real it's the same. In fact, furloughed pilots, due to COVID-19, are using this simulator to keep up their hours and skills while grounded. Weather sure, it's real oh and we will throw in realistic clouds based off

real time satellite and weather data. You planted a tree? Go find it, we have over 2 trillion trees in game. You want fly around that mountain and through the cloud, go for it, just be careful because you just might ice over your plane or hit some bad turbulence. The level of graphical detail and how the planes react to the environment is something never seen before. Computer wise to fully experience the beauty of the game you will need a stout desktop. Or you could get the new Xbox coming out this year and play it as the game is for both platforms. You will need

a 4K monitor and feel free to accessorize with any of the fully functional simulator joy sticks and controls to add to the experience. All that seems to be missing at this point is VR and rumor is that will be coming at some point. Say what you will about video games, but when it comes to MFS look at what this game offers and the potential to explore the world and learn how to fly. Seeing as what this version of the game has given us and the time it took to finally happen it will suffice for now, but it makes you ask just how much better can it get?

   Line judges at Wimbledon have to learn curse words in every language to know when a player violates the rule of no cursing when playing in Wimbledon.

Why You Should Not Expect to Ever Receive a Cybertruck That Looks Exactly Like a Cybertruck
[Patrick Kennedy]

I have zero doubts that the Cybertruck that Elon hyped up to the world from that stage was a real, running and driving prototype. As a matter of fact, I know it was, as I have seen clips of it driving. However, what we were shown was not a pre-production prototype; it was a concept truck showcasing what *could* be possible if we lived in a world without federal safety regulations, but that's not the world we live in. Tesla is an electric car manufacturer, so they use an adaptable rolling chassis known in the electric car industry as a skateboard chassis. A skateboard chassis contains the battery, electric motors, controllers, suspension, and everything else required to drive down the street on a chassis that can be widened and lengthened in order to fit a variety of body types. What this essentially means for Tesla is that the only thing they need to develop in order to create a driving concept car is a body and interior (if they plan to showcase one), and I believe that is exactly what they did to create the Cybertruck you were shown.

Figure 1 - Tesla Model S Skateboard chassis

Because of this highly versatile chassis, Tesla can come up with a vehicle that looks however ridiculous or crazy they want, and it will drive like a car. However, there is a very big difference between a concept car and a production car, and the differences are usually the result of government regulations, real world functionality, and creating a vehicle that is realistically capable of mass manufacture. Take Figure 2 for example: the concept car for the 2015 WRX was shown at auto shows to show the design language and direction that Subaru was taking with the upcoming generation of WRX. When the production model was released, many fans of Subaru and vaping alike were disappointed with the softer and toned-down styling. However, many of the styling cues from the concept car are present in the production model; take note of the basic headlight shape, lower grills, bulged box fenders, and door creases. Unfortunately, while I'm sure the Subaru concept artists would have loved to produce the concept car as-is, it simply was not realistic to produce it in the volume that Subaru wanted while also hitting their price targets and making it accessible and convenient to own for the average buyer. Take for example the inconvenient door handles that are flush with the body, the high belt line creating poor outward visibility from the resulting smaller greenhouse, and the complexity of the rear quarter panel's aggressive curves (the more complex a panel is, the harder it is to reliably stamp it). I expect that if Elon delivers the Cybertruck, it will likely take styling cues from the concept, but be changed aesthetically in order to function in the real world (and hopefully have less restrictive outward visibility).

Figure 2 - Subaru WRX prototype (top) vs the production 2015 Subaru WRX (bottom)

The problems don't end there. In order to sell a car in Europe, the manufacturer must ensure the vehicle conforms with pedestrian impact standards. For example, companies have to allow for a certain amount of space between the engine and hood of the car (it should be noted that the Cybertruck won't have an internal combustion engine up front, but the "hood" of the car is a rigid stainless steel alloy that could cause injury). This allows a clear space for the hood to deflect in order to protect the head of a pedestrian in the event of a low speed impact. Sharp corners and extremely strong alloy bodies don't bode well for the pedestrians that may be hit. Furthermore, in order to be safe in a crash, vehicles must be designed to crumple to dissipate the energy and protect the occupants. This is why people walk away from crashes where the car looks absolutely obliterated; those vehicles were designed to buckle and bend due to the careful selection of materials and frame design. Make a vehicle too rigid, and it will transfer the energy directly to the occupants and cause injury instead. The concern with the Cybertruck is that the stainless steel alloy body, which Elon musk claims is so hard to machine-press into simple curves that they had to make the truck as angular as it is, will fail to properly protect the occupants in the event of a crash. Moreover, many body shops won't even take in a Tesla for damage repairs because something as simple as a fender on a Model 3 can take literal months to arrive. Making a car out of unpainted stainless steel means that if someone manages to crumple or gouge the bodywork, you have to replace the entire panel unless you paint it, as any body filler used to fix damage will need to be painted over to cover it. On a vehicle with difficult-to-produce panels from a company notorious for struggling to supply replacement parts, this creates a risk of being without it for months on end if it needs collision repair. On a premium vehicle that will likely be financed by the overwhelming majority of owners, that could mean making multiple payments on a truck while it sits in the lot of a body shop.

Stainless steel scratches too, and in order to fix that, you must manually "re-grain" the steel in order to restore it. Just ask any DeLorean owner about that.

Figure 3- This DeLorean, also made out of stainless steel, will need an entirely new fender in order to be repaired

I would like to reiterate that I am not claiming the Cybertruck won't exist in some form or another at some point in the future; I am simply saying that there will need to be changes made to it in order to make the vehicle realistically legal for sale and convenient to own. Elon Musk even claimed that the Cybertruck could theoretically have a drag coefficient of .30, albeit with "many small changes," so he is expecting it to see some changes as well. Tesla is no stranger to production and design issues causing delays, as every single model they have released to date has been delayed. The Tesla Model X was delayed for a staggering 18 months due to issues with supply (and the falcon doors), and the new Roadster, unveiled in 2017 and slated for a 2020 release, has been delayed until at least 2021. I expect the Cybertruck will get the same treatment.

So why would Tesla promote the Cybertruck like they have, if they can't realistically deliver it as-is? Think of how many people placed deposits on the Tesla Model 3, only to see multiple delays and underwhelming production numbers. Despite overpromising and underdelivering, people didn't vilify Tesla; they continued to believe in the company's wild promises and continued to get excited about them when they didn't quite pan out. Tesla doesn't operate like your typical automaker. They act like a tech company, and Elon is incredibly talented at getting people excited. By showing this wild concept vehicle with a controversial design, getting everyone worked up, and charging $100 for allocations, Elon is essentially convincing the public to hand Tesla interest-free loans. How many people will come back in two years when the Cybertruck still hasn't launched in order to reclaim their $100? It's only a $100, right? More importantly, over 250,000 of these allocations have been sent in already, so those are literally hundreds of thousands of "orders" that Tesla can take to a VC and say, "Look I have 250,000 orders for this truck, can I have a few billion dollars please?" The $25,000,000 that people just gave him *interest-free* for a product that *doesn't even exist yet* can literally be turned into additional billions of dollars in investor cash. Props to you, Elon.

In summary, Elon Musk isn't scamming people, but he isn't exactly delivering on his promises. I hope that I'm wrong, and that he actually manages to somehow build this ludicrous looking machine that looks like it was rendered on a Gameboy Advance. However, given how the Model 3 production went, I don't see production of this model being fast enough to fill orders in a timely manner. This isn't to discourage those who seek to purchase a Cybertruck, but rather to give a more realistic outlook on it. At the end of the day, Tesla owners are beta testing an idea. By buying into the idea, you help pave the way for a world in which electric cars are commonplace, and support for them is ubiquitous. To be a Tesla owner is to live with the spotty build quality, lackluster interiors, and poor parts support in the pursuit of a future where these issues are a thing of the past. As a rabid car enthusiast that thoroughly enjoys fast cars, I think Tesla makes some really cool cars. I just think it's important to perhaps wait to give someone money until they can give you something tangible in return.

How Submarine Communications Cables Work – Cable Laying
[James Taylor]

In the previous issue of the AITS Newsletter, I gave a brief explanation of what submarine communication cables are and why they're so important. These cables literally span oceans and allow us to have high speed communications between endpoints on opposite sides of the globe. But how are they installed in the first place?

Installation of undersea cables is an expensive and time-consuming operation. Before installation can even begin, however, a variety of specialists in several fields (oceanographers, geologists, geophysicists) must work together to select a proposed path for the cable and then have it surveyed. Once the survey has been completed, engineers can design a cable system appropriate to the water depths and sea floor conditions along the path.

Figure 4 - The cable laying ship Nexans Skagerrak

The actual installation is done by specialized ships that carry thousands of tons of cable and the equipment to deploy it. The cable is tested end-to-end to ensure its functionality and then the ship departs from the coastline. It will travel at a carefully determined speed and with enough slack on the cable to accommodate the contours of the seabed and avoid any tensile stress. The cable will be strung out behind the vessel sometimes as far as 8km.

Submarine cables are normally laid on top of the seabed but in areas of higher marine activity, such as fishing and commercial shipping, the cable will be buried to reduce the risk of accidental damage. In deep waters, the cable is threaded through a remotely operated vehicle (ROV) which digs a trough in the ocean floor (usually about 1m deep), places the cable, and then buries it with silt and rock. In areas where the cable cannot be covered by sediment, a trench may be carved into the rock of the seabed itself. The average depth of the seabed where the cable lays is around 3,600m underwater but can reach depths up to 11,000m. In shallower areas, such as the cable landing points, installation may be assisted by divers.

Figure 5 - A typical "sea plow" ROV

The cable laying ship sails the entire journey, from end to end, without stopping. Once the laying process has been completed, the cable will come ashore at a carefully designated landing point. These locations must be in areas with little marine traffic, no strong ocean currents, and a gently sloping sea floor. Since such areas are rare, many undersea cables will share the same landing point. After any necessary post-lay inspections have concluded, the cable will be connected to a cable termination station where it will be connected to the land-based network infrastructure. Since, landing points are often in remote areas based on their required criteria and termination stations are normally situated in highly populated areas of high demand, cables may have to be laid inland for a significant distance before they can be connected.

In the next issue, I'll dive into the composition of undersea cables and signal transmission.

Apple iPhone 12 vs. Samsung Galaxy S20
[Alexandra Martinez]

If you're in the market for a smartphone this year, the time is right to start looking at a 5G phone, especially with the multiple models Apple and Samsung has to offer. however, there are a few key differences between each. If you're wondering which one is right for you, you've come to the right place. Here we're going to outline what's different between Apple and Samsung new 5G phone.

To keep things simple, we'll be looking mostly at the base model iPhone 12 and the Galaxy S20. But there's also iPhone 12 mini, iPhone 12 Pro, iPhone 12 Pro Max models to consider, as well as Galaxy S20 FE, Galaxy S20+ and Galaxy S20 Ultra models.

Size and Shape

The iPhone 12 and Galaxy S20 are very similar, though the S20 is just a hair wider, longer, and thicker at 6.0 by 2.7 by 0.31 inches (HWD) compared with the iPhone's 5.8 by 2.8 by 0.29 inches. They weigh in almost identically with just a gram of difference between them. While the S20 has more rounded edges. Apple uses a glass sandwich design. Both phones have aluminum bodies and IP68 ratings, which means they can be dunked in up to 4.9 feet of water for up to 30 minutes. There are also plenty of color variations for both phones, so it really comes down to a matter of taste in this category.

Screen

While the iPhone 12 looks like it edges out the Galaxy S20 in terms of processing power, Samsung's phone appears to have a bit of an advantage when it comes to the screen. Both the iPhone 12 and Galaxy S20 use OLED displays that can produce remarkably wide colors and excellent contrast, but Samsung continues to lead in resolution. The S20 features a 6.2-inch screen with 3,200 by 1,440 pixels, making it both larger and sharper than the iPhone 12's 6.1-inch, 2,530-by-1,170 screen. The S20's display also supports up to a 120Hz refresh rate, which the iPhone 12 doesn't. That means smoother scrolling on the Galaxy S20.

Cameras

Apple has been making progress with its cameras, but the iPhone 12 won't be getting the powerful new imaging features that the iPhone 12 Pro and 12 Pro Max will have. The standard iPhone 12 features a dual 12MP camera stack on the back, with an f/1.6 wide-angle lens and an f/2.4 ultrawide lens. On the other side, the phone sports a 12MP True Depth selfie camera with an f/2.2 aperture.

The Galaxy S20 has a similar set of cameras, with 12MP sensors on f/1.8 wide and f/2.2 ultrawide lenses, plus a pixel-binning 64MP f/2.0 telephoto camera the iPhone 12 lacks (but that the iPhone 12 Pro has). The S20 also features a 10MP f/2.2 selfie camera.

Hardware

Apple has had an edge in pure power for a while, and the iPhone 12 features the company's newest A14 Bionic chip. The A13 Bionic in the iPhone 11 Pro already edged out the Qualcomm 865 found in the Galaxy S20, so the iPhone 12 is likely even faster than that.

5G Support

Both sets of phones feature support for 4G LTE with multiple carrier aggregation, but Apple takes the win here.

Apple's first step into 5G is impressive, considering the wide selection of bands supported in both sub-6GHz and mmWave ranges. The phone also supports DSS, which reuses certain 4G LTE bands for 5G speeds.

Only the Verizon version of the Galaxy S20 supports mmWave, which means the phone on other carriers (or unlocked) limits it to low- and mid-band 5G, without support for faster, shorter range high-band mmWave. If you want better 5G on a Samsung phone, the Galaxy S20+ and S20 Ultra cover the full 5G spectrum, including mmWave.

Which phone to get?

Now the real question. Which phone should you get? Well that's up to you. Both phones are great, and each phone as it differences between each other. It just depends on the features, OS, storage, and price a user wants. Price is becoming more of a consideration, as iPhone 12 starts at $799 to the Galaxy S20's $999, it certainly has a lead in the value department.

	iPhone 12	Galaxy S20
Lowest Price	$799	$999
Processor	A14 Bionic chip	Qualcomm 865
Storage	64GB, 128GB, 256GB	128GB, 256GB
Connectivity	LTE, 5G	LTE, 5G (mmWave Version Only)
Display Size	6.1 inches	6.2 inches
Display Type	OLED	Dynamic AMOLED
Display Resolution	2532 by 1170	3200 by 1440
Front-Facing Camera	12MP	10MP
Rear Camera	12MP, 12MP Wide	12MP, 12MP Wide, 64MP Telephoto
OS	iOS 14	Android 11
Special Features	MagSafe	120Hz Refresh Rate

Not cute or cuddly – about 10-20% of power outages in the US are caused by squirrels.

USB – One Connector to Rule Them All
## [Chris Stoermer]

Long ago, before today's Digital Natives, in a time now forgotten called, "the 80s", the mainframe systems spawned a new creature, the micro-computer. No longer would the dumb terminal, with its limited power and monochrome 80-character screen, rule the computing world. No more queueing up for compilers, run time, or print jobs. The micro-computer brought real computing power straight to your desk; as many clock cycles as your 8086 could handle and it was all yours. Unfortunately, the initial interface devices for these micro-computers all seemed to be on a different type. We had RS-232 9-pin and 25-pin serial ports, parallel ports and SCSI ports, and AT, DIN and PS/2 connectors, just to name a few. A computer technician really had to know their hardware "back in the day".

After several years of struggling with basic input-output devices on his own home systems, a computer architect, Ajay Bhatt, got together with three other computer engineers from Intel – Bala Cadambi, Jim Pappas and Steve Whalley – to work the problem of making these micro-computers easier to use for non-engineers. By 1994, they were visiting with all the major hardware vendors to discuss the idea of a simple, single-interface design for all plug-n-play devices. In the short span of two years the Universal Serial Bus, version 1, had arrived and, because Intel really likes using acronyms, the technology was dubbed USB for short.

USB 1.0 could handle a max data speed of 12 megabits-per-second which was bad throughput in 1996, but realistically, due to the limitations of affordable cabling and equipment, actual speeds achieved were more in the 1.5 megabits-per-second range.

Ajay Bhatt [Photo: Flickr user Intel Free Press]
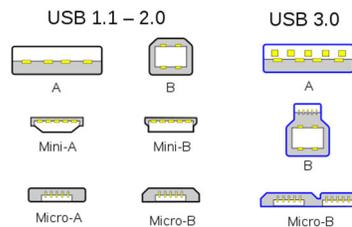
USB A/B connectors, [wikipedia]

USB 2.0 was released in 2000 and boosted data transfer speeds to 480 megabits-per-second, 40 times faster than the original. USB 2.0 also included a higher power output for charging devices and new mini connectors for two formats; A & B. The higher data transfer speeds also introduced the solid-state flash drive which, ultimately, led to the demise of many storage media including the floppy disk, Compact Disk, Zip drive, Jazz drive and many others. It has been suggested that there are more than six billion USB devices in the world today.

USB 3.x had three version releases in 2008, 2013 and 2017; each version essentially doubling data rates from 5 Gigabits-per-second to 20 Gigabits-per-second. Additionally, a new connector, USB-C, was introduced in 2014 to replace all the previous connectors. USB-C is double-pinned so the connector is reversable.

USB-C connector [wikipedia]

With the release of USB 4 in 2019 and a date transfer rate of 40 gigabits-per-second – more than 3,000 times faster than USB 1 – the USB-C connector is taking over the pluggables market. Who knows. Maybe it will be the one to rule them all.

Speed up your Windows 10 PC with these Tips
[Richard Sanzone]

Is your Windows 10 PC running slowly? Did it run much smoother when it was new? Windows 10, like most operating systems, can accumulate software processes, tasks, and bloatware over time that can degrade performance. Check out these tips to clean up your Windows 10 PC to make it run like new.

Disable "Live Tiles". Have you noticed that some of those tiles in the start menu are animated? Some of the tiles even have dynamic information displayed, such as stock prices, weather, and news headlines. Some of these animated tiles use processing power and internet data to display the live information. You can disable the active function of specific Live Tiles by right-clicking on the tile and navigating to "More->Turn live tiles off". You can even disable all the Live Tiles at once by typing "gpedit.msc" into the start menu and enabling the setting at " User Configurations > Administrative Templates > Start Menu and TaskBar > Notifications > Turn off tile notifications".

Uninstall unnecessary and unused programs. Some programs will introduce background processes, such as updates and notifications, that will add a slight processor load that can add up over time and create a noticeable performance decrease. Open your Win10 Control Panel, navigate to "Programs and Features", and browse the list of installed programs. You may be surprised at some of the programs that are still installed that you may have long forgotten. Select the unwanted programs and click the uninstall button.

Disable unnecessary Scheduled Tasks. Windows 10 has a list of tasks that are scheduled to run on a recurring basis. These tasks usually include checking for updates to installed programs. Some scheduled updates are desired, such as updates to virus scanners and security software, but some updates, such as Angry Birds, messenger upgrades, and the daily scoreboard for Candy Crush, are not essential and can be disabled.

Look at your scheduled tasks by typing "Task Scheduler" into the Win10 start menu. Browse through the Task Scheduler Library and disable the tasks that you do not want to run automatically on a recurring basis.

Remove processes from the automatic Start Up list. Like Scheduled Tasks, Windows 10 has a list of processes that automatically run when you start up the PC and login. These processes usually include background updates on installed programs that you might not need to update every time you login. Type "Task Manager" into the Win10 start menu and navigate to the "Startup" tab. Browse through the list of tasks and disable the tasks that you do not want to run every time you login to your PC.

Prevent updates from rebooting your PC when you are using it by setting Active Hours. You may have experienced the frustration of waiting on a reboot in the middle of a work session because a Windows Update needed a restart. Windows 10 has a setting called "Active Hours" where specific hours of the day can be configured to not attempt update restarts. Type "Change Active Hours" into the Windows start menu to set the hours that you want to not have reboot interruptions.

Did you know that the Battle of Hastings took place in a town known today as Battle.

Microsoft and Linux: Best Friends
[Jonathan Piott]

In the late 90s, Microsoft was vocally opposed to the open-source movement which included, in large part, Linux. In 2001, former Microsoft CEO Steve Ballmer infamously said, "Linux is a [disease] that attaches itself in an intellectual property sense to everything it touches." Shortly after that and for the same reason, Microsoft co-founder Bill Gates described the open-source GPL (GNU General Public License) as "Pac-Man-like". Since then, things have cooled down, and Microsoft has made peace with open source. Microsoft president Brad Smith even said that Microsoft had been "on the wrong side of history when open-source exploded at the beginning of the century."

In the last few years, Microsoft and Canonical (which makes Ubuntu, a distribution of Linux) are more than just peaceful, they seem downright friendly. Microsoft has even integrated a full Linux environment in their operating system. As the Ubuntu wiki describes it, "Windows Subsystem for Linux (WSL) allows users to run a Linux terminal environment, install packages from the Ubuntu archive, and run Linux applications and workflows on Windows 10." So, with WSL, you can run most Linux commands in windows, and they are working on getting applications with a graphical interface running as well. This is mostly so that developers can build and test applications in a Linux environment without actually having to run Linux. But, is that all there is to it?

Over on the Ubuntu side, things are looking pretty cozy as well. Microsoft has made some of their open-source projects available for use on Linux. Visual Studio Code is commonly used on all platforms, which includes Linux. The newest version of Microsoft Edge is being built for Linux as well. In the upcoming version of Ubuntu 20.10, Active Directory integration will be available by default. Does all of this mean we will continue to see more collaboration and integration between the two? Will the two user communities follow suit as well? I guess we will just have to wait and see.

Bob Dylan's real name is Robert Allen Zimmerman.

Deepfakes: A Terrifying, but Exciting Technology
[Michael Hamilton]

With the release of deepfake apps like Reface and Zao, the spread of deepfakes and, by association, disinformation has turned into a much more common issue. You may have seen a video where Buzzfeed teamed up with Jordan Peele to make a PSA on deepfakes in which Peele ventriloquizes Barack Obama, making him voice opinions on things like President Donald Trump and the Black Panther movie. There has been software to make fakes for videos and images for quite some time, but the Buzzfeed video showcases how far that software has come. That video came out in the first half of 2018, and AI continues to make the whole process of generating these fakes easier.

Deepfakes utilize a type of artificial neural network called an autoencoder. Autoencoder structure involves an encoder that reduces an image to a lower dimensional latent space and a decoder which then reconstructs the image from that latent representation. Deepfakes utilize this technology by having the autoencoder target a person's key physical features. A generative adversarial network (GAN) is then used to improve the process. A GAN is a machine learning framework that operates as a type of game for neural networks, wherein two neural networks compete with each other. This is utilized by Deepfakes by having a GAN train the decoder to generate videos that are then compared against a discriminator that attempts to determine whether the images were generated. This goes back and forth until the discriminator can't detect the forgery.

Of course with this kind of powerful technology, bad actors are bound to appear. The Buzzfeed video I mentioned earlier was very transparent about the fact that it was a deepfake video to put a spotlight on the technology as a warning, but could have very easily have been passed off as real and the technology has only advanced since the release of that video. Deepfakes have gained quite the notoriety due to the use of the technology in the creation of adult videos of people without consent and the creation of videos that misrepresent well-known political and business leaders. So much so, that major corporations are starting to take a stand against the spread of these fakes.

September 2020, Microsoft announced Microsoft Video Authenticator, a tool to help combat the spread of misinformation, with deepfakes being cited as a major concern. The authenticator will be able to analyze a still photo or video and provide a percentage chance that the media was artificially manipulated. For videos, it will provide this percentage on each frame as it plays. This will work by detecting the blending boundary and any subtle fading or greyscale elements that the human eye may not be able to detect. Microsoft expects the sophistication of deepfake technology to grow in response to their attempts at detection and will be continuing to seek and develop further methods for certifying and maintaining the authenticity of all types of media.

Microsoft has also announced a tool that will be built into Microsoft Azure that will help ensure the authenticity of created content. The tool will enable content producers to add digital hashes and certificates to content that will live with the content as metadata wherever it travels online. There will then be a reader, which may exist as a browser extension or some other tool, which checks the certificates and hashes created by Azure. This reader then provides details about who produced the media and lets the viewer know if the content is authentic or if it has been altered in any way.

While deepfakes have, understandably, raised concerns about privacy, identity, and the spread of disinformation, it is still an amazingly cool innovation with many lighthearted and positive showcases. With readily available apps like Reface, you and your family and friends can now be put into your favorite movies and with more advanced versions of the technology, characters in media no longer need to pass away with their actor. Of course, deepfake technology now requires that we be much more aware and skeptical than ever, but it also has a lot of potential that we should be excited about.

The word "y'all" was first used by William Lisle.

You have heard about power over Ethernet, but what about Ethernet over power?
[Laureli Dougherty]

TP-Link AV1000 Powerline Adapter   *TP-Link AV2000 Powerline Adapter*

🐿 **Hewlett-Packard's name was decided by a coin toss.**

Yes, you heard me right: Ethernet over power. First introduced in 2001, then adopted by IEEE 1901 in 2010, powerline network adapters bring the reliability and stability of wired network connections to network topologies that would otherwise depend on wireless connections. These adapters support high-speed data transfers that would please even the biggest need-for-speed gamers (like myself!), while being much more affordable than adding data drops to your home or private office.

Take for example the TP-Link AV1000 Powerline Ethernet Adapter—one of two models that I have purchased for use in my home—that supports high-speed data transfer rates of up to 1000Mbps; that's double the speed that Frontier offers for residential connections right now. Best of all? This set of two adapters only costs $50 on Amazon at the time this article was written. And yes, I did say one of two models I am using currently; the TP-Link AV1000 adapters are cross-compatible with the TP-Link AV2000 Powerline Adapters that I first bought in 2017, which also support 1000Mbps speeds for each port but has the added benefit of having two data ports on each adapter. For under $200, I brought fast and reliable network connections to 5 devices in three rooms of my house that otherwise would have had to rely on wireless access from an AP in a non-central location.

These systems are remarkably easy to set up. Simply plug one adapter directly into a power outlet near your router and connect the router to the adapter with an appropriately rated Ethernet cable; you'll want to make sure the category Ethernet cable you choose supports the speed your ISP is providing so you don't accidentally create a bottleneck. Then, plug in the other adapter(s) into power outlets in the room(s) you want. After that, all you need to do is press the button on the side of the adapters to sync them up, and you're all set! Once the adapters are synced, you have nothing else to do but plug and play with your desired devices. You'll only ever need to re-sync if you experience a power outage or if, like me, you have a playful pet who enjoys unplugging things!

While these devices might not have taken off in popularity before, they are just what we need in a world where more and more people are having to consider the possibility or necessity of working from home. These powerline Ethernet adapters bring speed, reliability, and affordability by turning a wirelessly connected home into a wired one. Now that you're in the know, go buy some before their prices skyrocket the same way webcams did!

Intel and AMD Processors: What's the difference?
[Troy Bacon]

Most people have heard of Intel processors, but you may not be familiar with a different manufacturer called AMD. Both companies were founded in the late 1960s. Intel has been the chip maker with the largest market share for many years, but until just recently, AMD is starting to become a serious competitor. In this article I will explain the advantages and disadvantages of each chip maker.

Which CPU is better?
The answer to this question will depend on your intended-use scenario. Intel's high-end CPUs are faster and consume less power than AMD chips. However, for entry or mid-level computing scenarios, AMD chips will get the job done at a lower cost. Recently, AMD released their Ryzen 7 line of processors, which is a competitive offering to Intel's Core i-7 processors. AMD is now starting to release chips which compete with Intel's higher-end market, but this is a new development, and Intel still holds the largest market share.

Who has the highest processing speed?
For the typical entry-level or mid-range use application, the AMD Ryzen 3 and Ryzen 5 CPUs are just as fast as Intel's Core i-3 and i-5 CPUs. If your intended use is to run Windows 10 with Outlook, Excel, Word, and browse the Internet, the AMD chips will perform just as well as the corresponding Intel chips. The main benefit of going with AMD would be the lower cost for the CPU, thereby saving you some money. For very fast processors, Intel currently has the advantage. While AMD does offer high-speed processors that compete with Intel's higher-end Core i-7 and Core i-9 processors, the AMD processors require more power than the Intel CPUs. The main advantage here is the power savings that you get with the high-end Intel chips. These higher-end processors are only necessary for computers that are running high-performance software, such as video games, statistical software, and video-editing software. If your typical use-case is to run Microsoft Office and an Internet browser, you don't need these high-end processors.

Who has the best price?
AMD is the clear winner when it comes to lowest price. Intel has been the market leader for decades, and their higher prices are reflected in their name recognition. For the past two decades, AMD offered lower prices on comparable Intel chips for entry-level and mid-range computing processors. And just recently in 2017 with the introduction of the AMD Ryzen processors, they are beginning to compete with Intel's higher-end market. This continuing competition from AMD will certainly challenge Intel's ability to keep their prices at current levels.

Conclusion
So, which processor should you choose? It depends on your use-case. For a standard desktop or laptop computer for typical office use, I would recommend an AMD processor since the cost will be lower, and the performance will be the same as the corresponding Intel processor. For computers that will do video editing, gaming, or run statistical software, I would recommend going with the Intel processor due to the increased power-efficiency. However, I would check back with AMD in a couple years to see how they are progressing. I suspect, in the not-too-distant future, that AMD's higher-performance chips will be just as a good, and perhaps at a lower cost, than Intel's.

**Did you know that pigs are considered the world's 5th smartest animal?**

VDI
[Daniel Weirsema]

When you are in the market for a computer the first thing you consider is your budget, then how nice of hardware can you get for it. Well those thoughts might be changing. Virtual Desktops Instances are becoming one of the next big technologies for your home and office. Soon you might have the option to just buy a thin client instead of a desktop or even a gaming system. Less money for you, but still the same performance that you are used too, or maybe better.

What is VDI

Virtual Desktop Instances is a lot like remoting in from home. So instead of installing and running your OS on your computer's hardware, you are connecting to one of many virtual machines from a server. When you hit connect the software will find a free virtual machine from the server for you to use. From there to the user it is just like any other computer, but with some interesting advantages. Say you know you must render a video and don't have the time to wait the usual time it takes. The IT team might be about to allocate more processing power to your virtual desktop. Or if you want to use a new piece of software that has major hardware requirements. Instead of finding a new product or having to upgrade your hardware. IT can just meet the specifications when they build your virtual desktop.
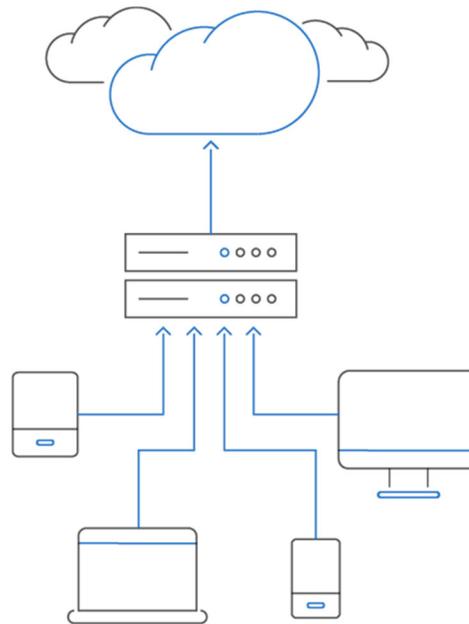
Thin Client

One of the benefits of VDI is the user not having to buy an expensive piece of hardware to use. Why spend all that money when you don't need too, and a thin client will do just fine. A thin client is just a computer with limited hardware and processing power. You don't need much processing power just to connect to a server and display the remote session.

VDI Advantages

- Cost to the user
- Security everything is centralized, so easier to secure.
- In house IT is still a major role so fixing issues is fast
- Powerful computing for everyone
- Remote work

VDI Disadvantages

- Cost to staff IT to manage the system
- Poor home internet means this does not work
- Lack of privacy
- If something in the VDI system goes down everything does.

Google and VDI

Google has already entered the VDI market in a unique way. They have made a new gaming platform that is VDI called Stadia. With Stadia you can connect to any game they offer from a web browser on your computer or app on your phone. You have instant access to AAA or indie games with any hardware you already own. Since the processing power is done on Google's end. This could allow for more details, people, and bigger games on the devices you already own. No more upgrading every few years.

VDI's Future

VDI could be anywhere in the future from your phone or your work computer. Maybe even a hybrid where you only use it to work on projects that need more resources, while still maintaining your usual hardware. The possibilities are interesting to think about. Remote work is an exciting aera. It could be a future when your phone can have the same processing power as your thin client computer. Working remotely would be limited just by internet speed, not by how new your hardware is.

A goat named William Windsor served as a Lance Corporal in the British Army.

EA is looking to make a splash
[Dylan Wray]

EA Games has announced they will start supporting EA titles in official collegiate competition. The league is managed by an organization called LevelNEXT which start off with the first ever collegiate *Madden 21'* tournament with $150,000 in scholarship prize winnings. The league's broadcast rights will be managed by Learfield a company that already works with UNT and hundreds of athletic departments across the US. UNT is one of 10 university esport leaders to join a committee to provide feedback and concerns to LevelNext for the Madden tournament, and for leagues in the future.

Collegiate esports has grown significantly over the years it will be interesting to see this new approach from EA in how they tap into familiar organizations like Learfield, and start with a comfortable title that's familiar to athletic departments across the US. This should allow and encourage other universities and departments to give esports a shot. Madden has not been the most popular esport title to spectate however, so hopefully we see other additions to this platform. Personally I think it would be great if EA officially sponsored Apex Legends in this model, as it would be a significant nod to the player base and it's a game that transitions well to the "traditional esport" community. We shall see what this new program brings to collegiate esports, hopefully for the better.

Asset Management Newsletter
[Jimmy Grounds]

For those of you who don't know me, I am the Assistant Director of Asset Management. Our team is charged with managing the 30,000-plus personal property items used on the UNT/System campuses. You may have previously worked with our team during our annual physical inventory of assets in your area.

In order to better serve you, we will be sending a bi-monthly newsletter on the 1st and 15th of every month starting on Nov. 15 of this year. This will give you reminders of deadlines; the latest news about asset inventory, central receiving and surplus topics; proactive guidance to help you all year long; and more.

Specific topics include requisitions, asset identification, the budget category tool, p-cards, blanket POs, inventory maintenance, logistics, departmental transfers and, of course, annual inventory. Please let me know if there is a specific topic or question you have that we can address in the newsletter!

Look for the newsletter in a couple of weeks from Asset.Management@unt.edu.

Have a great day!

Solution to last newsletter's brainteaser

Which of the following scrambled words does not belong when the words are unscrambled and why?

"UATISN" "AOTATW" "LCAAGYR" "TTOOORN" "ARWAWS"
"AUSTIN" "OTTAWA" "CALGARY" "TORONTO" "WARSAW" – unscrambled!

There could be 2 answers to this brainteaser.

1. CALGARY does not belong since it is the only city that is not a capital city.

2. WARSAW does not belong since all the other cities are cities in North America.

Not only are squirrels a nuisance to power supply, they also forget where they hide half their nuts!