AITS Newsletter

AUGUST 2025

Enjoy this brain teaser ☺

What is the five-digit number, with no zeroes and no repeated numbers, in which the second digit is two times the first, the third is three times the second, the fourth is four times the first, and the last is one-half more than the second?

NotPetya: A Wake-Up Call

[Abraham John, Asst VP, AITS]

My article for the AITS newsletter is typically just a "fluff" piece but in this issue, I am going back a few years to the most crippling cybersecurity event that took place called NotPetya.

Before we get into the NotPetya incident, it bears noting that Industrial Control System (ICS) hacking is in a different category since it can affect the physical infrastructure that we rely upon to make civilization, as we know it, work. The power outage during the December 23, 2015, incident in Ukraine was a direct result of the BlackEnergy malware infection. Attribution as noted by researchers pointed to state actors who acted with a specific goal of disrupting the power grid. The reason an occurrence in Ukraine is important to note is because we have similar control systems that would be vulnerable to this type of targeted action.

We are, increasingly, surrounded by devices that are meant to make our daily lives easier and more predictable, but this comes at a price. We are very dependent upon the automation and interconnected systems that make modern life possible. If into this orchestrated, well-meaning, and automated existence a bad actor with malicious intent and will to disrupt or destroy enters, we would be hard-pressed to stop them, let alone contain the damage in the short run. Malware that has recently targeted ICS has also been executed against civilian targets and while attribution is extremely difficult in this distributed landscape, it is widely believed that state actors were involved.

The incident in 2017 was preceded by the original Petya and WannaCry in 2017. The original Petya spread through malicious email attachments that required action on the part of the user. The original Petya and WannaCry used the EternalBlue exploit that was stolen from the NSA to propagate through the network via an unpatched vulnerability in Microsoft's Server Message Block (SMB) protocol. Both original Petya and WannaCry are classified as ransomware intended for financial gain.

On June 27, 2017, a malware outbreak known as **NotPetya** emerged from Ukraine and rapidly propagated across global networks. Initially mistaken for ransomware, NotPetya was later revealed to be a **wiper** i.e., a malware that destroys —a destructive tool designed to irreversibly damage systems rather than extort money. The descriptions and behaviors exhibited by this malware were all documented by several security researchers and security firms like CrowdStrike and FireEye along with US government based researchers and researchers around the globe.

Malware Anatomy and Behavior

NotPetya shares superficial traits with the **Petya ransomware family**, particularly the **GoldenEye variant**, which was a rebranded evolution of the Petya/Mischa ransomware bundle.

GoldenEye and Petya: Common traits with diverging intent

- **MBR Manipulation**: Overwrites the Master Boot Record, rendering systems unbootable.

- **Ransom Note Interface**: Mimics ransomware behavior but lacks a functional decryption mechanism.

- **Encryption of MFT**: Encrypts the Master File Table, making file recovery impossible.

- **Use of a Dropper**: Using a dropper program allows the delivery of a malicious payload using an otherwise allowed and safe program. The dropper was manually patched from GoldenEye binaries, not recompiled from source. This probably means the hackers did not have access to the source code.

Encryption Strategy

Traditional ransomware will encrypt and send the encryption key to a remote server to allow decryption if the victim pays the ransom. Unlike traditional ransomware, NotPetya's encryption is irreversible. It lacks any mechanism to transmit or retrieve a decryption key, confirming its role as a wiper. This design choice underscores its intent to destroy rather than ransom.

Infection Vector and Initial Execution

Security researchers found that NotPetya was initially distributed via a compromised update to **MeDoc**, a Ukrainian tax accounting software. The actual takeover and infection of Linkos, the maker of MeDoc was quite elegant and had taken place over a year before the actual release of NotPetya.

The hackers took over the update mechanism of MeDOC and used that as the vehicle for infection. Once executed, the malware checks for administrative privileges. If not present, it attempts to escalate using **SeShutdownPrivilege** and **SeDebugPrivilege** tokens. Once it gains elevated access, it begins its destructive routine.

Coconut Crab

Credential Harvesting and Lateral Movement

NotPetya is particularly dangerous due to its ability to spread **laterally** across networks without relying solely on vulnerabilities:

- **Mimikatz Integration**: Mimikatz is a set of vulnerability exploits written that extracts plaintext credentials from memory.

- **PsExec and WMIC**: Executes commands remotely using harvested credentials.

- **EternalBlue and EternalRomance**: Exploits SMBv1 vulnerabilities to propagate across unpatched systems. Both of these zero-day exploits were stolen from the NSA by a hacking group called the Shadow Brokers and leaked in 2017.

This multi-pronged approach means that even fully patched systems can be compromised if they are networked with an infected host as a result of credential harvesting.

File Encryption and Triple Threat Behavior

1. **File Encryption**: Targets specific file extensions and encrypts them.

2. **MFT Encryption**: Prevents access to the file system.

3. **Credential Theft**: Enables propagation and privilege escalation.

Unlike traditional ransomware, NotPetya did not store or transmit encryption keys, making recovery impossible even if the ransom was paid. This is the reason NotPetya is classified as a wiper i.e., malware that destroys.

Reboot and Fake Ransom Note

After executing its payload, NotPetya forces a system reboot. Upon restart, users are greeted with a ransom note demanding Bitcoin payment. However, the note is a facade:

- The displayed Bitcoin address is hardcoded and reused across infections.
- The email address for payment confirmation was quickly shut down.
- No mechanism exists to decrypt files, confirming its role as a wiper.

Kill Switch and Vaccine

Researchers discovered a simple vaccine mechanism:

- Creating a file named C:\Windows\perfc prevents execution.
- The malware checks for this file before proceeding, acting as a rudimentary kill switch.
- Researchers also found this file on certain computers that were not infected. Speculation by the researchers is that these devices were used to gain and maintain a foothold. It is unlikely IT Administrators would wipe and rebuild computers that were not infected.

This discovery allowed some organizations to halt the spread, though many were infected before the vaccine was publicized.

Galapagos batfish

Code Path and Binary Modification

NotPetya was not compiled from scratch:

- It is a manually patched binary of the **GoldenEye** Petya variant.
- The modifications were made directly to the compiled binary, not the source code.
- This technique allowed attackers to reuse existing ransomware infrastructure while altering its behavior.

This approach reflects a high level of sophistication and intent to deceive forensic analysts.

Corporate Disruption and Economic Fallout

NotPetya caused billions of dollars in damages across multiple industries. Some of the examples are listed:

- **Maersk**: Lost access to its entire IT infrastructure, halting operations in 130 countries. Maersk was only able to restore their domain services as result of a solitary domain controller in their Ghana office that shutdown as a result of a power outage and had not been brought back online.

  In this case the solitary domain server’s hard disks were transported by a relay of employees from Ghana to London so recovery could proceed.

- **Merck**: Suffered significant disruption, later winning a $1.4 billion insurance lawsuit over damages caused by NotPetya.
- **FedEx**: Its TNT Express subsidiary was severely impacted, leading to delayed shipments and financial losses.

- **Nuance:** Transcription services and specifically the company's healthcare segment was affected by this malware leading to a 22% decline in their revenues.

These cases underscore the vulnerability of global supply chains and the importance of robust incident response plans and speaks to the interconnected nature of our world.

Strategic Shifts in Cybersecurity

NotPetya catalyzed a reevaluation of cybersecurity strategies across industries:

- **Zero Trust Architecture**: Organizations began adopting models that assume breach and verify every access request.
- **Network Segmentation**: Maersk's lack of segmentation allowed the malware to spread unchecked.
- **Incident Response Planning**: Enterprises invested in playbooks, tabletop exercises, and rapid recovery protocols.
- **Cyber Insurance**: The Merck lawsuit set a precedent for coverage of cyberattacks under traditional insurance policies.

These changes reflect a growing recognition of cybersecurity as a core component of business continuity.

Aye-Aye

Policy Reform and Legal Frameworks

Governments and international bodies began reevaluating how cyberattacks are classified and responded to. The ambiguity surrounding attribution and intent led to calls for clearer definitions of:

- ***Cyber warfare***
- ***State responsibility***
- ***Thresholds for retaliation***

Legal scholars debated whether NotPetya constituted an "armed attack" under international law, and whether existing treaties adequately address cyber operations.

National Cyber Strategies

Countries updated their national cybersecurity strategies to include:

- ***Critical infrastructure protection***
- ***Public-private partnerships***
- ***Cyber incident reporting mandates***

International Cooperation

The attack prompted increased collaboration among nations:

- **NATO** expanded its cyber defense posture.
- **The UN Group of Governmental Experts (GGE)** intensified efforts to define norms of responsible state behavior in cyberspace.
- **Bilateral agreements** on cyber threat intelligence sharing became more common.

Organizational Governance

Enterprises and regulators began requiring:

- **Board-level cybersecurity oversight**
- **Third-party risk assessments, Mandatory breach disclosures**

Lessons Learned and Future Outlook

Six years after the attack, the cybersecurity community continues to draw lessons from NotPetya:

- **Preparedness Matters**: Organizations with robust backup and recovery systems fared better.
- **Supply Chain Risk**: The compromise of MeDoc highlighted the dangers of third-party software dependencies.
- **Global Interconnectedness**: A regional attack can have global repercussions, emphasizing the need for international cooperation.

As cyber threats evolve, the legacy of NotPetya serves as a stark reminder of the stakes involved.

Conclusion

NotPetya wasn't just a cyberattack—it was a strategic wake-up call. It forced organizations and governments to confront the reality that cybersecurity is no longer just a technical issue, but a matter of national security, economic stability, , international diplomacy, and organizational survival. Its blend of familiar ransomware tactics and destructive payload marked a new era in cyberwarfare—one where the lines between criminal activity and geopolitical conflict are increasingly blurred.

NotPetya, Petya, WannaCry, BlackEnergy and Stuxnet all opened a new era in the international arms race. Countries other than the US and Russia find that they are in a catch-up game. This also means that we need to take steps to keep our networks and systems patched and as invulnerable as possible against a bad actor. In this interconnected world, this responsibility is not the sole domain of a single company or agency.

The attack's legacy continues to shape cybersecurity discourse, influencing policy, governance, and enterprise resilience. As we move forward, the lessons of NotPetya must remain central to our strategies, guiding us toward a more secure and resilient digital future.

While this article is not my usual "fluff" piece, it has, hopefully, been informative.

Australian Peacock Spider

Common Computer A/V Solutions

[Diego Phipps]

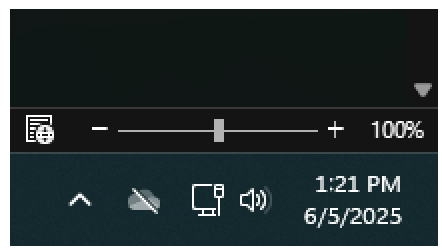
UNT hosts several conference rooms rigged with audio/visual racks and equipment. While these A/V systems are designed and configured with the user experience in mind, many problems encountered when using them are found on the computers interfacing with these systems. Here, I will cover a short checklist for troubleshooting audio issues commonly encountered when using devices in combination with UNT A/V systems.

The A/V installations in our conference rooms have a couple of options when using the system. Each room typically has a PC preconfigured and connected specifically for the room and an HDMI panel for hooking up personal devices, with a switching panel allowing you to switch between modes. Problems are typically encountered when using personal devices, due to the fact they have not been configured to use the rooms audio and video devices. We'll start with video.

It's not common that video problems are encountered when plugging an HDMI cable into the A/V panel. On the off chance you encounter this problem, ensure that you have selected the correct input mode on the panel. 'Computer/PC' is for the A/V PC and 'HDMI' is for personal devices connected through HDMI. Ensure the HDMI cable is properly seated in both the computer and panel. For personal laptops, navigate to your device's display settings and ensure that your device detects that an external display is connected. If no display is detected, it might be worth trying a different cable.

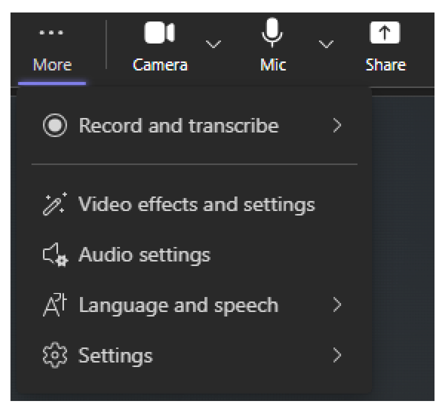
For audio, you will want to ensure that all the proper audio devices are available and selected on both the computer and the application you are using.

1.) First, select the sound icon in the bottom right of the task bar.
2.) Select the sound output options button to the left of the volume slider
3.) Select the audio device you wish to use. Devices like external speakers and headphones will be found here if they are connected.



If all the audio/video settings in windows are set, its likely that you will need to configure the settings in Microsoft teams.

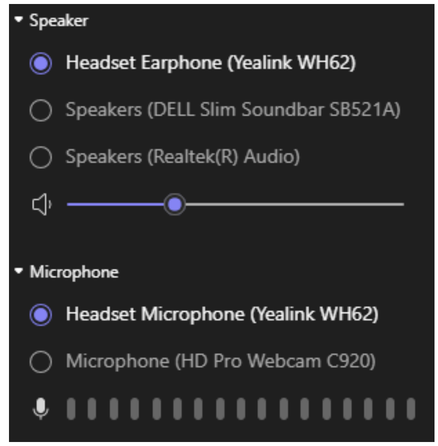
1.) Ensure that both the camera and microphone are enabled in the call.
2.) Click the drop-down arrow for the camera and ensure you have the correct camera device selected. Ensure that you have the correct microphone selected in the mic drop down as well.



Coatimundi

3.) If you can hear audio from your computer but not teams, click the 3-dots icon, select audio settings, and verify that you have the correct speaker selected.

If you continue to experience audio/video problems, it is likely they will involve troubleshooting steps outside of the scope of this initial checklist. There can be several root causes such as drivers, disabled audio devices, a malfunctioning wireless receiver, blown speakers, incorrect cables, gain levels etc. 95% of A/V issues can remedied with any of the above outlined methods. If you run into something more complicated, feel free to reach out! I love getting to flex my audio chops!




Axolotl

Accelerating Onboarding: Practical Tools for Building Confident, Capable Teams [Madison White]

Employee onboarding in IT is more than a checklist—it's the launchpad for productivity, system fluency, and long-term success. A well-structured start boosts engagement, shortens time-to-productivity, and encourages autonomy early on. According to the Association for Talent Development, organizations spend an average of $1,252 and 33 hours training each new employee. With that level of investment, it's essential to make every minute count.

Here in AITS, we're continuously optimizing how we bring new team members—whether technicians, analysts, or support staff—into our fast-paced, technical environment. Below are three scalable strategies that help new employees and managers ramp up efficiently while strengthening long-term adaptability. ☐

1. Leverage a Shared Online Source Manual

Providing a centralized, easily accessible manual—such as a shared OneNote or internal knowledge base—is a simple yet powerful tool. These resources serve as a "living document" that captures operating procedures, ticketing workflows, system access guides, and FAQs in one consistent location.

This approach offers several key benefits:

- **Reduces memorization:** Employees can focus on understanding processes, not memorizing them.
- **Encourages self-reliance:** Team members learn to locate answers independently, building confidence and reducing dependence on supervisors.
- **Ensures consistency**: Updates are reflected in real time, ensuring everyone has access to the most accurate and current information.
- **Supports new leadership transitions**: A documented knowledge base also helps new managers quickly familiarize themselves with existing office practices, expectations, and workflows—streamlining their adjustment period and reducing disruptions to team operations.

Whether onboarding a frontline staff member or a new team lead, comprehensive internal documentation accelerates alignment and reduces unnecessary questions and delays.

Naked Mole Rat

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2. Use High-Level Slide Decks to Introduce Core Concepts

Developing a concise, high-level slide deck for new employees is a great way to lay the groundwork. These presentations should cover essential tools, workflows, policies, and expectations—without overwhelming the audience with fine details.

When done well, this method does more than deliver information—it equips employees with the reasoning behind the work. By explaining the "why" behind policies and procedures, the "how" often follows naturally. This empowers new hires to apply core concepts flexibly, even in the many unique situations we can't predict or train for directly. When we take the time to demonstrate how the tools we use function—beyond just how to use them—employees gain a deeper understanding that enables them to apply those tools effectively in a wide range of situations.

Why this method works:

- **Promotes clarity:** New staff get a structured overview of systems, access paths, workplace expectations, and key contacts.
- **Supports layered learning:** As hands-on training begins, the slide

deck remains a reference point to reinforce understanding.
- **Documents expectations:** A standardized onboarding presentation ensures consistent messaging and minimizes the risk of miscommunication or misunderstandings.
- **Encourages adaptable thinking:** Teaching the rationale behind processes allows employees to make informed decisions when encountering unfamiliar scenarios.

Given that the average attention span is approximately 8.25 seconds, a well-designed, focused presentation helps ensure that key information is absorbed and retained —especially in the early, often overwhelming days of onboarding.

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3. Incorporate Visual Media for Better Retention

Visual content—such as process flowcharts, diagrams, or infographics—can significantly enhance knowledge retention and engagement. Research shows that people process visuals much faster than text, and visual instruction can improve retention by up to 400%.

By converting complex policies or procedures into visual formats:
- **Clarifies complex systems:** Employees gain a clear, intuitive understanding of how tasks and decisions flow.
- **Breaks down cognitive load:** It reduces cognitive load by breaking down multi-step processes into digestible segments.
- **Increases autonomy:** New hires can reference these visuals quickly during on-the-job learning, increasing confidence and reducing repeated questions.

Pangolin

Whether it's mapping an Active Directory structure, outlining VPN setup steps, or displaying the support call escalation path, visuals transform dense information into actionable insights.

Effective onboarding is not just about transferring knowledge—it's about empowering employees with the tools, context, and confidence to succeed. By implementing shared documentation, structured presentations, and visual communication tools, departments can deliver a more consistent, engaging, and self-sufficient onboarding experience.

These strategies not only accelerate the ramp-up period for both staff and leadership—they also help build a culture of self-sufficiency, clarity, and continuous learning from day one.

AI and Robotics: Transforming the Manufacturing Landscape [Teekshnaa Ravi Seethappa]

In today’s rapidly growing global economy, the manufacturing industry is expanding at an unprecedented pace. For decades, factories have relied on robots to handle repetitive tasks, improving efficiency and consistency on the production line. These traditional robots were programmed to perform specific, routine actions which they did so with great success.
However, the rise of Artificial Intelligence is taking robotics to a whole new level. AI is enabling robots to not just follow instructions, but to learn, adapt, and even make decisions. This advancement raises an important question: Are AI-driven robots safe, and could they eventually take over most human labor in manufacturing? As we explore how AI is transforming robotic systems and the manufacturing Landscape, it’s essential to consider both the opportunities and the challenges of this new industrial revolution.

Tasmanian Devil

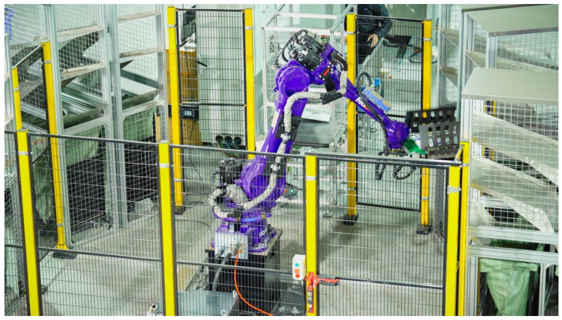
How is AI taking over robotics?
The way that machines function and communicate in the manufacturing sector has changed dramatically as a result of the incorporation of artificial intelligence into robotics. AI-powered robots have developed to perform increasingly sophisticated and dynamic activities, in contrast to older robots that were restricted to jobs like welding, assembling, or packaging.

These robots can now be trained to evaluate data, identify patterns, and react intelligently to changing situations, thanks to developments in machine learning algorithms and real-time data processing. This enables them to spot flaws in the product, adapt to different materials, and even gain insight from previous performance to get better over time. Additionally, AI improves their visual and other senses, allowing them to notice more subtle details and make more precise adjustments while producing. Robots are now cognitive partners that adapt to contemporary production procedures and make significant contributions, rather than only being programmed tools.

AI Robots in Processing Operations
Processing functions are among the most significant uses of AI-driven robots in manufacturing. These days, these robots can complete a variety of production jobs remarkably quickly, accurately, and reliably. AI-enabled machinery is improving the production process's quality and efficiency in a variety of tasks, including welding, painting, carving, drilling, sawing, and polishing.

The remarkable accuracy with which these robots can perform jobs is what makes them unique. AI technologies, for instance, guarantee that only the required quantity is used when painting or cutting materials, reducing waste and protecting priceless resources. This degree of accuracy lowers material prices and over consumption while simultaneously enhancing product quality and advancing sustainability objectives.

AI also enables these robots to modify their performance in response to real-time



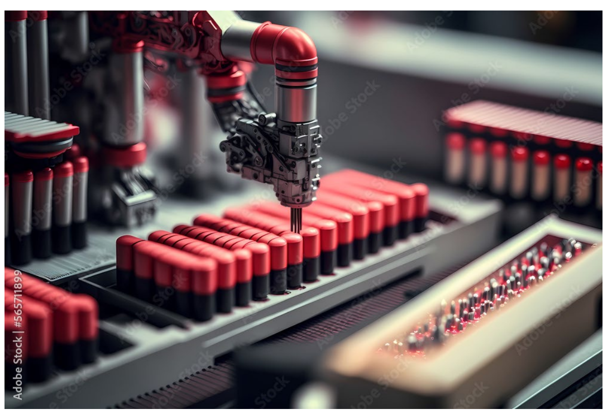
data. They are capable of autonomously recalibrating their actions, detecting irregularities in materials, and producing consistent results even under changing circumstances. Because of their versatility, they are perfect for high-demand production settings where uninterrupted quality and efficiency are required.

Monitoring of Smart decision-making Robots

AI-driven robots are being utilized increasingly for monitoring and streamlining manufacturing processes in addition to carrying out manual labor. By gathering and evaluating data in real time to facilitate more intelligent decision-making on the manufacturing floor, these intelligent systems go beyond conventional automation.

Echidna

For example, a lot of manufacturers now use robots with AI capabilities to manage their inventories. These devices automatically send out signals when goods need to be reordered, monitor stock levels continuously, and identify shortages. This helps maintain a steady operational flow and lowers the possibility of production delays brought on by supply chain interruptions.



Challenges of AI-robots: Safety

Although there are many benefits to using AI-driven robots in production, there are also a number of issues that must be considered. Safety is one of the biggest issues, particularly in settings where people and robots coexist. These devices can be dangerous if not used appropriately, even though they are frequently introduced to manage dangerous tasks and lower risks.

Numerous industrial robots are big, strong, and capable of precise, fast operations. Accidents may happen if human workers are not trained to deal with them or if safety procedures are not rigorously adhered to. An employee who enters a robot's operating area at the wrong time, for example, runs the risk of suffering severe injuries. Making ensuring robots **can accurately identify and avoid human** presence while operating is crucial as AI makes them more independent and adaptive.

Even though there are worries that automation may replace human labor, AI-driven robotics is also opening new job prospects, especially in higher-skilled and specialized positions. Manufacturers are increasingly focusing on employing staff with experience in artificial intelligence (AI), data analysis, robotics programming, and system maintenance as robots replace monotonous and physically taxing labor.

The workforce is becoming more technologically savvy because of this shift, and there is a growing need for qualified engineers, technicians, and data specialists. To guarantee seamless and effective operations, these experts oversee programming, overseeing, and improving robotic systems. Instead of destroying jobs, artificial intelligence (AI) is changing the nature of work in manufacturing by decreasing the need for manual labor and creating opportunities for more lucrative and intellectually stimulating career paths.

Bilby

What Can ChatGPT Do?
A Look at How This AI Can Help You Every Day
[Damon Knowles]


Alligator gar

AI is increasingly becoming a valuable part of our everyday lives, offering practical benefits that help us work smarter, save time, and make better decisions. From smart assistants that help manage our schedules to AI-powered tools that streamline tasks like writing, data analysis, and customer service, artificial intelligence is helping people across all industries boost productivity and reduce manual effort. With AI handling routine or repetitive tasks, we're free to focus more on creativity, collaboration, and problem-solving.

Beyond the workplace, AI also enhances personal life in meaningful ways. It can recommend personalized content, assist with health tracking, help manage finances, and even provide tutoring or language learning support. By integrating AI tools into our daily routines, we're able to make more informed choices, stay organized, and respond more quickly to changing needs — all while gaining insights we might otherwise miss. Used thoughtfully, AI doesn't replace us; it supports us, acting as a digital partner in both our professional and personal growth.

In an age where technology is woven into nearly every aspect of our lives, tools like ChatGPT are proving to be surprisingly versatile, helpful, and for many essential. Whether you're a student, professional, hobbyist, or just curious, here are some of the most helpful things ChatGPT can do to make your life easier and more productive.

1. Answer Questions & Explain Complex Topics
ChatGPT is trained on a vast range of knowledge. If you're trying to understand something from quantum physics, to cooking techniques you can ask for an explanation in simple terms. It can also compare concepts, summarize research, or provide historical context on just about any topic.
Example:
"Can you explain black holes like I'm 12?"
"What's the difference between a virus and a bacterium?"
"Summarize how inflation works in simple terms."
"What does 'machine learning' mean in one paragraph?"

2. Help with Writing Tasks
Need help drafting an email, writing a report, creating a resume, or even composing a poem? ChatGPT can generate, revise, and polish writing in various tones and formats — professional, casual, creative, and more.
Example:
"Write a polite email asking for a deadline extension."
"Can you help me make my cover letter sound more confident?"
"Write a thank-you email after a job interview."
"Make this sentence more professional."
"Turn my bullet points into a paragraph."

3. Code Help & Troubleshooting
Developers from beginners to pros use ChatGPT for help writing, understanding, or debugging code. It supports many languages, like Python, JavaScript, C#, and more. You can even ask it to explain what a specific line of code does or help build small tools and scripts.
Example:

“Why am I getting this Python error?”
“Create a JavaScript function that calculates loan payments.”
“Fix this PowerShell script that won’t run remotely.”
“How do I write a loop in JavaScript that skips weekends?”
“Explain this regex: ^[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+$.”

4. Learning & Tutoring
Whether you're studying for exams or just brushing up on a subject, ChatGPT can act as a tutor. It can quiz you, explain formulas, walk you through a math problem, or simulate a conversation in another language to help you practice.
Example:
“Help me study for my biology test on photosynthesis.”
“How do you convert a decimal to a fraction?”
“Test me with 5 multiple-choice questions on U.S. history.”
“Break down the steps to solve a quadratic equation.”
“Teach me the basics of Spanish verbs.”

5. Planning & Organization
If you’re overwhelmed with tasks, ChatGPT can help you break them down and organize them. From creating to-do lists and planning a vacation to suggesting a workout routine or a weekly meal plan, it’s a handy digital assistant.
Example:
“Help me plan a 3-day trip to Chicago on a budget.”
“Make a study schedule for finals week.”
“Make a weekly cleaning checklist for a small apartment.”
“Help me organize a birthday party for my 10-year-old.”
“Plan a balanced daily routine with work, meals, and workouts.”


Kinkajou

6. Creative Brainstorming
Stuck in a creative rut? Whether you’re writing a story, designing a game, naming a business, or brainstorming marketing ideas, ChatGPT can generate fresh concepts and help you explore different directions.
Example:
“Give me ideas for a children’s book about a robot dog.”
“Suggest Instagram captions for a nature photography account.”
“Brainstorm names for a dog grooming business.”
“Give me a plot idea for a sci-fi short story.”
“Suggest TikTok content ideas for a plant shop.”

7. Technical Support & Troubleshooting
Running into computer issues? ChatGPT can guide you through fixing common problems like resolving a black screen, connecting to a network, or running command-line tools like PsTools or PowerShell.
Example:
“Why does my monitor go black randomly?”
“Help me use PsExec to run a command remotely.”
“Why can't I connect to a network drive?”
“Laptop won’t boot — what should I check first?”

8. Entertainment & Conversation
Sometimes, you just want to chat, play a word game, or get a movie recommendation. ChatGPT can keep you company, play trivia, or suggest books and shows based on your preferences.
Example:
“Recommend a comedy series like *The Office*.”
“Let’s play 20 questions

“Play a word association game with me.”
“Suggest mystery novels like Gone Girl.”
“Give me movie night ideas for a family of four.”

ChatGPT is like a versatile Swiss Army knife for information, productivity, and creativity. It’s not a perfect expert, but it’s fast, helpful, and available 24/7. The more specific and clear your request, the more useful it becomes and the better it gets at helping you get things done.

In summary, the benefits of using AI in daily life are both practical and far-reaching. From streamlining everyday tasks like scheduling, writing, and data organization to offering personalized recommendations for learning, wellness, and entertainment, AI helps us work and live more efficiently. In the workplace, it can reduce repetitive tasks, enhance decision-making, and support collaboration by providing quick access to relevant insights. At home, AI can simplify chores, improve time management, and even assist with personal goals like fitness or financial planning. As these tools become more accessible and user-friendly, they’re not just for tech experts — they’re becoming valuable companions for anyone looking to stay organized, make smarter choices, and focus on what truly matters. By thoughtfully integrating AI into our routines, we unlock new ways to be more productive, creative, and connected in both our professional and personal lives.

Glaucus Atlanticus

The Power of Restart: Why Turning It Off and On Again Still Works

[Sharukh Mithani]

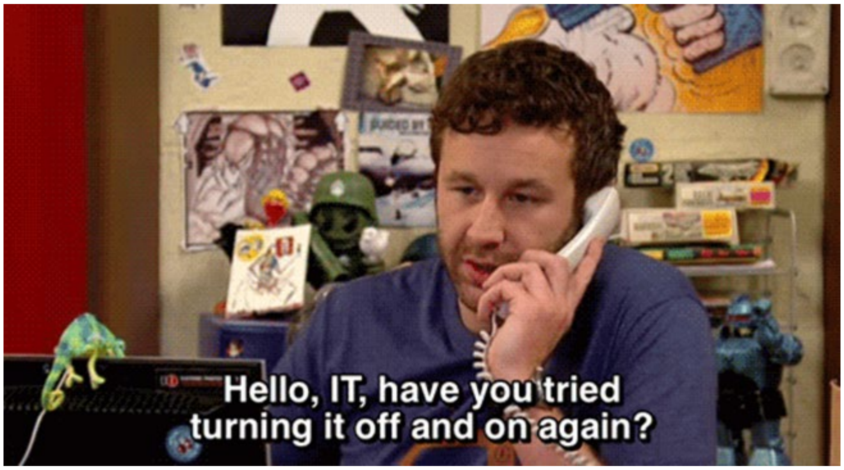


Image from The IT Crowd, a British sitcom known for its comedic tech support scenes.

It's the most cliché IT advice of all time – and it still (usually) works. But why?

When something isn't working correctly, whether it's a slow device, an unresponsive application, or a weird glitch, the cause is often something temporary. It might be a program that didn't close properly, memory that's gotten too full, or background processes that have stacked up over time. Restarting your device shuts everything down and starts it back up clean. It's like giving your system a fresh start and often clears up issues without any extra troubleshooting.

Restarting helps because it resets a wide range of system components that can run into problems the longer your computer is on. This includes things like memory leaks from apps that don't release RAM properly, background services that may be unresponsive, and system processes like print spoolers that sometimes freeze. A reboot clears cached data, resets drivers, resets hardware connections, and ensures all startup services load correctly. It's one of the easiest ways to fix a wide variety of issues. And with most modern Windows computers having fast flash-based storage, a restart can take less than a minute.

The same advice applies to other devices too. Modern mobile devices are effectively portable computers; restarting them will clear temporary system cache and app data. This can be useful for fixing app or connectivity issues on your device.

A similar principal can be applied to your internet browser. Clearing your browser's cache is essentially like "restarting" your browser. Over time, cached files (like images, scripts, and old page data) can get outdated or corrupted, leading to pages not loading correctly or behaving strangely. When you clear the cache, you force the browser to fetch fresh content, which often resolves weird glitches, just like restarting your computer clears out old data and stuck processes. It's a good first step whenever a website "just isn't working right."

However, it's important to note that **Shutting Down is not always the same as Restarting**. On Windows, a feature called Fast Startup saves parts of the system state to speed up boot times. While this is nifty if you need to get back to work, it won't necessarily fix glitches that occur, and it's important on Windows to specifically select "Restart" when trying to perform troubleshooting.

It's also important to know the limitations of restarting. While it may fix some issues, it isn't a cure-all. Restarting is a great first troubleshooting step, but if the problem persists, it's a good idea to do more digging (or contact IT Support).

Irrawaddy Dolphin

In short, restarting is a quick first step that allows you to easily eliminate common issues that may occur. It’s a great way to save time, frustration, and a potential call to IT support. So, the next time something isn’t working quite right, try turning it off and on again. You might be surprised how often it does the trick.

Sunda Colugo

Multi-Factor Authentication (MFA) and the importance of DUO

[Ruben Cruz]

Cybersecurity is an ever-evolving landscape. Threat actors are constantly trying to gain access to our assets, including, but not limited to funding and data. According to the 2025 Annual Verizon Data Breach Investigation Report, cyberattacks have nearly doubled in the last year, with 22% of attackers gaining unauthorized access using stolen credentials.

The rise in cyberattacks highlights just how critical it is for everyone to stay alert and take cybersecurity seriously. Threat actors are getting smarter and more aggressive, using everything from stolen passwords to social engineering to try to gain access to our systems. Keeping our systems secure isn't just an IT job, it's on all of us, and you are our first line of defense. Strong passwords and Multi-Factor Authentication (MFA) are two of the ways we can help protect our accounts.

As the name suggests, MFA uses multiple forms of authentication to verify the user is who they say they are. It adds an extra layer of security to your account. If your username and password are compromised, MFA helps ensure an attacker cannot access your account.
Typical factors for MFA are:

1. **Something you know** – Typically a username or password.
2. **Something you are** – A biometric identifier such as a fingerprint or iris scan.
3. **Something you have** – Such as an identification key or phone.

Glass Frog

In our organization, we use:
• **Something you know** – Username and password
• **Something you have** – Phone for DUO pushes

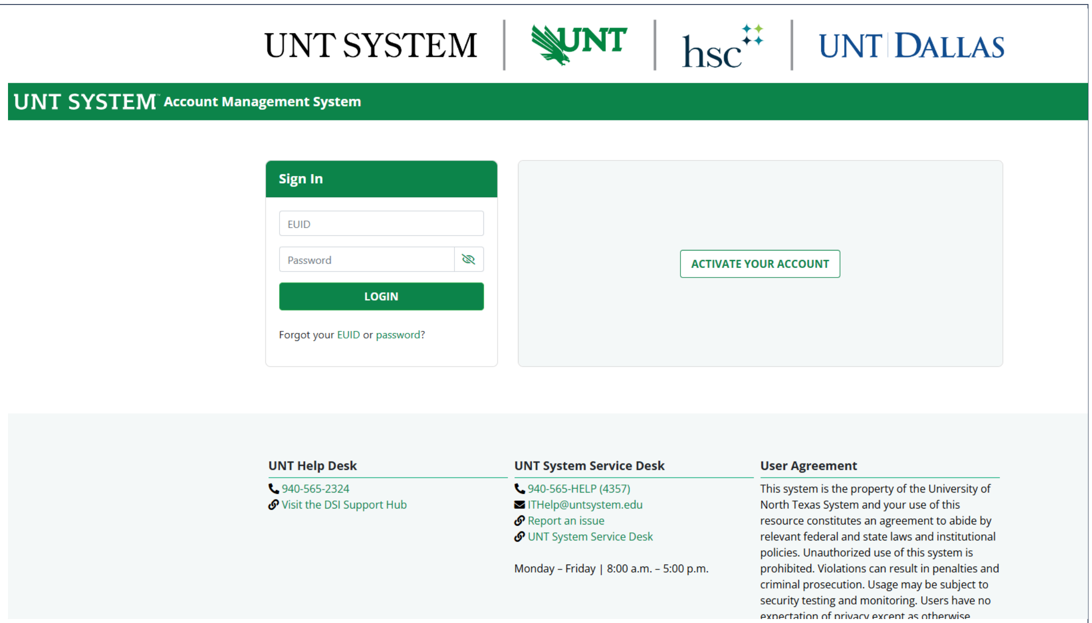
You can access UNT's DUO-MFA page here: Duo MFA FAQs | University of North Texas They have great documentation on how to set up DUO, and how to add a new phone to your account.

When you log into your account, you enter your username and password as your first form of authentication. Then receive a DUO push as your second form of authentication. When prompted, you get two options:
• **Deny**
• **Approve**
If you select **Deny**, you are not authenticated, and access to your account will be denied.
If you select **Approve**, the system recognizes and acknowledges that you have successfully authenticated and grants you access.

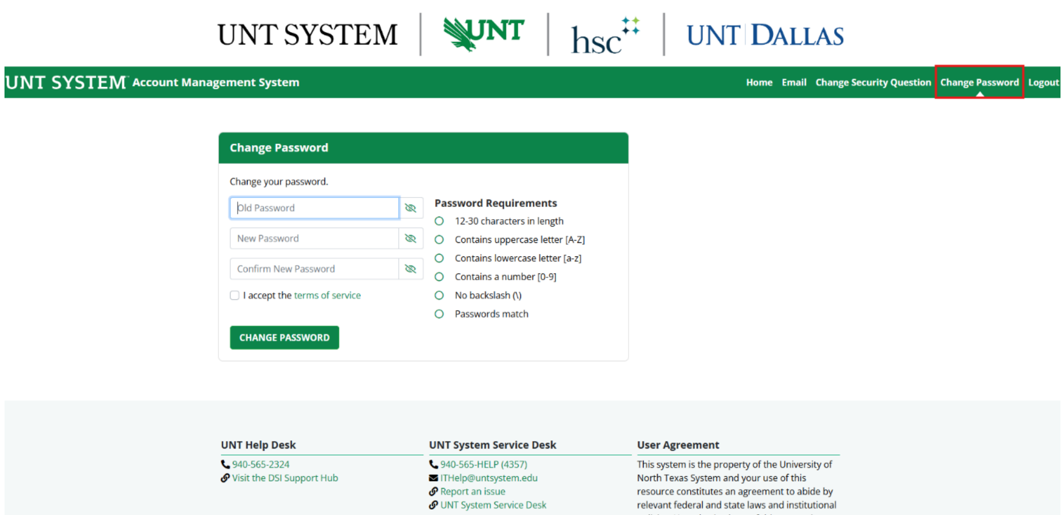
If you ever receive a DUO push and you are not logging into your account, it is important that you select the **Deny** option. This will prevent unauthorized access to your account. The system recognizes a **Deny** as: *"This is not me." – Authentication failed – Do not grant access*.

You can report unauthorized attempts to access your account to your IT team. If this occurs, it typically means your username and password have been compromised. It is a good idea to change your password to prevent more unauthorized attempts to access your account. You can do this by navigating to the UNT System Account Management System website. University of North Texas System - Account Management System - Home

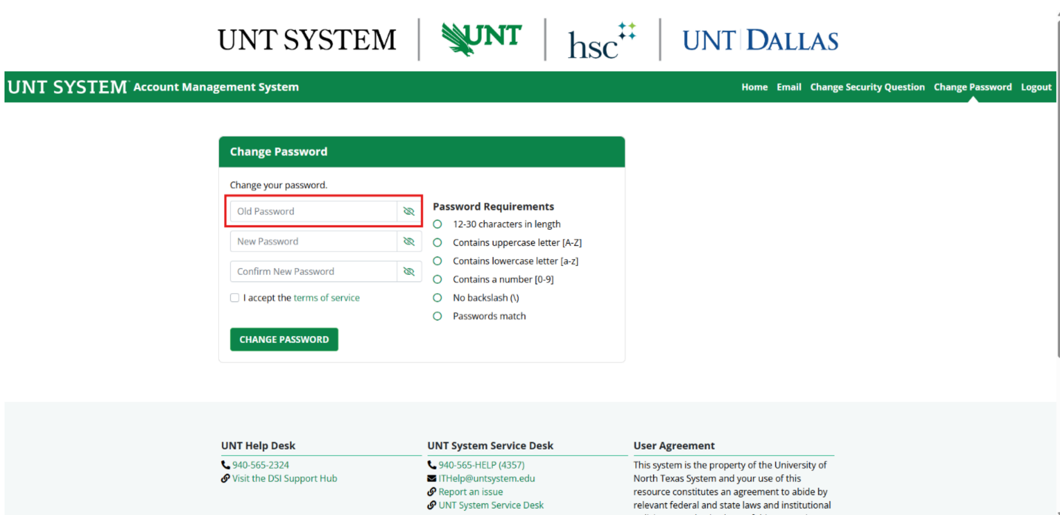

Honduran White Bat



Sign in with your EUID and password.

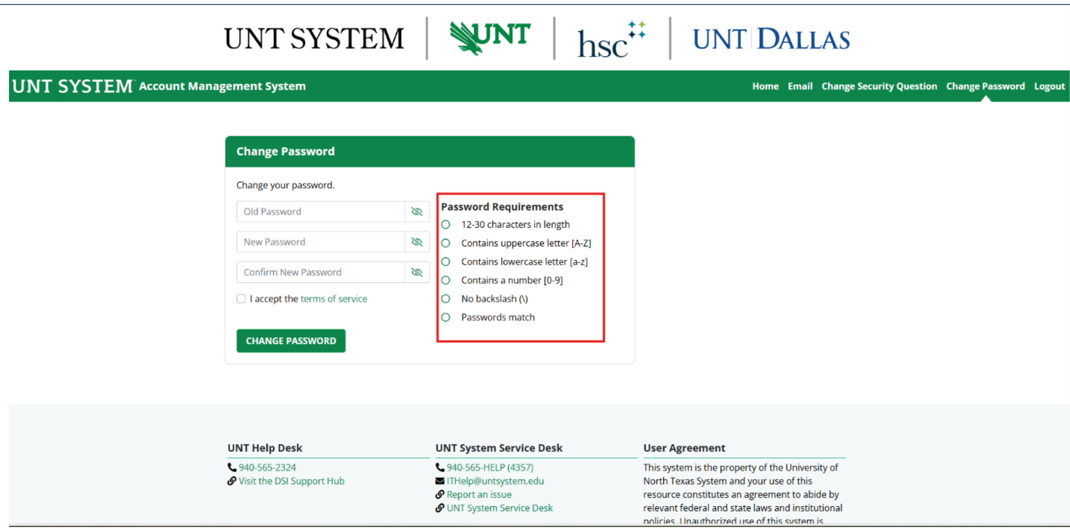


Select "Change Password."

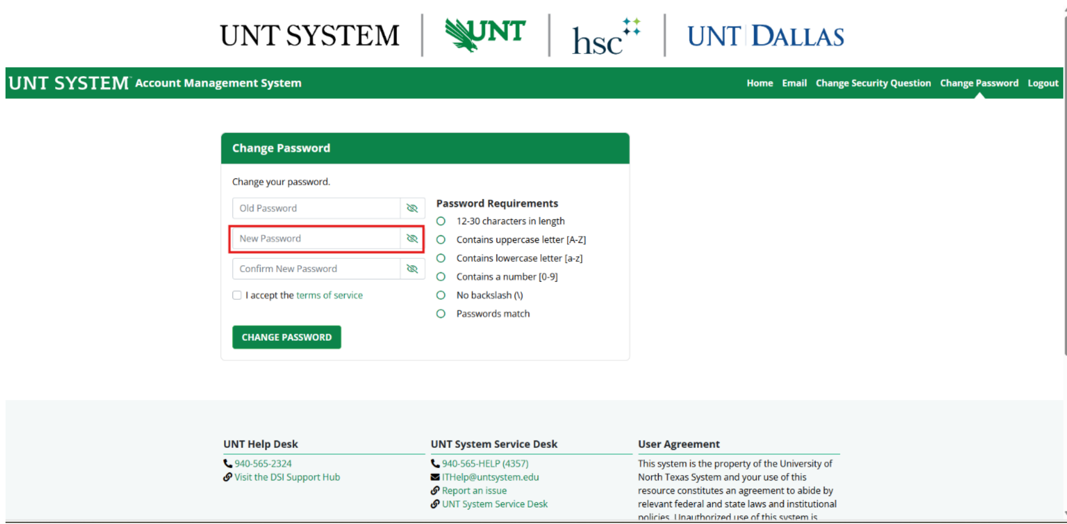


Enter your old password.

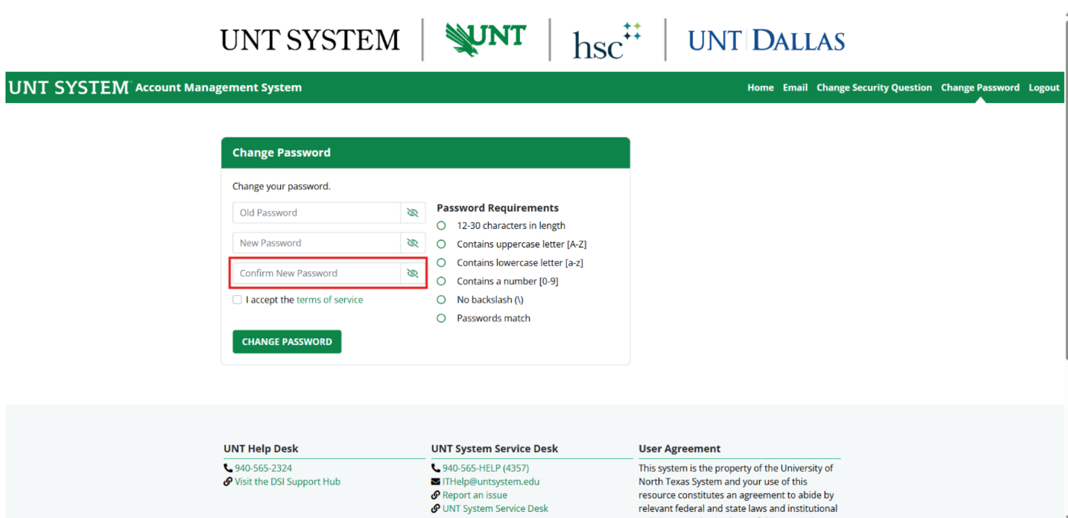
Leafy Seadragon



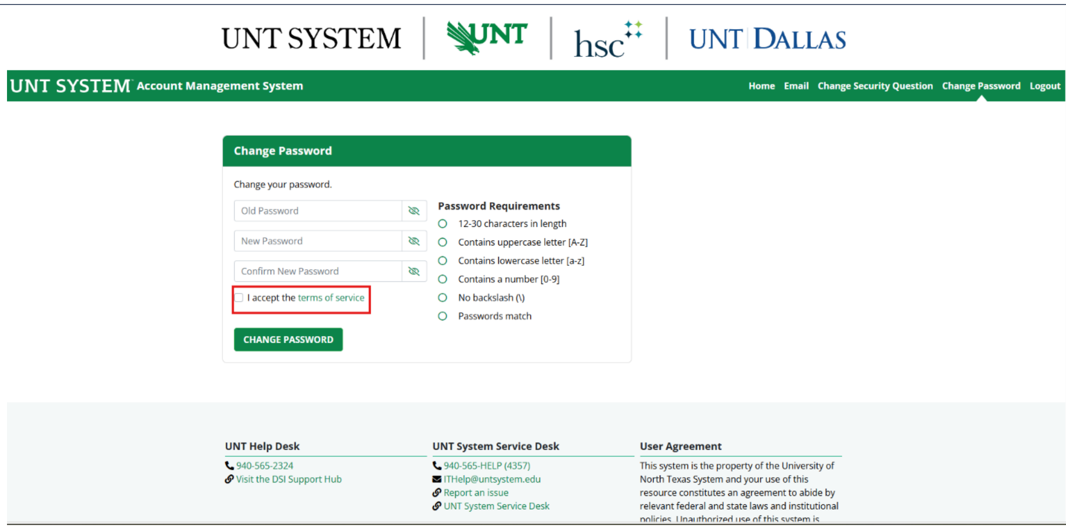
Follow the guidelines for creating your new password.



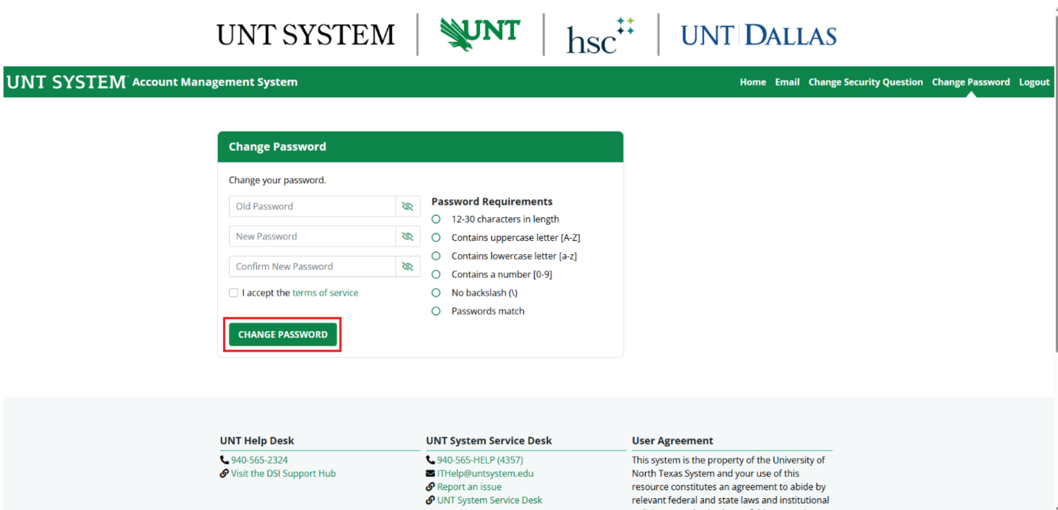
Enter your new password



Enter the new password again to confirm it matches.



Read the terms of service and select the checkbox “I accept the terms of service.”



Select “Change password.”

Protecting our organization isn’t a one-time fix. It’s an ongoing process that requires everyone to stay informed and alert. A DUO push isn’t just a notification on your phone; it’s a critical decision point that can prevent unauthorized access to your account and our systems. If you have any questions or concerns, don’t hesitate to reach out to your IT team.

Dik-dik

If It Still Works, Why Upgrade?

[Christopher Horiates]

In today's world of constant updates and shiny new tech, the question "If it still works, why upgrade it?" can sound almost rebellious. But with Microsoft preparing to end support for Windows 10, that question is more relevant than ever—especially when you realize that even a place as cutting-edge as Disneyland still runs on technology from the early 2000s.

A Surprising Discovery at Disneyland

During a recent visit to Disneyland, I noticed something that most guests would overlook. Near a ride operator's booth, I spotted a familiar sight: a fully functional Windows XP interface, complete with the iconic green Start button and rolling hill wallpaper. This wasn't a glitch or a forgotten screen, it was actively controlling the ride in real time.
When I asked the young operator if that was Windows XP, I got a puzzled look. But I knew what I saw. The green start button with the blue taskbar along with the stock default rolling hill background, how could one forget? And that moment sparked a deeper curiosity: how could one of the most technologically advanced entertainment destinations in the world still rely on software that most of us abandoned over a decade ago?

The Windows 10 Countdown

Microsoft will officially end support for Windows 10 Home and Pro editions on **October 14, 2025**. For most consumers and businesses, this means upgrading to Windows 11 to stay secure and compatible in an increasingly connected world. But for organizations like Disney, where systems are deeply embedded and mission-critical, upgrading isn't just a matter of clicking "Update Now." It's about balancing risk, reliability, and operational continuity.

Okapi

Why Disney Still Runs on XP

Despite its futuristic image, Disney has a long history of using older operating systems in its attractions. Why? Because they work. And when it comes to ride control systems, stability often trumps novelty.
While Disney clearly keeps its connected systems up to date (I spotted Cast Members using modern Microsoft Surface devices), some behind-the-scenes tech remains delightfully retro. After some digging and a few conversations, I uncovered a few fascinating examples. It's not easy cracking into the backend of the Mouse House Magic:

- **Toy Story Midway Mania** uses embedded Windows XP systems inside the ride vehicles for gameplay and target tracking.
- **Indiana Jones Adventure** originally ran on Windows 95-based systems and has since been upgraded—though not necessarily to the latest OS.
- Most ride safety and motion systems are powered by **industrial PLCs (Programmable Logic Controllers)**, not Windows. The XP systems typically handle visuals, diagnostics, or effects—not the ride's core mechanics.

When Stability Matters More Than Upgrades

Upgrading a ride system isn't like updating your phone. A single software patch could disrupt the delicate choreography of lights, sounds, and motion that make Disney rides so magical. If a system performs flawlessly day after day, there's little incentive to change it.

Plus, a full system overhaul could mean months of downtime, millions in costs, and extensive retraining. For a park that welcomes tens of thousands of guests daily, that's a steep price to pay for a newer interface.

But What About Security?

Yes, Windows XP has been unsupported since 2014. But Disney likely mitigates risks through strict network isolation, air-gapped systems, and physical security. A ride control panel running XP behind a locked console is a far cry from an office PC exposed to the internet.

What started as a casual observation turned into a fascinating lesson in technical pragmatism. That XP screen wasn't a relic—it was a trusted tool, still doing its job after all these years.

The Bigger Picture

As we prepare to say goodbye to Windows 10 and embrace the next wave of operating systems, it's worth remembering: not all upgrades are necessary. Sometimes, the best tech decision is to stick with what works, especially when lives, safety, and millions of magical moments depend on it.
So next time you're on a ride or using some kiosk or ATM, think about what's powering the system. You might be surprised by how much of our world still runs on old software—and how often that's exactly the right choice. As consumers and most businesses, we don't have that luxury as we are in a very connected world with threats evolving daily so we must maintain up to date systems that still get security patches. But for where systems need stability and they can be isolated from a connected world and perform very specific repetitive certain functions, if it still works, why upgrade it?

Warty Frogfish

Intel i-Series vs. Ultra-Series: What’s The Difference

[Troy Bacon]

Intel has traditionally categorized its mainstream processors under the "Core i-series" (i3, i5, i7, i9), which have been a staple in consumer desktops and laptops for years. These processors have evolved through numerous generations, offering increasing core counts, clock speeds, and integrated graphics capabilities to cater to a wide range of users, from casual browsers to demanding gaming and content creation. The "i-series" has become synonymous with Intel's primary offering, providing a clear hierarchy of performance with higher numbers generally indicating greater power.

The introduction of the "Intel Core Ultra series" marks a significant shift in Intel's branding and architectural focus, especially for mobile platforms. Unlike the incremental improvements often seen in successive "i-series" generations, the Ultra series, beginning with Meteor Lake, brings a new tile-based architecture. This design fundamentally changes how the processor components (CPU, GPU, NPU) are integrated, allowing for greater modularity and efficiency. This architectural departure is key to the Ultra series' enhanced capabilities, particularly in areas like AI and power management.

A primary distinction of the Intel Core Ultra processors is the dedicated Neural Processing Unit (NPU), branded as "Intel AI Boost." This NPU is specifically designed to accelerate AI workloads, offloading these tasks from the CPU and GPU. This results in more efficient and faster execution of AI-enhanced applications, such as video editing with AI features, real-time language translation, and intelligent video calling. While some "i-series" processors incorporate AI instructions within the CPU, the dedicated NPU in the Ultra series provides a significant leap in AI performance and power efficiency for such tasks.

Patagonian Mara

Furthermore, the Ultra series often features more powerful integrated graphics, typically utilizing Intel's Arc Graphics (Xe-LPG architecture). This offers a substantial improvement in graphical performance compared to the integrated UHD or Iris Xe graphics found in many "i-series" processors. This makes Ultra processors more suitable for light to moderate gaming and demanding creative applications without necessarily requiring a discrete graphics card. The power efficiency of the Ultra series is also a major focus, particularly for mobile devices, allowing for longer battery life without sacrificing performance.

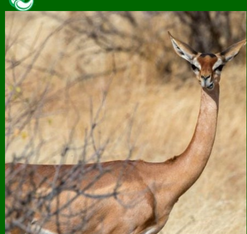
In essence, while the Intel i-series continues to offer robust performance for general computing, gaming, and content creation, the Intel Core Ultra series represents Intel's forward-looking vision for the "AI PC." It prioritizes integrated AI acceleration through its NPU, enhanced integrated graphics with Arc, and superior power efficiency through its new tile architecture. This makes the Ultra series particularly appealing for users who heavily rely on AI-driven applications and seek a balance of performance and extended battery life in modern, thin, and powerful laptops.

I Wanted to build a PC, but console gaming is fine

[Michael Garcia]

January - March 2021: I want a graphics card.

Dad said I should start a journal so I don’t forget some things in life, so I did.
I’ve been saving up for a graphics card, something like a 3060 to be specific.
I heard it’s really good for Minecraft with pretty shaders. My old computer kind of melts dust out of the air if I try to load too high of graphics settings.
I just want to play with the fancy lighting and the realistic water, not that the original blocky graphics are bad.
I was able to pick out a nice case on newegg. It’s white with little RGB lights, something different and it looks like something from space even without the graphics card.
The 3060 is finally out, I stayed up and hit refresh like a hundred times.
It sold out instantly, bots I can only assume.
And now the only ones I can find are over $1,200 on ebay.
That seems like a lot for one computer part. I thought they were supposed to be around $300 like an xbox which is a whole computer...
Maybe there’s a shortage or whatever.
I would go try and find one in person but my immune system is not the best.
My neighbor Steve lives next door. He’s nice and always has something to say, lives in big house double our size, but doesn’t really leave it. There are notices on his door that his lawn needs to be mowed sometimes.
He started getting these huge boxes delivered every week filling up his driveway.
I helped him carry one once while on my afternoon walk with mom. It was very very heavy.
“Why is this so heavy?” I asked.
He said it was for his new job "in the mines."
Ok.
I poked again and he just said “it’s for the eeeeth” after we set the last box down.
I don’t know what that is, maybe something from world of warcraft or final fantasy 14. Mom said I need to learn to make conversation with people better.



Gerenuk

April - May 2021: Steve is doing something.

Dad said the electric bill went up...
Why.
I don’t really use the oven or anything, my dad and I just microwave tv dinners but thats for like 4 minutes at a time, the chicken patties take longer if they are frozen.
One of our outlets has been buzzing lately like a big bug type of buzz.
Kind of weird, but I put some tape over it to remind myself not to touch it.
Steve’s garage recently is literally glowing like fruity pebbles colors.
It’s always buzzing now… sounds like some beehive, and there’s this fan that blows hot air into the alley now.
I asked him what he was doing and he said, “stacking dat hash on them chains, chat.”
I nodded but I don’t really watch twitch or youtube live unless its a friend that is streaming.
He mentioned something about “doggy coin” and to “pay attention to the rocket man” he says.
I asked if that’s like a collectible like those classic coins people have.
He giggled and told me “it’s the true money and will replace our current corrupt system.”
I didn’t really know what to say to that. I know Steve likes to display his sun burnt faded anarchy tapestry on his window, maybe its like that.
He games too so I did ask if he had any extra graphics cards, but he said all of his were spoken for.
That’s ok I know he’s working on some big project, ill just keep saving up.

June – August 2021: Summer is hot.

Still no 3060 anywhere...
Prices are wild.
Even the older graphics cards from like 2016 are hundreds of dollars.
I don’t want anything fancy to be honest just something that lets me run shaders and maybe some older emulation, my poor ps2 got stepped on and I really want to play tony hawk pro skater too.
But it’s like everyone decided graphics cards are diamonds now.
I saw someone selling a 1050 Ti with a missing fan for $350 on craigslist.
And steve’s garage sounds like it’s going to take off at this point.
The floor vibrates a little in the house now when I walk past that area near his, there’s nothing that could cause this noise in the culdesac... Steve?
There’s even tubes and pipes coming out of the window now, I think he’s building an anime robot.
He keeps making jokes about how he’s “passively earning” while I “actively exist” when I see him.
I laughed even though I think he’s referring to me being laid off twice this year, we both live with our parents, my mom must have told his and now he’s making jokes...
He did offered me a used card shortly after, but it was covered in dust and had a bent corner.
He said it was “fine for the minecraft mines but not his mines,” but it smelled like burnt plastic and actually had rust so I said I was fine.
I just want to build my pc.
Maybe one day I’ll get to place a torch in a ray traced cave in minecraft.


Markhor

September - November 2021: Steve is buying all the graphics cards.

This whole time it was Steve, he is the one taking all the new graphics on the on newegg and amazon.
Steve has so many graphics cards he started putting them outside now!
Not all of them, but I think the garage is filled up. There’s a folding table by the side of his house with like computer parts and fans taped to cardboard boxes. One has a towel draped over it like a sun hat. I don’t think that’s safe.
There’s wires running through his windows and under the siding now, like Christmas lights but not festive or friendly. One of the cords snakes under our fence I saw... I don’t want to assume anything but our microwave makes a weird clicking noise when it's plugged in now, and the other neighbor’s motion sensor lights flash randomly even when it’s not windy. The air fryer doesn’t work if the tv is on too. Is it ghosts? Or maybe Steve doing something with his mega super computer causing the power here to be unstable that comes to the culdesac? What is he even trying to play on his computer.
Our electricity flickered twice last week. Mom blamed the power company but I saw Steve outside with a shovel and a headlamp that morning. He waved and said, “just optimizing the flow my bro.” I waved back but he went inside kind of fast.
I don’t know much about electricity, but our porch light buzzes now and the walls feel warmer or that is just me feeling things. I think the fridge makes a different hum too but frozen microwave meals heat easier now.
Steve ordered a giant industrial fan yesterday. It’s just strapped to his porch now, blowing air across the driveway where more of his graphics cards are hanging out in the open under a giant wooden cover like it’s a weird electronics barbecue. The fans on them are loud and wobbly, like maybe they are about to lift off.

December 2021: 2022 is coming soon.

I think something happened at Steve’s place the other night.
I woke up around 3 am to the smell of burnt plastic like when I accidentally microwave my tv dinners too much, and this strange glow bouncing off my window blinds. It looked... orange?
I peeked outside and thought I saw saw something in Steve’s garage trying to become a sun… but it was way too early.

Could've been a figment of another dumb dream. I was pretty tired and it's always bright over there anyway.
The next day, everything seemed fine I guess. His garage door was closed, strange, but some of the tubes and fans were gone and the bush near his porch looked kind of sad.
His dusty outside graphics cards are still going because the lights are still on.
There's this weird shadow mark on the side of his house now, just a big melted streak someone tried to paint over but poorly. His big giant fan's missing, and the window that used to glow like skittles now has a dirty blanket pinned over it.
So far no one's really said anything. I haven't seen Steve since then, but a new box still showed up on his porch this morning as usual.

Late December 2021: Winter is cold.

I walked past Steve's place again today on my way to the corner store.
Something feels different now. Not in a big obvious way, just… off.
The wires are gone. All of them. The ones that used to run through the windows, down his driveway, over the his trash bins, even the one that hung awkwardly across that dead tree branch near the other neighbors house that doesn't like Steve, all disappeared. There are some still going to our backyard though.
I hadn't even realized how many there were until they weren't there anymore to be honest. The ground looks a little patchy where some of them were hammered down.
It's quieter too. Not completely silent I mean there's still a little buzzing near the plastic table out front where some of the cards are still plugged in but not like before. No more low rumble through the walls. No more transformer clicking.
Even the heat that used to roll off the sidewalk near his place is just… gone. It feels colder now like it should. Maybe that's just the winter weather, or maybe I got used to his garage being a giant space heater for the culdesac.
I haven't seen Steve come outside yet, but I did spot a few energy drinks on the porch and a screwdriver in the dirt.
The new box is still sitting there, unopened. No label this time. Just tape, and some faint dents on the side like something shifted inside during delivery.
I'm not really sure what's going on, but the quiet is starting to feel louder to me than the noise ever did.


Babirusa

February 2022: I hope Steve is ok.

I don't think the box on Steve's porch ever got opened.
It was just kind of... there for a while. Got rained on once, then disappeared one day like it never mattered to begin with or someone maybe took it.
The buzzing finally stopped too. Even the last little table of graphics cards out front is gone now. The plastic folding chair he had is still there though. One leg's a little bent and it leaves a funny shadow on the sidewalk when the streetlight hits it at times.
But I actually did see Steve again last week, just briefly. He was wearing a hoodie with some weird ugly monkey on it and he said something about "digitally owning real things" and how "the future lives on a chain now" I believe.
I nodded. I think I've gotten good at doing that.
He said he was pivoting and I should to, then waved at a tablet he was holding and pointing to like it explained anything, I couldn't see what he had on it.
That dirty blanket's still over his garage window, but now it doesn't even glow behind it. Just sits there like a curtain to something that's not happening anymore.
Sometimes when I walk past, I still think I hear the hum. But maybe it's just my ears filling the silence. I wonder what kind of high level graphics he was able to achieve with all those graphics cards maybe he was able to do 8k gaming like the ps5 or some sort virtual reality thing.
Minecraft's been running pretty well on this little xbox I ordered from walmart for $300. I found a deep cave system under my little house and lit the whole thing up with torches. Looks nice with the water dripping down the sides even without shaders or ray tracing.
I think I'm okay with this.
I never did build that PC that I said I would, I still have the case. It's still on my desk and still glows like the stars at night when I plug it in.

Understanding the Difference: AI, Machine Learning, and Deep Learning

[Alex Martinez]

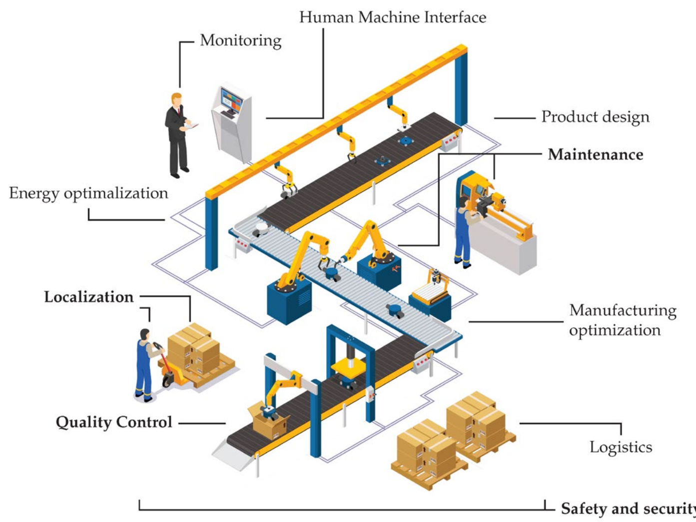
In today's technology-driven world, terms like Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL) are often used interchangeably. However, understanding their differences helps clarify how these technologies impact our daily work and future strategies.

What is Artificial Intelligence (AI)?

AI is the overarching concept that refers to any technique that enables machines to mimic human intelligence. This includes reasoning, learning, problem-solving, and perception. AI-powered applications can range from rule-based, such as simple automation, to more advanced systems like natural language processing and robotics. AI aims to simulate human-like tasks, whether through basic algorithms or complex models.

A few examples of AI include smart assistants like Alexa and Siri, as well as online recommendations from services like Netflix and Amazon.

What is Machine Learning (ML)?



Machine Learning is a specific approach within AI that allows systems to automatically learn and improve from experience without explicit programming. ML uses statistical techniques to identify patterns in data and make predictions or decisions. Common applications include spam filtering, fraud detection, recommendation engines, and image recognition.

Unlike traditional programming, where rules are hard-coded, ML algorithms learn rules from data. This adaptability makes ML especially powerful for tasks with large, complex datasets.

What is Deep Learning (DL)?

Deep Learning is a specialized subset of Machine Learning that uses neural networks with multiple layers – hence "deep." Inspired by the human brain's structure, these networks can analyze vast amounts of unstructured data such as images, video, and audio with remarkable accuracy.

DL has powered major breakthroughs in computer vision (e.g., facial recognition), natural language processing (e.g., ChatGPT), and autonomous vehicles. While ML models often plateau in performance, DL models improve significantly with more data and computational power.

Ocean Sunfish

While AI is the overarching concept, Machine Learning provides the methods for learning from data, and Deep Learning refines this further by enabling highly complex tasks through neural networks. Understanding these differences helps organizations choose the right tools to innovate, automate, and solve business problems effectively.

AI vs. machine learning vs. deep learning

	AI	Machine learning	Deep learning
Optimal data volumes	Varying data volumes	Thousands of data points	Big data: millions of data points
Outputs	Anything from predictions to recommendations to decision-making	Numerical value, like a classification or score	Anything from numerical values to free-form elements, like free text and sound
How it works	Machines are programmed to mimic human activity with human-like accuracy	Uses various types of automated algorithms that learn to model functions and predict future actions from data	Uses neural networks that pass data through many processing layers to interpret data features and relationships
How it's managed	Algorithms require human oversight in order to function properly	Algorithms are directed by data analysts to examine specific variables in data sets	Algorithms are largely self-directed on data analysis once they're put into production

Solution to last newsletter's brainteaser

Counting for all of us is about as natural as breathing, I am sure you will agree!

W The lovely but not terribly-bright contessa was swindled of her jewels. She knew that her beautiful pin had nine diamonds down each side, and across the top/bottom. These were clustered as shown below but she had never examined the arrangement closely. A clever thief figured out a way to steal four of the magnificent diamonds so the contessa did not miss them. He reset the diamonds so that there were still nine diamonds on each side of the pin but only 20 diamonds in total. How did he reset the jewels to get away with 4 of them?

3	3	3
3		3
3	3	3

Answer:

4	**1**	**4**
1		**1**
4	**1**	**4**