

**Welcome to What's Next.**



## **Please Note**

We will be referencing actual companies and offerings.  
We do not endorse any company or their work.

# Emerging Technology

tools or other applied science that hasn't fully developed or been adopted yet

# Emerging technologies are vital to IT modernization.

- ▶ Make processes more efficient.
- ▶ Expand data and analytics capabilities.
- ▶ Strengthen security, safety and reliability.
- ▶ Highlight potential problems early and continuously.

# ITC tracks emerging tech that are relevant to agencies.

65+

IT-related emerging technologies from computer chips to space junk management

8

major categories of IT-related emerging tech from virtual reality to robotics

4

stages of adoption from R&D through private and government experiments

15+

folks researching and running experiments on IT-related emerging tech

Emerging Tech Theme

# Advanced Cybersecurity



# Cybersecurity

protecting systems and sensitive information from digital attacks



# Cyberthreats, attacks and impacts continue to rise.

**38%**

increase in global  
cyber attacks in 2022  
(Security Magazine)

**112M**

attacks on IoT devices  
in 2022, an increase of  
87% (SonicWall)

**\$2M**

average cost of a  
public sector data  
breach in the US (IBM)

**29%**

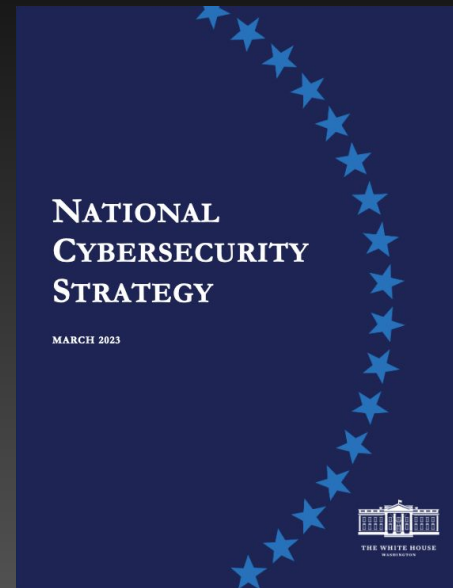
forecasted growth of  
public cloud services  
in 2023 (Gartner)



# The National Cybersecurity Strategy just rolled out.

**The five pillars strongly emphasize public private partnerships.**

1. Defend Critical Infrastructure
2. Disrupt and Dismantle Threat Actors
3. Shape Market Forces to Drive Security and Resilience
4. Invest in a Resilient Future
5. Forge International Partnerships to Pursue Shared Goals



# Cyberthreat tactics and techniques are growing.

## Mitre Enterprise ATT&CK Matrix

14 categories of threat

220+ techniques

Associated detections & mitigations

Separate matrices for ICS & mobile

Used extensively by CISA

Category	Techniques
Reconnaissance	10 techniques
Resource Development	7 techniques
Initial Access	9 techniques
Execution	13 techniques
Persistence	19 techniques
Privilege Escalation	13 techniques
Defense Evasion	42 techniques
Credential Access	17 techniques
Discovery	30 techniques
Lateral Movement	9 techniques
Collection	17 techniques
Command and Control	16 techniques
Exfiltration	9 techniques



One tool in cybersecurity is the **Software Bill of Materials (SBOM)**.



# Software code is usually made up of shared elements.

*Library*  
*Module*  
*Binary*  
*Compiler*  
*File*  
*Installer*  
*Data Feed*  
*Controller*  
*Service*  
*Plug-In*  
*API*



## **Security Warning**

Many software elements are shared and modified among companies and organizations.

# Trace how those elements were made and changed.

**Inspect  
every...**

*Library*  
*Module*  
*Binary*  
*Compiler*  
*File*  
*Installer*  
*Data Feed*  
*Controller*  
*Service*  
*Plug-In*  
*API*

**...to find out...**

- Where did it come from?
- Who made it?
- When was it updated?
- Who updated it and do I trust them?
- Does it still comply with security policies?
- Did the upgrade fix the vulnerabilities?

# Software components aren't getting fixed fast enough.

**1,703**

audited codebases  
mostly as part of  
mergers and  
acquisitions activity

**96%**

of audited codebases  
contained open-source  
components

**89%**

of audited codebases  
use open-source  
components that are 4+  
years out of date

**54%**

of audited codebases  
contained license  
conflicts

*Based on Synopsis Cybersecurity Research Center of codebases*



# Software Bill of Materials

a list of components used to make computer code and how they've changed

# Agencies may have to acquire/require SBOMs soon.

Executive Order 14028 mandates SBOMs for purchased software.

NIST, CISA and NTIA have all published guidance.

OMB M-22-18 permits agencies to add SBOM req's to solicitations.

SBOM requirements NOT included in the recent NDAA.

FAR cases being decided over next 6-9 months.

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## Focus

In-agency software teams

External software suppliers

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## Potential Pricing Structure

Per user per month

Open source / “free”

Included in software dev packages

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## Potential Vehicles

STARS 8(a)

Alliant

Multiple Award Schedule



Emerging Tech Theme

# Generative AI

# Artificial Intelligence (AI)

the science and engineering of making intelligent machines

We **train** AI systems by feeding in **data** and letting them find **patterns**.



All of that pattern analysis  
creates a framework for  
how words work together.



Large Language Model (LLM)



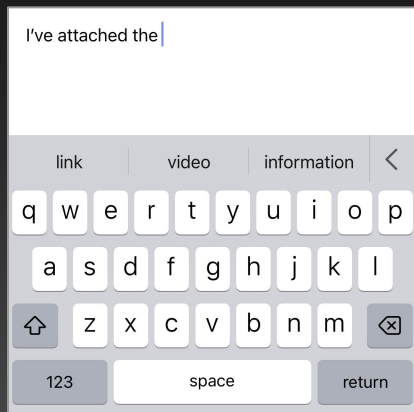
AI can now do more than **analyze** phrases, bullets, sentences, paragraphs, chapters and books.

AI can now **generate** new content.

# Generative AI

using AI models to create new content

# LLMs can be used to generate all sorts of content.



Predict your next word

Public service is a career that offers an opportunity to serve the public, improve lives and improve the world. It is considered a public trust that requires loyalty to the Constitution, laws, and ethical principles. Public servants are expected to be mindful of and respectful to the communities while prioritizing their growth and development.

Being a public servant requires embracing change, being open to new ideas, and developing a passion for making a difference. It also requires being aware of your mind and eyes open, and taking time to listen to the needs of the community.

Public service is considered a public trust that requires loyalty to the Constitution, laws, and ethical principles. Public servants should not hold financial interests that conflict with their duties.

1.

Write an essay

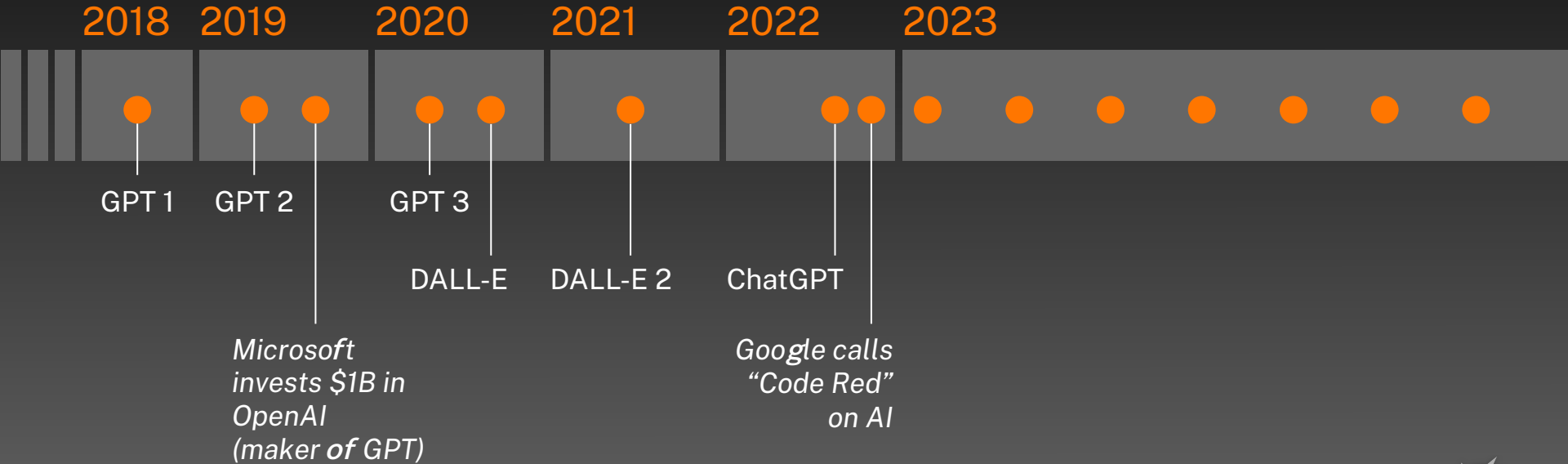
```
document.addEventListener('click', function(e) {
  var copyButton = document.querySelector('#copy');
  copyButton.addEventListener('click', function() {
    chrome.tabs.query({active: true, currentWindow: true}, function(tabs) {
      function(url) {
        var url = tabs[0].url;
        // TODO: Copy URL to clipboard
      }
    });
  });
});
```

Create software code

Generative AI goes beyond text to **images** and **audio**.

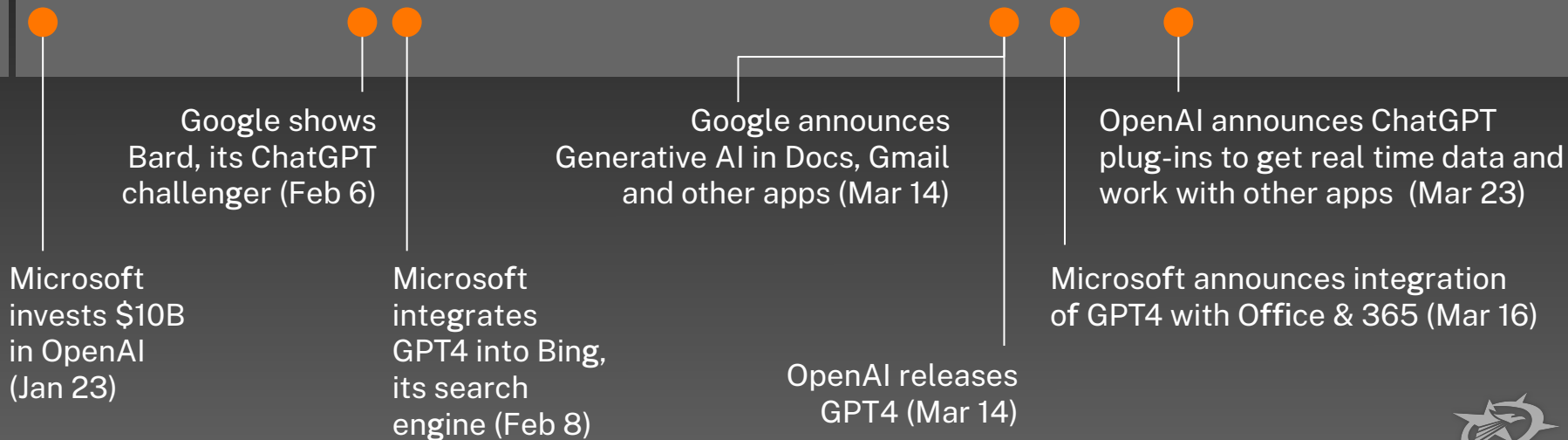


# The pace of Generative AI advancements is going up.



# The last 3 months have been big for Generative AI.

2023



“After about an hour of work, the model converted a highly technical Statement of Work into a rudimentary Performance Work Statement that appears, to the untrained eye, to be in line with the FAR. The final product is about two pages. All text was generated by the model.”

*Quote from report on experiment with ChatGPT run by Chris Robinson, ITC*



# Like the tech, the business models are also emerging.

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## Access

Browser-based + standalone apps

Being integrated into other apps

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## Pricing

Monthly subscription

Pay by the character/word/image

“Free” (in exchange for data)

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## Security

No guarantees of confidentiality

Data likely mined to refine model

Risk of cyberthreat/malicious code

# Ask questions before acquiring Generative AI for a test.

Is **agency IT** bought in/approve?

What **relationships** does the government have with potential vendors today?

What are the **SLAs** and terms of service?

How do vendors **gather, process, store and secure** information?

What **biases** do the models have?

Who **owns** the data and results?

## Potential Vehicles

*MAS / IT Professional Services*

*SIN Alliant*

*STARS 8(a)*

## Potential Vendors

*Larger tech companies*

*Small businesses and startups*

*System integrators*

*Smaller resellers*