



Tech Update 2022

Major Topics



- Cloud software innovations
- Communications – C-Band, 5G, phones, LEO, Wi-Fi 6E
- Emerging technology – Web3
- Hardware
 - Innovation
 - Supply chain
 - Processors
 - Computers
 - Monitors
 - Glasses
 - Scanners
- TV – 8K, rollup
- Productivity
 - Integrating work, applications, and life/living
 - Applications
- Security – Endpoint, Pluton
- EV – delivery/tractors
- Market Conditions
- Strange, but true

Learning Objectives

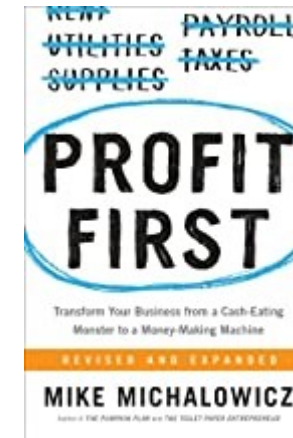
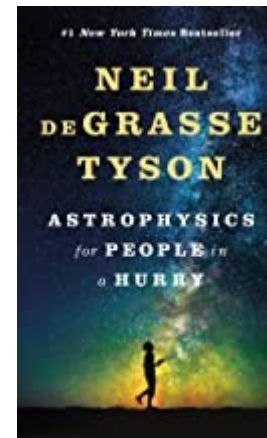
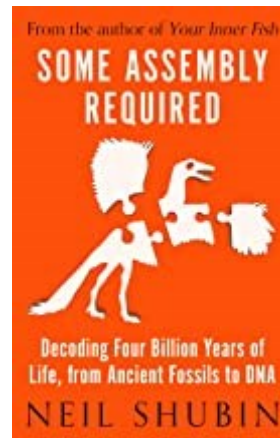
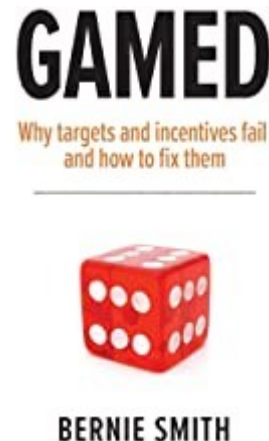
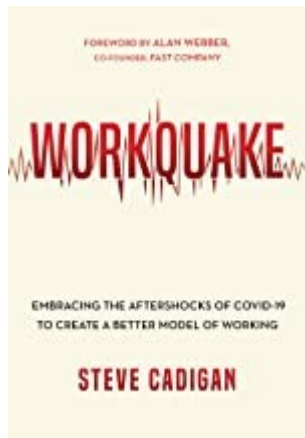


- Select hardware and software that can enhance productivity and security
- Evaluate current communications choices to improve efficiency
- Differentiate between key products & able competitors to pick the best tools for the job
- Create strategic and tactical benefit lists that benefit you and your business

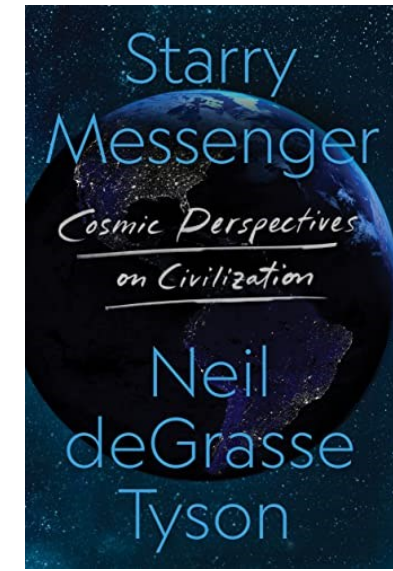
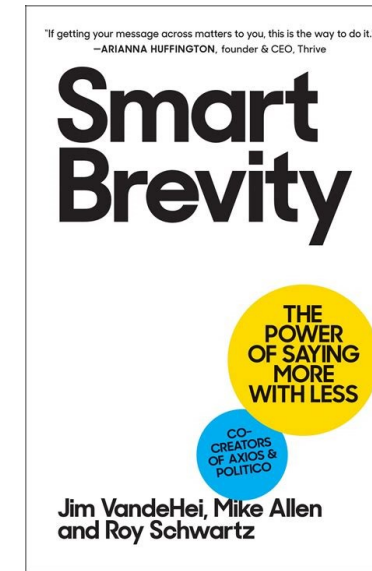
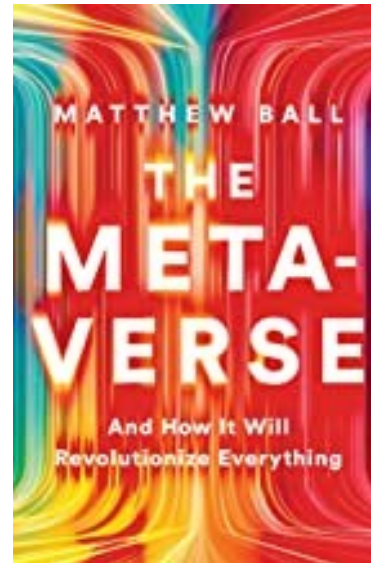
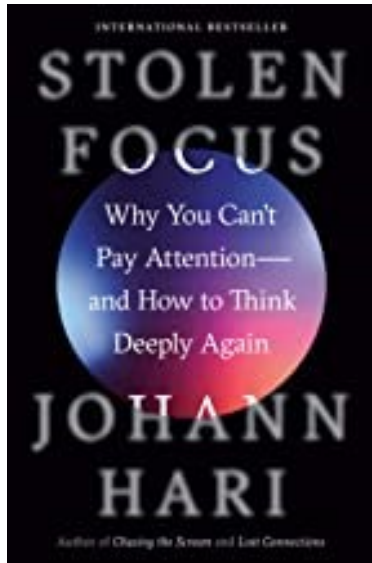
Last Year's Recommendations



- All are still solid recommendations
- Many I have recommended in the last week
- Steve Cadigan's and Bernie Smith's is certainly best of class
- Note the two science books



A Few Recommendations





Cloud Software Innovations

It's A Small Cloud After All

Gaps That Used To Exist Are Better



- Power Automate and other RPA tools
- Digital Plumbing
- SaaS Accounting Software
- All major software innovations are SaaS
- APIs are commonly published and usable by end-users
- Low code and no-code tools improving
- Cloud Productivity Suites (covered later and in other sessions)

Process Mining



- Analyzing logs from process automation software to identify exceptions or other unusual transactions
- Can unlock process optimization efforts through millions of historical transactions
- Uses data science to discover, validate and improve workflows by combining data mining and process analytics
- Leaders include Celonis and Minit (acquired by Microsoft)
- Celonis acquired Process Analytics Factory GmbH, a company that provides process mining insights in Power Automate
- This is an area which has been critical in the enterprise, and is now moving down into mid-market businesses




Levels Of Cloud Security Improve



- Use of containers – isolated virtual machines
- Microsoft Azure Pluton (covered later and part of Windows 11)
- Examples: Carbon Black, Crowdstrike, Darktrace, Red Canary (AI)
- “In 2021, protections built into Windows, Azure, Microsoft 365, and Microsoft Defender for Office 365 have blocked more than 9.6 billion malware threats, more than 35.7 billion phishing and other malicious emails, and 25.6 billion attempts to hijack Microsoft enterprise customers by brute-forcing stolen passwords—that’s more than 800 password attacks per second”

Cetrom's Advanced Cybersecurity Defense System



-  Ransomware Detection & Remediation
Next-Generation Antivirus Technology
Forensics-level Detection & Response
-  Multiple Back up Solutions Onsite & Offsite
Data Encryption at Rest & In Transit
Email Attachment & Link Scanning
-  Two-factor Authentication
Adopt Least Privilege Model
Employee Cybersecurity Recurring Training
-  Patch Management
Email Encryption
Standard Antivirus

Windows 11 Security



- Microsoft Pluton: Built on the principles of Zero Trust
- Smart App Control prevents users from running malware
- Microsoft Defender SmartScreen for enhanced phishing detection and protection
- Credential Guard by default – advanced white-listing of applications by the operating system
- Local Security Authority (LSA) by default
- New Personal Data Encryption
- Config Lock
- Hypervisor-Protected Code Integrity (HVCI)
- Windows Defender Application Control (WDAC)

Seven Properties Of Highly Secure Devices – Remember For AMD Pluton










Property	Examples and Questions to Prove the Property
 Hardware-based Root of Trust	Unforgeable cryptographic keys generated and protected by hardware. Physical countermeasures resist side-channel attacks. <i>Does the device have a unique, unforgeable identity that is inseparable from the hardware?</i>
 Small Trusted Computing Base	Private keys stored in a hardware-protected vault, inaccessible to software. Division of software into self-protecting layers. <i>Is most of the device's software outside the device's trusted computing base?</i>
 Defense in Depth	Multiple mitigations applied against each threat. Countermeasures mitigate the consequences of a successful attack on any one vector. <i>Is the device still protected if the security of one layer of device software is breached?</i>
 Compartmentalization	Hardware-enforced barriers between software components prevent a breach in one from propagating to others. <i>Does a failure in one component of the device require a reboot of the entire device to return to operation?</i>
 Certificate-based Authentication	Signed certificate, proven by unforgeable cryptographic key, proves the device identity and authenticity. <i>Does the device use certificates instead of passwords for authentication?</i>
 Renewable Security	Renewal brings the device forward to a secure state and revokes compromised assets for known vulnerabilities or security breaches. <i>Is the device's software updated automatically?</i>
 Failure Reporting	A software failure, such as a buffer overrun induced by an attacker probing security, is reported to cloud-based failure analysis system. <i>Does the device report failures to its manufacturer?</i>

Table 1. Required Properties of Highly Secure Devices with Examples.

- Create a secure root of trust
 - Security processor
 - Cryptographic engines
 - Hardware Random Number Generator(RNG)

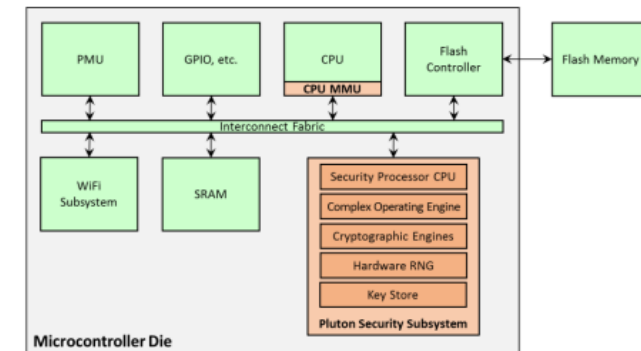


Figure 2. Architecture of the Experimental Sopris Highly Secure WiFi-enabled Microcontroller.

The End Of Passwords: Azure AD



- Hybrid Identity management with three techniques
 - Password hash synchronization (PHS)
 - Pass-through authentication (PTA)
 - Federation (AD FS)
- Passwordless Login
 - Windows Hello fingerprint, facial recognition
 - FIDO 2 token-based authentication: mobile app, hardware token
- Identity Lifecycle management
- Conditional Access
- Identity protection

What Makes Automation Effective?



- Low maintenance
- Faster than manual approaches
- Minimal incremental expense
- Accurate
- Easier than alternatives
- Makes the impractical possible
- Intuitive for users, requiring little training

Favorite Automations



Software

- Expenses
- Credit Card
- PDF Conversion
- Email
- Grammatical/writing support
- Streaming
- Voice to text

Hardware

- Wireless connections
- Printer options
- Peripheral choices
 - Camera
 - Microphone
 - Headset
- Firestick/Apple TV/Roku/Echo
- Phone hardware-cellular or VOIP

Sophisticated Automations



Software

- AI learning
- Graphics upscaling
- Self-driving/driving assistance
- Lidar
- ECG
- EKG

Hardware

- Neural processing
- GPU rendering
- Tesla and many others
- Scanner on iPad Pro
- Apple Watch
- Karidamobile

What Accounting Automations?



Software

- AP and expense reporting
- Bank and credit card feeds
- 1040 workpapers and OCR
- Payroll time keeping
- Mileage tracking
- Low-code, no-code workflow automation tools

Hardware

- Tablets
- Surveillance cameras
- Smartphones
- Scanners
- Persistent high-speed internet

What Is A PROP Solution?



- Process and Resource Operation Planning (PROP) solutions are for growing SMBs that need more than the Entry level solutions, but cannot afford or do not need a full ERP solution yet
- PROP solutions are the middle of the road option
- Lower price than ERP but with more functionality than entry-level systems



Best Productivity Applications



Accounting

- AccountantsWorld Accounting Power, Payroll Relief
- Acumatica
- Corpay One
- Dext
- Open Systems
- Path by Simplex Financials
- SmartVault
- Spire Systems
- Verady
- Zoho

Public Practice

- BooXkeeping
- Canopy
- CPA.com .cpa domain
- Cetrom
- Doc.It
- Clarity Practice Management
- Corvee
- Liscio
- Suralink
- TPS Software

Power Automate



- Transfers and integrates the data in workflows between applications without human intervention
 - Hundreds of pre-built connectors available and bots can be created using a web-based low-code no-code environment
 - Where connectors not available, users can use custom code to integrate Power Automate with a solution's APIs
 - Where APIs not available, Robotic Process Automation (RPA) bots can emulate the rote work of a data entry employee (adding records or scraping data from the screen)
- Tools like Power Automate compensate for the "islands of automation" created by "best in breed" solutions as compared to the integrations associated with a suite of apps

Artificial Intelligence



- Many services use AI to enhance knowledge work
 - [Otter.ai](#) audio transcription
 - [Grammarly's](#) writing assistance
 - Microsoft Word's [inclusive language checker](#)
 - Optical character recognition algorithms used by [Zoho Expense](#), [Dext](#), [Corpay One](#), and others

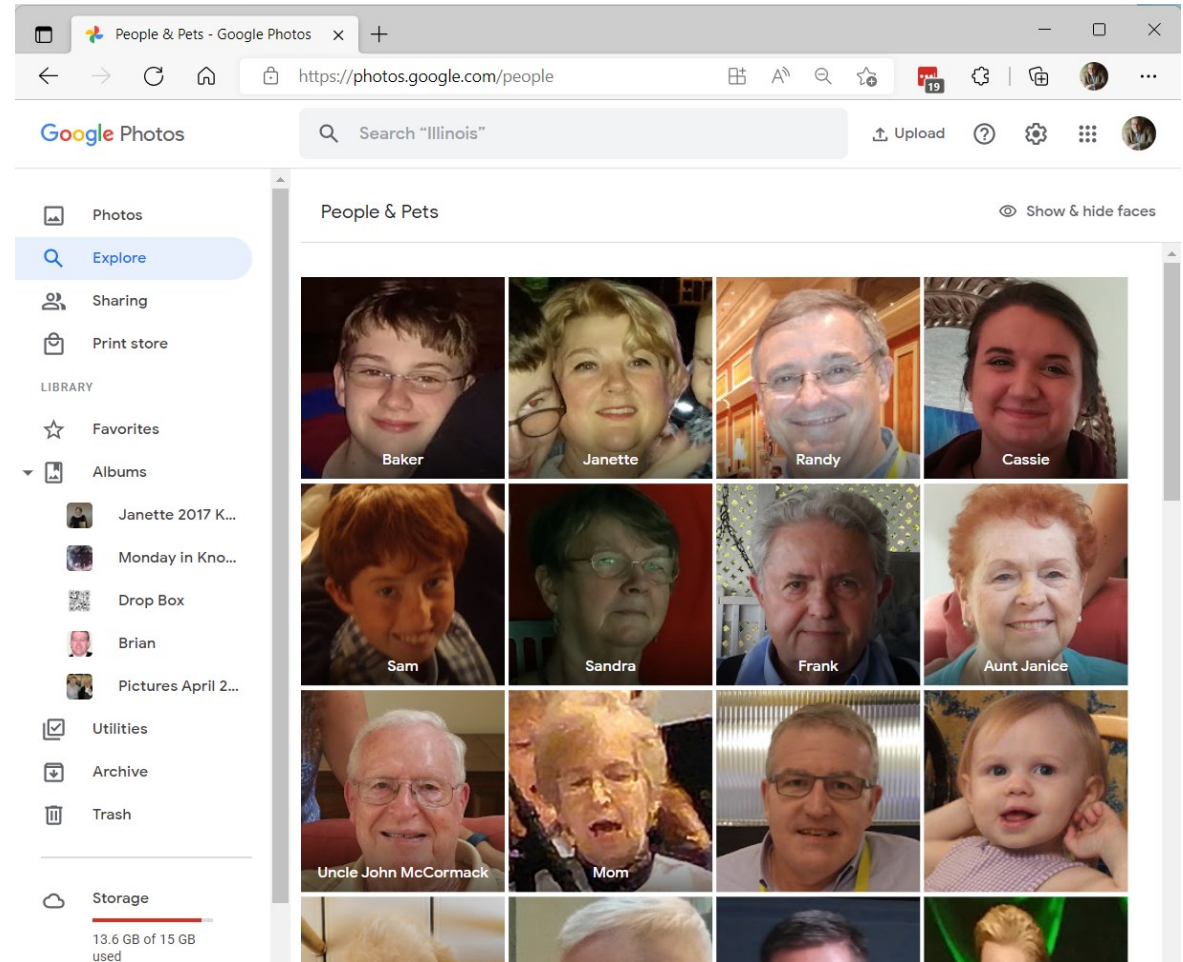
The screenshot displays the Otter.ai interface for a meeting titled "20220204 Liscio". The interface includes a search bar, a navigation menu with options like "Home", "My Conversations", "More", "GROUPS", "DIRECT MESSAGES", and "FOLDERS", and a main transcript area. The transcript shows a message from Randy Johnston with a "Good" highlight. Below the transcript is a video player with a play button and a "1x" volume indicator.

Otter's translation service uses AI to identify words and speakers

Artificial Intelligence



- Other services use AI to improve your personal life
 - Google Photos uses AI-powered facial recognition to group pictures by person, improved by your feedback
 - Streaming services like YouTube and Twitch use AI to offer real-time closed captioning of content
 - CCTV cameras can distinguish between the video of a person and the video of a pet



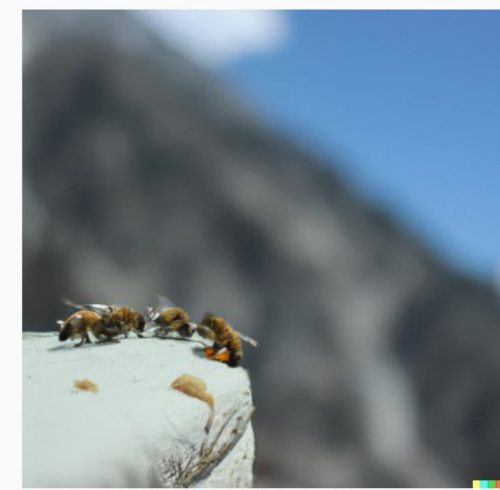
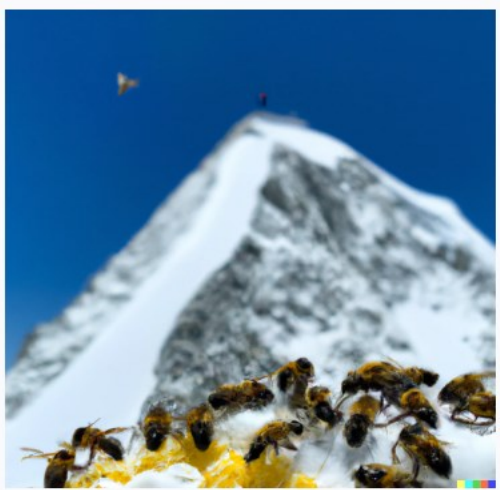




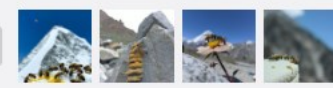
Google Photos uses AI to group your photos by person

Edit the detailed description

Surprise me Upload →

bees on the K2 Mountain **Generate**

Recent New



Report issue

Edit the detailed description

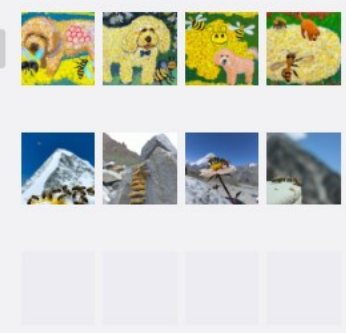
Surprise me Upload →

An impressionist painting of a golden doodle dog, a maltipoo dog, and bees

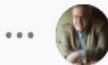
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Recent New



Report issue



Edit the detailed description

Surprise me

Upload

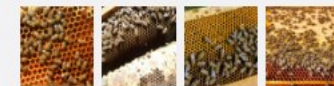
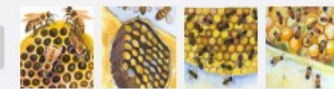


a watercolor of Honeycomb with bees on it

Generate

Recent

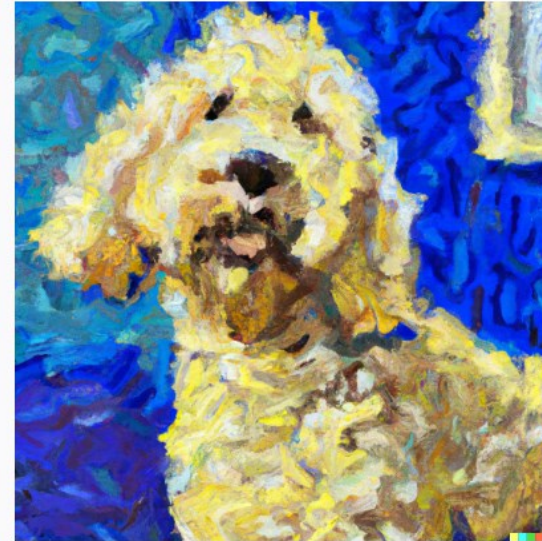
New



Report issue



“A Van Gogh Painting Of A White Golden Doodle Dog”



Microsoft Teams Premium (2/2023)



- New features:

- **Meeting Guides:** Meant to help users pick the right meeting experience (client call, brainstorm meeting, help desk support, etc.). IT admins will be able to customize and manage this feature, so that options will be preset for particular meeting types.
- **Branding:** Teams users can brand meeting experiences with custom logos, backgrounds for the Teams lobby and custom scenes for Together Mode.
- **Intelligent recap:** Users will get personalized highlights from Teams meetings.
- **AI-generated tasks:** Action items are automatically assigned from meetings.
- **Personalized insights:** Call outs for times in a meeting when a user's name was mentioned, screens are shared and when people join and leave.
- **Intelligent search:** Search for transcripts will get more features like suggested speakers to help find specific points for reference.

Microsoft Teams Premium (2/2023)



- New features (continued):
 - **Live translations for captions:** Available in 40 spoken languages
 - **Advanced meeting protection:** Users will get tools for better securing confidential meetings, such as board meetings, financial discussions or product launch plans. This will include watermarking to deter leaks and limiting who can record and more. Microsoft 365 E5 customers will be able to leverage existing Microsoft Purview Information Protection sensitivity labels to automatically apply relevant meeting protection options.
 - **Advanced webinars:** Will include features like registration waitlist and manual approvals, automated reminder emails, a virtual green room for hosts and presenters and the ability to manage what attendees see.
 - **Advanced virtual appointments:** Extra features such as pre-appointment SMS reminders, a branded lobby experience and post-appointment follow-ups.

Microsoft Places (In Beta)



- Helps staff schedule when in/out of office, coordinate meetings
- Includes booking of meeting rooms/spaces which match mix of in person/virtual attendees
- Hot desk booking (think audit staff room)
- Facilitates impromptu “serendipitous meet-ups”

Home My team Admin Team policy M T W T F +1 office day

My dashboard Workspaces Collaborators Analytics

Let's set you up for success, Jenny.
74% of your co-workers are planning to be in the office on Tuesday!

Today August 2022

22 Mon	23 Tue	24 Wed	25 Thu	26 Fri
Remote	Remote	Office day	Office	Wellness day
Home office	Home office	Desk A8 / Bldg 4	Desk A7 / Bldg 4	Day off
20% in office	70% in office	90% in office	60% in office	0% in office

Suggested office day

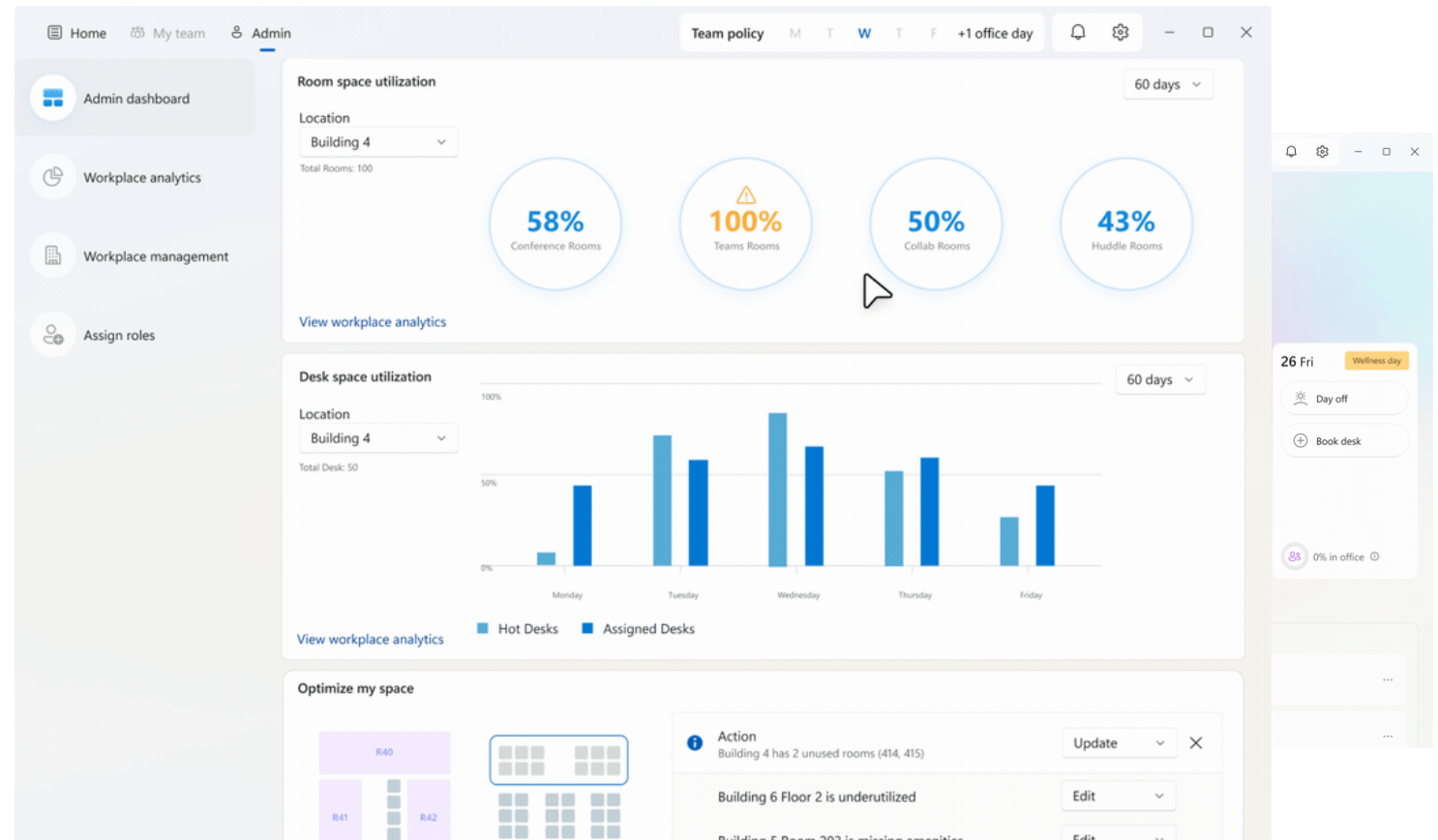
Collaborators

- Andre Lawson Home office
- Carlos Slattery Bldg 4
- Chris Naidoo Home office
- Charlotte Waltson Home office

Microsoft Places



- Leverages [Teams Rooms](#) (Teams Rooms are free for up to 25 rooms, \$40/room/mo. for premium features)
 - [Supported devices list](#)
- Reporting on space utilization
- Recommendations for energy savings on days when floors/spaces are not needed



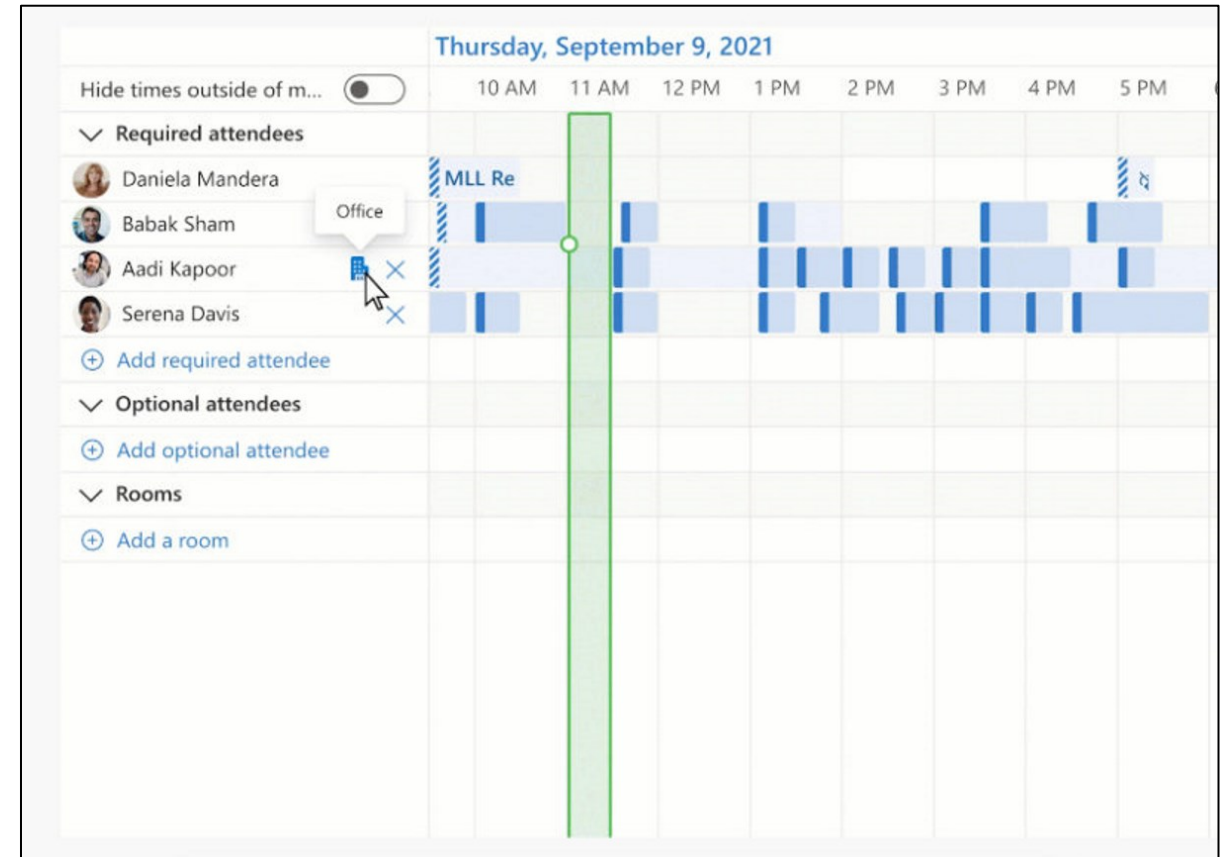
Microsoft Places (Beta)



New Outlook Features For Hybrid EEs



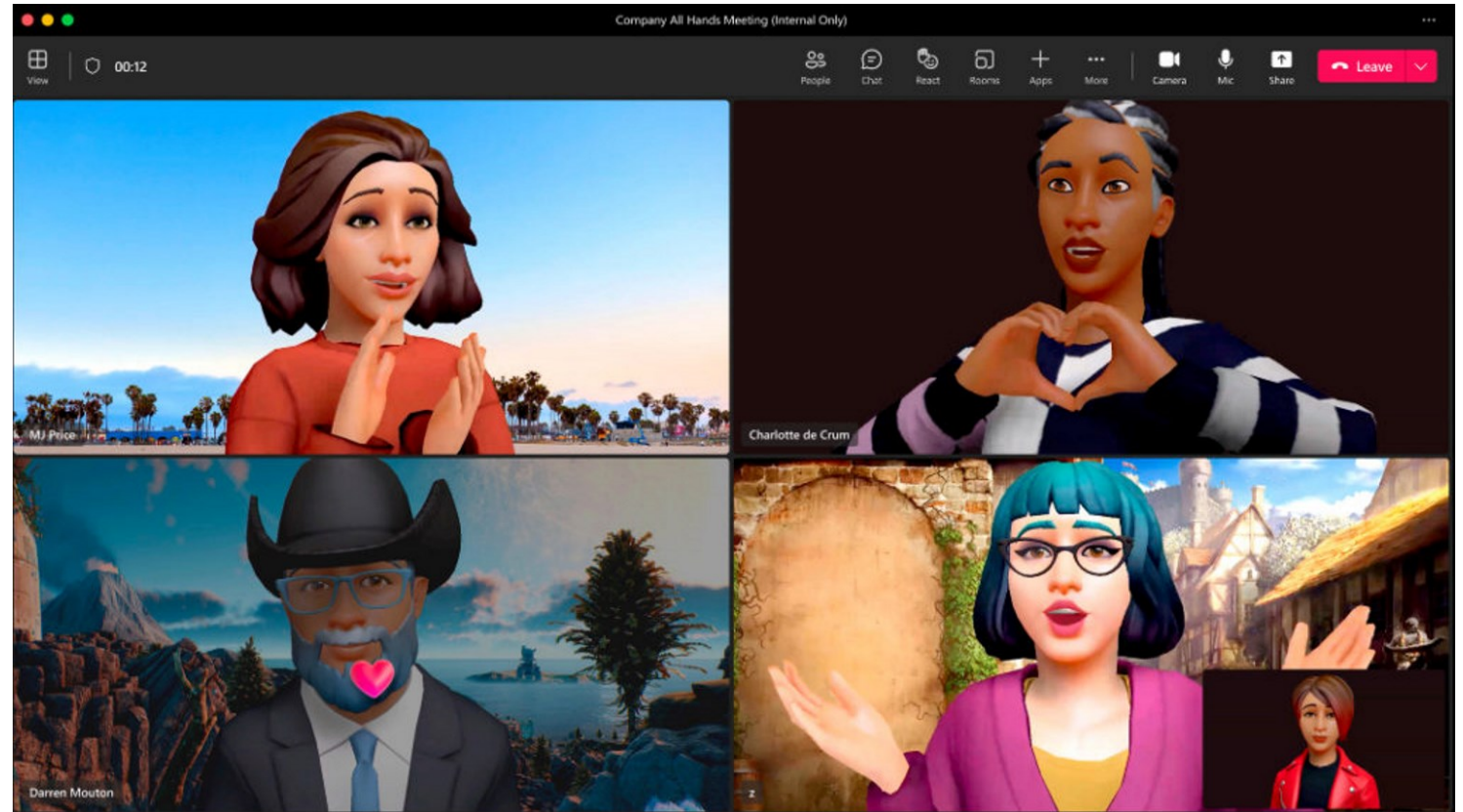
- Adding support for working hours and locations to simplify meeting planning
- Same features will be available in Teams by the end of 2022
- New Meeting Recap feature coming which summarizes all meeting info and links to the recordings, if available
- Outlook on MacOS is getting support for focused profiles and MacOS filters



Teams And Avatars Preview (Beta)



- Teams will launch a preview soon which makes a user's Meta avatar available in Teams
- This is designed to be a substitute for a camera-on meeting for “bad hair days”





Communications

Update On Developments



- Web3
- 5G wireless
- LEO
- 10G broadband – Mediacom/CableLabs
- Wi-Fi 6E

Web3



- An idea for a new iteration of the World Wide Web based on blockchains, which incorporates concepts including decentralization and token-based economics
- Contrast with Web 2.0, where data and content are centralized in a small group of companies referred to as “Big Tech”
- Web 1.0 were static web pages for consumers from 1991-2004
- Not the 1999 vision of semantic web 3.0 by Tim Berners-Lee
- Term coined in 2014 by Gavin Wood, Ethereum co-founder
- Popularity surged in 2021 from cryptocurrency enthusiasts, large technology companies, and venture capital firms

What Else Is Web3?



- Self-sovereign identity without relying on OAuth for identity
 - Ceramic
 - IDX
 - Sign in with Ethereum using a wallet address
- Non-fungible tokens (NFTs)
- Decentralized finance (DeFi) where users exchange currency without bank or government involvement
- Jack Dorsey (Twitter) claims web3 will shift power to VCs from Big Tech
- Benefits?
 - Improve data security
 - Scalability
 - Privacy
- Risks?
 - More cybercrime
 - Online harassment
 - Hate speech
 - Child pornography

What Happened With Web2?



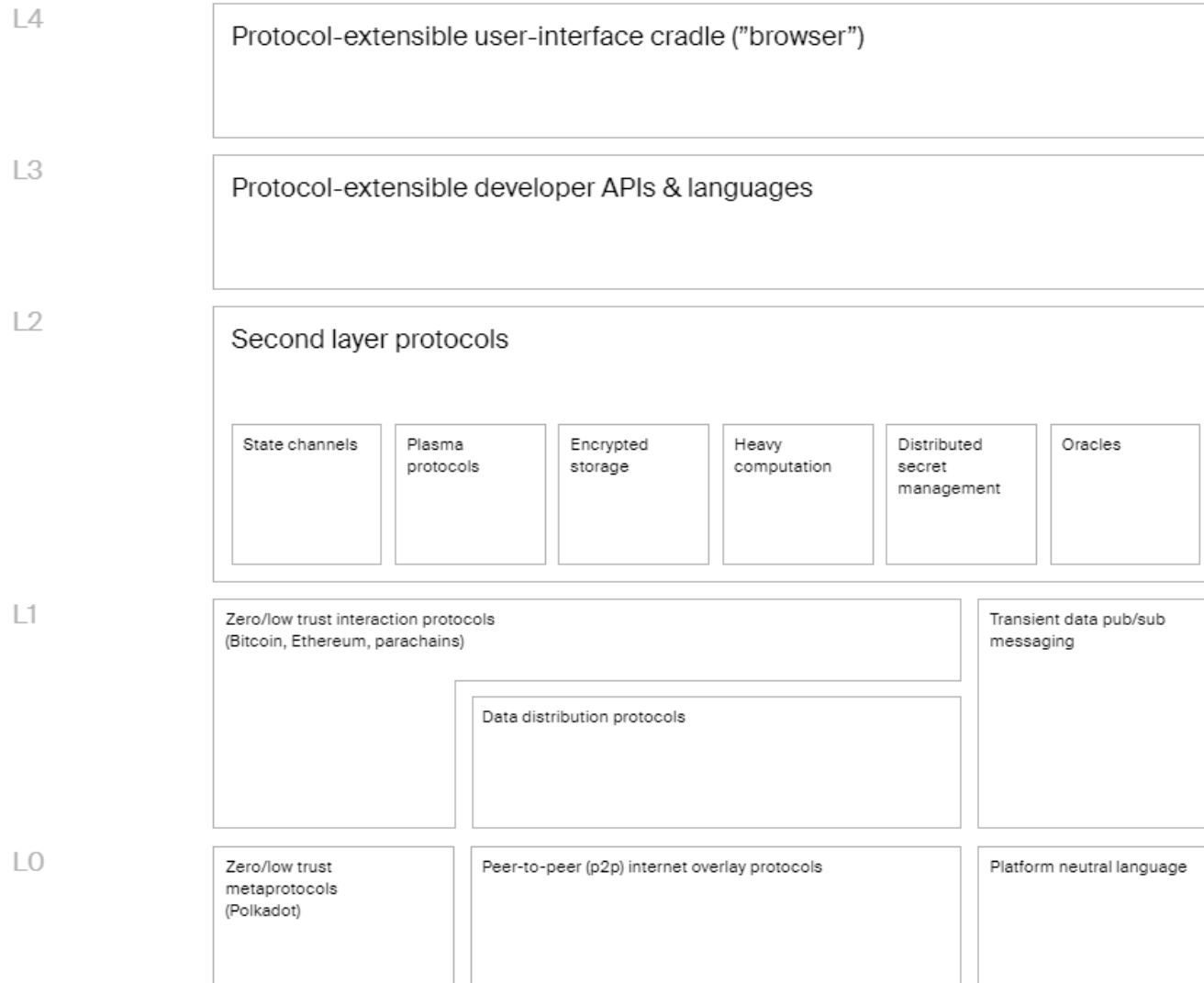
- Dynamic content with end-user publishing on social media, video channels, and on various centralized platforms
- Monetization of Apps
 - Company launches an app
 - It onboards as many users as possible
 - Then it monetizes its user base through advertising or selling data
- Security and privacy issues
 - Data breaches since you don't have any control over your data
 - Countries with free speech issues are at risk
 - Bank accounts can be shut down with governmental action

Utopian Web3 Enhances Internet



- Enhancements
 - Verifiable
 - Trustless
 - Self-governing
 - Permissionless
 - Distributed and robust
 - Stateful
 - Native built-in payments
 - MetaMask
 - Torus
- Decentralized Autonomous Organizations (DAOs)
- Cryptoeconomic protocol
 - Blockchains
 - Decentralized servers (P2P)
 - Combination of the two
- Tokens serve as \$ incentive
 - Filecoin
 - Livepeer
 - Arweave
 - The Graph
- Networks like Solana

Web 3.0 Technology Stack



Web3 Foundation

5G Spectrum, Auctions, And More

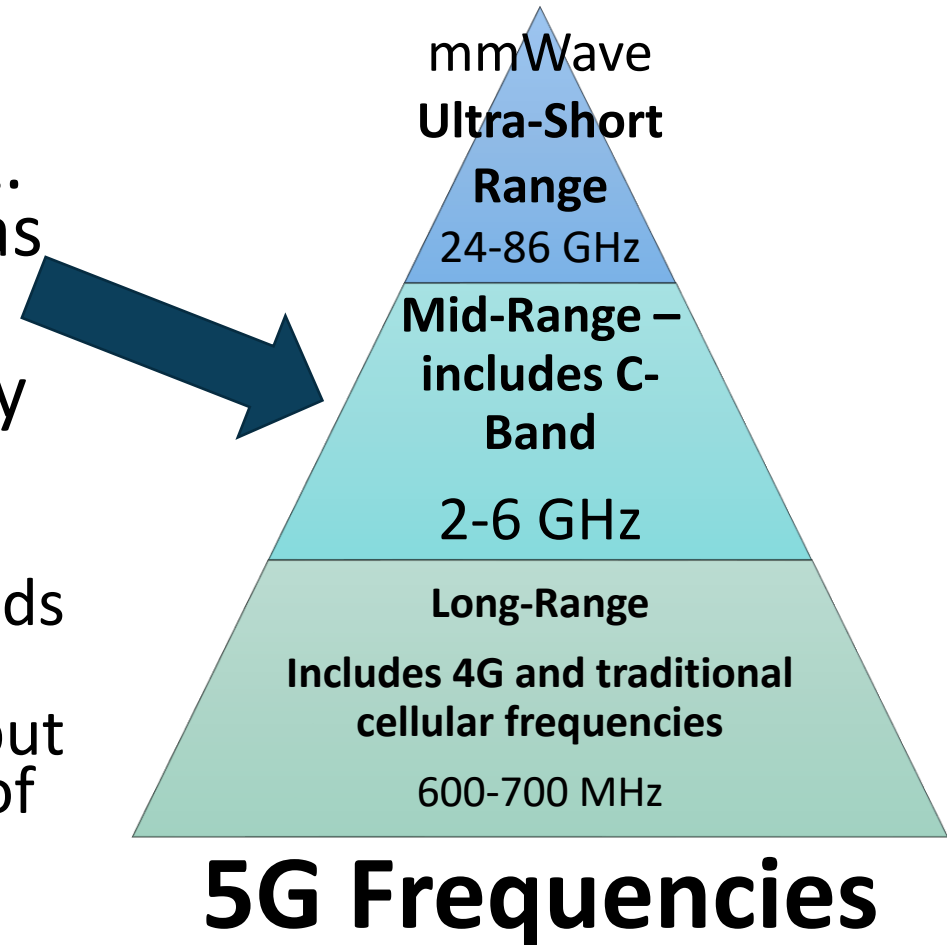


- Concern that C-Band auctioned in 2021 interferes with aviation communications delayed AT&T and Verizon rollout of 5G
- Aircraft altimeters run in the 4.2-4.4 GHz spectrum
- More frequencies to be auctioned this year in the U.S.
- Canada's Innovation, Science & Economic Development (ISED) ministry [auctions C-Band](#) instead of Telesat, who wanted to fund Lightspeed LEO
- Transportation Secretary Pete Buttigieg will have to be “the decider” according to Ray LaHood, former secretary on grant programs and projects for infrastructure including internet
- Verizon's faster 5G network launched Jan. 19. The network runs on its C-Band spectrum, which Verizon paid \$50 billion for in order to bring a faster 5G connection to people at further distances than the millimeter-wave spectrum can reach

OK, So What Is C-Band?



- It's a set of radio airwaves operating at a frequency range between 3.7 and 3.98GHz. That frequency falls under what is known as midband spectrum
- AT&T and Verizon have deployed 5G mainly on low-band spectrum or high-band millimeter wave
 - Low-band has excellent coverage, but its speeds are often equivalent to those of 4G LTE
 - Millimeter-wave has excellent performance, but its coverage is often limited to just a handful of blocks in certain cities or in parts of an arena, stadium or airport



So, How Fast Is C-Band/Midband?



- Verizon C-Band is 1 gigabit per second, or 10x faster than 4G LTE
- T-Mobile has C-Band for 2023. Their previous speed is 400 Mbps
- Software upgrades and the right hardware is required, and that includes Apple's iPhone 12, iPhone 13, and 5G iPad lines; Samsung's Galaxy S21 & S22 line, Z Flip 3 and Z Fold 3; and Google's Pixel 6 and 6 Pro
- AT&T 5G Plus, Verizon Ultra Wideband are C-Band offerings

Who Gets This, And When?



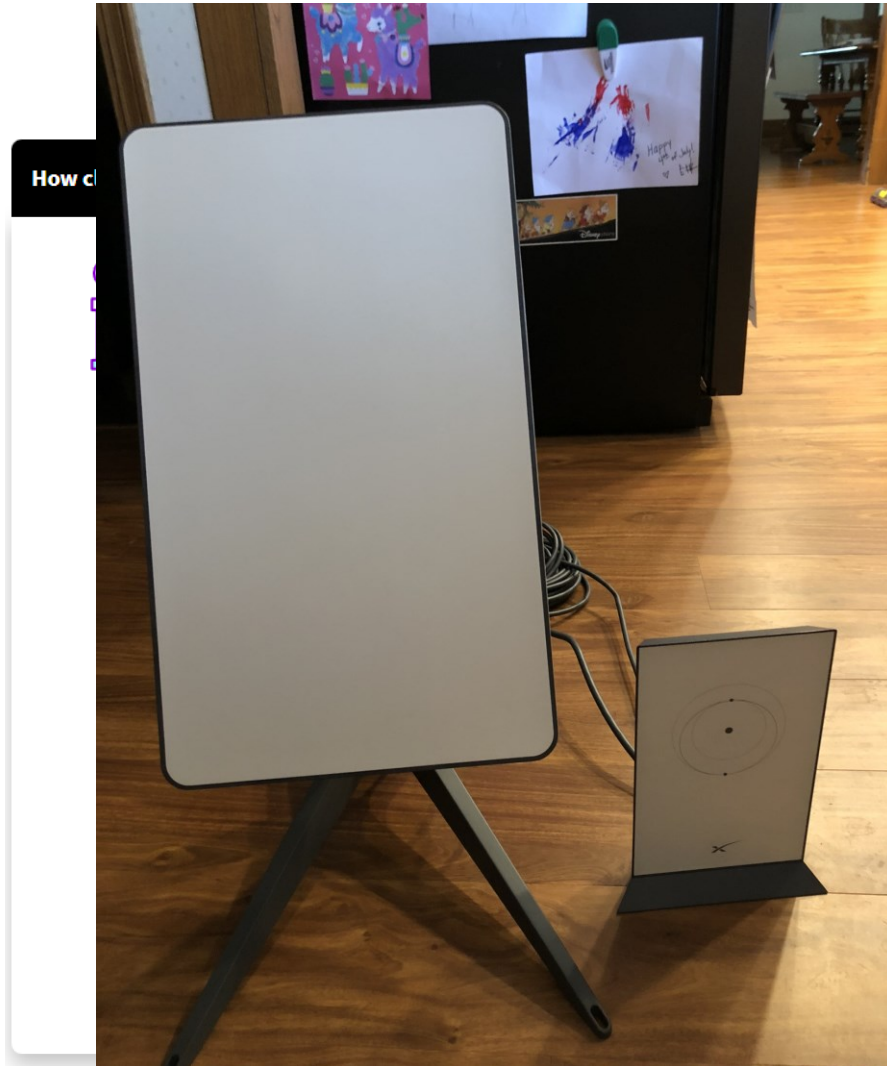
- Verizon covers 100 million people with 5G now
- AT&T 70-75 million by the end of 2022, and 200 million in 2023
- T-Mobile announced in November 2021 that 80% of its customers within its 200 million-person 5G coverage can access its midband 5G service (which it calls "Ultra Capacity")
- If your data usage is unlimited, 5G may work for your home and a smaller office, eliminating wired lines
- Unfortunately, unlimited high-speed data plans were withdrawn by Verizon early this year, and others are following suit

Phone Reveals For 5G



- Samsung's Galaxy S21 FE brings the best of 2021 into 2022
- OnePlus 10 Pro slowly reveals what a flagship phone will be
- TCL reveals new midrange phones
- Nokia's 2022 phone lineup includes 5G and feature phone options
- iPhone 14 is slightly larger, adds SOS via satellite
- iPhone 14 Pro/ProMax also has a 48 megapixel camera (!)

Low-Earth Orbit Satellites



- SpaceX Starlink
 - New Premium service
 - \$500/mo. \$2,500 for antenna
 - 150-500mbps, 20-40ms latency vs. 100-200 for \$110
- Amazon Project Kuiper
- OneWeb
- Viasat
- Inmarsat-UK
- Telesat-Canada

10G



- CableLabs Launches 10G Challenge: Powering the Future of Broadband Innovation
 - \$300,000 to six Challenge winners
 - Four categories: live, work, learn and play
 - Judged, in part, by industry experts from Corning, Mayo Clinic and Zoom
- Videos
 - [Healthcare](#)
 - [Work](#)
 - [Education](#)
 - [Gaming and entertainment](#)

Wi-Fi 6E

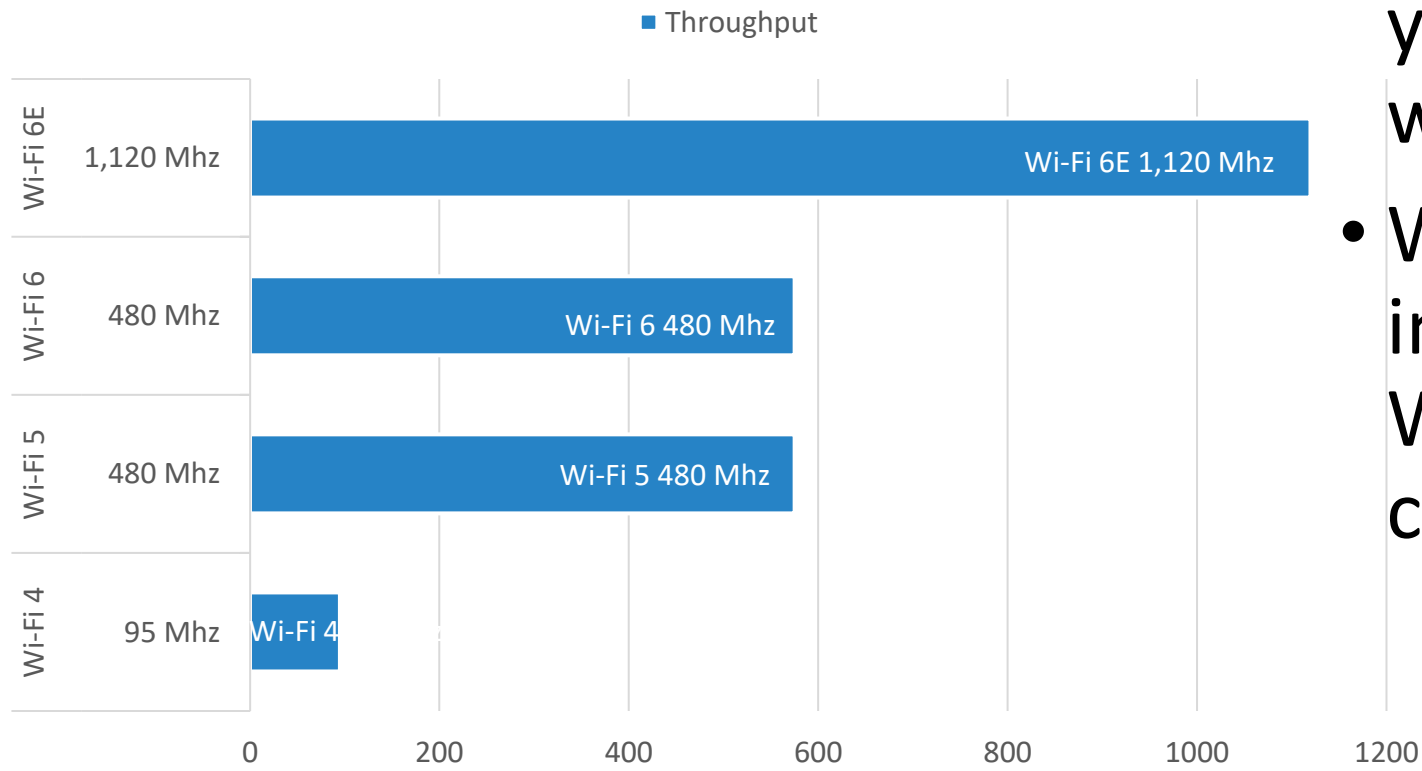


- Speed - with additional dedicated high-speed channels and no legacy Wi-Fi interference, Intel® Wi-Fi 6E (Gig+) enables speeds up to 6x faster than Intel® Wi-Fi 5 on managed networks and nearly 3x faster than Wi-Fi 5 for home and consumer use
- Latency - low latency is key to seamless experiences in real-time applications like videoconferencing and gaming. With Intel® Wi-Fi 6E (Gig+) products using the unshared 6E spectrum, latency is up to 75 percent lower than with Wi-Fi 5, for the convenience of wireless internet without the excessive lag
- Interference - Wi-Fi 6E devices use a new, exclusive spectrum that is much larger and has many more channels than the spectrum used by other generations of Wi-Fi devices. This results in greater reliability and efficiency, as this spectrum can only be used by Wi-Fi 6E devices and is not impacted by legacy device traffic

Wi-Fi 6E



Throughput By Technology



- Waiting for 6E technology will reward you with greater wireless throughput
- While Wi-Fi 5/6 vastly improved speeds over Wi-Fi 4, 6E speed is critical



Hardware

*It's A Big Year For Hardware
Innovations*

Note These Things Happening



- Graphics processors everywhere (GPUs)
- Artificial Intelligence/Machine Learning hardware emerging
- Performance and efficiency cores for better price performance
- Battery life extending with energy conservation tricks
- Display technologies are changing again
- Hardware acceleration is happening almost everywhere
- Communications speeds are improving, but not 100% coverage

So, Chip Designs Commonly Have



- Two types of CPUs - Performance and efficiency
- GPUs for graphical smoothness
- Neural processors and TensorFlow in smartphones
- Display interfaces are more universal
 - Brighter
 - New format – 15x10 (or 3x2) instead of 16x9
 - 8K
- Innovations from Intel, AMD, Qualcomm, TSMC, ARM, Apple in the M1/Bionic chips, Google with System on a Chip (SOC)

Which Means...



- It is time to buy a new phone
- Most of your desktops and laptops are notably obsolete compared to current technologies
- Only marginal improvements seem to be happening in server computing and storage
- Artificial intelligence and machine learning can run efficiently in hardware. Developers are sure to take advantage of this

For Me



Observations

- Intel has fallen behind and is trying to catch up in CPU/GPU
- Standards are evolving quickly
- Hardware speeds for everything are increasing – CPU, GPU, RAM, I/O

Decisions

- Buying
 - Desktop
 - AMD Ryzen 9 – worth the money
 - Radeon – GPUs needed
 - 32 GB RAM minimum
 - Laptop – EVO in Dragonfly, Z16
 - Thunderbolt 4
 - 5G

And What To Make Of All This?



PC Buyer

- Windows 11, Microsoft 365
- Intel Core i5-i9, AMD Ryzen 5-9
- Dedicated GPU (ARC, Radeon)
- 16-32GB of RAM, DDR5
- PCIe Gen 4 128GB-1TB of NVM Express Solid-State drive (NVMe)
- Thunderbolt 4, delivers HDMI/USB

Mac Buyer

- MacOS, Microsoft 365
- M1 PRO/MAX ARM (Expect M2)
- Dedicated ProRes graphics
- 8-64GB of RAM (only DDR4 now)
- PCIe Gen 4 128GB-2TB of NVM Express Solid-State drive (NVMe)
- Thunderbolt 4, delivers HDMI/USB

Owner/Manager Tech Options



- Customer and Team Experience
- Wireless – public & private – Wi-Fi 6E, LEO
- Mobile – Smartphone, tablet, touchscreen – 5G
- Sound, video, and lighting
- Security – Cybersecurity session
 - Firewalls
 - Multi-factor Authentication
 - Encryption
 - Spam/anti-malware
- Backup
- CRM for Sales
- Microsoft 365/Google Workspace for productivity
- Website appearance/SEO
- Updated operational systems
 - POS
 - Accounting
 - Rental/contracts
 - Workflow/process
 - EV delivery trucks - Brightdrop
- Training
- Focus

Quantum Computing 99% Accuracy



- Researchers in Australia have proven that virtually error-free computer operations are possible using a silicon-based quantum device
- “Today’s publication shows our operations were 99 percent error-free,” says Professor Andrea Morello from the University of New South Wales-Sydney
- “When the errors are so rare, it becomes possible to detect them and correct them when they occur. This shows that it is possible to build quantum computers that have enough scale, and enough power, to handle meaningful computation.”
- The team achieved a one-qubit operation fidelity of 99.95 percent, and a two-qubit fidelity of 99.37 percent, demonstrating that they could preserve quantum data in silicon for 35 seconds vs. 100 μ s

“Fab”ulous



Coming “Soon”: New Fabs

Company	Investment (Billions of USD)	Strategy
	95	Four new plants: Two in Europe, Two in USA \$3.5B expansion of Mexico facility
	205	“Pursue leadership in chip production”
	100	“Expand production capacity”

Sources: Company and Media Reports



- 3/4 of chipmaking is done in east Asia
- Existing facilities
 - Will produce 16% more than 2021
 - Which produced 8% more than 2020
- Chip shortage is not likely to ease until 2025

Supply Chain Woes Continue



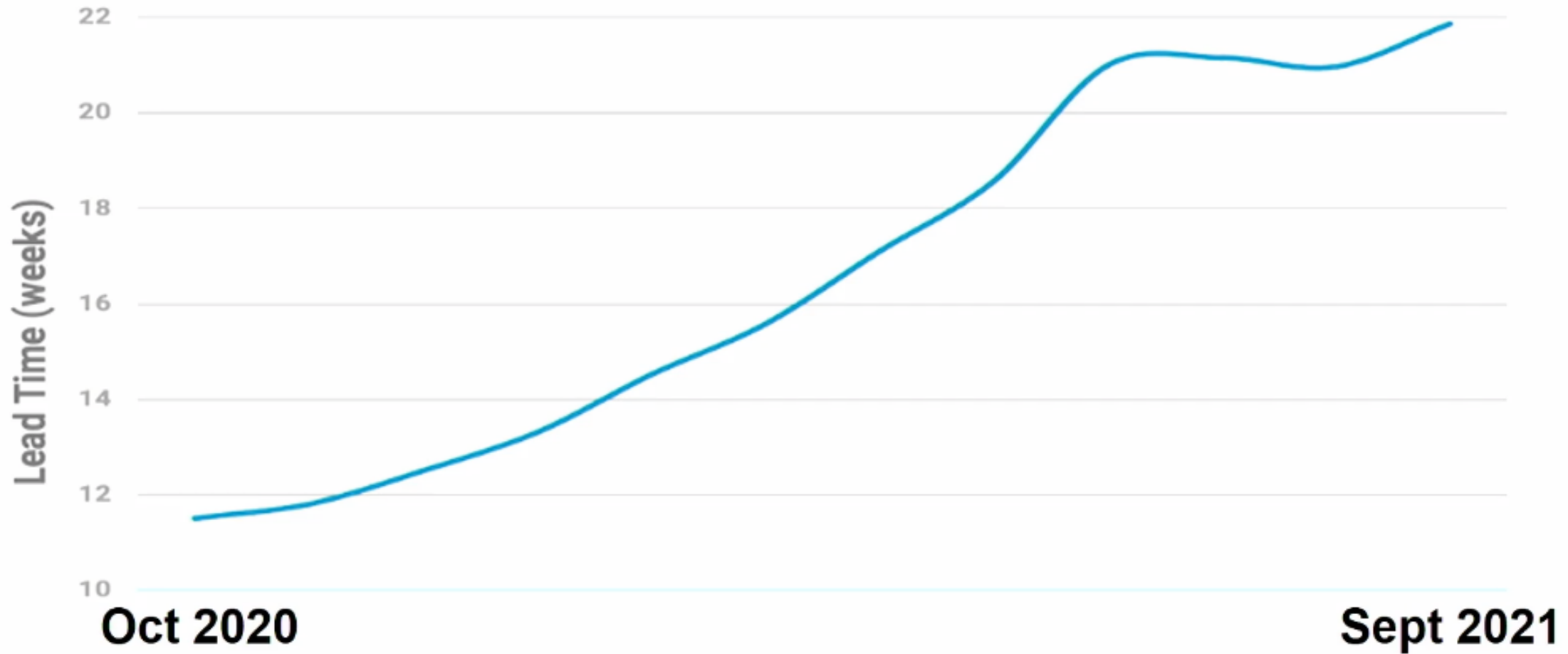
Trucks at KY Speedway Awaiting Chips for Completion



Leap In Lead Time For Chips



Source: Levadata/CEA



China's Pursuit Of Chip Self-Reliance Is Worrisome



- Alibaba's three-year-old chip unit, T-Head unveiled its third processor, Yitian 710, based on Britain's Arm
- Hanguang 800 in 2019 for artificial intelligence
- XuanTie 919 for self-driving cars
- TenCent Holding announce three chips for AI, Cloud Computing and video
- Beijing will invest \$150B in 2014-2030, but TSMC will spend \$100B
- Huawei Technologies, Ltd. is close to matching Intel, Qualcomm, and Arm
- SMIC in Shanghai is up to a decade behind TSMC
- China has 23% of global chip capacity, but only 7.6% of sales



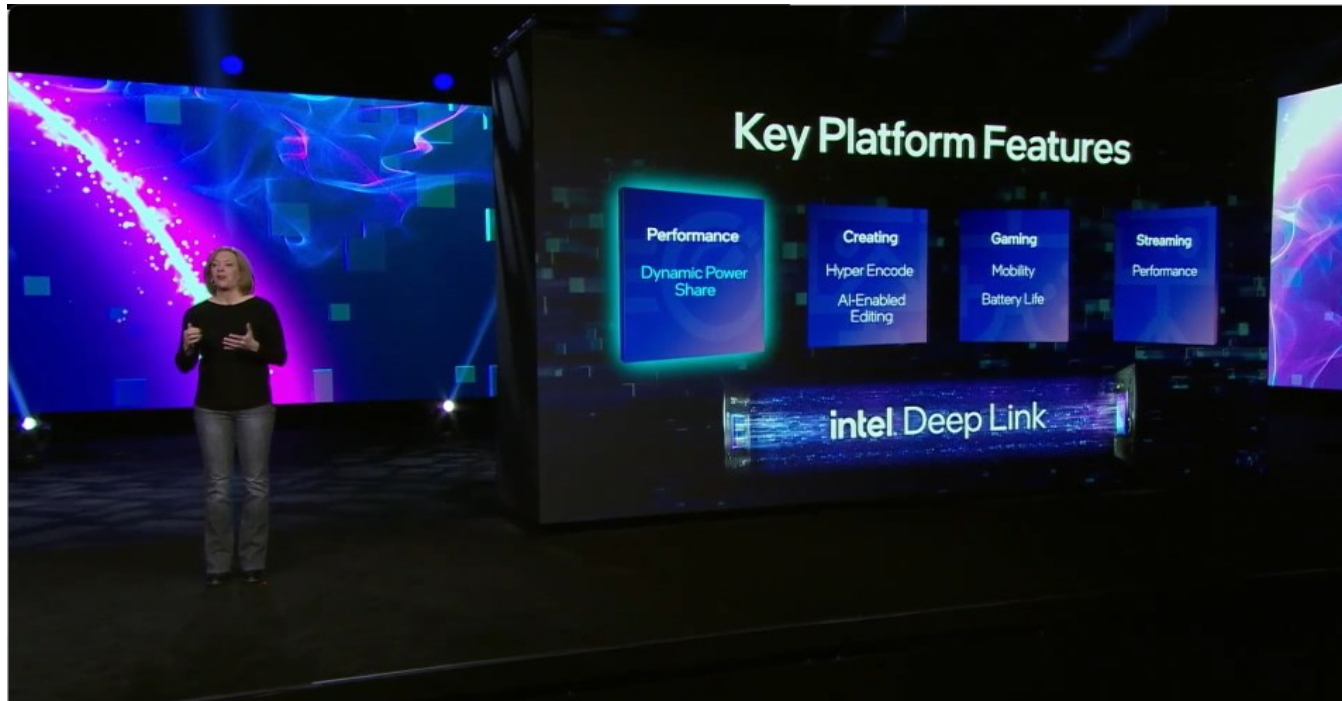
- Gregory Bryant, Exec VP, GM Client Computing
 - Advances in PC chips
 - Graphics
 - Mobileye (automobile)
- 12th Gen processors—Alder Lake
 - S-series desktop
 - KS-series up to 5.5 GHz
 - H-series mobile
 - P-series mobile
- 20 new computer designs, 350 by year end, 50 new CPUs
- Raptor Lake in H2 2022
- Meteor Lake in 2023

Intel Innovations



- Intel Core i9-12900K
 - First hybrid design
 - Two core architectures – performance & efficient cores
 - Intel thread director
- Screenovate – phone/watch/computer/2nd display/TV-Q4
- H-series mobile – 5 GHz
 - 14 cores
 - 40% faster than prior gen
- P-series mobile thin/light
 - 2x performance over U-series
- ARC Graphics...

Intel® ARC™ Graphics



- Lisa Pearce, VP, GM Visual Compute Group
 - ARC (dedicated graphics, code-named Alchemist) on TSMC 7nm
 - Deep Link
 - Hyper Encode (1.4x speed using DCPU/GPU)
 - AI-Enabled Editing
 - Dynamic Power Share between CPU and GPU
 - XeSS – Super Sampling = XMX AI upscaling on neural networks like NVIDIA DLSS and DirectX 12 Ultimate
 - 16 Vector engines, 256 bit
 - 16 Matrix engines, 1024 bit
 - Xe HPG has rasterization and ray tracing with Xe2 HPG, Xe3 HPG, and Xe Next all in development for future gens
- 50 designs use ARC, but code-names Battlemage, Celestial, Druid to come

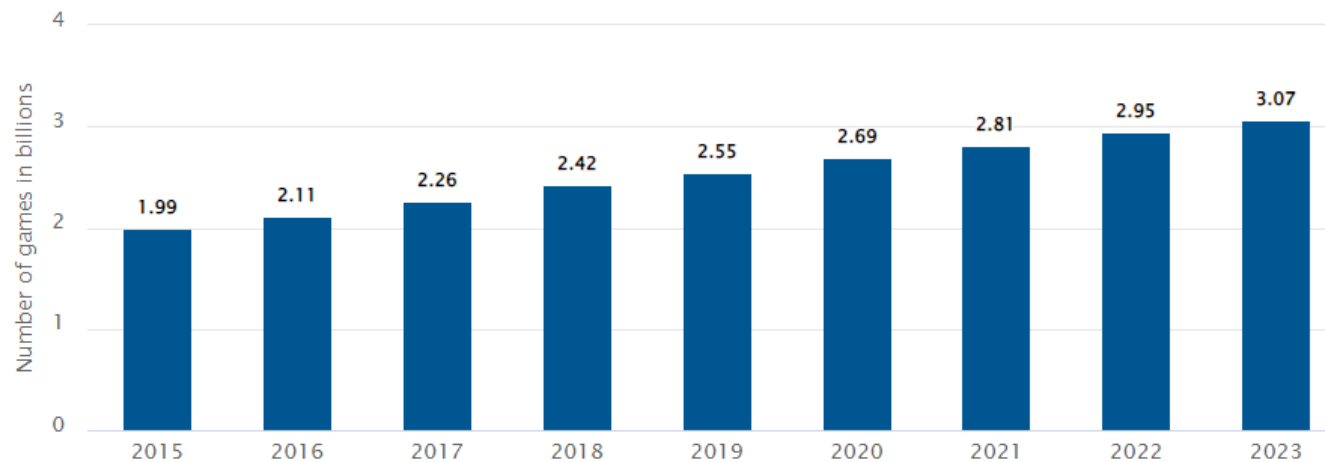
Gaming Statistics Drive Investments



- Intel at CES claimed that gaming is done by 1B daily
- Two of every 5 people across the world is a gamer, China #1, US #2
- Pandemic may have accelerated the trend
- Smartphone 40%, Console 28%, PC 21%
- PlayStation leads consoles
- 2020 revenue \$159.3B
- 2021 revenue \$175.8B

Number of active video gamers worldwide - 2015 to 2023

in billions



Source: Newzoo (2020)

Designed by  FinancesOnline

Microsoft's Activision Purchase



- \$67.8B “metaverse deal”
- Properties like Candy Crush, Call of Duty, Overwatch and Diablo are popular
- Neglected titles include StarCraft, Guitar Hero, the Tony Hawk skateboarding games and MechWarrior
- Will add as many Activision titles to Xbox subscription service Game Pass as possible
- Metaverse competition against Facebook, Apple
- Antitrust regulators might not let Microsoft keep games off Sony's competing PlayStation game console
- Workforce discrimination drove down the price
- \$3B “breakup fee”

Intel Evo Platform



Intel Evo Platform
Announcing 3rd specification

New Key Spec Technologies

- Intel® Wi-Fi 6E (Gig+)
- Intel Connectivity Performance Suite
- Dynamic Background Noise Suppression
- 12th Gen H-series
- Intel Arc GPU

- Evo Platform – 100 designs
 - Wi-Fi 6E (Gig+)
 - 12th Gen H-Series
 - Wake from sleep < 1 second
 - 9 hours on full HD Display
 - Thunderbolt 4
- Examples
 - Dell Precision Mobile Workstation
 - Lenovo Yoga

My Latest PC Purchase



1/8

★★★★★ 4.4 (5) [Ask a question](#)

HP EliteBook 845 14 inch G9 Notebook PC - Wolf Pro Security Edition

SCREEN SIZE 14

- Windows 10 Pro (available through downgrade rights from Windows 11 Pro)
- AMD Ryzen™ 7 PRO 6850U (up to 4.7 GHz max boost clock, 16 MB L3 cache, 8 cores, 16 threads)
- 32 GB memory; 1 TB SSD storage
- 14" diagonal WUXGA display
- AMD Radeon™ 680M Graphics [See all Specs](#)

Can't find what you are looking for?

[SEE SIMILAR PRODUCTS](#)



~~\$3,197.00~~ **SAVE \$988.00**

\$2,209.00

Earn 1X HP Rewards Points

My Latest PC Purchase



USB-C Universal Quad 4K (QV4K) Docking Station with 100W Power Delivery

Maximum View. Enterprise Productivity.

MODEL NUMBER: DOCK570USZ

★★★★★ 3.9 (9) [Write a review](#)

\$482.99

This item is temporarily unavailable on Targus.com

Would you like us to notify you when it arrives?

[EMAIL ME](#)

Boost your team's productivity with the only enterprise-class universal dock equipped to power your device while connected to your most important peripherals and up to four 4K monitors.

FEATURES

- Supports single 5K and four 4K UHD displays via four DisplayPort (3840 x 2160 p60) or four HDMI (3840 x 2160 p50) ports (or combination of)
- Alt Mode host compatible (including Thunderbolt™ 3 and other alt modes)
- Power Delivery 2.0 up to 100WDC (90W legacy devices using barrel tips)

hp Elite Dragonfly G3



- 12th-gen Intel
- 32 GB of LPDDR5 memory
- 2 TB PCIe 3x4 NVMe SSD
- Wi-Fi 6E, BT 5.2, 4G LTE, 5G
- Two Thunderbolt 4 USB-C ports
- USB-A, headset jack, HDMI 2.0 = no dongles
- HP also changed from a 16:9, 13.3-inch display to a 3:2, 13.5-inch size
- 3,000 x 2,000 pixel OLED
- 1,000 Nits
- 5-megapixel Auto Frame webcam (focus on your face during movement)
- 4 discrete amplifiers for immersive sound and dynamic voice clarity
- AI-based noise reduction improves audio even when wearing a mask

ThinkBook 13X Gen 2i, Evo Certified



Charging Mat And Built In Qi Charger



LenovoTM

ThinkBook Plus Gen 3



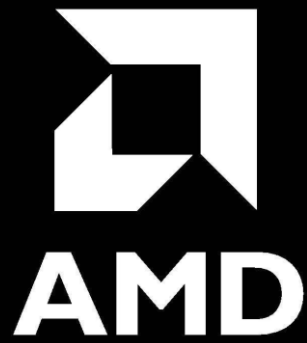
ASUS ZenBook 17 Fold OLED



Top Portable Computers

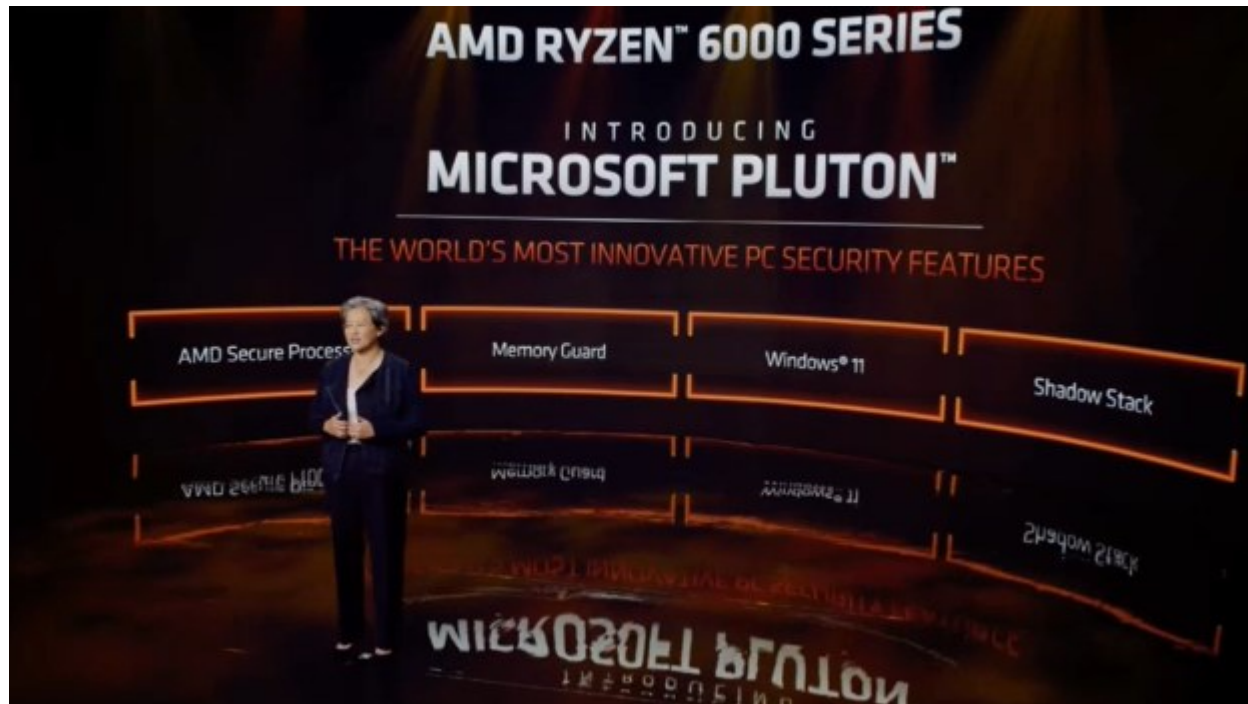


- Dell XPS 13 Plus
- HP Elite Dragonfly Chromebook
- Lenovo ThinkBook Plus Gen 3
- Lenovo ThinkPad Z Series
- MSI GS77 Stealth
- Acer Predator Triton 500 SE
- Asus ROG Z13 Flow
- Asus ROG Zephyrus G14
- Asus ZenBook 17 Fold OLED
- Alienware x14



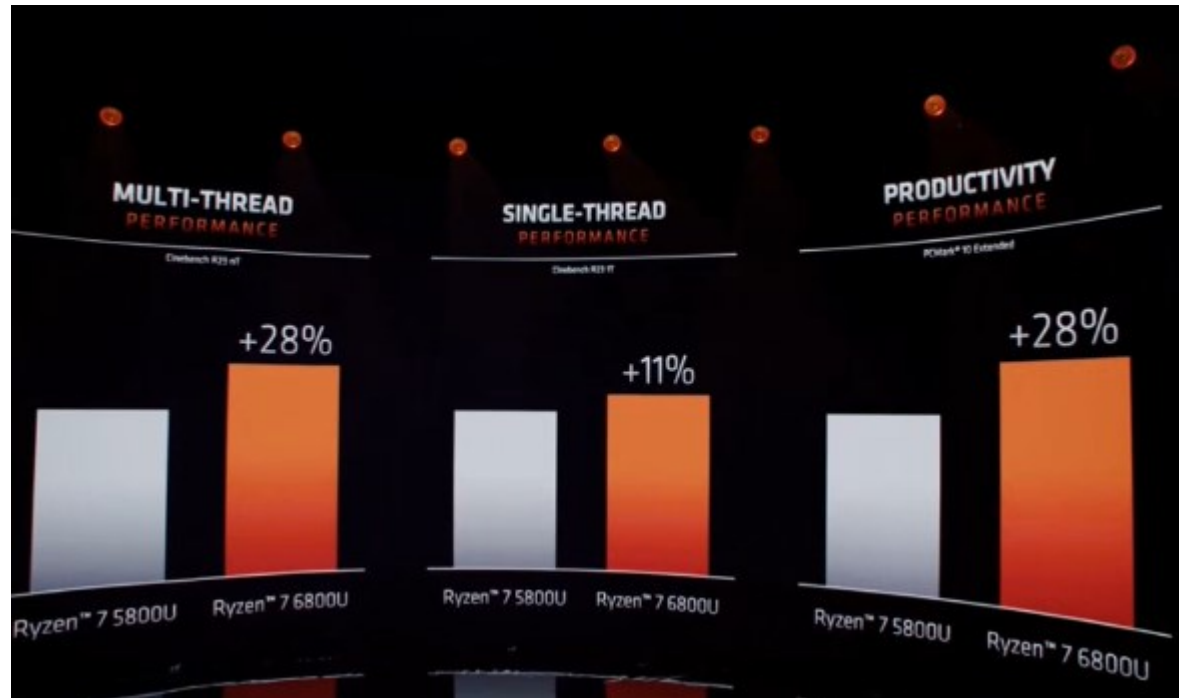
- Dr. Lisu Su, President and CEO
 - 30% PC growth last two years
 - 49% notebook growth
 - 350M PC shipments in 2021
- Mobile, 2018 launch, new designs every year, 150 last year
- AMD Ryzen 6000 Mobile “Rembrandt”
 - Zen 3+ CPU Core 6 GHz (up to 8 cores)
 - 12 RDNA 2 Graphics (2x performance)
 - 6nm on TSMC
 - DDR5
 - Wi-Fi 6E
 - USB 4
 - Double the performance of 5000 - 69% faster video encoding
 - First to integrate Microsoft Pluton
 - 24 hours of battery life
- Tesla, Samsung partners

AMD / Microsoft Pluton™



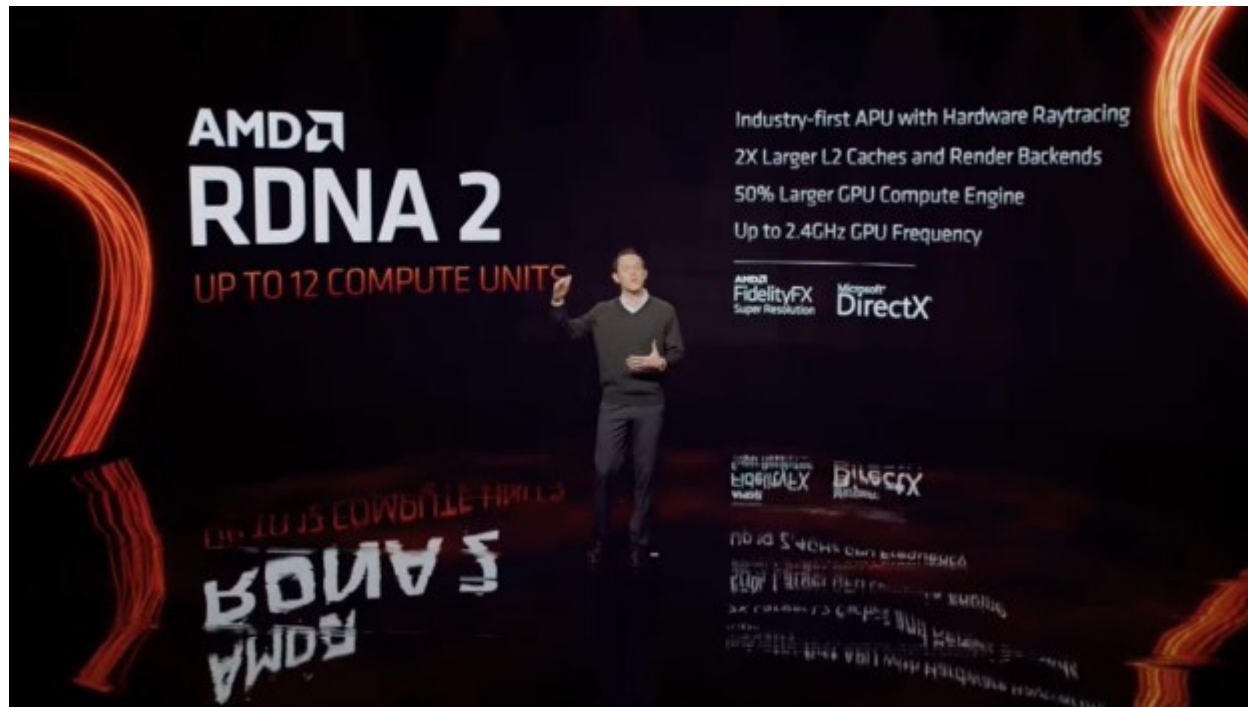
- Protects
 - System credentials
 - User identities
 - Encryption keys
 - Personal information
- Emulates a TPM, but eliminates communication channel attack vector
- Secure Hardware Cryptography Key (SHACK) - keys never exposed outside of hardware
- Random number generator in hardware
- Project Cerberus for secure identity
- SHA2 AES
- First introduced in the Xbox One in 2013
- Used in [Azure Sphere Security Service \(AS3\)](#)
- Most innovative security in a PC processor

AMD Ryzen 6000 Performance



- Jason Banta Corporate VP & GM, OEM PC
- Ryzen 5000 Zen 3 (8 Vega CUs in 2021)
- Ryzen 6000 Zen 3+ (20 new models)
 - Core power reduction (30% on Teams, 40% on Netflix, 15% on web browsing)
 - 50 new power management features
 - Deep sleep states in between operations
 - System management firmware - Adaptive Power Management learns from the OS and utilizes on die sensors to adjust speeds quickly and accurately
 - Longer battery life
 - Reduced fan noise
 - Cooler notebook
- Performance and Efficient core on same die
- 200 new laptop designs from partners

AMD RDNA 2



- First mobile GPU with Raytracing
- 2x larger L2 Cache
- Combo of Zen 3+, RDNA 2, and FSR=1080p true AAA gaming on an Ultrathin notebook
- FidelityFX – real-time upscaling = 59-114 FPS

AMD Connected Platform



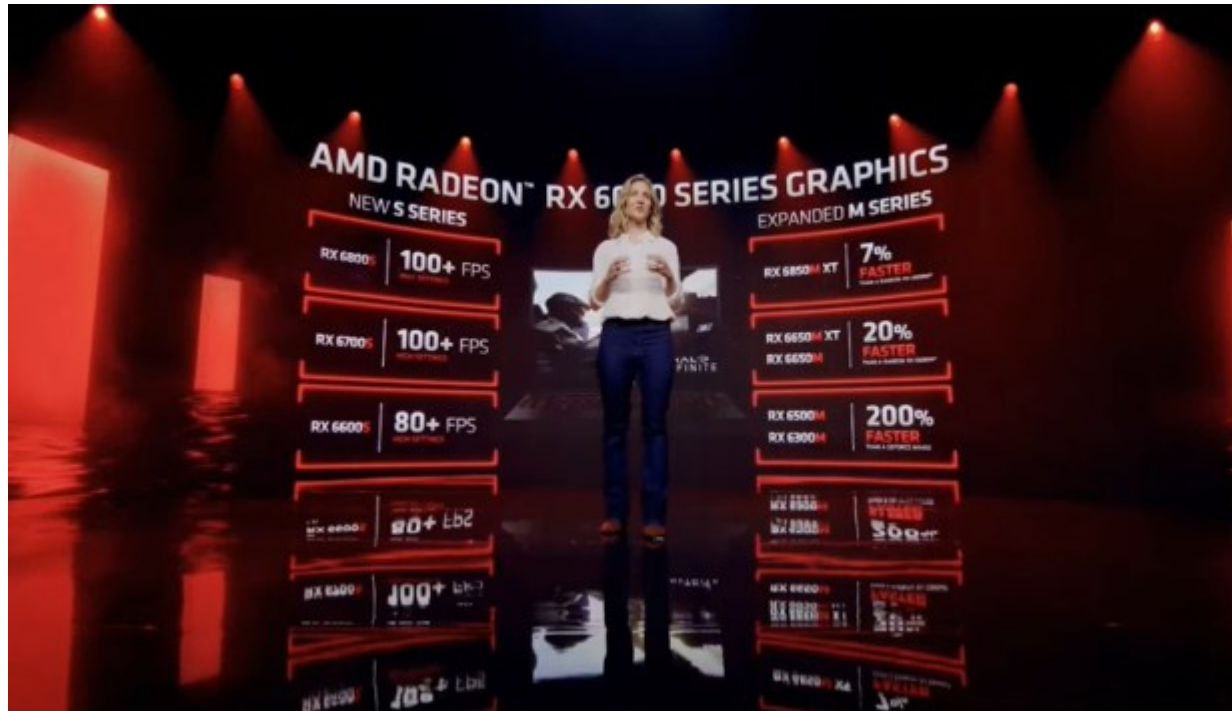
- USB4 for 40 Gbps = 4K movie in 7 seconds
- PCI-E Gen 4(2x of Gen 3)
- DDR5 memory
- Wi-Fi 6E
- Bluetooth LE 5.2
- New display engine
 - HDMI 2.1
 - DisplayPort 2

Lenovo ThinkPad Z13 & Z16 Series



- Co-Designed with AMD for the Ultimate Collaboration Laptop
- AMD Ryzen 7 Pro 6860Z
- AMD Radeon RX 6500M
- 13" and 16" models
- AMD Pro Security
- FHD Camera
- OLED Display
- Mic array
- Dolby ATMOS Audio
- 3D Haptic touchpad
- Microsoft Pluton
- \$1549+

AMD Radeon High Performance



- Laura Smith, Corporate VP & AMD Fellow
 - 8K displays
 - Refresh up to 480Hz
 - AMD FreeSync on Samsung QD-OLED
 - 2021 RX6600M-6800M (8)
- AMD Radeon RX6000 (18)
 - RX6000S for thin laptops
 - RX6850M XT series
 - RX6500 XT in desktops
 - 16 compute units, 2.6GHz
 - 16MB cache
 - \$199

AMD Adrenalin Super Resolution



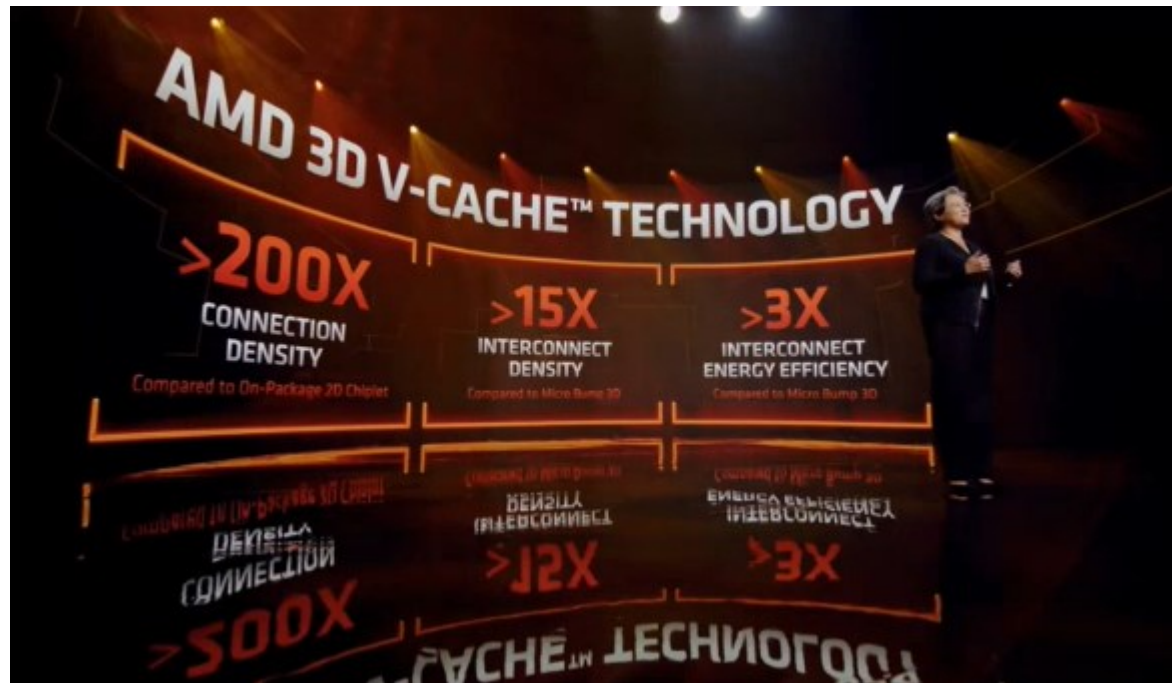
- Frank Azor, Chief Architect Gaming Solutions
 - 15% YOY performance
 - Lower resolution in software, software doubles frame rate
 - Advantage for gamers
 - Amplified performance – 100 FPS
 - Premium visuals – 144Hz
 - Built to game with cooling and acoustics
 - SmartShift Max
 - SmartShift Eco conserves powers on battery
 - SmartAccess Graphics optimize battery life or maximize graphics performance

m17 R5 Ryzen Edition



- Ryzen 9 6980HX, 5GHz
- 8-64 GB of memory
- 256GB-4TB M.2
- RX 6850M XT Graphics with 12GB of GDDR6
- 17" 500 nit, 120Hz, 4K UHD display, Dolby vision certification, vapor chamber design, element 31 thermal interfaces
- Cherry MX mechanical keyboard
- \$1,599

AMD Desktop Innovations In 2022



- Ryzen 7 5800X3D
 - 8 cores, 16 threads
 - 4.5 GHz
 - 64MB 3D V-Cache
 - 32MB 2D Cache
 - Drops into AM4 motherboards
- 15% faster than Ryzen 9 5900X
- 123 processors since 2017
- Expect Ryzen 7000 Zen 4 in 5nm, already in labs
 - PCIe Gen 5
 - DDR5
 - LGA 1718 socket – AM5
 - 5GHz
 - 2H 2022

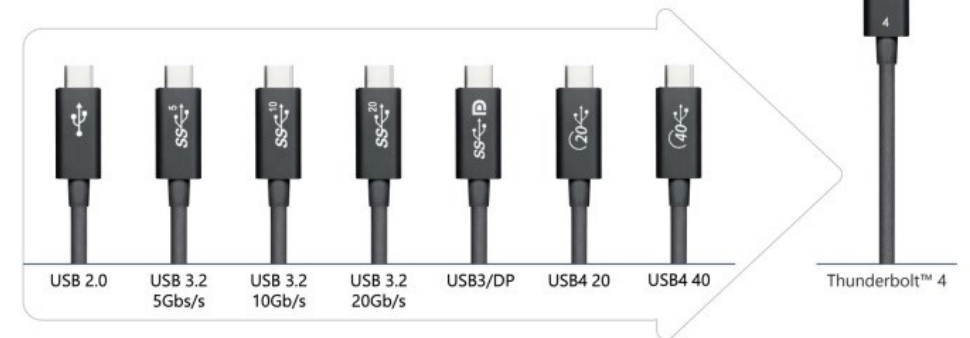
Thunderbolt™ 4



- Thunderbolt™
 - Ports provide high bandwidth for connecting high-speed devices
 - Cables help to ensure a quality connection between the device and a PC
 - Accessories make it easy to expand the capabilities of your PC with docking options and external devices
- Can daisy chain up to five Thunderbolt devices

Cable simplification

One Thunderbolt 4 universal cable can replace these other cables to make cable selection fast and easy



Thunderbolt™ 4



- **Flexibility.** Some ports power your devices. Others transfer data from devices to the PC. Still others transfer video signals from your PC to an external monitor. A Thunderbolt™ port can do all three. It delivers high-speed data transfer, outputs a video signal, and can deliver power to compatible devices (including charging a lightweight laptop) simultaneously
- **Bandwidth.** Thunderbolt 4 ports have a 40Gbps (gigabits per second) bidirectional bandwidth. That means data can be moved to and from external storage quickly, and that up to five Thunderbolt devices can be connected for flexible device configurations—all powered by one port
- **Versatile connectivity.** Thunderbolt 4 ports are compatible with many connection standards, including previous versions of Thunderbolt™, USB, DisplayPort, and PCIe. The ports fit standard USB-C type connectors
- **Speed.** Thunderbolt 4 ports have the same high-speed 40Gbps bandwidth as Thunderbolt™ 3. However, minimum PCIe data requirements have increased from 16Gbps to 32Gbps. This means that high-speed external PCIe devices like storage and external graphics could see significant increases in transfer rates and performance
- **Security.** VT-d based DMA protection helps prevent security threats by remapping requests from external devices and checking for proper permissions
- **Wake from sleep.** This feature allows a PC to be brought out of hibernation with peripherals that are connected through a dock

Thunderbolt™ 4

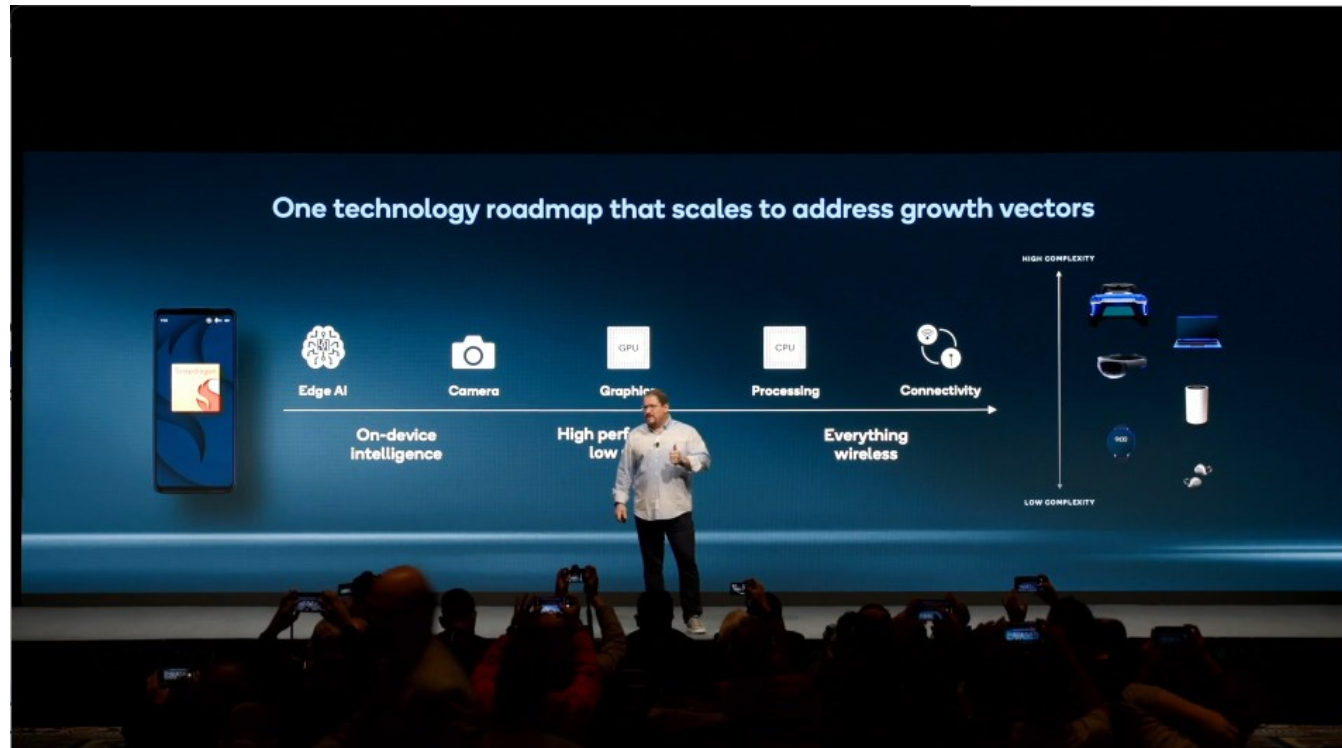


- **Thunderbolt™ devices.** Connect devices bearing the Thunderbolt™ logo, including docks, displays, storage, and video capture devices. Thunderbolt™ 3 devices and cables are compatible with Thunderbolt 4 ports. Older Thunderbolt devices will work too, but require an adapter
- **External monitors.** Connect multiple displays. One Thunderbolt 4 port can connect up to two 4K 60hz DisplayPort or HDMI monitors through a compatible dock or an adapter. Thunderbolt designated monitors can be connected directly
- **Storage.** Connect a high-speed external Thunderbolt™ SSD to expand the storage capacity of your system and achieve speeds on par with internal drives
- **USB peripherals.** Connect USB devices like mice, keyboards, controllers, and headsets for gaming

- **PCI Express (PCIe) devices.** Utilize a PCIe expansion chassis to access compatible PCIe devices, such as video capture devices for live-streaming gameplay
- **Networking.** Connect to a high-speed 10 Gigabit Ethernet network via an adapter or use a Thunderbolt cable to connect two computers over a peer-to-peer network. This allows for transferring large volumes of data from one PC to another, which is ideal when upgrading to a new system
- **Charging.** Connect your phone, a lightweight notebook PC (that requires less than 100W), and other compatible USB

Version	Year Introduced	Peak Rated Throughput	Connector Type
Thunderbolt 1	2011	10Gbps	mini DisplayPort
Thunderbolt 2	2013	20Gbps	mini DisplayPort
Thunderbolt 3	2015	40Gbps	USB Type-C
Thunderbolt 4	2020	40Gbps	USB Type-C

Qualcomm 5G – Connected Intelligent Edge




- Cristiano Amon, President and CEO, Qualcomm Inc.
 - 1 billion connected devices
 - Cloud growth 35% YOY
 - 2025 – 64% of data will be created outside of data centers
 - \$15B to 100B to 700B
 - Wireless 5G mmWave is universal last mile
 - Backhaul & direct access, AT&T CEO, Jeff McElfresh

Qualcomm – Snapdragon 8 Mobile



Snapdragon sets the bar for premium-tier Android smartphones



- #1 **Connectivity**
Fastest 5G and Wi-Fi speeds¹
- #1 **Qualcomm® AI Engine**
Leading on-device AI use cases and performance per watt²
- #1 **Snapdragon Sound™**
CD Lossless and LE Audio for Bluetooth³
- #1 **Snapdragon Sight™**
Leading with mobile-first camera features⁴
- #1 **Security**
Leading security features for mobile⁵
- #1 **Snapdragon Elite Gaming™**
Leading in desktop-level features on mobile⁶

1. First announced in October 2022 and 5GPP Release 16. 2. Based on AI benchmarks in commercially available devices and across four chipsets. 3. First announced in October 2022. 4. Based on DxOMark camera scores. 5. First announced in October 2022. 6. First announced in October 2022. Snapdragon Elite Gaming, Snapdragon Sight, Snapdragon Sound and Qualcomm AI Engine are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

- Qualcomm AI
- Snapdragon Sound
- Snapdragon Sight
- Snapdragon Elite Gaming
- Snapdragon Spaces +
- Microsoft Mesh – chip platform for AR glasses
- Next generation ARM with 200 enterprises
- Battery life all day

Snapdragon Digital Chassis



Snapdragon
digital chassis

A platform for the
future of automotive

Snapdragon
car-to-cloud
Software and services
platforms to drive new
monetization models

Snapdragon
cockpit platform
In-car experiences that integrate
instrument clusters, navigation,
premium audio, cameras and multiple
displays with app ecosystems

Snapdragon
ride platform
L2+ / L3 Driver Assistance
and Automated Driving SoC
Platforms with Arriver Vision
and Drive Policy stacks¹

Snapdragon
auto connectivity platform
5G connectivity to cloud, C-V2X,
Wi-Fi and Bluetooth within and
around the vehicle, precise positioning
and PLC for EV charging

¹ Never expected to drive in 2022, subject to regulatory approval and other closing conditions. Snapdragon digital chassis, Snapdragon car-to-cloud, Snapdragon ride platform, Snapdragon cockpit platform, and Snapdragon auto connectivity platform are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

- Car-to-Cloud
- Ride platform – arriver Ride Vision SOC with ADAS
- Cockpit platform
 - Volvo, Henrik Green
 - Renault, Luca de Meo
 - Honda, BMW, Cadillac LYRIQ
 - Alpine Digital Cabin
- Auto Connectivity platform
 - 5G to cloud
 - C-V2X – ADAS AI
 - Wi-Fi
 - Bluetooth
 - PLC for EV charging

Fujitsu fi-8170 Deluxe



- Fast, double-sided scanning of up to 70 pages per minute (PPM)
- 100-page automatic document feeder (ADF) with enhanced handling
- Includes PaperStream Capture Pro Software with 1 year maintenance
- Color LCD panel for easy operation from the front of the scanner
- Supports both USB 3.2 and ethernet wired network connections
- TWAIN & ISIS compatible - Works with hundreds of scanning software solutions
- \$1495 (\$1320 street)

ViewSonic® VX1755



- 17.2" Display
- 144Hz
- AMD FreeSync™ Premium
- IPS Panel
- 1920 x 1080 Resolution
- USB Type-C
- Second USB Type-C for power or for keyboard and mouse
- \$306.99

Boost Mobile Productivity With Multiple Monitors



- MobilePixels Trio & Trio Max
- Two sizes options - 12.5" and 14.1" 1080p Displays
- Two or Three screens
- Windows, Android & Mac
- Eye care mode
- USB-C
- Starting at \$519.99 USD



The Mobility bundle includes

Two TRIO Max monitors | Two sets of Magnets(8 pieces) | One AI Camera | One Foldable Keyboard | One mini Mouse | One Sleeve

**Laptop is not included*

Samsung Ark



SAMSUNG Freestyle



- Ultraportable Projector
- Less than 2 pounds
- 180° cradle stand
- 30 to 100" projection
- 550 lumens
- 1080p
- Auto-focus, -leveling
- 360° sound
- Optional USB-C battery
- \$899

8K And Roll-Up TV



- Sony Master Series Sony Z9K mini-LED 8K TV



- LG Signature OLED R



The Mini-LED, MicroLED, OLED And QD-OLED TVs To watch In 2022



- Sony A95K QD-OLED (XR-65A95K Master Series TV)
- Sony Bravia Z9K Master Series 8K TV with mini-LED (XR-85Z9K)
- Sony A90K OLED
- Hisense U7H ULED TV
- Hisense U8H Mini LED TV
- Panasonic LZ2000 OLED TV
- LG G2 OLED with OLED evo G (97-inch)
- LG C2 42-inch 4K OLED TV (OLED42C2)
- TCL XL Collection QLED TV (98-inch)
- Samsung MicroLED TV (89-inches)
- Samsung QN900B 8K Neo QLED TV (QN85QN900B)
- Samsung The Frame with Neo QLED



Productivity

Recurring Issues



Soft/People

- Training
- Choosing between alternatives
- Productivity/Collaboration
- Simplification
- Change Management
- Project Management

Hard/Technology

- Hardware choices
 - Computers
 - Mobile
 - Communications
- Security
- Emerging Technology

Technology Benefits



Strategic

- Leverage people
- Improve client service
- Collaborate with everyone
- Automate where possible
- Innovate appropriately
- Optimize work
- Diversify team
- Balance everything

Tactical

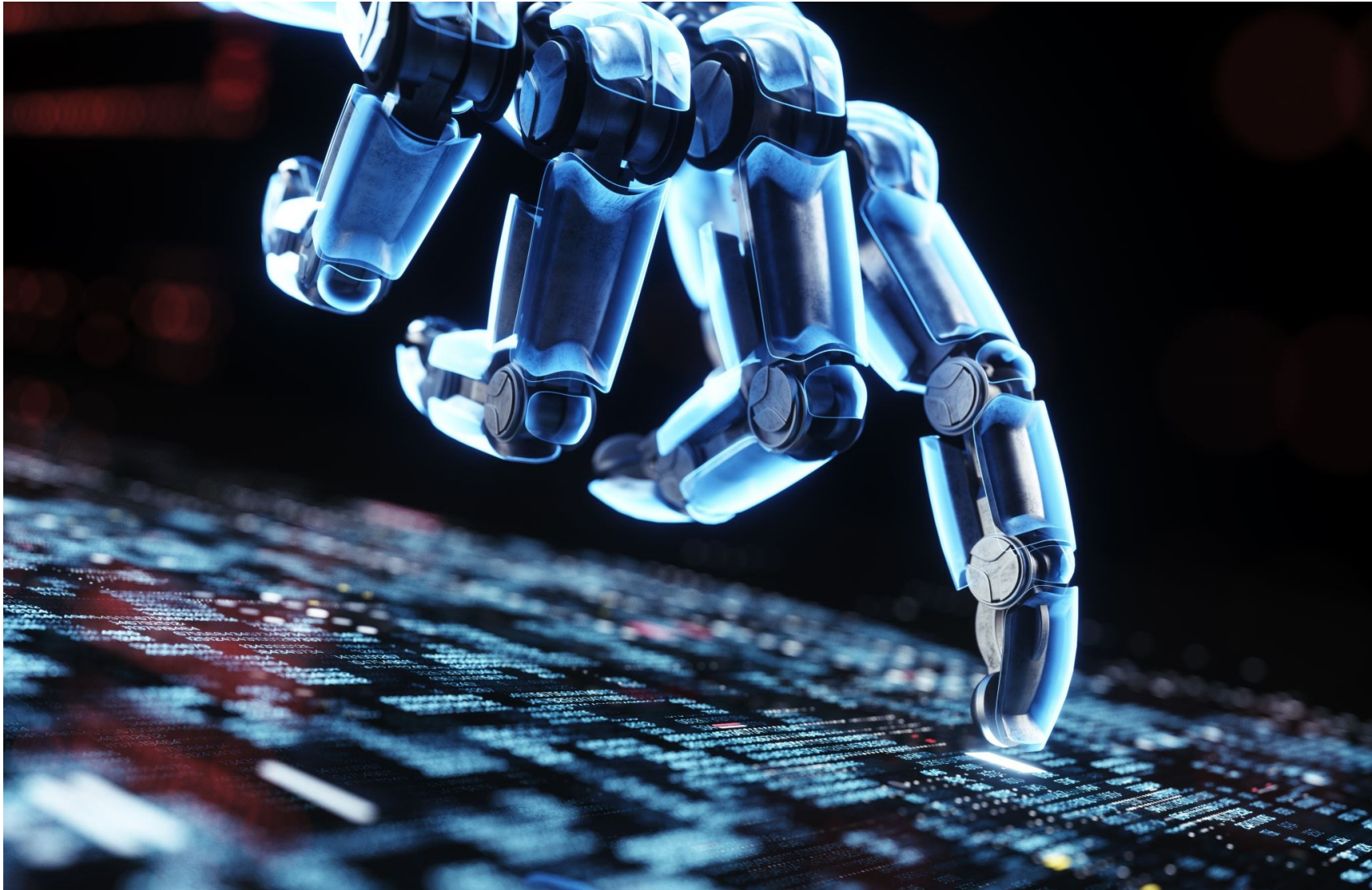
- Optimize time and resources
- Ease of use – reduce friction
- Speed interactions
- Reduce repetitive tasks
- Choose or lose tools
- Select sustainable workflows
- Encourage new views/methods
- Flexible with people

Keep It Simple Stupid – KISS

Principle



- The principle is a design rule that states that systems perform best when they have simple designs rather than complex ones
- Kelly Johnson formulated the KISS principle in the mid-1900s while working as an engineer for the Lockheed Skunk Works, Lockheed Martin's advanced aircraft development program
- Like older concepts
 - Albert Einstein: "Everything should be made as simple as possible, but not simpler."
 - Occam's (or Ockham's) Razor: A 14th century theory that states that in a series of hypotheses, the simplest one is most likely to be correct unless the burden of proof rests on a more complicated theory



When
Technology
Is Easy To
Use And
Secure, It Is
Likely
Complex
Out Of Sight

Examples



Google



iPhone

Browser

The Goldilocks Issue



- Too big, too small, just right
- Each of your needs are different
- This is true about
 - Hardware
 - Software
 - Professional services



Businesses Are Valued Most With ARR/MRR



- Annual/Monthly Recurring Revenue leads to subscription models in technology
- Is ARR the least cost or most effective approach for you?
- How much choice do you have?
 - Microsoft 365
 - Professional or Accounting Software
- Private Equity/Venture capital impact/Independence






Example - Productivity Suite Pricing



Suite

- Microsoft 365
- Google Workspace
- Zoho One
- Adobe Creative Cloud
- Apache Open Office

Annual Price Range

- \$60-684  Microsoft
- \$72-216  Google Workspace
- \$444  Zoho One
- \$959.88  Creative Cloud
- Free  Apache OpenOffice®



Security

More Time Is Needed To Cover Properly

Are Apple AirTags Your Friend?



- AirTags are taking stalking to a whole new level
- Commonly slipped into coat pockets or attached to cars
- At least Apple devices warn you that “Unknown Accessory Detected – This Item Has Been Moving With You For A While”
- Famous people, models, and common folks are all targets
- According to Apple, "AirTag is designed with a set of proactive features to discourage unwanted tracking — a first in the industry — that both inform users if an unknown AirTag might be with them, and deter bad actors from using an AirTag for nefarious purposes“
- AirTags chirp after 8 to 24 hours if unregistered

Meta Wants To Track People's Facial Expressions In Metaverse



- Meta Platforms Inc. wants to monitor people's facial expressions, eye movements, and body poses as well as create "virtual stores" that sell ad-sponsored digital goods in an effort to monetize the metaverse, dozens of recently filed patents suggest
- Meta also plans to collect data on users so that it could tailor specific ad content while they immerse themselves in the metaverse
- One patent filing shows a sketch of a "wearable magnetic sensor system" that the user places around their torso for "body pose tracking"
- Another patent can detect a user's facial expressions through a headset. The system would then compute the expressions and "adapt media content" based on its findings
- The firm is also said to be developing an "avatar personalization engine" that can create three-dimensional avatars based on a user's photos
- Meta CEO Mark Zuckerberg has said his company plans to invest \$10 billion per year over the next decade to develop metaverse technology

3 Simple Cybersecurity Resolutions



- Say “yes” to update
 - Installing updates promptly is one of the best ways to be more cybersecure. Next time an app offers you an update, click “yes” instead of “no”, “cancel” or “remind me later”
- Say "no" to feeble passwords
 - Strong passwords keep your data safe, so don't let yourself choose feeble passwords in 2022, and if somebody shares a password with you, or asks for yours, just say "no"
- Say "woah" to unexpected messages
 - Scams come in all shapes and sizes, but no matter how they're dressed up, they always want something valuable, URGENTLY. So don't be rushed—take your time in 2022

Passphrase Vs. Password – Why?



- Human error is a crucial element of a successful cyberattack attempt
- Weak credentials are a prime suspect
- A passphrase is a password composed of a sentence or combination of words
- Passphrases generally tend to be longer and more complex than the average password, which increases overall security
- The biggest factor in the consideration of passphrase vs. password is simply the amount of time it takes to crack a password
- However, password managers remain your best approach



Market Conditions

Considerations For Now And The Future

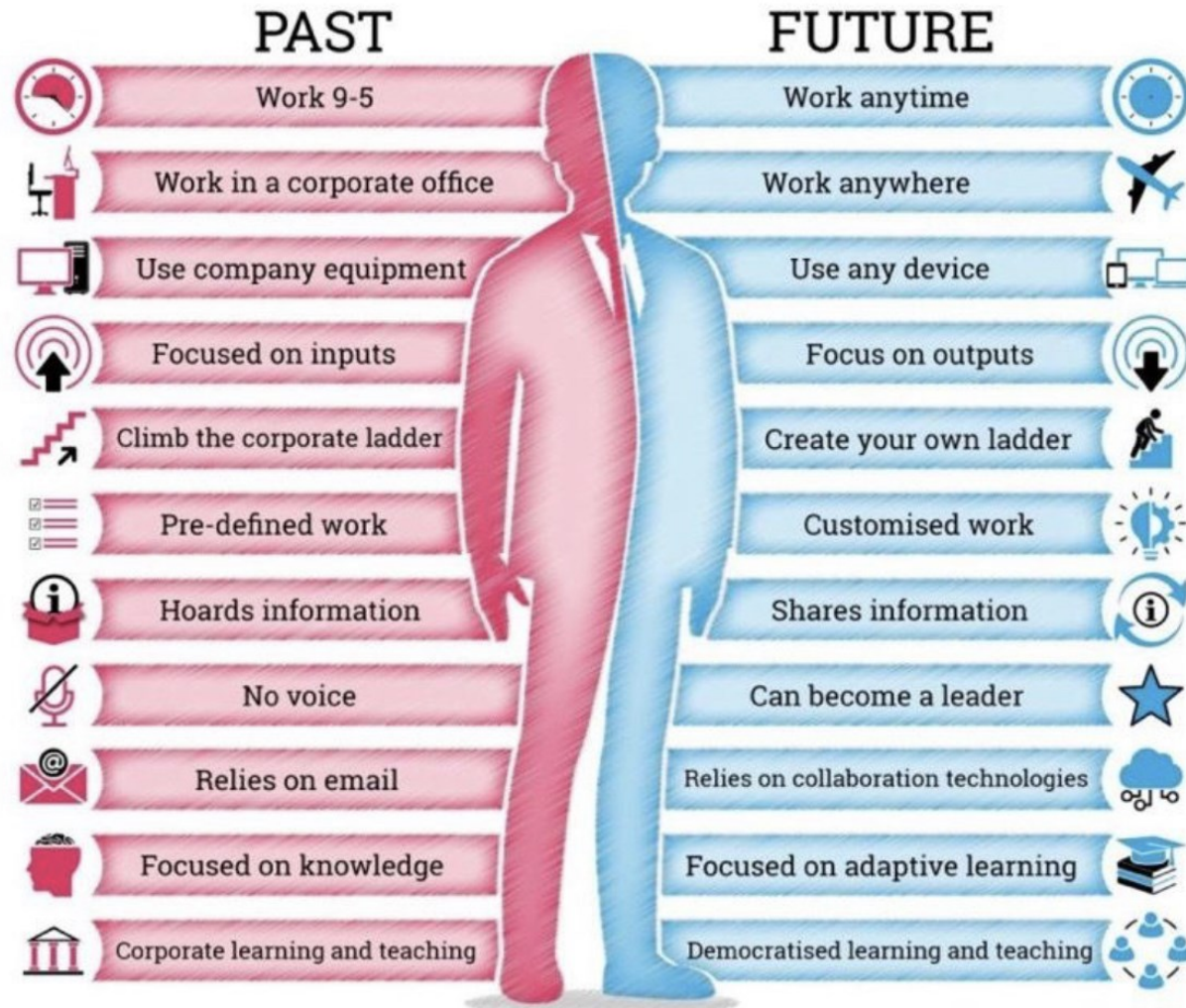
Key Themes For 2022



- Challenging labor market
 - Remote work still big
 - Data Economy
 - Effective automation
 - Diversity and balance
 - Sustainability
- 2021
 - Insight
 - Innovate
 - Independence
 - 2022
 - Guide
 - Grow
 - Give

The evolution of the employee

Data source: @capture_brain | Infographic design by @agrassoblog for educational and motivational purposes



Labor Is Tight Everywhere



- Record resignations in 2020-2021
- Employee costs increasing
- Outsourcing is common with labor prices going up
- Commoditization of services driving value of labor down
- Globalization was formerly a competitive advantage

So Now We Have An Endemic



- Variants of COVID-19 continue to force people to work remotely
- Technology enablement wins for productivity and collaboration
- SaaS improvements provide more capability
- Maintaining culture and on-boarding remain challenges
- Technology ease of setup and security even more important
- Workplace safety varies with inconsistencies and sensitivities

If You Don't Pay For It With Money, You Pay For It In Other Ways



- A **Data Economy** is a global digital ecosystem in which data is gathered, organized, and exchanged by a network of vendors for the purpose of deriving value from the accumulated information
- Data inputs are collected by a variety of actors including search engines, social media websites, online vendors, brick and mortar vendors, payment gateways, software as a service (SaaS) purveyors, and an increasing number of firms deploying connected devices on the Internet of Things (IoT)
- Data is the new oil

Consider That Within 5 Years Most Data Will Be Created At The Edge



Impact of Data

- Who does the data analytics?
- What is meaningful data?
- When is the data useful?
- Where do we store the data?
- Why is this shift happening?
- How do we handle the volume?

Accounting Considerations

- Who handles the data?
- What controls need applied?
- When is accounting involved?
- Where is the value?
- Why must standards change?
- How do we perform financial reporting?

Diversity A Concern



Balance

- Skills vs. qualifications
- Value of various viewpoints
- Region, race, and sex
- Divergence
- Choice and options
- Legacy and new solutions

Bias

- Training and Education
- AI bias
- Desire for “like kind”
- Convergence
- Limitations
- Fewer dominant, many startups

Sustainability



Business

- Financial-Profit
- Intellectual-New solutions
- Digital-Conservation
- Physical-Disposable
- Human-Leverage of labor

Planet

- Resources
- Undiscovered capabilities
- Renewable
- Reusable
- Value of relationships

Electric Vehicles - Coming Of Age



- GM Silverado truck, BrightDrop, Cruise
- Chrysler Airflow Concept
- Mercedes Vision EQXX
- BMW iX Flow
- Sony Vision-S 02



John Deere See And Spray



We've Been Talking Ag Robots Five+ Years, With Naio Orio & Vitrover





Strange But True

Reverse Aging By 2033? – Biotech, Nanotech, Infotech



- [Maximum Life Foundation](#) reports efforts in AI, Sensors, Robotics, 3D printing, genomics, Big Data and more
- Resources at <https://www.fightaging.org/>



Virtual Reality













- Your next [chemistry lesson](#) could be in virtual reality

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Conclusion



- Software and cloud-based innovations continue to lead how technology is simplifying the lives of everyone
- Communication changes are making faster internet available in more places, but the deployment takes a long time
- Hardware is advancing rapidly, although the impact of the new tech is limited by problems with the current supply chain



Thank You!

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